The Royal Society of Edinburgh

Media Information

For Immediate Release 17 June 2005

What do Young People think about Climate Change?

Ahead of the G8 Summit, and amidst warnings of dire consequences, senior school students in Fife and Tayside are being asked to decide how Scotland should respond to Climate Change. Meeting on Tuesday June 21 at The University of St Andrews for a discussion forum organised by The Royal Society of Edinburgh (RSE), S5 & S6 students will have the opportunity to hear evidence and opinion from experts in the field of Climate Change, to challenge and question them and to air their views.

The students are expected to debate the environmental, economic and social implications of different strategies and to come to their own conclusions. A report of the Students' proposals will be sent by The RSE to decision-making bodies, including the Scottish Parliament, helping the views of the young people to be heard. Students from the following schools are to participate: Glenwood High School, Glenrothes; Grove Academy, Broughty Ferry; Inverkeithing High School; Kirkland High School, Leven; Morgan Academy, Dundee; St Andrews High School, Kirkaldy and St Saviour's RC High School, Dundee.

Dr Harinee Selvadurai, Education Officer for The Royal Society of Edinburgh said:

> *The purpose of this event, which is part of the RSE's series of discussion events for senior school pupils held throughout Scotland, is to give the Students access to experts covering different aspects of the issue, and crucially for the Students to reach their own conclusions. The choices we make in responding to Climate Change will have far reaching social, economic and environmental consequences and so it is essential that young people have a say in the way their world develops. We shall be seeking to draw their conclusions to the attention of key decision and policy makers, to contribute to the debate and in finding solutions.*

Members of the Media are cordially invited to attend at 2.15pm to hear the Students' conclusions.

Programme

09.30	Registration
10.00	Welcome & introduction by chairperson Dr Maggie Gill, FRSE, Director of the Macaulay Institute
10.05	Climate Change: Is it really happening and how will it affect us? Dr Simon Allen, University of Edinburgh
10.25	All Talk and No Action: The strange world of climate change politics. Ms Morag Watson, WWF Scotland
10.45	Climate Change Begins at Home. Dr Dave Reay, University of Edinburgh
11.05	Refreshments
11.20	Workshops
12.00	Lunch
12.30	Workshops
14.15	Student presentations (Members of the Media welcome to attend)
15.00	Summary and closing remarks by chairperson
15.05	Close

Abstracts & Biographies:

CHAIRPERSON: PROFESSOR MAGGIE GILL FRSE, MACAULAY LAND USE RESEARCH INSTITUTE.

Maggie Gill has a BSc in Agricultural Science from the University of Edinburgh and a PhD from Massey University, New Zealand. She worked as a researcher into the nutrition of sheep and cattle in the south of England from 1976 to 1989, when she moved jobs to work in the research arm of the UK Government's Overseas Development Administration, initiating and consulting on projects on dairy cattle nutrition in Bolivia, Kenya and

India, amongst many other countries. Since 2000, she has been Chief Executive and Director of Research at the Macaulay Land Use Research Institute in Aberdeen.

Maggie is an Honorary Professor of the University of Aberdeen and was a member of the Scottish Science Advisory Committee from 2002 to 2004. She retains an active interest in agricultural research for developing countries, being a member of the Consultative Group for International Agricultural Research Standing Panel on Mobilising Science. She was made a Fellow of the Royal Society of Edinburgh in 2003.

CLIMATE CHANGE: IS IT REALLY HAPPENING AND HOW WILL IT AFFECT US?
DR SIMON J ALLEN, UNIVERSITY OF EDINBURGH

Simon Allen is a lecturer in sustainable development at the University of Edinburgh, where he runs a Master of Science degree programme in Environmental Sustainability. His main research interests relate to the complex links between climate change, the natural environment and society. He has contributed to studies of the impacts of climate change on Scotland and other regions of the UK, and to assessments of government policies to limit greenhouse gas emissions. Before joining the University of Edinburgh in 1997, he was a research scientist at the Institute of Hydrology, Wallingford, where he worked on a range of projects focused on the relationships between land use, climate change and water resources, e.g. investigating the role of land use changes in causing the prolonged drought in the West African Sahel.

Introduction

Although climate change features with increasing regularity in the news, public understanding of the issue is poor, with little appreciation of how our own lifestyles contribute to the problem, its likely future effects on society and what can be done to slow it down. For a problem that is nowadays often identified as our most serious environmental threat, there is little evidence of government action that has reached the lives of everyday people. In the name of editorial balance, media coverage often includes contributions from those who still deny the existence of climate change as a serious threat to society's well-being, or claim that actions to prevent it will be too costly, so are not economically feasible.

This introductory presentation will briefly review the evidence for climate change that arises from an overwhelming consensus of the world's climate scientists. It will then briefly introduce some of the most serious likely impacts of climate change, strongly suggesting that climate change is a real problem, demanding society's serious concern and action.

What is the evidence for climate change?

Climate change is caused by enhancement of the natural greenhouse effect that results from various human activities which release "greenhouse gases" into the atmosphere. These gases enhance the atmosphere's ability to trap heat energy radiating from the Earth's surface, thereby increasing the temperature at the Earth's surface – in much the same way as the glass panes of a greenhouse keep heat inside it, resulting in a greater internal temperature compared to the environment outside. The main greenhouse gas is carbon dioxide (CO_2), which is released when any kind of fossil fuel (coal, oil, gas) is burnt. Almost all aspects of modern industrial society require energy for them to operate, and this is most often supplied by fossil fuels, to the extent that there is a very strong relationship between a country's economic wealth and its energy consumption. There is also a large amount of carbon stored in trees and in certain soils (such as Scotland's peat bogs), so changes in land use, like cutting down forests or draining wetlands for agriculture are also important sources of CO_2.

The scientific evidence for climate change comes from the research of climate scientists working all over the world. In 1988 the United Nations Environment Programme and the World Meteorological Office formed the Intergovernmental Panel on Climate Change (IPCC) to produce global assessments of the risks of climate change, based on the work of the world's climate scientists. So far the IPCC has produced three assessments, finding increasingly strong evidence of climate change resulting from human activities. The most recent assessment, published in 2001, concluded that "there is new and stronger evidence that most of the warming observed over the last 50 years is attributable to human activities". The report was based on the work of over 600 scientists and was agreed by 99 member countries of the IPCC, and therefore provides an extremely authoritative consensus.

The main problem in detecting climate change and measuring how fast it is happening is that the weather is changing all the time, from day to day and week to week as we experience rainstorms, dry spells or unseasonable frosts. The weather also changes from place to place. These changes in weather are often much larger than any underlying gradual change in climate, making it very difficult to prove that the climate is changing. The only solution is to examine daily weather records going back over many years from a network of weather stations covering as much of the Earth's surface as possible, and to calculate long-term averages of global surface temperature. Using this technique, the IPCC scientists found that over the last century, global average surface temperature has increased by about 0.6 °C. Other measurements over recent decades also show a warming climate, for instance the increased melting rates of glaciers and the shorter duration of arctic sea ice in winter.

Weather records are only available back to about 1860, but by using measurements such as the widths of tree rings and the concentration of gases in bubbles of air trapped in ancient polar ice, IPCC scientists have been able to reconstruct the climate much further back in time, and also to study past amounts of greenhouse gases in the atmosphere. These measurements produce a very clear picture of accelerating increases in greenhouse gases from the beginning of the Industrial Revolution, accompanied by accelerating increases in temperature, with the 1990s being the warmest decade of the last millennium (1000 to 2000 AD).

How will climate change affect us?

Changes in global temperature will be accompanied by changes in rainfall patterns, storminess and rises in sea level. Many aspects of the natural environment and human society are sensitive to these aspects of climate, so the impacts of climate change are likely to be many and various. In Scotland, concern centres mainly on increased flooding of both coastal areas and river corridors. Climate change is likely to affect tourism, particularly skiing, with little winter snowfall predicted in Scotland by the 2050s. Some changes may be positive, for instance Scottish agriculture is likely to benefit from a warmer climate, with farmers able to grow a wider range of crops.

Although we will undoubtedly experience some direct effects of climate change in Scotland, we are a relatively wealthy country, so therefore have the capacity to adapt to climate changes. For instance, we can afford to strengthen sea walls to prevent flooding of vulnerable areas, or can use the National Health Service to protect our citizens from diseases spreading from warmer areas.

The most severe and earliest impacts of climate change are likely to fall on poor developing countries, which combine high vulnerability with a low capacity to adapt, creating a high risk of serious loss of human life, e.g. the flooding of the Ganges delta, or mass starvation caused by crop failure in the arid countries of Africa. Although such disasters will not affect Scotland directly, we live in a globalised world, so will share in the costs of humanitarian relief and will be affected by political tensions over environmental refugees, or by increases in global food prices.

ALL TALK AND NO ACTION: THE STRANGE WORLD OF CLIMATE CHANGE POLITICS
MS MORAG WATSON, WWF SCOTLAND

Morag Watson is Education Policy Officer for WWF Scotland and has worked in the field of sustainable development and public understanding of science for over eight years. In this time she has worked for the Royal Botanic Gardens, been involved in many science festival events and was one of the founding members of staff at Our Dynamic Earth, an earth sciences visitor attraction in Edinburgh.

She is chair of the Sustainable Development Education Policy Network and a member of the Sustainable Development Education Liaison Group advising the Scottish Executive on sustainable development education.

A graduate of the University of Edinburgh, Morag holds a degree in Environmental Geoscience and spent four years studying the links between geology, ocean, atmosphere and biology of our planet.

Introduction

Without a doubt the debate on climate change has come a very long way since it first began. From a subject that was once only discussed by a few scientists and environmentalists it is now front page news. Tony Blair has called climate change 'the greatest threat we have ever faced''. When the leaders of the eight most powerful countries in the world meet at the G8 summit on the 3rd July 2005, climate change will be at the top of the agenda.

What Has Been Done to Stop Climate Change?

At the United Nations climate summit in Kyoto in 1997, legally binding targets were agreed in order to achieve a reduction in industrialised countries' emissions of the six main greenhouse gases, by just over 5% by 2012, compared with 1990 levels.

It took over four years for the world's leading industrial nations to agree on rules that would allow the Kyoto Protocol's recommendations to be put into practice. But the US had rejected the agreement. This is bad news: the US – which has 4% of the world's population – accounts for around 25% of global emissions, and is therefore the world's largest carbon dioxide emitter. The good news is that a large enough number of nations have ratified the protocol for it to become international law, the Kyoto Treaty, on 16 February 2005.

As part of the Kyoto Protocol, the UK agreed to a 12.5% cut in emissions. The British government has also set itself a separate domestic target for carbon dioxide: to emit 20% less in 2010 than in 1990; but by its own admission it is unlikely to meet this target.

UK Emissions

In December 2004, the British government admitted that it had not done enough on climate change. Emissions actually rose in 2003 and 2004 and the government is letting the power and big industry sectors off the hook by

failing to set them challenging targets. Transport emissions are running away, with continued growth in car use, the railways in crisis and government support for increasing air travel.

A 2004 WWF report found that the UK is responsible for almost 30% higher carbon dioxide emissions than the figures released by the government. The figures are so much higher because the government only counts those emissions generated by factories, power plants, vehicles, etc in the UK. Since a majority of our food, manufactured goods and raw materials are imported, the economy generates carbon dioxide emissions elsewhere in the world, as well as those from aviation. Now we only have five years left to get tough on industry and transport, and deliver the government's promise of a 20% cut in carbon dioxide by 2010.

To stabilise climate change altogether, emissions of carbon dioxide would have to be reduced by around 70% globally by 2050. The British Government has stated its ambition to reduce CO_2 emissions by 60% by 2050. The current international agreements do not propose reductions of anything near this level.

Why Do the Actions not Match the Words?

Although the UK government states that climate change is a priority and has set itself emission reduction targets, these commitments are not being matched by the government's actions. If climate change is the greatest threat we have ever faced, what could possibly be more important than taking action to limit its effects?

Organisations concerned about climate change have challenged the government on their lack of action and called for much tougher regulations. However the government is resisting these calls, saying that there is no public support for such measures. The government has argued that imposing tougher regulations without public support would result in an outcry, the government would loose public support and no one would vote for them during elections. Earlier this year the Prime Minister summed this up by saying: "If we were to put forward as a solution to climate change something which would involve drastic cuts in economic growth or standards of living, it would not matter how justified it was, it simply would not be agreed to."

But if the public are not interested in climate change, why is it so often in the news? There would be no point in journalists wasting time and money on climate change reports if no one was interested in them. A survey carried out in 2005 found that 70% of the UK public were concerned about the environment.

If the government is to take tougher action on climate change, one of the toughest challenges will be to close the gap between what the government believes people think and what people actually think.

CLIMATE CHANGE BEGINS AT HOME
DR DAVE S REAY, UNIVERSITY OF EDINBURGH

Dave Reay is a NERC (Natural Environment Research Council) Research Fellow at the University of Edinburgh. He studies greenhouse gas emissions in environments ranging from the Southern Ocean to evil-smelling drainage ditches. He has written numerous academic and popular articles about his work and is author of the book Climate Change Begins at Home, published by Macmillan Science (2 September 2005). Dave is also Editor of the leading climate change website www.ghgonline.org. He lives in a house well above sea level.

Why should we act?

Climate change is one of the greatest threats that humankind faces in the 21st century. The next hundred years could see coastlines and islands submerged, and a surge in heat waves, droughts, floods, and therefore in pests, disease, famine and displacement.

Some potential impacts of climate change:

In Scotland

- 90% less snow by 2080.
- Ski industry defunct by 2025.
- Cod could be commercially extinct by 2010.

In the UK

By 2050:

- Malaria may be re-established.
- extra 5,000 cases of skin cancer per year
- extra 2,000 cases of cataracts per year
- 10,000 extra cases of food poisoning each year

By 2080:

- Annual flood damage losses may top £20 billion
- Annual storm surges — currently once every 20 years.
- 50% less rain in South East England — the end of the English lawn

Worldwide

- The UN estimate that 150,000 people a year already die because of climate change
- By 2025 5 billion people will be at risk of having no water
- By 2050 there will be 150 million climate change refugees
- Diseases set to spread to the developed world in the next century include: Plague, Dengue, West Nile Virus, Leishmaniasis, Bilharzia, Chagas' disease, Lyme Disease, Tick-borne Encephalitis, Rocky Mountain Spotted Fever.

By 2080

- Flooding to threaten 2 billion people per year — 4 times today's figures
- 300 million more people will be at risk from Malaria (currently killing a child every 30 seconds)
- Yields of staples like wheat, rice, maize and soybeans could halve
- Famine could threaten 80 million more people

The Power of One

With summer in full swing and the days growing hotter there is already talk of heat waves. Professor Sir Liam Donaldson, the UK's chief medical officer, last month updated the guidance on how to cope with excessive heat following an indication from the Met Office that July and August this year could be particularly warm.

Into these potentially record July temperatures the leaders of the most powerful nations on earth – the G8 – will arrive next month for a summit at Gleneagles. The lead topics up for discussion: Africa and Climate Change. At that G8 Table of Power will sit George W Bush, leader of the world's biggest greenhouse gas emitter, and Kyoto Protocol drop-out. One would like to think that the current G8 President, Tony Blair, will get agreement on some meaningful emission cuts. History, though, suggests otherwise.

During the last 10 years my belief that the US and others will act in a concerted way to tackle global warming has ebbed away, just as carbon dioxide concentrations in the atmosphere have crept up and up. Working in a building of climate scientists you can hear the groans each time news comes in of more political back-sliding on climate change mitigation.

So, what to do? Should the scientists and everyone else simply wait until things get so bad that politicians are forced to act? Maybe, if you believe you can make no difference. However, there is a way to fight back…

Take all the greenhouse emissions of developed world (rich) nations. Now break them down into the end-user responsible: A quarter of all these emissions are due to energy use at home, another quarter is from transport, and most of the rest comes from the places we work and go to school. From things like using energy efficient appliances at home, through traveling by train rather than plane, to switching the lights off when they're not needed, we can make big dents in all three of these climate-changing facets of our lives.

As an individual, each of us can cut our lifetime contribution to global warming by over 1,000 tonnes of greenhouse gas by being climate aware. Multiply this up for everyone in your school, your street, or your town, and the potential savings are huge. Through increasing awareness and individual action in the developing world we can achieve not just one Kyoto Protocol-sized reduction in emissions, not two, but a cut equivalent to half a dozen Kyotos. All before the politicians have decided who will sit where at the next climate change meeting.

As individuals we each have a big stake in the global climate. Things could get very bad for a very large number of people. Sure, we need the politicians to take action too – let's hope they don't have air-conditioning at Gleneagles – but while we're waiting for them to do their bit, let's get on with doing ours.

Workshops

Workshop 1

- There is much discussion in the media about whether climate change is generated by man or simply as part of natural cycles. Does that really matter?
- Do you believe that climate change is a real threat? Why?
- Do you feel it is serious enough to demand the thorough restructuring of industrialised societies in order to make the necessary cuts in greenhouse gas emissions?

Workshop 2

- Given that some of the most devastating consequences of climate change will be for developing countries, why does climate change matter to us in Scotland?
- Air travel and air freight transport is a major contributor to climate change, yet cheap air travel has enabled many more people to travel the world, which together with global trade has contributed to more equal economic development. Should air travel be taxed or even curtailed to limit its environmental impact?

Workshop 3

- Do you agree that developed countries, who gained their economic dominance through the fossil-fuel-based Industrial Revolution, should accept the biggest share of the reduction in global greenhouse gas emissions?
- Should developing countries be expected to meet Kyoto targets and limit their access to goods such as fridges, when they haven't contributed as much to the causes of climate change as the rest of the world?
- Developing countries are exempt from greenhouse gas emission reduction targets under the Kyoto Protocol – does this give them an unfair competitive advantage in the global economy? This argument has been used by the USA to explain its non-ratification of the Kyoto Protocol – do you think it is reasonable?

Workshop 4

- 70% of the UK public are concerned about the environment, but are they willing to make drastic changes to their lifestyle?
- Would these drastic changes make our lives better or worse?
- How can the governments of rich developed countries introduce policies to control greenhouse gas emissions, when these will impose restrictions on the lifestyles of their electorates, who have the power to vote them out of office?

Workshop 5

- How can each of us help to fight global warming?
- What would you be prepared to give up or change, if anything, to reduce the risk of dangerous climate change?
- Does it matter that any changes you make today will mainly affect future generations, and particularly those in developing countries?