

# CLIMATE CHANGE AND THE UK RISKS AND OPPORTUNITIES

What does the Intergovernmental Panel on Climate Change Fifth Assessment Report mean for the UK?

# Contents

---

Introduction	1
Foreword	2
Findings of the IPCC report	
Science	3
Economics, adaptation & mitigation	4
Implications for the UK	
Health	5
Food & farming	6
Security & the military	7
Business	8
The Energy & Climate Intelligence Unit	9

# Introduction

---

The Intergovernmental Panel on Climate Change (IPCC) is the world's leading authority on climate science, economics and policy options, concerning both adaptation and mitigation. Its latest assessment, completed in November 2014, represents the culmination of 830 authors' work drawing on more than 30,000 pieces of research.

In this booklet, six experts distil the report into key risks and opportunities for the UK, focusing on climate science, the role of adaptation and mitigation, health, food and farming, security and the military, and business.



# Foreword

by LORD TURNER OF ECCHINSWELL

---

**Climate change is one of the forces that are re-shaping our world. Climate impacts can affect economies, businesses, societies and nature; policies implemented in response can also bring change, either evolutionary or transformational.**

An appreciation of evidence on climate change is therefore crucial for effective policymaking. Evidence-based policies will ease the transition to a resilient low-carbon economy and take advantage of opportunities on offer; bad policy will expose businesses and societies to increasingly serious risks and perhaps unnecessary expense.

The Intergovernmental Panel on Climate Change is the leading global authority on the science, economics and implications of climate change. Every five or six years, it distils information from academic studies and other sources into a set of reports that represents the current state of knowledge.

There is of course no guarantee that its projections will turn out to be correct in every detail. Climate change is not an area in which we can expect exact predictions; instead the IPCC gives us the best picture currently available of risks and opportunities ahead. Its conclusions are therefore essential information for policymakers, business leaders and informed citizens, whose decisions will have implications for many decades to come.

A handwritten signature in black ink that reads "Adair Turner".

# Findings of the IPCC Report

## SCIENCE

1 Climate change is unequivocal, with evidence observed on every continent and in the ocean. It is at least 95% likely that human agency, particularly the emission of greenhouse gases, is the dominant cause.

2 The average temperature at the Earth's surface has risen faster over the past century than at any time in the past two millennia, and probably much longer. The rate of increase has slowed over the last 16 years but other indicators of climate change such as ocean warming, sea level rise and melting glaciers have not slowed – nor has acidification of the ocean.

3 The concentration of carbon dioxide in the atmosphere is higher than it has been for at least 800,000 years. If emissions continue rising at the current rate, consequences by the end of the century include a global average temperature 2.6-4.8C higher than present and sea level 0.45-0.82 metres higher. This warming presents risks of triggering major and irreversible changes such as melting of the Greenland ice sheet.

4 Projecting changes for the UK is not straightforward given our geographical position, with weather influenced by changeable factors including the jet stream and the Gulf Stream. However, an increase in extreme events such as heatwaves, increasing flood risk due to rising sea level and rain, and increased drought risk in the south appear likely.

5 Projected global trends with impacts on Britons include a reduction in agricultural output, and damage to nature including increased risk of species extinctions, disruption of the marine food web and increased pressures for species migration.



“ The overall scientific picture of climate change is clearer than it has ever been, although our understanding will never be perfect. What we do know is that the climate system takes decades to respond to changes in carbon emissions, so decisions made now will affect future generations as much as the current one. ”

**- Professor Joanna Haigh**  
*Co-Director, Grantham Institute, Imperial College London*

# Findings of the IPCC Report

## ECONOMICS, ADAPTATION & MITIGATION

- 1 Investing in adaptation is prudent because greenhouse gases already in the system make further climate impacts inevitable. Many aspects of climate change, and ocean acidification, will continue for centuries even if emissions fall rapidly.
- 2 Capacity to adapt is progressively eroded as climate impacts progress. A combination of adaptation measures and substantial cuts in greenhouse gas emissions can limit risks from climate change.
- 3 Limiting global warming to 2 Celsius, the internationally agreed goal, is feasible if governments act quickly and in concert. Most feasible pathways have emissions peaking within about a decade and declining to zero in the second half of the century. Costs of the transition to 2C would shave about 0.06% off annual economic growth if governments enacted co-ordinated measures such as a global carbon price.
- 4 The sum of current pledges from governments is not enough to meet the 2C target. On current trajectories, 3C or 4C is more likely. Few studies have mapped the economic consequences of such a change.
- 5 Transition to the 2C pathway implies rapid and profound changes in areas such as energy supply, buildings and transport. Early transition in the energy sector is economically and technically favoured: measures include substantial energy efficiency improvements, a three-to-four fold increase in low-carbon generation by 2050, and electrification of services such as heating and transport.



“ The evidence clearly shows that a prudent climate change policy involves both adaptation and decarbonisation; neither on its own is enough. The evidence suggests that decarbonisation will be cheaper if it starts earlier, with reducing energy waste a key priority. ”

**- Professor Jim Skea**

**Research Councils UK Energy Strategy Fellow and Professor of Sustainable Energy, Imperial College London: member of the Committee on Climate Change: Vice-Chair, Working Group 3, Intergovernmental Panel on Climate Change**

# Implications for the UK

## HEALTH

1 The risk of extreme heat events (heatwaves) is likely to have increased in large parts of Europe due to climate change. Further extremes are expected in future with the very young and the elderly most vulnerable to the effects of heat.

2 There could be modest reductions in cold-related mortality and morbidity due to fewer cold extremes, although cold snaps will still occur.

3 More flooding would increase the risk of deaths from drowning, the spread of infectious diseases and risks of mental health conditions. The prevalence of mental health problems (distress, anxiety, and depression) was two to five times higher among individuals who reported flooding in the home in 2007.

4 New and resurgent vector-borne diseases, including Dengue, are moving north as temperatures rise, and have recently appeared in Europe.

5 Overall the impact to health from climate change in the UK is likely to be negative, but tackling climate change can have significant 'co-benefits' for health. These include reduced air pollution from emissions, and improving general fitness and cardiovascular health through shifting to 'active transport' such as cycling and walking.



“ Climate change *is* a health issue, and we take climate change very seriously. The science is clear and the time to act is now. We anticipate significant benefits to health from a low-carbon lifestyle, and significant impacts on health if we don't. ”

**- Professor David Walker**  
*Deputy Chief Medical Officer for England*

# Implications for the UK

## FOOD & FARMING

---

- 1 Extreme weather conditions are projected to increase and are likely to hit UK food production. (Extreme weather led to the UK needing to import wheat in 2012 and 2013).
- 2 Moderate warming may expand the growing season of some crops in the UK. But the overall impact on crop yields is unclear.
- 3 Globally, climate change is likely to reduce crop yields over time. Given the needs of an expanding global population, the security of supply of our imported food and livestock feed is at risk, with more volatile prices likely.
- 4 Agriculture needs land and water, but both are threatened by more droughts and floods. (Farmers will need access to enough water and, with most of the UK's best land below the 5m contour line and sea-levels rising, more investment in flood management is needed).
- 5 Heat stress also reduces yields in livestock, whilst the gradual warming already seen has led to the arrival of new diseases such as Bluetongue.



“ The IPCC’s review of the latest evidence points to the range of possible challenges ahead. The impacts on agriculture of the extreme events this decade alone mean that we can’t keep on gambling on our ability to produce food in the UK whatever the weather. ”

**- Guy Smith**  
*Vice-President, National Farmers' Union*

# Implications for the UK

## SECURITY & THE MILITARY

- 1 Climate change poses an increasing risk to geopolitical stability and therefore the security and wellbeing of all.
- 2 Climate change acts as a 'threat multiplier', exacerbating existing threats to peace and security. This is likely to result in an increased demand for UK military engagement, be it in the form of conflict prevention, conflict resolution, or humanitarian assistance.
- 3 Many developing countries, including some in the Commonwealth, are already feeling impacts of a changing climate, in addition to stresses such as poverty and shortages of food and water. Some governments are already struggling to meet the needs of their populations through lack of capacity and resilience.
- 4 Increased instability in countries affected by climate change poses a risk to supplies of essential raw materials and to the emerging markets that the UK requires for sustained economic growth.
- 5 There is no security solution to climate change, just a greater risk of insecurity if we choose not to act.



“ The UK military, along with colleagues around the world, recognises the threat that climate change poses to global security and our national interests. They will act to address the challenges this presents, but they cannot and should not be doing it on their own. As the IPCC concludes, limiting the risks of climate change requires a combination of adaptation measures and substantial cuts in greenhouse gas emissions. ”

**- Rear-Admiral Neil Morisetti**  
*Former Commander of UK Maritime Forces and UK Climate and Energy Security Envoy. Currently Director of Strategy, Department of Science, Technology, Engineering and Public Policy, University College London*

# Implications for the UK

## BUSINESS

---

- 1 Climate change presents a variety of risks and opportunities to UK businesses; there is no 'one size fits all' implication. Risks and opportunities come from climate impacts and climate policies.
- 2 Sectors likely to be adversely affected by direct climate impacts include food, tourism, fisheries and insurance. Sectors likely to be affected by climate policy include energy, construction, transport and manufacturing. All sectors are likely to experience increasing disruption to supply chains.
- 3 In general, businesses that adopt proactive strategies are likely to thrive. Such strategies include supply chain resilience, anticipation of and adaptation to direct climate impacts, reducing energy consumption, innovating and investing in low-carbon technologies. Failing to prepare means preparing to fail.
- 4 For investors, some traditional blue-chip stocks such as fossil fuel companies will become increasingly risky. Gas providers could benefit temporarily from a low-carbon transition, but coal companies will not.
- 5 Businesses have an interest in encouraging governments to adapt and reduce emissions quickly, as modelling shows the economic costs of constraining climate change at any given level are higher if action is deferred.



“ The opportunities over the next 15 years are tremendous – but so are the risks. Overall, the best strategies for businesses are rooted in understanding the risks that climate change brings, and the opportunities offered by the transition to a resilient, low-carbon business model. ”

**- Jeremy Oppenheim**  
*Director, McKinsey & Co; Programme Director, New Climate Economy*

# The Energy and Climate Intelligence Unit

---

**The Energy and Climate Intelligence Unit is a non-profit organisation that supports informed debate on energy and climate change issues in the UK.**

Climate change presents important challenges and opportunities to Britons in the decades ahead, while the choices we make on energy have implications for society, the economy and the climate system. We believe that debates on these issues should be underpinned by evidence, and involve the full range of stakeholders. We support journalists and other communicators with accurate and accessible briefings on key issues, and work with individuals and organisations that have interesting stories to tell, helping them connect to the national conversation.

Our **Advisory Board** reflects the breadth of society's interest in energy and climate issues. It includes climate scientists, energy policy experts and economists, as well as a range of other stakeholders including MPs and Peers. All of our funding comes from philanthropic foundations. We gratefully acknowledge the support of the European Climate Foundation, the Grantham Foundation for the Protection of the Environment, and the Tellus Mater Foundation.



**Rushanara Ali**  
MP for Bethnal Green  
& Bow



**Richard Benyon**  
MP for Newbury



**The Rt Rev  
Richard Chartres**  
Bishop of London



**Dr Fiona Godlee**  
Editor in Chief, British  
Medical Journal



**Professor  
Michael Grubb**  
Professor of  
International Energy  
and Climate Change  
Policy, UCL



**Professor  
Joanna Haigh**  
Co-Director, Grantham  
Institute, Imperial  
College London



**Marylyn  
Haines Evans**  
Public Affairs Chair,  
National Federation of  
Women's Institutes



**Martin Horwood**  
MP for Cheltenham



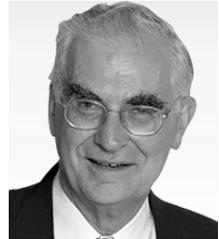
**Lord Howard  
of Lympne**



**Robin Lustig**  
Journalist and  
Broadcaster



**Rear Admiral  
Neil Morisetti**  
Former Commander, UK  
Maritime Forces



**Lord Oxburgh  
of Liverpool**



**Lord Puttnam  
of Queensgate**



**The Earl of  
Selborne**



**Dr Emily  
Shuckburgh**  
Head of Open Oceans,  
British Antarctic Survey



**Guy Smith**  
Vice President, National  
Farmers Union



**Graham Stuart**  
MP for Beverley and  
Holderness



**Sir Crispin  
Tickell**  
Former Ambassador to  
the United Nations



**Dr Camilla  
Toulmin**  
Director, IIED



**Lord Turner of  
Ecchinswell**

