

Royal Society submission to the Energy and Climate Change Committee's inquiry on 'IPCC 5th Assessment Review'

1 The Royal Society welcomes the opportunity to respond to the House of Commons Energy and Climate Change Committee's inquiry on 'IPCC 5th Assessment Review'.

2 The Royal Society is the national Academy of science in the UK. It is a self-governing Fellowship of many of the world's most distinguished scientists. The Royal Society's Science Policy Centre (SPC) draws on the expertise of the Fellowship to provide independent and authoritative scientific advice to UK, European and international decision makers.

3 The Royal Society report *Climate change: A summary of the science*¹ produced in 2010 was a compact, accessible statement which described in terms of level of certainty the current state of knowledge. Similar reports following this pattern were subsequently produced in other countries.

4 The Society is currently preparing a new overview of the science of climate change in conjunction with the US National Academy of Science. The report will address key questions of public interest and communicates new developments in climate science. It will articulate the key elements of current scientific understanding about how the Earth's climate system is changing and why, and presents information on new and developing areas of the science including what is being done to address remaining unknowns and uncertainty.

5 Royal Society reports have also been produced on such related issues as geoengineering the climate², governance of research into solar radiation management³, ground-level ozone⁴ and ocean acidification⁵. The Royal Society also holds frequent meetings on subjects relevant to climate science including a recent two-day discussion meeting on 'Next steps in climate science'⁶ and a briefing for MPs, Peers and parliamentary staff, held jointly with the Parliamentary Office for Science and Technology (POST), on the findings of the latest IPCC report⁷.

6 The Working Group I (WGI) Fifth Assessment Report (AR5) of the Intergovernmental Panel on Climate Change (IPCC) provides a comprehensive and authoritative analysis of the physical science basis of climate change. The latest report confirms that there is unequivocal evidence for a warming world, largely caused by greenhouse gases emitted by human activities. The IPCC report is based solely on publicly available, peer-reviewed studies by thousands of scientists across a wide range of disciplines. The main

¹ <http://royalsociety.org/policy/publications/2010/climate-change-summary-science/>

² <http://royalsociety.org/policy/publications/2009/geoengineering-climate/>

³ <http://royalsociety.org/policy/projects/solar-radiation-governance/>

⁴ <http://royalsociety.org/policy/publications/2008/ground-level-ozone/>

⁵ <http://royalsociety.org/policy/publications/2005/ocean-acidification/>

⁶ <http://royalsociety.org/events/2013/climatescience-next-steps/>

⁷ <http://www.parliament.uk/mps-lords-and-offices/offices/bicameral/post/post-events/climate-science-the-fifth-ipcc-assessment-report/>

conclusions are robust and reflect the range of uncertainty, as well as the established science, according to leading climate scientists in the UK and abroad.

7 Climate science, like any other scientific discipline, develops through vigorous debates between experts, but there is an overwhelming consensus regarding its fundamentals. Climate science has a firm basis in physics and is supported by a wealth of evidence from real world observations.

8 Societies and governments face a range of choices in response to climate change. Each option has economic, social and environmental risks, attractions and cost. The IPCC report presents the science of climate change, which societies and governments can use to inform the important decisions that will need to be made. The WGI AR5 confirms that, unless there is substantial global action to reduce greenhouse gas emissions, there will be significant global climate change with serious impacts for both society and the environment.

9 In 2010, the InterAcademy Council (IAC) was commissioned by the United Nations to review the processes and procedures of the IPCC after a small number of errors were discovered in its Fourth Assessment Report. The IAC convened a committee of a dozen experts from around the world to conduct an independent review. The Royal Society was represented on this committee.

10 The Committee found that the IPCC assessment process had been successful overall. Through its assessment report, the IPCC has gained enormous respect and even shared the Nobel Peace Prize in 2007 for informing climate policy and raising awareness worldwide. However, the world has changed considerably since the creation of the IPCC and the IPCC must continue to adapt to these changing conditions in order to continue serving society well in the future.

11 The IAC committee made 22 recommendations for how the IPCC could reform its practices in order to enhance the authoritative nature of AR5 and future assessments. The recommendations focused on issues related to governance and management, the review process, characterizing and communicating uncertainty, communications, and transparency; the IAC did not review scientific conclusions.

12 At its plenary session in South Korea in October 2010, the IPCC agreed to implement many of the IAC's recommendations and to establish task groups to address other recommendations (since AR5 was already underway, some of the recommendations would need to be implemented at a later date). The proposed actions of these task groups were further discussed and acted upon in subsequent plenary sessions. However, the principal recommendations on senior management and governance have yet to be fully acted upon. Any proposed governance structure for future climate assessments should therefore be scrutinised carefully.

13 By continuing to evolve and adapt to scientific advances and the needs of policymakers and the public, the IPCC will remain a valuable asset to a world coping with climate change.

14 On the release of the Summary for Policymakers of the Working Group 1 (WG1) Fifth Assessment Report (AR5) from the Intergovernmental Panel on Climate Change (IPCC) in September 2013, Paul Nurse, President of the Royal Society, said⁸:

"It is becoming increasingly clear that we are responsible for warming of the Earth primarily due to the burning of fossil fuels. Predicting the implications of this or how the picture will change in the future are big

⁸ <http://royalsociety.org/news/2013/Royal-Society-response-climate/>

challenges for scientists and today's report by the IPCC, whilst recognising uncertainties, gives us the best possible insight into what may lay ahead. Those who predict imminent disaster are probably overstating the case, but equally those who claim that we can carry on regardless are likely to be burying their heads in the sand.

"Predicting what will happen to climate is very complicated and there is still a lot that we do not know, but we cannot afford to wait until we can predict the future with absolute certainty before addressing the risks. We invest substantially, both as a country and individually, to insure ourselves against a wide range of risks that are less likely than climate change."

"The IPCC report provides a sound evidence base on which policy makers can make their decisions on appropriate action. Ignoring the problem is simply not sensible and most governments, businesses and individuals recognise that. The more convincing the evidence becomes, the more confident I am that rationality and science will win out and we will grasp the opportunities that decarbonising our economy offers."

15 Additional comments from Fellows of the Royal Society who are climate scientists:

16 Professor Eric Wolff FRS, Royal Society Research Professor, Department of Earth Sciences, University of Cambridge:

"The new report confirms how unprecedented the kick that we are giving the climate system is: concentrations of greenhouse gases are probably higher, and rising faster, than at any time in the last 800,000 years."

17 Professor Joanna Haigh CBE FRS, Professor of Atmospheric Physics, Imperial College London

"The new IPCC report confirms, with even greater confidence than in previous reports, that global warming continues and that this is largely a result of greenhouse gases produced by human activity. The concentration of carbon dioxide in the Earth's atmosphere now exceeds anything it has experienced in the past 3 million years and its continuing upward trend is almost certain to result in further global warming. Changes in solar activity alone cannot explain the global surface temperature variations of the past 150 years and, even if the Sun were to enter a new 'grand minimum' state within the next century, would be very unlikely to provide more than a small, temporary, partial compensation for likely anthropogenic warming."

18 Professor Sir Brian Hoskins FRS, Director of the Grantham Institute for Climate Change at Imperial College London:

"This Summary for Policy Makers provides further strong confirmation that human activity is having a significant and growing impact on the climate.

"It is based on a comprehensive review and rigorous assessment of the state of climate science by some 850 scientists, who reviewed over 9000- scientific articles, and includes voices from all sides of the issue. This report significantly strengthens the consistent message from the four previous assessment reports; we are conducting a dangerous experiment with our planet.

"The evidence of changes in many different aspects of the climate system, from the ice sheets to the deep ocean, shows that climate change is happening. To reduce the serious risks posed by increasing changes in

the climate, we need to redouble our efforts globally to limit carbon dioxide and other greenhouse gas emissions.”