Biographies and Abstracts | Meeting a Global Temperature Goal of 1.5 C

Introduction
David Warrilow OBE, FRMetS

ABSTRACT | David will provide the background to setting global climate targets and the IPCC 1.5C report. He will consider the origin of the concept in the UN Framework Convention on Climate Change and its subsequent development both as a scientific and political issue.

BIOGRAPHY | David Warrilow was a senior government science advisor and international negotiator on climate change and environmental issues, such as ozone depletion and air pollution. He led the UK delegations to the Intergovernmental Panel on Climate Change (IPCC) for over 20 years and was a lead negotiator for the EU on the scientific issues covered in the United Nations Framework Convention on Climate Change (UNFCCC). He managed a significant research programme at the Department of Energy and Climate Change providing underpinning scientific evidence and analysis of climate change, energy and ozone depletion in support of the UK's domestic and international policies.

Prior to this he undertook research at the Met Office on the development of observing systems, hydrometeorology and flood design, and climate modelling of land surface process.

Since retiring from the civil service in January 2016 David has undertaken several speaking engagements on the scientific background to the Paris Climate Agreement and on the use of science to support policy. He was appointed President of the Royal Meteorological in October 2018.

Background to the 1.5 goal – what does it mean and context
Professor Myles Allen, University of Oxford

BIOGRAPHY | Professor Myles Allen, Professor of Geosystem Science, Leader, Climate Research Programme, University of Oxford. Professor Myles Allen's research focuses on how human and natural influences on climate contribute to observed climate change and risks of extreme weather and in quantifying their implications for long-range climate forecasts.

He is currently a Coordinating Lead Author on the Intergovernmental Panel on Climate Change Special Report on 1.5 degrees, having served on the IPCC's 3rd, 4th and 5th Assessments, including the Synthesis Report Core Writing Team in 2014. Key research contributions include developing the statistical methods used to quantify the size of human influence on climate; the application of Probabilistic Event Attribution to quantify the contribution of human influence to specific individual weather events; and the observation that cumulative emissions of carbon dioxide largely determine global mean surface warming, which implies that a substantial fraction of current fossil carbon reserves cannot be emitted into the atmosphere if warming greater than 2oC is to be avoided.

Professor Allen leads the www.climateprediction.net project, using distributed computing to run the world's largest ensemble climate modelling experiments, and in 2010 was awarded the Appleton Medal and Prize from the Institute of Physics "for his important contributions to the detection and attribution of human influence on climate and quantifying uncertainty in climate predictions.

Options and challenges for achieving scenarios related to 1.5 c goal
Dr Joeri Rogelj,Grantham Institute at Imperial College London

ABSTRACT | Limiting global warming to 1.5°C requires steep reductions in carbon-dioxide emissions. In this talk, Dr Joeri Rogelj from the Grantham Institute at Imperial College will draw from the recent IPCC Special Report on Global Warming of 1.5°C to look at how this can be achieved at a global scale. The talk will present both the quantified geophysical requirements and societal transitions in the energy and other sectors that would allow to stay within these limits. The required transitions emerging from the scientific literature will then be contrasted with some current trends and planned developments in key sectors.

BIOGRAPHY | Dr Joeri Rogelj is Lecturer in Climate Change and the Environment at the Grantham Institute at Imperial College London, and Senior Research Scholar at the International Institute for Applied Systems Analysis (IIASA). His research aims at actively informing the international climate policy debate through dedicated interdisciplinary research and analysis, and focusses on the scientific assessment of international climate agreements, the identification and response to major gaps in knowledge for effective climate policy, and the development of new concepts bridging the divide between social and physical sciences. Over the past decade, Joeri Rogelj has led several major scientific climate change assessments, including the Emissions Gap Reports by the United Nations Environment Programme (UNEP). He served as a Coordinating Lead Author on the IPCC Special Report on Global Warming of 1.5°C, and is currrently a Lead Author on the IPCC's Sixth Assessment Report.

Sky - Meeting the Goals of the Paris Agreement
Georgios Bonias,Shell

ABSTRACT | The Paris Agreement on Climate Change has sent a signal that a new energy system is emerging. Shell's latest scenario, Sky, illustrates a technically possible, but challenging pathway for society to achieve the goals of the Paris Agreement. A technologically, industrially, and economically possible route forward, consistent with society limiting the global average temperature rise to well below 2°C from pre-industrial levels. The Sky scenario illustrates technically possible rapid and accelerating changes to the global energy system. Over the course of 50 years, it completely transforms the way society uses and produces energy. In Sky, by the 2070s electricity exceeds 50% of end-use energy consumption, with the sector nearing five times the size of that seen in 2017, fossil fuels are effectively absent from power generation with solar starting to dominate and biomass generation has emerged, linked with CCS to offer an important carbon sink. The Sky scenario relies on a complex combination of mutually reinforcing actions by society, markets and governments. It adopts an approach grounded in current economic and policy development mechanisms, but then progressively becomes 'goal-driven' to achieve society's ambition for net-zero emissions by 2070. In the Sky scenario, the Paris agreement goal on holding the global average temperature rise to well below 2°C is achieved, with the temperature getting peaking at 1.75°C. Reforestation can be a further game changer to hold the temperature increase to 1.5°C.

BIOGRAPHY | Georgios Bonias is an Energy Modeller working in the Shell Scenarios team in Strategy & Planning. He is an integral part of the development of Shell's World Energy Model and focuses on generating insights for Shell strategy and businesses. He has significant analytics and business experience having worked as Analytics Lead for Shell Lubricants Supply Chain in Global Commercial before joining the Scenarios team. Prior to Shell he has worked in Procter and Gamble in diverse supply chain roles. He holds Masters degrees in Business Administration and Applied Mathematics from the London School of Economics.

Global temperature trends and future projections including those related to a 1.5°C goal
Prof Jason Lowe, Met Office

ABSTRACT | The new IPCC special report has outlined the urgency and challenge of limiting global average warming to no more than 1.5°C above pre-industrial levels. It has demonstrated the benefits and challenges of doing so using the latest comprehensive but still evolving scientific evidence. In this presentation we will discuss the warming to date, and the distance from the warming limit. We will outline the characteristics of emission pathways that give a sizeable chance of limiting warming to 1.5°C with and without overshooting the warming level and highlight different ways of reaching this goal. This will include considering in more depth the physical constraints on limiting warming to the 1.5°C level, including the need to progress to zero and negative emissions. We will also highlight the need for an insurance policy arising from the possibility of exceeding 1.5°C, and what this means for adaptation planning.

BIOGRAPHY | Professor Jason Lowe is Head of Climate Services in the Met Office Hadley Centre. He is also Chair of Interdisciplinary Climate Research in the Priestley Centre at the University of Leeds. He has spent considerable time developing and communicating policy relevant science, including having a large involvement in designing several of the Met Office Hadley Centre Climate Programmes. This includes establishing the knowledge integration team and approach at the Met Office, which has regular contact with policy makers and practices co-development approaches to ensure usability and relevance. Professor Lowe has contributed to the development of innovative and collaborative ways of producing and delivering mitigation advice and was chief scientist on the AVOID1 and AVOID2 programmes. His recent work includes leading the development of the UKCP18 projections, which will be launched later in 2018 and will provide a tool for UK policy makers, regulators, businesses and the public to equip themselves for the weather and climate impacts of the future.

The Role of Greenhouse Gas Removal In Meeting The 1.5 c Target
Prof Gideon Henderson, University of Oxford.

ABSTRACT | At the time of the Paris Agreement, 87% of the future energy/climate scenarios that meet the agreed 2oC target, and all of those consistent with 1.5oC, required humans to remove greenhouse gases from the atmosphere, as well as making stringent cuts to emissions. The need for greenhouse gas removal (GGR) continues to be recognised in the new IPCC 1.5oC report, at a scale of 100-1000 GtCO2 by the end of the century. While IPCC scenarios typically rely on reforestation and bioenergy with CCS (BECCS) to achieve the required GGR, there are significant limitations to the availability of land and the sustainability of both these GGR techniques. A much broader range of GGR approaches have been suggested, including direct air capture and enhanced weathering, but these are typically at a lower level of technology readiness and require research and development.

As a result of the UK Government's Clean Growth Strategy1, published in 2017, the Department for Business, Energy and Industrial Strategy asked the Royal Society and the Royal Academy of Engineers to assess the various methods by which large scale GGR might be achieved. The resulting report2, which I chaired, was published in September 2017. In this talk I will outline the major findings of the report, with a particular focus on how the UK might use GGR to help achieve net zero emissions by 2050.

1. *https://www.gov.uk/government/publications/clean-growth-strategy*
2. *https://royalsociety.org/topics-policy/projects/greenhouse-gas-removal/*

BIOGRAPHY | Gideon is a Professor at the Department of Earth Sciences (of which he was Head for 2013-2017) and holds a Senior Research Fellowship at University College Oxford, and an associate position at Columbia University, USA.

His research seeks to understand the ocean, the carbon cycle, and the long-term operation of the climate system, falling into two main areas:

- Making novel measurements on natural archives of past climate to quantify climate processes important for future change (e.g. sea level, rainfall patterns, permafrost stability)

- The chemistry of the modern ocean, including study of the carbon cycle, nutrient metals, contaminants, and tracers used to assess ocean processes.

Gideon is a Fellow of the Royal Society, and currently serves on the Royal Society Science Policy Advisory Group. He has chaired Royal Society working groups reporting to government and publically on Ocean Resources and, as published in September, on Greenhouse Gas Removal.

Development and climate justice
Dr Alix Dietzel, SPAIS - University of Bristol

ABSTRACT | What does the IPCC report imply for climate justice? My talk will focus on why climate change is a matter of justice and how this perspective can help us to understand the global response to climate change. I will discuss why keeping global temperatures to 1.5°C is a matter of justice, and who might be morally responsible for meeting this target. Reflecting on the capability of states, sub-state actors and individuals, I will make the case for widespread systemic changes in how we respond to climate change.

BIOGRAPHY | Alix Dietzel is a Lecturer in Global Ethics at the School of Sociology, Politics and International Relations (SPAIS) at the University of Bristol. Her research focuses on cosmopolitan climate change justice and the normative evaluation of state and non-state climate change responses. She aims to bridge the gap between those concerned with the ethical dimensions of climate change and those who focus on the global governance of the climate change problem.