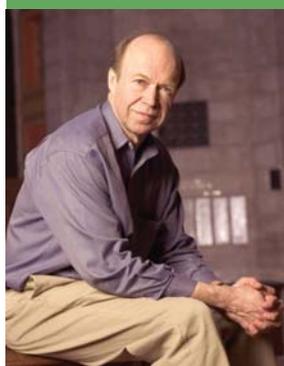


Keynote speakers

Keynote 1


**Negative CO₂ emissions
- why, when and how
much?**

Tuesday, May 22, 09:10

**James
Hansen**

 Professor,
Columbia University

Dr. James Hansen, formerly Director of the NASA Goddard Institute for Space Studies, is an Adjunct Professor at Columbia University's Earth Institute. Dr. Hansen is best known for his testimony on climate change in the 1980s that helped raise awareness of global warming. He is a member of the U.S. National Academy of Sciences. Dr. Hansen is recognized for speaking truth to power and outlining actions needed to protect the future of young people.

Keynote 2


**The Necessity and the
Allure of Negative CO₂
Emissions - A Question
of Balance**

Tuesday, May 22, 09:50

**Anders
Lyngfelt**

 Professor,
Chalmers University of
Technology

Fluidized-bed combustion is the basis for the research of Anders Lyngfelt. Since 1998 he is developing a process for carbon dioxide capture, chemical-looping combustion (CLC), which is also a fundamentally new principle for burning fuels with inherent capture of CO₂. His group of researchers has more than 4000 h of operational experience of chemical-looping combustion in pilots up to 100 kW, using gaseous, solid and liquid fuels. He is in the Clarivate Analytics' list of highly cited researchers.

Keynote 3


**Geological storage
of carbon dioxide for
negative emissions**

Tuesday, May 22, 15:00

**Sally M.
Benson**

 Professor, Energy
Resources Engineering;
Co-Director, Precourt
Institute for Energy; Director,
Global Climate & Energy
Project, Stanford University

Sally M. Benson, who joined Stanford University in 2007, is the co-director of Stanford's Precourt Institute for Energy and the director of the Global Climate and Energy Project (GCEP). A Professor in the Department of Energy Resources Engineering in the School of Earth, Energy & Environmental Sciences, she studies technologies and pathways to reducing greenhouse gas emissions.

Prior to joining GCEP, Benson was a staff scientist in the Earth Sciences Division at Lawrence Berkeley National Laboratory (LBNL). In 2004, she completed a four-year term as Deputy Director of Operations at the lab. Benson also served as Division Director for Earth Sciences and Associate Laboratory Director for Energy Sciences at LBNL.

A ground water hydrologist and reservoir engineer, Benson has conducted research to address a range of issues related to energy and the environment. Her research interests include geologic storage of CO₂ in deep underground formations, technologies and energy systems for a low-carbon future, and geotechnical instrumentation for subsurface characterization and monitoring.

The author or co-author of over 160 scientific publications, Benson is a member of the American Geophysical Union, the Society of Petroleum Engineers, the American Association for the Advancement of Science, and the American Chemical Society.

Keynote 4



CO₂ capture technologies status in the real world and the road for negative emissions

Tuesday, May 22, 16:10

Michael Monea

P.Eng., P.Geo., ICD.D,
President and CEO,
The International CCS
Knowledge Centre

Michael (Mike) Monea is the President and CEO of the International CCS Knowledge Centre a non-profit organization which he helped establish with BHP and SaskPower. As a world-leading scientist, research and development is a key component in Mike's mission to help reduce greenhouse gases through CCS technologies.

Prior to the Knowledge Centre, Mike was the President of CCS Initiatives at SaskPower where he was in charge of creating and building the world's first carbon capture plant for a coal electric unit, infamously known as Boundary Dam 3.

Keynote 5



What we know and do not know about negative emissions

Wednesday, May 23, 08:30

Sabine Fuss

Ph.D.,
Mercator Research Institute

Sabine Fuss has a PhD in economics from the University of Maastricht, the Netherlands, where she was located at the Economics Faculty and UNU-MERIT. She currently leads the working group on Sustainable Resource Management and Global Change at the Mercator Research Institute on Global Commons and Climate Change. She also holds a guest affiliation with the International Institute for Applied Systems Analysis' Ecosystems Services and Management Program and is member of the steering committee at the Global Carbon Project. Her research focuses on the functioning and design of instruments for sustainable resource management and the provision of public goods with

special interest in climate change mitigation and, in particular, negative emissions. She has authored 60 peer-reviewed journal papers and is a lead author for the IPCC.

Keynote 6



An integrated assessment modeling perspective on negative CO₂ emissions: Why do most models find NETs so attractive?

Wednesday, May 23, 09:10

Detlef van Vuuren

Professor,
Utrecht University

Detlef van Vuuren (1970) is a senior researcher at PBL Netherlands Environmental Assessment Agency and a professor in Integrated Assessment of Global Environmental Change at the Faculty of Geosciences, Utrecht University. His research concentrates on response strategies to global environmental and sustainable development problems using integrated assessment models. In this context, he leads the IMAGE integrated assessment modelling team. In total, Detlef van Vuuren published more than 260 articles in refereed journals including Nature, Science and PNAS and he is included in the list of the world's most highly cited researchers. Detlef van Vuuren is involved in steering groups of several international research organizations such as the Integrated Assessment Modelling Consortium (IAMC), the Global Carbon Project (GCP) and the World in 2050 (TWI2050). He has also participated in several assessments as (coordinating) lead author including those of IPCC. In support of IPCC, Detlef van Vuuren had a coordinating role in the development of the Representative Concentration Pathways (RCPs). Over the last decade, Detlef van Vuuren was involved in several publications on negative emissions, among which the publication of RCP2.6 – the marker 2 degree C scenario used by IPCC. In two recent publications in Nature Energy and Nature Climate Change, Detlef van Vuuren is aiming to support a more open debate on negative emissions among others by exploring what it would take to reduce the use of negative emissions.

Keynote 7



Integration of Carbon Dioxide Removal into the European Union's climate policy

Wednesday, May 23, 09:50

Oliver Geden

Head of the EU Research Division, German Institute for International and Security Affairs (SWP)

Dr Oliver Geden is Head of the EU Research Division at the German Institute for International and Security Affairs (SWP), Research Associate at the Institute for Science, Innovation and Society, University of Oxford, and currently visiting scholar at the Max Planck Institute for Meteorology. During his time at SWP he has been seconded to the Federal Foreign Office and the Federal Ministry for Economic Affairs and Energy. Recently, he has been selected as lead author for IPCC AR6, WG3, ch12.

Keynote 8



Direct Air Capture

Thursday, May 24, 08:30

Jennifer Wilcox

Professor,
Colorado School of Mines

Jennifer Wilcox is an Associate Professor in the Chemical and Biological Engineering Department at the Colorado School of Mines. Her Ph.D. in Chemical Engineering in 2004 is from the University of Arizona, and her B.A. in Mathematics in 1998 is from Wellesley College. She received an ARO Young Investigator Award, an ACS PRF Young Investigator Award, and an NSF CAREER Award. Within her research group, she focuses on trace metal and CO₂ capture. Her research involves the coupling of theory to experiment to test newly designed materials for sorbent or catalytic potential. She has served on a number of committees including the National Academy of Sciences and the American Physical Society to assess CO₂ capture methods and impacts on climate. She is the author of the first textbook on Carbon Capture, published in March 2012.

Keynote 9



Negative emissions from soil management

Thursday, May 24, 08:50

Pete Smith

Professor,
University of Aberdeen

Pete Smith is the Professor of Soils and Global Change at the Institute of Biological and Environmental Sciences at the University of Aberdeen (Scotland, UK) and Science Director of the Scottish Climate Change Centre of Expertise (ClimateXChange).

Since 1996, he has served as Convening Lead Author, Lead Author and Author for the Intergovernmental Panel on Climate Change (IPCC), which was awarded the Nobel Peace Prize in 2007. He was the Convening Lead Author of the Agricultural Mitigation chapter of the IPCC Fourth Assessment Report and for the Agriculture and Forestry Mitigation chapter of the IPCC Fifth Assessment, and for the IPCC Special Report on Climate Change and Land. He has coordinated and participated in many national and international projects on soils, agriculture, bioenergy, food security, greenhouse gases, climate change, mitigation and impacts, greenhouse gas removal / negative emissions and ecosystem modelling.

He is a Fellow of the Royal Society of Biology, a Fellow of the Institute of Soil Scientists, a Fellow of the Royal Society of Edinburgh, a Foreign Fellow of the Indian National Science Academy and a Fellow of the Royal Society (London).

He has published >400 peer-reviewed journal papers with total citations of >19000 with an H-index of 73. He is a Highly Cited Researcher: (<http://hcr.stateofinnovation.com/>).

Keynote 10


**Afforestation/
reforestation and global
biomass resources for
negative CO₂ emission**

Thursday, May 24, 09:30

**Almut
Arneth**

 Professor,
Karlsruhe Institute of
Technology

Almut Arneth is Professor of Plant-Atmosphere Interactions at the Karlsruhe Institute of Technology, department of Geography and Geoecology and leads the Division Ecosystem-Atmosphere Interactions at the KIT department Atmospheric Environmental Research. Her research focuses on terrestrial ecosystem state and functioning in response to climate change (including changes in atmospheric CO₂ concentration) and land-use change. She uses chiefly process-based dynamic models of ecosystem processes that can be applied on regional to global scales and over years to centuries to investigate these interactions. She also contributes actively to efforts to develop coupled Human-Environment models, aiming to arrive at much improved identification of feedbacks that exist between ecosystem and socio-economic processes in the land-use change system.

She coordinated the European Commission funded LUC4C project (Land-use change: assessing the net climate forcing and options for climate change mitigation and adaptation (www.luc4c.eu) and has contributed in leading roles in multiple other national and EC-funded projects on the topic. She also contributes to a number of international research initiatives including being:

- Coordinating lead author to the Global Assessment of the Intergovernmental Science-Policy Platform on Biodiversity & Ecosystem Services (IPBES);
- Coordinating lead author to the IPCC special report on climate change, desertification, land degradation, sustainable land management, food security and greenhouse gas fluxes in terrestrial ecosystems
- Lead author of the IPCC 6th Assessment Report, WG II
- Member of the scientific steering committee of the Future Earth AIMES project (Analysis & Modelling of the Earth System);

- Member of the EC Scientific Advisory Group Horizon 2020, societal challenge 5 (Climate action, resource efficiency and raw materials).
- Member of the scientific steering committee of LUMIP, the land-use change impact model inter-comparison project under the auspices of CMIP6, contributing to AR6.

Keynote 11


Enhanced Weathering

Thursday, May 24, 10:10

**Phil
Renforth**

 Ph.D.,
Cardiff University

Dr. Phil Renforth is an engineer and geochemist interested in understanding how rocks and minerals may be used to sequester carbon, and leads the Carbonate Systems Engineering Group at Cardiff University. Renforth is a PI on the RCUK-funded research project “Greenhouse Gas Removal in the Iron and Steel Industry,” which aims to explore atmospheric CO₂ sequestration using iron and steel slag. Generally, his research examines the carbonation of alkaline waste materials (including cement, ash, red mud, caustic waste, etc.), and the enhanced weathering of ‘natural’ materials. He is also interested in understanding geochemical carbon sequestration in the ocean by increasing ocean alkalinity. Renforth teaches modules on engineering geology and soil mechanics in the School of Earth and Ocean Sciences at Cardiff University.