

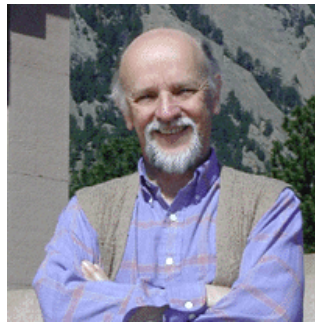


University of
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The Institute for Sustainable Systems and Technologies (ISST) of the University of South Australia is pleased to invite you to a public seminar.

“Climate, Energy and CO₂ Stabilization”
Presented by Dr Tom M.L. Wigley

Date: Friday 9th February 2007
Time: 12:00 pm to 13:00 pm (light refreshments provided)
Venue: Mutual Community Lecture Theatre
H2-02, Basil Hetzel Building
University of South Australia
Frome Road, Adelaide
RSVP: 6 February 2007 to alanna.wang@unisa.edu.au



Dr Tom Wigley is a senior scientist at the National Center for Atmospheric Research and the former Director of the Climatic Research Unit, University of East Anglia, Norwich, U.K. Born and educated in Australia, Dr Wigley trained as a meteorologist with the Commonwealth Bureau of Meteorology before going on to complete a Ph.D. in theoretical physics.

Dr Wigley has published widely in the field of climatology and related sciences, and is the author of more than 200 highly cited refereed journal articles and book chapters. In addition, he is a Fellow of the American Meteorological Society (AMS) and the American Association for the Advancement of Science (AAAS).

His current interests include projections of future climate and sea-level change, carbon-cycle modelling, the interpretation of past climate changes (including the detection of anthropogenic influences), climate modelling and model validation, and economic and policy aspects of mitigation (i.e., reducing the emissions of greenhouse gases).

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ABSTRACT

Climate, Energy and CO₂ Stabilization

This talk evaluates the potential for existing technologies to satisfy the demands of Article 2 of the UN Framework Convention on Climate Change, which calls for stabilization of greenhouse gas concentrations in the atmosphere while allowing for sustainable economic development. Carbon dioxide (CO₂) is by far the most important cause of future climate change. To stabilize CO₂ concentrations at an acceptable level will require, eventually, reducing CO₂ emissions to well below present levels. This in turn will require a vast increase in energy obtained from sources that do not add CO₂ to the atmosphere (“carbon neutral” sources). Calculations are presented to show how much carbon-neutral energy will be needed, accounting for uncertainties in the no-climate-policy baseline and the chosen level for CO₂ concentration stabilization. Suggestions that we can follow a CO₂ stabilization pathway, at least out to 2055, using existing technology are discussed and criticized. The number of mitigation “wedges” (where each wedge represents a cumulative reduction in CO₂ emissions by 25 GtC/yr) required to follow various stabilization pathways is determined, along with attendant uncertainties. The number of wedges required to get to 2055 is shown to be substantially larger than previous estimates (such as those by Pacala and Socolow), implying that stabilization of CO₂ concentrations cannot be achieved using existing technology alone. Beyond 2055 the required number of wedges increases rapidly. A massive development and deployment of new, carbon-neutral energy technologies is therefore needed to “solve” the global warming problem.



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