

Contact: Simon Dunford t: +44 (0)1603 592203 f: +44 (0)1603 259883 e: s.dunford@uea.ac.uk

Communications Office
University of East Anglia
Norwich Research Park
NR4 7TJ
United Kingdom

Web: www.uea.ac.uk/comm

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Global carbon emissions reach record 10 billion tonnes - threatening two degree target

Global carbon dioxide emissions from burning fossil fuels have increased by 49 per cent in the last two decades, according to the latest figures by an international team, including researchers at the Tyndall Centre for Climate Change Research, University of East Anglia (UEA).

Published today in the journal *Nature Climate Change*, the new analysis by the Global Carbon Project shows fossil fuel emissions increased by 5.9 per cent in 2010 and by 49 per cent since 1990 – the reference year for the Kyoto protocol.

On average, fossil fuel emissions have risen by 3.1 per cent each year between 2000 and 2010 – three times the rate of increase during the 1990s. They are projected to continue to increase by 3.1 per cent in 2011.

Total emissions - which combine fossil fuel combustion, cement production, deforestation and other land use emissions - reached 10 billion tonnes of carbon¹ in 2010 for the first time. Half of the emissions remained in the atmosphere, where CO₂ concentration reached 389.6 parts per million. The remaining emissions were taken up by the ocean and land reservoirs, in approximately equal proportions.

Rebounding from the global financial crisis of 2008-09 when emissions temporarily decreased, last year's high growth was caused by both emerging and developed economies. Rich countries continued to outsource part of their emissions to emerging economies through international trade.

Contributions to global emissions growth in 2010 were largest from China, the United States, India, the Russian Federation and the European Union. Emissions from the trade of goods and services produced in emerging economies but consumed in the West increased from 2.5 per cent of the share of rich countries in 1990 to 16 per cent in 2010.

In the UK, fossil fuel CO₂ emissions grew 3.8 per cent in 2010 but were 14 per cent below their 1990 levels. However, emissions from the trade of goods and services grew from 5 per cent of the emissions produced locally in 1990 to 46 per cent in 2010 - overcompensating the reductions in local emissions. Emissions in the UK were 20 per cent above their 1990 levels when emissions from trade are taken into account.

“Global CO₂ emissions since 2000 are tracking the high end of the projections used by the Intergovernmental Panel on Climate Change, which far exceed two degrees warming by 2100,” said co-author Prof Corinne Le Quéré, director of the Tyndall Centre for Climate Change Research and professor at the University of East Anglia. “Yet governments have pledged to keep warming below two degrees to avoid the most dangerous aspects of climate change such as widespread water stress and sea level rise, and increases in extreme climatic events.

“Taking action to reverse current trends is urgent.”

Lead author Dr Glen Peters, of the Centre for International Climate and Environmental Research in Norway, said: “Many saw the global financial crisis as an opportunity to move the global economy away from persistent and high emissions growth, but the return to emissions growth in 2010 suggests the opportunity was not exploited.”

Co-author Dr Pep Canadell, executive director of the Global Carbon Project, added: “The global financial crisis has helped developed countries meet their production emission commitments as promised in the Kyoto Protocol and Copenhagen Accord, but its impact has been short-lived and pre-existing challenges remain.”

‘Rapid growth in CO₂ emissions after the 2008-2009 global financial crisis’ by GP Peters, G Marland, C Le Quéré, T Boden, JG Canadell and MR Raupach is published online by Nature Climate Change on December 4 2011.

The Global Carbon Project is opening an office at the Tyndall Centre for Climate Change Research at UEA in 2012, funded by the Natural Environment Research Council. The office will support the annual publication of emissions statistics for the atmosphere, ocean and land reservoirs.

For more information, visit www.globalcarbonproject.org

¹ Values reported here are in billion tonnes of carbon. To convert emissions to billion tonnes of CO₂, multiply the value by 3.67.

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Notes to Editors

1. To arrange interviews with Prof Corinne Le Quéré, please contact Simon Dunford at the UEA Communications Office on +44 (0)1603 592203 / 07827 082668 / s.dunford@uea.ac.uk or Prof Le Quéré on +44 (0)1603 592840 / 0789 0556096 / c.lequere@uea.ac.uk
2. The paper is available as a PDF on request.
3. The Global Carbon Project is a joint project of the Earth System Science Partnership, which aims to foster international collaboration on carbon cycle research. It produces an annual report with the latest figures on all major carbon exchanges that result from human activities.
4. The University of East Anglia (UEA) is ranked in the top one per cent of universities in the world and is consistently in the top ten for student satisfaction. It is a leading member of

the Norwich Research Park, one of Europe's biggest concentrations of researchers in the fields of environment, health and plant science. Its School Environmental Sciences is one of the longest established, largest and most fully developed schools of environmental sciences in Europe. In the last Research Assessment Exercise it achieved the highest possible research ranking, with 95 per cent of activity classified as internationally excellent or world leading.

5. The Tyndall Centre for Climate Change Research is an active and expanding partnership between the Universities of East Anglia (Headquarters), Cambridge, Cardiff, Manchester, Newcastle, Oxford, Southampton, Sussex, and recently Fudan University in Shanghai. It conducts research on the interdisciplinary aspects of climate change and is committed to promote informed and effective dialogue across society about the options to manage our future climate.