

# Global Carbon Report Card 2017: Trends in anthropogenic carbon sources and sinks

The long-term redistribution of carbon among fossil fuel reserves, the atmosphere, oceans and land (the global carbon budget) largely determines the degree of human-driven climate change.

This presentation outlines the four key trends in the global carbon budget identified in an international research effort driven by the Global Carbon Project:

1. The apparent stabilisation in the growth of fossil fuel emissions and the likely emissions decline from land use change.
2. The continued growth in atmospheric carbon dioxide.
3. The growth in the land and ocean sinks in response to the accumulating atmospheric carbon dioxide.
4. The growth of the global methane concentrations after a long period of stability.

Some countries have shown a consistent declining emissions trend over the past 10 years, illustrating the feasibility of accelerated decarbonisation pathways. Emerging economies, particularly China, show variable new trends of great importance to the global totals and its consistency with the low carbon pathways of the Paris Climate Agreement. A major tug-of-war is emerging between the continued increase of emissions from some fossil fuel sources and the rapidly expanding low carbon energies.

The presentation will conclude with a discussion of the evolving strength of the carbon sinks in continuing to remove a significant fraction of the human emissions, and some of the drivers behind those sinks – including recent greening trends and the enhancement of plant growth by the effects of elevated concentrations of atmospheric carbon dioxide.



**Dr Pep Canadell** is a senior principal research scientist in the CSIRO Climate Research Centre and executive director of the Global Carbon Project, a global network of scientists who study the human impact on the carbon cycle and associated changes in the climate system. He leads the ESCC Hub's Project 2.9, *Risk assessment of future carbon sources and sinks*, which supports Australia's involvement in the Global Carbon Project. Pep works with collaborators around the world to develop global and regional budgets of the main greenhouse gases including carbon dioxide, methane and nitrous oxide. He also studies the size and vulnerability of Earth's carbon pools, carbon-climate feedbacks, and pathways to decarbonisation to stabilise the climate. A focus of Pep's work is using science to answer questions of policy relevance.