

New phase of globalization could undermine efforts to reduce CO2 emissions

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New research reveals the growth of carbon production from Chinese exports has slowed or reversed, reflecting a "new phase of globalisation" between developing countries that could undermine international efforts to reduce emissions.

The study, involving researchers from the University of East Anglia (UEA) and colleagues in China and the United States, investigated how complex supply chains are distributing energy-intensive industries and their CO₂ emissions throughout the global South. It found that [trade](#) among developing nations—known as South-South trade—more than doubled between 2004 and 2011.

Some production activities are relocating from China and India to other developing [countries](#), such as Indonesia, Vietnam and Thailand, particularly for raw materials and intermediate goods production in energy-intensive sectors.

In turn, the growth of CO₂ emissions embodied in Chinese exports has slowed or reversed, while the emissions embodied in exports, such as textiles, from less-developed regions like Vietnam and

Bangladesh have surged.

International trade increased by more than 50% from 2005 to 2015, with approximately 60% of the increase tied to rising exports from developing countries. Yet over the same period, South-South trade grew even faster—more than tripling—to reach 57% of all developing country exports (US\$9.3 trillion) in 2014.

Publishing their findings in *Nature Communications*, the authors warn this trend may seriously undermine international efforts to reduce [global emissions](#) that increasingly rely on rallying voluntary contributions of more, smaller, and less-developed nations.

It follows research published last month in *Geophysical Research Letters*, in which the authors argue that the Chinese [export](#)-embodied CO₂ emissions have peaked due to the changing structure of Chinese production. They suggest more attention should be focussed on ensuring countries that may partly replace China as major production bases increase their exports using low-carbon inputs.

Co-author on both studies Dabo Guan, professor in climate change economics at UEA's School of International Development, said: "The rapid growth in South-South trade reflects a fragmenting of global supply chains whereby early-production stages of many industries have relocated from countries like China and India to lower-wage economies, a trend that has accelerated since the global financial crisis in 2008.

"In addition to their important implications for global economic development, these trends will affect the magnitude and regional distribution of future global CO₂ emissions."

Relatively little attention has been paid to the rapid rise of South-South trade since the 2008-2009

[global financial crisis](#). Yet the period since 2009 has also witnessed decreases in Chinese coal consumption that underpin a levelling off of global CO₂ emissions, as well as the forging of the Paris Agreement whereby nations are determining their contributions to the global effort to reduce CO₂ emissions.

"The carbon intensity of the next phase of global economic development will determine whether ambitious climate targets such as stabilizing at 2 °C will be met, and our findings depict the nascent rise of energy-intensive and emissions-intensive production activities in other Asian countries such as Vietnam and Pakistan," said Prof Guan.

"The success of international climate mitigation efforts may therefore depend on curtailing growth of coal-based energy and emissions in now-industrialising and urbanising countries. Otherwise, countries like China and India may meet their nationally determined contribution under the Paris Agreement by hollowing out low-value, energy-intensive manufacturing, and offshoring those activities to emerging markets elsewhere in Asia with less stringent climate policy measures.

"Successfully mitigating climate change therefore urgently depends on decarbonising not only energy systems in developed countries but also the entire process of industrialization."

The researchers used the latest available data on international trade and CO₂ emissions from 2004, 2007 and 2011 to track emissions related to both intermediate and final goods and services from 57 industry sectors that were traded among 129 regions (101 of which are individual countries).

In total, CO₂ emissions embodied in goods and services exported from developing countries increased by 46% between 2004 and 2011, from 2.2 to 3.3 gigatonnes (Gts). Although a substantial and growing quantity of these emissions were represented in exports to developed regions (1.8 Gt in 2004 and 2.2 Gt in 2011, growing by an average of 2.9% per year), the emissions embodied in South-South trade increased much more rapidly: from 0.47 Gt in 2004 to 1.1 Gt in 2011 (1.33% per year). The growth is mainly driven by the increasing

export volume and partly offset by a decline in [emission](#) intensity.

More information: Jing Meng et al, The rise of South–South trade and its effect on global CO₂ emissions, *Nature Communications* (2018). [DOI: 10.1038/s41467-018-04337-y](https://doi.org/10.1038/s41467-018-04337-y)

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