Study shows that global mitigation efforts to avoid climate change cannot neglect small and medium emerging emitters

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International efforts to avoid dangerous climate change by reaching the global 1.5°C target are unlikely to be achieved in "emerging emitter" countries without substantial further decreases in the costs of non-emitting energy deployment or economic support and low-carbon

technology transfer from historically high-emitting countries.

This is according to new research led by Professor Dabo Guan from Tsinghua University and his international research team of "Carbon Emission Accounts and Datasets for Emerging Economies)", and published in the *National Science Review*.

The researchers analyzed the trends and drivers of emissions in each of the 59 countries where emissions 2010-2018 grew faster than the global average (excluding China and India). They also projected their emissions under a range of longer-term energy scenarios, and estimated the costs of decarbonization pathways.

The findings showed that total emissions from these "emerging emitters" reach as much as 7.5 Gt CO_2/year in the baseline 2.5° scenario—substantially greater than the emissions from these regions in previously published scenarios that would limit warming to 2°C even 1.5°C.

Such unanticipated emissions would in turn require non-emitting energy deployment from all sectors within these emerging emitters, and faster and deeper reductions in emissions from other countries to meet international climate goals.

Moreover, the annual costs of keeping emissions at the low level are in many cases 0.2%-4.1% of countries' GDP, pointing to potential trade-offs with poverty reduction goals and/or the need for economic support and low-carbon technology transfer from historically high-emitting countries.

The researchers conclude that these results highlight the critical importance of ramping up mitigation efforts in countries that to this point have been largely ignored.

Coordinator of the research Dabo Guan, Chair of Climate Change Economics at Tsinghua University and The Bartlett School of Sustainable Construction, University College London, UK, says that "global carbon space for limiting 1.5°C is exhausting while we need to give sufficient consideration of global equality of socioeconomic developments. Developed countries must go negative emissions as soon as possible in order to accommodate the space to be required by emerging emitting economies."

Steve Davis, a Professor of Earth System Science at the University of California, Irvine, says that "by looking in detail at trends and projections of low-income countries' emissions, this study addresses a big blindspot of global integrated assessment models, which almost always lump those countries into an undifferentiated 'rest of world' category."

However, Can Cui, the lead author of the study, a Ph.D. student at Tsinghua University points out, the emerging emitters such as Myanmar, Laos, Zambia and Ethiopia, are on their way to industrialization, and they seem to have neither the technological, nor financial capacity to achieve low carbon developments, which requires supports from the developed countries and global major economies for capacity buildings for all related fields.

Professor Guan added that "China can potentially play a bridging role in promoting North- South and South-South collaborations in knowledge transfers and technological spillovers for help the emerging emitters to increase their emission discharge per unit of output (therefore less emissions), decelerate their emission growth trends, and eventually reduce emission space required for their economic growth."

More information: Can Cui et al, Global mitigation efforts cannot neglect emerging emitters, *National Science Review* (2022). DOI:

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