

Fair burden-sharing for global climate protection

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Economic growth in China means more global CO₂ emissions. Scientists from ETH Zurich have examined what fair burden-sharing in global climate protection might look like. Credit: flickr.com

(Phys.org) -- Discussions on a global climate agreement always centre on the transfer of money to developing and emerging countries. Scientists from ETH Zurich have now examined what fair transfer payments might look like and provide a concrete cost estimate. They present their results in the latest issue of the journal *Nature Climate Change*.

Whether in Copenhagen, Cancun or Durban, the results of the last three international climate negotiations have fallen way short of the expectations. The problem is well known, yet seems practically irresolvable: the [industrial countries](#) that have caused greenhouse-gas

emissions in the past demand that developing and emerging countries reduce their future [CO2 emissions](#). Countries like China or India, however, remain reliant on cheap [energy sources](#) such as coal or [crude oil](#) to fuel their economies, and they demand compensation if they are to commit themselves to the ambitious two-degree target. Although such transfer payments are largely undisputed, it still remains absolutely unclear as to which countries should receive or contribute how much. Moreover, a CO2 price that quantifies how much preventing the emission of one ton of CO2 is worth has yet to be agreed on.

Florian Landis, a doctoral student at ETH Zurich's Centre for Energy Policy and Economics, and Thomas Bernauer, a professor at ETH Zurich's Institute for Environmental Decisions, have now examined what fair transfer payments might look like and, for the first time, provide a concrete cost estimate based on the assumption that CO2 prices are determined regionally. The advantage of regional CO2 prices is that they take into account the countries' different states of economic development.

Calculating transfer payments with climate models

The scientists began by determining the economic disadvantage regions face if they reduce emissions and set this in relation to expected future benefits. They were thus able to estimate regional CO2 prices. The scientists divided the world into four regions for these calculations: Africa and Latin America, Asia, Eastern Europe and the former Soviet Union, and the OECD nations. They then combined [global climate](#) models with regional economic framework conditions, and thus examined how regional CO2 prices behave under different emission, [climate-change](#), and economic scenarios.

The calculations revealed that the relationships between CO2 prices and extremely different assumptions and scenarios are strikingly similar. «It

is astonishing that we arrive at comparable results in all the scenarios, given that all our work's bases were fraught with uncertainties,» says Florian Landis. The impact emissions have on the rise in temperature and how this is reflected in economic losses is difficult to gauge. It is also hard to predict how future [greenhouse gas emissions](#) will develop.

Money transfers necessary on a grand scale

Landis and Bernauer now posit that a climate policy that backs the trade in emission allowances and thus leads to a global CO₂ price needs to be interpreted as a compromise between regional CO₂ prices. Based on this global CO₂ price, the researchers ascertained which regional CO₂ prices this price might be based upon. From this, they derived transfer payments such that regional investments in climate protection net of transfers equal investments that would have resulted from regional CO₂ prices. Using the example of an average global CO₂ price of USD thirty-five, the scientists calculated what that means for the four regions in concrete terms. According to the calculations, global transfer payments of between USD fifteen and forty-eight billion a year would have to flow from richer to poorer countries depending on the scenario.

As the study, despite all the uncertainties it takes into account, provides such clear results, the scientists find it easy to conclude: if you are striving for a global solution to the climate problem, money must be redistributed on a grand scale. Landis and Bernauer thus see their study as a contribution to the debate that permits a realistic estimate of the transfer amounts. «The amounts of 100 to 200 billion a year discussed thus far aren't based on a solid analysis of costs, responsibilities, capacities, and interests», explains Thomas Bernauer. «We have tried to develop an approach based on fundamental principles of fairness with which the politically controversial debate on transfer payments can be conducted in a more objective and scientific manner.

More information: Landis F & Bernauer T. Transfer payments in global climate policy. *Nature Climate Change*, Published online, 3rd June 2012. [DOI: 10.1038/nclimate1548](https://doi.org/10.1038/nclimate1548)

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