

Earth & Space

Activating social tipping dynamics for a global decarbonization by 2050

by **Ilona M. Otto**¹ | Research Associate

doi.org/10.25250/thescbr.brk479

¹: Potsdam Institute for Climate Impact Research, Potsdam, Germany

This Break was edited by Ayala Sela, Scientific Editor - TheScienceBreaker

We recently witnessed rapid societal changes in response to perceived health risks. Can similar mechanisms be used to fight global warming? A new study explores social tipping dynamics that could result in world-wide carbon neutral societies within 30 years.



Image credits: Ilona M. Otto

Social sciences in the second part of the 20th century and early 21st century were predominantly occupied with gradual change processes. Most statistical models used to analyze socio-economic data assume change occurs gradually - in a linear manner. Recent months have demonstrated that we might be facing the end of linearity in studying socio-economic phenomena, meaning that change is occurring more quickly than ever and in an uncertain direction. While some changes in the global system are driven by non-human forces (for example, a disease outbreak), others are driven by humanity's conscious interventions. It is these changes which were the focus of our study. We analysed "social tipping"-contagious processes of rapidly spreading new technologies, behaviors, and social norms, that can

facilitate a structural reorganization of our global society.

Major and abrupt change is also needed to meet ambitious climate policy targets. Limiting global warming to 1.5 °C, as stipulated in the Paris Climate Agreement, implies that the world's energy and transport systems, industrial production, and land use will no longer emit carbon dioxide into the atmosphere by the middle of this century. Carbon emissions, that until 2019 were still rising at rates of up to 2% per year, would thereby need to pivot to a rapid decline of 7% per year or more. While global emissions in 2020 are likely to decline as a result of the COVID-19 pandemic/coronavirus crisis, it is very likely that emissions will spike again soon after business returns to normal. The need for drastic

change remains urgent, and may require a better understanding of social tipping elements. Social tipping elements refer to small changes or interventions that can have a global and long-lasting socio-economic effect.

For the purpose of this study, over 130 international experts suggested over 200 different candidates for social tipping elements. This list was finally boiled down to six interventions that had evidence supporting their tipping character and were most likely to trigger a rapid decrease in global carbon emissions. These are: removing fossil fuel subsidies and incentivizing decentralized energy generation, building carbon-neutral cities, divesting assets linked to fossil fuels, revealing the moral implications of fossil fuels, strengthening public education and engagement on the topic of climate, and disclosing information on greenhouse gas emissions.

This list does not necessarily provide a comprehensive list of “silver bullet” solutions. It is rather an initial selection of tools that can help in developing more refined and rapid socio-economic transformation pathways. Furthermore, these social tipping elements operate at different time scales. Some changes, like those in stock markets and prices, can occur very rapidly, while institutional changes require more time. Transforming public subsidies and taxation systems, as well as climate education

also require more time and are needed to stabilize an emerging system.

However, we argue that a relatively small minority of people can be sufficient to change the behavior of the majority. There are documented instances of technology and normative changes in which 10–25% population were sufficient to reach the tipping point and become the dominant pattern. However, that might require changes to occur within the “right” share of population, including well connected influential people, trend-setters and social leaders. To give an example, our models show that about 10% of environmentally concerned financial investors are likely to induce a tipping in the financial markets, leading to a rapid reduction of the value of fossil-fuel assets.

Each of the proposed social tipping elements exists in the real world to varying degrees, locations and scales, and has the potential to boost the reduction of global carbon emissions. It is not possible to predict exactly when and where tipping points will be reached, however, the system can be imperfectly navigated to achieve certain desirable conditions and capacities. Many of the nominated social tipping elements extend beyond achieving greenhouse gas reduction and can be potentially interlinked with achieving other global policy goals. Finally, many of these proposed interventions include a range of wellbeing and public health co-benefits.