Socio-Political Feedback on the Path to Net Zero

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Anthropogenic emissions of CO₂ must soon approach net zero to stabilize the global mean temperature. Although several international agreements have advocated for coordinated climate actions, their implementation has remained below expectations. One of the main challenges of international cooperation is the different degrees of socio-political acceptance of decarbonization.

In this contribution, we interrogate a minimalistic model of the coupled human-natural system representing the impact of such socio-political acceptance on investments in clean energy and the path to net-zero emissions. Despite its simplicity, the model can reproduce complex interactions between human and natural systems, and it can disentangle the effects of climate policies from those of socio-political acceptance on the path to net zero. Although perfect coordination remains unlikely, as clean energy investments are limited by myopic economic strategies and a policy system that promotes free-riding, more realistic decentralized cooperation with partial efforts from each actor could still lead to significant emissions cuts.

Since the socio-political feedback on the path to net zero could influence the trajectories of the Earth System for decades to centuries and beyond, climate models need to incorporate better the dynamical bi-directional interactions between socio-political groups and the environment. Our model represents a first step for incorporating this feedback in describing complex coupled human and natural systems.