

SOE 20: Traffic Dynamics, Urban and Regional Systems

Time: Wednesday 18:00–18:15

Location: H37

SOE 20.1 Wed 18:00 H37

About CO₂ emissions from cities: scaling with city-size —
•DIEGO RYBSKI, TILL STERZEL, DOMINIK E. REUSSER, CHRISTINA FICHTNER, and JÜRGEN P. KROPP — Potsdam Institute for Climate Impact Research, 14469 Potsdam, Germany

Analyzing CO₂ emission inventories of almost 200 cities from various countries we find power-law relations between the emissions and city size, measured in population. The results suggest that in developing countries large cities emit more CO₂ per capita compared to small cities, i.e. they tend to comprise super-linear correlations. For devel-

oped countries the results suggest the opposite, i.e. linear or sub-linear correlations, implying better efficiency of large cities. We derive how the total emissions of an entire country relate with the power-law correlations and find that the size of the most populated city is dominating in the case of linear and super-linear correlations, while a transition occurs to sub-linear correlations, where the size of the largest city has no influence. We conclude that from the climate change mitigation point of view, urbanization is desirable in developed countries and should be avoided in developing countries, if efficiency increasing mechanisms can not be established.