



Countdown to Drawdown: an initial overview of exponential scaling of potential societal tipping points for deep decarbonization of global energy infrastructure by 2050

Mark McCaffrey (1) and Avit Bhowmik (2)

(1) National University for Public Service, Centre for Sustainable Development Studies, Budapest, Hungary (marksmccaffrey@gmail.com), (2) Stockholm Resilience Centre, Stockholm University, Stockholm, Sweden

EGU Abstract

The 194 signatories to the Paris Agreement range in size from small island nations (Tuvalu, less than 10,000 people) to massive states (India and China, which between them have 2.6 billion people). Their cultural backgrounds, political, economic and social systems vary widely. What they all share is an agreement for climate stabilisation at 1.5-2°C. A roadmap outlining potential exponential transitions towards a carbon-free economy may benefit from a logarithmic “powers of ten” framework that sets aside backgrounds and systems to examine the relative population concentration scales—from the individual (10^0) to local/neighborhood (10^3) to the national/transnational scales (10^8) and ultimately the global population of around 10 billion anticipated in 2050 (10^{10}). What are the related targets and indicators for successful engagement at each level for rapid and radical reductions of carbon emissions and concentrations? What are the possible interventions and barriers that may be applied at different levels of population concentration? What “drawdown” strategies are most appropriate for different scales? Could focusing demonstrations of clean energy and sustainable practices on the local/neighborhood to urban scale (10^3 - 10^4) provide a leverage that has not been achieved at more complex national and transnational scales? Ultimately, backgrounds and systems are important factors in the equation, but the “powers of 10” scaling framework may provide a compass to assist in identifying the challenges, opportunities and related thresholds and tipping points for achieving deep decarbonization and transformation of the global energy infrastructure at every level of society over the next thirty-three years.