



Tipping positive change for climate resilience

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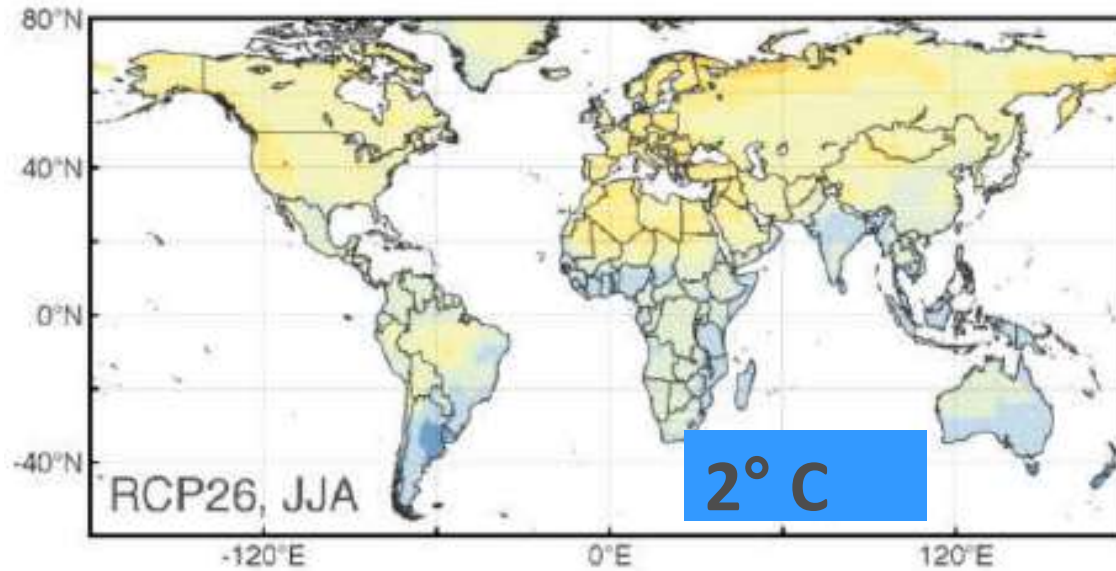
Social Complexity and System Transformation
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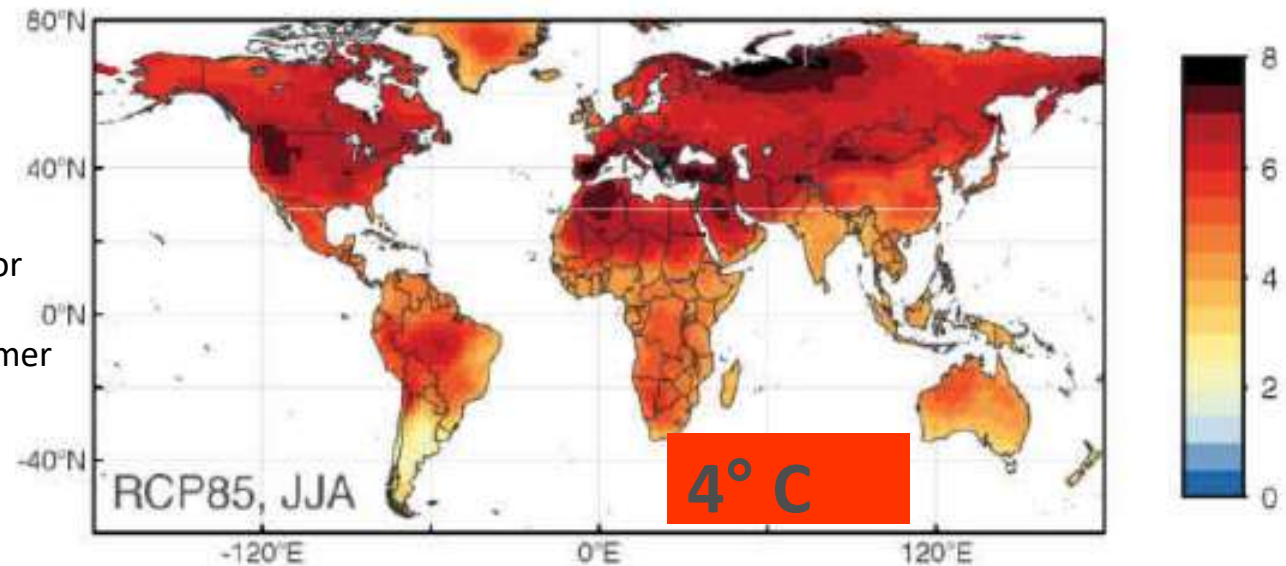
 [@ilonamotto](https://twitter.com/ilonamotto)

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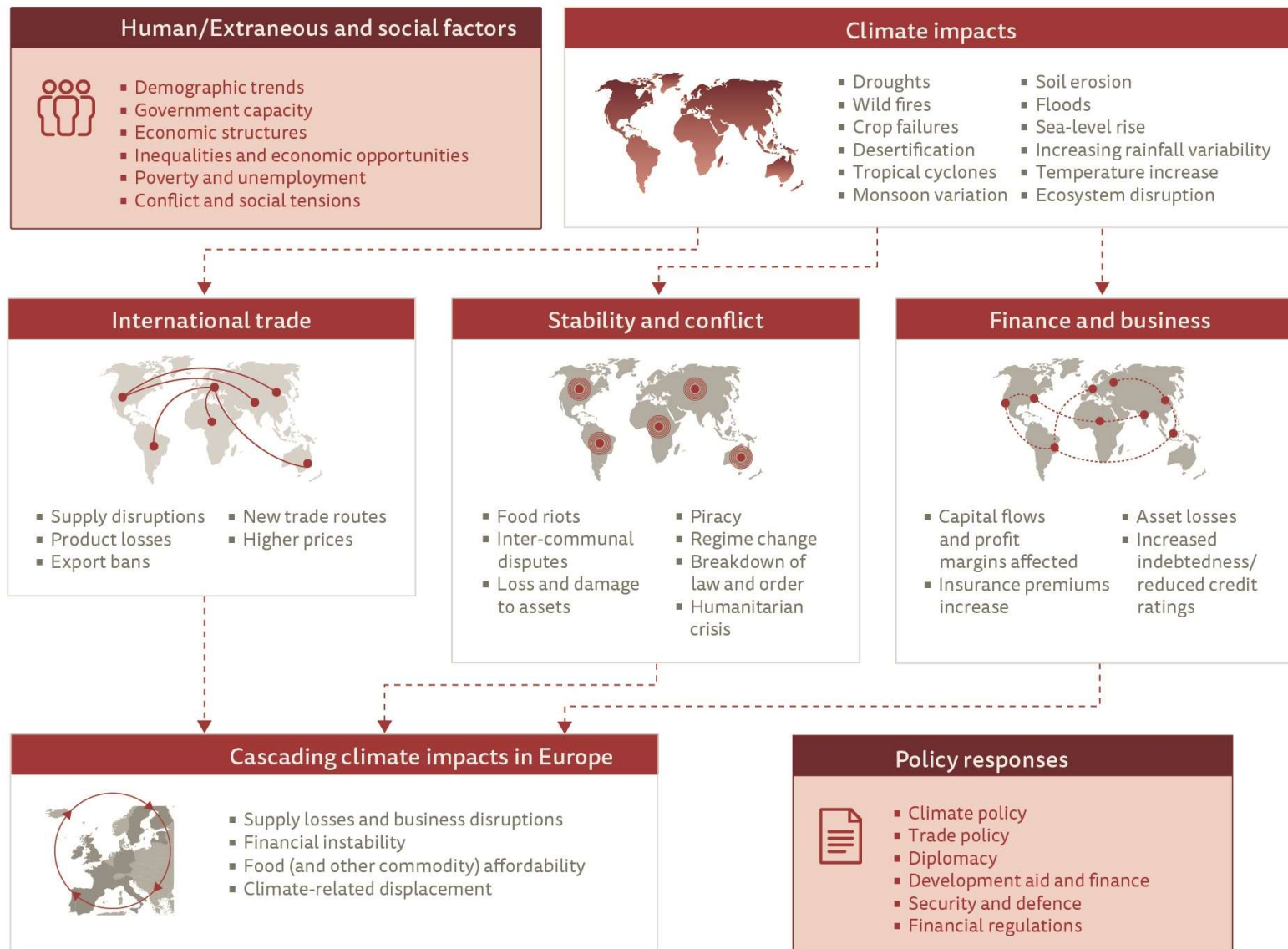
Challenges ahead



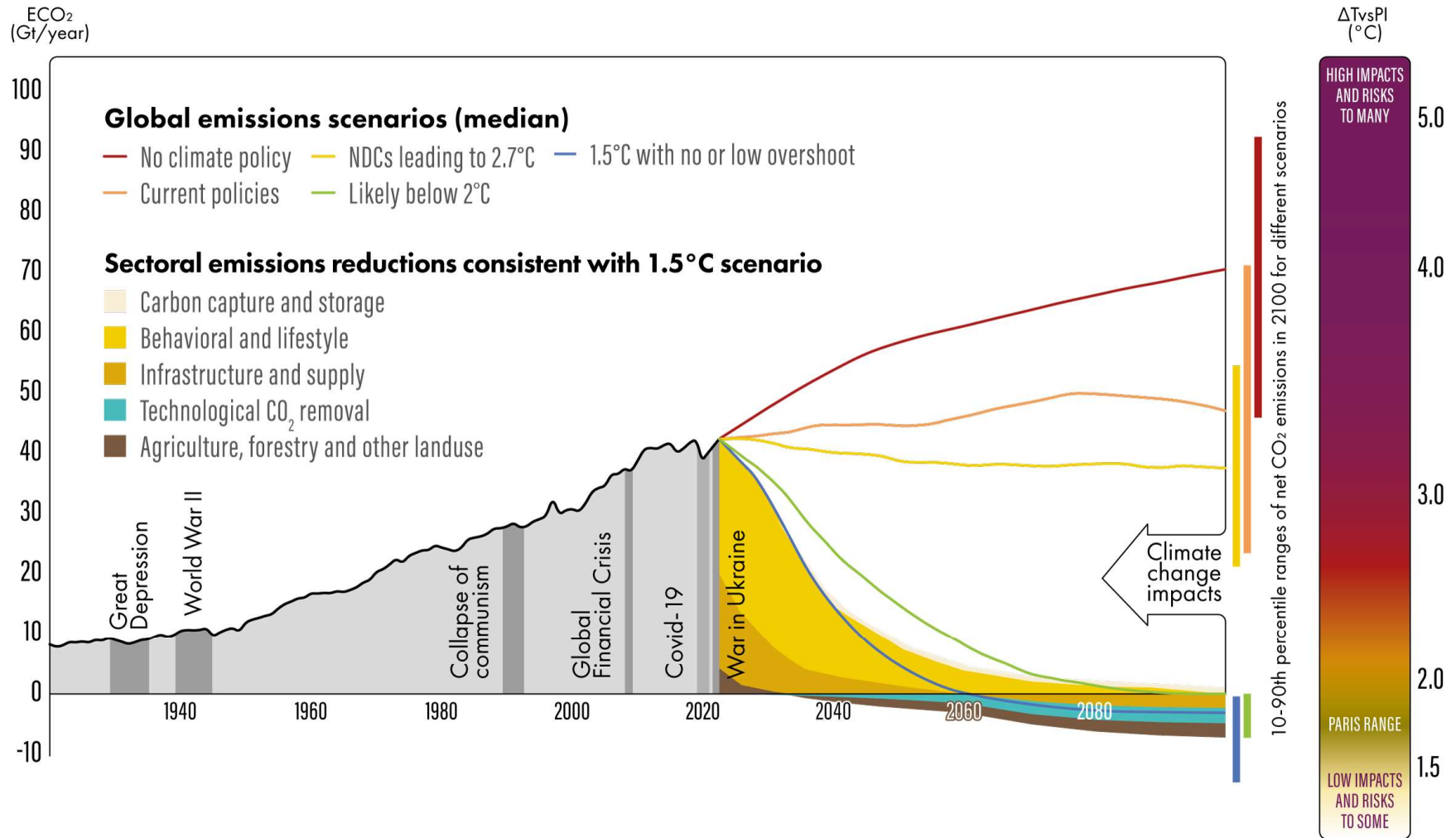
Multi-model mean global temperature anomaly for RCP2.6 for (2°C world, top) and RCP8.5 (4°C world, bottom) for the boreal summer months Source: World Bank 2014



Cascading climate risks

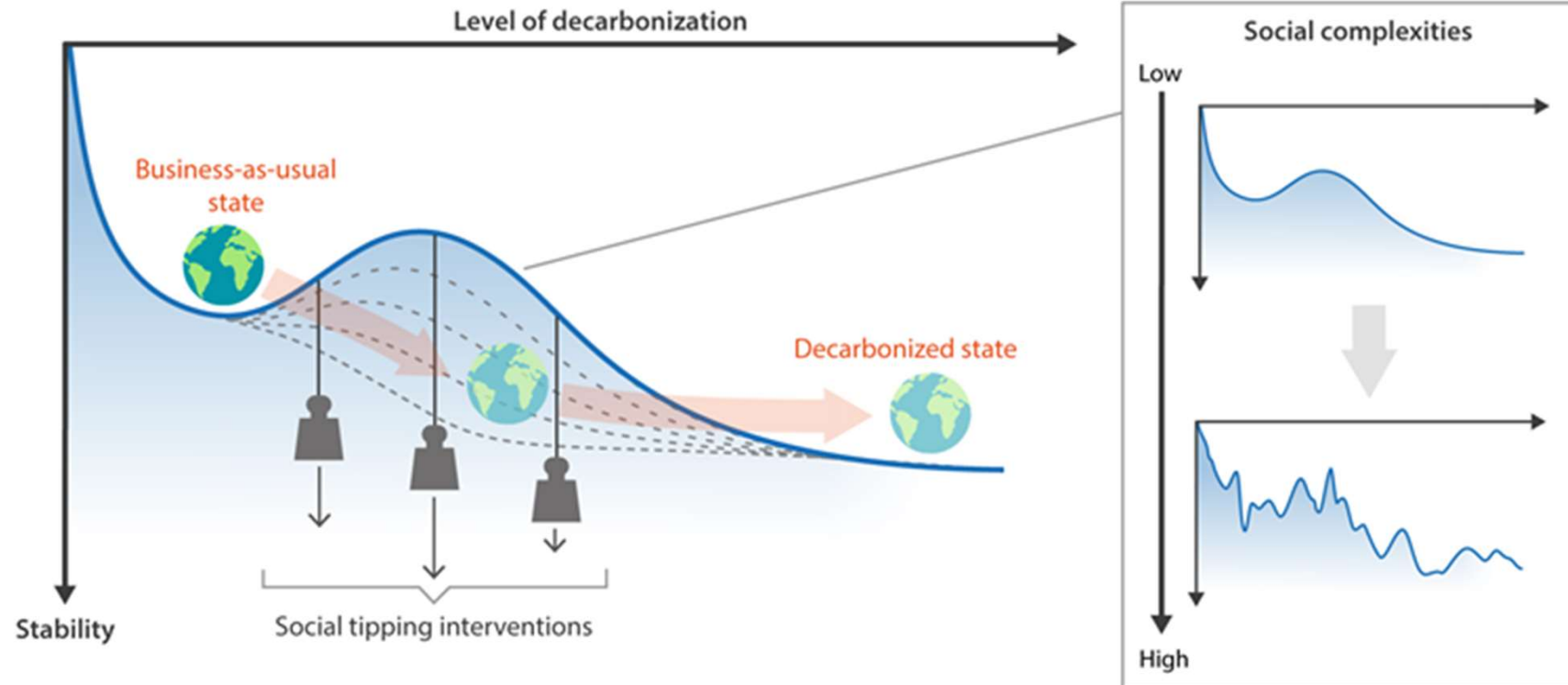


Net-zero emissions by the mid-century



Source: Otto et al. Transition4Climate (2022)

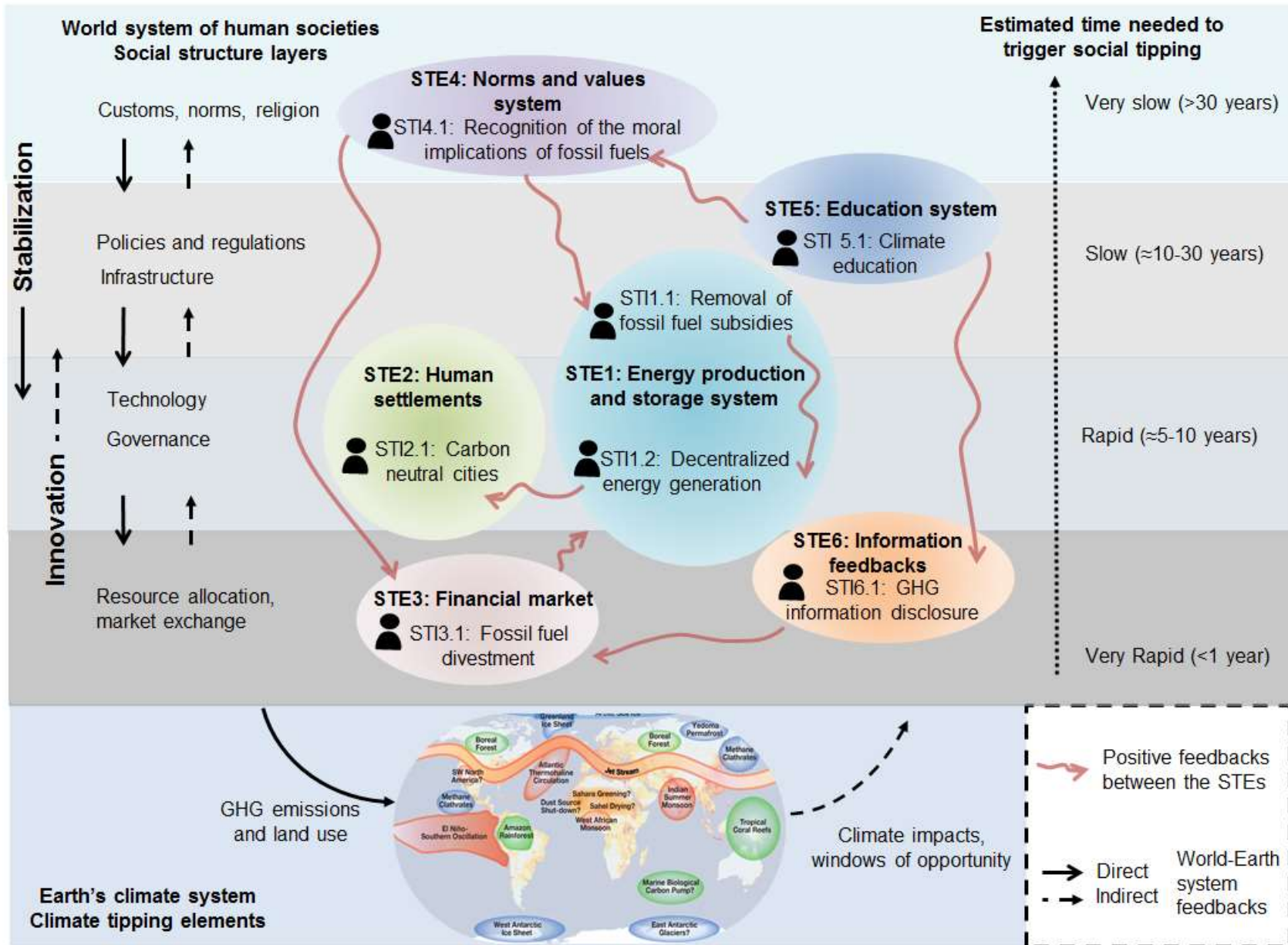
Social tipping dynamics



Source: Otto, Donges, et al. (2020)

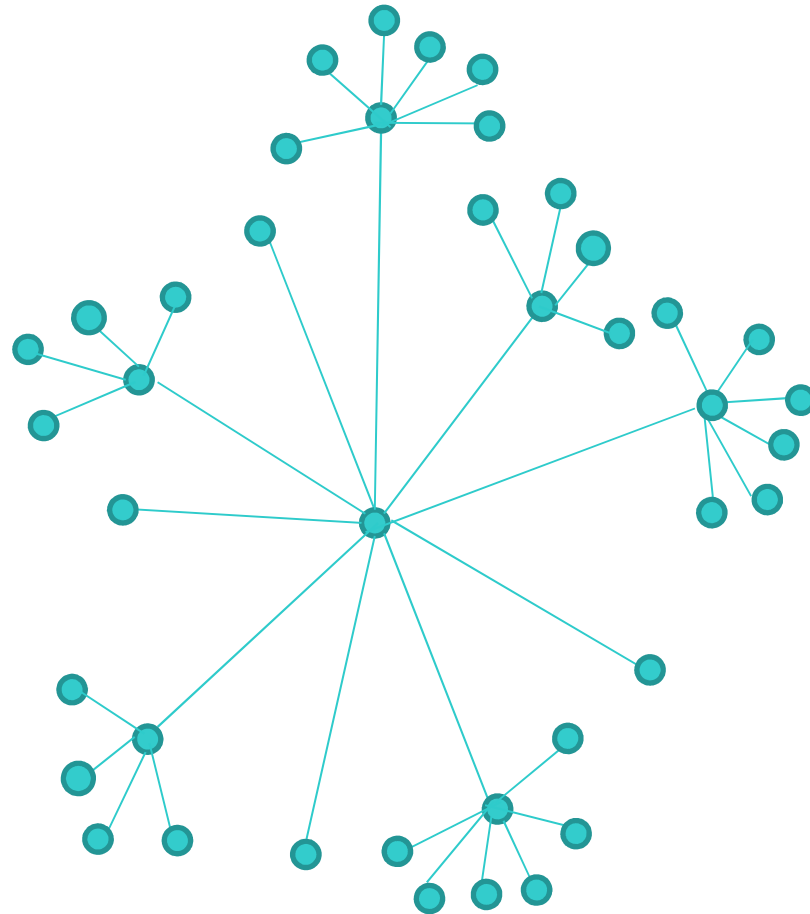


Inducing a global social tipping

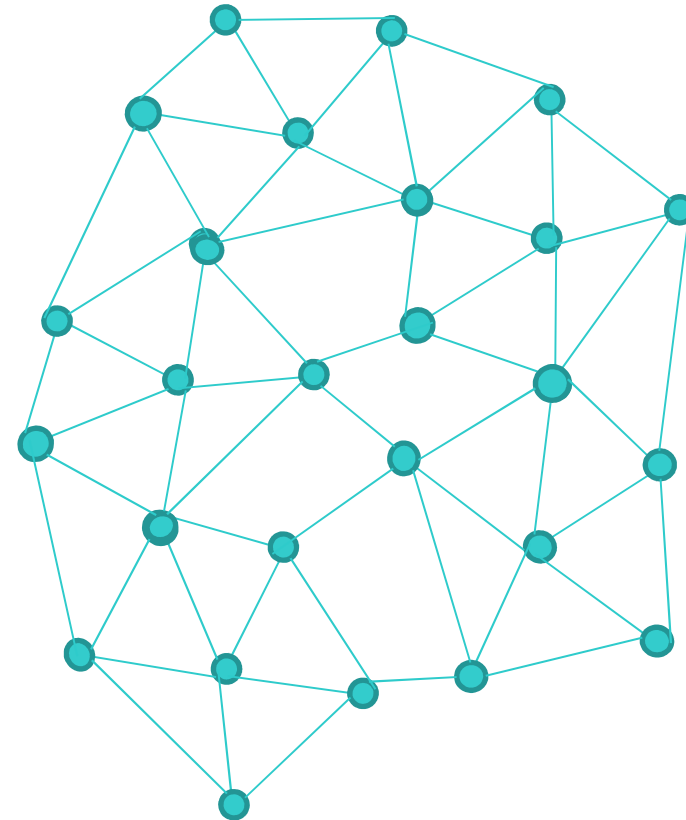


Otto, Donges, et al. (2020)

Does an individual matter?



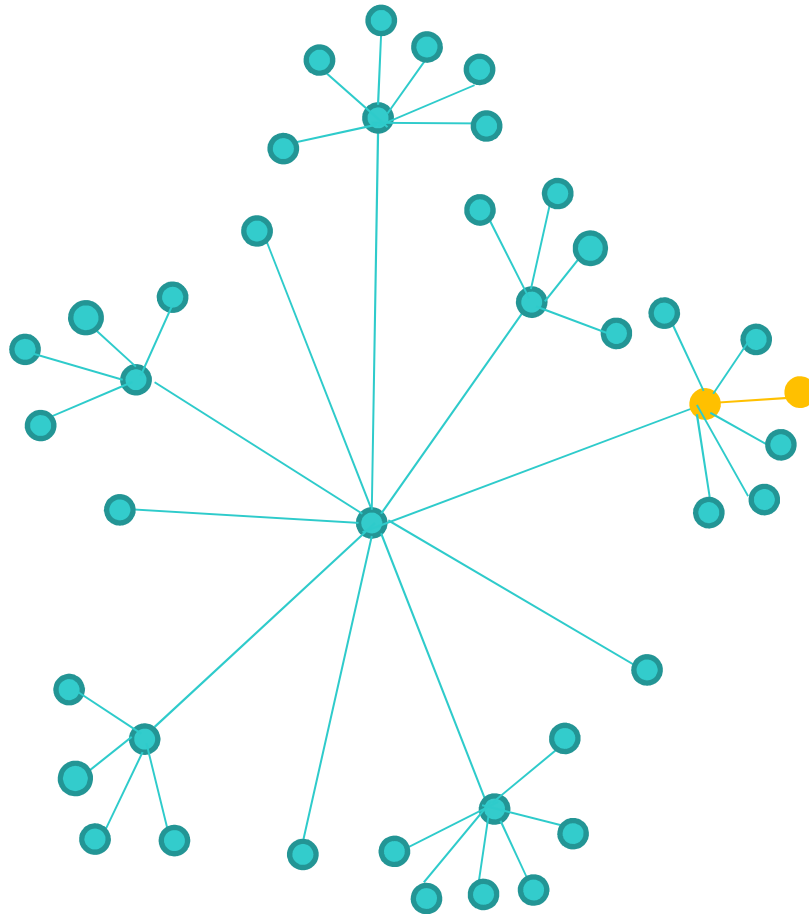
Fireworks (weak ties)



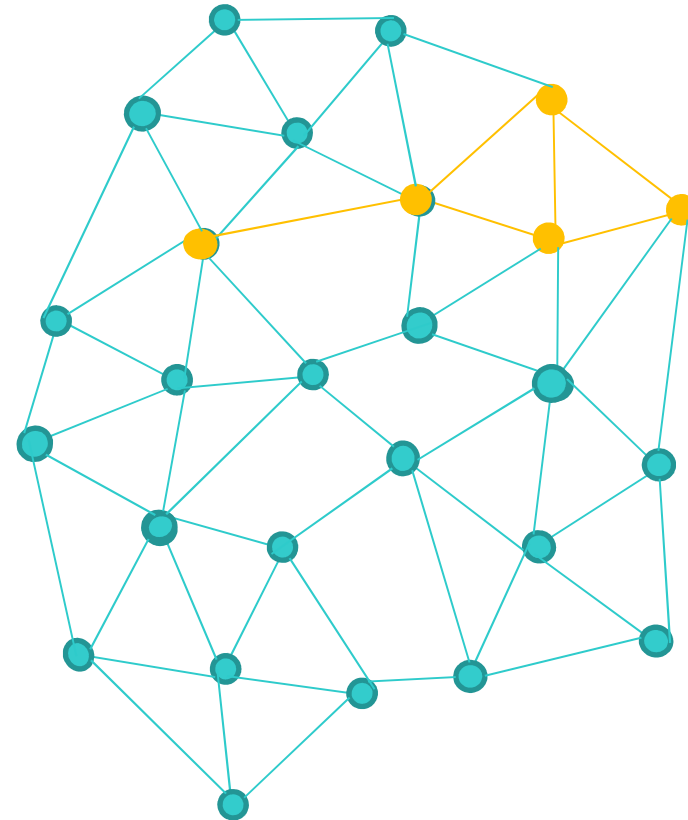
Fishing net (strong ties)

Adapted from: Centola 2021, „How to make big things happen“;
Baran 1962 „On distributed communication.

Does an individual matter?



Fireworks (weak ties)

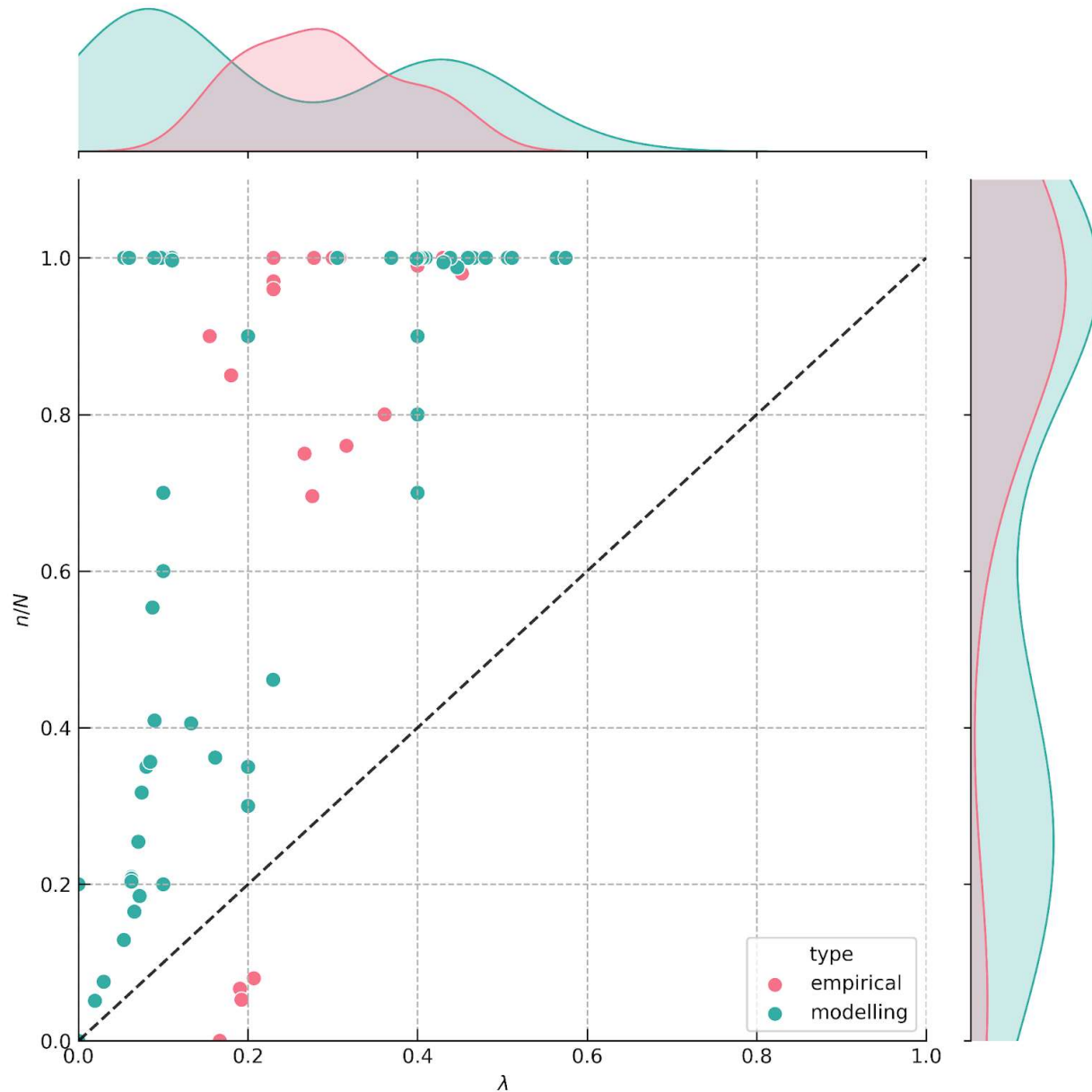


Fishing net (strong ties)

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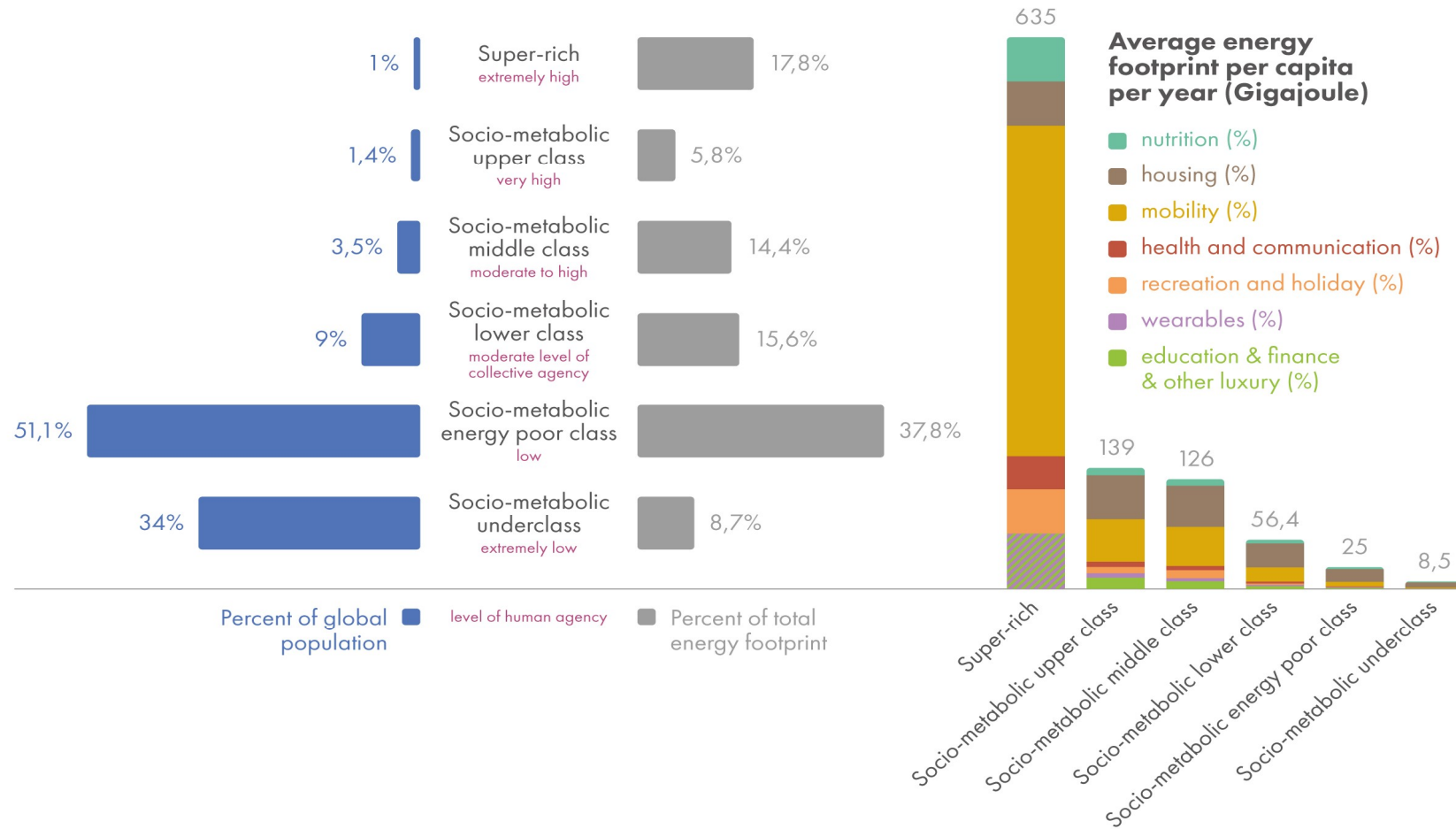


Minorities of about 20-25% tip the majority



The critical mass size λ and the steady state adopter fraction n/N . $N = 87$ modelling and empirical results of complex contagion in social networks. After a critical mass of ~ 0.25 in a population, the steady state distribution of norm adopters converges quickly to a fully tipped state. Source: Everall, Donger, Otto, submitted.

Carbon inequalities



Source: Otto and Schuster, submitted



Take home messages



- 1. Climate change impacts, cascading and systemic risks will intensify;**
- 2. No silver bullet for a rapid net-zero transition; a silver buckshot is needed;**
- 3. Technology alone will not lead to deep transformation;**
- 4. Values and norms are important for stabilizing the new emerging system;**
- 5. About 10-25% committed minority can tip the majority.**



