

Climate Politics and the Fractal Carbon Trap: Getting Unstuck

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Steven Bernstein and Matthew Hoffmann. 2019. “Climate Politics, Metaphors and the Fractal Carbon Trap.” *Nature Climate Change* 9 (December): 919–925.

Steven Bernstein and Matthew Hoffmann. 2018. “The Politics of Decarbonization and the Catalytic Impact of Subnational Climate Experiments.” *Policy Sciences* 51 (2):189–211.



The “Old” Challenge :
Distributing Emissions Reductions



The “New” Challenge: Decarbonization,
Disrupting Carbon Lock-In (Unruh 2000)

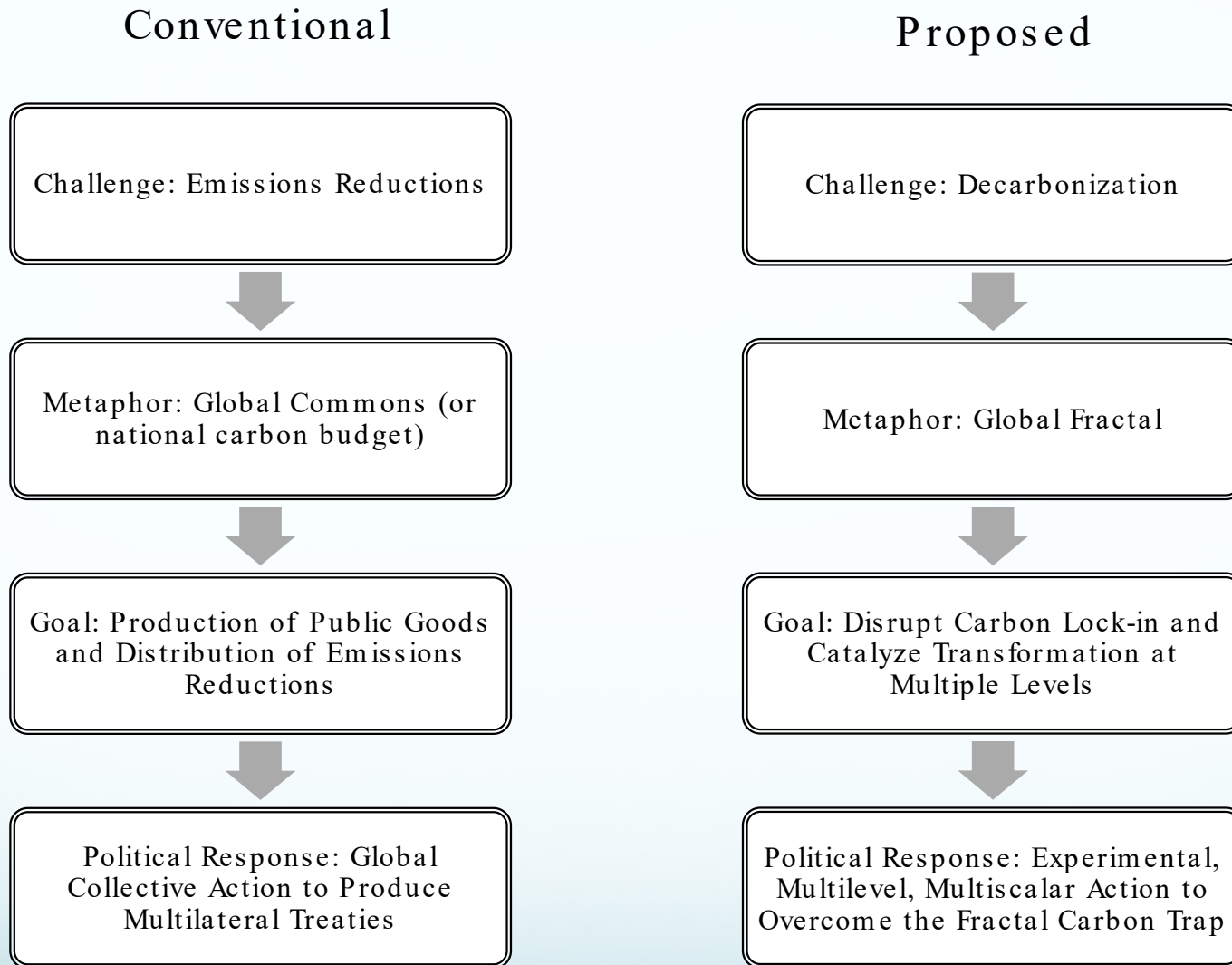
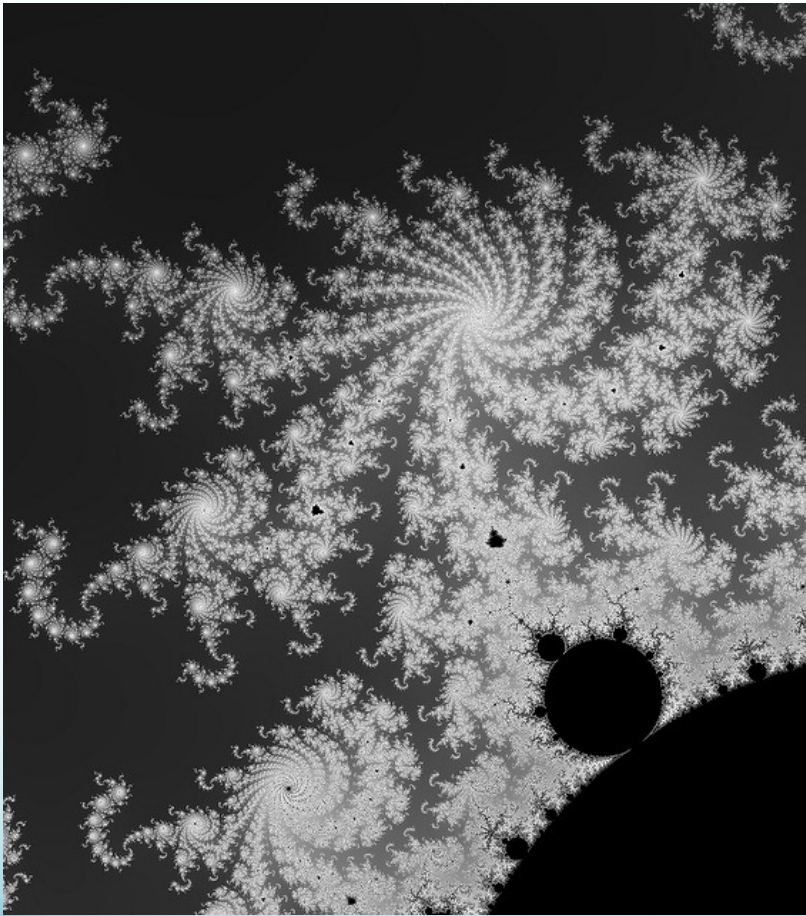


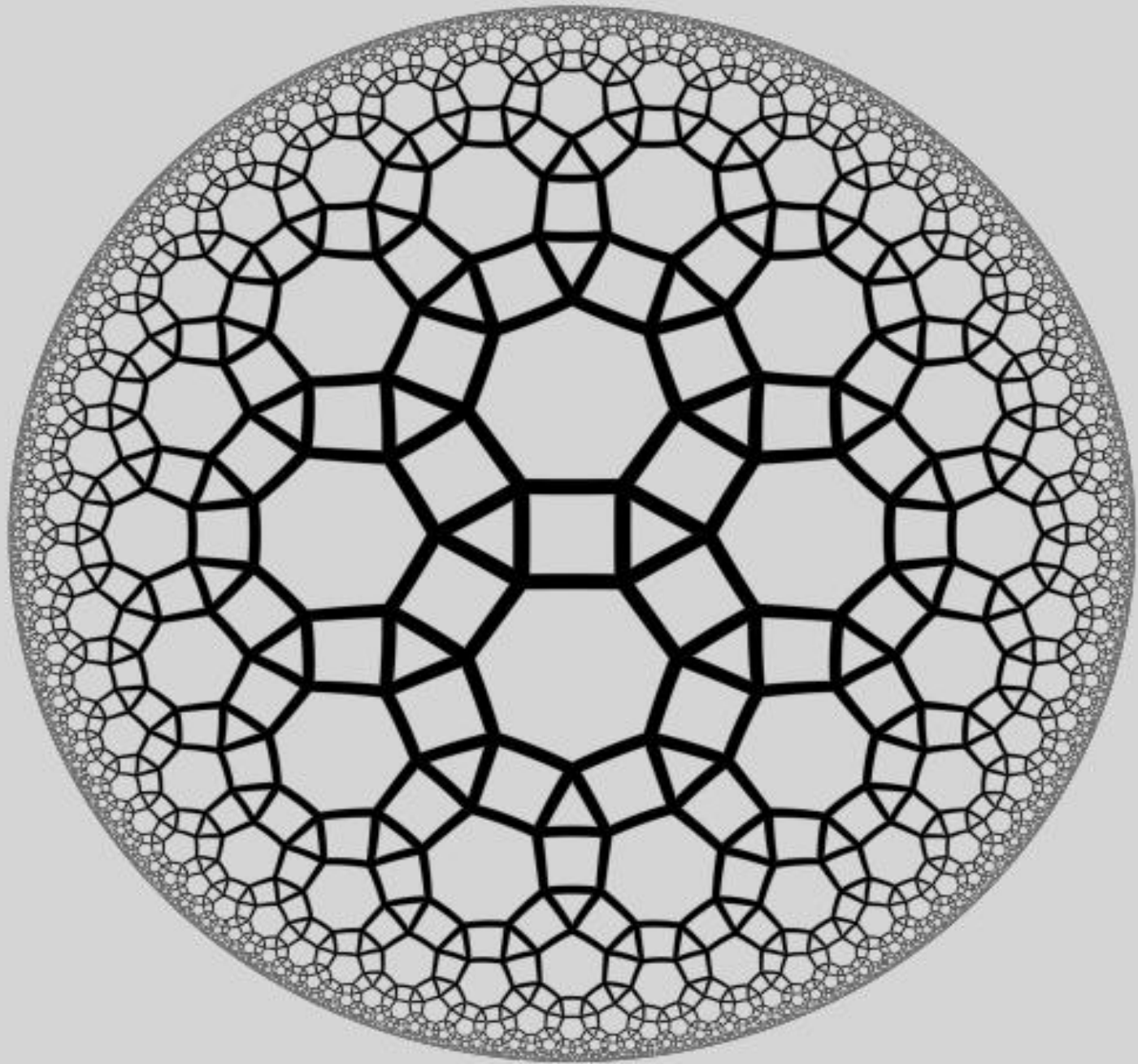
Figure 1: Metaphors and Climate Politics—The conventional logic of the global commons metaphor and the logic of the proposed global fractal metaphor

Fractal Carbon Lock-in



Fractal Carbon Lock-in

- Fractal Characteristics of Carbon Lock-In?
 - Repeated Patterns at Different Scales (Self-Similarity)
 - Interdependence/ Reinforcement Across Scales
 - Self-Organization



Where's the trap?

- Inspired by Barret and Swallow (Fractal Poverty Trap)
 - Poverty persists because multiple equilibria, factors at multiple levels and scales reinforce the equilibria

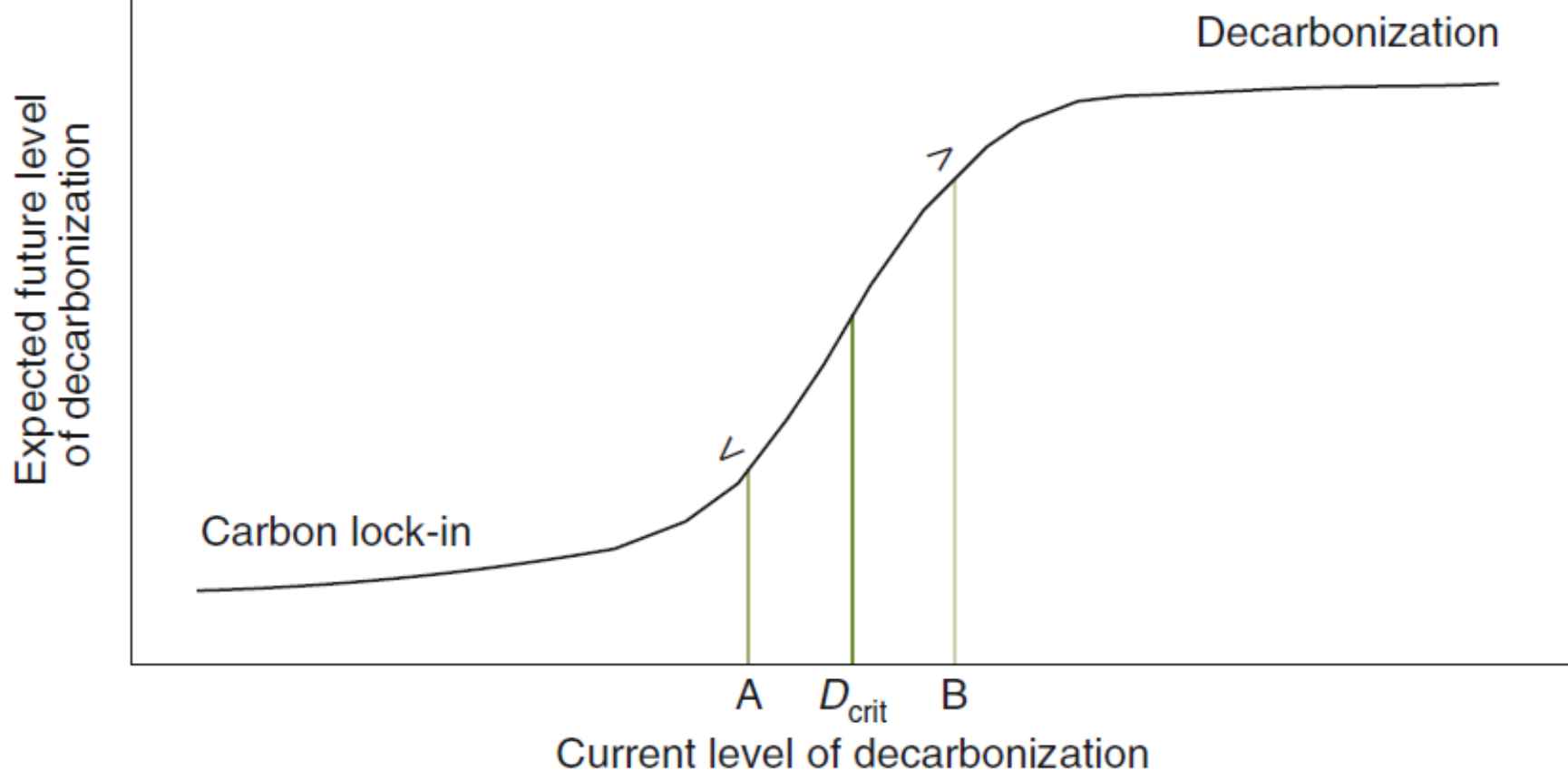


Fig. 2 | The fractal carbon trap. Visual representation of the potential trajectory of a specific targeted system in the fractal with two attractors — carbon lock-in and decarbonization. D_{crit} is the threshold point at the boundary between the two attractors. A and B represent potential interventions in the system below and above that boundary.

What Makes a Trap?

- Thresholds Determined by Multiple Factors
 - Economic
 - Technology
 - Cultural
 - Political
- Threshold determined by both local and interdependent factors
- Political and cultural dynamics especially challenging, interventions must navigate...
 - counter-coalitions supported by incumbent interests and industries,
 - campaigns that appeal to entrenched cultural norms and practices,
 - Institutional arrangements that often favor existing policies in path-dependent ways

Examples of Fractal Carbon Trap Dynamics



MISSION INNOVATION

Accelerating the Clean Energy Revolution



THE °CLIMATE GROUP



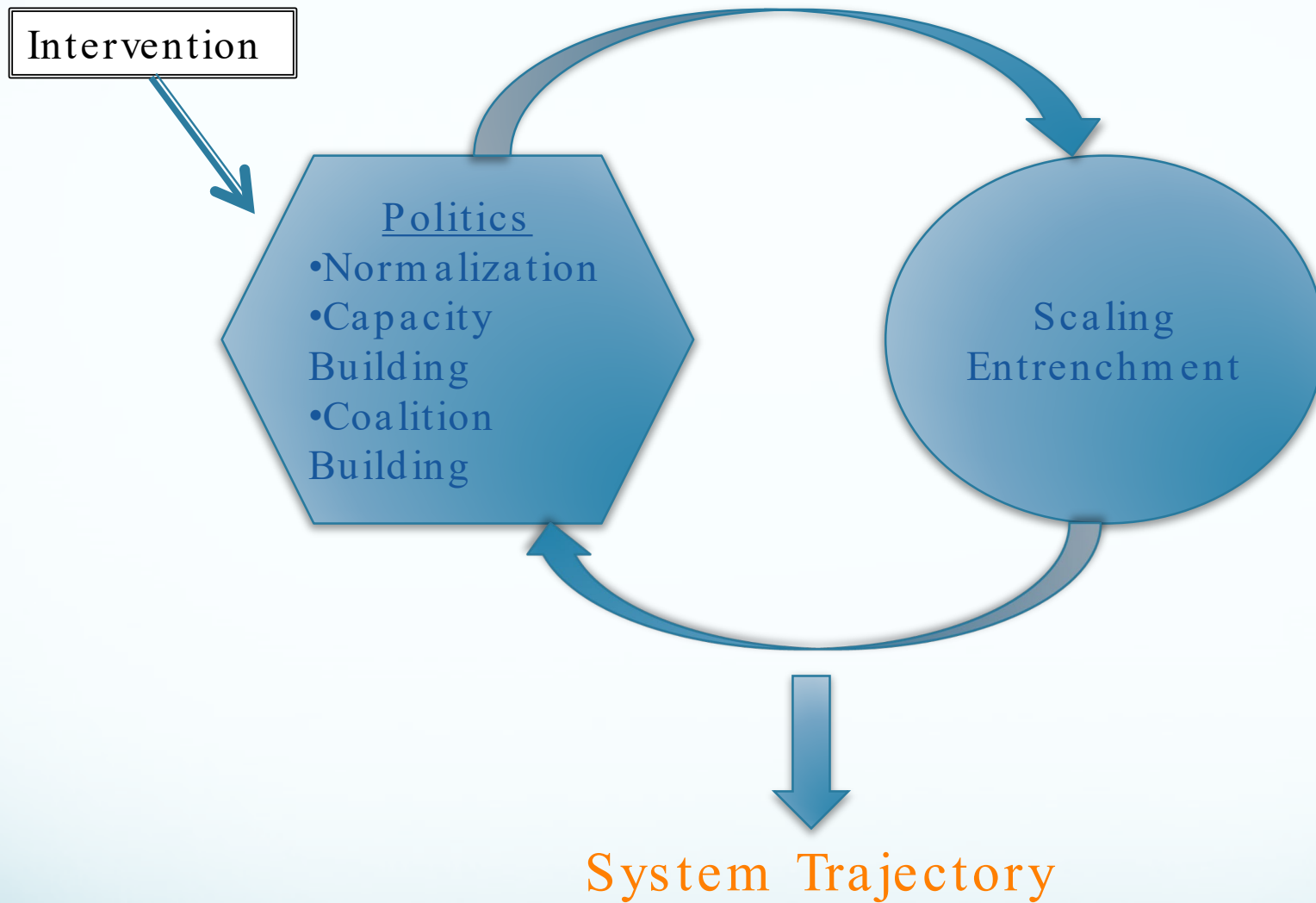
CARBON DISCLOSURE PROJECT

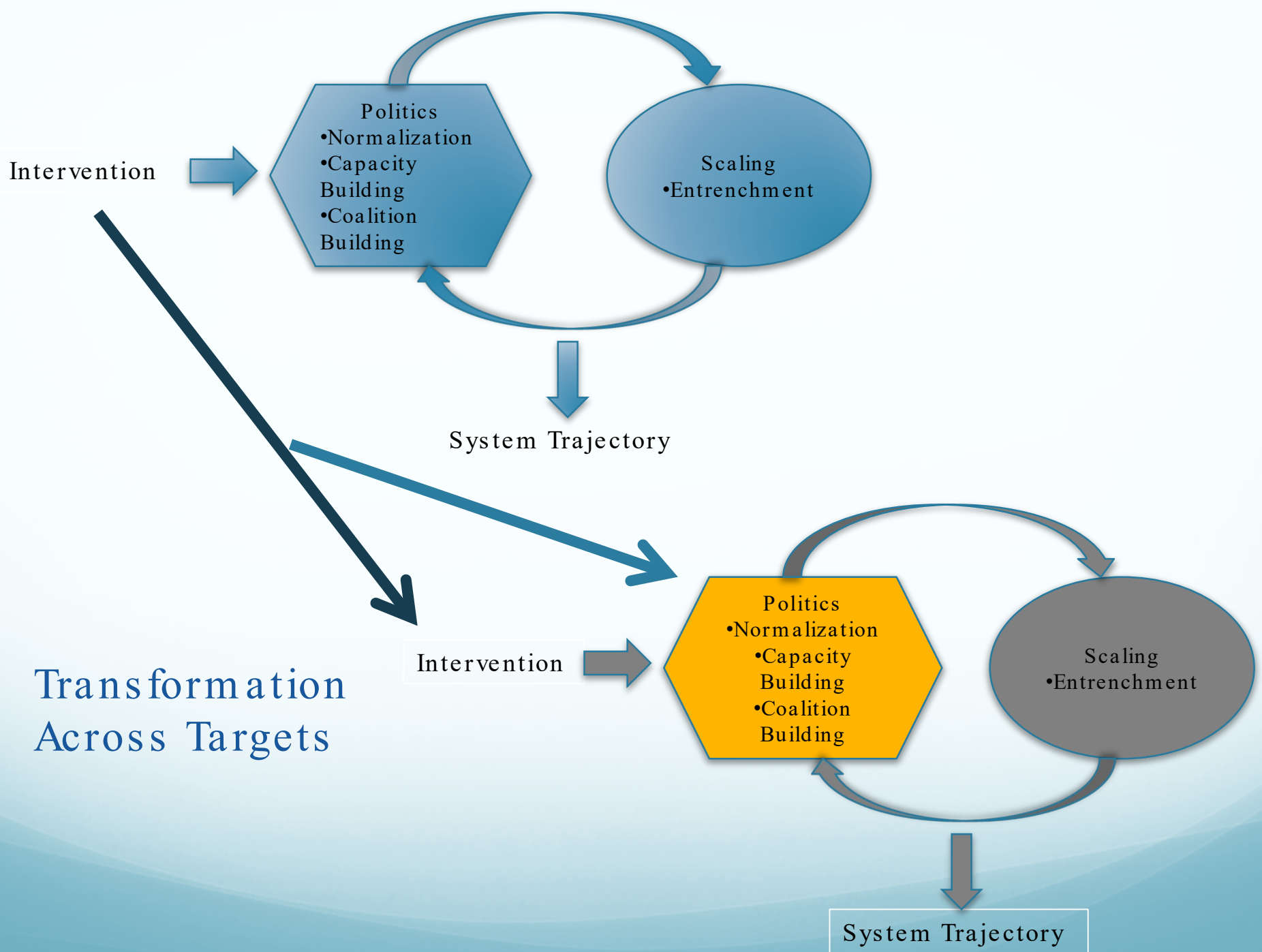


Lots of Action

Cases

- C40 Electric Vehicle Network
- The Climate Group: Smart Cities
- Carbon Trust
- IISD's Subsidies Campaign
- Colorado Renewable Energy Policy
- Germany's Energy Plan
- Clean Energy Ministerial
- Canadian Provincial Carbon Markets
- Corporate Carbon Pricing
- CDP
- Divestment Campaigns
- Toronto Waterfront and Climate plans
- Global Green Freight
- Africa Green Energy Corridor
- Asia-Pacific Partnership
- REEEP
- Copenhagen's Municipal Plan
- Green Economy Canada
- Ontario Coal Phase-out
- Norway EV Policy





Implications

1. E.g., in paper: Norway EVs, Energiewende, and CDP.
 - Each shows some movement toward D_{crit} threshold, but also shows dynamics of trap (look at political-economy factors that make progress and also lead to trap).
 - Norway very successful uptake, 39% all new cars EV in 2017, some diffusion to shipping and aviation; Germany FIT model diffused, demand for renewable technologies, EU directive
2. BUT, beware Efficiency Trap.

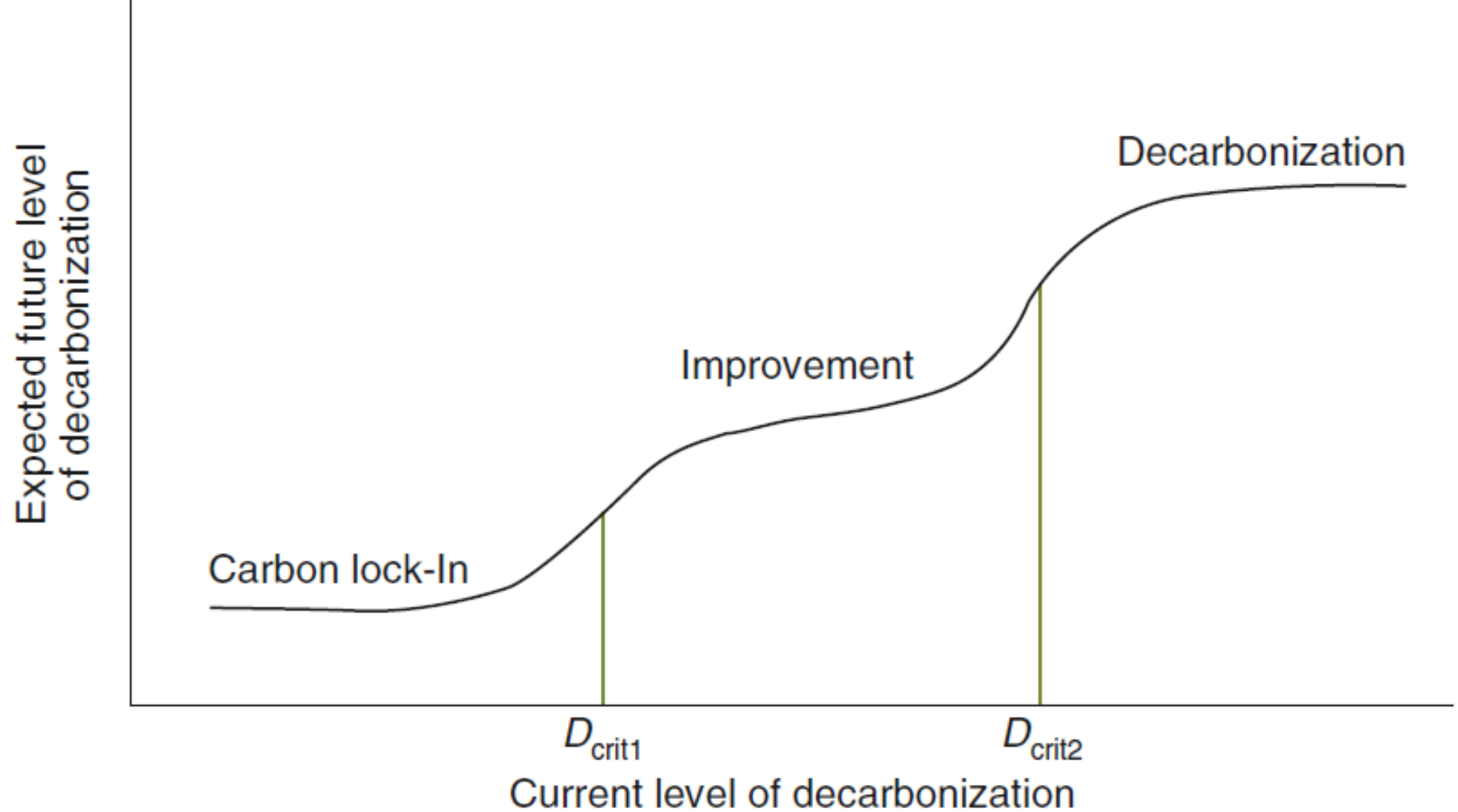


Fig. 3 | The double trap. Visual representation of the potential trajectory of a specific targeted system in the fractal with three attractors — carbon lock-in, improvement and decarbonization. D_{crit1} and D_{crit2} are the threshold points at the boundaries between attractors.

Double Trap Examples

1. Norway:

- EVs second vehicle; driving longer distances
- Emissions still going up in transportation sector (26% 1990-2018; 2.8% in 2017-2018).
- Tax and incentives supported by offshore oil production
- Look for evidence of moving over threshold, ramping up targets and policies, diffusing, maintaining momentum

2. Germany:

- Will fall well short of 2020 targets.
- Nuclear phase-out, fracking revolution and other pricing dynamics led to coal being cheapest energy, increasing demand, extending life of coal plants
- Household costs remained high while manufacturers received exemptions (though still public support-high normalization) but could undermine coalitions.

3. Colorado NEE:

- Redefined “new” energy economy to include natural gas, undercutting commitment to renewables.

Implications

1. Politics matters – interventions flows through fractal trap structure, pol-economy factors key
2. How we value interventions important – focus less on emission potential, more on how initiatives influences thresholds (e.g., institutional, capacity normative, coalitional changes) and trajectories of other systems (e.g., Carbon Trust), monitor over time (ripple effects and positive and negative feedback).
 - Related – Sabel's insight – execution more/ as important as design (learning possible)

Implications

3. Look at interactions beyond climate change – e.g., SDGs and recognizing integrative and interactive policies: mainstreaming and recognizing positive and negative ramifications of decarbonization.
4. Politics of getting started are different than the politics of maintaining and extending climate action (beware bridge fuels that entrench new interests; nudging limits – “done enough”)
 - E.g., Create broader coalitions of support by building justice and equity into every climate action (Brian Topp – just transition, GND?); Smart 2020 (climate group) overly technocratic, democracy demands and fail to catalyze broad decarbonization; lacked coalition to build on early

Diagnostic Questions

1. Does it disrupt dependence on fossil energy?
2. Does it build coalitions that favor more aggressive actions?
3. Does it normalize (taken-for-granted, legitimate) aggressive climate action – e.g., BC tax?
Energiewende, Norway EV.
4. Is it sensitive to broader connections? Does it spark climate action elsewhere?

Thank you!