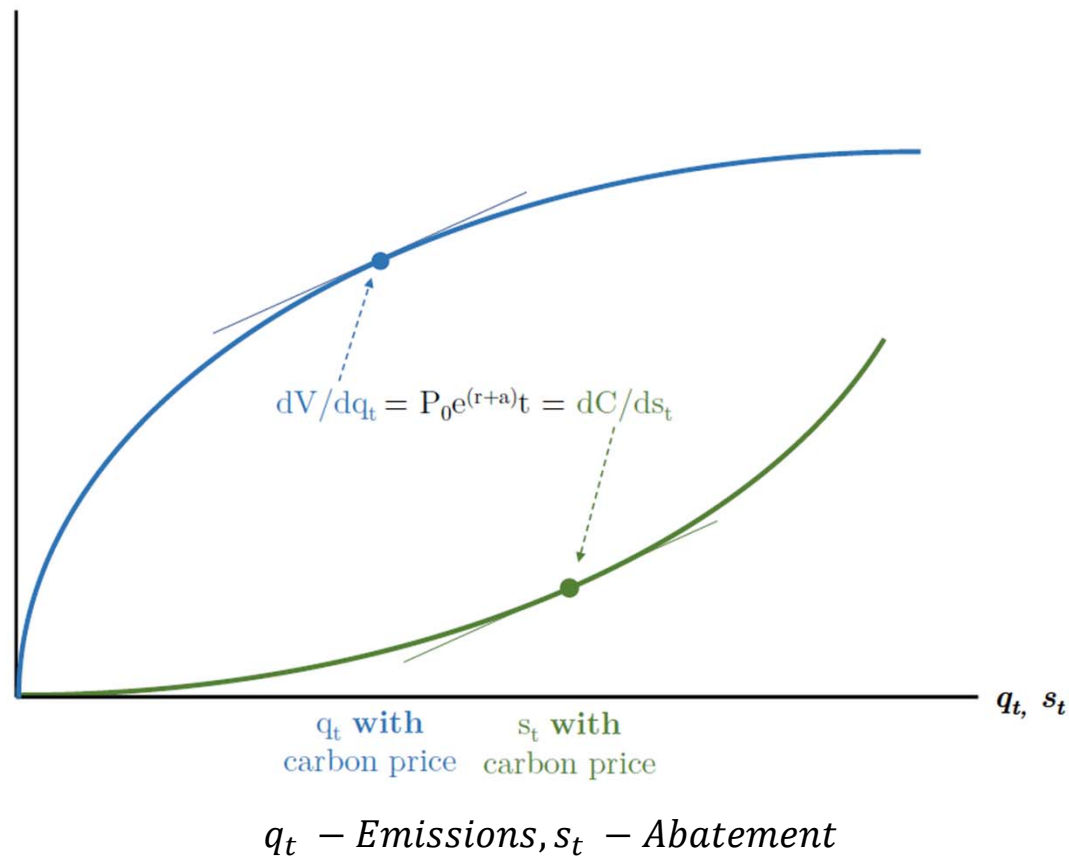


Policy Goals

Gilbert E. Metcalf

Economics of Climate Change
AEA Continuing Education Workshop
January 2020

Climate Change as a Cost-Benefit Analysis



PARIS AGREEMENT



UNITED NATIONS
2015

Article 2

1. This Agreement, in enhancing the implementation of the Convention, including its objective, aims to strengthen the global response to the threat of climate change, in the context of sustainable development and efforts to eradicate poverty, including by:

(a) Holding the increase in the global average temperature to well below 2°C above pre-industrial levels and pursuing efforts to limit the temperature increase to 1.5°C above pre-industrial levels, recognizing that this would significantly reduce the risks and impacts of climate change;

(b) Increasing the ability to adapt to the adverse impacts of climate change and foster climate resilience and low greenhouse gas emissions development, in a manner that does not threaten food production; and

(c) Making finance flows consistent with a pathway towards low greenhouse gas emissions and climate-resilient development.

2. This Agreement will be implemented to reflect equity and the principle of common but differentiated responsibilities and respective capabilities, in the light of different national circumstances.

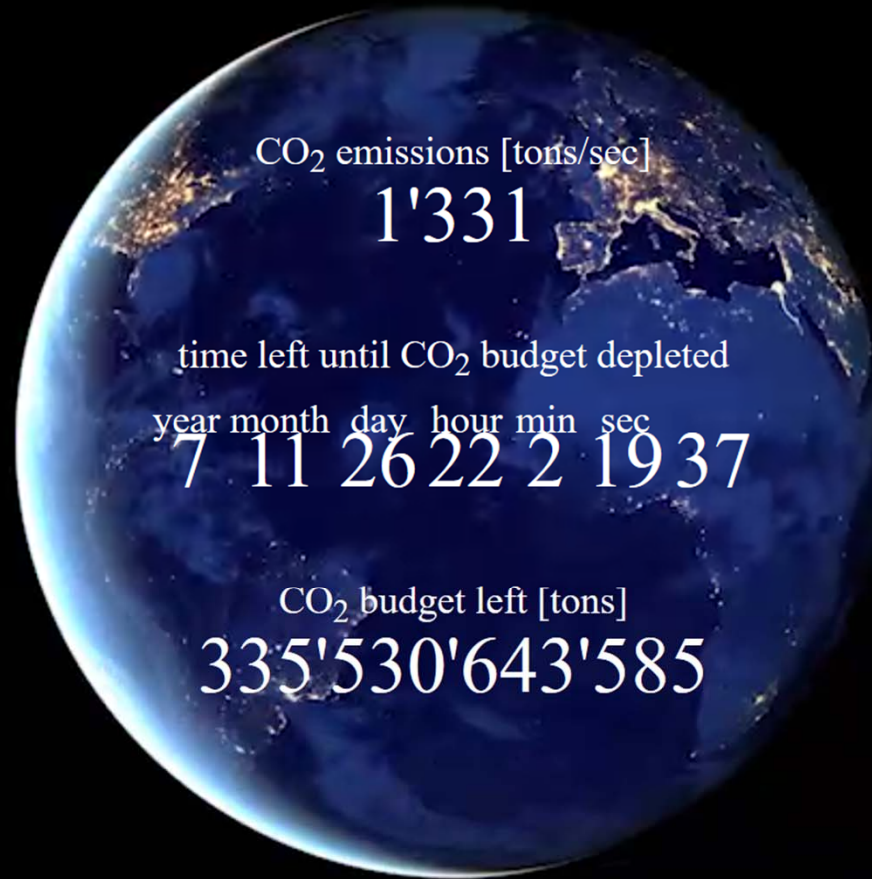
Related Concept: Carbon Budget

- How much warming degree

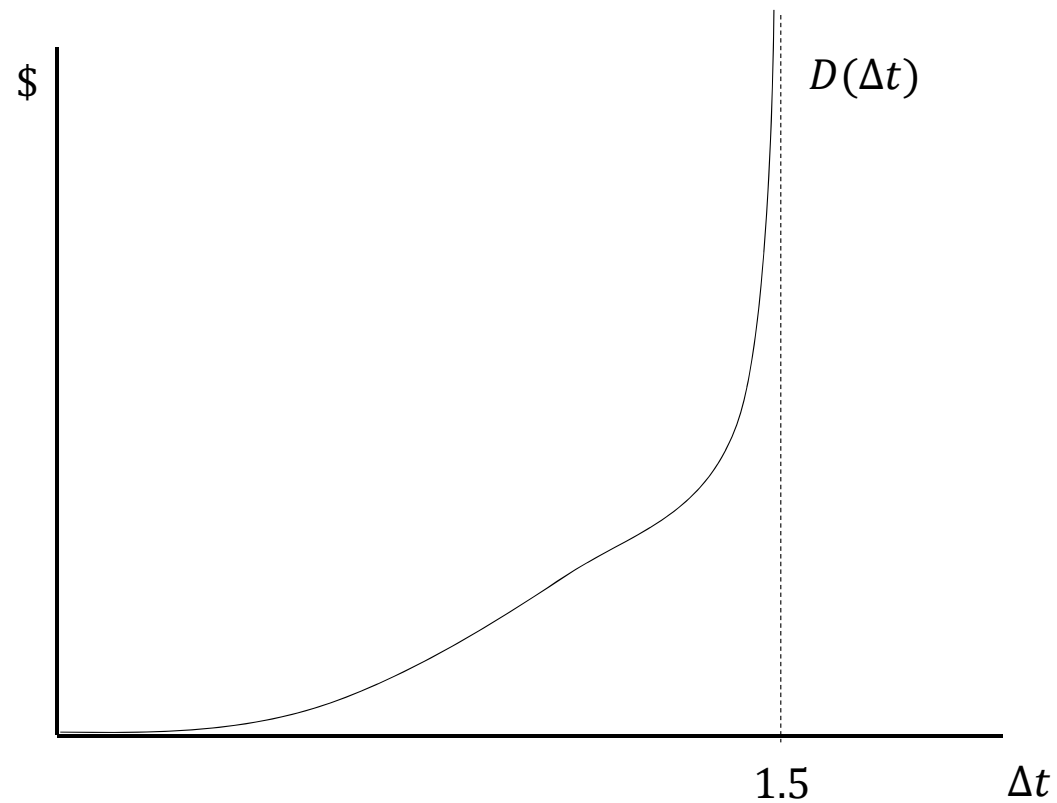
Additional Warming since 2006–2015 [°C] ^{*(1)}	Approximate Warming since 1850–1900 [°C] ^{*(1)}	Remaining Carbon Budget (Excluding Additional Earth System Feedbacks ^{*(5)}) [GtCO ₂ from 1.1.2018] ^{*(2)}			Key Uncertainties and Variations ^{*(4)}					
		Percentiles of TCRE ^{*(3)}			Earth System Feedbacks ^{*(5)}	Non-CO ₂ scenario variation ^{*(6)}	Non-CO ₂ forcing and response uncertainty	TCRE distribution uncertainty ^{*(7)}	Historical temperature uncertainty ^{*(1)}	Recent emissions uncertainty ^{*(8)}
		33rd	50th	67th	[GtCO ₂]	[GtCO ₂]	[GtCO ₂]	[GtCO ₂]	[GtCO ₂]	[GtCO ₂]
0.3		290	160	80	Budgets on the left are reduced by about –100 on centennial time scales	±250	–400 to +200	+100 to +200	±250	±20
0.4		530	350	230						
0.5		770	530	380						
0.53	~1.5°C	840	580	420						
0.6		1010	710	530						
0.63		1080	770	570						
0.7		1240	900	680						
0.78		1440	1040	800						
0.8		1480	1080	830						
0.9		1720	1260	980						
1		1960	1450	1130						
1.03	~2°C	2030	1500	1170						

2°C scenario

1.5°C scenario

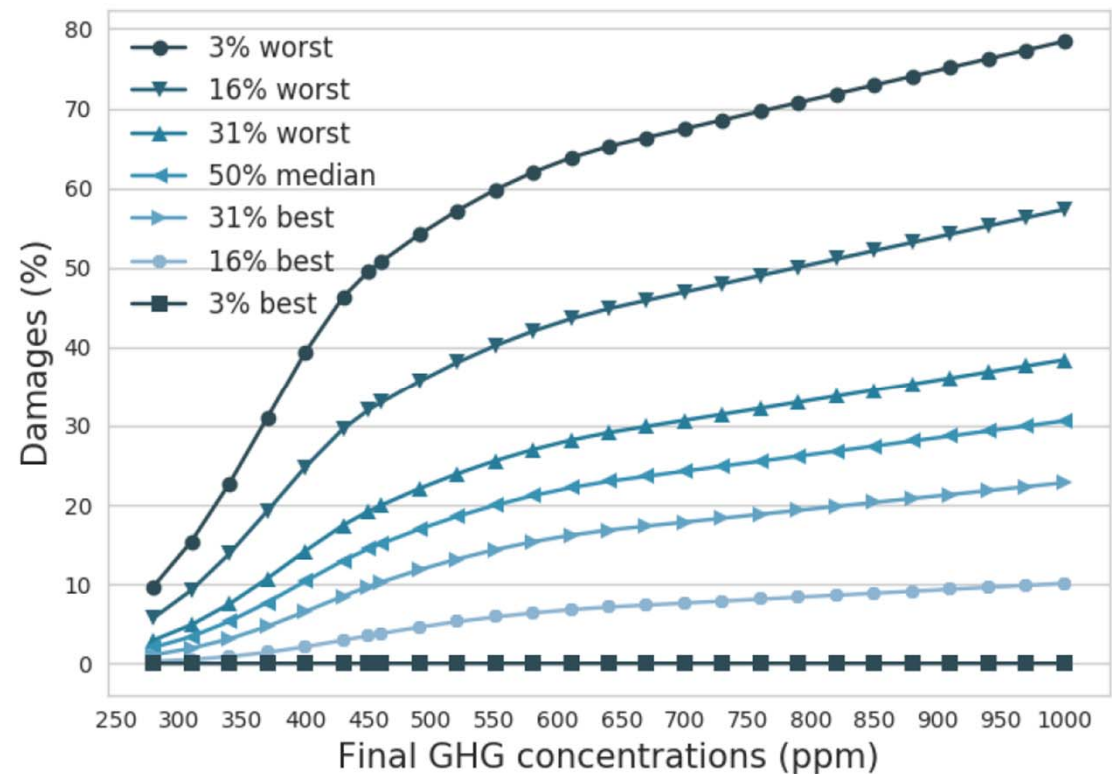


(a) Holding the increase in the global average temperature to well below 2°C above pre-industrial levels and pursuing efforts to limit the temperature increase to 1.5°C above pre-industrial levels, recognizing that this would significantly reduce the risks and impacts of climate change;



Thresholds and Catastrophes

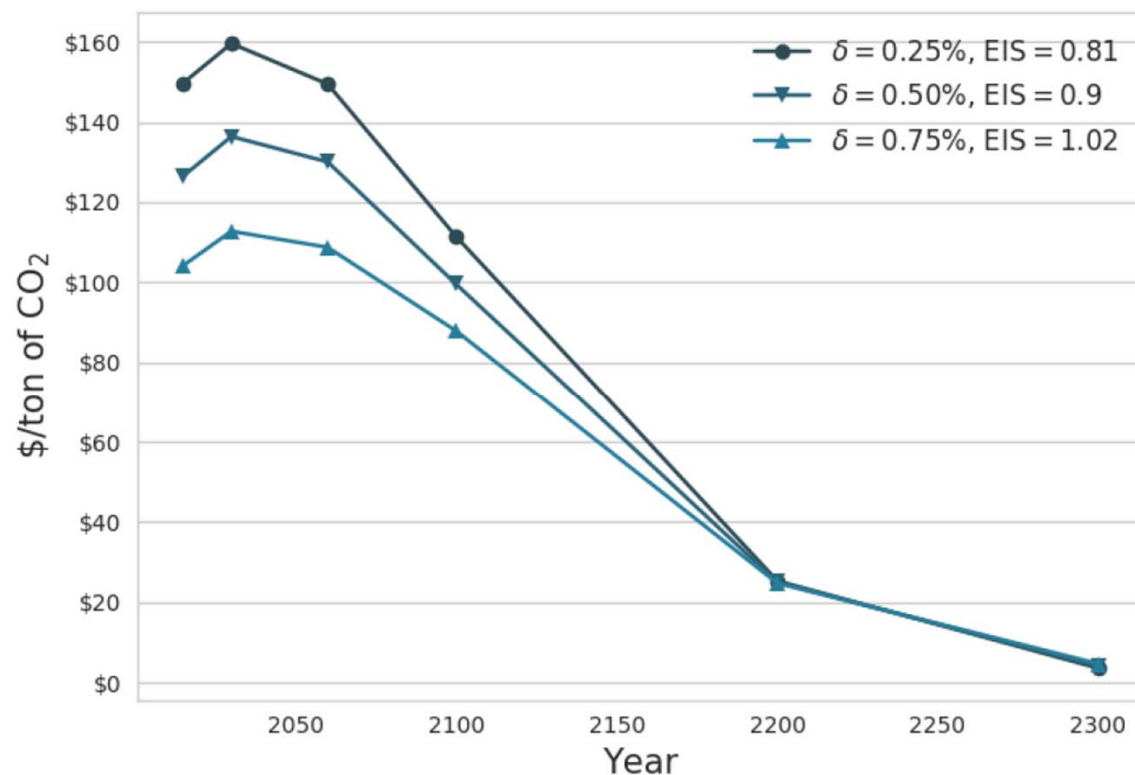
- Economists might characterize catastrophes as the potential of a very large loss of output



Daniel et al. (2019)

Thresholds and Catastrophes

- Even here, models don't set an absolute limit on cumulative emissions
- Rather, they call for a high initial price on emissions
 - Drive technology earlier (but recall BMT α)
 - Reduce risk of tipping point



Daniel et al. (2019)

Political Acceptability

- Economists tend to favor putting a price on emissions

“Adam Smith’s Invisible Hand with a Green Thumb”

- International negotiators and others focus on emission limits
 - Carbon budget, temperature increase limits, etc.
 - Favors policies with strict limits on emissions
- Hybrid policies possible that combine price and quantity controls
 - May be less efficient but enhance political acceptability

“We argue that traditional economic lessons on efficiency and equity are subsidiary to the primary challenge of garnering greater political acceptability”

- Klenert et al. (2018)

Hybrid Policies

EDITOR'S CHOICE

An Emissions Assurance Mechanism: Adding Environmental Certainty to a U.S. Carbon Tax

FREE

Gilbert E Metcalf ✉

Review of Environmental Economics and Policy, rez013, <https://doi.org/10.1093/reep/rez013>

Published: 19 December 2019 **Article history** ▼



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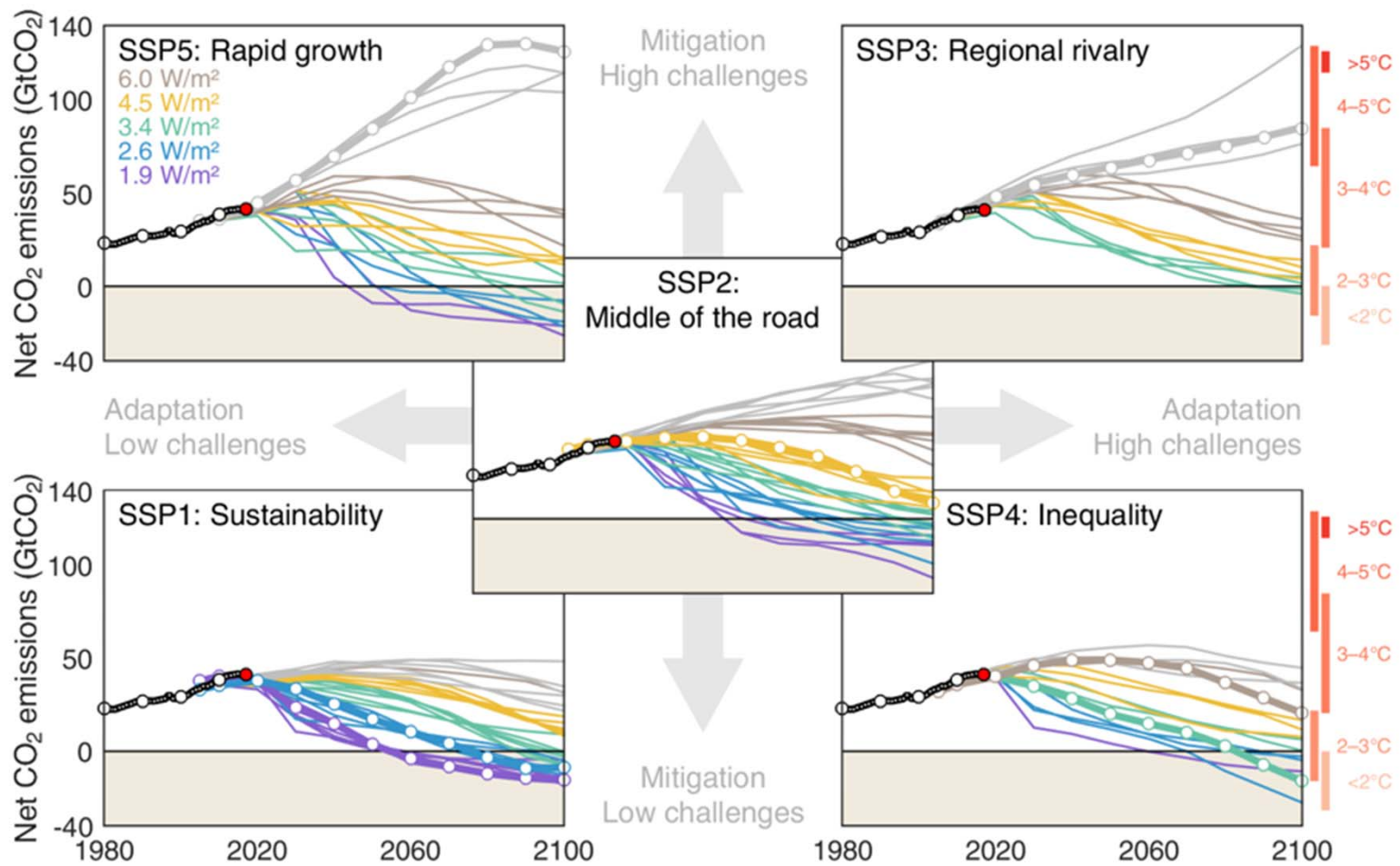
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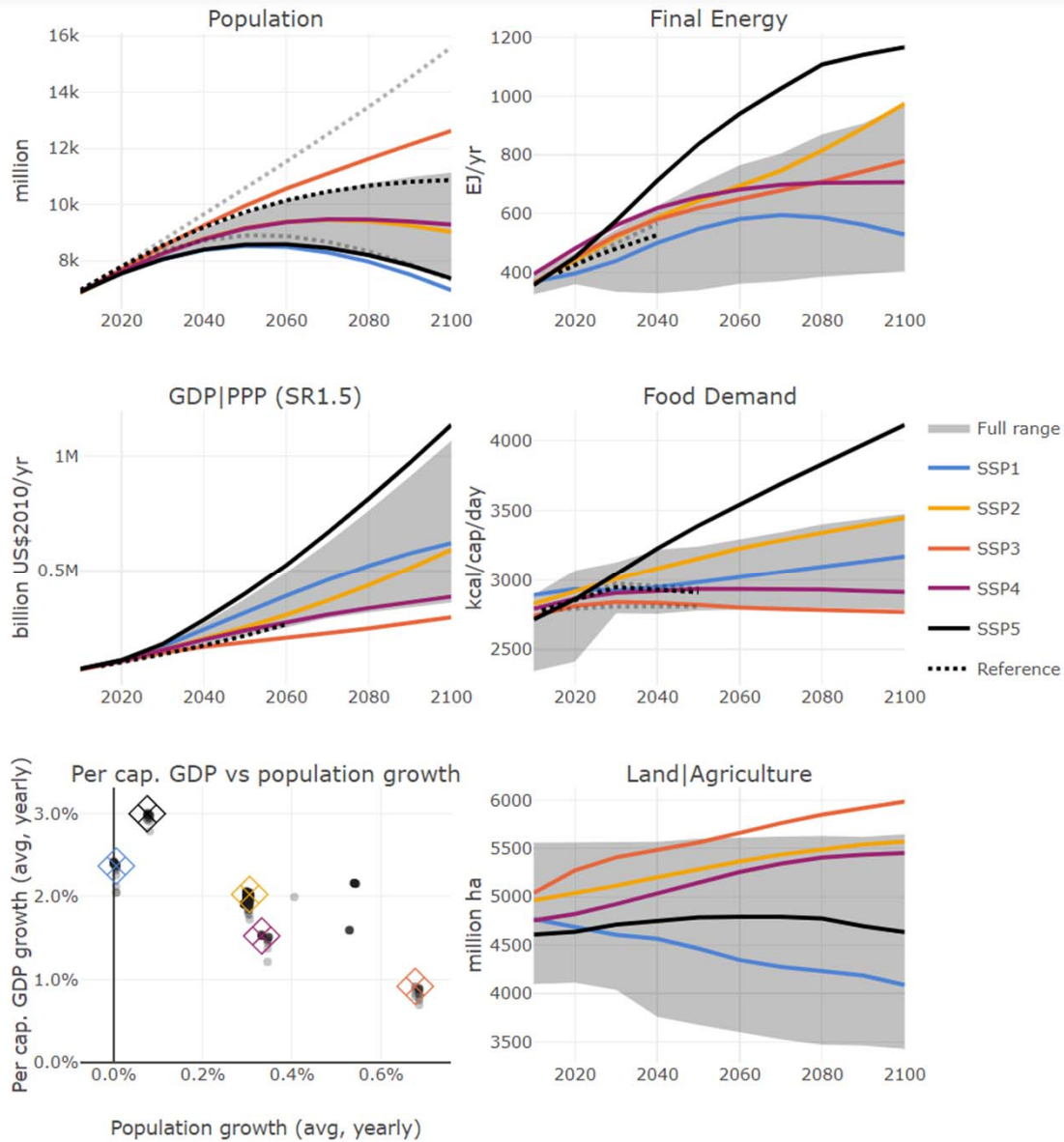
Abstract

Economists have long favored a carbon tax as the most efficient policy to curb greenhouse gas emissions. One barrier to broader support for this policy option is its failure to ensure limits on emissions. Environmental groups, in particular, have expressed skepticism about carbon taxes for this failure to explicitly limit emissions. In response, policymakers have shown interest in a hybrid carbon tax that provides some assurance that emissions reduction targets will be met. To demonstrate how such a hybrid tax could work, I propose a prototype emissions assurance mechanism (EAM)

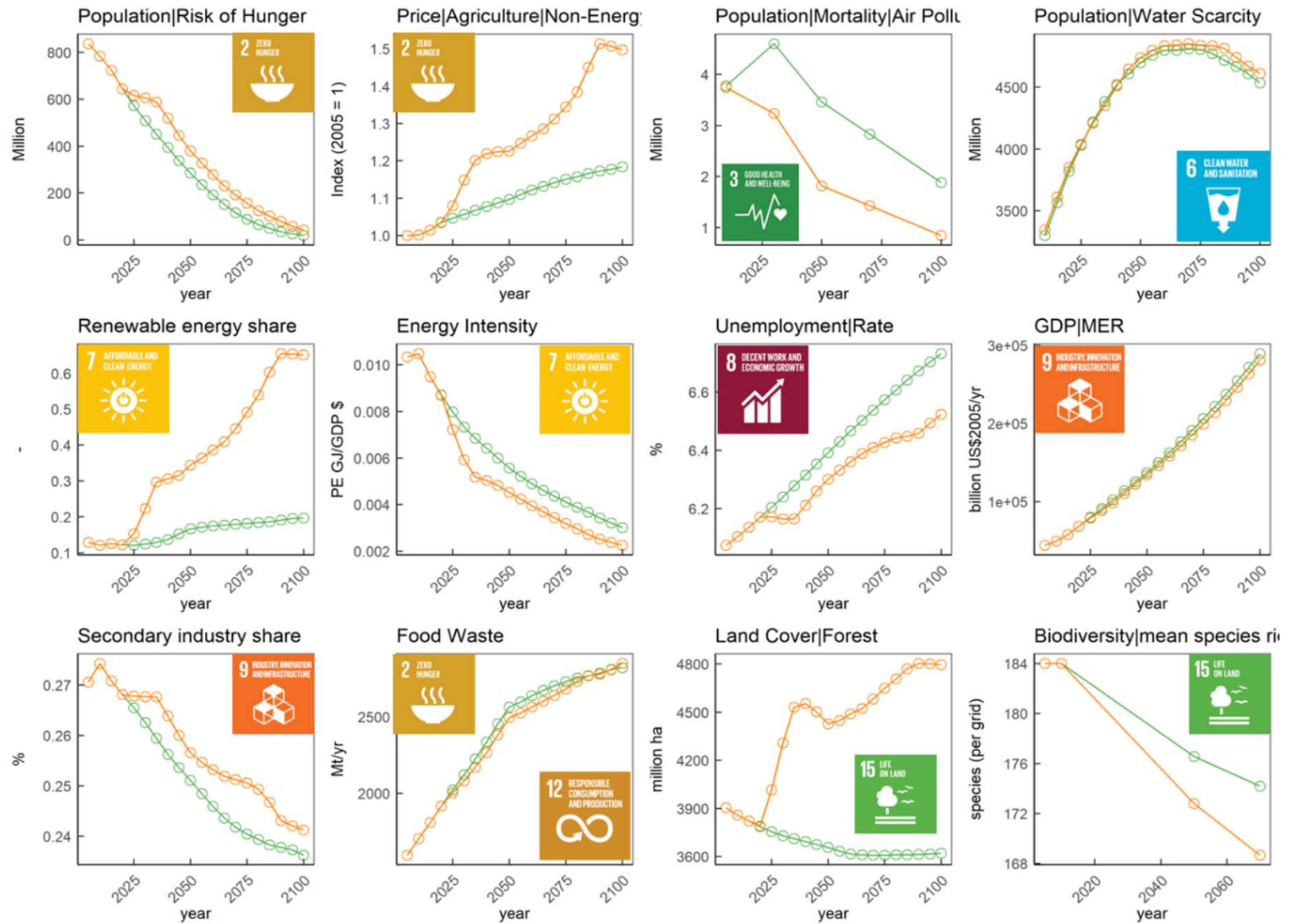
Interplay with Other Goals

- Climate and Development
 - UN Sustainable Development Goals (SDGs)
 - Shared Socioeconomic Pathways (SSPs)
- Income inequality
 - Within countries
 - Across countries





BAU
Mitigation



Political Challenge



France



Ecuador



Nigeria



Indonesia