



THB

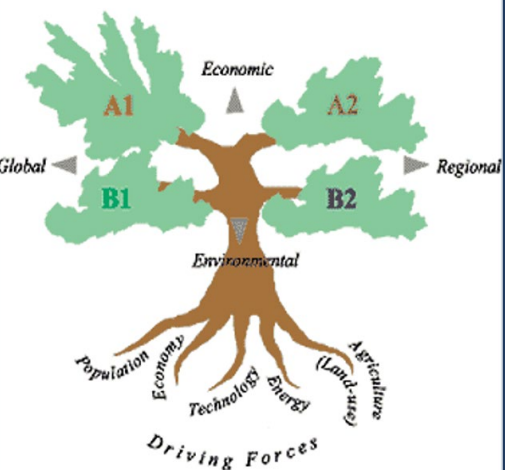
How Climate Science Got Off Track With Scenarios

Roger Pielke Jr.

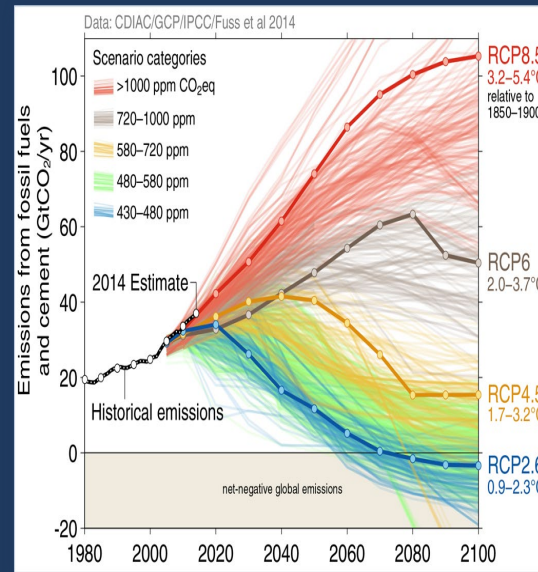
American Enterprise Institute — University of Colorado Boulder

11 October 2026

SRES Scenarios

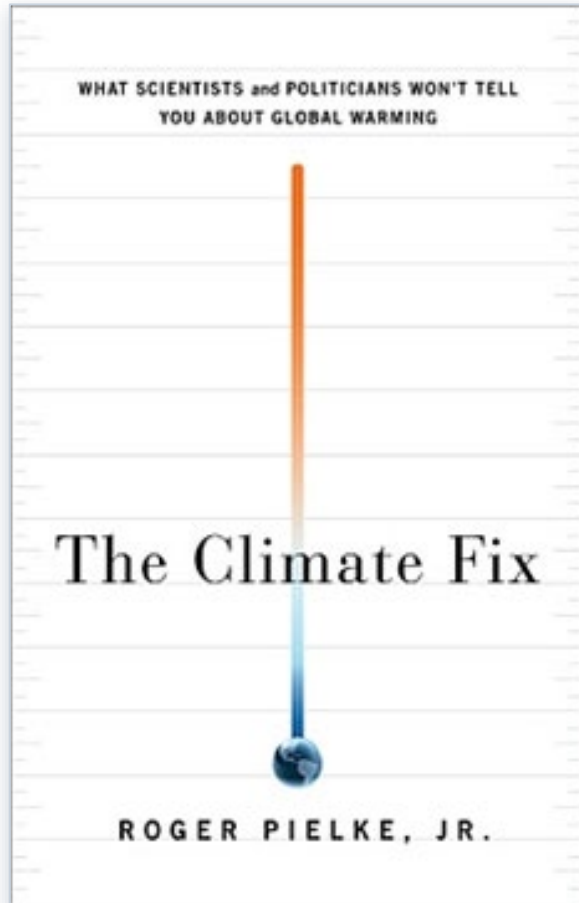


**KEEP
CALM
IT'S
BUSINESS
AS USUAL**



Before diving in ... let's make this clear

My views



Climate change is

- Real
- Serious
- And deserving of serious attention to both mitigation and adaptation policies



This talk: the systemic misuse of scenarios

in climate research and policy



Scientific integrity

This is a story of scientific integrity, first and foremost

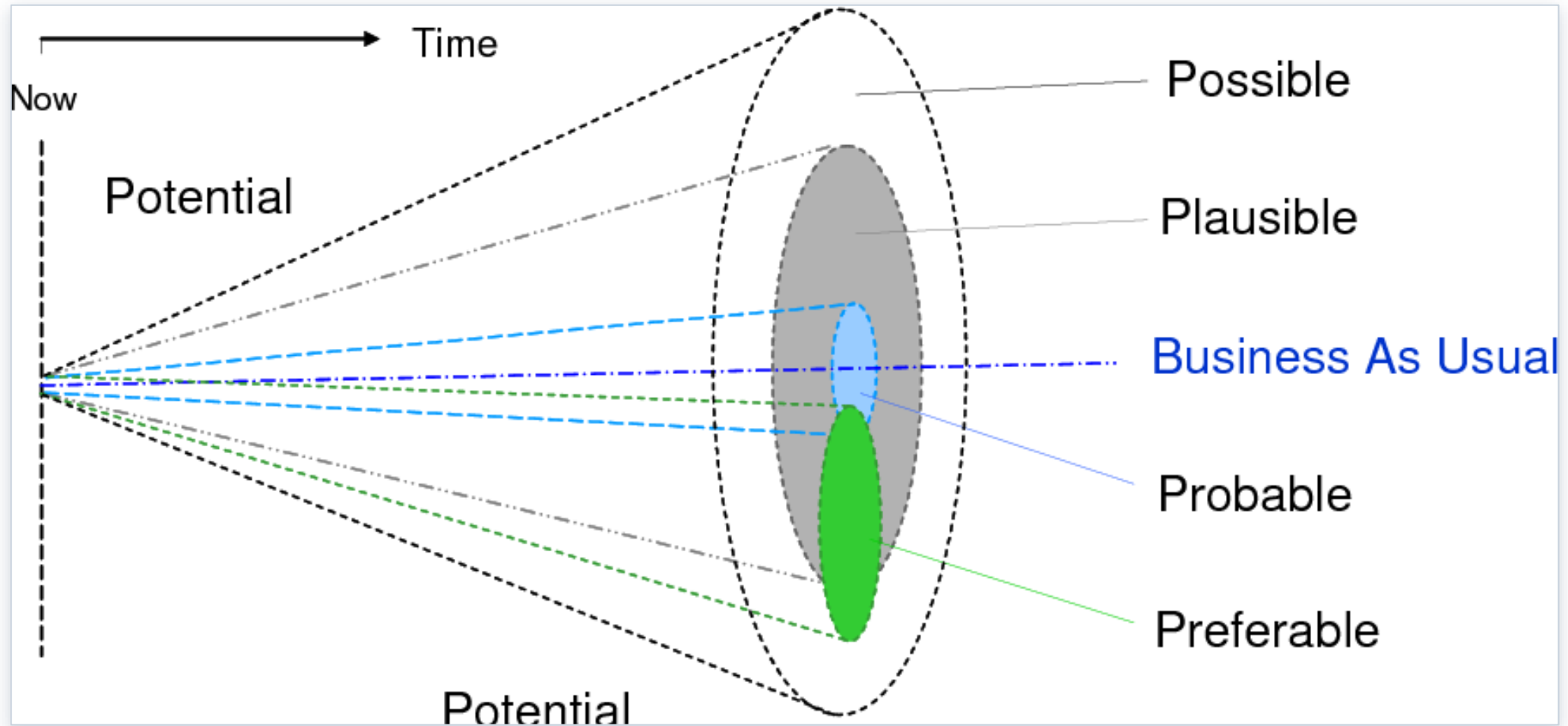
A big deal

The consequences reach research, assessment and policy



Possible, plausible, probable, preferable

The futures cone



Source: <https://www.semanticscholar.org/paper/Title-%3A-A-generic-foresight-process-framework-Year-Voros/ffd5a52cc3dd7e5ed566f5ff199658f3eebca99b>



**The three scenarios
now judged to be
“implausible.”**

- **SSP5-8.5**
- **RCP8.5**
- **SSP3-7.0**

**These scenarios have
dominated climate
research, policy, and
media representation
of projective climate
science for 15 years**

Cumulative CO₂, 2020–2100 (Gt)

Cumulative CO ₂ , 2020–2100 (Gt)		
RCP — 2011	SSP — 2016	CMIP7 — 2026
Scenario	Family	Cumulative CO ₂ 2020–2100 (Gt)
SSP5-8.5	SSP	7,804
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SSP3-7.0	SSP	5,274
HIGH	CMIP7	4,906
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LOW	CMIP7	1,268
SSP1-2.6	SSP	1,013
RCP2.6	RCP	840
VERY LOW	CMIP7	309
SSP1-1.9	SSP	132



25+ years of debate about climate scenarios

Six episodes, 2000–2026

Episode	Core claim	Claimants	Defenders	Resolution
1. Probabilities 2000–02	Scenarios need likelihood judgments	Schneider; Pittock, Jones & Mitchell; Reilly et al. (MIT)	Grübler, Nakićenović, SRES authors	Refusal for 20 years; one-sentence concession in AR6
2. Exchange rates 2002–06	MER conversion inflated developing-country growth	Castles & Henderson; McKibbin, Pearce & Stegman; Ryten	Nakićenović + 14 co-authors; IPCC Dec. 2003 press release	Method absorbed, critique never conceded
3. Baselines 2006–15	Baselines assume most of the mitigation task	Pielke, Wigley & Green; Stevenson & Pielke	van Vuuren, Riahi; Sheehan	Finding intact; baselines unchanged
4. Architecture 2006–17	Forcing-first design with no plausibility test	None; a design choice	Moss et al.; RCP and SSP teams	Design adopted; the seed of Episode 5
5. RCP8.5 2017–22	RCP8.5 implausible at construction	Ritchie & Dowlatabadi; Hausfather & Peters; Burgess, Ritchie & Pielke	Schwalm, Glendon & Duffy	Critics prevailed on the method
6. Retirement 2021–26	Retire the very high pathways	AR6 WGI; ScenarioMIP team	—	CMIP7 retirement, no retrospective

Source: Pielke, “Twenty-Five Years of Argument About Scenarios,” THB (draft, 2026)



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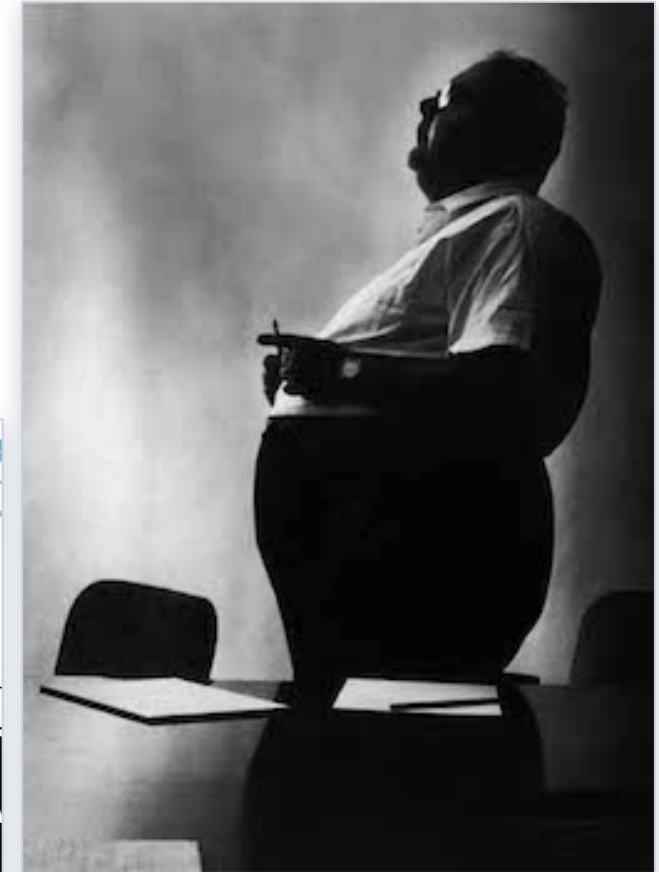
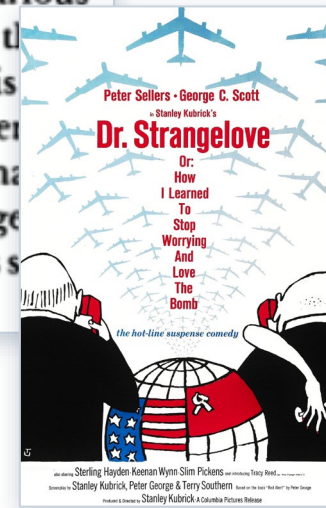
Scenario planning (originally called “future—now”)

1960s, Herman Kahn and Rand Corporation

An initial purpose: Scenarios as an exploratory tool for the intellect

11. As near as I can tell the term *scenario* was first used in this sense in a group I worked with at the RAND Corporation. We deliberately chose the word to deglamorize the concept. In writing the scenarios for various situations we kept saying “Remember, it’s only a scenario,” the kind of that is produced by Hollywood writers both hacks and genuises. There is *priori* concept that a scenario should be taken seriously or that it is intended to reflect aspects of the real world. Some scenarios do; others do not. Scenarios are simply a more or less imaginative sequence of events that are put together so that each event forms a context for the other events and so that there is some continuity over time in the “narrative.”

Kahn 1979 (World Economic Development, 1979 and Beyond)



Scenario planning also as plausible futures



“Scenarios are attempts to describe in some detail a hypothetical sequence of events that could lead plausibly to the situation envisaged.”

Kahn & Wiener 1967



Source: <https://www.hudson.org/research/2214-the-use-of-scenarios>



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Evolution of policy research & practice, e.g., ...

1981: President Reagan, Executive Order 12291; Requiring cost-benefit analysis for federal regulations



Projections are necessary in many types of policy analyses



For example, methodology of cost-benefit analyses

- Identify a “do nothing” option (e.g., reference or BAU)
- Identify alternative options (e.g., A, B, C ...)
- Estimates costs, benefits of proceeding with BAU, A, B, C...
- Account for time value of money
- And so on ...

Requires plausible projections of the future

For a reference/BAU future & also departures from that baseline

Source: <https://doi.org/10.1016/B978-0-12-812885-5.00001-9>



Two contrasting views of the role of scenarios

Plausible futures (projections)

- Business as usual/reference/baseline
- Policy interventions

Tools for the intellect (exploratory)

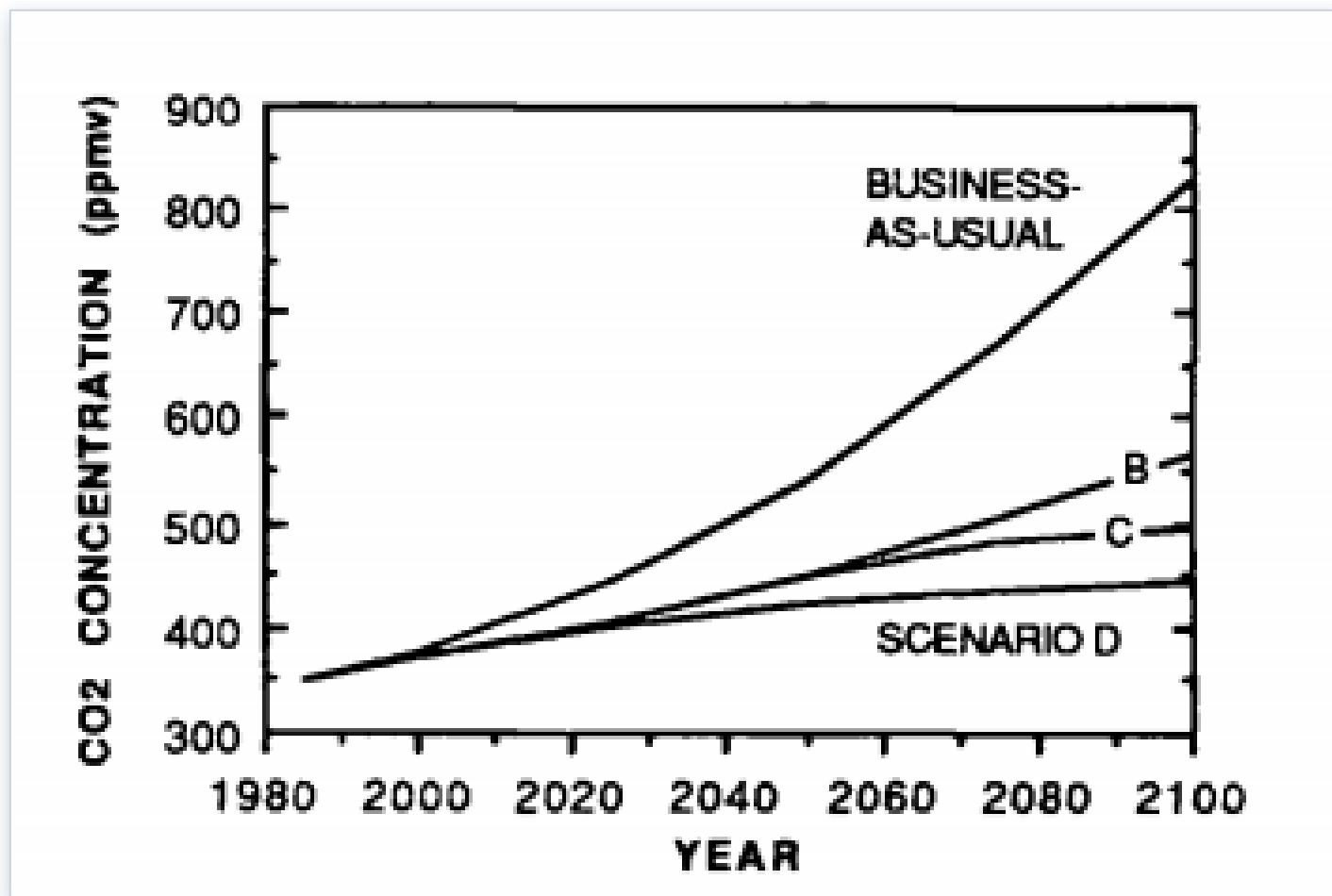
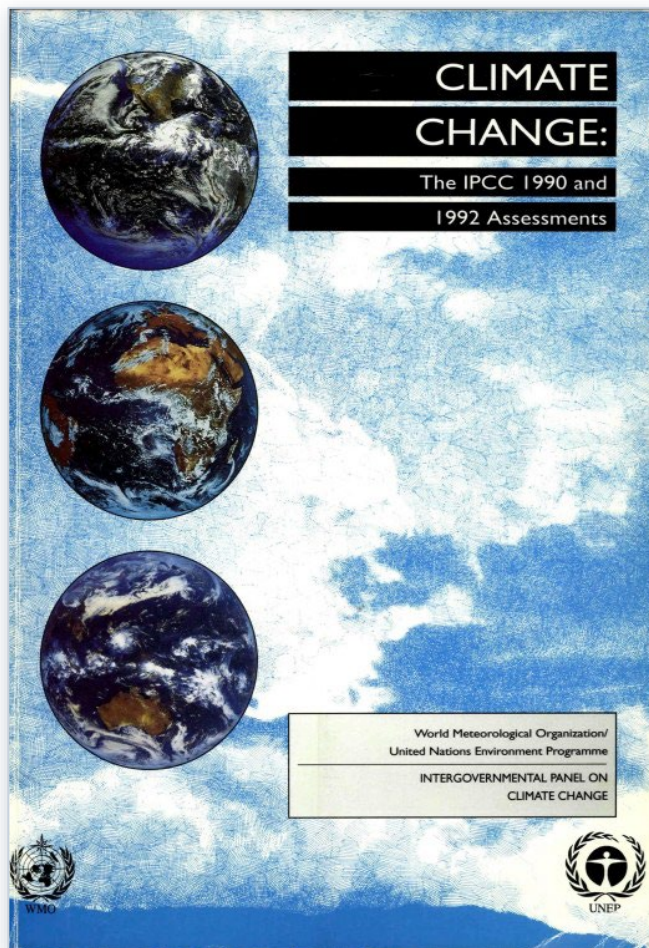
- To inform robust decision making
- To motivate hypothesis generation
- To explore hypotheses
- To build and test exploratory models
- And so on ...

These two perspectives have been variously dominant under the IPCC at different points in time



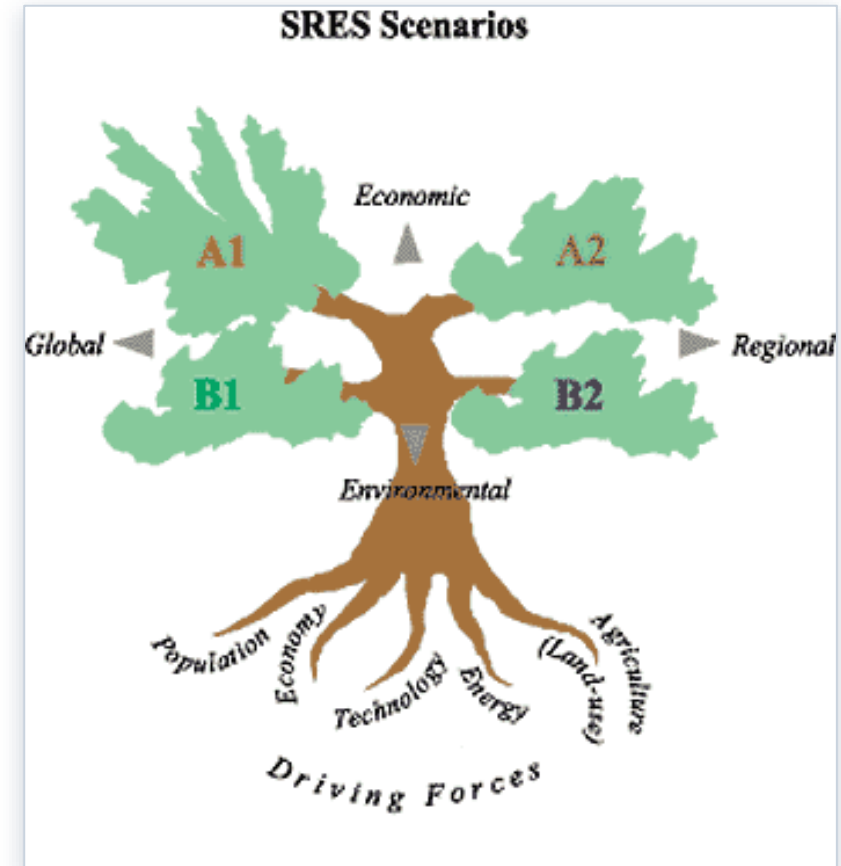
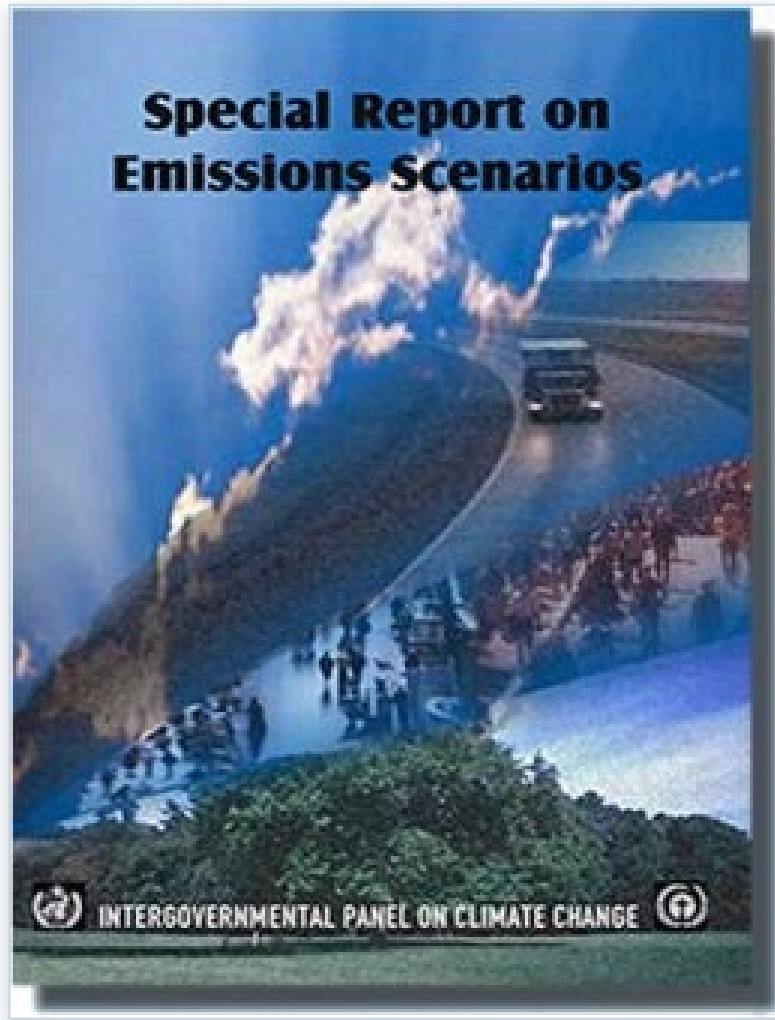
IPCC First Assessment Report 1990

Scenarios (“Task A”) as plausible projections of the future; BAU as a “reference scenario”;
Scenarios B, C, D as “policy scenarios”



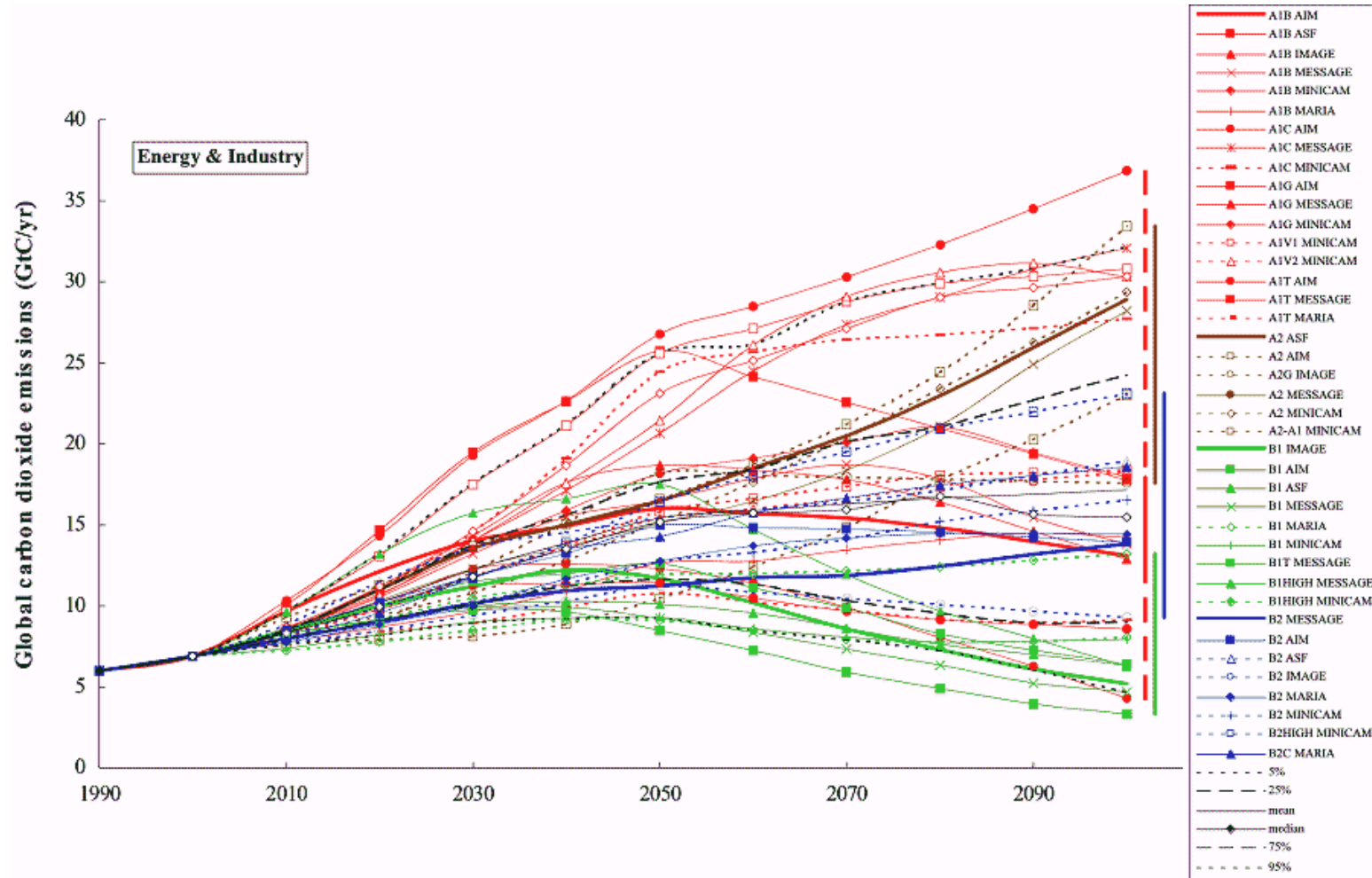
IPCC 2000: SRES Scenarios

Adopted an exploratory approach to scenarios; Informed IPCC TAR & FAR



IPCC 2000 SRES scenario range

No “reference scenario”



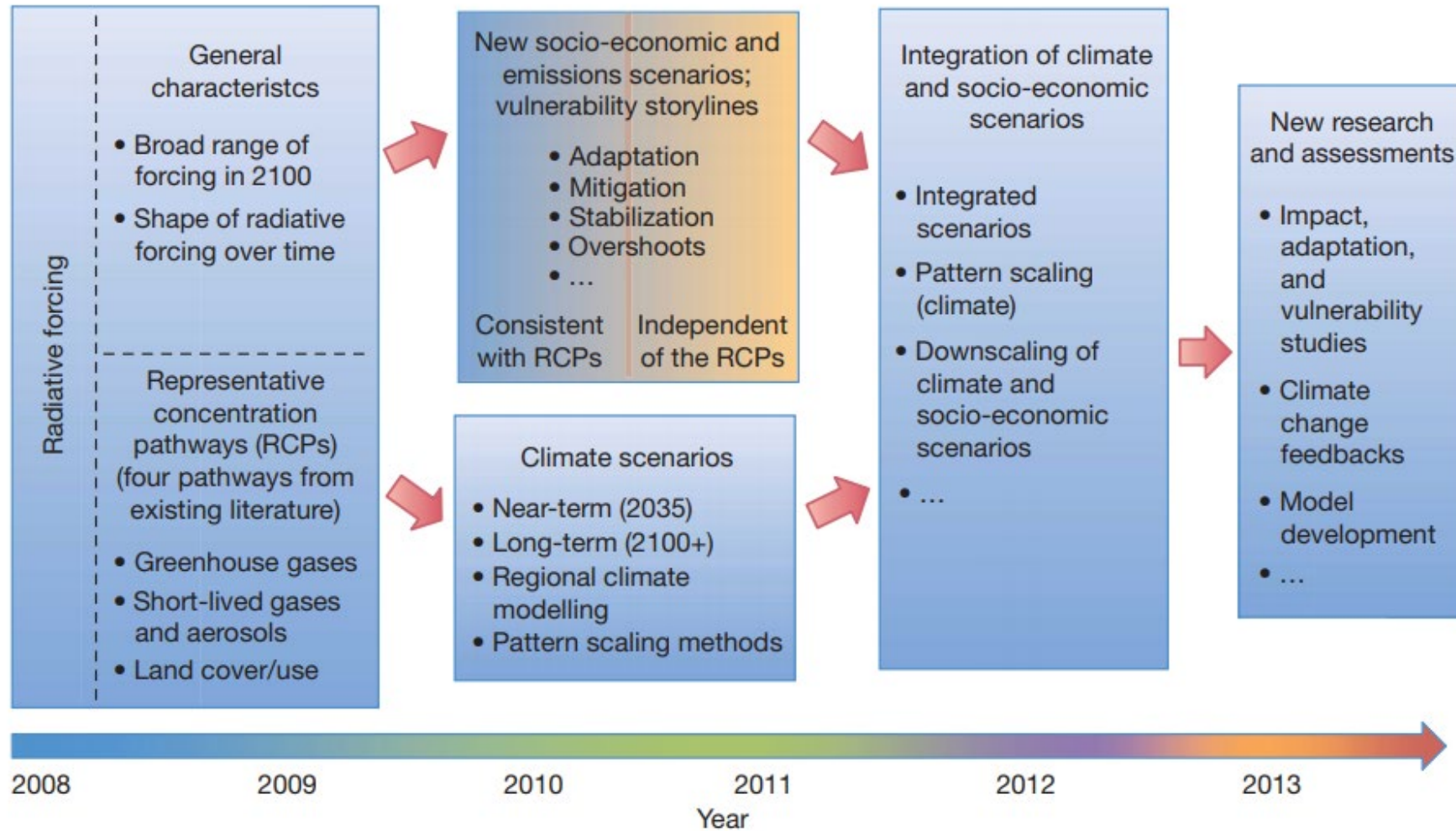
“there was no objective basis on which to assign likelihood to any of the scenarios”

IPCC 2000



Post-SRES scenarios ~2005 to present

Representative Concentration Pathways (RCPs); Informed the IPCC AR5, SRI5, SROCC



Source: Moss et al. 2010



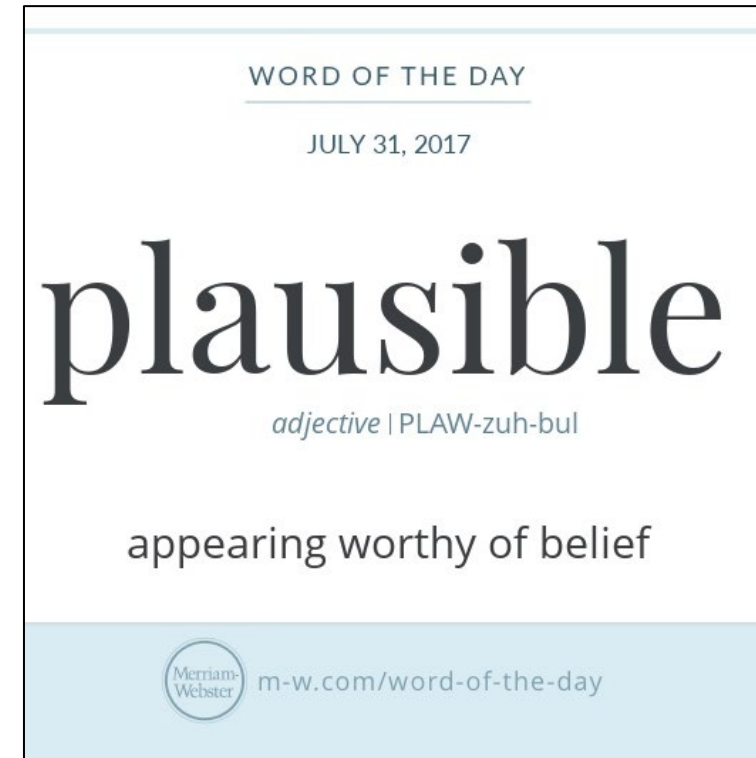
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“Emissions scenario” (IPCC 2014)

RCPs reflected a return to projections in AR5

“A plausible representation of the future development of emissions of substances that are potentially radiatively active (e.g., greenhouse gases, aerosols) based on a coherent and internally consistent set of assumptions about driving forces (such as demographic and socioeconomic development, technological change, energy and land use) and their key relationships.”



Source: IPCC 2014



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Radiative forcing

“Radiative forcing refers to changes in the energy balance of the global Earth system. More precisely and technically, according to the IPCC, radiative forcing is “the change in the net, downward minus upward, radiative flux (expressed in Watts per square meter; W/m^2) at the tropopause or top of atmosphere due to a change in an external driver of climate change, such as, for example, a change in the concentration of carbon dioxide (CO_2) or the output of the Sun.”



Source: Pielke and Ritchie 2021

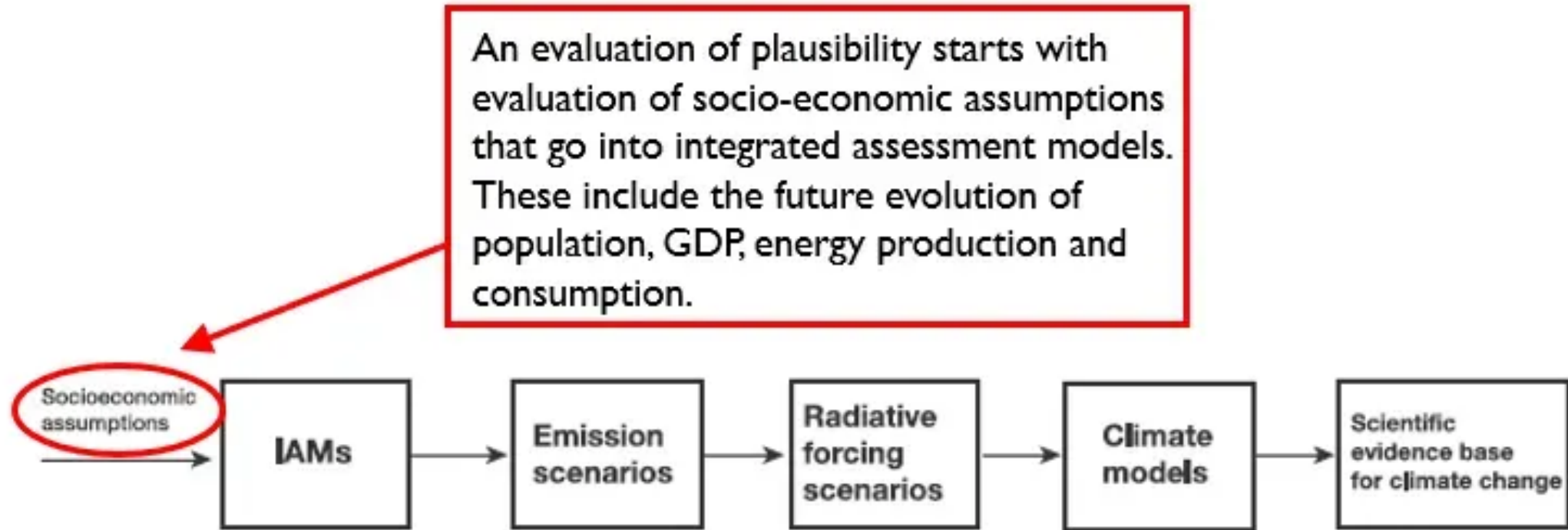


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Plausibility starts with socio-economic assumptions

The sequential path from scenarios to climate model outputs

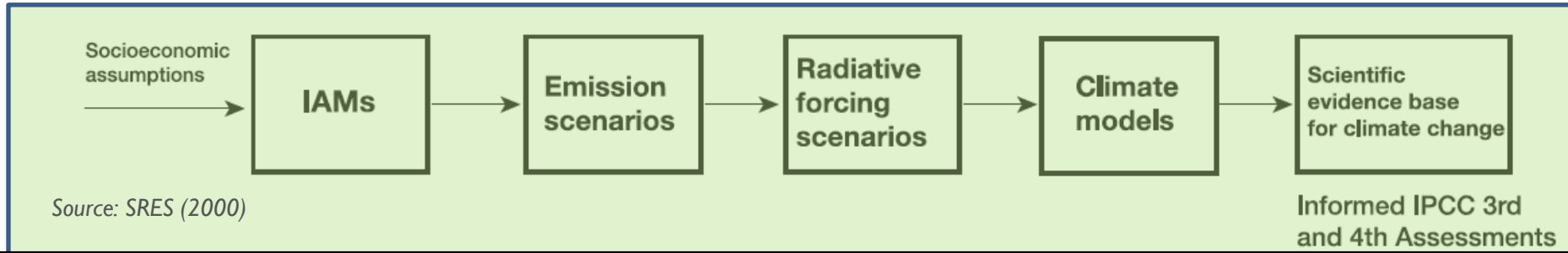


One step at a time – from socio-economic assumptions as inputs to climate model outputs

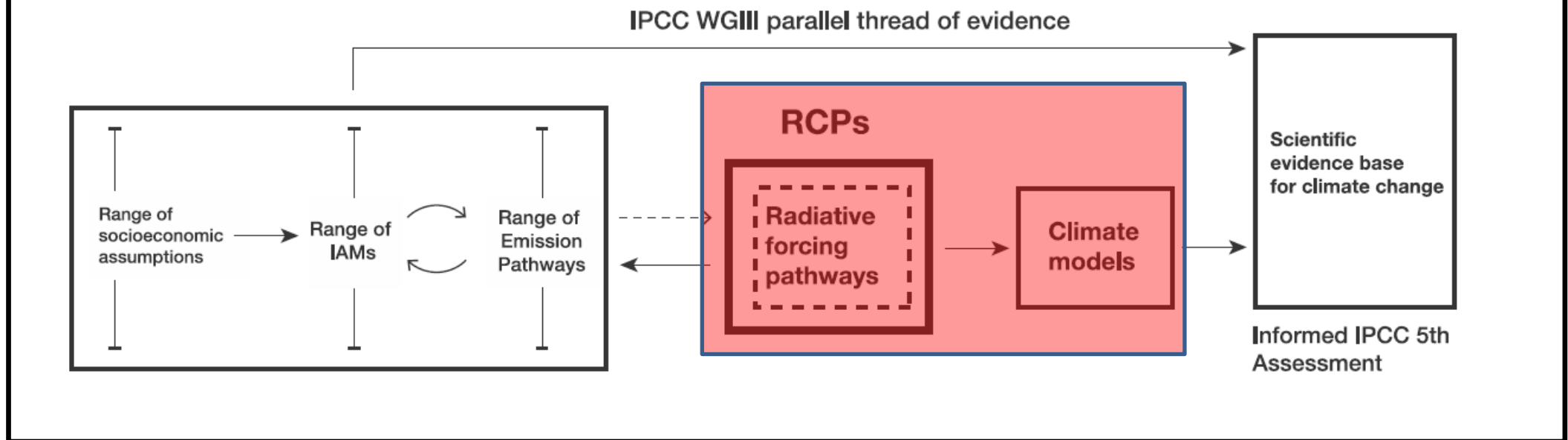
Source: adapted from IPCC SRES 2000



How the IPCC detached climate modeling from socio-economic plausibility starting in 2005 (RCPs)

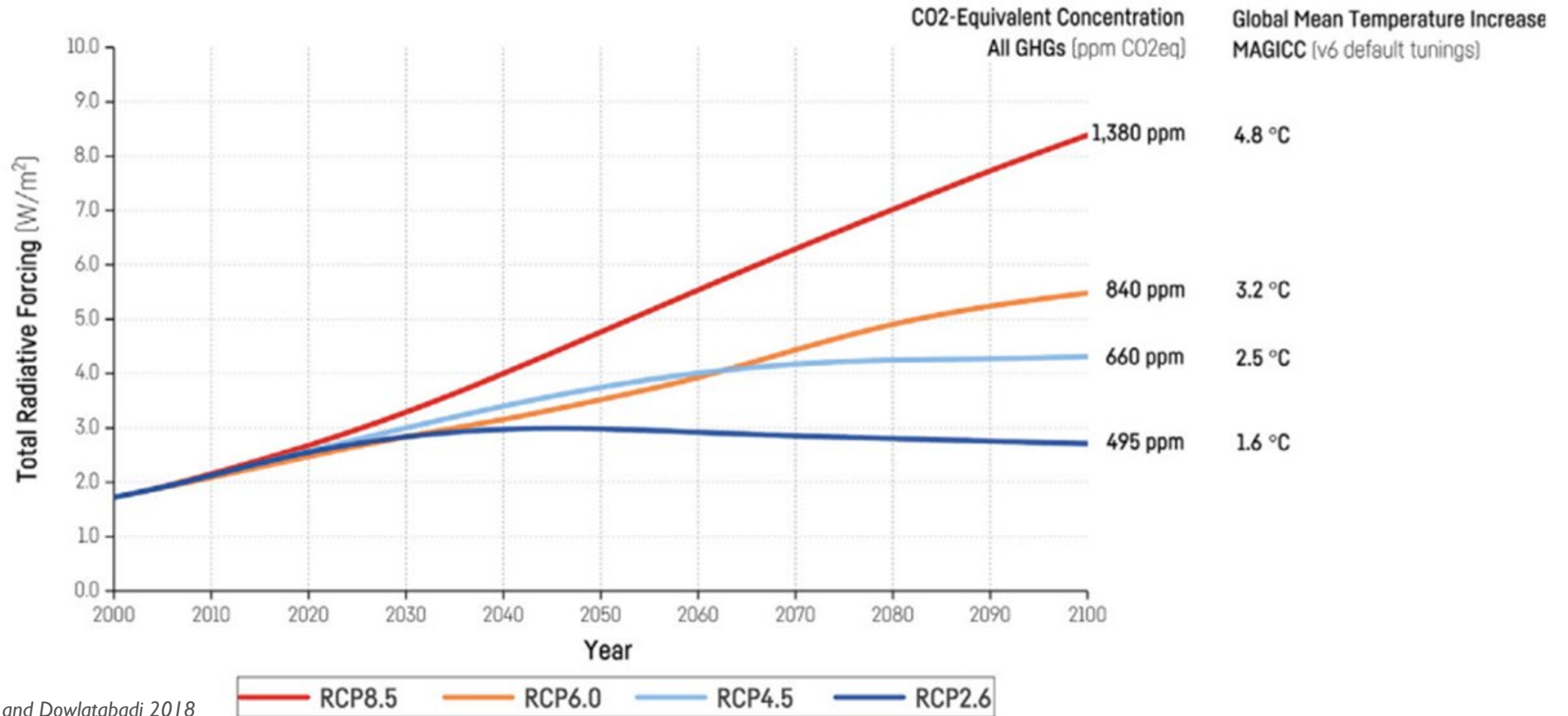


RCPs - Representative Concentration Pathways (2011)



RCPs as radiative forcing pathways

But often forgotten: these RF pathways come from scenarios



IPCC AR5 Integrated Assessment Models

(producing 1184 scenarios)

(2.) Model/Scenarios:

RCP6.0

- AIM-Enduse 12.1
- AIM-Enduse[Backcast] 1.0
- BET 1.5
- DNE21 V.11
- DNE21 V.12
- EC-IAM 2012
- ENV-Linkages (WEO2012 calibration)
- Ecofys Energy Model
- FARM_3.0

RCP4.5

- GCAM 2.0
- GCAM 3.0
- GCAM 3.1
- GEM-E3-ICCS
- GRAPE ver2011
- GRAPE_ver1998
- GTEMREF32
- IEEJ ver.2011
- IGSM
- IMACLIM v1.1

RCP2.6

- IMAGE 2.4
- IMAGE 2.4 EMF22
- KEI-Linkages

- MARIA23_org
- MERGE-ETL_2011
- MERGE_AME
- MERGE_EMF22
- MERGE_EMF27
- MESSAGE V.1
- MESSAGE V.2** **RCP8.5**
- MESSAGE V.3
- MESSAGE V.4
- MiniCAM_EMF22
- POLES AMPERE
- POLES EMF27
- POLES-AME
- Phoenix 2012.4
- REMIND 1.1
- REMIND 1.2
- REMIND 1.3
- REMIND 1.4
- REMIND 1.5
- SGM_EMF22
- TIAM-ECN
- TIAM-WORLD 2012.2

- TIAM-World_2007_version
- TIAM-World_Mar2012
- TIMES-VTT-2011
- WITCH_AME
- WITCH_AMPERE
- WITCH_EMF22
- WITCH_EMF27
- WITCH_LIMITS
- WITCH_RECIFE
- WITCH_ROSE
- WorldScan2
- iPETS_1.2.0

Scenario	Baseline IAM
RCP2.6	IMAGE 2.4 B2
RCP4.5	GCAM 2.0
RCP6.0	AIM SRES B2
RCP8.5	MESSAGE V.2 SRES A2r

Source: IIASA 2016

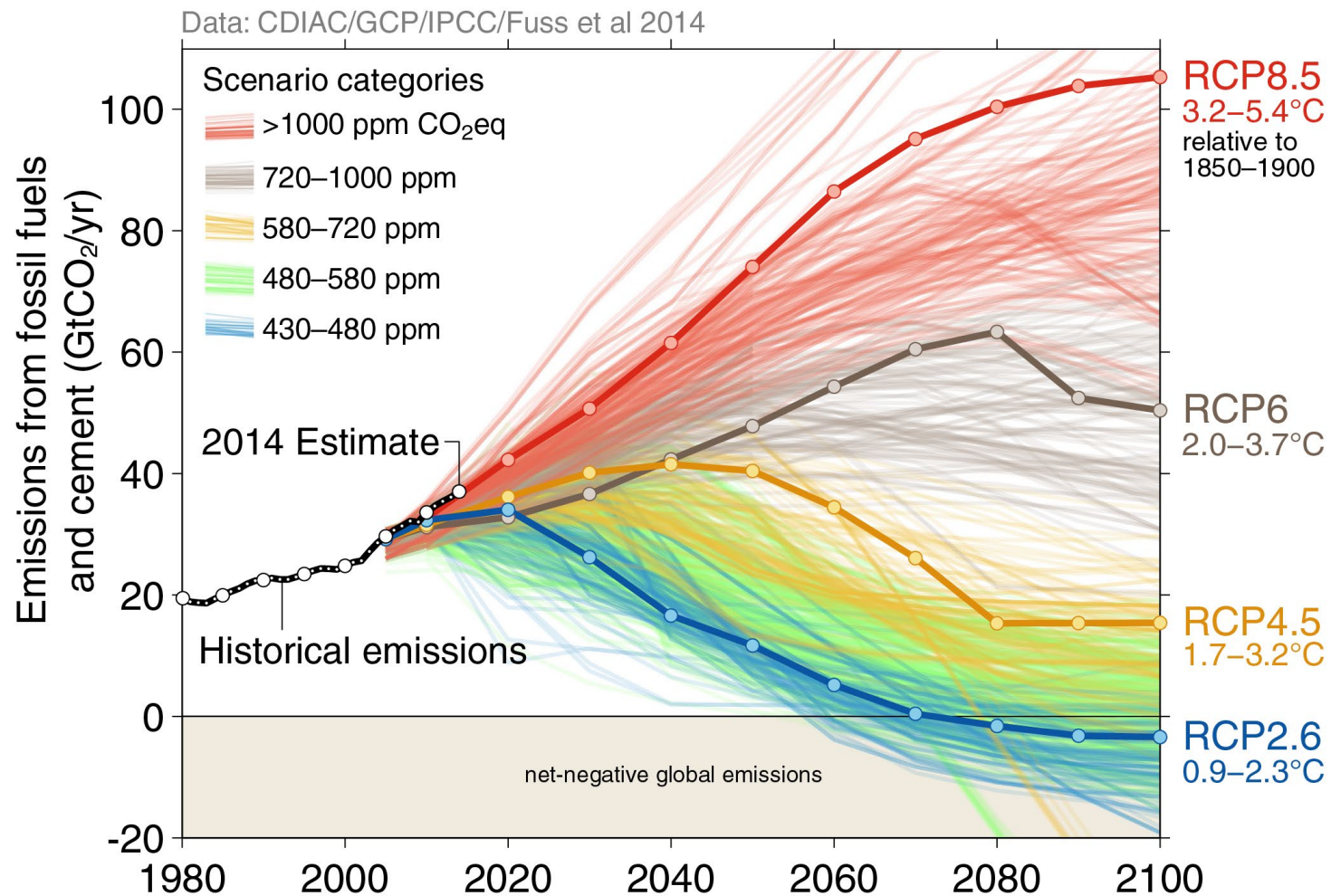


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Representative Concentration Pathway Scenarios

4 of the 1,184 AR5 Scenarios



Massive confusion!

Scenarios as exploratory for climate modeling vs. projections for informing policy

*“Given that the **primary goal** of this [RCP] exercise is to provide input data for climate models, the core products will be global emissions and concentrations of long-lived greenhouse gases, gridded emissions of shorter-lived species, and gridded land-use and land-use change information.”*

Van Vuuren 2008

*“RCPs are **mainly intended** to facilitate the development of integrated scenarios by jump-starting the [climate modeling] process through the provision of data on emissions, concentrations, and land use/land cover needed by [climate models].”*

Moss et al. 2008



RCPs are not in fact RCPs

They are re-named from pre-existing scenarios, which come with fully characterized socio-economic inputs (e.g., population, GDP, etc.)

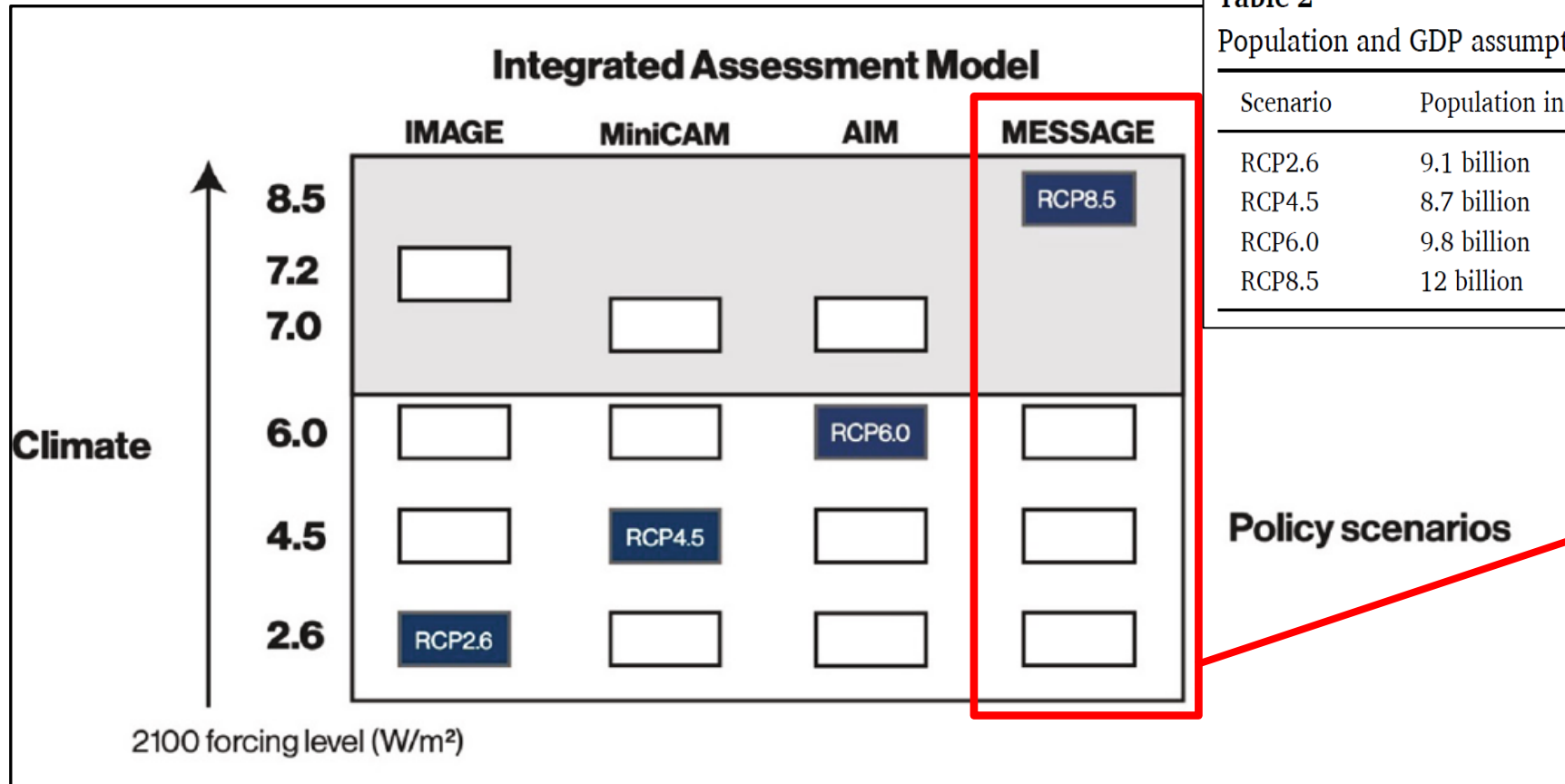


Table 2

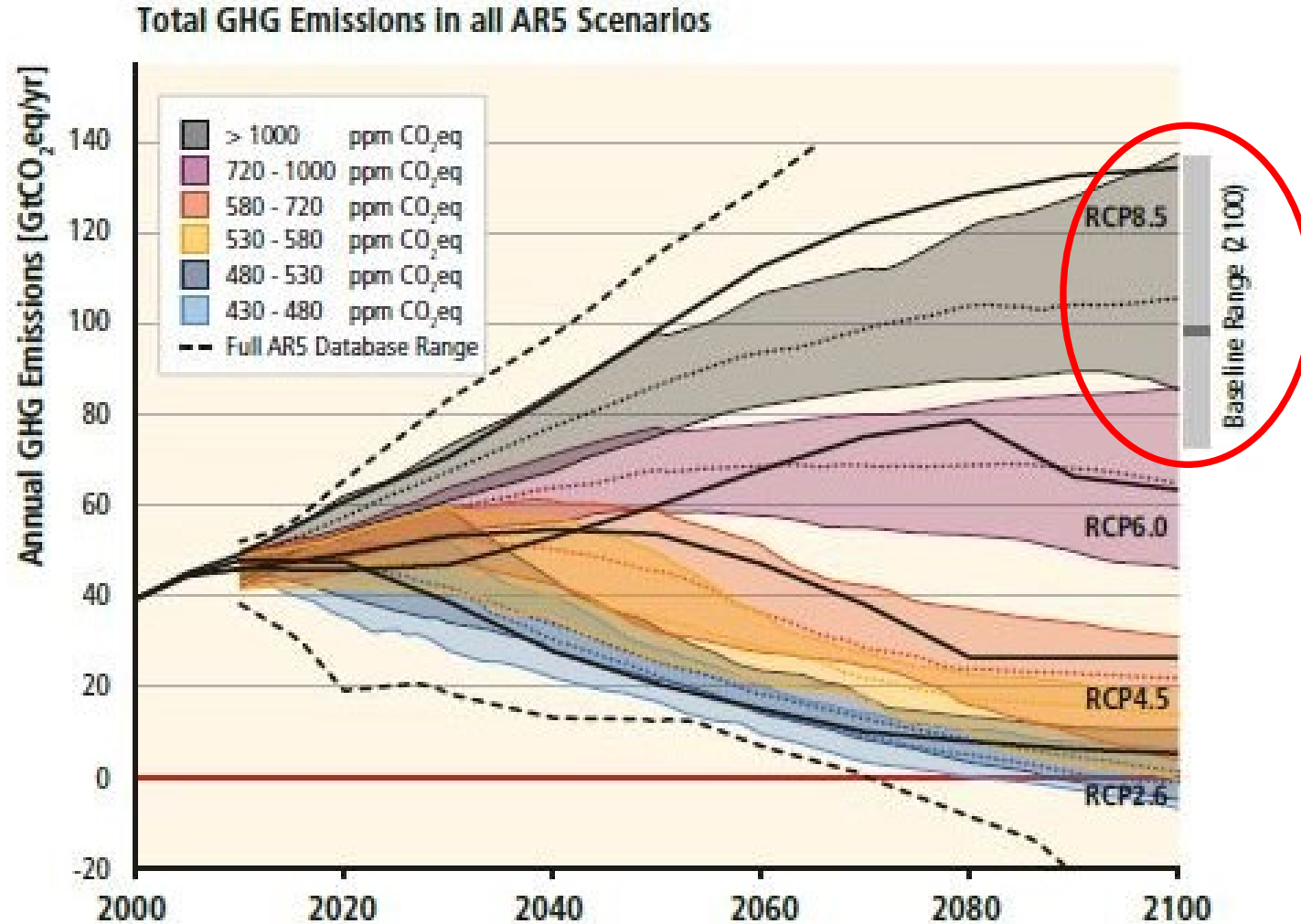
Population and GDP assumptions of the baseline scenarios of the RCPs.

Scenario	Population in 2100	GDP in 2100	References
RCP2.6	9.1 billion	\$329 trillion (1995\$)	[46]
RCP4.5	8.7 billion	\$340 trillion (2005\$)	[44]
RCP6.0	9.8 billion	\$225 trillion (2005\$)	[47]
RCP8.5	12 billion	\$250 trillion (2005\$)	[34]

To evaluate climate policy using an IAM, it would be necessary to compare scenarios within a column. Comparing across columns is meaningless.

IPCC AR5, CMIP5, CMIP6

RCP8.5 as “baseline” (i.e., “business as usual”)



Source: IPCC 2014



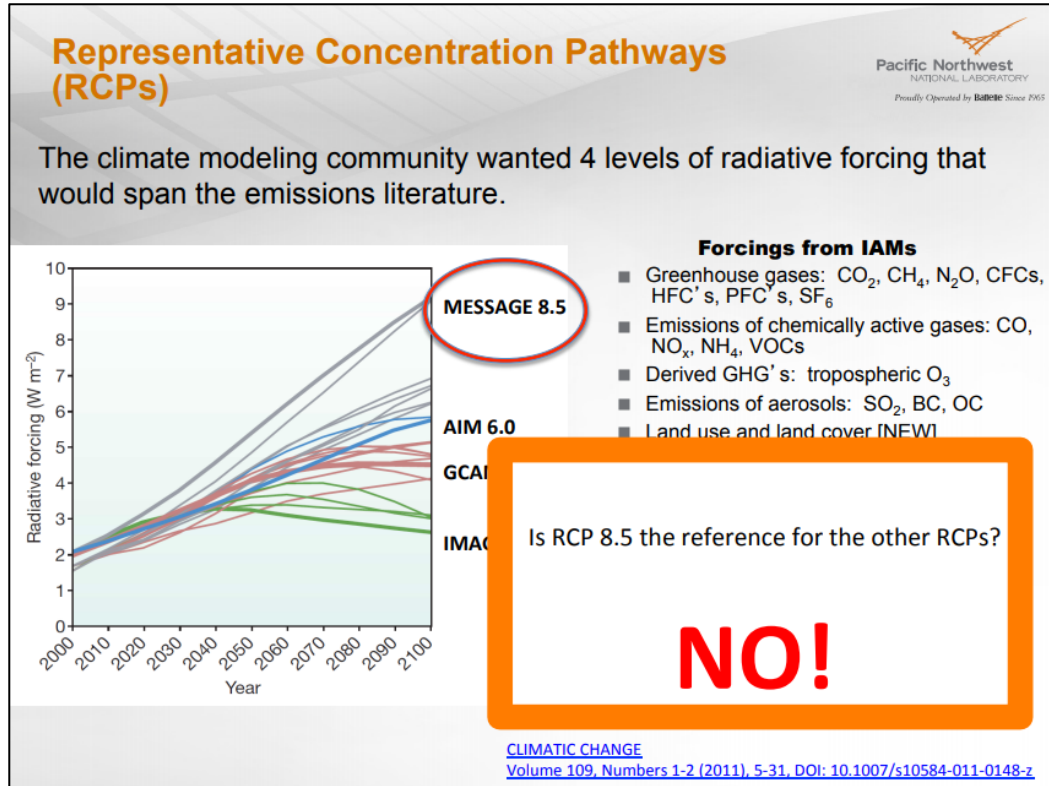
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Despite warnings by RCP creators

RCP8.5 is systemically misused as a reference scenario for the other RCPs

Warning!



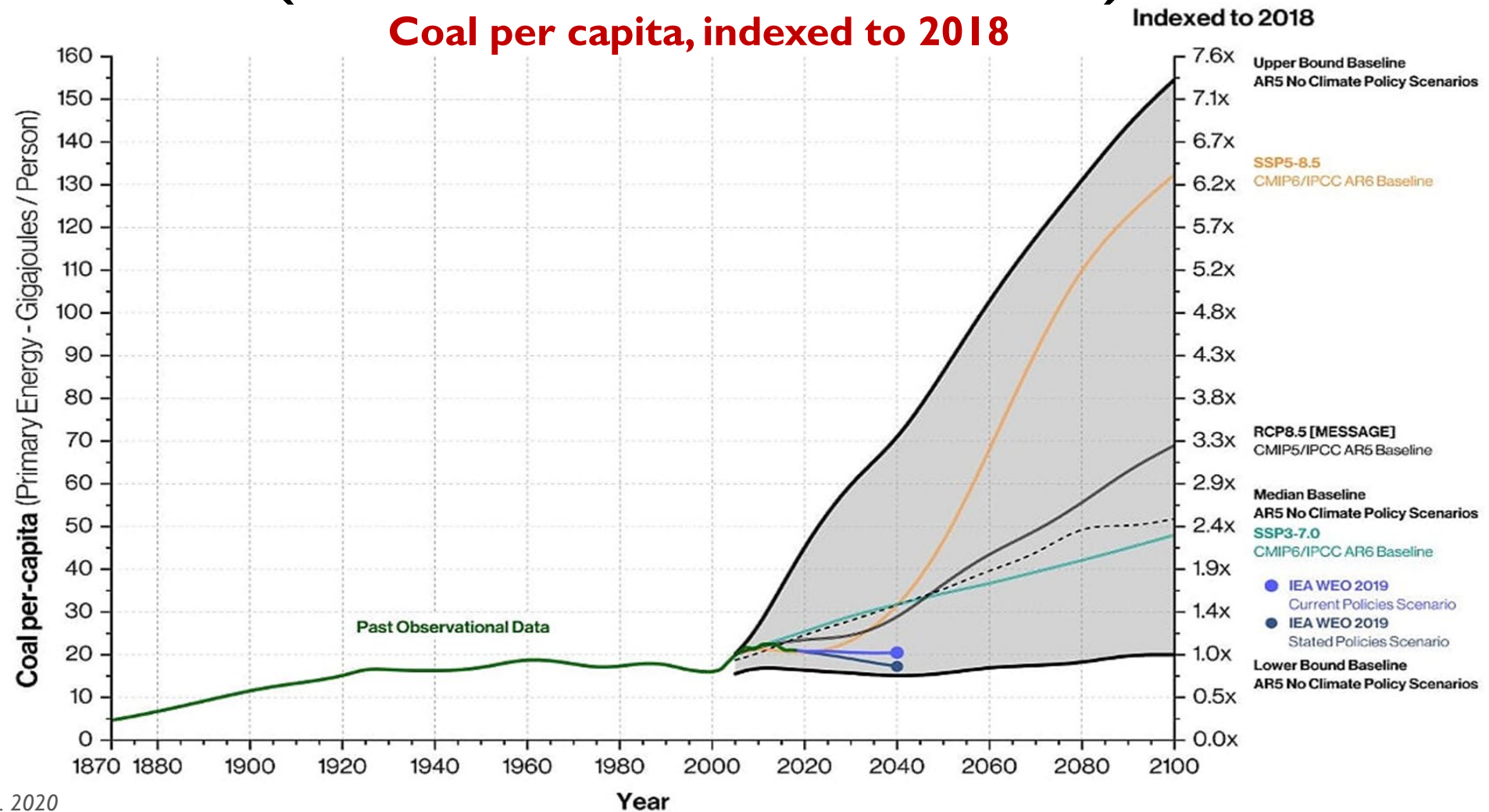
Ignored!



Source: http://www.globalchange.umd.edu/data/annual-meetings/2014/Moss-GCAM_scenarios_v1.pdf · From a presentation by Richard Moss in 2014 · Search of 13 Mar 2021

A coal-intensive future in the baselines (Ritchie and Dowlatabadi 2017)

Coal per capita, indexed to 2018



Source: Burgess et al. 2020



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Plausible 2005–2050 scenarios project 2°C to 3°C

Pielke, Burgess & Ritchie, Environmental Research Letters, 2022

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Plausible 2005–2050 emissions scenarios project between 2 °C and 3 °C of warming by 2100

Roger Pielke Jr^{5,1} , Matthew G Burgess^{1,2,3} and Justin Ritchie⁴

Published 11 February 2022 • © 2022 The Author(s). Published by IOP Publishing Ltd

[Environmental Research Letters, Volume 17, Number 2](#)

Citation Roger Pielke Jr et al 2022 *Environ. Res. Lett.* 17 024027



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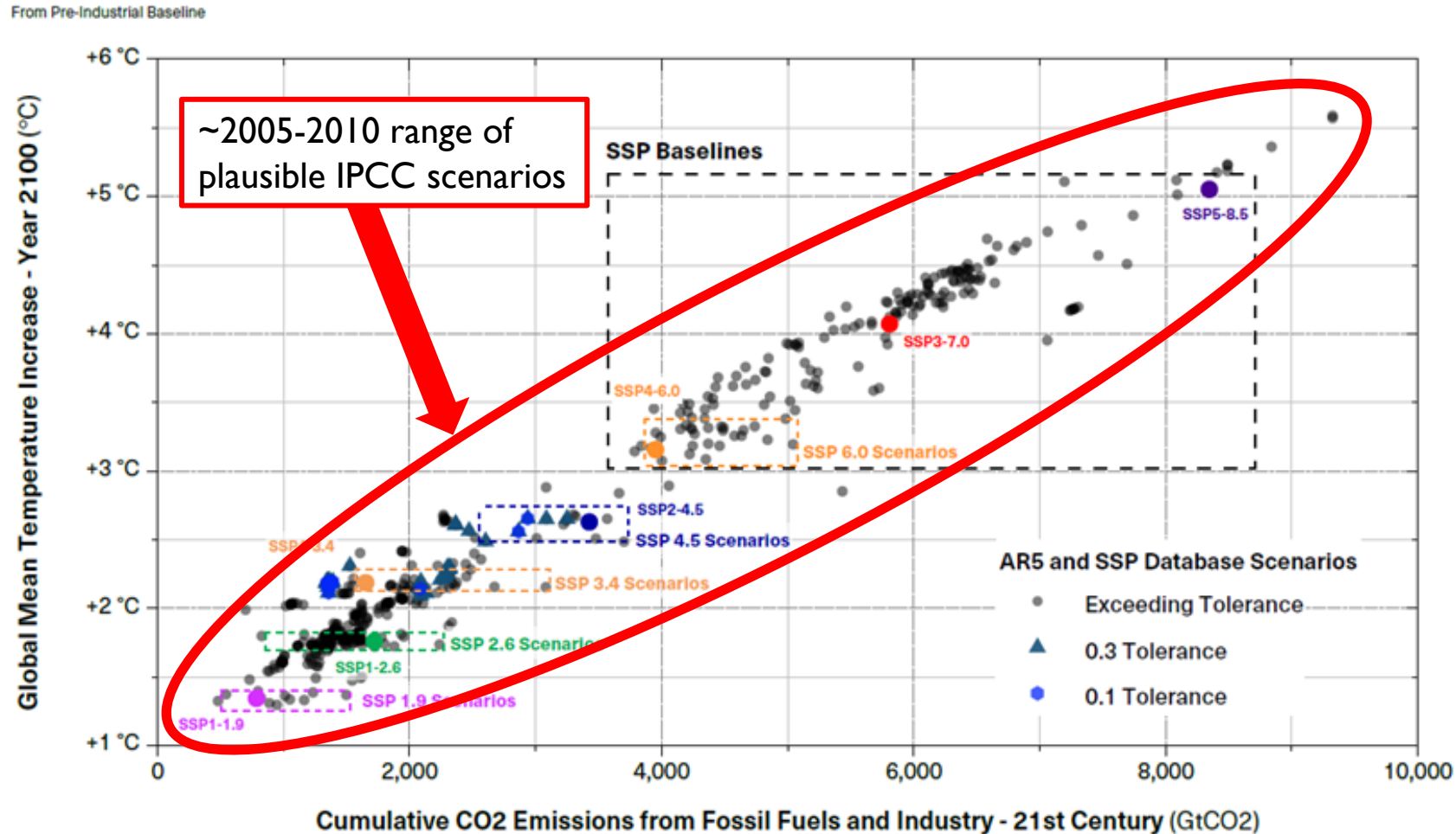


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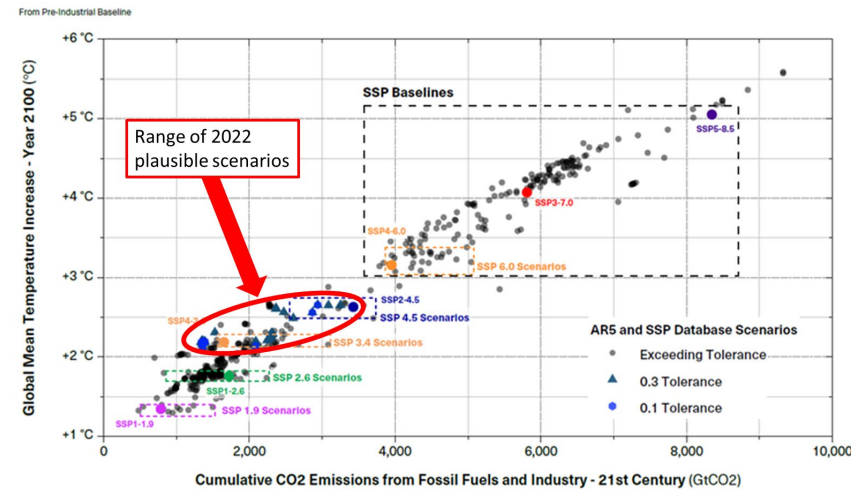
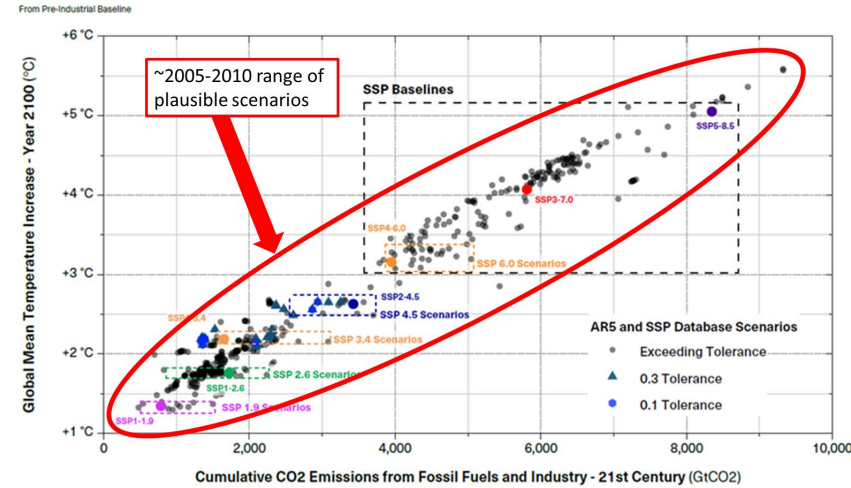
The plausible range of IPCC scenarios

2100 warming vs. cumulative CO₂ emissions, 2005–2010 range



The plausible range narrows over time

2100 warming vs. cumulative CO₂ emissions



So what?

What is wrong with using RCP8.5, SSP5-8.5 and SSP3-7.0 as baselines?

- These scenarios are fine for exploratory modeling and investigation
- However, – they are implausible – they have no connection to the real world
- They should play no role in climate research to inform plausible projections of climate, impacts or policy
- And the problems are not limited to these 3 scenarios
- Nor is misuse limited to misdefined baselines, the issues are much deeper (Pielke and Ritchie 2021)

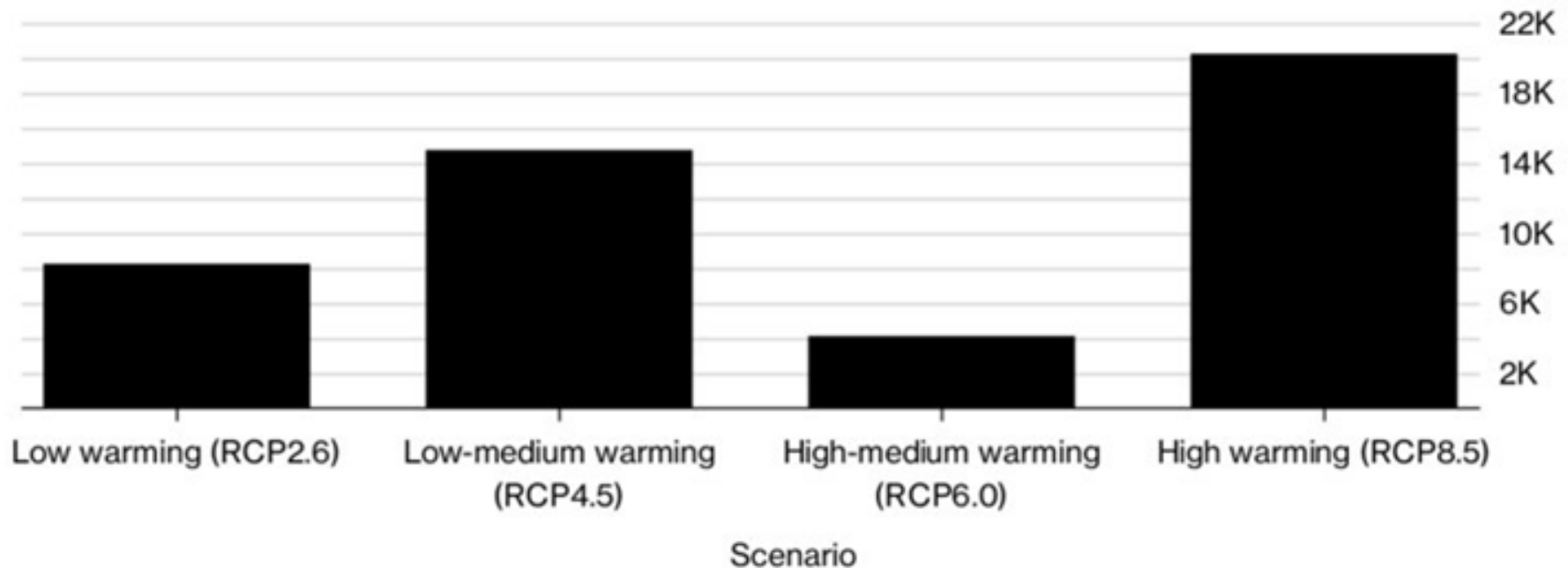


Research emphasizes an implausible scenario

Scrutiny for Most Popular Climate Scenario

Of the four main scenarios designed to run on climate-economic models, the most extreme one draws the most Google Scholar hits.

■ Hits on Google Scholar for papers citing each warming scenario



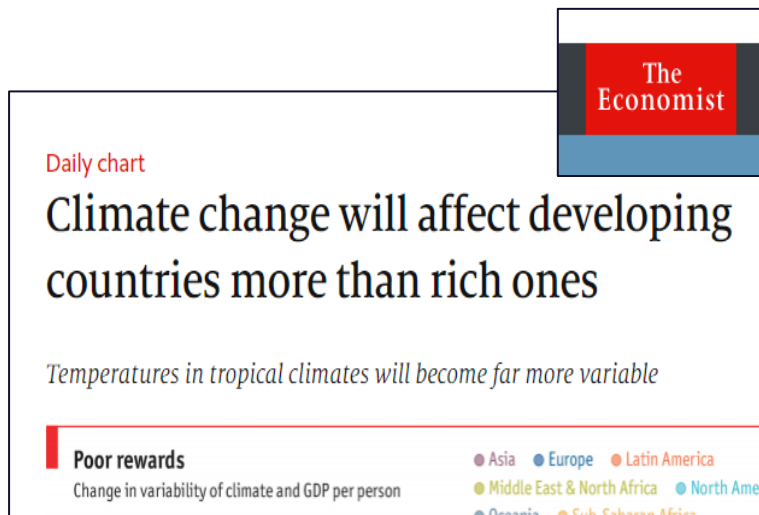
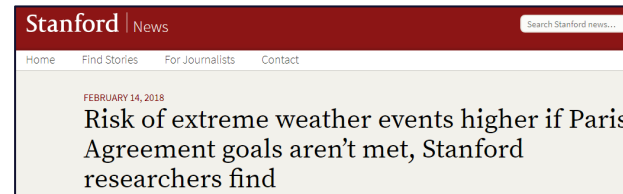
Google Scholar

Bloomberg



If you read a media report about climate impacts ...

It is likely that the story is based on RCP 8.5



Dominance of RCP8.5 Across Recent Climate Assessments

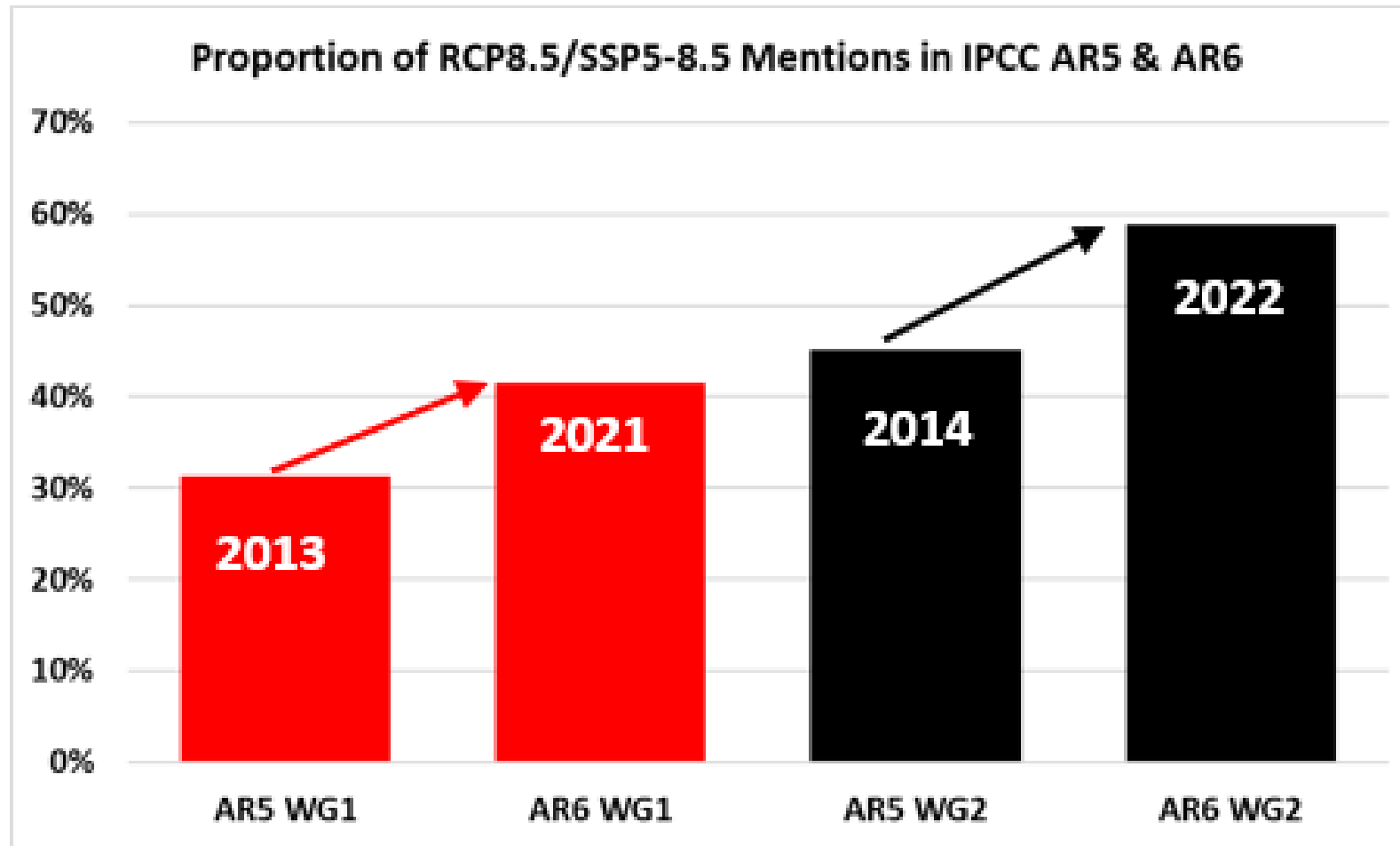
Prevalence of mentions of the RCPs in the IPCC Fifth Assessment Report and the U.S. National Climate Assessment.

Scenario	AR5 WG1	AR5 WG2a	AR5 WG2b	AR5 WG3	SUM
RCP2.6	629 (24.1%)	111 (28.6%)	62 (23.5%) 0	18 (30.5%)	820 (24.7%)
RCP4.5	715 (27.4%)	62 (16.0%)	52 (19.7%)	14 (23.7%)	843 (25.4%)
RCP6.0	446 (17.1%)	56 (14.4%)	15 (5.7%)	12 (20.3%)	529 (15.9%)
RCP8.5	821 (31.4%)	159 (41.0%)	135 (51.1%)	15 (25.4%)	1130 (34.0%)
TOTAL	2,611	388	264	59	3,322
Scenario	USNCA (2017, part 1)		USNCA (2018, part 2)		SUM
RCP2.6	47 (15.4%)		35 (6.6%)		82 (9.8%)
RCP4.5	82 (26.8%)		182 (34.4%)		264 (31.6%)
RCP6.0	11 (3.6%)		6 (1.1%)		17 (2.0%)
RCP8.5	166 (54.2%)		306 (57.8%)		472 (56.5%)
TOTAL	306		529		835



RCP8.5/SSP5-8.5 share of scenario mentions

IPCC AR5 and AR6, Working Groups 1 and 2



Research → Assessment → Public discourse



IPCC AR6 WG3 made a big mistake

Illustrative pathways and CMIP6 scenarios, AR6 WG3 Box TS.5

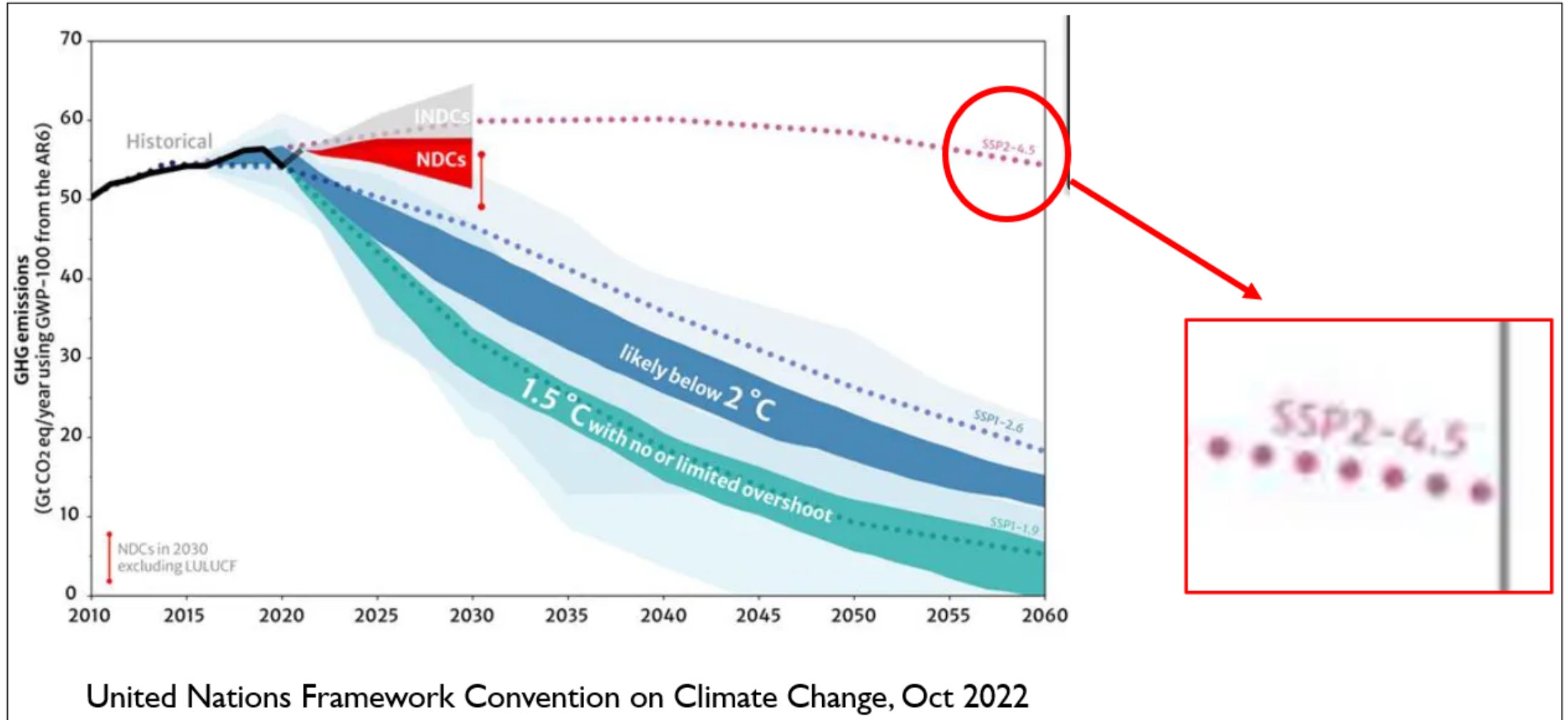
Box TS.5, Table.1 | *Illustrative Mitigation Pathways (IMPs) and pathways illustrative of higher emissions in relation to scenarios' categories, and CMIP6 scenarios.*

Classification of emissions scenarios into warming levels: C1–C8	Pathways illustrative of higher emissions	Illustrative mitigation pathways (IMPs)	CMIP6 scenarios
C8 exceeding warming of 4°C ($\geq 50\%$)			SSP5-8.5
C7 limit warming to 4°C ($> 50\%$)	CurPol		SSP3-7.0
C6 limit warming to 3°C ($> 50\%$)	ModAct		SSP2-4.5
C5 limit warming to 2.5°C ($> 50\%$)			SSP4-3.7
C4 limit warming to 2°C ($> 50\%$)			
C3 limit warming to 2°C ($> 67\%$)		IMP-GS (Sensitivities: Neg; Ren)	SSP2-2.6
C2 return warming to 1.5°C ($> 50\%$) after a high overshoot		IMP-Neg	
C1 limit warming to 1.5°C ($> 50\%$) with no or limited overshoot		IMP-LD IMP-Ren IMP-SP	SSP1-1.9



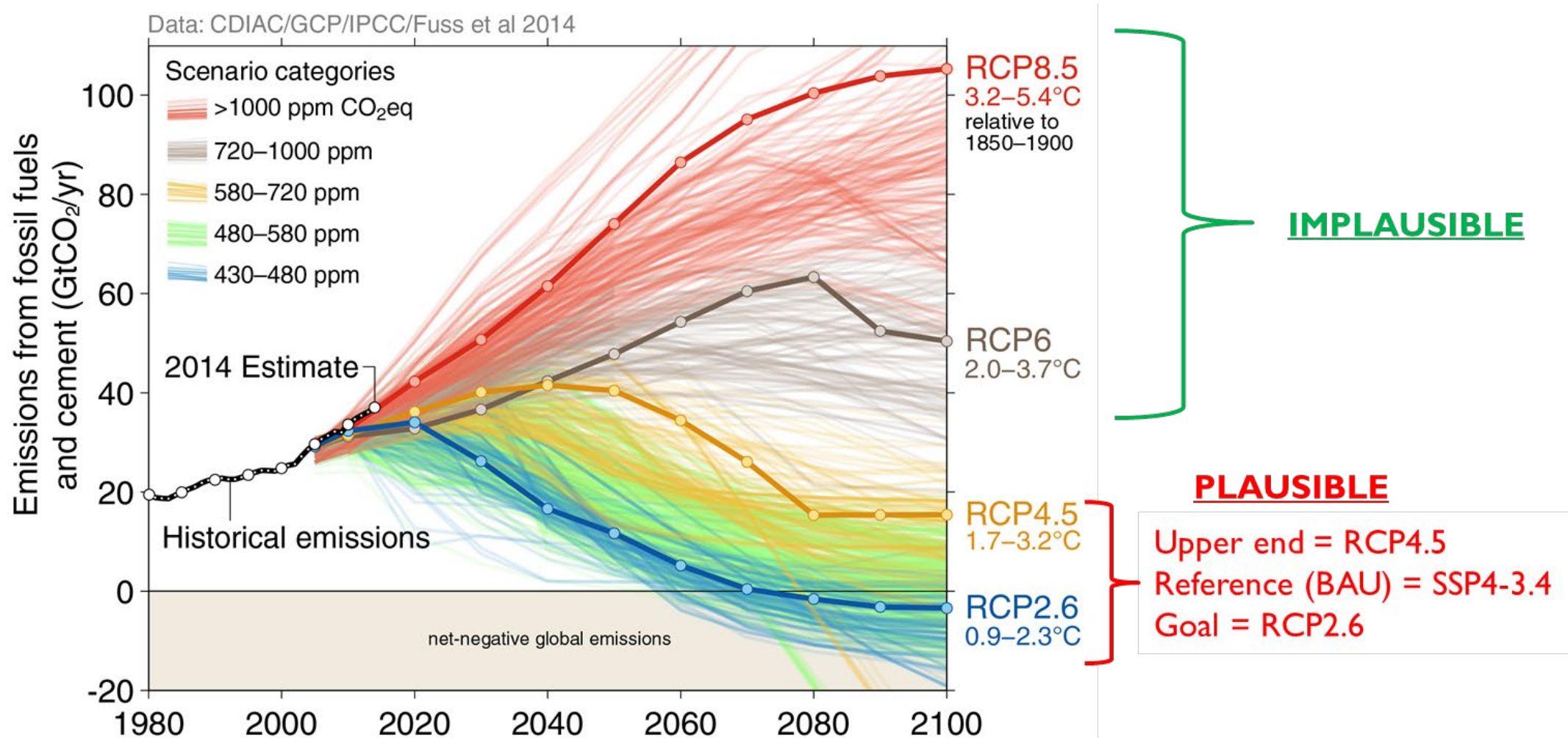
Don't take just my word for it ... UNFCCC

NDC synthesis report, October 2022



Which RCPs remain plausible?

Plausible range from RCP2.6 to RCP4.5



**The three scenarios
now judged to be
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- **SSP5-8.5**
- **RCP8.5**
- **SSP3-7.0**

**These scenarios have
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Cumulative CO₂, 2020–2100 (Gt)

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SSP1-2.6	SSP	1,013
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SSP1-1.9	SSP	132



CMIP7 retires RCP8.5, SSP5-8.5 and SSP3-7.0

Seven new scenarios for the IPCC AR7 cycle, 2026

H	High
HL	High-to-Low
M	Medium
ML	Medium-Low
L	Low
LN	Low-to-Negative
VL	Very Low

- **ScenarioMIP design:** [van Vuuren et al., 2026 Geoscientific Model Development](#)
- **IAM data release:** September 2026
- **Retired:** RCP8.5, SSP5-8.5, SSP3-7.0

CMIP7 on HIGH: “*not a ‘business-as-usual’ scenario nor the no-policy reference scenario.*”

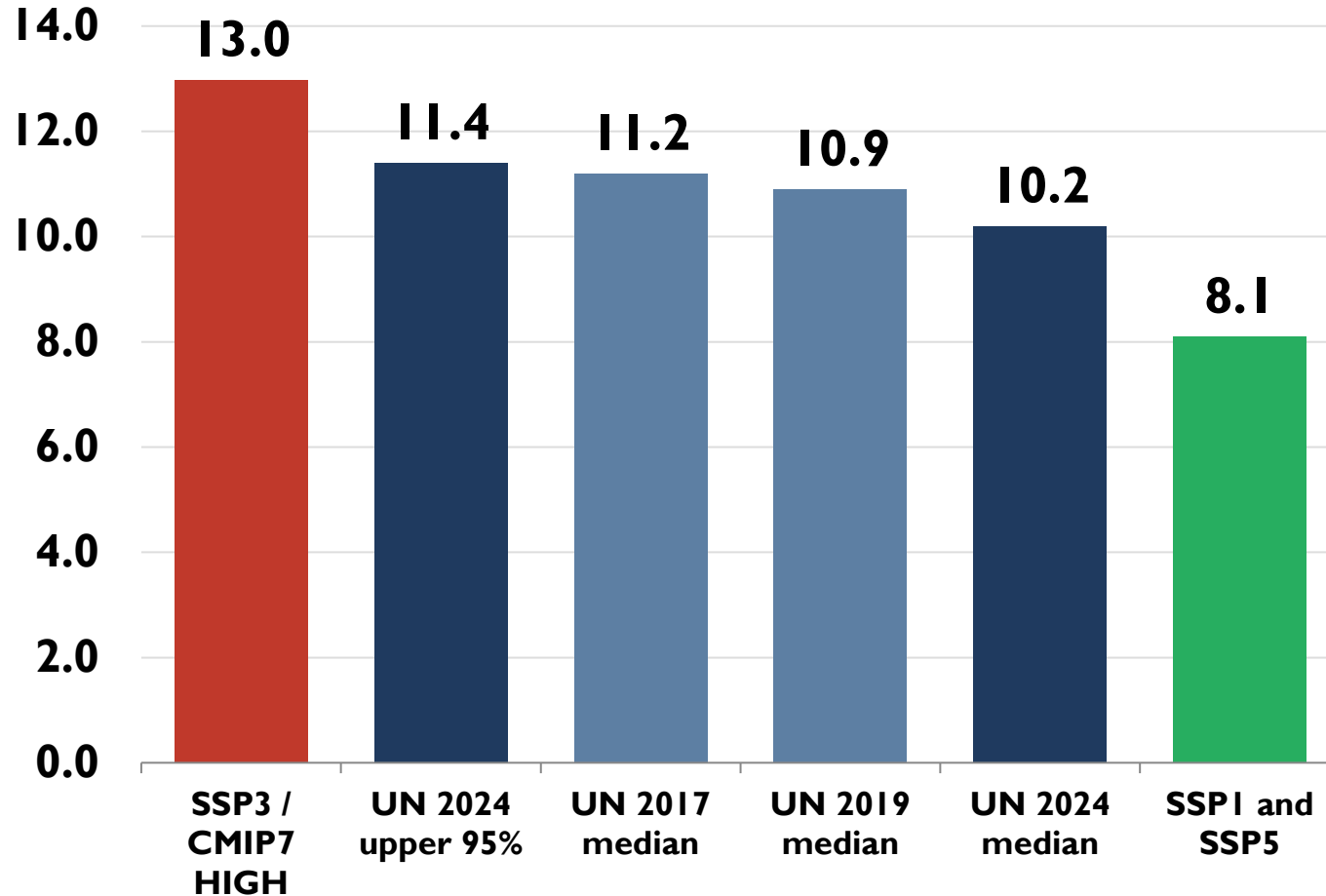
CMIP7 aimed HIGH at the upper end of plausible emissions.

Sources: van Vuuren et al. (2026) GMD; Ausubel (1995) Energy Policy; Pielke, THB, 7 Sept. 2026

But is CMIP7 HIGH plausible?

HIGH is based on on SSP3: a crowded, poorer world

World population in 2100, billions



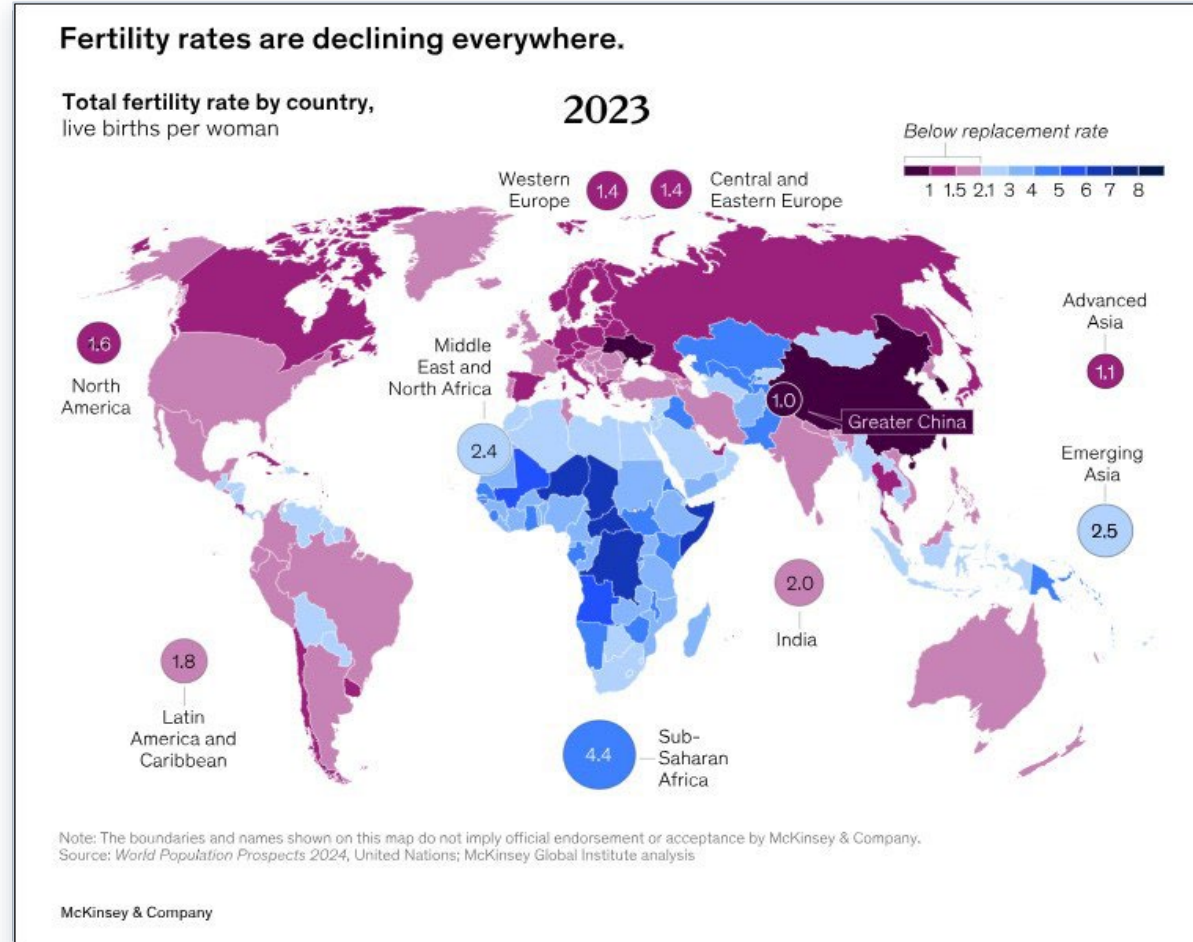
- CMIP7 authors judged SSP3- and SSP5-based high scenarios “reasonably similar” in emissions.
- **They picked SSP3 as “more interesting from an impact perspective.”**
- Every study built on HIGH will be based on 13 billion people at ~\$28,000 per capita with weak adaptive capacity, with the highest emissions in the set.
- **Fix: a fully developed SSP5-based companion HIGH, so users can compare results.**

Sources: IIASA SSP database; UN WPP; van Vuuren et al. (2026); Pielke, “Is the New HIGH Climate Scenario Plausible?” THB, 7 Sept. 2026



Fertility rates are declining everywhere

Total fertility rate by country, 2023



Source: <https://www.mckinsey.com/mgi/our-research/dependency-and-depopulation-confronting-the-consequences-of-a-new-demographic-reality>

CMIP7 HIGH: the bottom line

Exploratory only

13.0 billion

people in 2100 vs. UN median of 10.2 billion

0.66% / yr

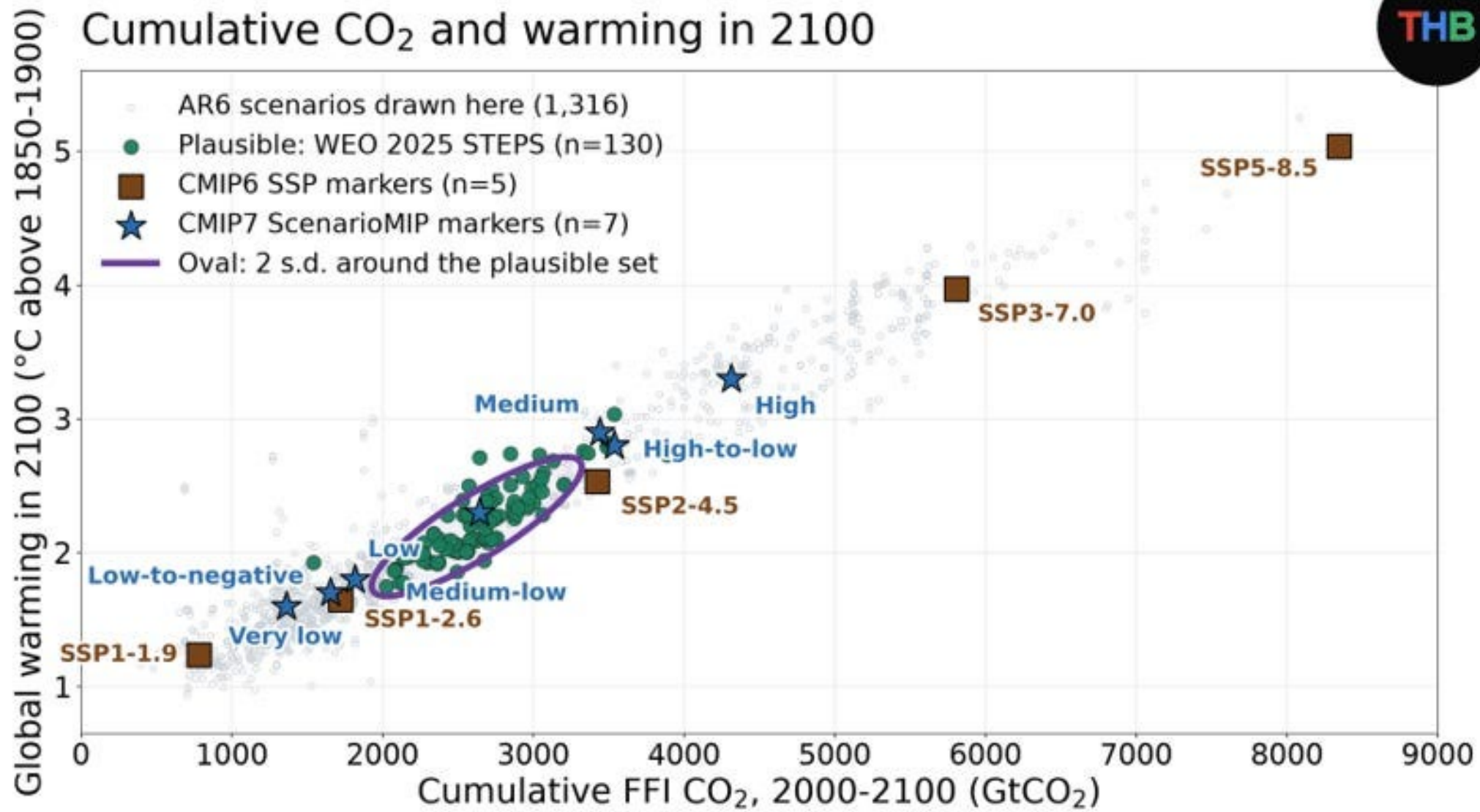
energy-intensity decline vs. 1.43% observed
since 1990

0.08% / yr

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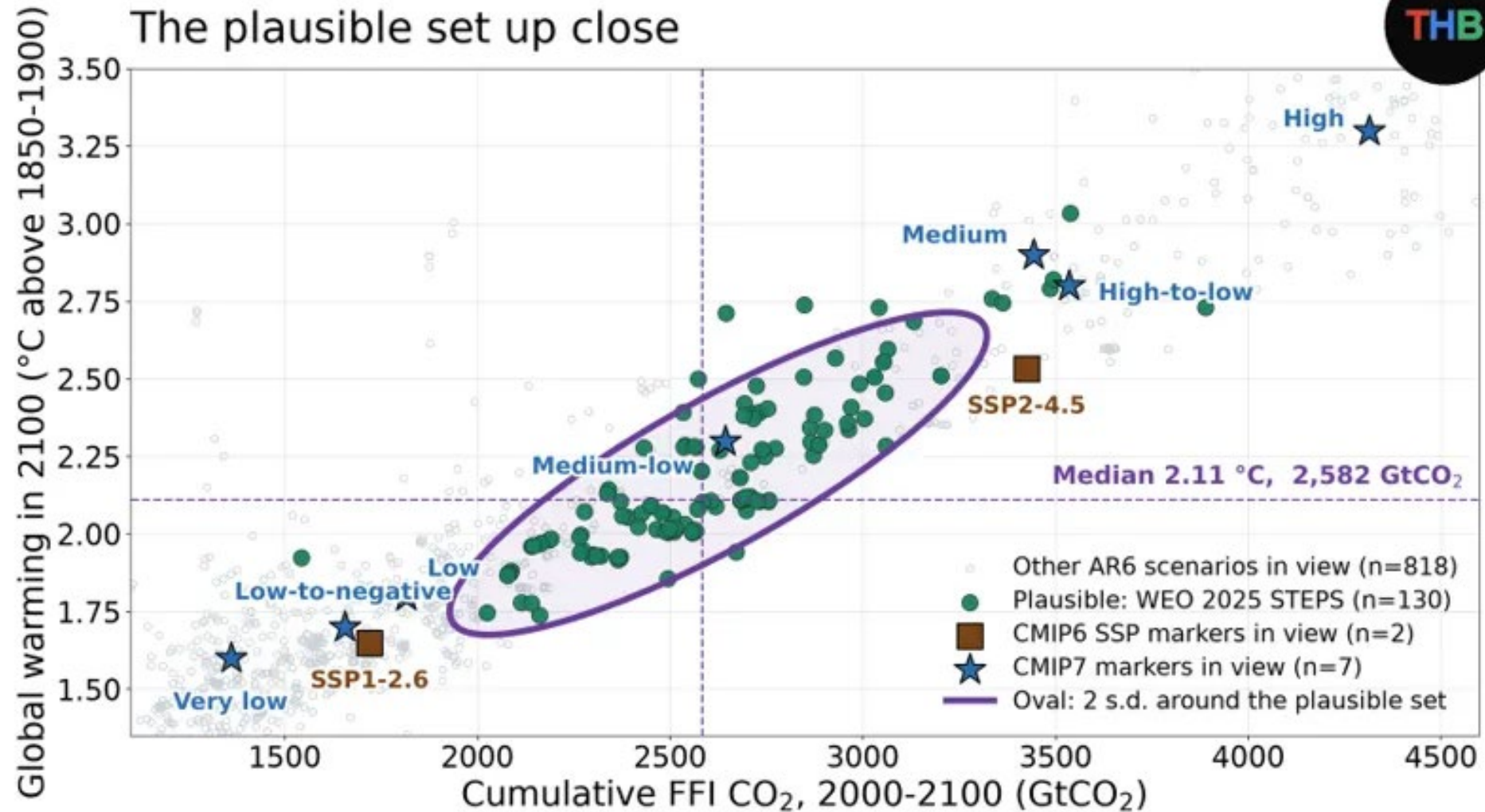
- **Plausible? No: But** the most pessimistic observed rates (population 11.4 billion, income +2.23%/yr, energy intensity –1.36%/yr, carbon intensity –0.17%/yr) yield cumulative emissions above HIGH.
- **Uniformly pessimistic:** only HIGH puts income, energy intensity and carbon intensity all below historical rates.
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- **Missing step:** CMIP7 released the scenarios with no formal plausibility assessment.

Source: Pielke, "Is the New HIGH Climate Scenario Plausible?" THB, 7 Sept. 2026



Source: analysis by Roger Pielke Jr., The Honest Broker

The new CMIP7 scenarios



Source: analysis by Roger Pielke Jr., The Honest Broker



Plausible scenarios still indicate 2°C to 3°C

Update of Pielke, Burgess & Ritchie (2022) with data through 2025

2.1°C

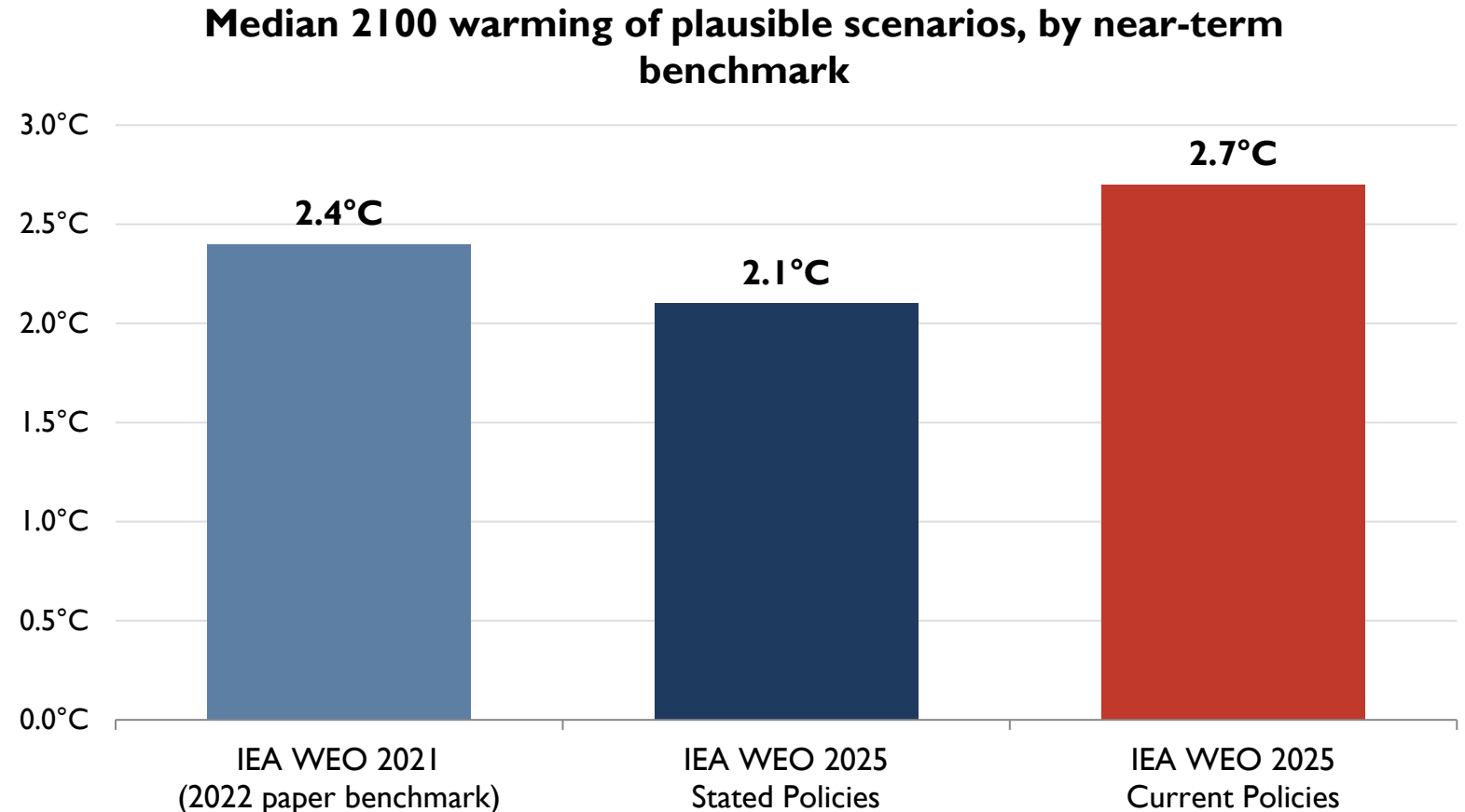
median 2100 warming of the plausible set (2.2°C in 2022)

0

plausible scenarios above 3°C (1.4% in 2022)

1,318

AR6 scenarios screened



Source: Pielke, "Plausible Scenarios Still Indicate 2°C to 3°C," THB, 14 Sept. 2026; Pielke, Burgess & Ritchie (2022) ERL 17:024027



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Right emissions, wrong reasons

How many **AR6** scenarios match the real world on all four **Kaya** factors?

1,318

AR6 scenarios with complete fossil and industrial CO₂ paths

76

pass the emissions filter against the IEA 2025 outlook

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also match population, GDP per capita, energy intensity and carbon intensity at the looser tolerance

0

pass all four Kaya factors at the tighter tolerance

Population tracks closely to 2050; energy and carbon intensity show wide scatter. Scenarios diverge from reality and need frequent updates.

Source: Pielke, "Plausible Scenarios Still Indicate 2°C to 3°C," THB, 14 Sept. 2026



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How do the new CMIP7 scenarios fare?

Plausibility test against observations and the IEA 2025 outlook

CMIP7 scenario	Plausible?	Note
Very Low	No	Needs emissions to fall >8% a year for three decades vs. ~1% in the IEA outlook
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Medium	Yes (looser tolerance)	Just beyond the upper edge of the tight test
High-to-Low	No	Outside the plausible set
High	No	Outside the plausible set

Suggested use

Medium-Low and Medium: bracket a reference range.

High: exploratory only; no role as a reference scenario.

Low family: policy scenarios, judged on feasibility; implausibility by design.

CMIP7 gives researchers a better basis for policy-relevant projections than the RCPs or SSPs.

Source: Pielke, "Plausible Scenarios Still Indicate 2°C to 3°C," THB, 14 Sept. 2026



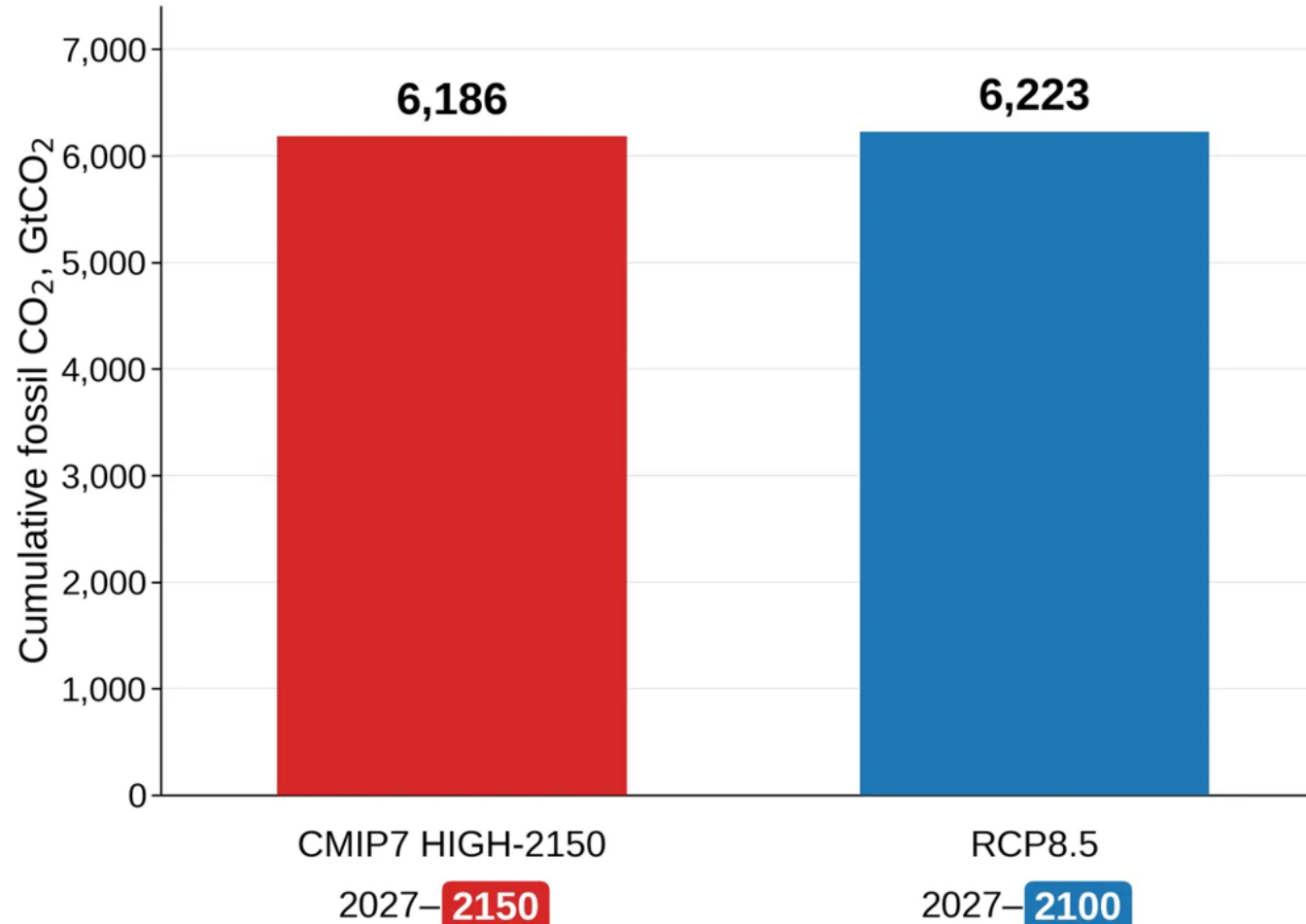
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The Ghost of RCP8.5 Returns



Cumulative fossil carbon dioxide emissions



Data: CMIP7 ScenarioMIP emissions (Sanderson & Smith repository); RCMIP v5.1.0 (Zenodo)

Source: analysis by Roger Pielke Jr., *The Honest Broker*

IPCC AR7 wants
CMIP7 ScenarioMIP
runs for AR7 to
extend through
2150. **Will AR7
replay the
RCP8.5 debacle?**



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Sources: Pielke, "Fool Us Once," THB, 23 Sept. 2026; van Vuuren et al. (2026) GMD 19:2627



Where things stand in autumn 2026

Four takeaways

1 Retirement

CMIP7 retired RCP8.5, SSP5-8.5 and SSP3-7.0 -- Well done!

2 Plausible futures

Plausible scenarios still point to 2°C–3°C by 2100, median ~2.1°C, with none above 3°C.

3 The new HIGH

Extreme and highly unlikely, built on the SSP3 world of 13 billion people; suited only to exploratory research.

4 The next misuse?

Extensions to 2150 reproduce RCP8.5 outcomes; AR7 plans to run every scenario to 2150.



Special thanks!

Matt Burgess (University of Colorado) and Justin Ritchie (University of British Columbia)

Of course, I am solely responsible for all claims and statements made in this presentation!

For further reading

- Ritchie, J., & Dowlatabadi, H. (2017). Why do climate change scenarios return to coal? *Energy*, 140:1276-1291.
- Pielke, Jr., R. (2018). Opening up the climate policy envelope. *Issues in Science and Technology*, 34:30-36.
- Burgess, M. G., Ritchie, J., Shapland, J., & Pielke, Jr., R. (2020). IPCC baseline scenarios have over-projected CO2 emissions and economic growth. *Environmental Research Letters*, 16(1), 014016.
- Pielke Jr, R., & Ritchie, J. (2021). Distorting the view of our climate future: The misuse and abuse of climate pathways and scenarios. *Energy Research & Social Science*, 72, 101890.
- Pielke Jr, R., & Ritchie, J. (2021). How Climate Scenarios Lost Touch With Reality. *Issues in Science and Technology*, 37(4), 74-83.
- Pielke Jr, R., Burgess, M. G., & Ritchie, J. (2022). Plausible 2005-2050 emissions scenarios project between 2 and 3 degrees C of warming by 2100. *Environmental Research Letters*, 17, 024027.



Further reading: 2026 updates

- [Pielke Jr., R. \(2026\). Is the new HIGH climate scenario plausible? The Honest Broker, 7 September.](#)
- [Pielke Jr., R. \(2026\). Plausible scenarios still indicate 2°C to 3°C. The Honest Broker, 14 September.](#)
- [Pielke Jr., R. \(2026\). Fool us once. The Honest Broker, 23 September.](#)
- Pielke Jr., R. (forthcoming). Twenty-five years of argument about scenarios. The Honest Broker.
- [van Vuuren, D. P., et al. \(2026\). The Scenario Model Intercomparison Project for CMIP7 \(ScenarioMIP-CMIP7\). Geoscientific Model Development, 19, 2627–2656.](#)
- [Ausubel, J. H. \(1995\). Technical progress and climatic change. Energy Policy, 23\(4–5\), 411–416.](#)
- [Pielke Jr., R., Wigley, T., & Green, C. \(2008\). Dangerous assumptions. Nature, 452, 531–532.](#)
- [THB Build Your Own Climate Scenario tool: scenarios.thehonestbroker.org](#)



Contact and resources

- **Roger Pielke Jr.**
 - Senior Fellow, American Enterprise Institute
 - Professor Emeritus, University of Colorado Boulder
- **WRITING**
- **The Honest Broker on Substack**
 - rogerpielkejr.substack.com
- **THB homepage**
 - thehonestbroker.org
- **On X**
 - [@RogerPielkeJr](https://twitter.com/RogerPielkeJr)
- **Email**
 - Roger.Pielke@aei.org

THB DASHBOARDS

US ExtremeWeather and Climate Change Dashboard

extremeweather.thehonestbroker.org

Global ExtremeWeather and Climate Change Dashboard

globalextremeweather.thehonestbroker.org

Global Tropical Cyclones

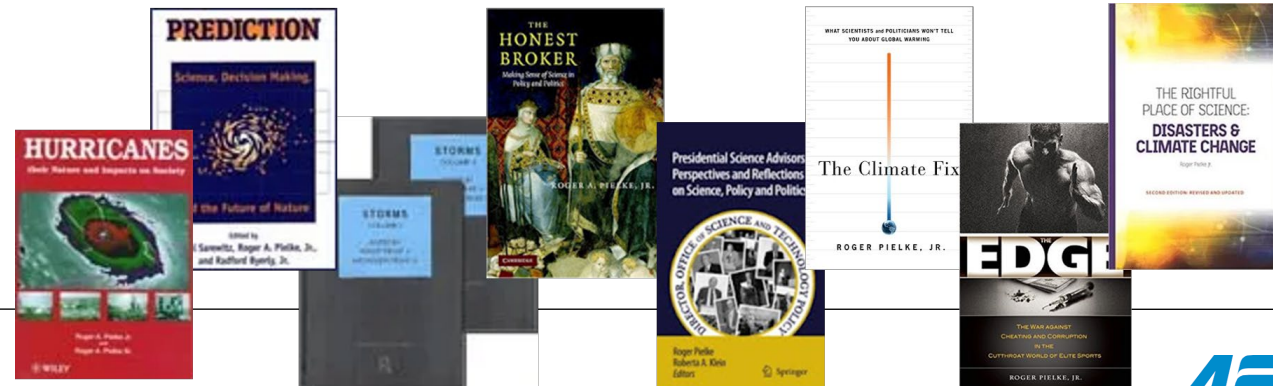
thehonestbroker.org/gtc

Decarbonization Around the World

decarbonization.thehonestbroker.org

Build Your Own Climate Scenario

scenarios.thehonestbroker.org



BACK UP and EXTRA



After the RCPs:

Shared Socioeconomic Pathways (SSPs); ~2016 to present

THE SHARED SOCIO-ECONOMIC PATHWAYS (SSPs)

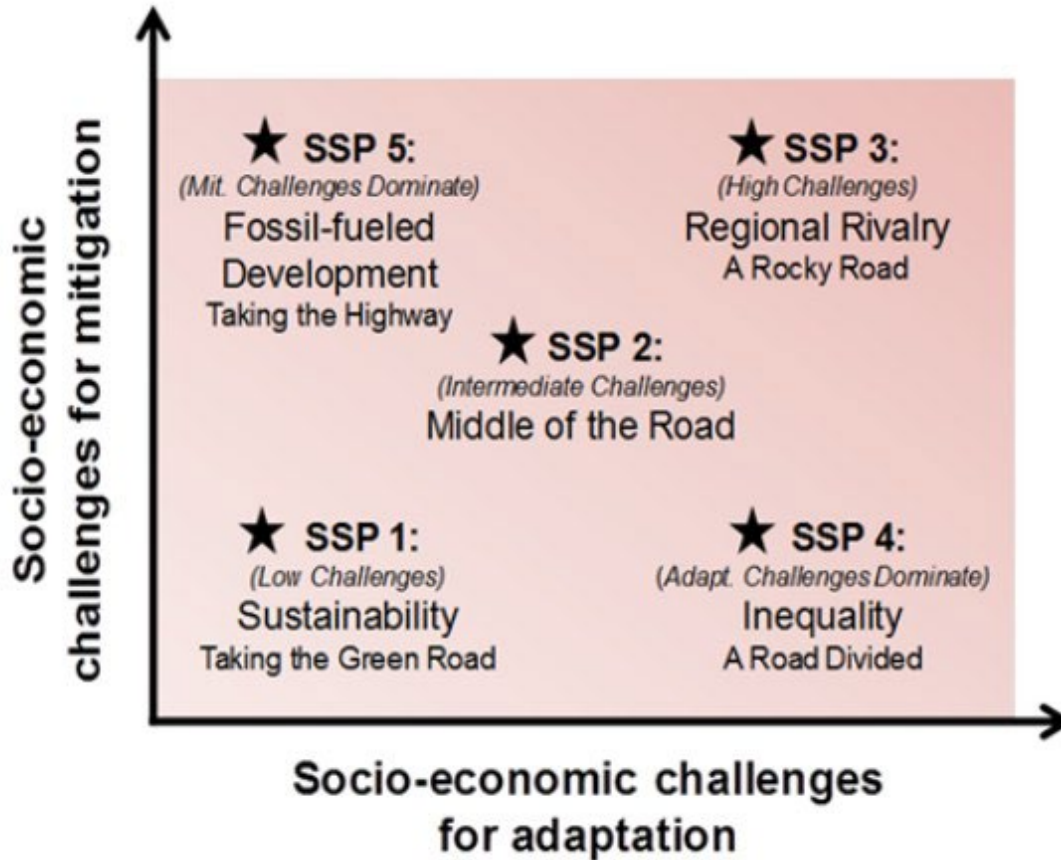


Fig. 1 Overview of SSPs

(Narratives in O'Neill et al., 2016, Glob Env Change, online first)

SSP1: low challenges for mitigation (resource efficiency) and adaptation (rapid development)

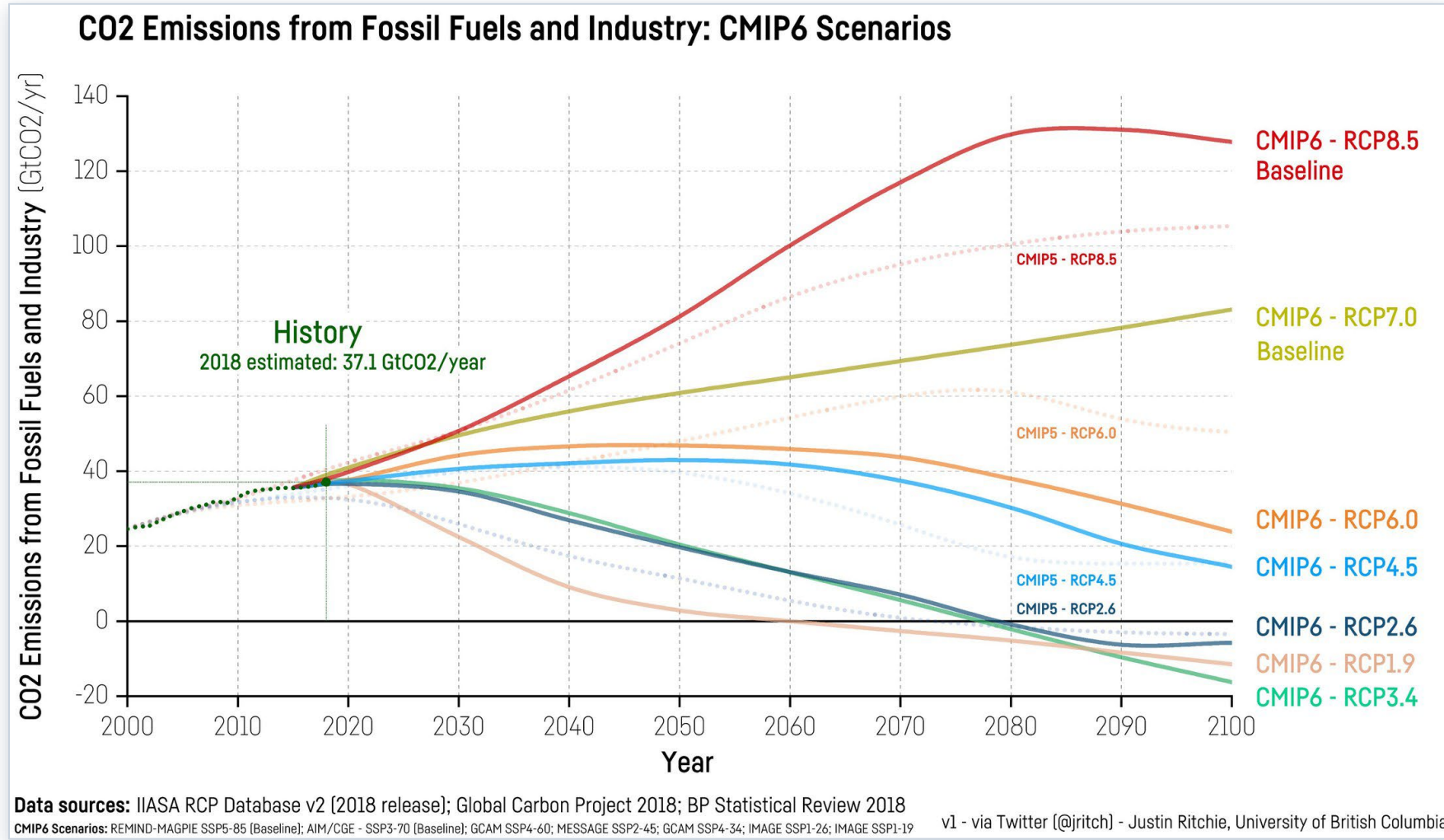
SSP3: high challenges for mitigation (regionalized energy / land policies) and adaptation (slow development)

SSP4: low challenges for mitigation (global high tech economy), high for adapt. (regional low tech economies)

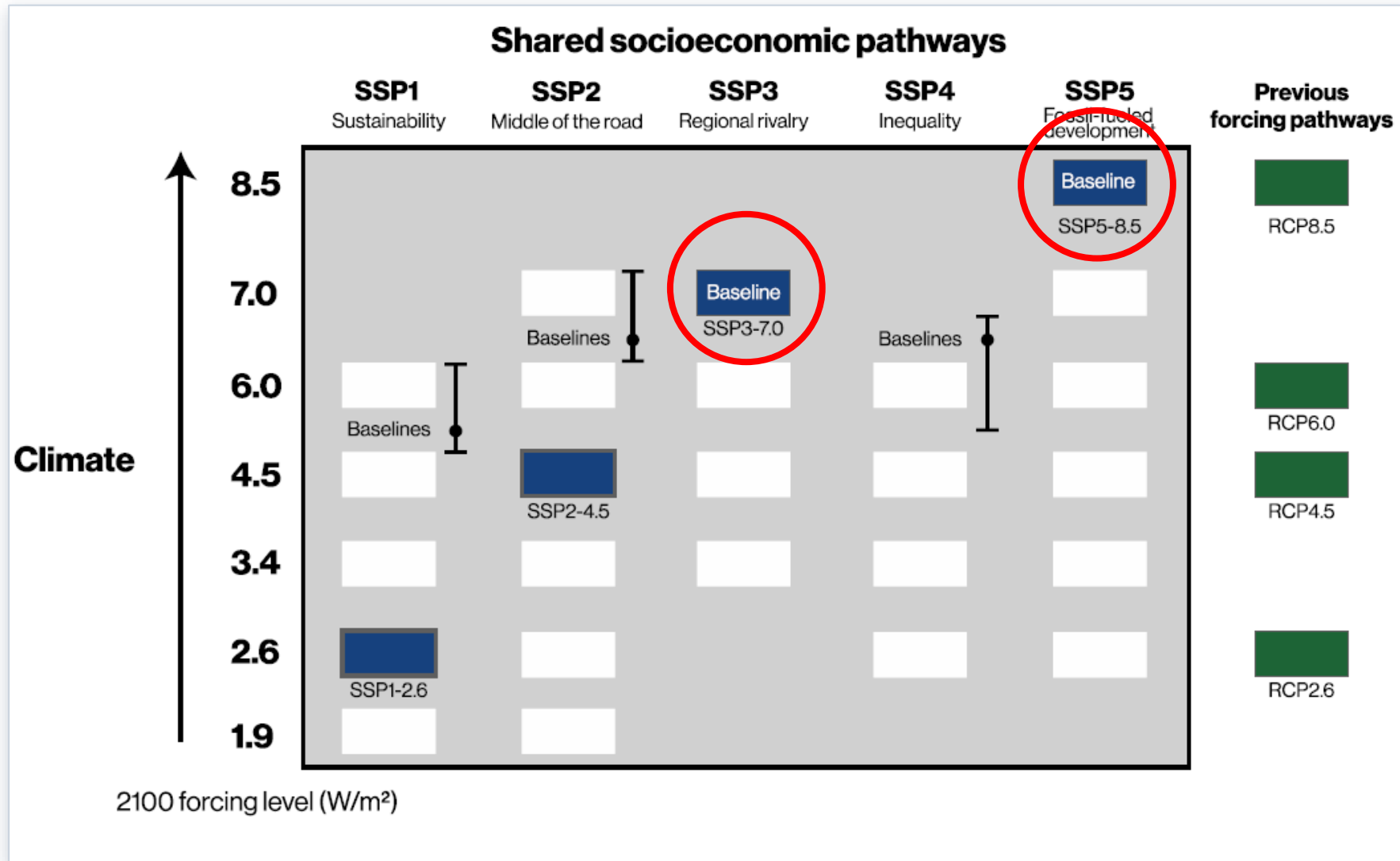
SSP5: high challenges for mitigation (resource / fossil fuel intensive) and low for adapt. (rapid development)

CMIP6 scenarios vs. history

CO₂ emissions from fossil fuels and industry

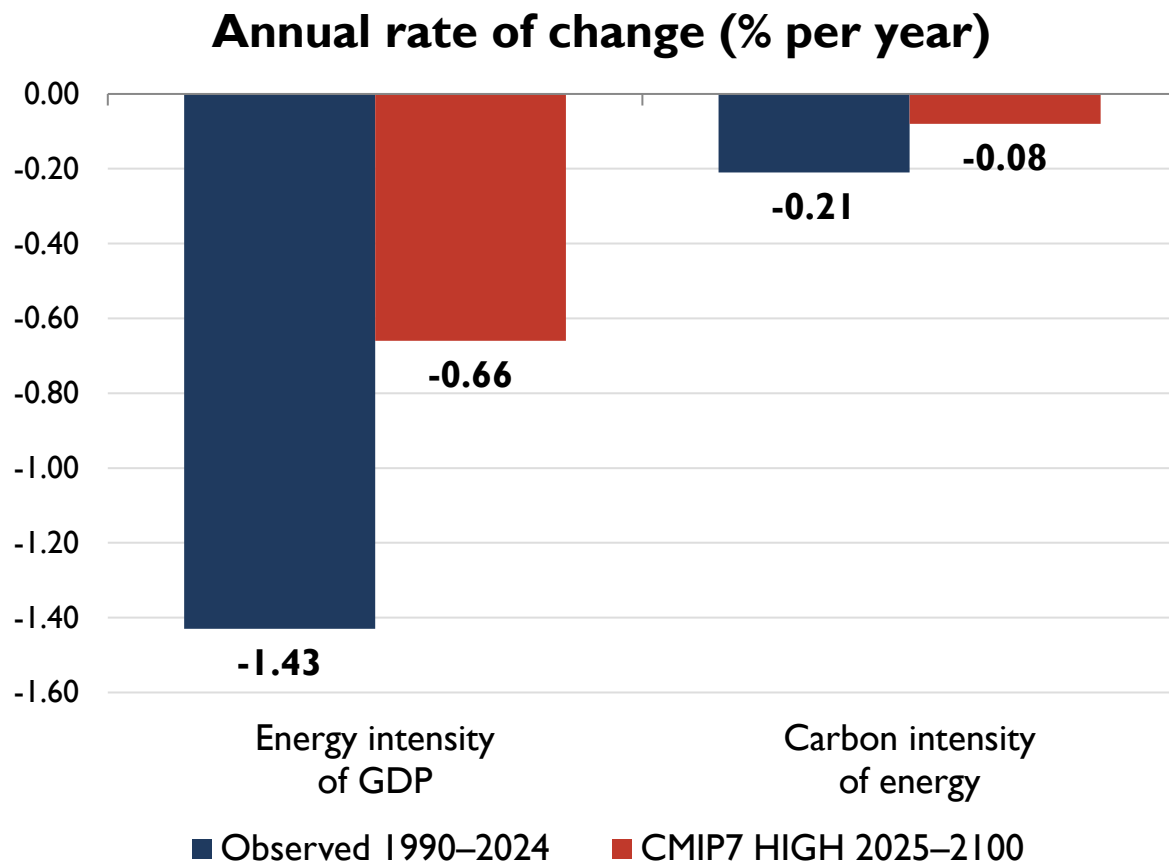


SSPs are repeating problems of the RCPs



Is the new HIGH scenario plausible?

HIGH vs. observed Kaya rates since 1990



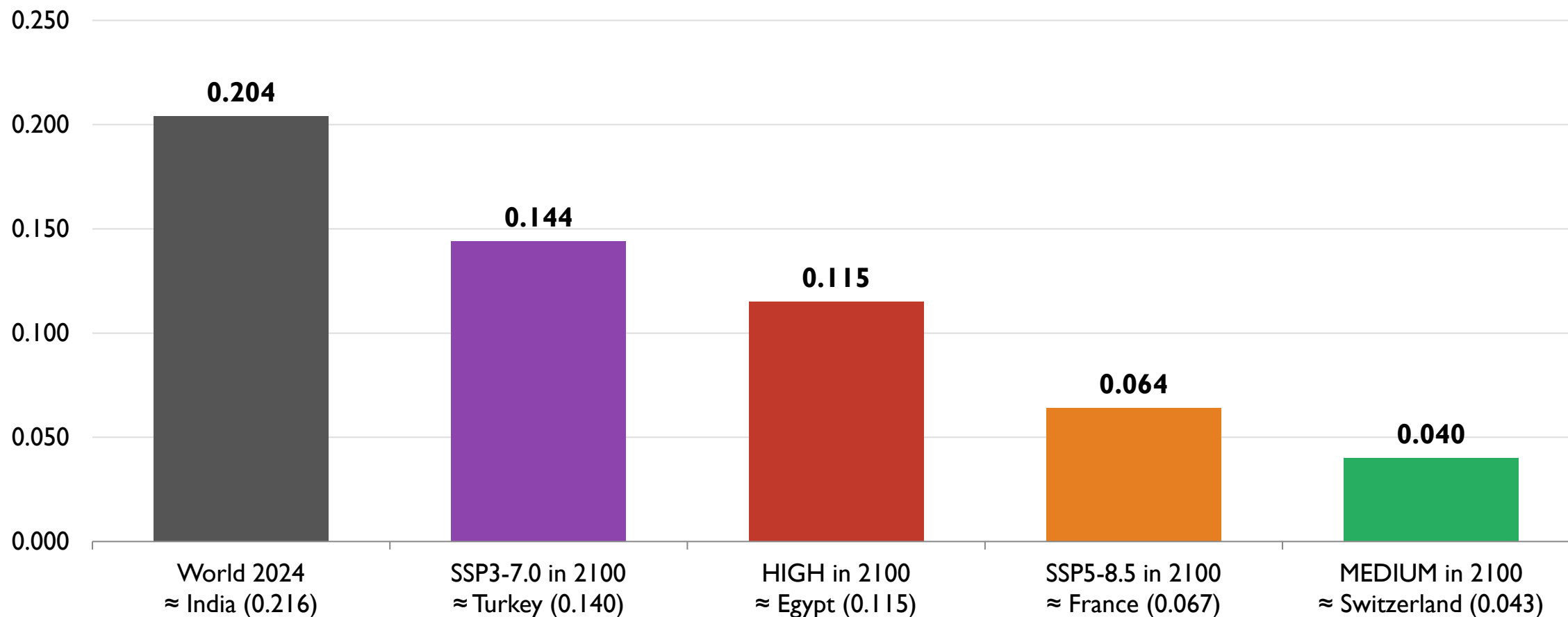
- **Efficiency:** HIGH cuts the historical pace of energy-intensity improvement by more than half for 75 years, slower than any sustained stretch in the historical record.
- **Fuel mix:** fossil fuels supply 73% of primary energy in 2100; solar and wind reach 11%, with a decline in nuclear output.
- **Carbon intensity of energy:** 58.3 kg CO₂/GJ in 2025, 54.8 in 2100.
- **Credit to CMIP7:** coal holds near 27% of energy, with no RCP8.5-style coal renaissance.
- **Energy per person** falls from 77 GJ to 72 GJ as population grows by 5 billion.

Source: Pielke, “Is the New HIGH Climate Scenario Plausible?” THB, 7 Sept. 2026 (Energy Institute, World Bank, UN, IIASA data)



In 2100, the HIGH world resembles Egypt in 2024

Carbon intensity of GDP (kg CO₂ per \$) and the closest country today



Source: Pielke, "Is the New HIGH Climate Scenario Plausible?" THB, 7 Sept. 2026

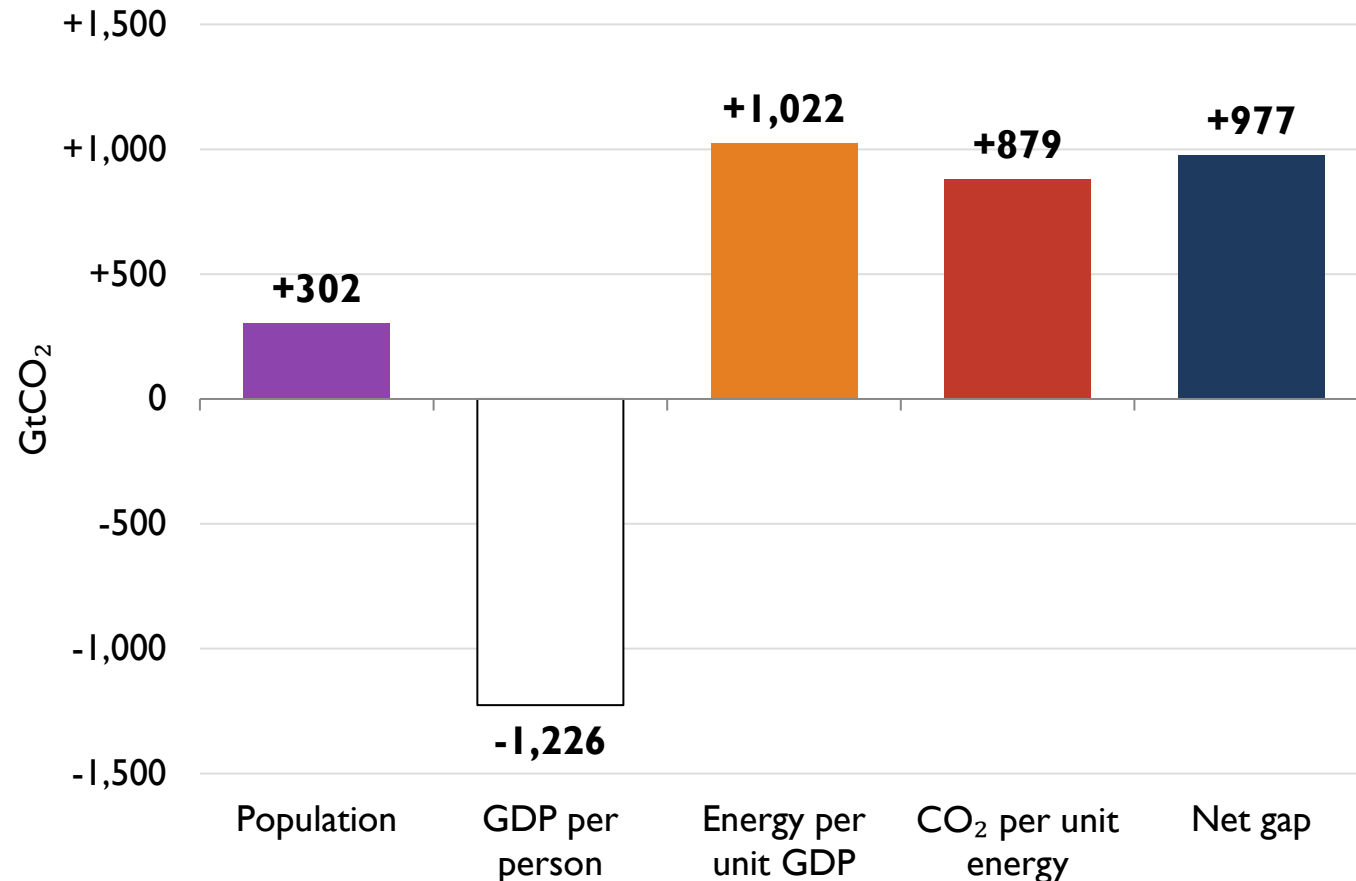


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HIGH minus MEDIUM: 977 GtCO₂

Kaya decomposition of the cumulative energy CO₂ gap, 2025–2100



In HIGH, the extra emissions come from slow efficiency gains and a stalled fuel mix in a crowded, poorer world.

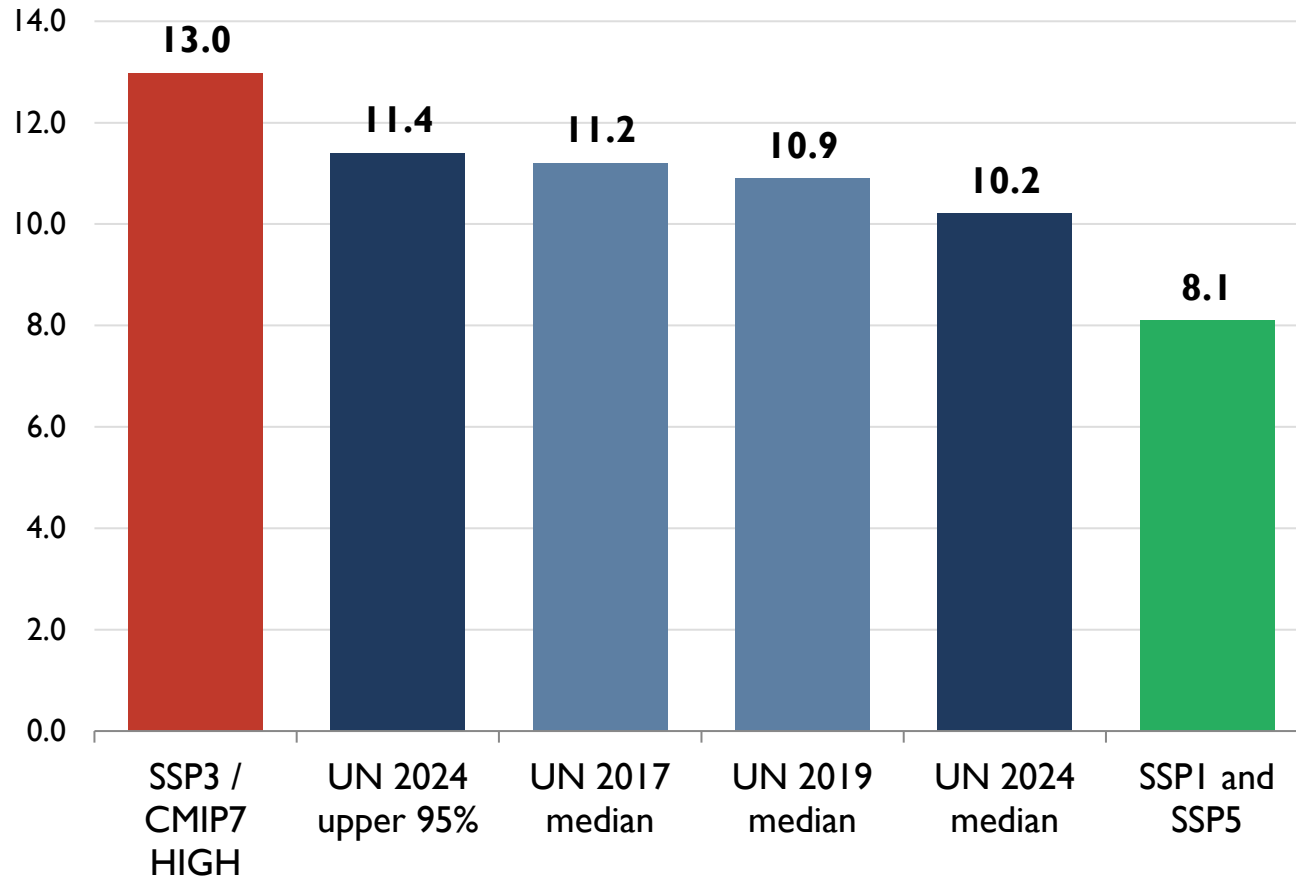
Lower income in HIGH offsets 1,226 GtCO₂ of the gap.

Emissions per person fall from 4.8 t today to 3.7 t in 2100, the global level of 1968.

Source: Pielke, "Is the New HIGH Climate Scenario Plausible?" THB, 7 Sept. 2026

HIGH rests on SSP3: a crowded, poorer world

World population in 2100, billions



- CMIP7 authors judged SSP3- and SSP5-based high scenarios “reasonably similar” in emissions.
- **They picked SSP3 as “more interesting from an impact perspective.”**
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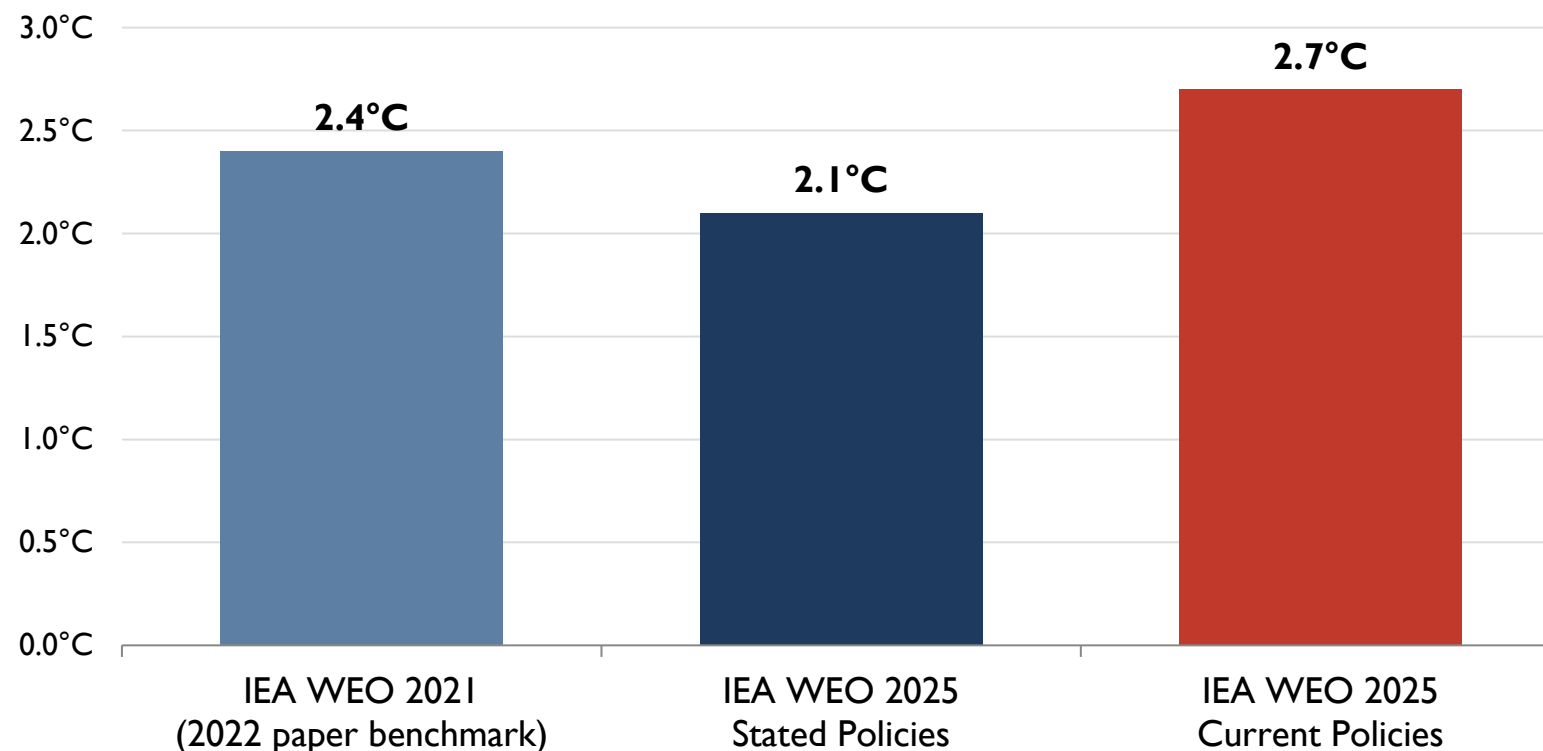
0

plausible scenarios above 3°C (1.4% in 2022)

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Median 2100 warming of plausible scenarios, by near-term benchmark



Source: Pielke, "Plausible Scenarios Still Indicate 2°C to 3°C," THB, 14 Sept. 2026; Pielke, Burgess & Ritchie (2022) ERL 17:024027



University of Colorado **Boulder**



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RCP8.5 returns by way of 2150

Exploratory scenario extensions recast as forecasts

Step 1: Move the goalposts

A Sept. 2026 NYT op-ed credits “conventional modeling of today’s policies and pathways” with odds out to 2150. CMIP7 built its extensions to 2500 “decoupled from the outcomes of IAM simulations,” to explore Earth-system dynamics.

Step 2: Forecast from the extension

The op-ed cites 3-in-4 odds of 3°C by 2150; a companion post cites ~70% odds of >4°C by 2150 under HIGH, both from Carbon Brief runs of a simple climate model.

Result: HIGH-2150 ≈ RCP8.5

Cumulative CO₂ of HIGH through 2150 matches RCP8.5 through 2100, with radiative forcing near RCP8.5 and SSP5-8.5 levels.

IPCC AR7: a lead author reports that all CMIP7 ScenarioMIP runs in AR7 will extend through 2150. **Will AR7 replay the RCP8.5 debacle?**

Sources: Pielke, “Fool Us Once,” THB, 23 Sept. 2026; van Vuuren et al. (2026) GMD 19:2627

