Toward a framework for an "ambition index" and online calculator

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Caveats:

"*Toward*…": Merely preliminary!

"…a *framework* for…": Not intended to generate one set of definitive numbers. Key choices and parameters are user-specified.

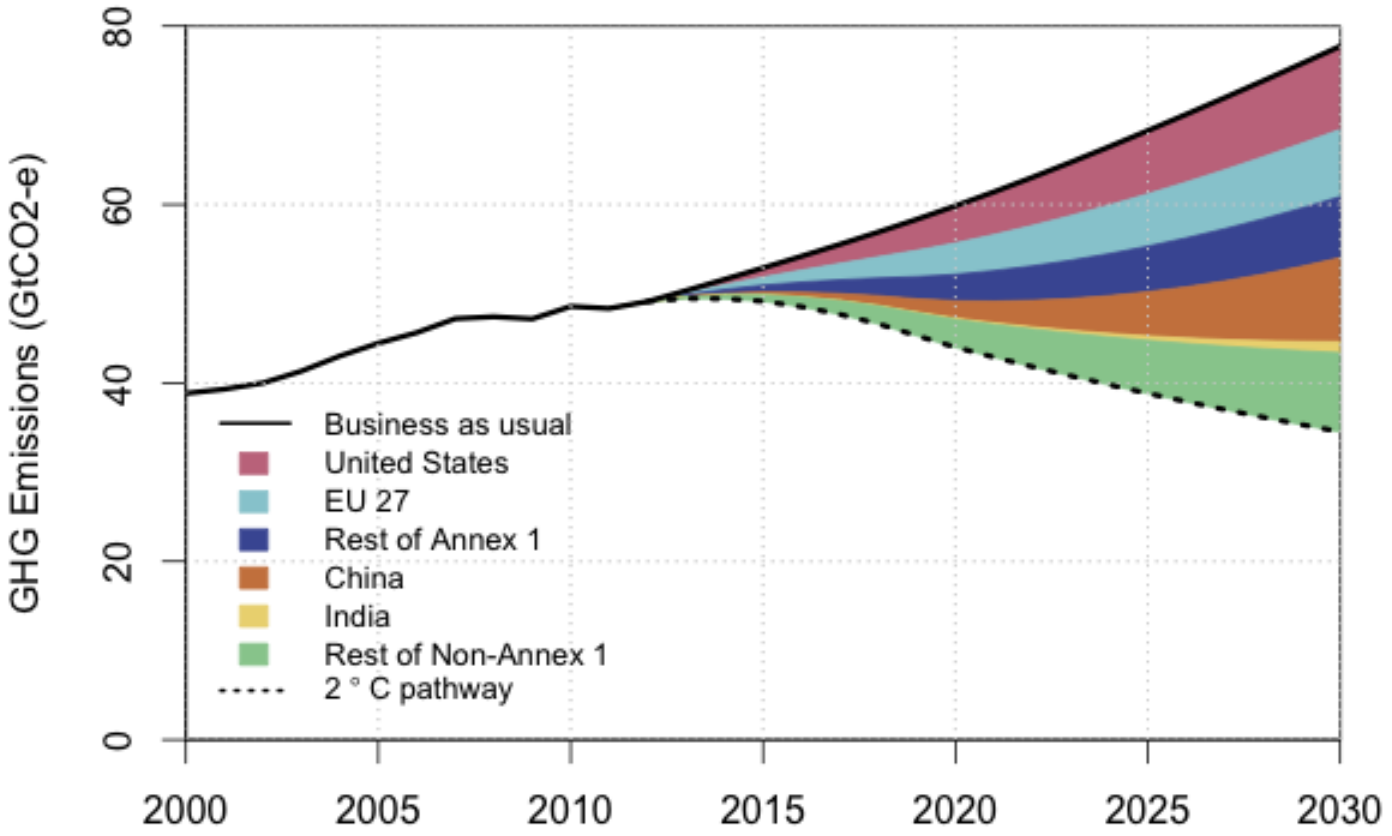
"…*an* …": Could certainly be others, though this one aims to be quite flexible and encompassing.

"…*ambition index*…": A.k.a. "equity reference framework", "cost-sharing method", "fair shares approach", etc.

"…and *online calculator*": A data-driven, quantitative exercise, but… rests on fundamentally normative, value- laden choices..

Two broad approaches to "fair shares":

- Resource-sharing: share the available carbon budget in accordance with specified equity principles
- Effort-sharing: share the required effort (tons of reductions, cost) in accordance with specified equity principles.



Underlying principles

Key design principles

- Effectiveness – consistent with a specified environmental objective
- Efficiency – consistent with minimizing cost, (i.e., equal marginal cost of GHG reductions).
- Parsimony – simple but defensible (Einstein's dictum)

Key equity principles

- Capability
- Responsibility

Principles, Article 3.1, UNFCCC, 1992

"The Parties should protect the climate system for the benefit of present and future generations of humankind, on the basis of equity and in accordance with their common but differentiated responsibilities and respective capabilities."

Principle 7, Rio Declaration, 1992

"In view of the different contributions to global environmental degradation, States have common but differentiated responsibilities. The developed countries acknowledge the responsibility that they bear in the international pursuit of sustainable development in view of the pressures their societies place on the global environment and of the technologies and financial resources they command."

Allow a progressive definition of capacity: e.g., exemption up to a specified income level

Traditional poverty line? $1/day? …$2/day?

("destitution line" and "extreme poverty line" of World Bank, UNDP, etc.)

LDC threshold?

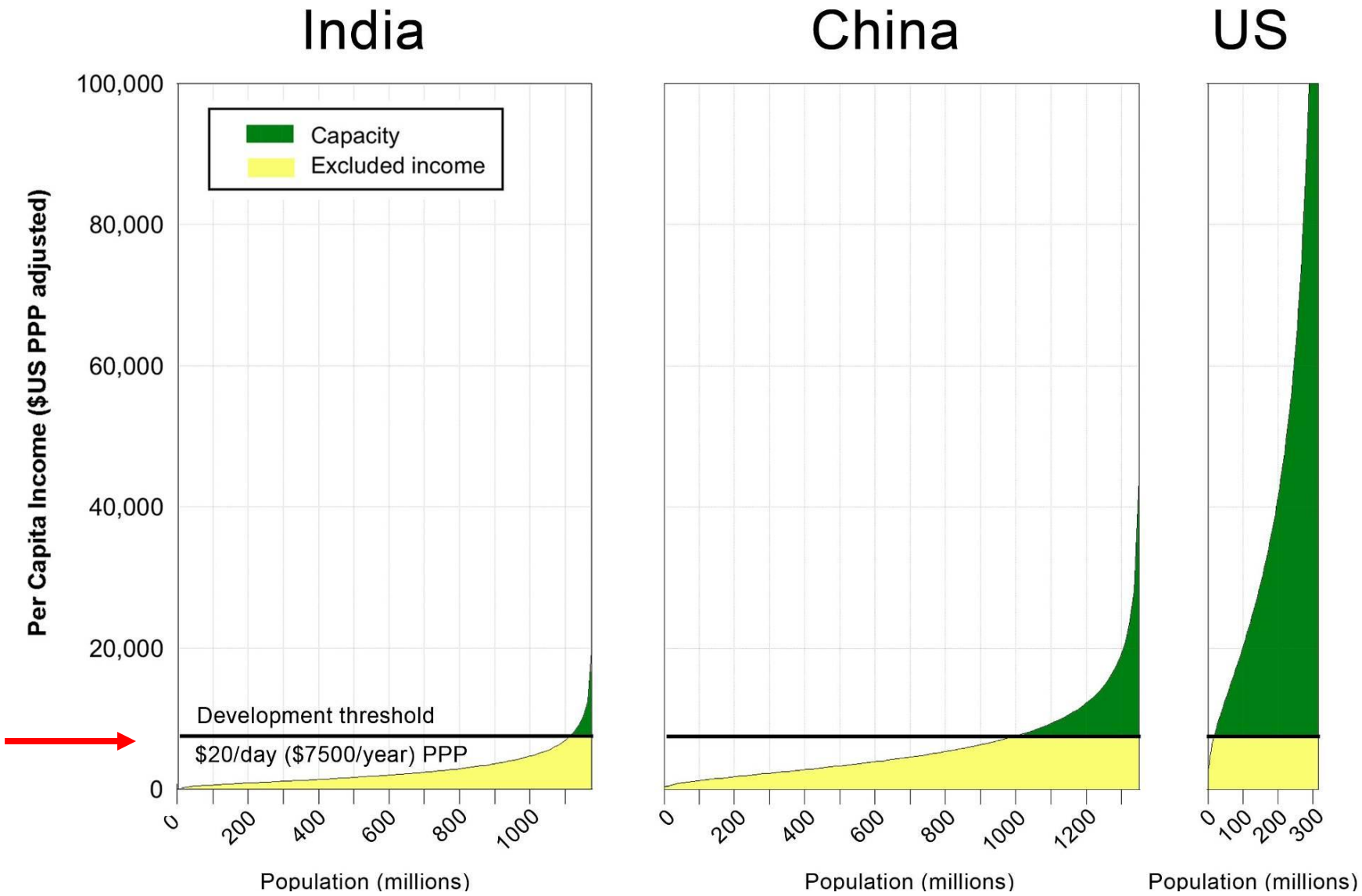
Empirical analysis? $16/day?

("global poverty line," after Pritchett (World Bank (2006))

For indicative calculations, consider development threshold 25% above global poverty line

⇨ about **$20/day** ($7,500/yr; PPP-adjusted)

Income, exemption and capacity: distributions within countries



Data: IMF, UNU-WIDER, Pritchett (World Bank/Harvard Kennedy School)

National "responsibility and capacity index"

	Population %	GDP per capita ($US PPP)	Capacity %	Responsibility %	RCI (obligations) %
EU 27	7.3	30,472	28.8	22.6	25.7
- EU 15	5.8	33,754	26.1	19.8	22.9
- EU +12	1.5	17,708	2.7	2.8	2.7
Norway	0.07	52,406	0.54	0.26	0.40
United States	4.5	45,640	29.7	36.4	33.1
China	19.7	5,899	5.8	5.2	5.5
India	17.2	2,818	0.66	0.30	0.48
South Africa	0.7	10,117	0.6	1.3	1.0
LDCs	11.7	1,274	0.11	0.04	0.07
Annex I	18.7	30,924	75.8	78.0	76.9
Non-Annex I	81.3	5,096	24.2	22.0	23.1
High Income	15.5	36,488	76.9	77.9	77.4
Middle Income	63.3	6,226	22.9	21.9	22.4
Low Income	21.2	1,599	0.2	0.2	0.2
World	100%	9,929	100 %	100 %	100 %

National "responsibility and capacity index"

	2010					2020	2030
	Population (% of global)	GDP per capita ($US PPP)	Capacity (% of global)	Responsibility (% of global)	RCI (% of global)	RCI (% of global)	RCI (% of global)
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- EU 15	5.8	33,754	26.1	19.8	22.9	19.9	16.7
- EU +12	1.5	17,708	2.7	2.8	2.7	3.0	3.0
Switzerland	0.11	39,181	0.60	0.27	0.44	0.37	0.30
United states	4.5	45,640	29.7	36.4	33.1	29.1	25.5
Japan	1.9	33,422	8.3	7.3	7.8	6.6	5.5
Russia	2.0	15,031	2.7	4.9	3.8	4.3	4.6
China	19.7	5,899	5.8	5.2	5.5	10.4	15.2
India	17.2	2,818	0.66	0.30	0.5	1.2	2.3
South Africa	0.7	10,117	0.6	1.3	1.0	1.1	1.2
Mexico	1.6	12,408	1.8	1.4	1.6	1.5	1.5
LDCs	11.7	1,274	0.11	0.04	0.07	0.10	0.12
Annex I	18.7	30,924	75.8	78.0	77	69	61
Non-Annex I	81.3	5,096	24.2	22.0	23	31	39
High Income	15.5	36,488	76.9	77.9	77	69	61
Middle Income	63.3	6,226	22.9	21.9	22	30	38
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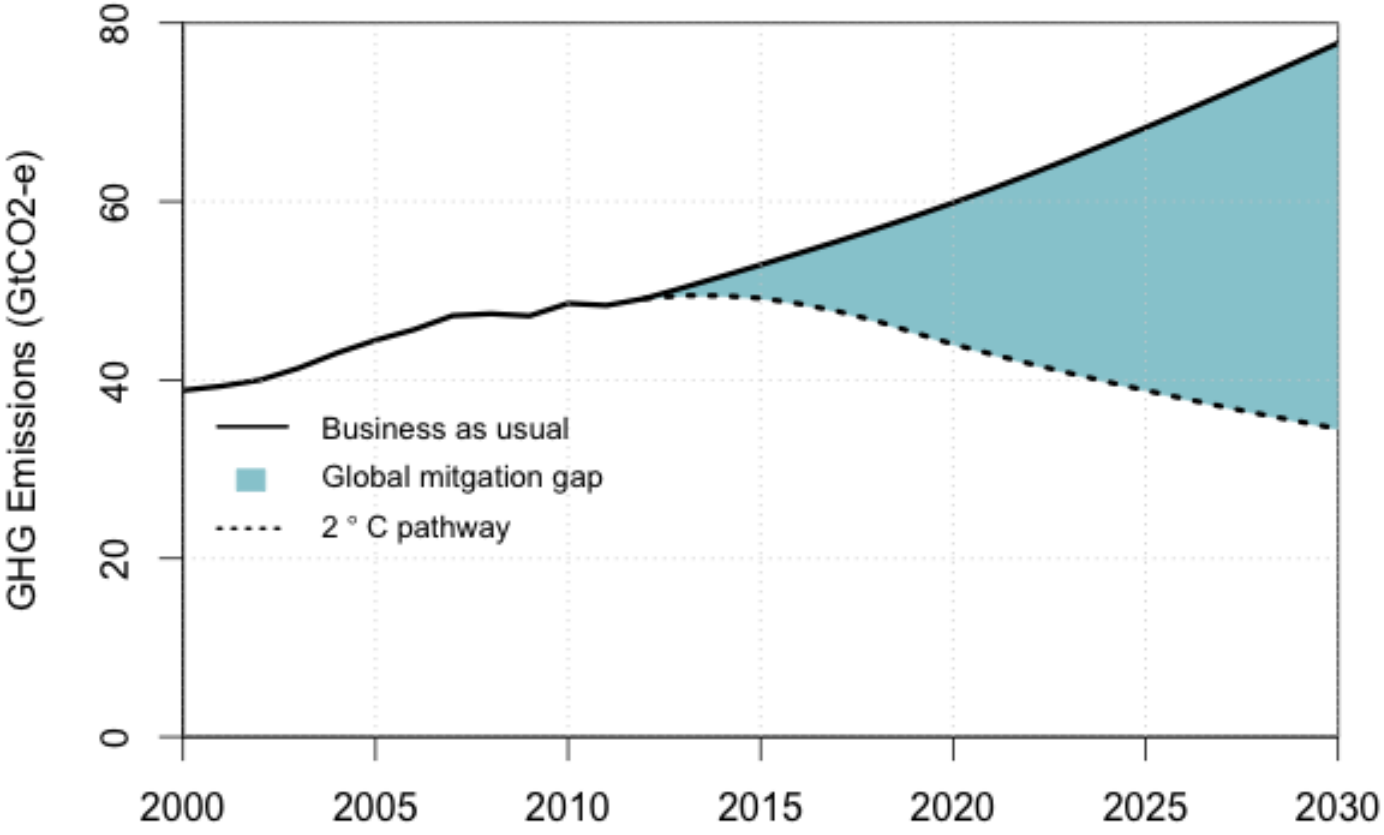
Allocating global mitigation obligations among countries according to “RCI”



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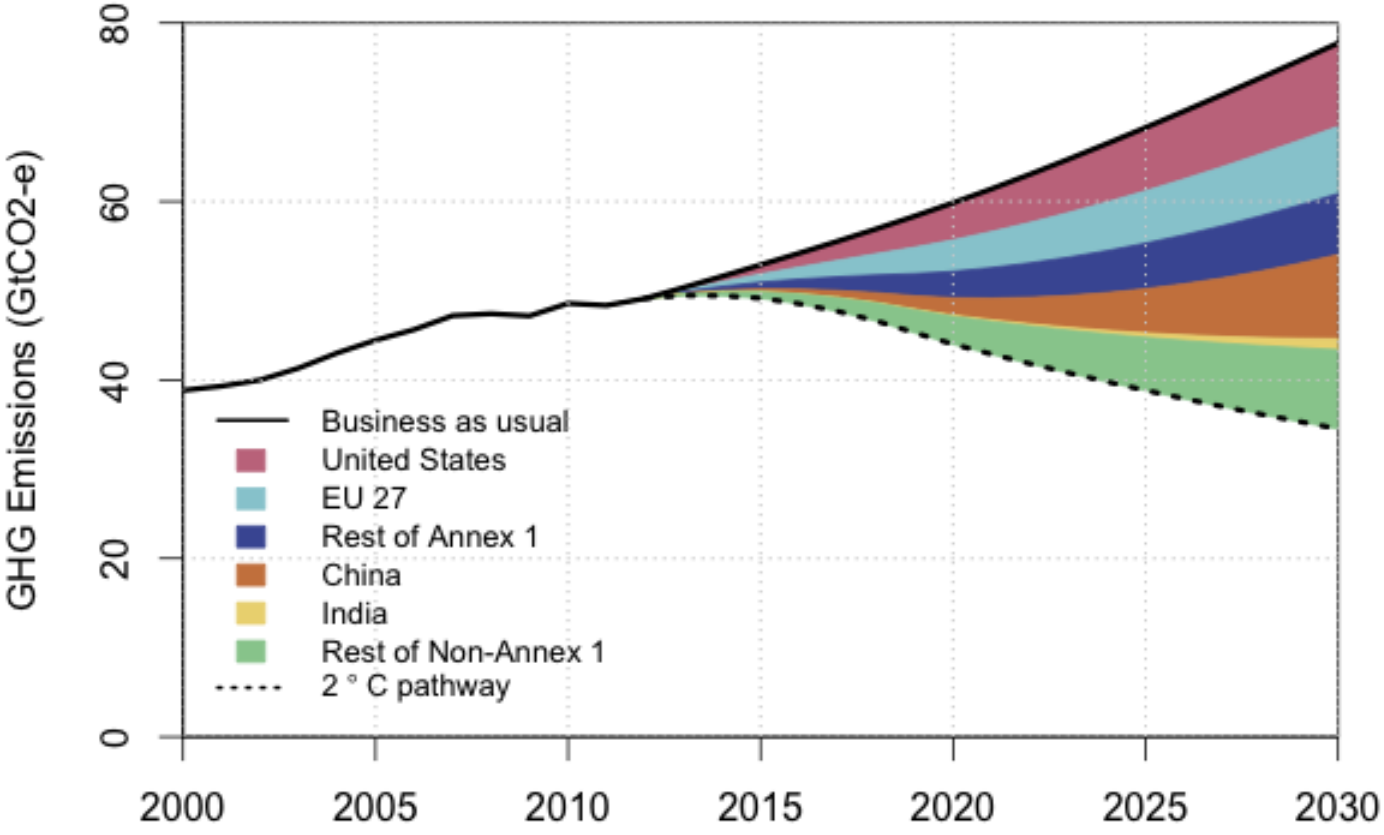
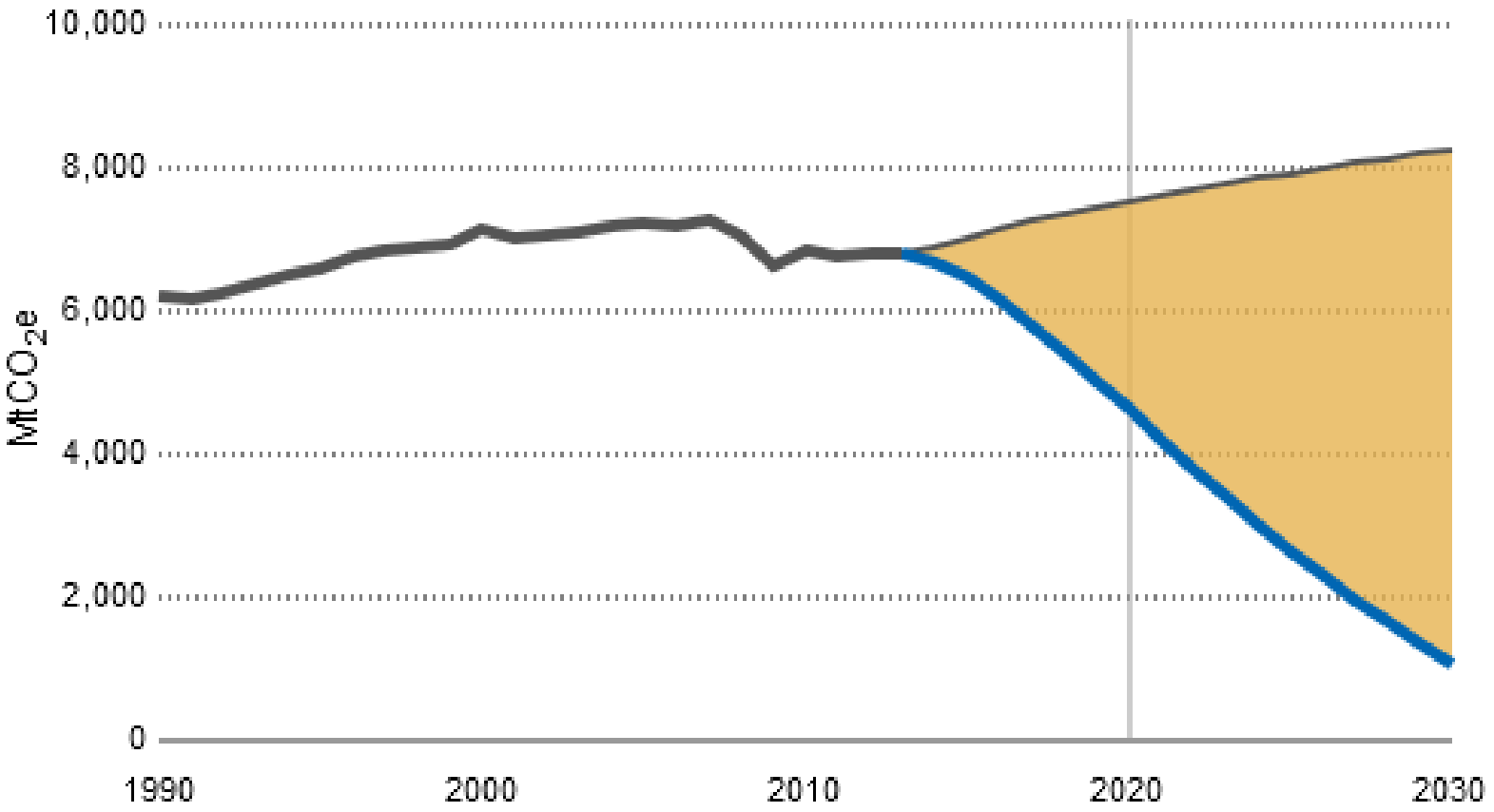


Example: United States



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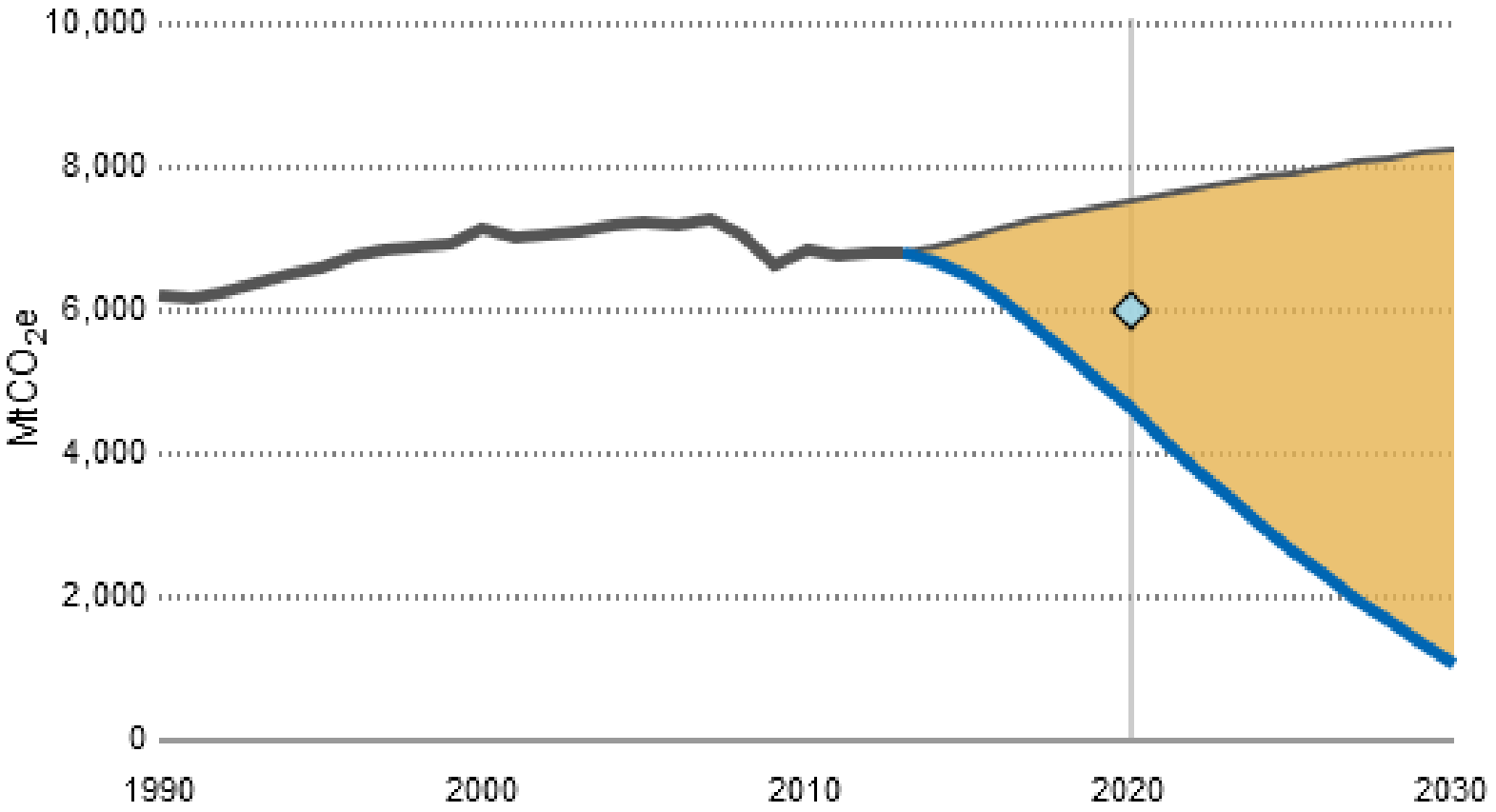

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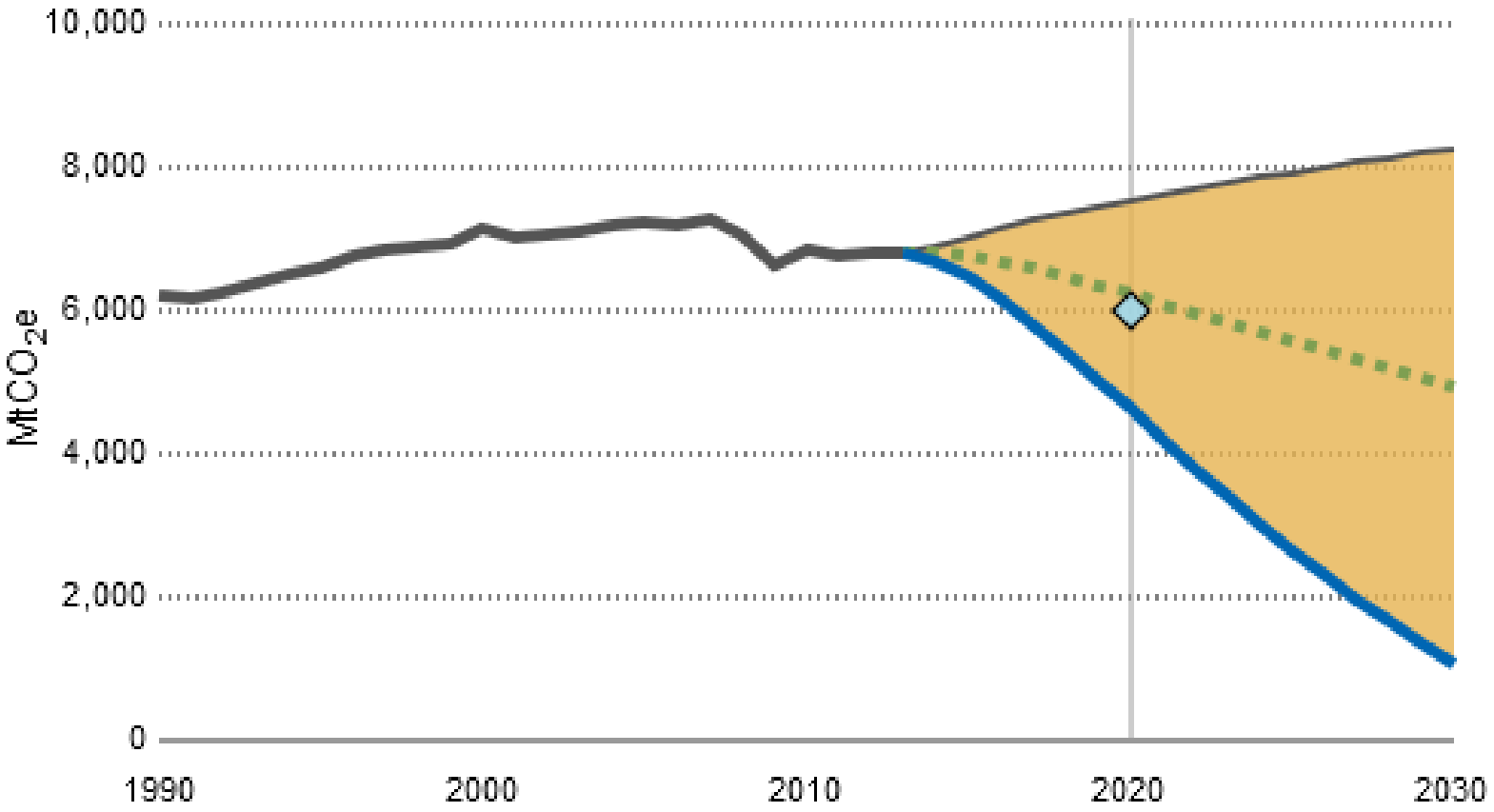

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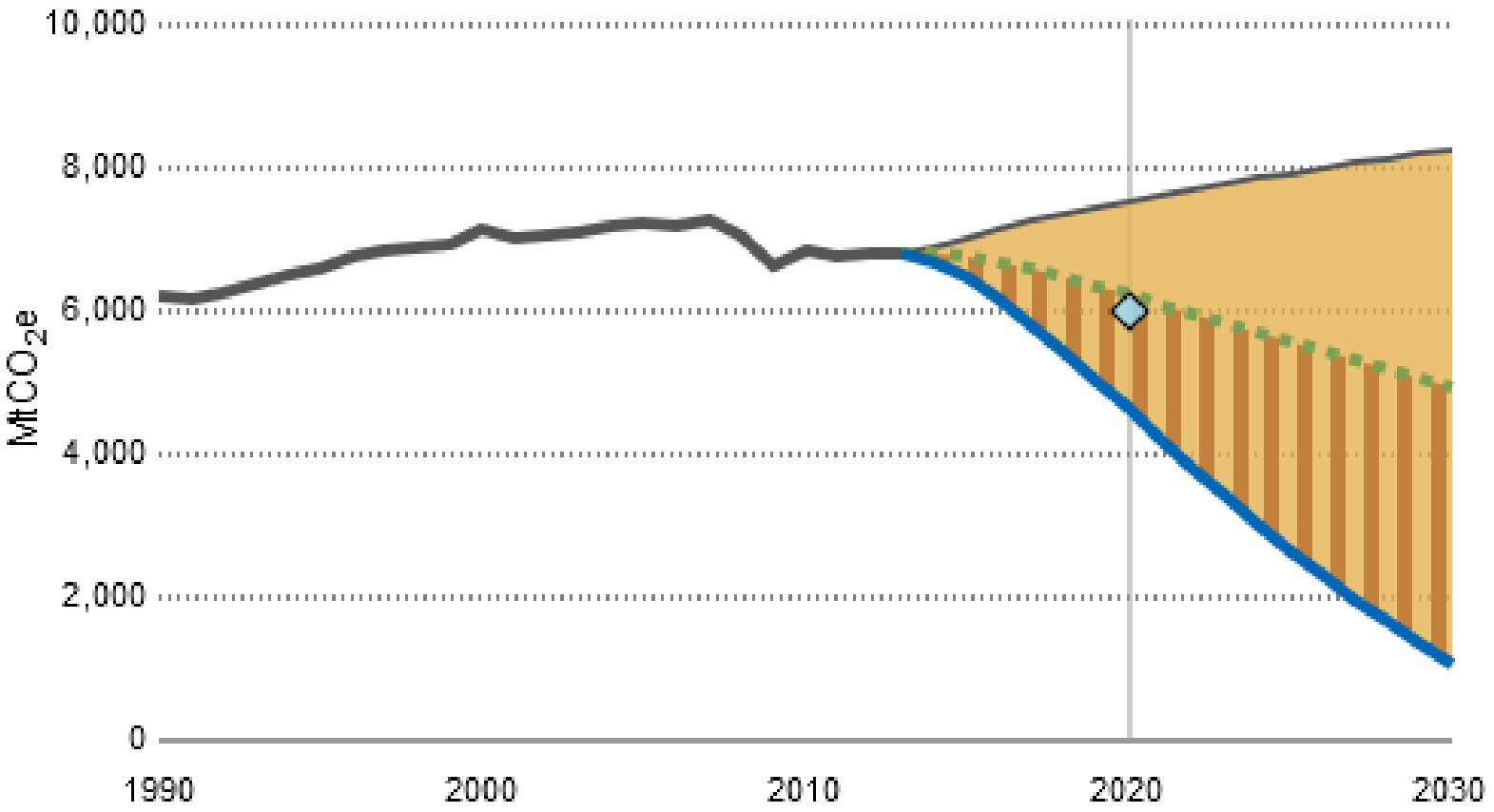
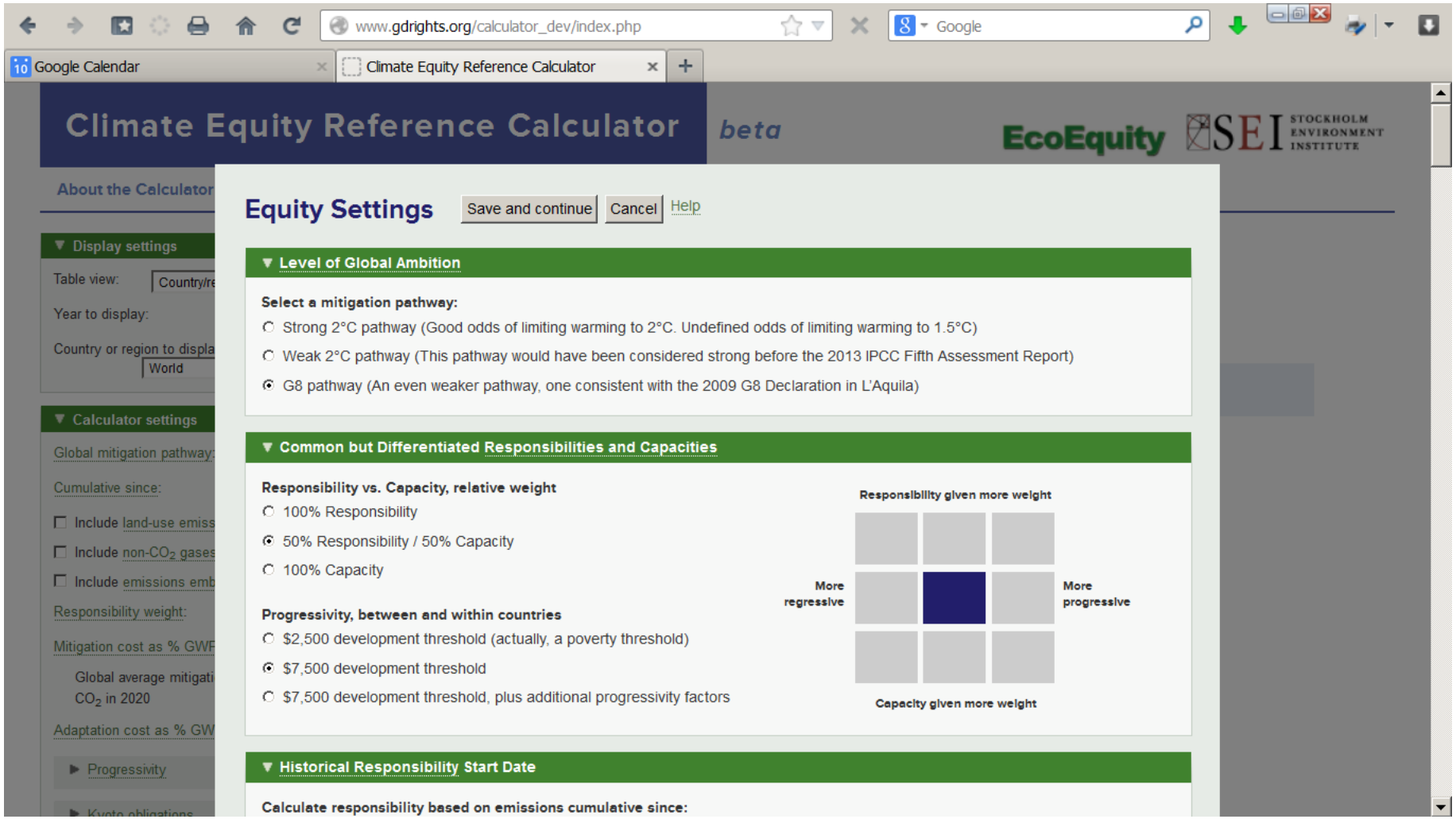
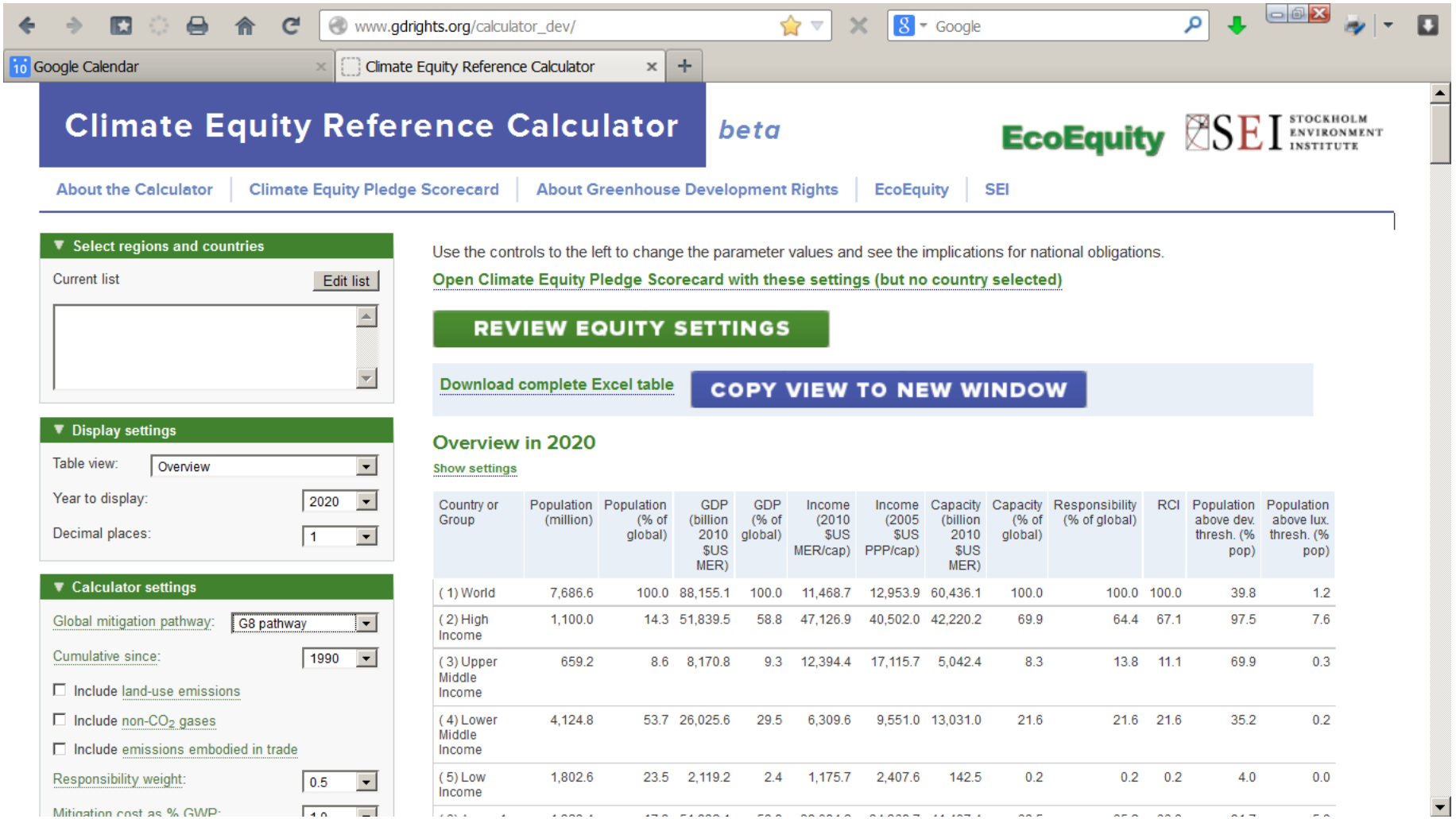


Online calculator: initial choices

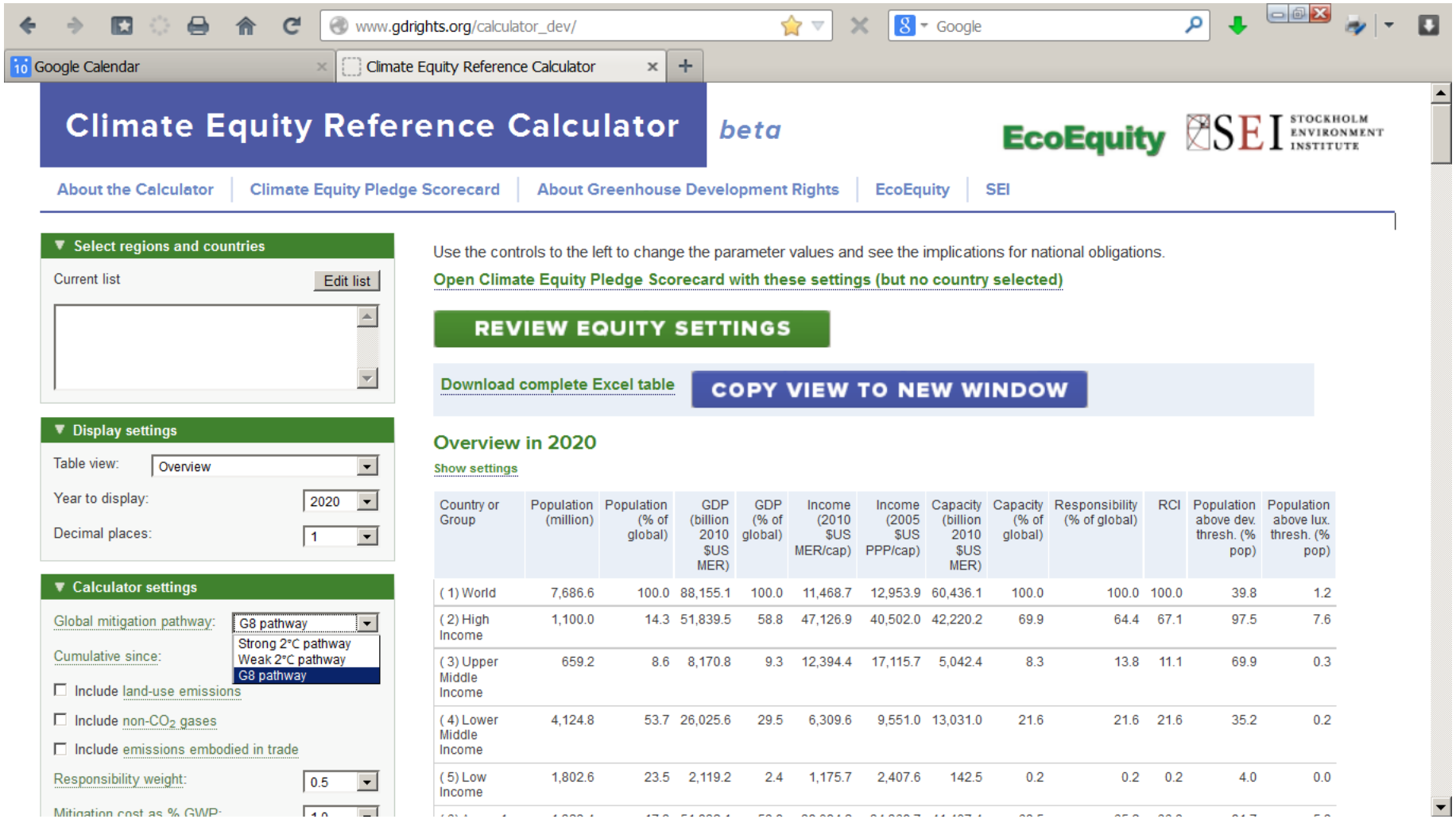


Online calculator: overview (195 countries)



Country or Group	Population (million)	Population (% of global)	GDP (billion 2010 $US MER)	GDP (% of global)	Income (2010 $US MER/cap)	Income (2005 $US PPP/cap)	Capacity (billion 2010 $US MER)	Capacity (% of global)	Responsibility (% of global)	RCI	Population above dev. thresh. (% pop)	Population above lux. thresh. (% pop)
(1) World	7,686.6	100.0	88,155.1	100.0	11,468.7	12,953.9	60,436.1	100.0	100.0	100.0	39.8	1.2
(2) High Income	1,100.0	14.3	51,839.5	58.8	47,126.9	40,502.0	42,220.2	69.9	64.4	67.1	97.5	7.6
(3) Upper Middle Income	659.2	8.6	8,170.8	9.3	12,394.4	17,115.7	5,042.4	8.3	13.8	11.1	69.9	0.3
(4) Lower Middle Income	4,124.8	53.7	26,025.6	29.5	6,309.6	9,551.0	13,031.0	21.6	21.6	21.6	35.2	0.2
(5) Low Income	1,802.6	23.5	2,119.2	2.4	1,175.7	2,407.6	142.5	0.2	0.2	0.2	4.0	0.0

Online calculator: select global mitigation level



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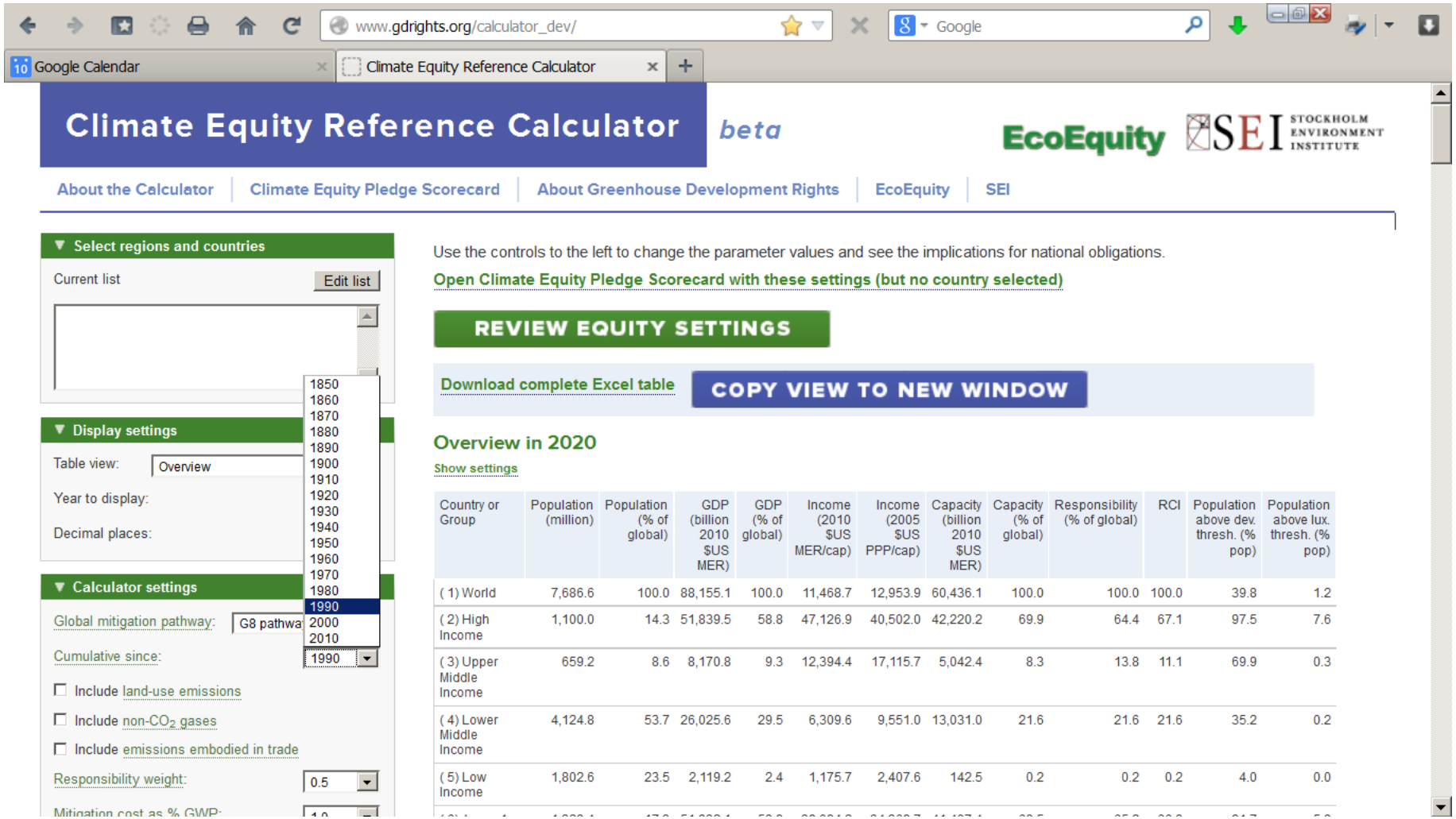
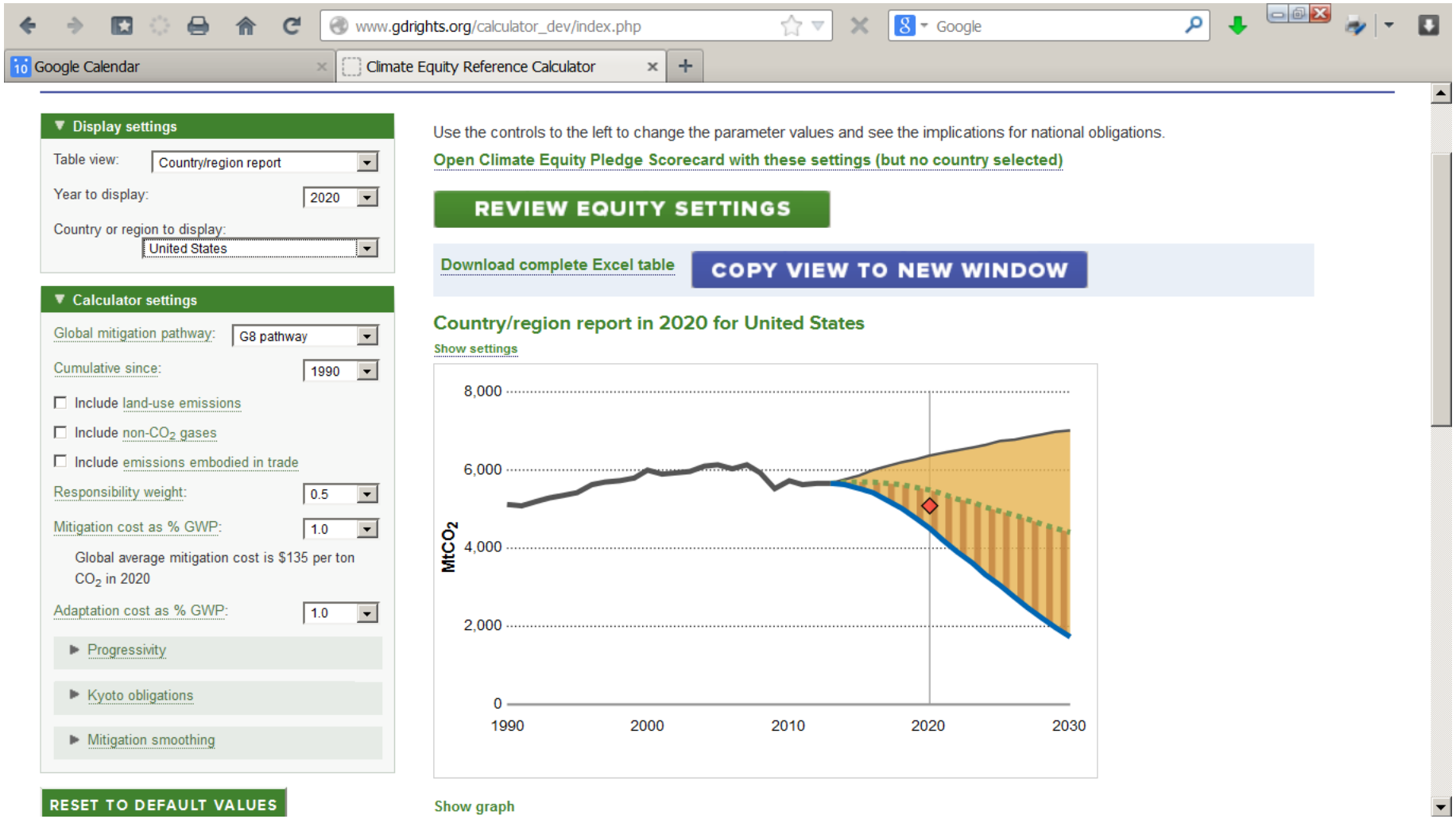
Online calculator: select year



Online calculator: select country (e.g., United States)



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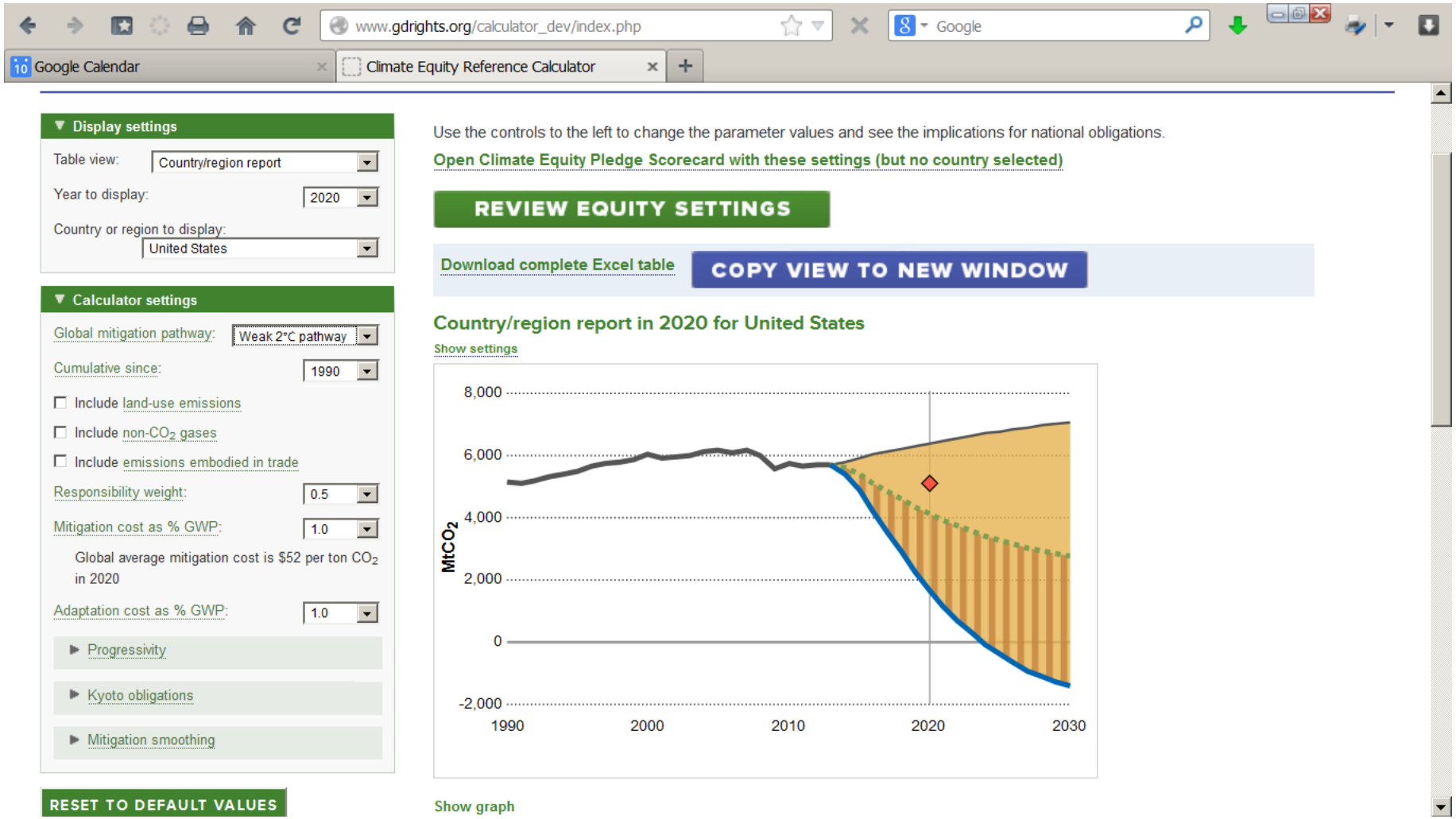


Online calculator: select country (e.g., United States)

www.gdrights.org/calculator_dev/index.php

Google Calendar | Climate Equity Reference Calculator

Display settings

Table view: Country/region report

Year to display: 2020

Country or region to display: United States

Calculator settings

Global mitigation pathway: Strong 2°C pathway

Cumulative since: 1990

- Include land-use emissions
- Include non-CO_2 gases
- Include emissions embodied in trade

Responsibility weight: 0.5

Mitigation cost as % GWP: 1.0

Global average mitigation cost is $46 per ton CO_2 in 2020

Adaptation cost as % GWP: 1.0

- Progressivity
- Kyoto obligations
- Mitigation smoothing

RESET TO DEFAULT VALUES

Use the controls to the left to change the parameter values and see the implications for national obligations.

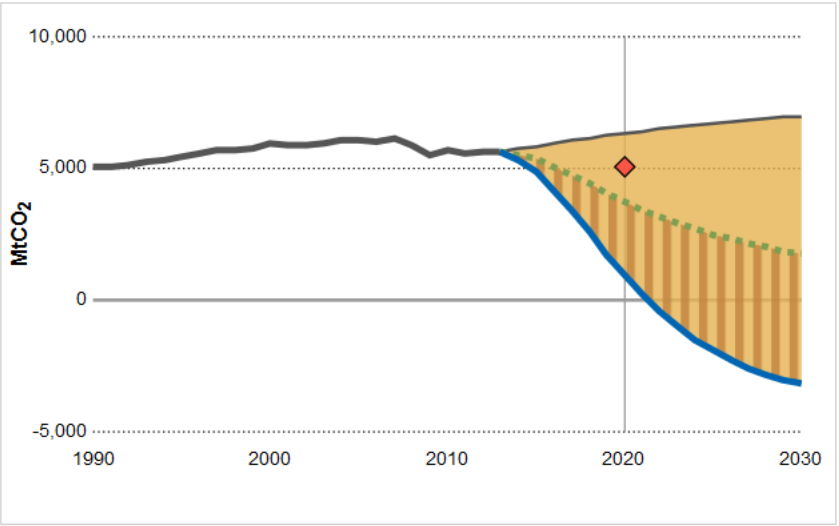
Open Climate Equity Pledge Scorecard with these settings (but no country selected)

REVIEW EQUITY SETTINGS

Download complete Excel table | COPY VIEW TO NEW WINDOW

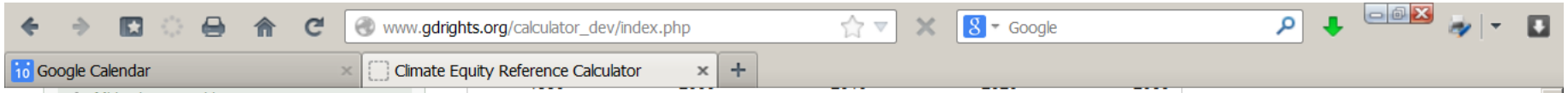
Country/region report in 2020 for United States

Show settings



Show graph

Online calculator: country details (e.g., United States)



▶ Mitigation smoothing

RESET TO DEFAULT VALUES

Show graph

key

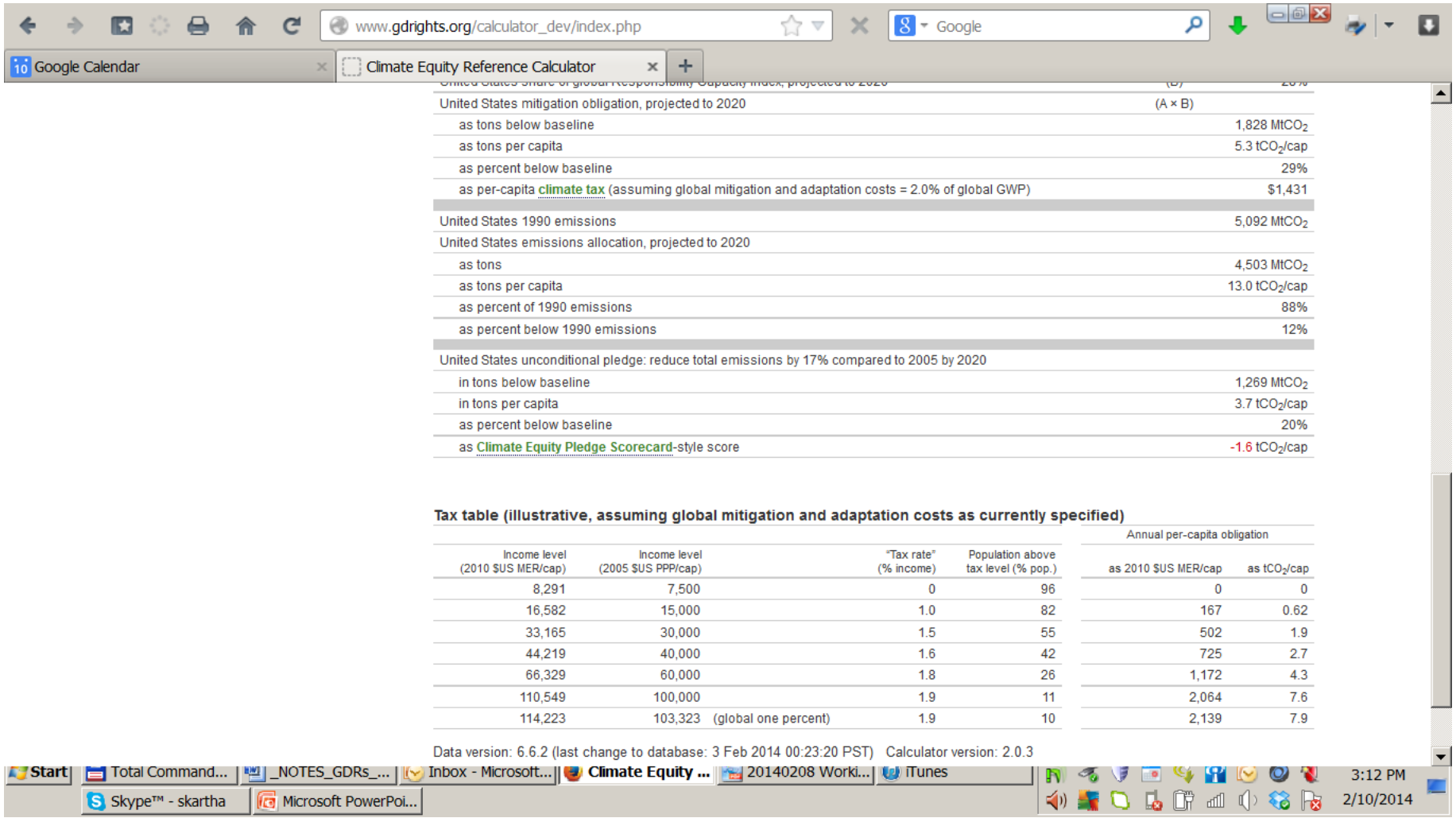
Mitigation obligation and pledges

United States baseline emissions, projected to 2020		6,331 $MtCO_2$
Global mitigation requirement below baseline, projected to 2020	(A)	6,506 $MtCO_2$
United States share of global Responsibility Capacity Index, projected to 2020	(B)	28%
United States mitigation obligation, projected to 2020	(A × B)	
as tons below baseline		1,828 $MtCO_2$
as tons per capita		5.3 tCO_2/cap
as percent below baseline		29%
as per-capita climate tax (assuming global mitigation and adaptation costs = 2.0% of global GWP)		$1,431
United States 1990 emissions		5,092 $MtCO_2$
United States emissions allocation, projected to 2020		
as tons		4,503 $MtCO_2$
as tons per capita		13.0 tCO_2/cap
as percent of 1990 emissions		88%
as percent below 1990 emissions		12%
United States unconditional pledge: reduce total emissions by 17% compared to 2005 by 2020		
in tons below baseline		1,269 $MtCO_2$
in tons per capita		3.7 tCO_2/cap
as percent below baseline		20%
as Climate Equity Pledge Scorecard-style score		-1.6 tCO_2/cap

Tax table (illustrative, assuming global mitigation and adaptation costs as currently specified)

Income level (2010 $US MER/cap)	Income level (2005 $US PPP/cap)		"Tax rate" (% income)	Population above tax level (% pop.)	Annual per-capita obligation as 2010 $US MER/cap	Annual per-capita obligation as tCO_2/cap
8,291	7,500		0	96	0	0
16,582	15,000		1.0	82	167	0.62
33,165	30,000		1.5	55	502	1.9
44,219	40,000		1.6	42	725	2.7
66,329	60,000		1.8	26	1,172	4.3
110,549	100,000		1.9	11	2,064	7.6
114,223	103,323	(global one percent)	1.9	10	2,139	7.9

Data version: 6.6.2 (last change to database: 3 Feb 2014 00:23:20 PST) Calculator version: 2.0.3



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final comments

1. An “ambition index” is not impossible. Very active discussions among some Parties, and within civil society.

2. An online tool is not impossible. The key tradeoff is between comprehensiveness and comprehensibility.

3. That said, such an index and tool necessarily involves normative and value-laden judgments. So, this is not a way to the bypass the normative discussion, but to structure it, make assumptions more transparent, and demonstrate the implications.

some questions

1. Through what process is such an index developed? Who convenes it? Who participates?
2. Is an ambition index applied to suppliers only, or also applied to buyers?
3. Is a widely shared common framework on ambition possible? If not, what are the alternatives?

Thank you

Online tool:

www.gdrights.org/calculator_dev

Please note:

This is a beta (preliminary) version, released for comment. Changes can be expected, and results should not yet be cited.

Please direct inquiries and provide feedback to:

skartha@sei-us.org