Gernot Wagner
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$40

12 agencies

3 models

Cass Sunstein

$40

~$40 revised July 2015 Social Cost of CO_2

Small correction to May 2013 revision; e.g. $37 down from $38. All in 2007 US$.

Discount Rate Year	5.0% Avg	3.0% Avg	2.5% Avg	3.0% 95th
2010	11	32	51	89
2015	11	37	57	109
2020	12	43	64	128
2025	14	47	69	143
2030	16	52	75	159
2035	19	56	80	175
2040	21	61	86	191
2045	24	66	92	206
2050	26	71	97	220

Significant increase over 2010 figures:
$37 up from $24

Source: "Technical Update of the Social Cost of Carbon for Regulatory Impact Analysis Under Executive Order 12866" (November 1, 2013).

Social Cost up due to new model versions

Core assumptions all remained unchanged from 2010 Interagency Working Group

IAM	Version used in 2010 Interagency Analysis	New Version	Key changes relevant to interagency SCC
DICE	2007	2010	Updated calibration of the carbon cycle model and explicit representation of sea level rise (SLR) and associated damages.
FUND	3.5 (2009)	3.8 (2012)	Updated damage functions for space heating, SLR, agricultural impacts, changes to transient response of temperature to buildup of GHG concentrations, and inclusion of indirect climate effects of methane.
PAGE	2002	2009	Explicit representation of SLR damages, revisions to damage function to ensure damages do not exceed 100% of GDP, change in regional scaling of damages, revised treatment of potential abrupt damages, and updated adaptation assumptions.

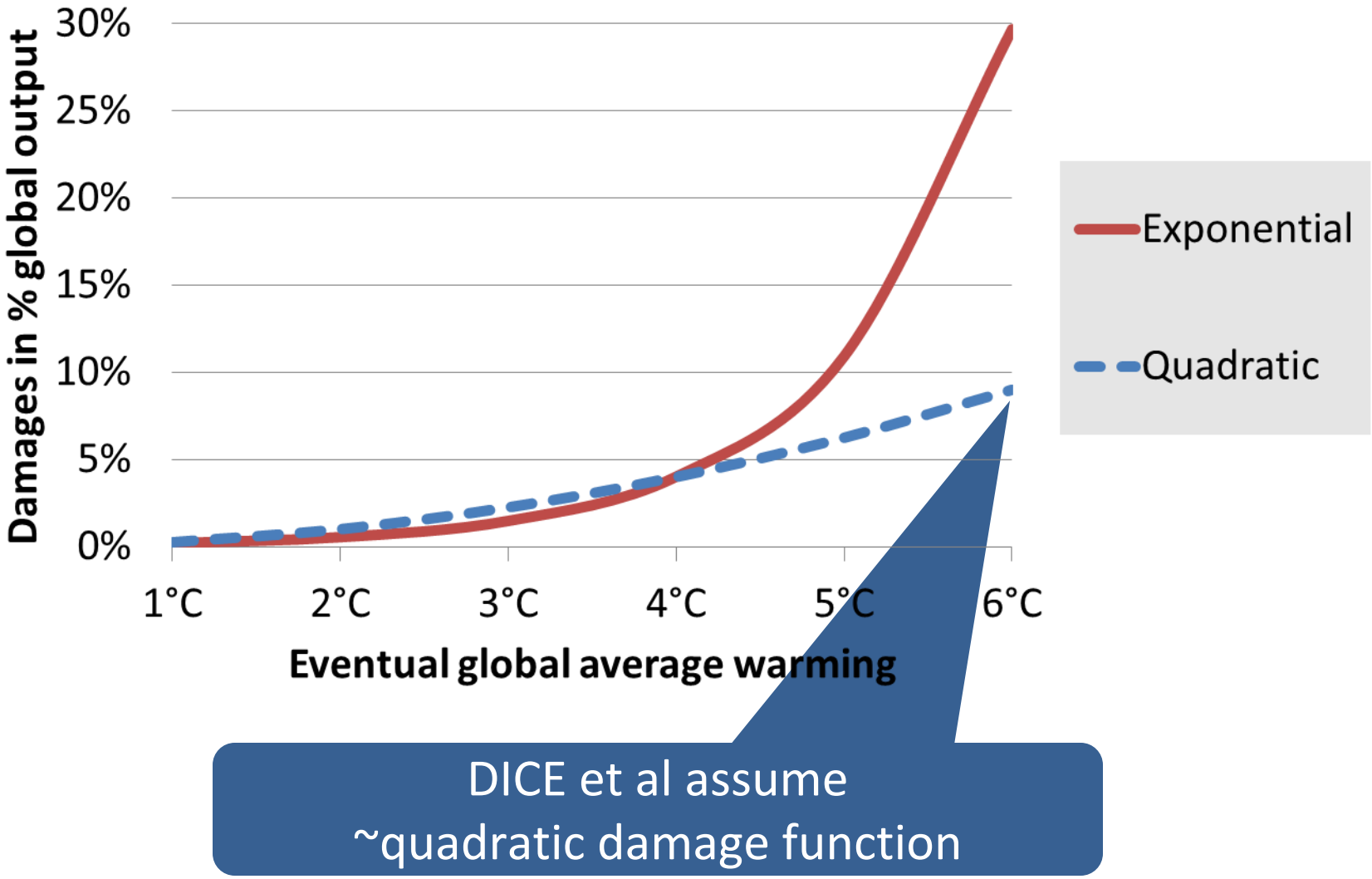
Update includes damages from sea level rise

Source: "Technical Update of the Social Cost of Carbon for Regulatory Impact Analysis Under Executive Order 12866" (November 1, 2013).

Discount rate and damage functions drive (almost) all

Shape of damage function critical for Social Cost

Large divergence for temperatures increases >5°C above pre-industrial



Source: Wagner & Weitzman's *Climate Shock* (2015)

Critical issues for Social Cost updates

Re-running 3 models with 2010 assumptions routine update, but only first step

- Declining discount rate
- Updated damage functions
- Damages as % of growth vs % of levels
- Additive vs multiplicative damages

- Revisit model selection (DICE, FUND, PAGE; CRED?, ENVISAGE?)
- Update assumptions to IPCC Shared Socioeconomic Pathways

- "IBM-ify" Social Cost calculations

"Good job.
More can and must be done."

Source: EDF *et al*. Comment on Technical Support Document: Technical Update of the Social Cost of Carbon for Regulatory Impact Analysis under Executive Order No. 12,866. (February 26, 2014); and Wagner & Weitzman 's *Climate Shock* (2015)

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−$15

>>$40

1.5 – 4.5°C

1.5 – 4.5°C

* Charney *et al* (1979)

1.5 – 4.5°C

* IPCC (1990)

1.5 – 4.5°C

* IPCC (1990, 1992)

1.5 – 4.5°C

* IPCC (1990, 1992, 1995)

1.5 – 4.5°C

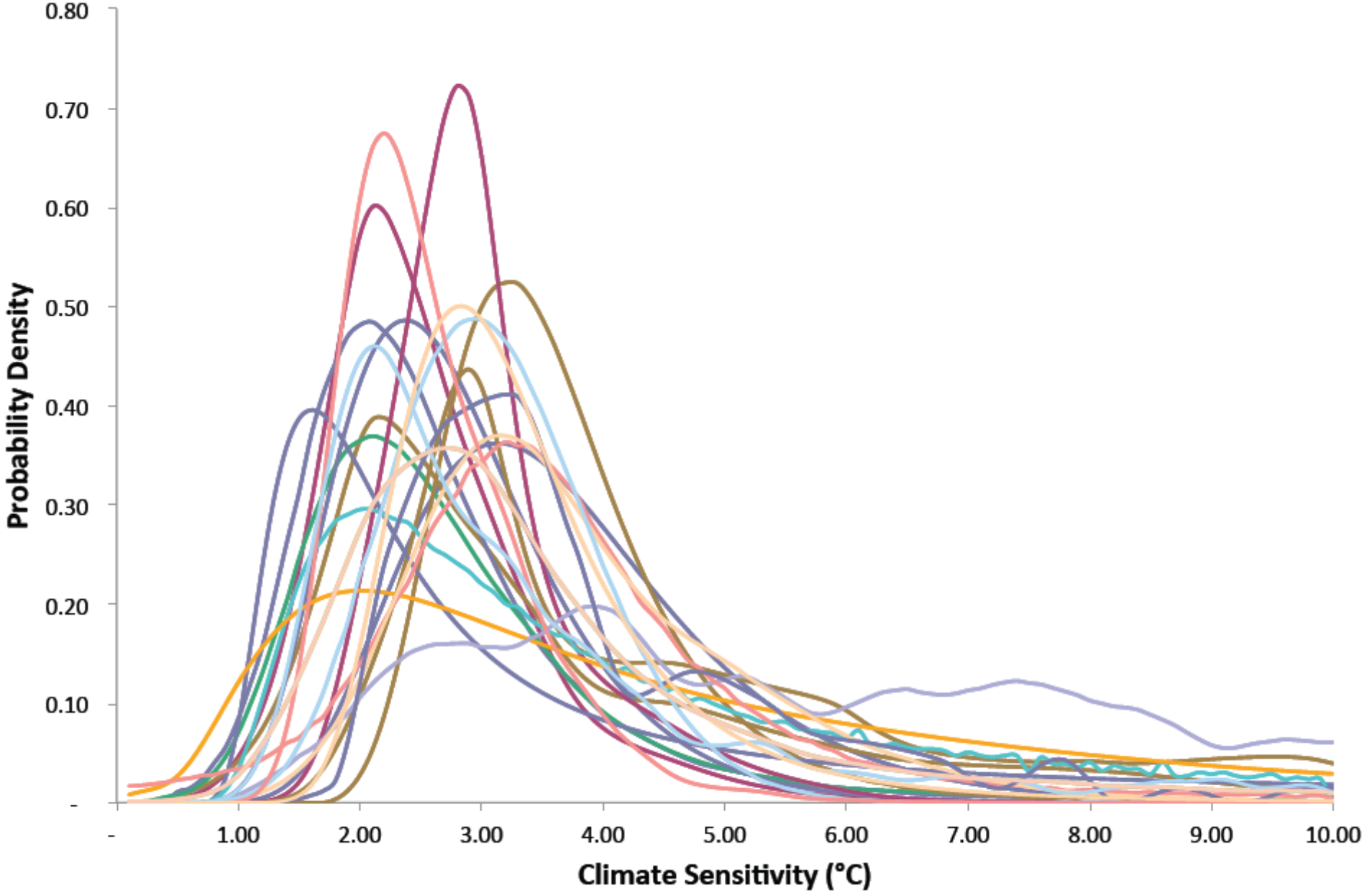
* IPCC (1990, 1992, 1995, 2001)

2.0 – 4.5°C

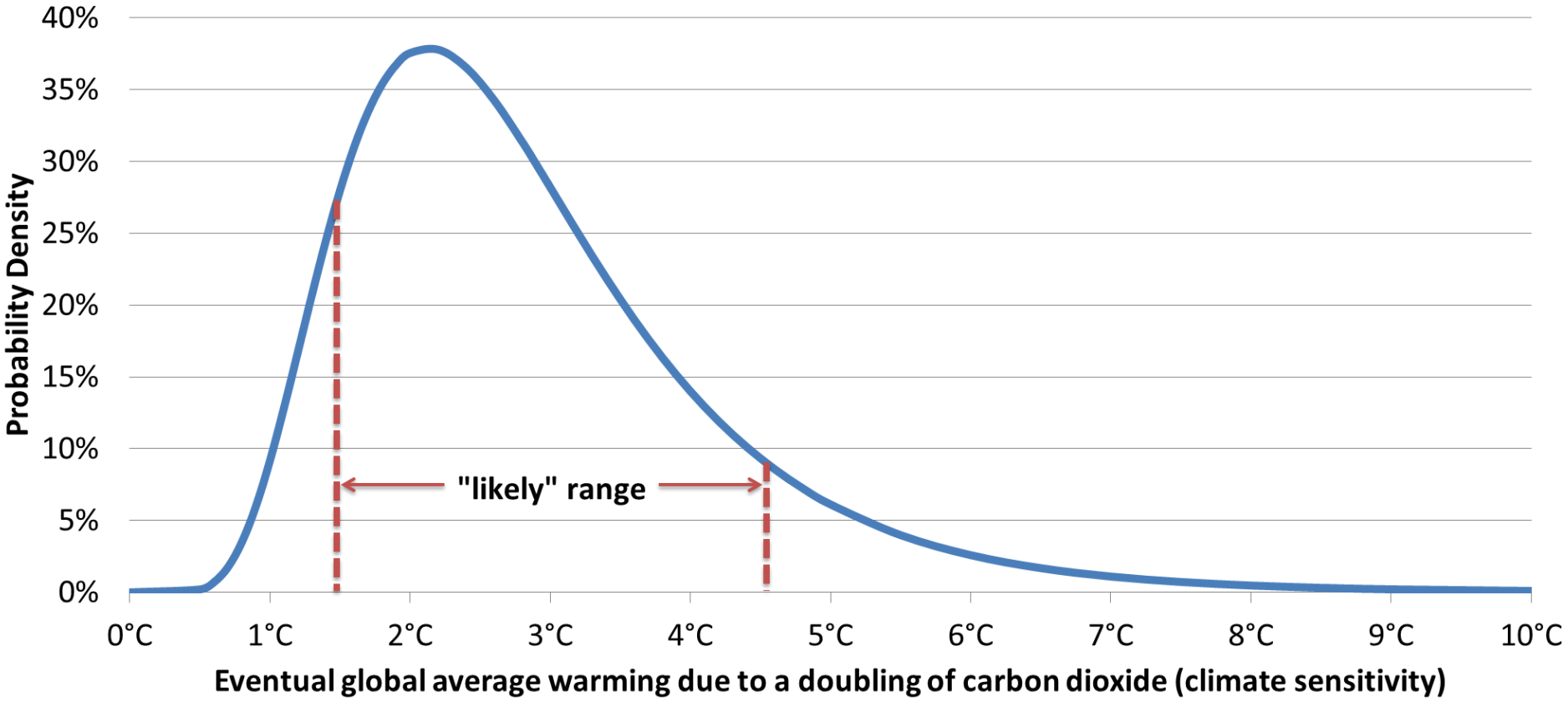
* IPCC (2007)

1.5 – 4.5°C

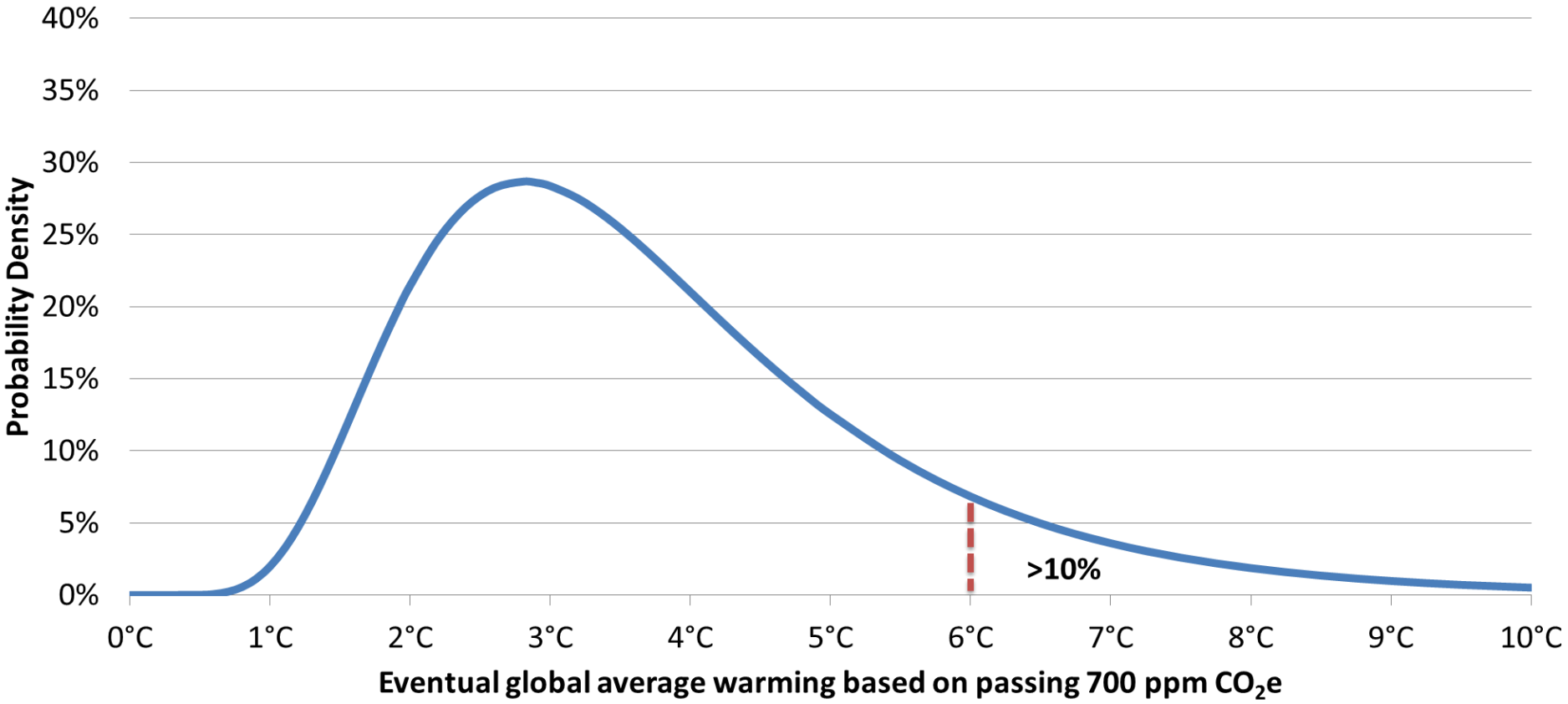
* IPCC (2013)



Source: Meinshausen *et al* (2009)



Source: Wagner & Weitzman's *Climate Shock* (2015)



Source: Wagner & Weitzman's *Climate Shock* (2015)

It’s not over ‘til the fat tail zings

By 2100, per IEA’s “New Policies Scenario”

CO_2e (ppm)	400	450	500	550	600	650	700	750	800
Median Δ°C	1.3°C	1.8°C	2.2°C	2.5°C	2.7°C	3.2°C	3.4°C	3.7°C	3.9°C
Prob >6°C	0.04%	0.3%	1.2%	3%	5%	8%	11%	14%	17%

<1.5x

10x

Source: Wagner & Weitzman’s *Climate Shock* (2015)

>>$40

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