IPCC's Exercise in Self-Contradiction

Conflict! Conflict!

Introductory Notes

- I will not tell you my climate model is better than the others.
  - I do not have a climate model.
    - That's clearly ***Model Inequity***! There ought to be a law!
- This presentation uses intellectual *jiu-jitsu*.
  - It uses IPCC's analysis and data against IPCC's analysis and data.
  - With apologies to giants in our field (many at this conference), I ignore their better data because the *jiu-jitsu* paradigm requires sticking with IPCC data.

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IPCC Terminology

Trace gas	Simplified expression Radiative forcing, ΔF (Wm^{-2})	Constants
CO_2	$\Delta F = \alpha \ln(C/C_0)$	$\alpha = 5.35$
	$\Delta F = \alpha \ln(C/C_0) + \beta(\sqrt{C} - \sqrt{C_0})$	$\alpha = 4.841$, $\beta = 0.0906$
	$\Delta F = \alpha(g(C) - g(C_0))$	$\alpha = 3.35$
	where $g(C) = \ln(1 + 1.2C + 0.005C^2 + 1.4 \times 10^{-6} C^3)$	

- Very curious. Not a ***change*** in "radiative forcing" (as implied by the Δ), but just plain old "radiative forcing."
- It sounds ominous!

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IPCC Terminology

(IPCC: 159 W/m^2)

Greenhouse effect

(IPCC: 3.7 W/m^2 for CO_2 doubling)

"Radiative Forcing"

Everything is referenced to the 1850-1900 “pre-industrial” period (ignore the dinosaurs)

- CO_2 in atmosphere
- Temperature rise
- “Radiative forcing”

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What is “radiative forcing”?

- **IPCC: “Radiative forcing** The change in the net, downward minus upward, radiative flux (expressed in W m^{-2}) due to a change in an external driver of climate change, such as a change in the concentration of carbon dioxide (CO2), the concentration of volcanic aerosols or the output of the Sun.”

- That is, *changes* in radiant flux due to *changes* in
  - GHGs
  - Albedo
  - Sunlight
  - … all w.r.t. “pre-industrial period”

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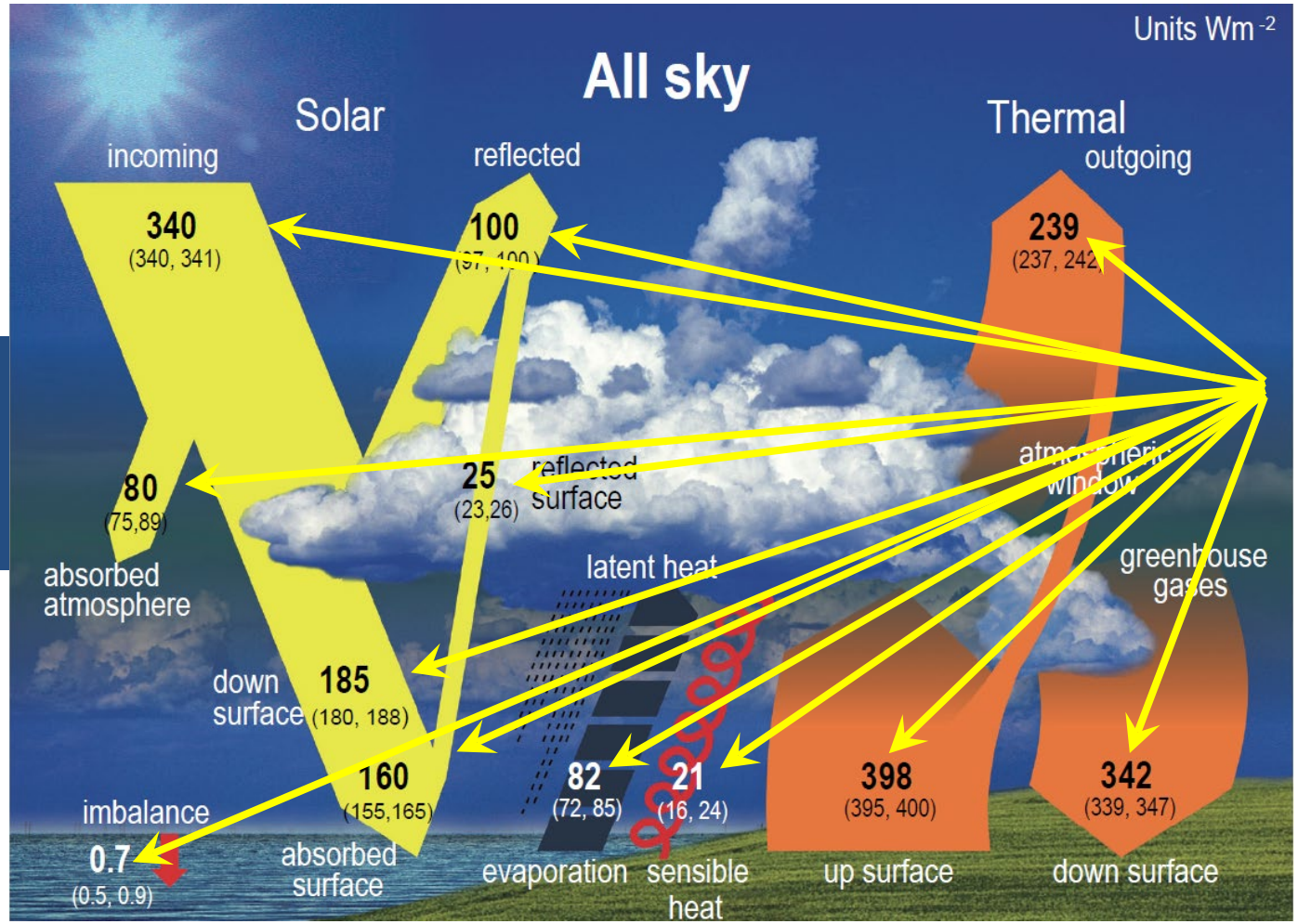
Heat-balance drawing from *AR6*

All numbers in W/m^2

All numbers averaged over spherical earth



All in all,
a dozen numbers

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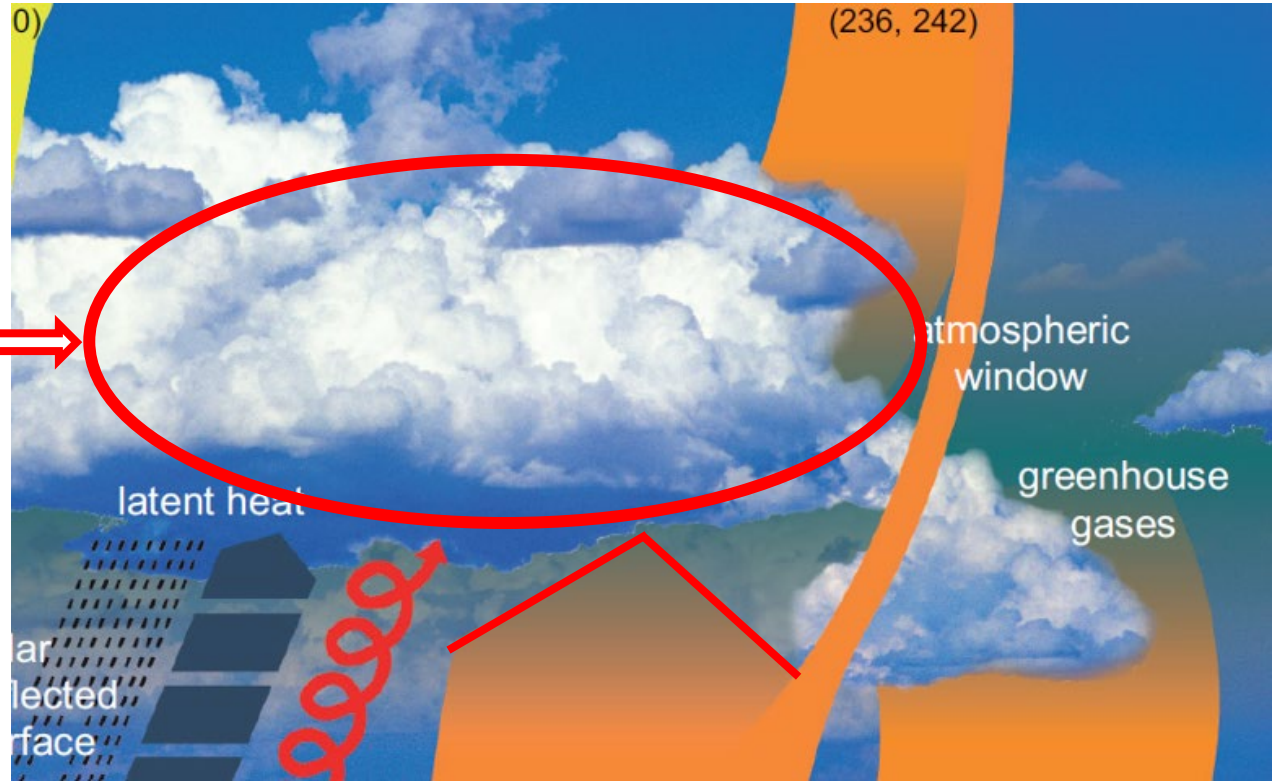
But Wait! There's More!

Why is this region blank?



Now for the missing number

- What is the IPCC's Specialty?
  - *The Greenhouse Effect*
- What number is missing from IPCC's heat-balance charts?
  - *The Greenhouse Effect*
- After a mere 31 years, the IPCC has assigned both a symbol and a number to the greenhouse effect.
- The greenhouse effect *G* is the numerical difference between surface radiation and radiation to space.
  - God forbid it should be in a heat-balance chart

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The Greenhouse Effect (IPCC *AR6*, 2021)

7.4.2.1 Planck Response

The Planck response represents the additional thermal or longwave (LW) emission to space arising from vertically uniform warming of the surface and the atmosphere. The Planck response α_P, often called the Planck feedback, plays a fundamental stabilizing role in Earth's climate and has a value that is strongly negative: a warmer planet radiates more energy to space. A crude estimate of α_P can be made using the normalized greenhouse effect $\tilde{g}$, defined as the ratio between the greenhouse effect G and the upwelling LW flux at the surface (Raval and Ramanathan, 1989). Current estimates (Section 7.2, Figure 7.2) give $G = 159\,\mathrm{W\,m^{-2}}$ and $\tilde{g} \approx 0.4$. Assuming $\tilde{g}$ is constant, one obtains for a surface temperature $T_s = 288\,\mathrm{K}$, $\alpha_P = (g-1)\,4\,\sigma\,T_s^3 \approx -3.3\,\mathrm{W\,m^{-2}\,°C^{-1}}$, where σ is the Stefan–Boltzmann constant. This parameter α_P is estimated more accurately

Assigns the symbol *G* to the greenhouse effect

Identifies *G* as 159 W/m^2

After only three decades, IPCC finally mentions S-B explicitly

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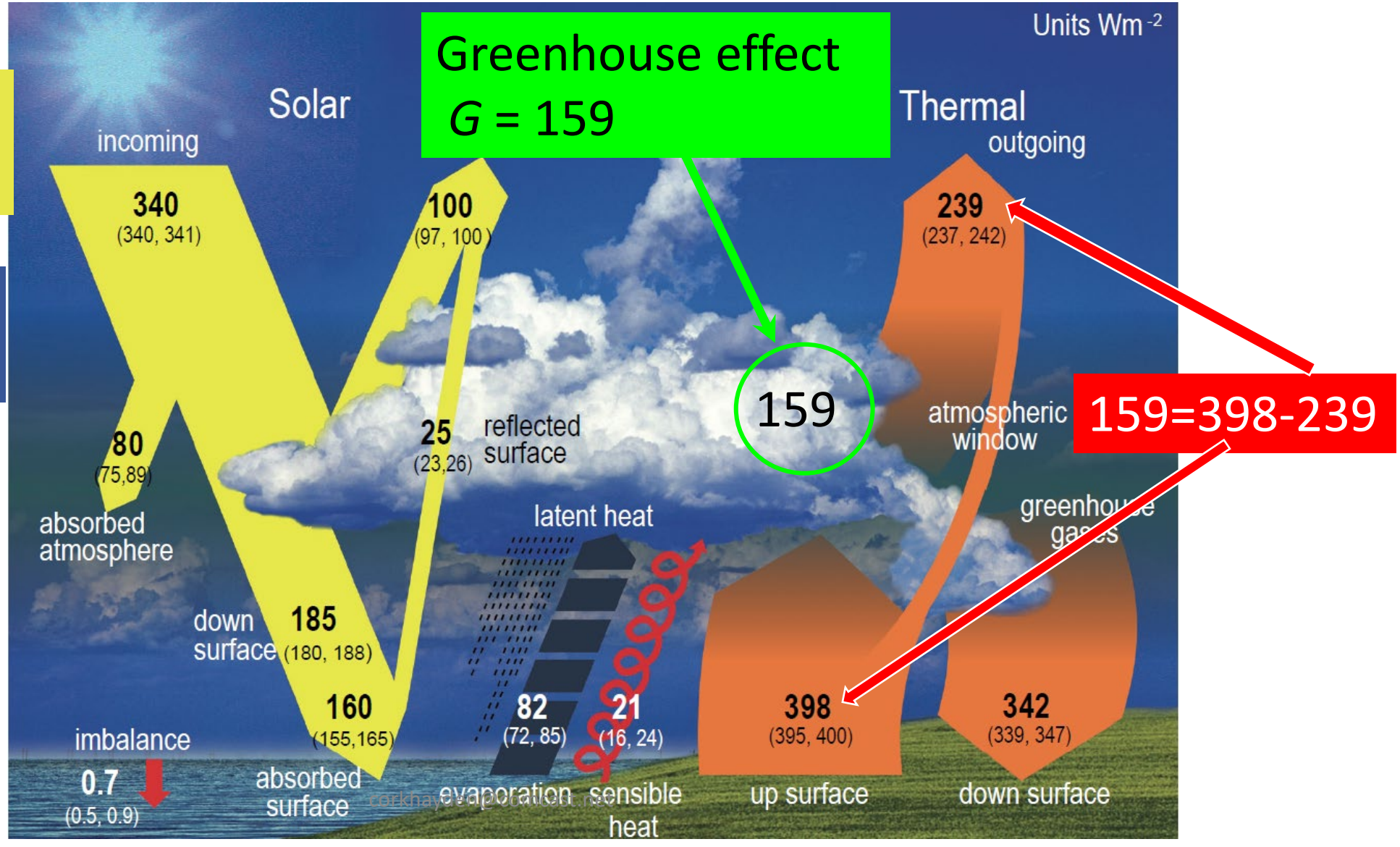
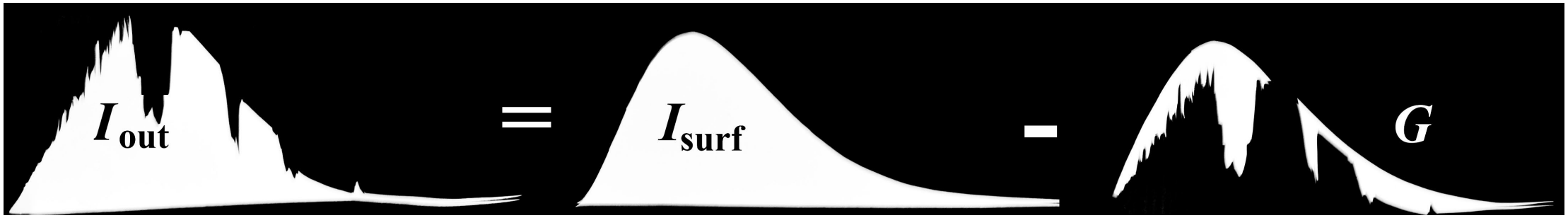
Heat-balance drawing from *AR6*

Sunlight
Spherical average

Albedo = 30%
Reflected/incoming



A visual explanation



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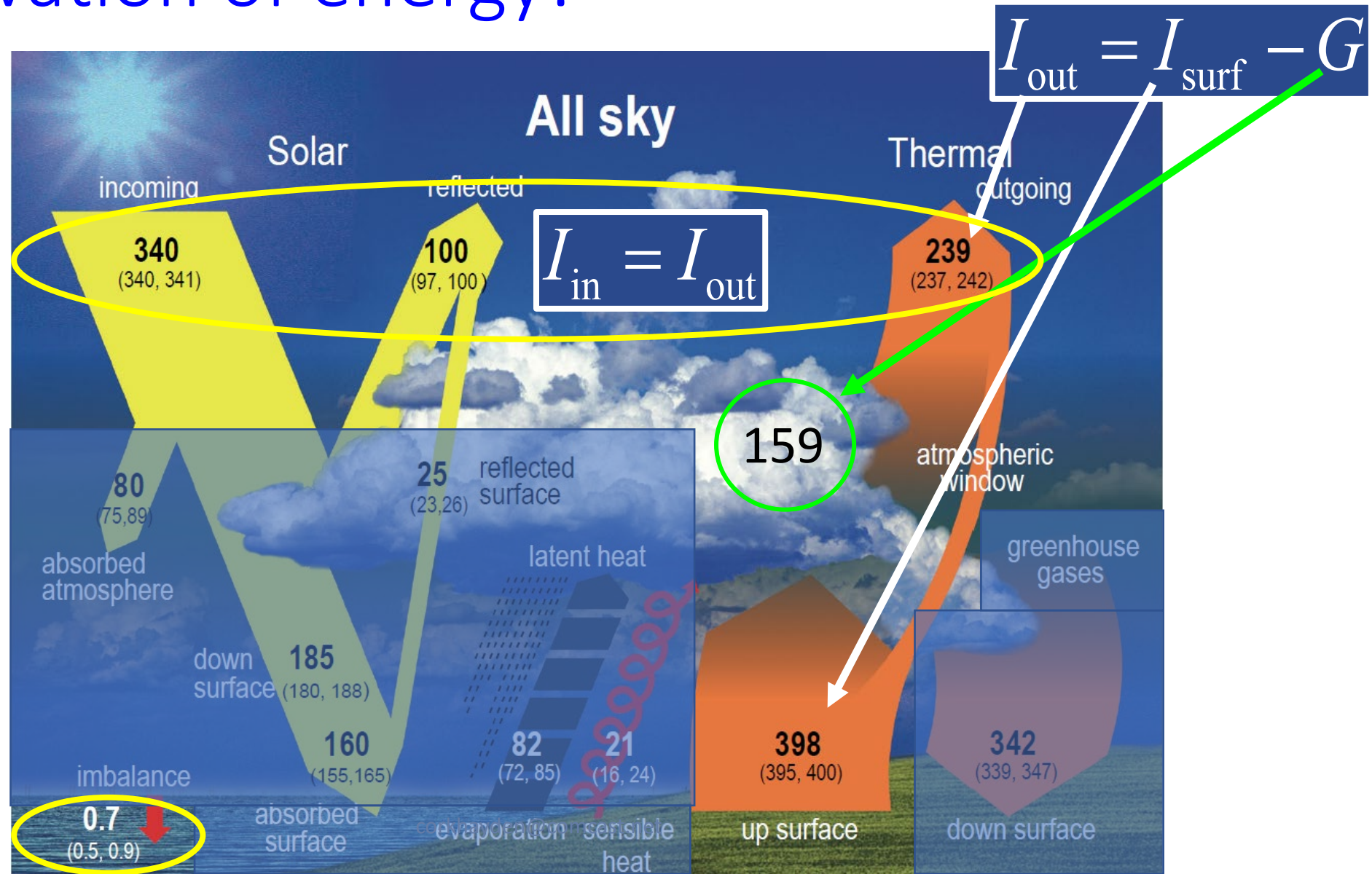
Conservation of energy!

These numbers are the ones that matter!

Ignore the INTERNAL interactions



Let’s do the trivial algebra

$$I_{\text{in}} = I_{\text{out}} \quad \& \quad I_{\text{out}} = I_{\text{surf}} - G$$

$$\Longrightarrow I_{\text{in}} = I_{\text{surf}} - G$$

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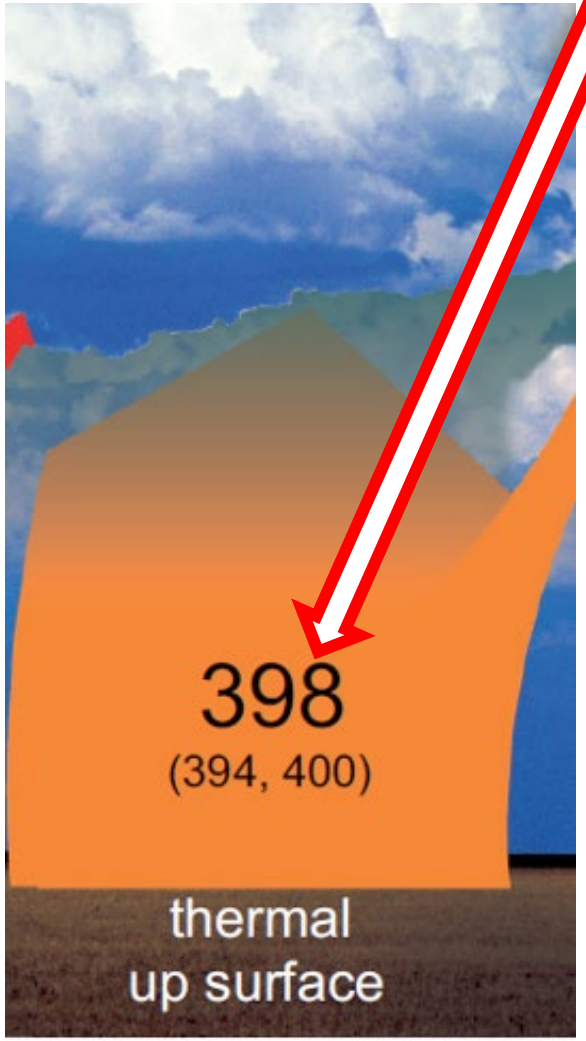
Almost there. Where does this come from?

Don't get wrapped around the axle about pretentious precision



It's calculable from the surface temperature

The Stefan-Boltzmann law tells us the temperature producing 398 W/m^2 is

$$T = 289.45 \text{ K } (=16.3^{\circ}\text{C})$$

You can always find the S-B law on the internet.

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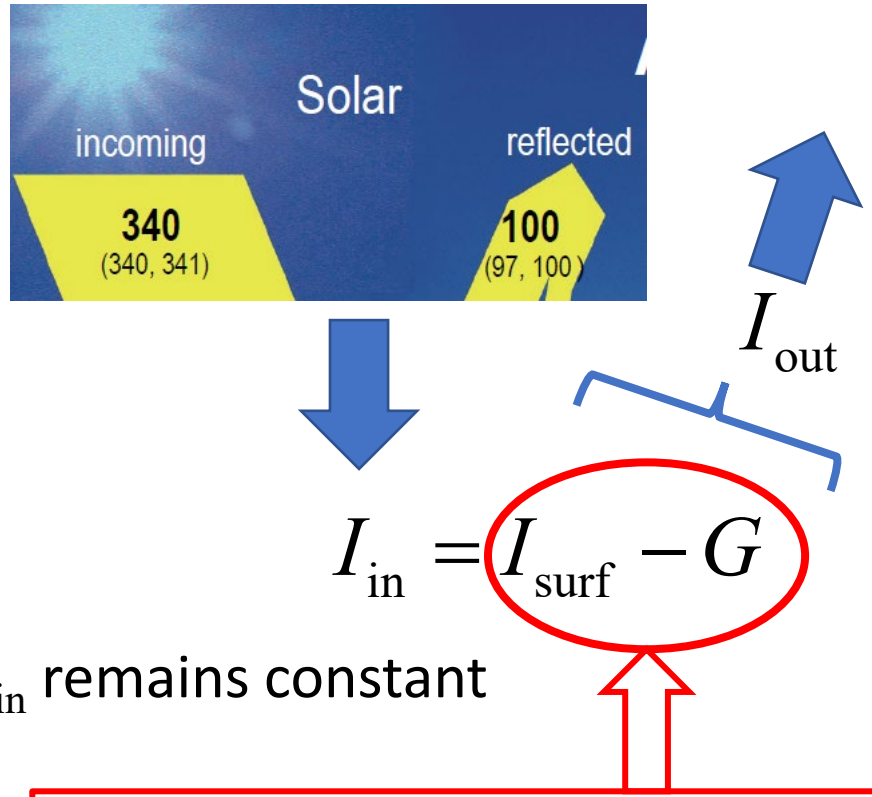
What if I_{in} remains constant as CO_2 rises?



$$I_{in} = I_{surf} - G$$

If I_{in} remains constant

Then, any increase in the greenhouse effect must be matched *exactly* by an increase in I_{surf}

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Now, you are ready to challenge your favorite Climate Guru

Ask a polite question …

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What about heat-balance charts for the future?

That’s where the big challenge lies.

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IPCC's Heat Balance Drawings for the future (Complete set)

- You might be seeing where you can make a buck.
- Challenge your Climate Guru to make a Heat Balance chart for the future.
- Put it in the form of a wager

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$10,000 wager (for real suckers)

"I'll bet you $10,000 that you can't find even one heat-balance drawing made for any year past 2021 in any IPCC *Assessment Report*." (There is no such chart, but practically no "climate scientist" would be stupid enough to take you up on the bet.)

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$1,000 wager (don’t get greedy)

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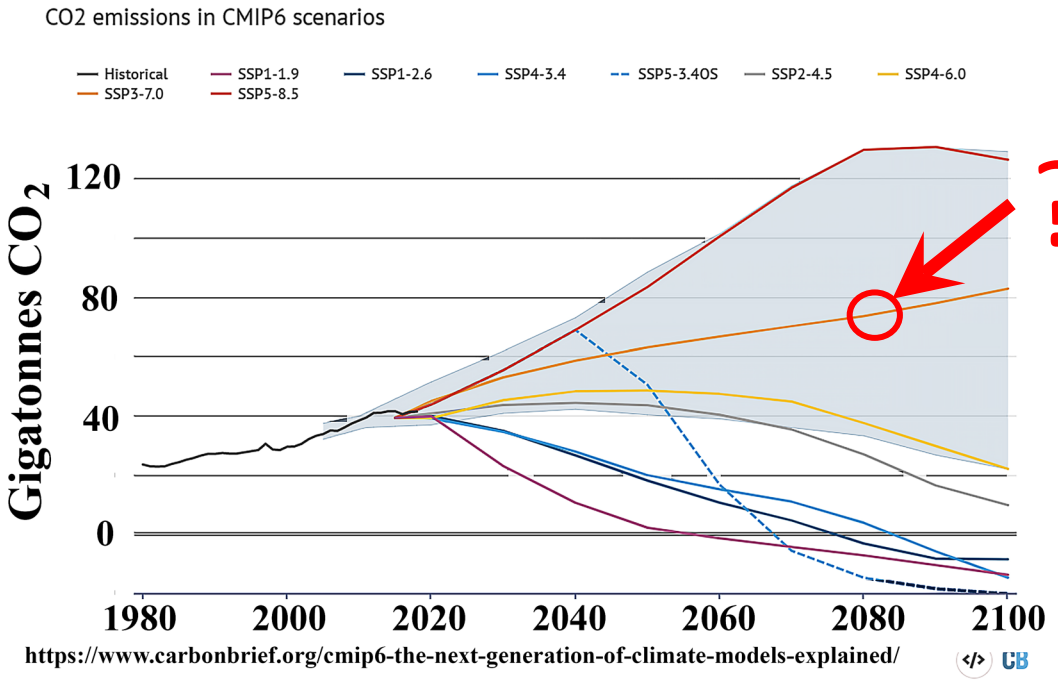
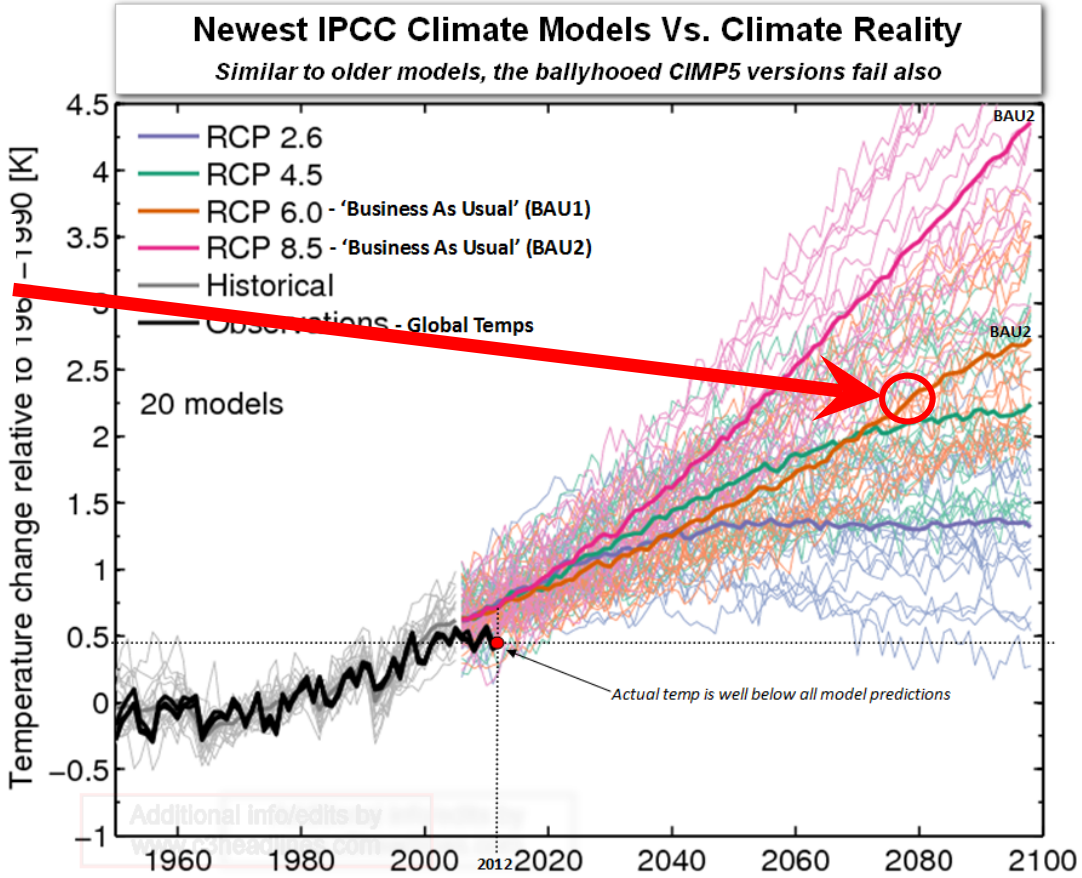
“Guru! Pick a model. Any model.
Pick a time. Any time 20+ years into the future.”



?



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“For that model and that time, find a heat-balance drawing in the literature. You have two weeks.”

“Alternatively, use numbers from your supercomputer output to make your own heat-balance drawing.”

“The numbers in your chart *must satisfy the conservation of energy.*”

“A thousand bucks says you can’t do it!”

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Why these bets are safe

The IPCC consists of a lot of experts in various fields plus their political bosses. One group makes the heat balance drawings for the present. Other groups make predictions about the future. They do not communicate with each other.

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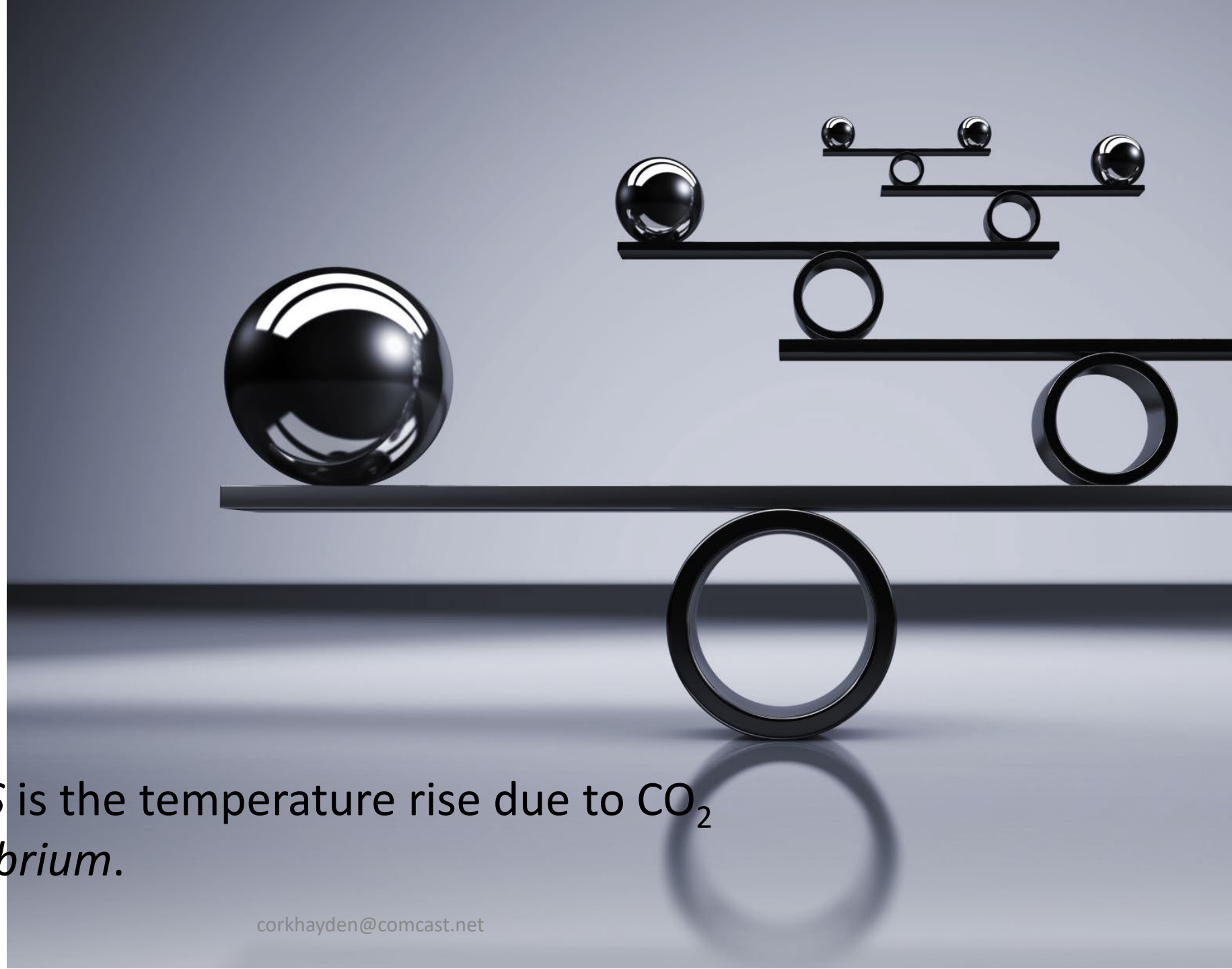
Equilibrium Climate Sensitivity (*ECS*)



By definition: *ECS* is the temperature rise due to CO_2 doubling *at equilibrium*.

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ECS, according to IPCC

IPCC says

- Most probable value: +3ºC
- "Very likely" range: 2ºC to 5ºC
- … caused by 3.7 W/m^2 increase in greenhouse effect due to CO_2 doubling.

Stefan-Boltzmann says, (but IPCC does *not* say)

- 16.7 W/m^2 increase in surface emission
- 11.1 W/m^2 to 28.1 W/m^2 increase in surface emission
- *WHAAAAT???*

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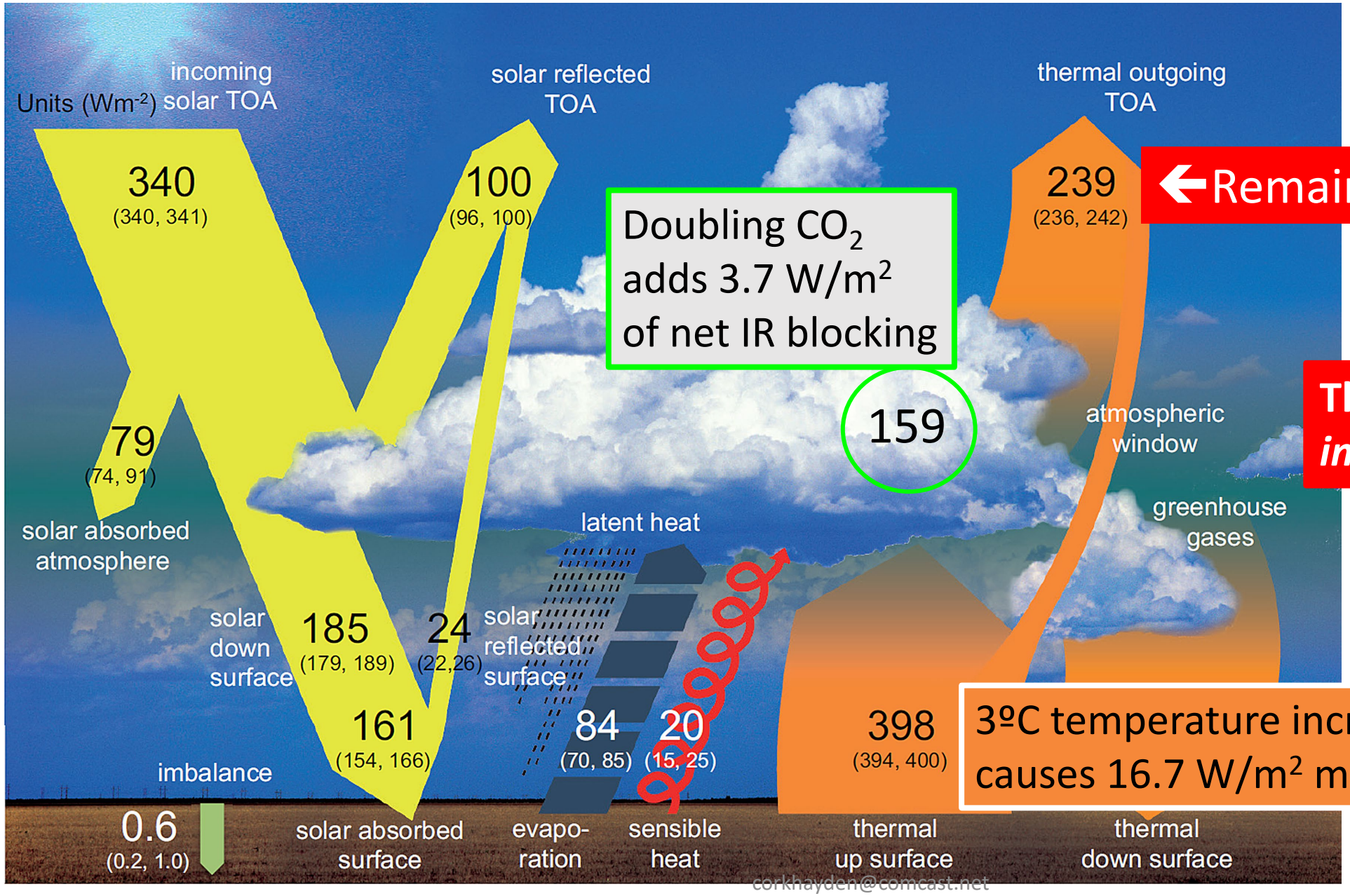
CO_2 Doubling



Remains constant

This is a physical *impossibility*

3ºC temperature increase causes 16.7 W/m² more IR

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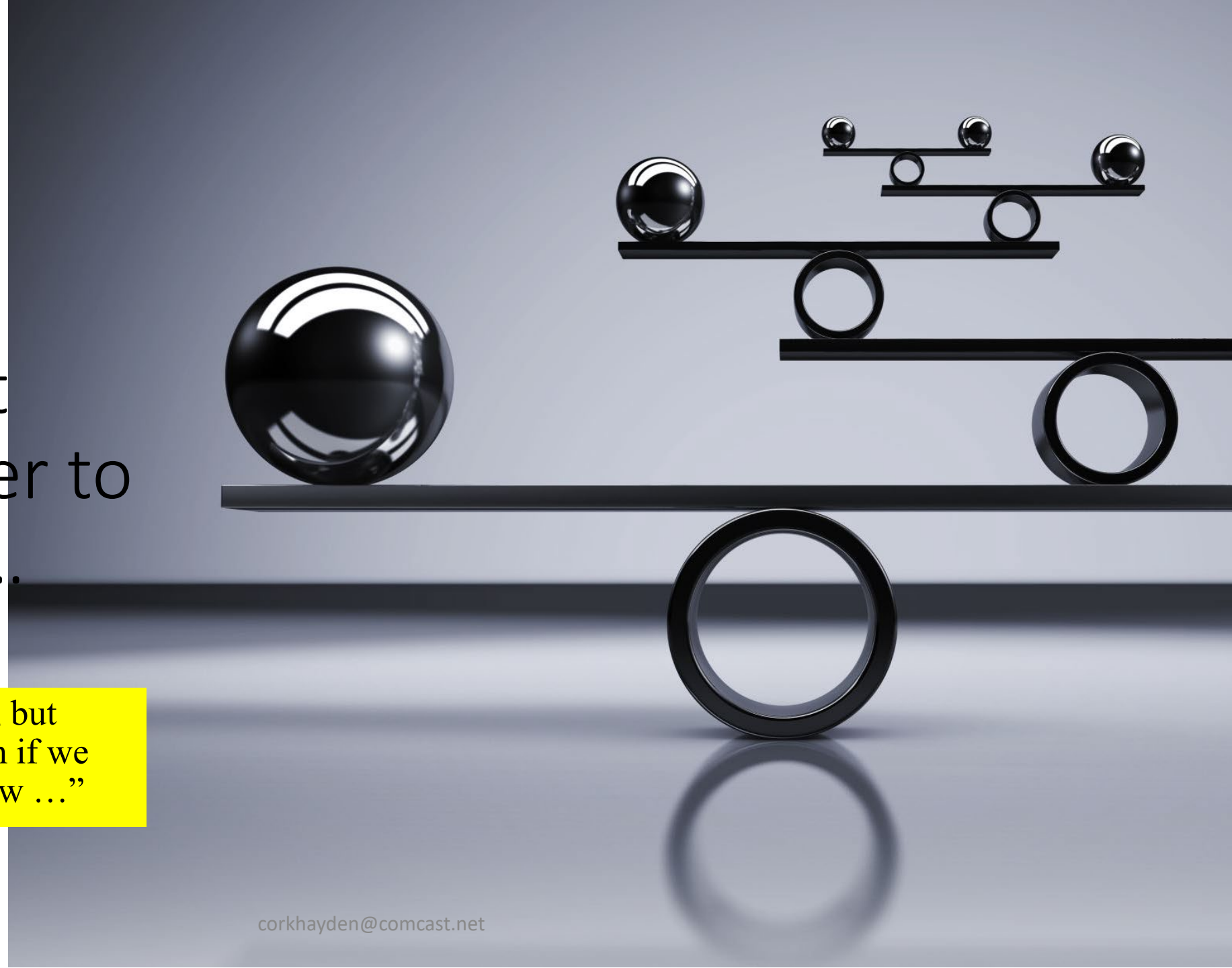
Well, IPCC's models don't generally refer to equilibrium …



"Things will be bad in 2050, but they'll be getting worse even if we stop producing CO_2 right now …"

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Shared Socioeconomic Pathways (SSPs)

CO_2 emissions

SSP*x*-"radiative forcing"

Temperature Consequences due to …

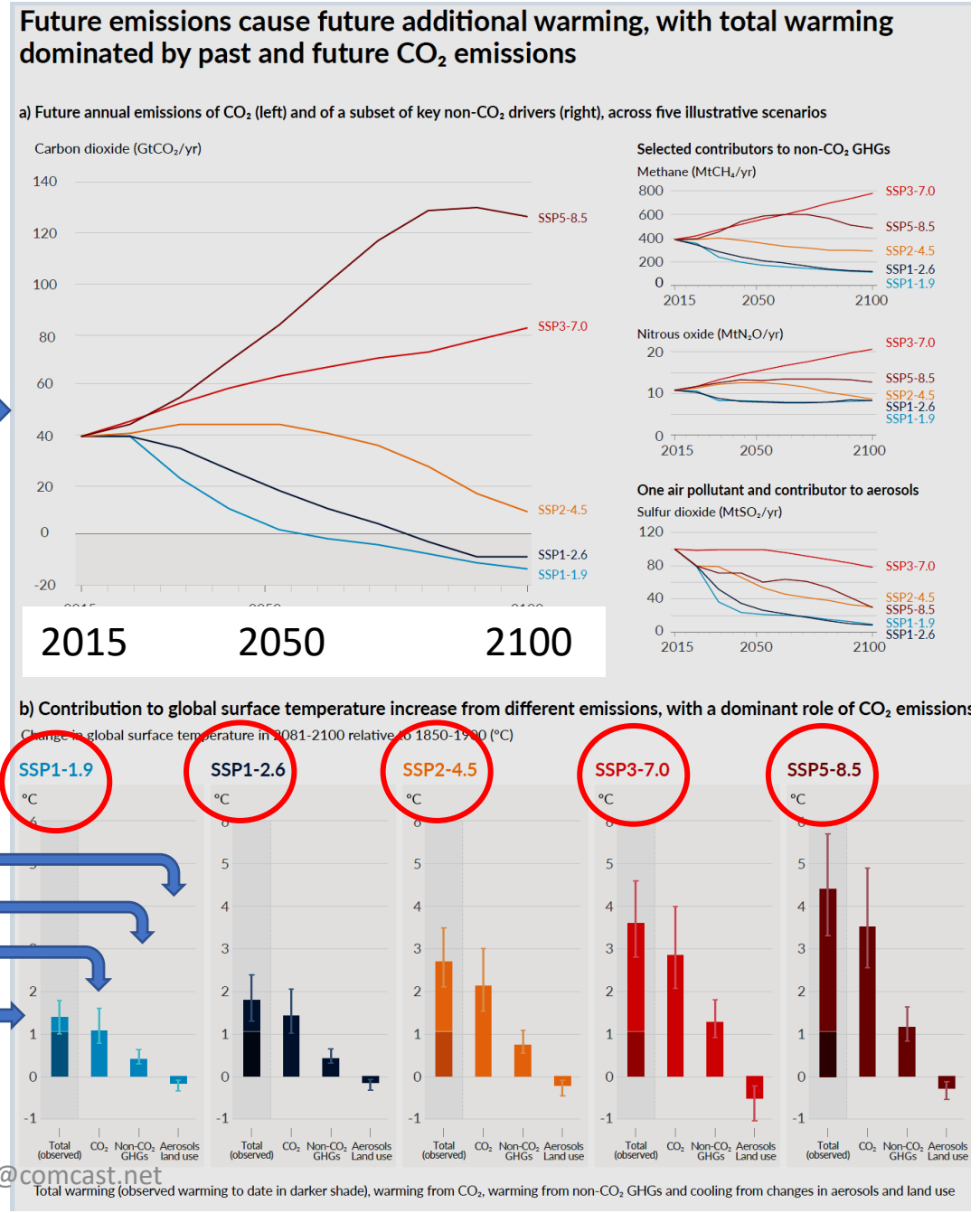
ºC

Albedo

Other GHGs

CO_2

Total



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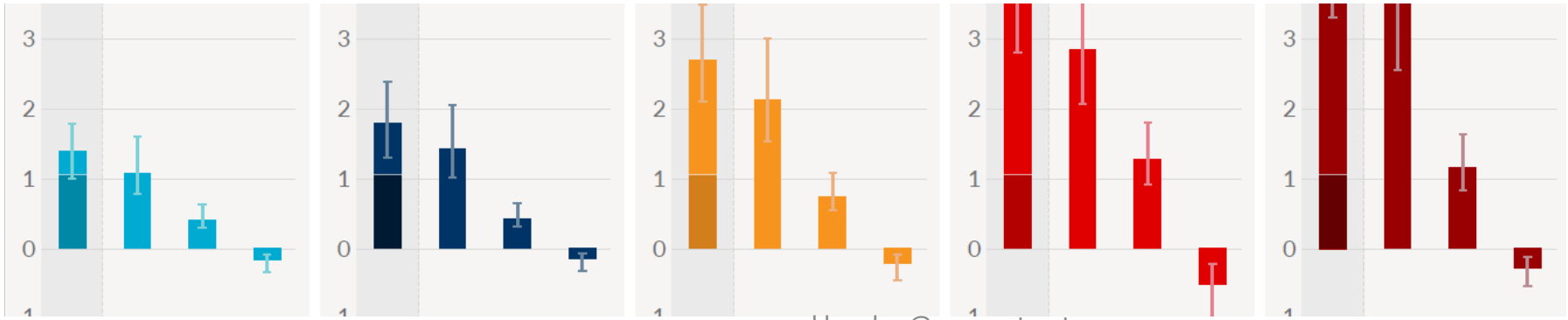
SSP*x*-"radiative forcing" (by 2080-2100)

- SSP1-1.9 ➔ 1.9 W/m^2 radiative forcing from all causes
- SSP1-2.6 ➔ 2.6 W/m^2 radiative forcing from all causes
- SSP2-4.5 ➔ 4.5 W/m^2 radiative forcing from all causes
- SSP3-7.0 ➔ 7.0 W/m^2 radiative forcing from all causes
- SSP5-8.5 ➔ 8.5 W/m^2 radiative forcing from all causes



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Radiative forcing due to *all causes?*

- Cause 1: changes in amount of atmospheric CO_2
- Cause 2: changes in amounts of other greenhouse gases
  - H_2O, CH_4, N_2O, O_3
- Cause 3: change in sunlight reaching orbit
  - (IPCC says zero)
- Cause 4: change in albedo (reflectivity of the planet)
  - (All models have albedo increasing a bit, lowering absorbed sunlight!)

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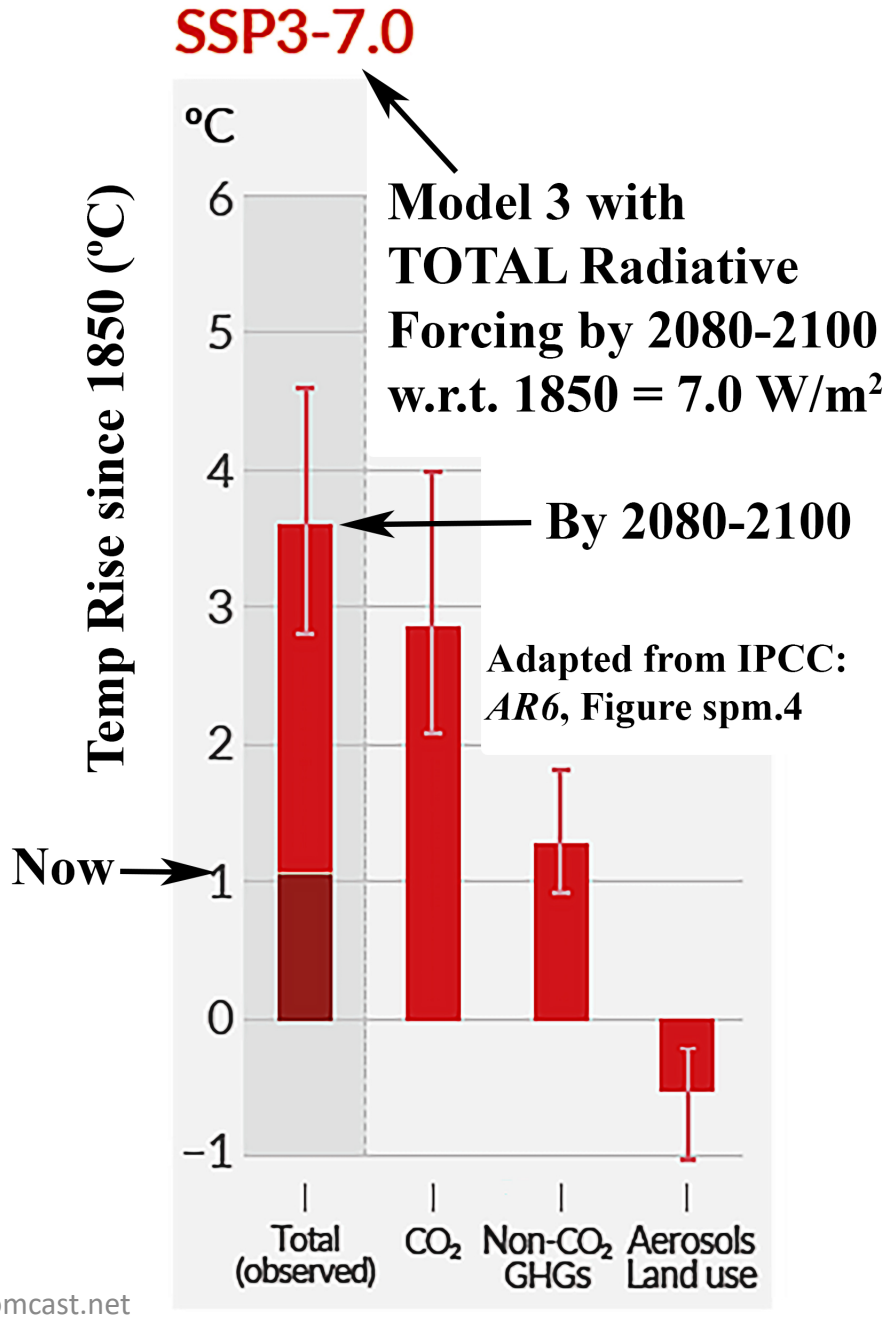
Example: SSP3-7.0



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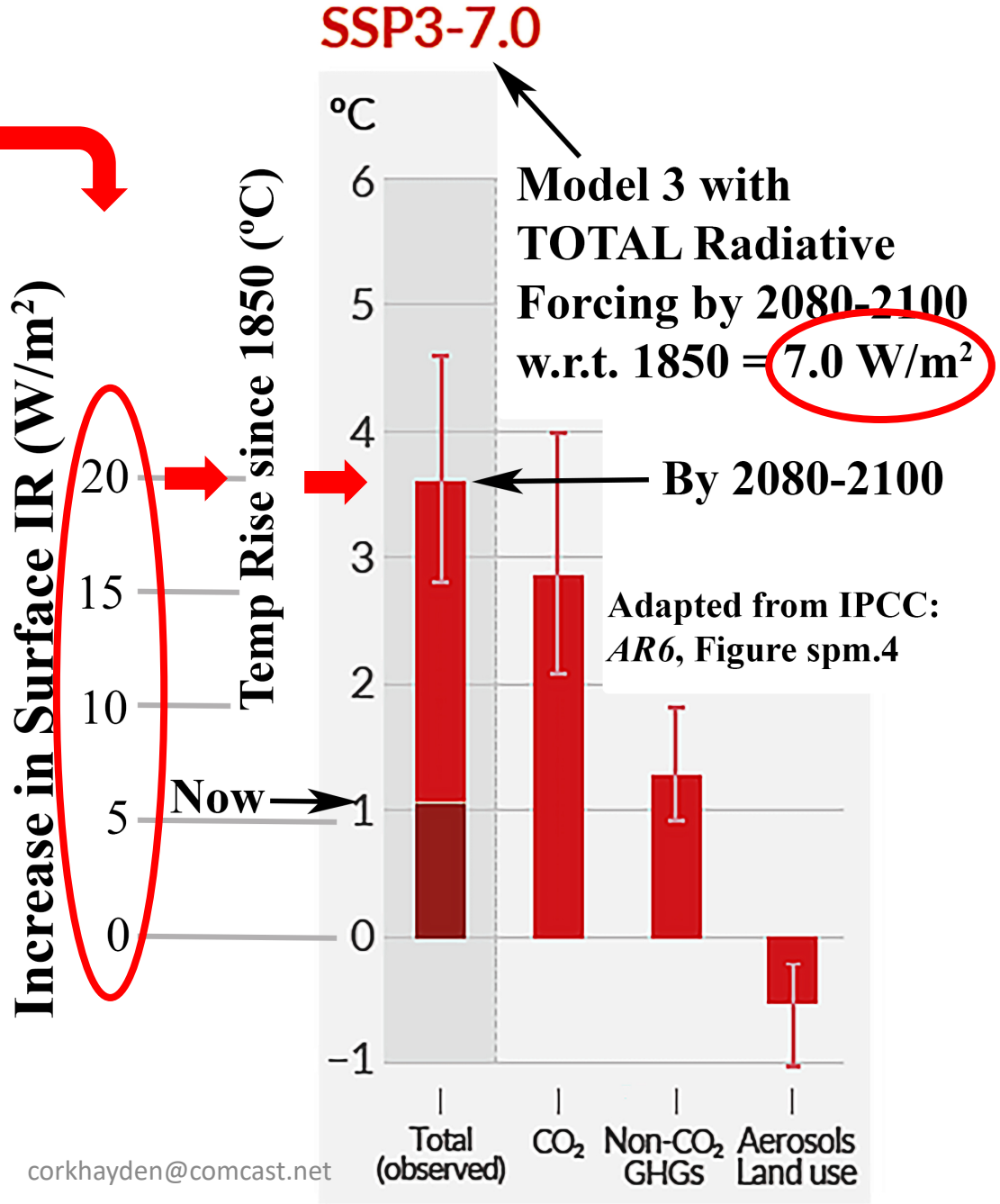
A closer look

This IPCC chart says that the increased ability to stop IR due to changes in CO_2 *and* all other GHGs *and* changes in albedo due to land usage *and* aerosols, is 7.0 W/m^2.

Somehow, that is supposed to block an additional 20 W/m^2 from going Into space.

Wanna buy a bridge?



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7 = 20 for very large values of 7

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What is the meaning of the bizarre results?

- Whenever the increase in surface radiation exceeds the increase in the greenhouse effect, the radiation to space increases
- When the radiation to space exceeds the heat absorbed from the sun, the earth is in a COOLING period
- So, how can a minor increase in the greenhouse effect cause the surface temperature to rise so much that it has to be cooling rapidly?
- Only the IPCC knows for sure.

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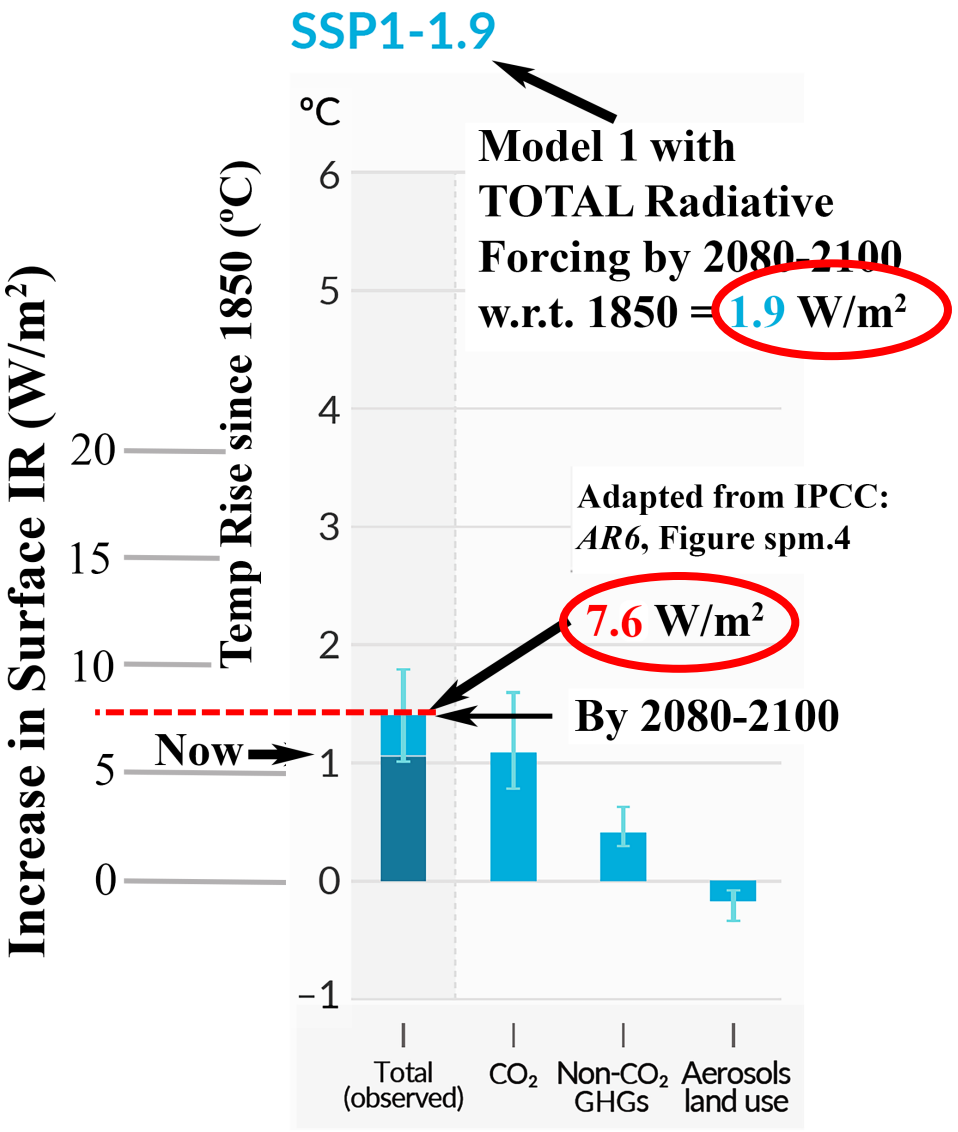
IPCC's case for lowest CO_2 increase

… caused by the most intrusive,
well-intentioned (of course),
governmental prohibitions.

The George Santos Award in Resume Embellishment
Goes to …
The IPCC!



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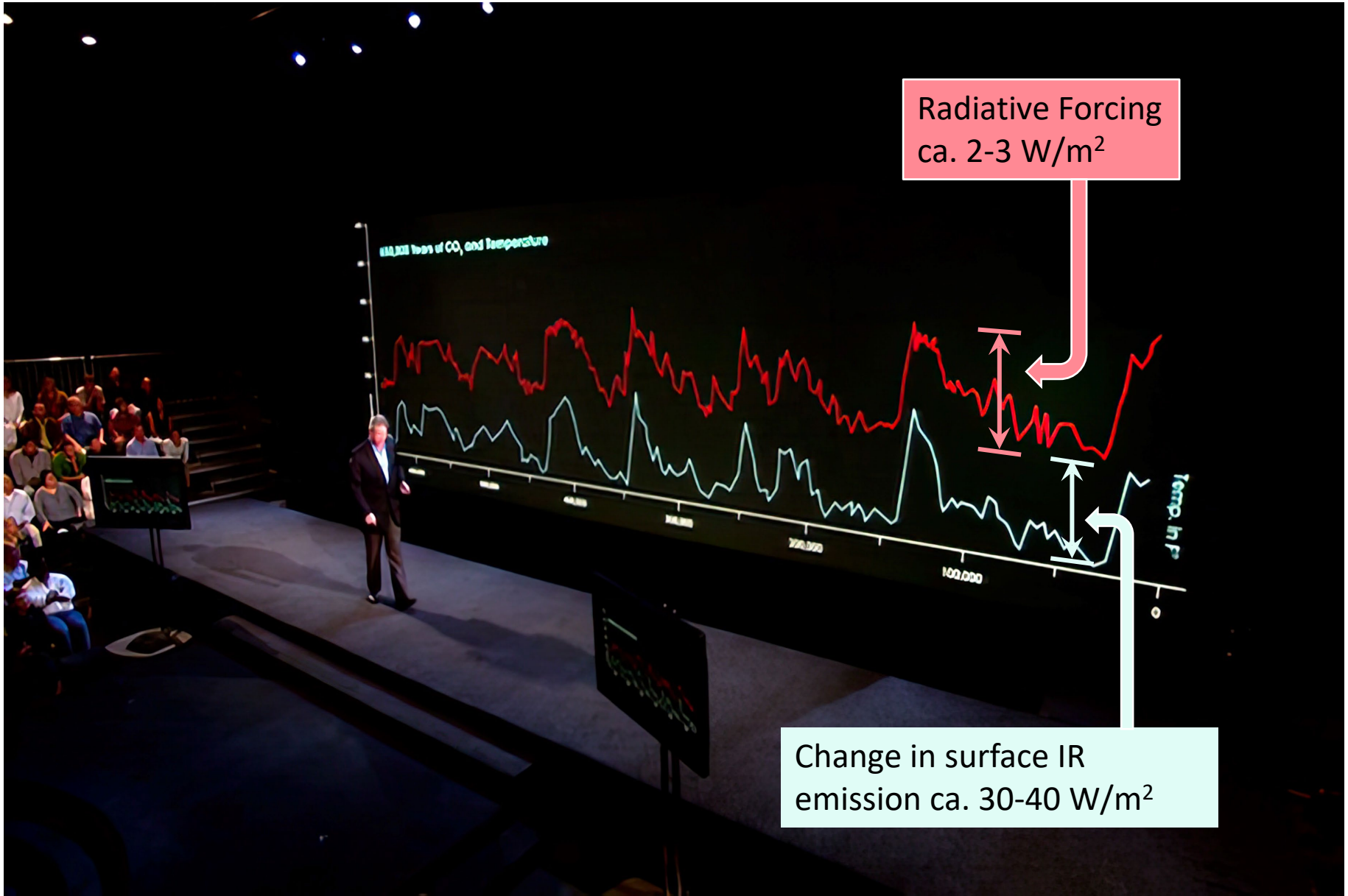
Gore!


Radiative Forcing
ca. 2-3 W/m²
Change in surface IR
emission ca. 30-40 W/m²

The “climate scientists” were not asking …

- Where did the CO_2 come from that caused the temperature to rise?
- Where did the CO_2 go so as to cause the temperature to decrease?
- How did the Milankovitch cycles cause the CO_2 concentration to change?
- Why did the temperature start to decrease when the CO_2 levels were high?
- Why did the temperature changes occur before the CO_2 changes?
- How about *Retroactive Causality*?
  - *Posthumous suicide?*

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Take-Home Message

The IPCC does not --- repeat, *does **NOT*** --- apply the Stefan-Boltzmann law to their ***RESULTS***.

Therefore, they cannot construct heat-balance charts for any of their scenarios.

You, however, must do so.

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Here's your homework!

- Learn the Stefan-Boltzmann equation $I = \left(5.67 \times 10^{-8} \ \frac{\mathrm{W}}{\mathrm{m^2 K^4}} \right) T^4$
- Apply it to current temperature of 289.45 K, and get I = 398 W/m^2
  - In Excel, use 5.67E-8 and 289.45^4.
  - In calculators, use 5.67 EXP or EE 8 ±
- Now apply it to some other temperature, such as 3ºC warmer (=292.45 K)
- Subtract to find the increase in surface radiation.
- Now you understand exactly how the world has been conned.

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Take-Home Principles

- Planetary Heat Balance: at equilibrium, the heat radiated to space must equal the solar heat absorbed:

$$I_{\text{out}} = \text{ absorbed sunlight}$$

- The heat radiated to space equals the heat radiated from the surface minus the greenhouse effect

$$I_{\text{out}} = I_{\text{surf}} - G$$

$$\text{absorbed sunlight} = I_{\text{surf}} - G$$

- Radiative forcing from GHGs simply adds to the greenhouse effect.

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You can fool all of the people some of the time and some of the people all of the time

… and that's enough to set up a multi-billion-dollar climate-crisis industry.

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