

Climate Change 2013: The Physical Science Basis

Working Group I contribution to the IPCC Fifth Assessment Report

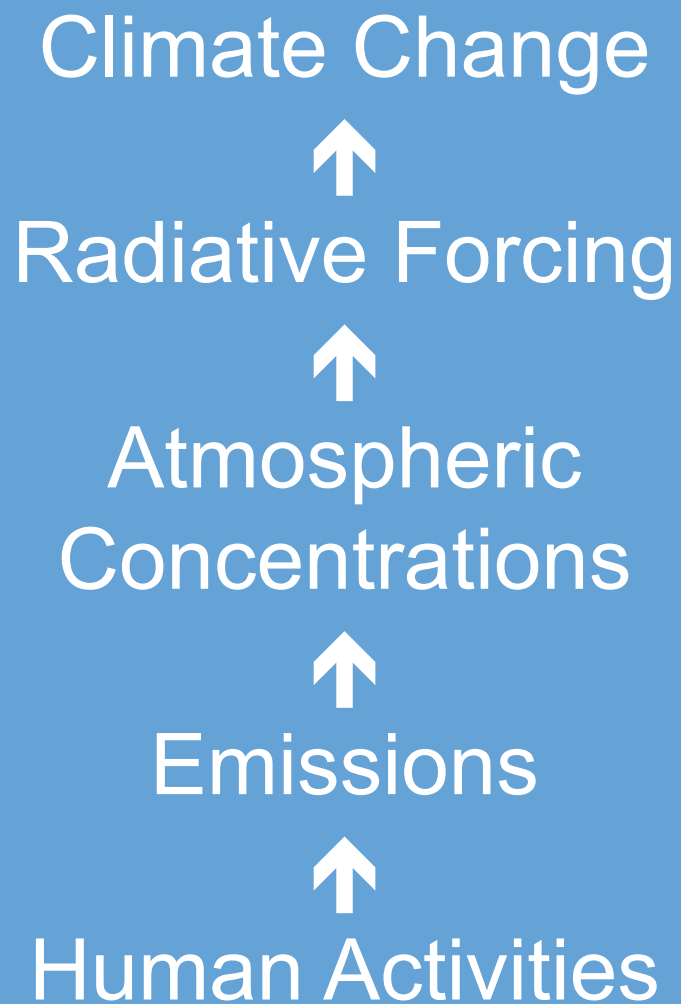
Radiative Forcing in the AR5

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CLA, Chapter 8

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What is Radiative Forcing?

- Change in energy flux caused by natural or anthropogenic drivers of climate change
(in W m^{-2})
- Positive → near-surface warming
- Puts various drivers on common scale, indicates magnitude of impact

What is Radiative Forcing?

- Includes rapid adjustments (e.g. cloud formation on aerosols)
- Stratospheric temperature adjustment included in TAR & AR4 RF; additional adjustments included in Effective RF (ERF)
- Effective RF used for aerosols & well-mixed greenhouse gases

Changes since AR4

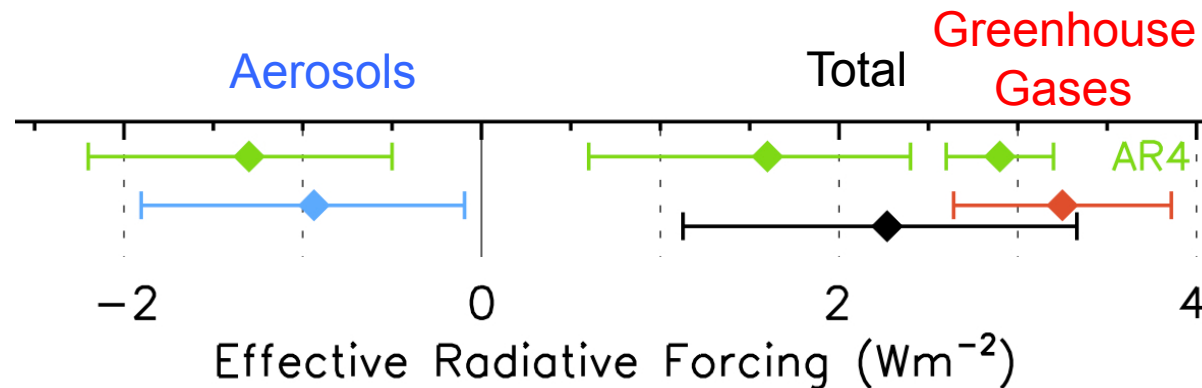


Figure 8.16

- Greenhouse gases continue to increase rapidly
 - Uncertainty ranges increased as now accounting for rapid adjustments to forcing
- Best estimate of net aerosol cooling reduced

Time evolution

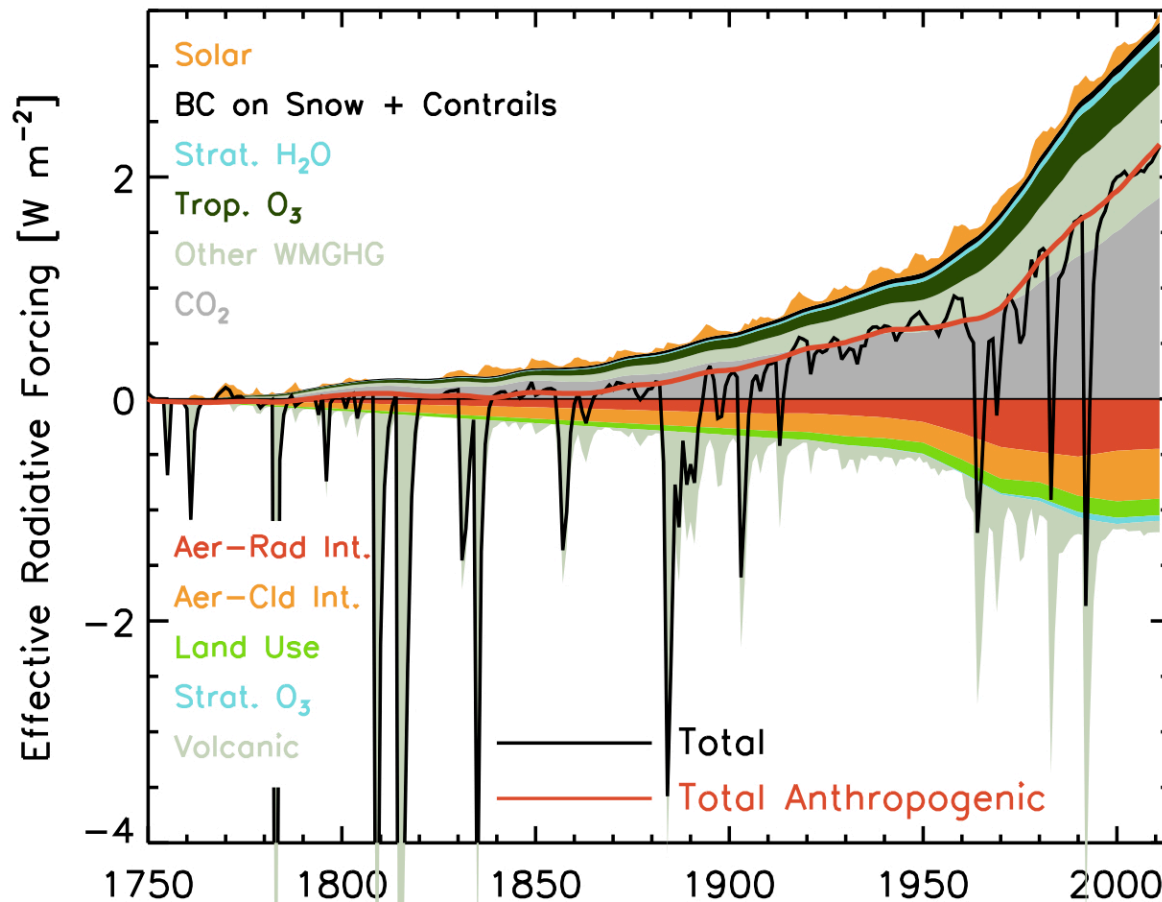
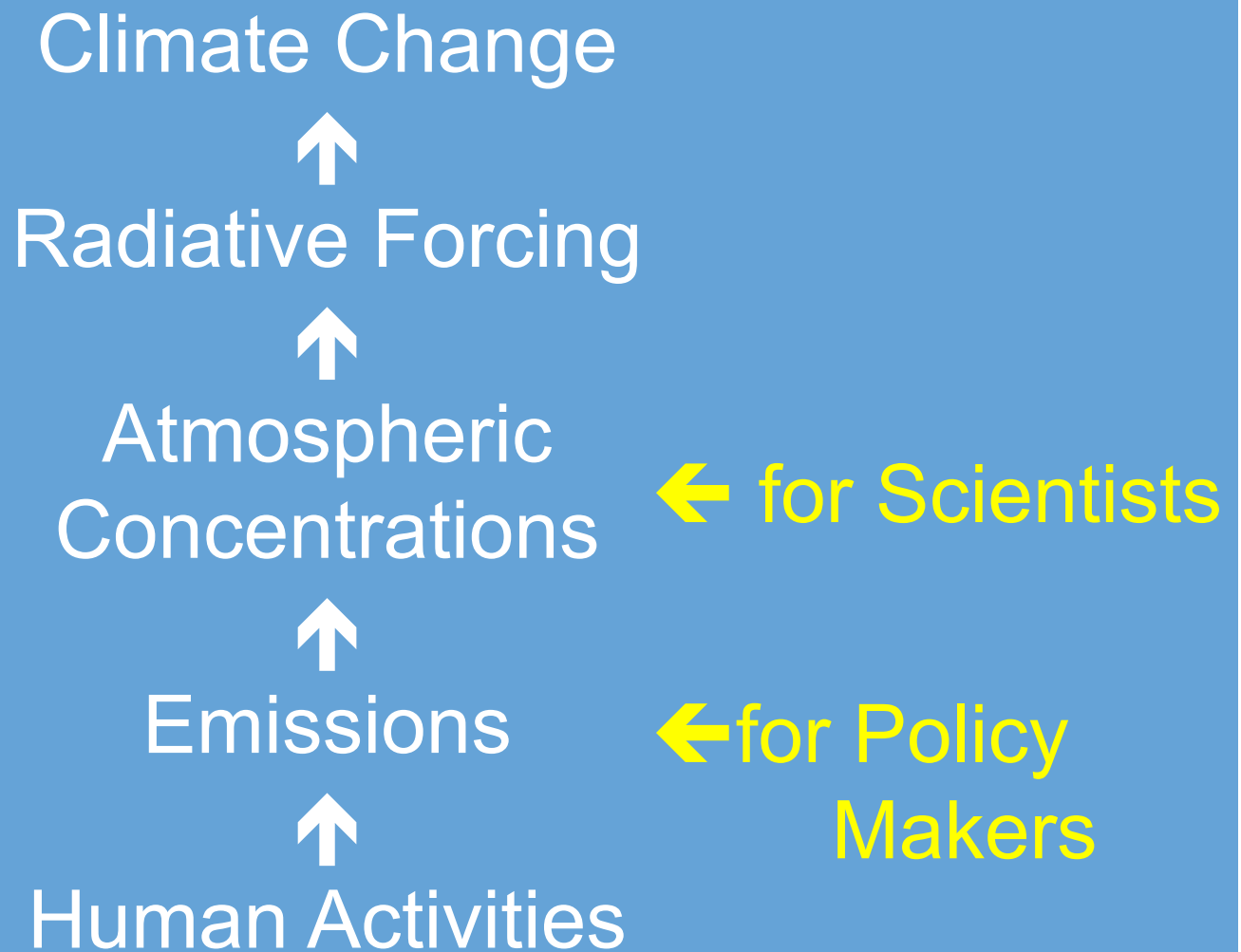


Figure 8.18

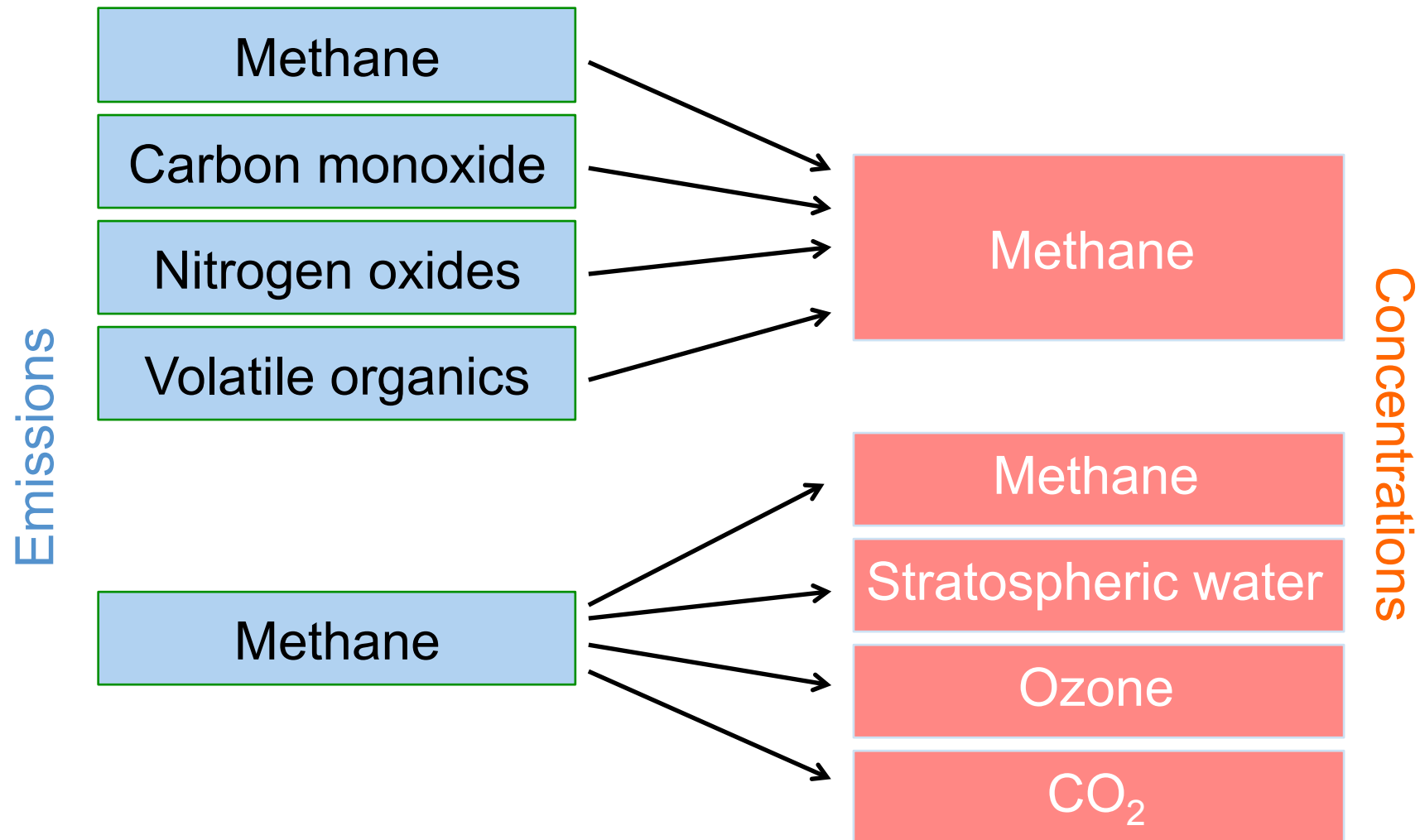
- Except volcanic, changes gradual
- Anthro faster since ~1970, CO₂ largest every decade since 1960s
- Time-averaged natural forcing small

From Concentrations to Emissions



Totals from Concentrations or Emissions Identical

From Concentration to Emissions



- Both perspectives in AR4, both in AR5

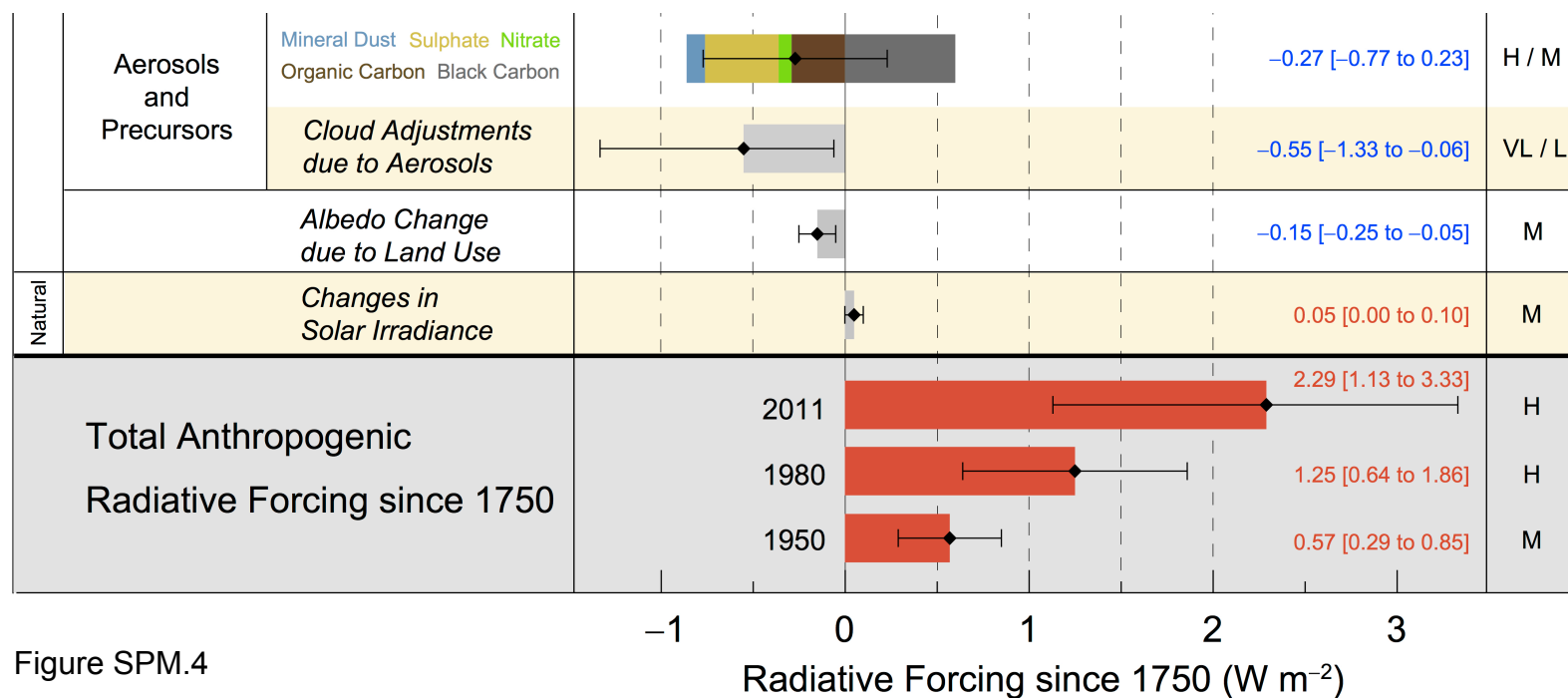
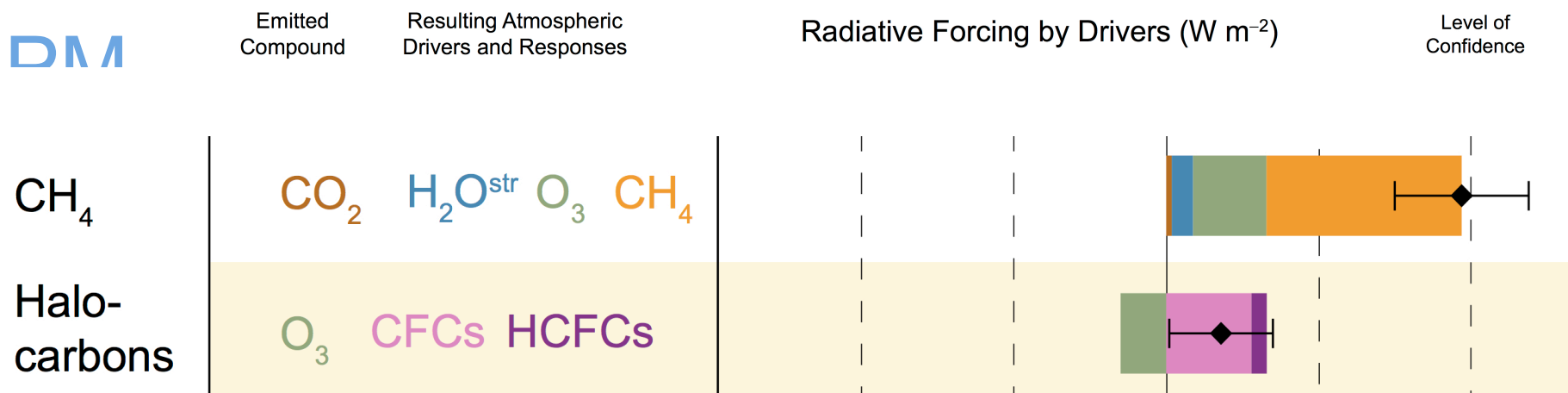


Figure SPM.4

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Further Information

www.climatechange2013.org

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