

Mitigating Near-Term Climate Change

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Question:

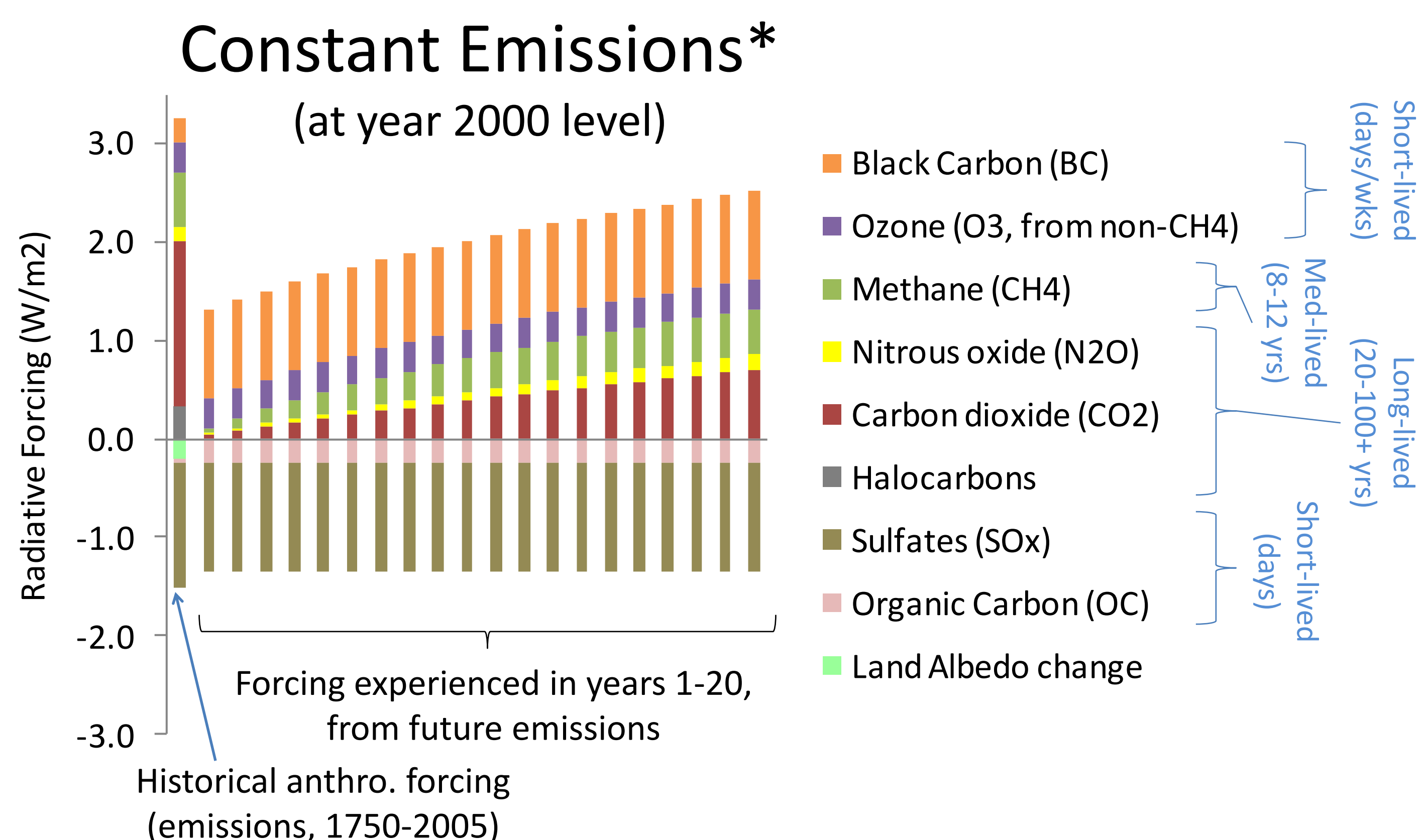
What does near-term climate forcing tell us about mitigation policy?

Answer:

- A rapid decline in CO₂ emissions is necessary, but insufficient.
- Aggressive parallel policies are needed for medium-lived (methane) and short-lived (black carbon, ozone) pollutants
- Instrument choice must be appropriate to the measurability of sources

Over 65% of near-term (20-year) incremental climate forcing will be caused by non-CO₂ emissions (black carbon, methane)

Forcing Produced by Next 20 Years of Emissions



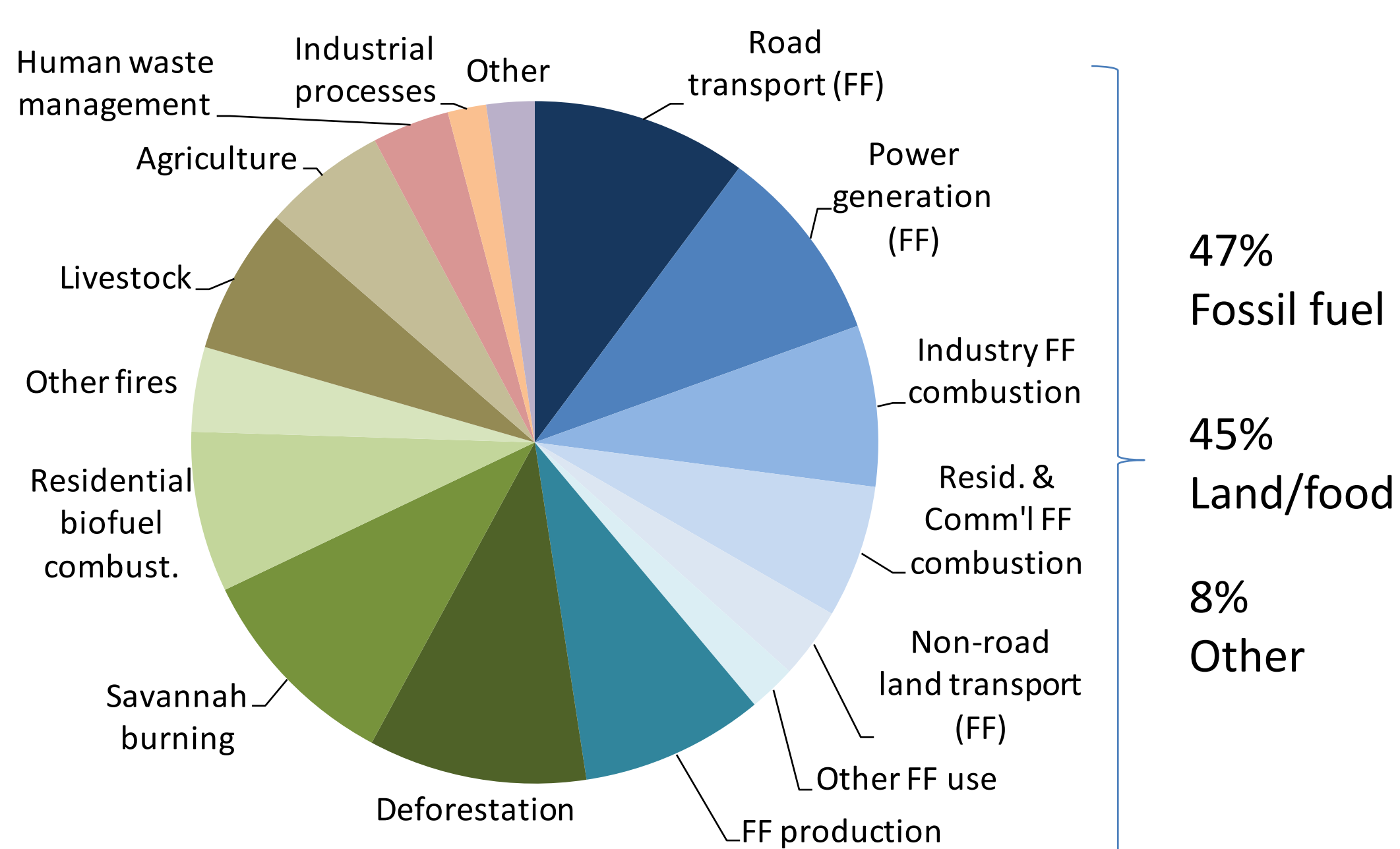
- Near-term emissions matter:
 - Emissions over the next 20 years will produce additional forcing in Year 20 (last column) comparable in magnitude to today's forcing from total historical emissions (1st column)
 - Even forcing from a single year (2nd column) is large relative to history
- Non-CO₂ emissions matter:
 - Over 65% of the additional contributions to Year 20 forcing will be from short-lived (BC, O₃) and medium-lived (CH₄) pollutants
- Results are similar for steady growth scenario and all SRES scenarios
- Results are similar for Year 50: ~50% forcing from short- and med-lived

Chart Interpretation: Impact of emissions between Year 1 and Year X, in terms of radiative forcing experienced in Year X
Short-lived pollutant impact is the same each year; medium- and long-lived pollutant impact grows each year.

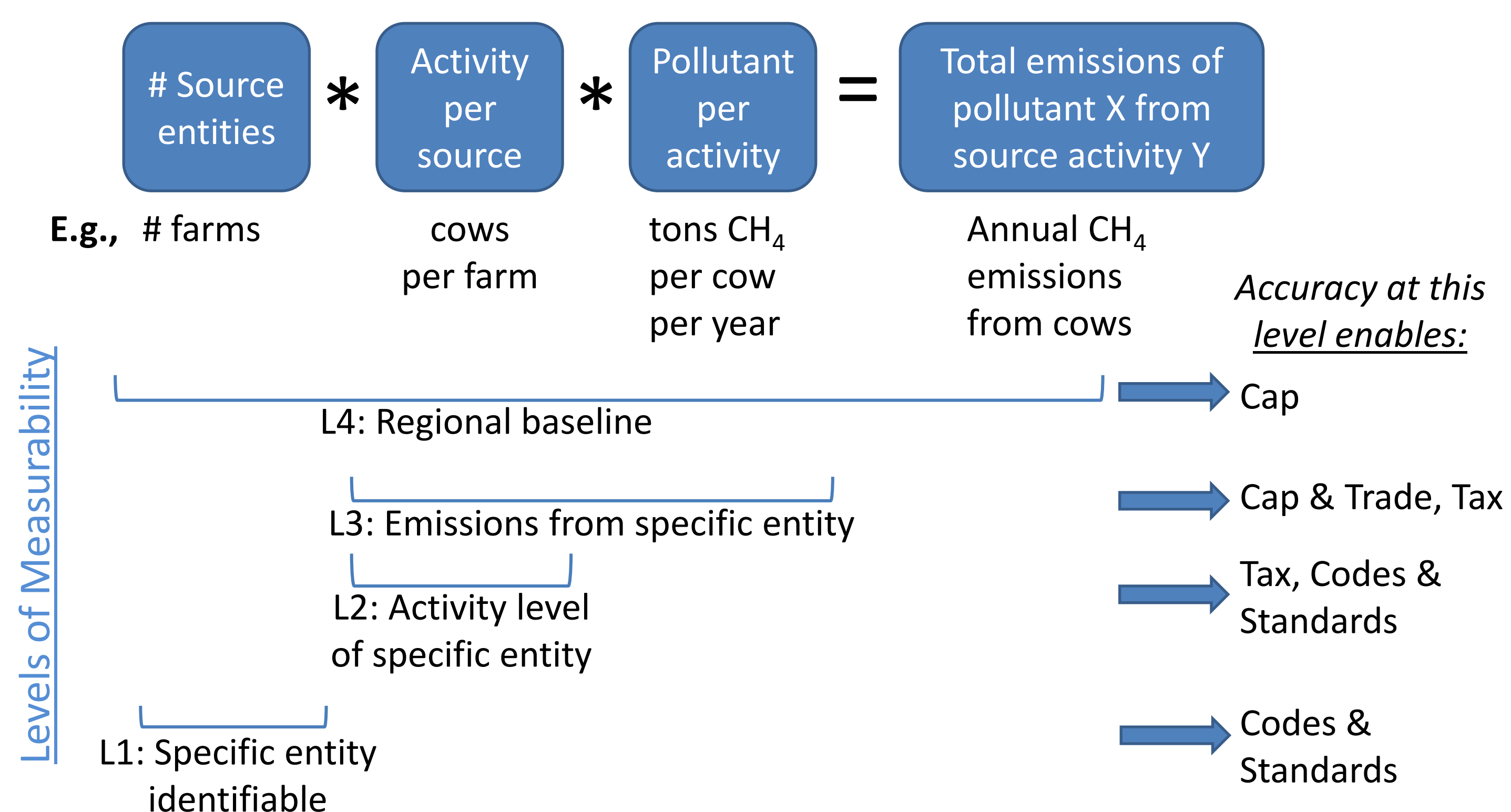
Most near-term forcing is produced by sources with poor measurability, requiring a variety of policy instruments:

Global Sources of Pollutants

Contributions of Future Emissions to Year 20 Forcing (as % of gross positive forcing)



Measurability Constrains Policy



Policy constrained by:

Highest level with +/- 5% accuracy in measurement:

For CO₂: fossil fuel combustion, cement mfg

As above

For non-CO₂: fossil fuel purchased for transport, residential, commercial

Farms, forests, savannahs, waste streams, households

*Footnotes:

Historical sulfate column includes other non-soot aerosols
Historical O₃ includes O₃ produced by CH₄; future does not
Historical CH₄ excludes reaction products; future includes
Halocarbon RF in next 20 years is too small to appear

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Data Sources:

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