

Methane Science and Policy

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Methane to Markets Ministerial Meeting
Washington D.C.
15 November 2004



Why Methane?

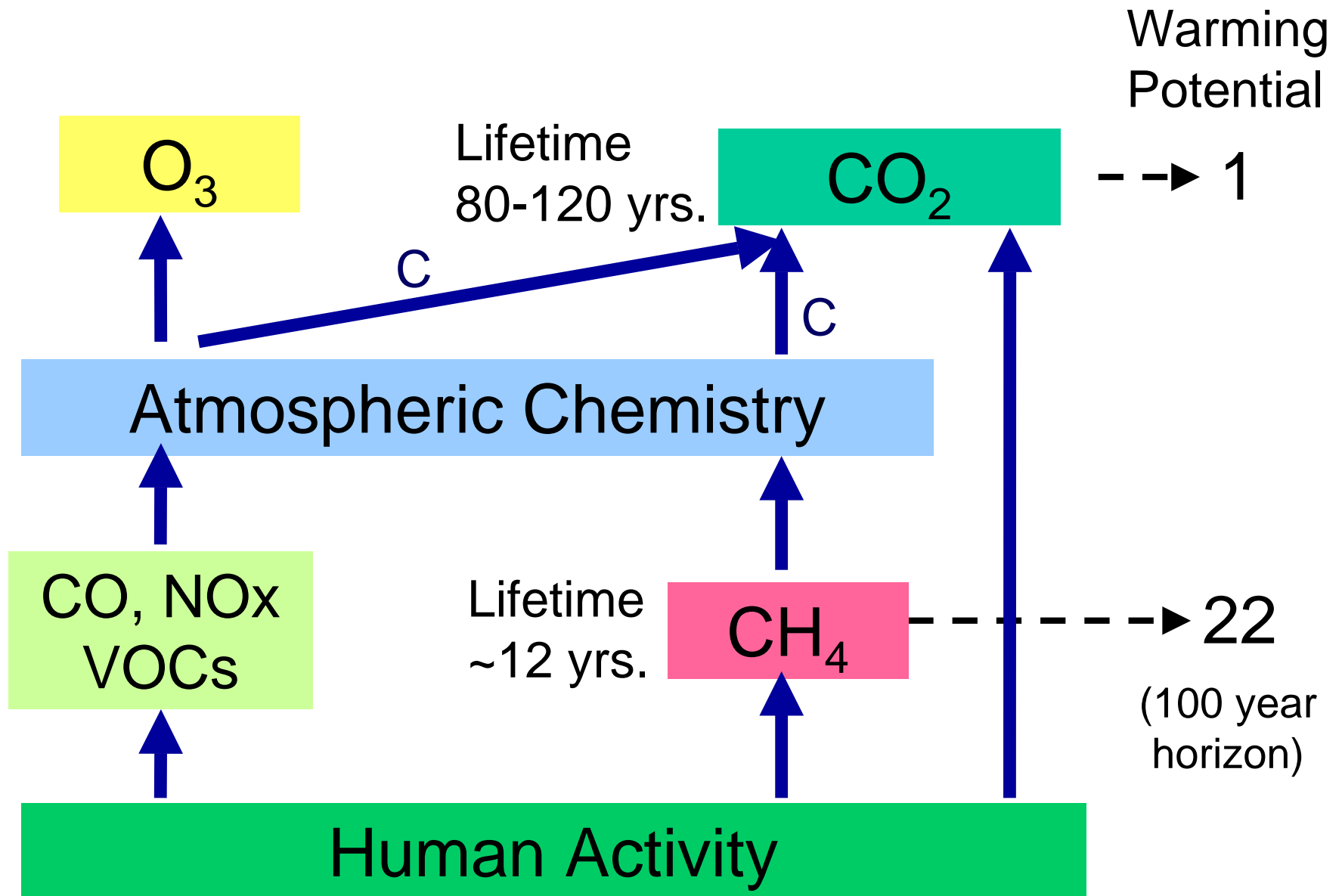
- Ultimately, an effective climate response must deal comprehensively with CO₂
- Facts about methane (CH₄) suggest potential short-term opportunities
 - 2d most important human greenhouse gas
 - There are low-cost options for reduction, some yielding a marketable product
 - A variety of policy measures are appropriate
 - Short lifetime but high radiation impact
- Easier progress for methane could yield experience valuable for other gases

Anthropogenic Sources

Capture?

- Oil production (flaring) ✓
- Gas distribution (leakage) ✓
- Coal mining (out-gassing) ✓
- Urban landfills (anaerobic decomp.) ✓
- Livestock (enteric fermentation)
- Manure Mgt. (anaerobic decomp.) ✓
- Rice growing (anaerobic decomp.)
- Biomass burning (incomplete combustion)

Climate Role of Methane



Marginal Cost of Abatement (US Data using IPCC GWPs)

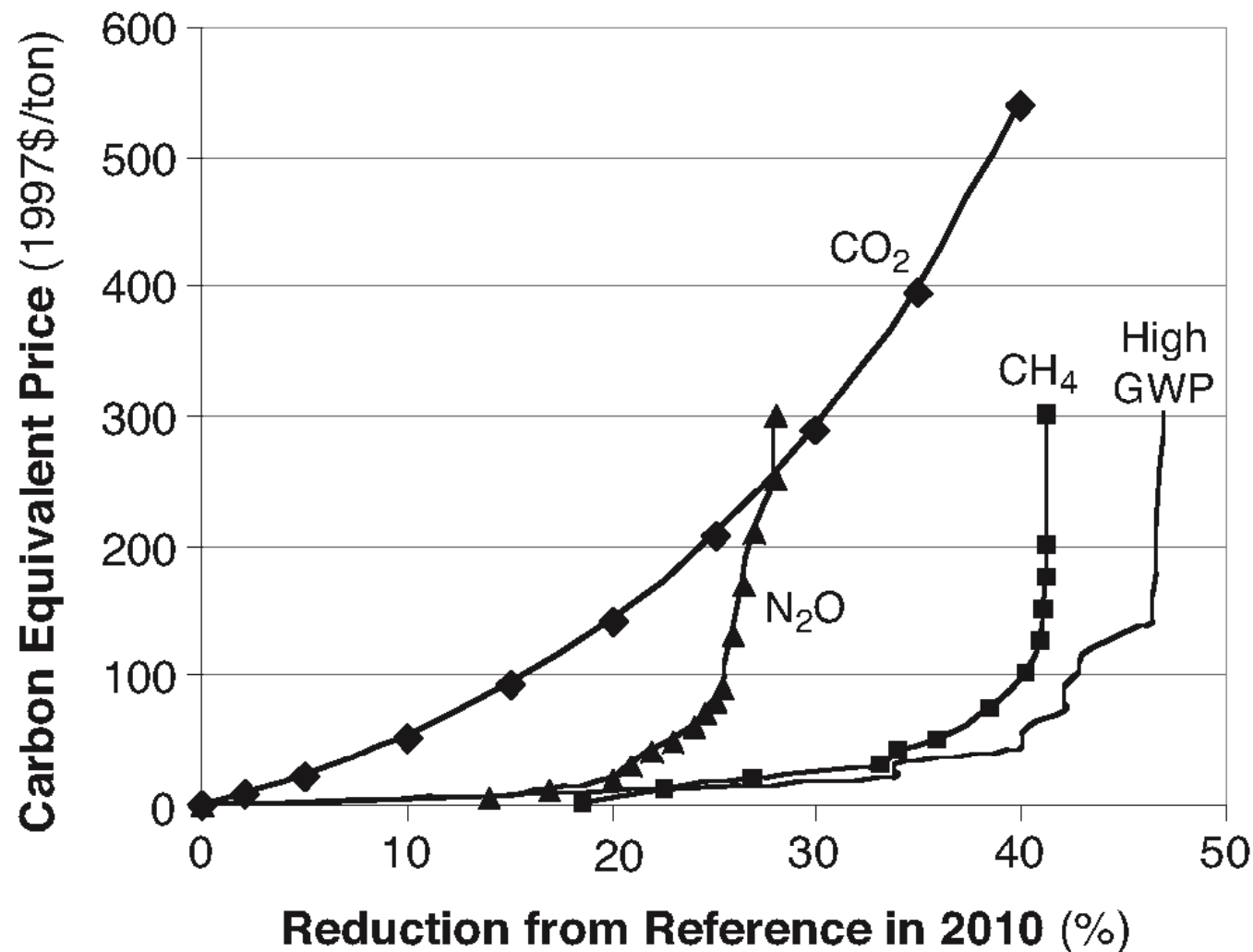


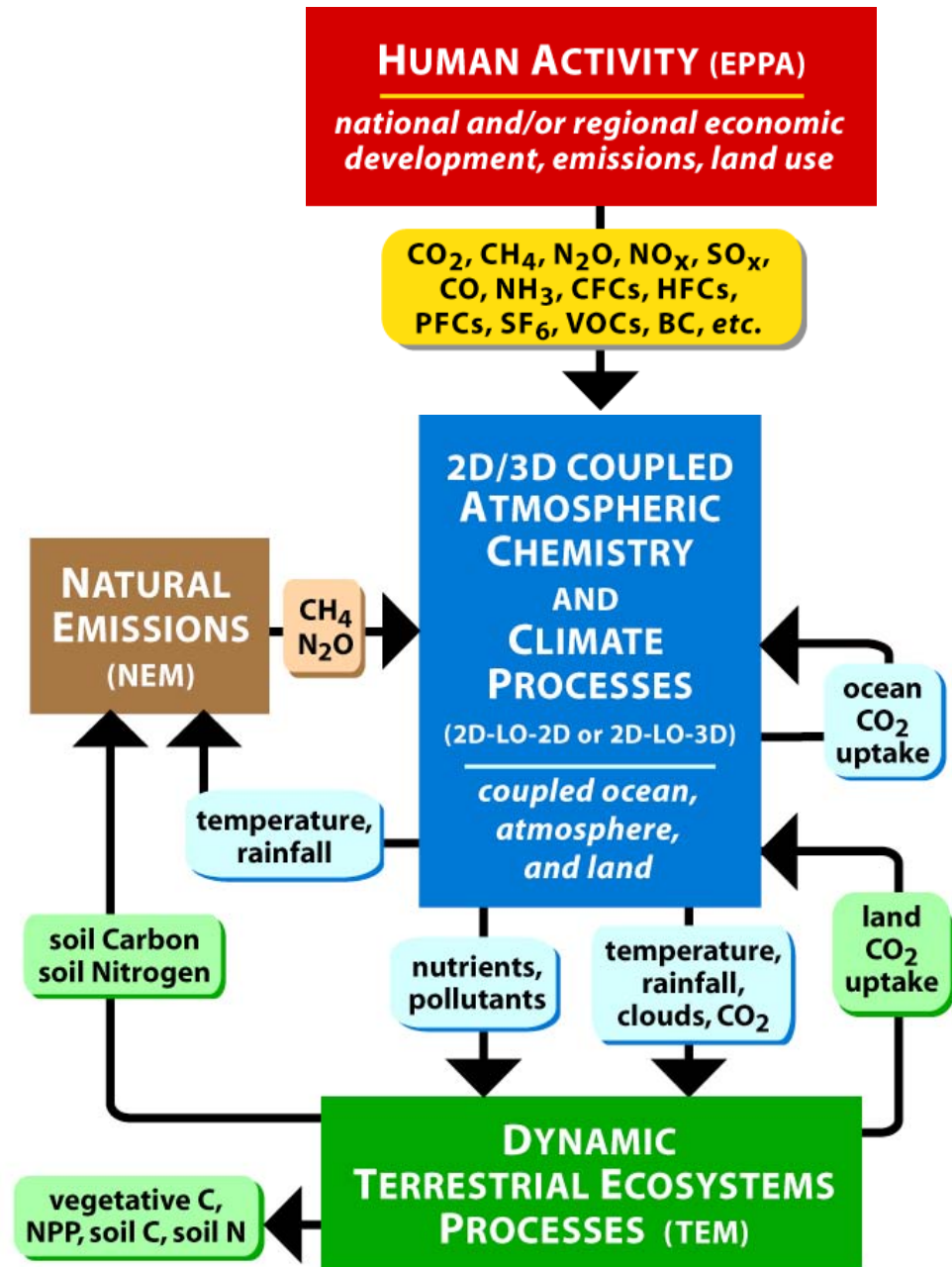
Illustration of the Value of Near-Term Methane Reduction

- Compare less-than-comprehensive policies
 - CO₂ for Annex B (ex the US & Australia)
 - CH₄ controls only, but universally applied
- Projected temperature change: 3 cases
 - Reference, no GHG emissions control
 - Methane reduction by a policies imposing a \$15 per ton carbon-equivalent penalty
 - Current Kyoto Protocol commitments (applied to CO₂ only) maintained to 2100
- Caution: Kyoto commitments are only a first step, but useful as a thought experiment

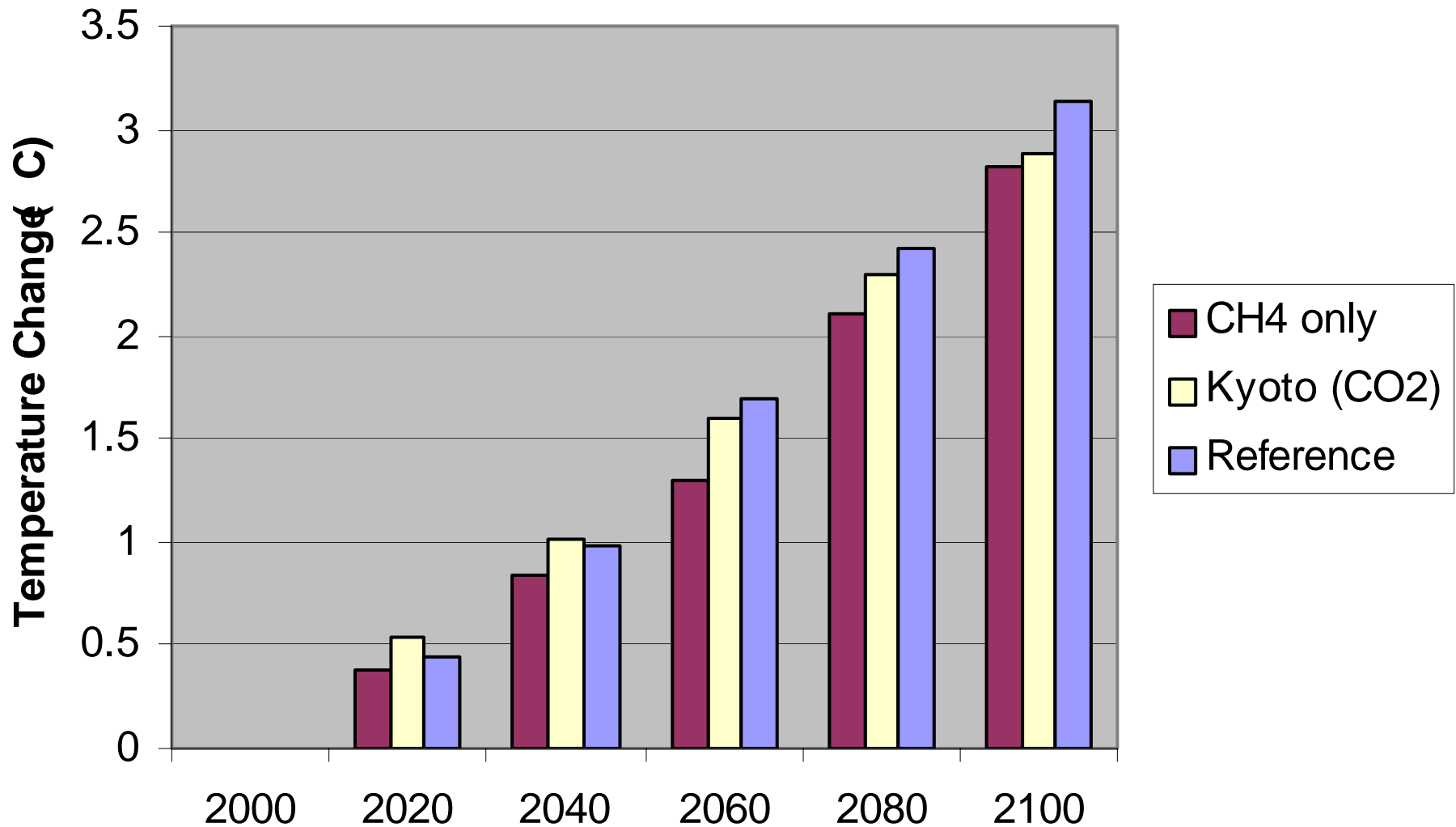
MIT Integrated Global System Model (IGSM)

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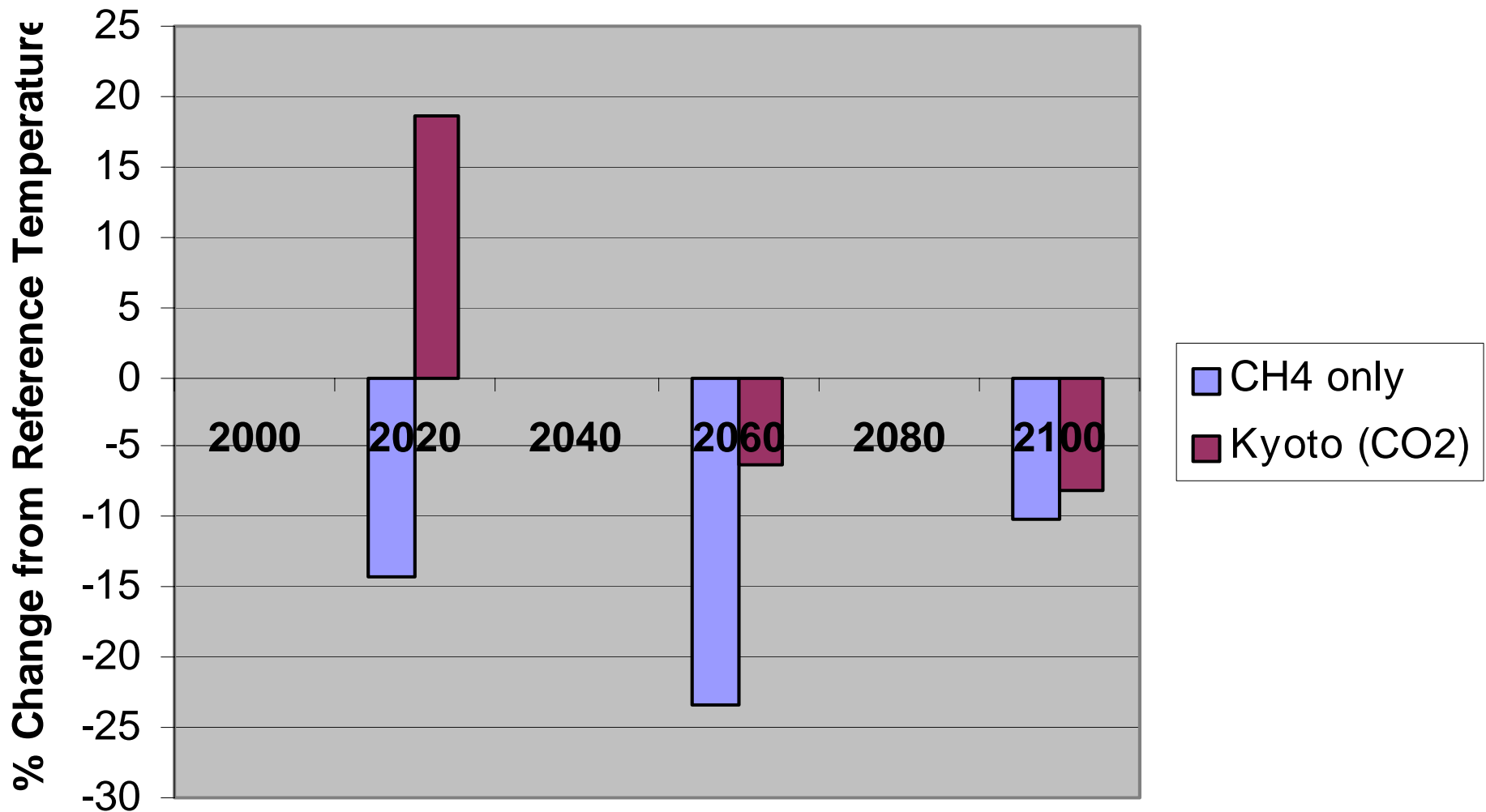
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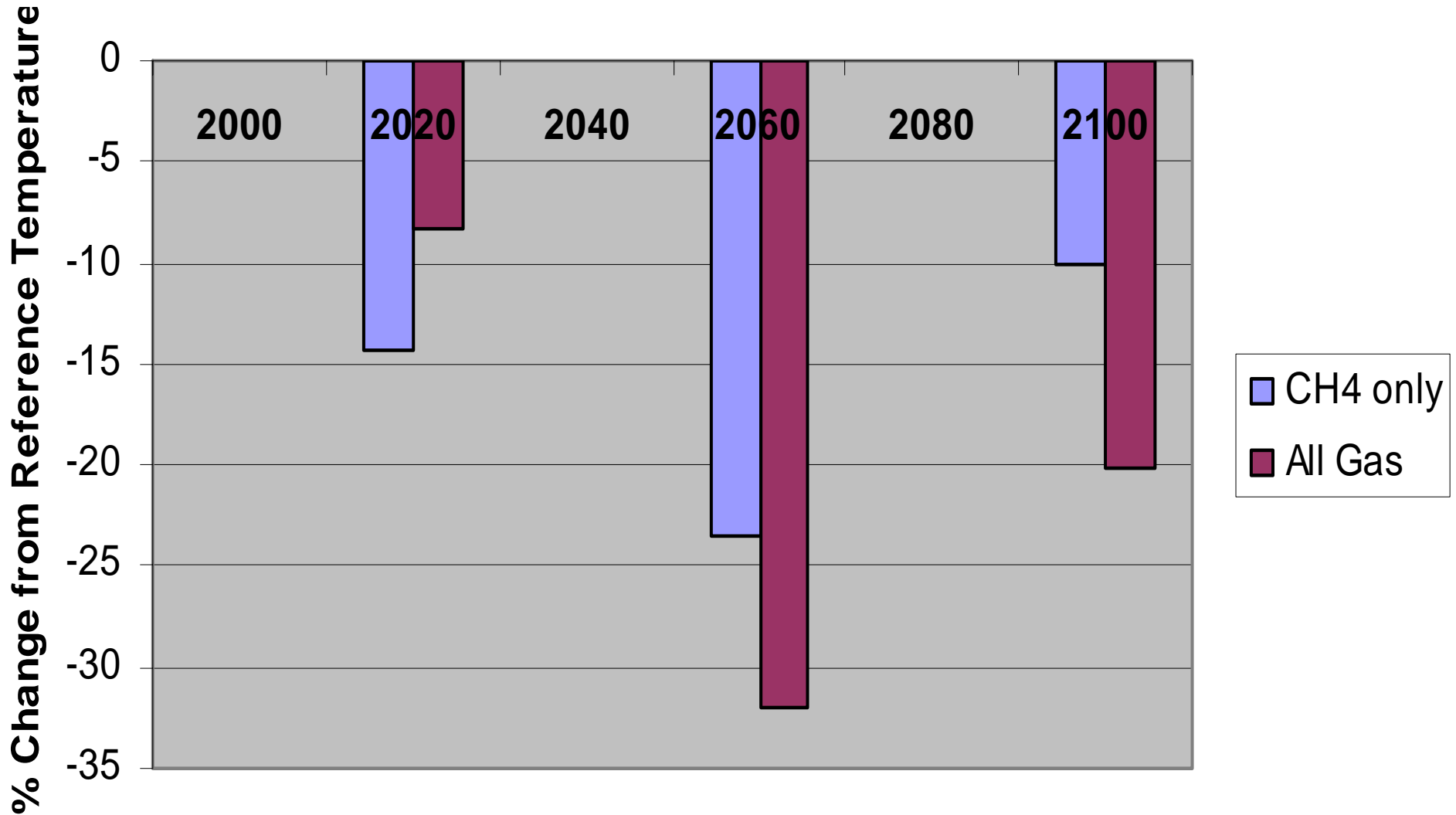
Departure from Projected Temperature Change



% Departure from Projected Temperature Change



% Departure from Projected Temperature Change



Interpretation

- Recall the difference in timing
 - Much of the effect of CO₂ control is after 2100
 - Almost all CH₄ effect comes during this period
 - So, CH₄ is a small part of a long-term solution
- But, while seeking comprehensive global action, CH₄ controls offer significant gains
- Not all CH₄ emissions offer opportunities for a marketable product
 - But countries in this Ministerial account for 64% of global human CH₄ emissions
- Other non-CO₂ GHGs offer similar gains

Thank You!