Inducing Innovation for Climate Change Mitigation

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Economic Approaches to Reforming Energy and Protecting the Environment

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The climate technology problem

- Stabilizing greenhouse gas (GHG) concentrations ultimately implies zero net emissions
- Will require large-scale, widespread global adoption of low-GHG energy technologies
- Doing so at reasonable cost will require substantial innovation to expand our options
- But views differ about the best policies for inducing this technological transition

Emissions price is key for technology

- Emissions price guides deployment of the most cost-effective mitigation technologies
- Creates demand-driven incentive for private sector development of new climate-friendly innovations

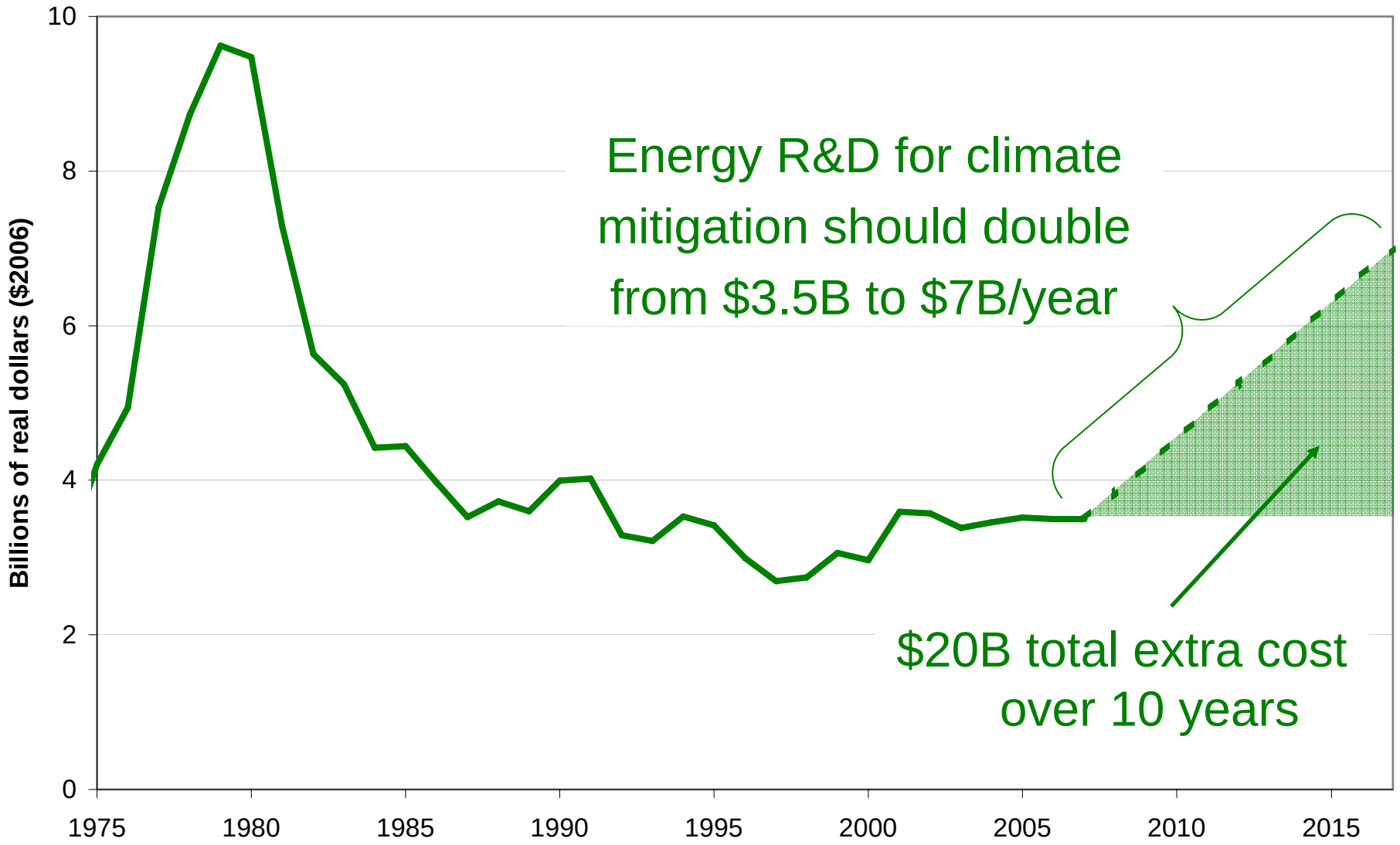
Well-targeted technology policy can reduce future mitigation costs

- Mitigation science and technology policy can reduce costs *if* it focuses on knowledge creation
  - knowledge is a public good just like a stable climate
- Four-part innovation policy strategy
  - reinforce incentives for private R&D
  - expand federal resources for research
  - improve climate mitigation research management
  - experiment with new research policy instruments

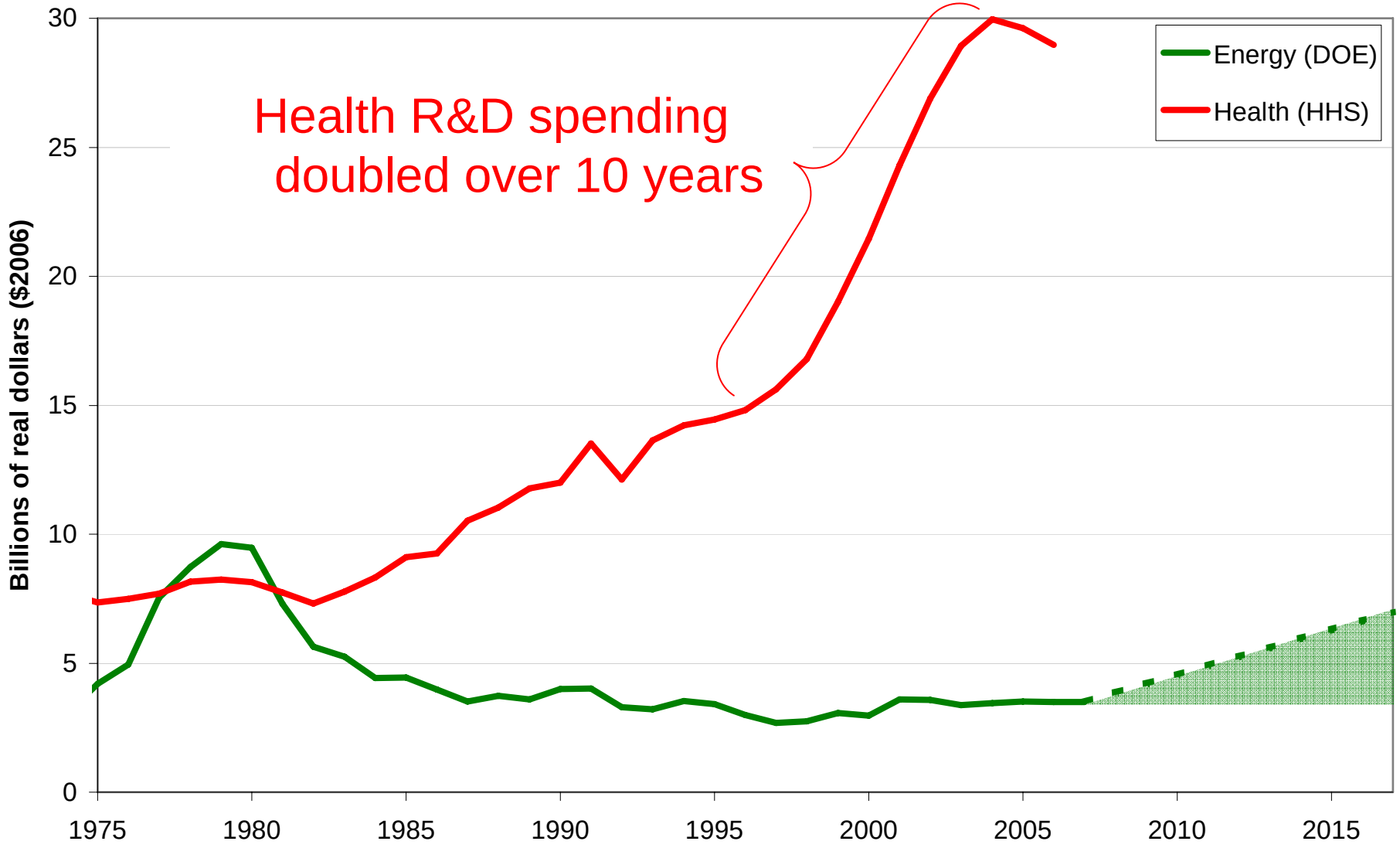
Mitigation innovation policy strategy

1. Encourage private sector research by making the R&E tax credit permanent
2. Double relevant federal research spending to about $7 billion/year over the next 10 years
   - offset by small portion of revenues from emissions price

U.S. Federal Energy R&D Spending (1975-2005)



U.S. Federal Energy and Health R&D Spending (1975-2005)



Mitigation innovation policy strategy

1. Encourage private sector research by making the R&E tax credit permanent
2. Double relevant federal research spending to about $7 billion/year over the next 10 years
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3. Improve research strategy and coordination
   - invigorate the Climate Change Technology Program
4. Experiment with innovation inducement prizes

Poorly-designed technology policy raises costs

- Government support should emphasize areas least likely to be undertaken by the private sector
  - strategic basic and applied research
  - training the next generation of researchers
- Technology approaches must *complement* rather than *substitute* for emissions pricing
  - R&D without market demand for the results is like pushing on a rope
  - technology deployment mandates/subsidies tend to increase societal costs relative to emissions pricing