

REFERENCE REPORT #35

**THREE PROPOSITIONS ON THE
ECONOMICS OF GREENHOUSE-GAS
REGULATION**

On July 18, 2007, The National Petroleum Council (NPC) in approving its report, *Facing the Hard Truths about Energy*, also approved the making available of certain materials used in the study process, including detailed, specific subject matter papers prepared or used by the Task Groups and their Subgroups. These Topic Papers were working documents that were part of the analyses that led to development of the summary results presented in the report's Executive Summary and Chapters.

These Topic Papers represent the views and conclusions of the authors. The National Petroleum Council has not endorsed or approved the statements and conclusions contained in these documents but approved the publication of these materials as part of the study process.

The NPC believes that these papers will be of interest to the readers of the report and will help them better understand the results. These materials are being made available in the interest of transparency.

The attached Topic Paper is one of 38 such working document used in the study analyses. Also included is a roster of the Subgroup that developed or submitted this paper. Appendix E of the final NPC report provides a complete list of the 38 Topic Papers and an abstract for each. The printed final report volume contains a CD that includes pdf files of all papers. These papers also can be viewed and downloaded from the report section of the NPC website (www.npc.org).

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THREE PROPOSITIONS ON THE ECONOMICS OF GREENHOUSE-GAS REGULATION

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Three propositions about climate change

- If greenhouse-gas emissions cause social harm, emitters should bear a cost intended to discourage emissions.
- Although it is impossible to calculate an “optimal” cost of emissions, the cost must be high enough to discourage consumption of greenhouse-gas-intensive goods and services.
- The real cost of emissions should rise on a predictable path over an extended period of time, as extremely sharp or erratic price changes have the potential to cause significant economic harm.

Proposition 1: Emitters must bear a cost

- Price signals are the least socially costly way to change behavior.
- Regulation in the absence of price signals swims against the tide by requiring individuals and firms to act in ways that are contrary to their apparent economic interests.
- Emissions abatement by publicly traded firms is unwise in the absence of price signals or mandates, except where abatement achieves high internal rates of return for other reasons.
- Technological “solutions” are unlikely to bring about a significant reduction of greenhouse-gas emissions so long as emissions do not entail substantial cost.

Proposition 2: The “optimal” cost cannot be calculated...

- Economic theory teaches that the emitter’s marginal cost per unit of emissions should be set equal to the marginal social cost imposed.
- With respect to greenhouse gases, this frame of reference works poorly because:
 - Social costs are imposed by the stock of greenhouse gases in the atmosphere, which we cannot regulate, rather than by the flow of emissions subject to regulation.
 - The extent and timing of social costs are highly uncertain.
 - The timing of emissions matters little in terms of the eventual social cost, but regulating emissions without reference to a time frame will be difficult.
 - The social costs imposed by today’s emissions will depend heavily upon future events that cannot be known at this time.
- We must therefore begin to raise the cost of emissions despite our inability to offer reliable estimates of how high that cost should be to achieve the desired outcome.

...but must be high enough to discourage consumption of greenhouse-gas-intensive goods and services

- We know that most greenhouse-gas emissions are attributable to the burning of fossil fuels for energy.
- We know that the medium-term price elasticity of demand for electricity and motor fuel is low.
- We know that energy demand responds differently when price changes are perceived as transitory than when they are expected to be enduring.
- We know that energy represents a small share of the production cost of most goods and services, so even large increases in the cost of fossil-fuel inputs will lead to relatively small increases in selling prices of most products.

The limits of price signals

- Energy is a preference good, and even large increases in the cost of fossil fuels are unlikely to reduce fossil-fuel demand significantly unless less costly alternatives are available.
- Cost increases are thus a necessary but not sufficient condition for the reduction of greenhouse-gas emissions.
- The larger or more abrupt the increase in costs, the greater the “leakage.”

Everybody likes “cap and trade”, but...

- “Cap and trade” is a slogan, not a policy—the details will make all the difference in terms of efficacy and efficiency.
- Cap and trade will not necessarily lead to greater emissions reductions than taxes, fees, or technological mandates.
- Cap and trade will not necessarily reduce emissions at lower cost than other methods of control.
- Unless it involves the imposition of significant costs on greenhouse-gas emissions, emissions regulation with a cap-and-trade system is a distraction.

Considerations in designing a cap-and-trade scheme

- What is the cap?
 - In the initial EU trading scheme and in the pending RGGI, caps were set so high that emissions reduction is minimal.
- Which sectors are included in the scheme?
- Who can trade?
 - Climate Action Partnership wants “a price signal for carbon that may vary by economic sector,” implying multiple prices and resultant inefficiency.
- What happens to existing limits if other sectors are included later?
- Do incumbents receive free allocations of emissions permits?
 - “Grandfathering” reduces incentive to lower emissions and rewards firms that have increased emissions since climate-change risks were identified in 1990.
- How quickly is the cap lowered?
- Are there escape clauses?
 - RGGI extends deadlines and favors mitigation over reduction if costs exceed specified levels.

And the biggest problem of all....

- Leakage - the shift of economic activity in response to changed costs - will be a serious problem with any cap-and-trade system that imposes significant costs on emitters.
- Cap-and-trade controls are effective in regulating emissions that affect defined areas, but the global nature of climate change poses an entirely different problem.
- Power plants and refiners cannot move, but if energy costs become burdensome, their customers can move to locations where regulations are less costly, increasing overall costs while bringing no environmental benefit.
- The only obvious way for a single nation to control leakage is to impose import taxes based on the carbon content of goods. France has endorsed this idea in principle, but it would be very unwieldy and have large economic costs.

Proposition 3: The real cost of emissions should rise predictably

- Almost all greenhouse-gas emissions are produced by capital investments with extremely long lifetimes.
- The knowledge that the real cost of emissions will rise continually will encourage investments that minimize emissions.
- Policy should encourage accelerated scrappage of high-emitting capital, not just lower emissions from new investment.
- One-time increases in the cost of emissions would be expected to have a negligible effect on investment behavior and thus on emissions.
- Large, abrupt increases in the cost of emissions have the potential to cause serious economic loss and to be counterproductive by encouraging leakage.
- If future scientific research indicates a need to lower emissions more rapidly than currently desired, the cost path can be altered, but should still allow for adjustment.

The bottom line

- Any regulatory system that does not raise the cost of greenhouse-gas emissions will be ineffective at controlling emissions.
- Large or abrupt policy changes have the potential to be extremely costly while delivering little benefit in terms of emissions reduction.
- The greatest challenge for U.S. policy will be to achieve credibility over the long time horizon involved.

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