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Senator Ted Stevens, Chairman  
United States Senate  
Committee on Commerce, Science, and Transportation  
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**Oral Testimony**  
**Hearing to Examine the Rise of Domestic Energy Prices**

“Good morning, Mr. Chairman. On behalf of the Rocky Mountain Institute, I appreciate the opportunity to testify before your Committee hearing to “examine the rise of domestic energy prices.” My name is Odd-Even Bustnes, a manager at the Rocky Mountain Institute. I hold graduate degrees in economics and in chemical engineering from Princeton and Oxford, and was previously a consultant with McKinsey & Company. RMI is a 23-year-old, independent, entrepreneurial, nonprofit applied research center in Old Snowmass, Colorado, and has a long history of expertise in energy strategy and policy.

RMI’s testimony will focus on what actions can be taken to profitably lower US oil consumption. My testimony will highlight the key findings of our major independent study, *Winning the Oil Endgame: Innovation for Profits, Jobs, and Security*, which was co-sponsored by the Office of the Secretary of Defense. The objective of this two-year research effort was to define the technologies that either exist today or are on the horizon that could significantly reduce US oil demand, and the measures necessary to accelerate market adoption. Our study is built around competitive-strategy business cases for the car, truck, plane, oil, and agriculture industries, and improving military effectiveness through efficiency. Its reception by those civilian and military sectors has been encouraging. We are honored that the book’s Forewords are by Secretary George Shultz and the former Shell chairman Sir Mark Moody-Stuart.

My two senior coauthors, RMI’s CEO Amory Lovins and Senior Director Kyle Datta, unfortunately could not attend today on such short notice, but they hope to be of service on another occasion. They each have decades of experience in energy policy. I do not; my role in our study was chiefly performing technological and economic analyses. I will therefore defer broad policy questions to my senior colleagues for their written response. However, I am happy this morning to give you an overview of our findings, and hope these will be of interest and value.

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Our analysis found that the United States of America can significantly reduce its use of oil within two decades, and in the process revitalize its economy, led by business for



profit. The profits arise because the best technologies already in or entering commercial service in spring 2004 can save or displace most of the oil we use, at a lower cost than buying it, even if the world oil price fell back to \$26 a barrel (in year-2000 dollars)—which was EIA's January 2004 Reference Case forecast for the year 2025—and if externalities are worth zero.

The broad outlines of a national path beyond oil are strikingly simple:

- Redouble the efficiency of using oil
- Replace the a quarter of remaining U.S. oil with advanced biofuels
- Save half of natural gas at an eighth of today's market price, and then substitute the saved gas for the rest of the oil via hydrogen over the long run

We found that half of the projected 2025 oil consumption can be saved by more efficient use costing on average \$12/bbl. The other half can be replaced by cost-effective saved natural gas and advanced biofuels costing less than \$26 per marginal barrel. By 2025, these cheaper savings and substitutions would cost less than \$26/bbl oil, and would save \$155 billion per year gross or \$70 billion a year net. Achieving this transition beyond oil would require a \$180 billion investment over ten years—half to retool the car, truck, and plane industries, and half to build the advanced biofuels industry. These investments would also create a million new jobs—three-fourths of them in rural and small-town America—and could protect another million jobs now at risk in automotive and trucking sectors.

Two technological breakthroughs underpin these remarkable findings: advanced materials and cellulose-based biofuels, both of which are on the horizon at the pre-commercial stage. We do not need to wait for the fuel cell; efficiency and biofuels can ultimately halve our projected consumption of oil, and bring us back to pre-1970 usage levels. As a free byproduct of the profitable oil savings, America's CO<sub>2</sub> emissions would decrease by 26%. These outcomes all assume the same doubled economy, the same mobility and vehicle attributes, and the same lifestyles as EIA's 2004 Reference Case forecast, but would yield stronger competitiveness, a more vibrant economy, and more robust security.

Our analysis details the technologies, economics, and business logic of how to get the nation off oil at a profit, but also describes innovative policies that support, not distort, business logic based on the sound tenets of market economics and free enterprise. These policies do not require fuel taxes, subsidies, mandates, or new Federal laws, but simply steer the relevant product markets in a direction that removes four key market barriers that prevent efficiency from competing on a level playing field with supply.

I'll submit for the record an Executive Summary of our findings and a few comments by third parties. The complete analysis is very detailed and integrative, but let me highlight here the five most important points.



- 1- First, with technology available today we can halve our demand for oil within three decades. Saving each barrel will on average cost only \$12—less than half what the government in 2004 forecast oil will cost in 2025, or less than one-fifth of recent prices. We conservatively excluded all external costs from this estimate, and assumed uncompromised performance and attributes of vehicles. The technologies that make this possible are lighter *and* safer materials, better aerodynamics, lower rolling resistance, and hybrid powertrains. All these technologies were commercially available in 2004.
  
- 2- Second, after halving its use of oil, the US can displace the rest from other fuels, primarily saved natural gas and biofuels. Of the remaining demand, one-third can be replaced with modern biofuels. These are *not* fuels such as ethanol made from heavily subsidized corn, but *rather* from the woody parts of plants like switchgrass and poplar. These feedstocks double the yield while saving capital and energy. Without competing for food crops' land or water, such “cellulosic ethanol,” plus biodiesel, can cost-effectively displace some four million barrels of oil per day, create 750,000 rural jobs, and boost farm income by tens of billions of dollars per year.
  
- 3- Third, in the long run, by saving half of natural gas at a cost of one-eighth of today's market price through efficiency, this gas can then be available to displace the remaining oil through via hydrogen in fuel-cell vehicles.
  
- 4- Fourth, winning the oil endgame is about national security through national competitiveness. We need to invest in our core automotive industries to retool them to make the more efficient cars and trucks that Americans want to buy. We need to invest in a secure domestic fuels infrastructure. These investments will yield cheaper trucking with doubled margins, affordable petrochemical feedstocks and airline fuel, lower and more stable fuel prices for all, and restored American leadership in making cars, trucks, and planes.
  
- 5- Fifth, to accelerate adoption, our study therefore suggested modest policy innovations that are market-oriented without taxes, innovation-driven without mandates, and doable administratively. Over the long term, the Federal policy portfolio should be consistent, and it should seek to increase consumer adoption of efficient vehicles while also increasing customer choice with size- and class-based feebates. This instrument combines fees on *inefficient* models with rebates on *efficient* ones—all calculated separately within each size class so one isn't penalized for choosing a large vehicle, but rewarded for choosing an *efficient* large vehicle. This pulls innovations faster from the lab to the showrooms because it encourages buyer investment that incorporates the value of fuel savings over the entire life of the vehicle, not just for the first 2-3 years. It basically matches the



societal and individual discount rates and deals with the information challenge at the same.

In addition to this policy instrument, our book also outlines in great detail six other modest policy options that would enable efficiency to fully compete in the market.

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In conclusion, many more jobs, dollars and security would be created by policies that steer the market towards alternatives to oil, such as efficient technologies and new fuels. The reduction in demand is the single greatest lever we have to permanently lower oil prices. We achieved this between 1977 and 1985, when US GDP grew 27 percent, but oil use fell 17%. That broke OPEC's pricing power for nearly a decade. Lets work together to do it again.

Mr. Chairman, thank you for listening to my testimony.”

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