

# ROLL CALL

## Lovins: Climate — Eight Convenient Truths

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1. Whatever your politics, your opinion of climate science shouldn't change what you do about energy. Whether you care most about national security, or jobs and prosperity, or climate and environment, exactly the same energy actions make sense and make money regardless. Focusing on outcomes, not motives, can thus build a wide and rapid consensus.

2. Protecting the climate is not costly, but profitable: Saving fuel is cheaper than buying fuel. Confusingly, economic theorists omitted those dollar savings, but as many business leaders know and apply, energy efficiency is one of the highest-return, lowest-risk investments on earth. Dow Chemical's \$1 billion investment in efficiency saved \$9 billion. DuPont made billions by cutting its greenhouse gas emissions 72 percent from 1990 to 2004 and will cut an additional 15 percent: Since 1990, it has raised production 40 percent but uses 7 percent less energy. Thus climate protection is not about cost, burden and sacrifice, but about profits, jobs and competitive advantage — sweetening its politics.

3. Since 1975, America has doubled the productivity of using oil and energy and tripled the productivity of directly using natural gas. But today's smarter technology can redouble our oil and gas productivity at about a fifth of those fuels' price and can probably quadruple our electric productivity at an eighth of its price, saving hundreds of billions of dollars a year. Integrative design, a game-changer not yet in any federal forecasts, can even make very big energy savings cheaper than small ones. If McKinsey's excellent analysis of 70 percent global greenhouse gas savings by 2030 at an average cost of just \$6 per metric ton of carbon dioxide had included new technologies and designs, it would show even bigger potential savings at negative net cost.

4. Oil dependence is a problem we needn't have, and it's cheaper not to. A \$180 billion investment to retool the fuel-inefficient vehicle industries and build a modern biofuels

industry could return \$70 billion a year even at one-third of today's oil price, a million new jobs (75 percent in rural and small-town America), a million at-risk jobs saved (mainly linked to automaking) and 26 percent less carbon. And America's warfighters needn't battle over oil we would no longer use.

5. Coal dependence is also unnecessary and uneconomic. Powerful electricity-saving technologies are getting better and cheaper faster than we're applying them, while generation rapidly shifts to low- or no-carbon but lower-cost "micropower" — cogenerating electricity together with useful heat in factories and buildings, plus renewables (except big hydro dams). Micropower in 2006 made one-sixth of the world's electricity and one-third of the world's new electricity. Wind power alone added more U.S. capacity in 2007 than coal did in 2003–07 and more than 2007 nuclear additions worldwide. In 2008, distributed renewables got \$100 billion of private investment and added 40 billion watts globally; nuclear got and added zero. Renewables in 2008 even got more global investment than all fossil-fueled power plants!

6. Nuclear power's commercial collapse continues, with only centrally planned customers and 33 U.S. projects unable to attract a penny of equity investment despite 100 percent-plus subsidies added in 2005. That's good for our wallets, nonproliferation and climate protection: New nuclear plants could save carbon, but two to 20 times less per dollar and 20 to 40 times less per year than the market winners — micropower and efficiency. If climate is a problem, we need the most solution per dollar and per year; costly, slow nuclear expansion would reduce and retard climate protection.

7. Exploring with utility partners the emergent distributed and renewable electricity future, we're finding that both steady renewable sources (geothermal, small hydro, waste-and-biomass combustion, solar-thermal-electric, etc.) and variable ones (wind and photovoltaics) can be diversified in type and location, forecasted, and integrated so they keep the lights on even more reliably than today. Distributed generation and efficient, timely use will massively save grid capacity; needed storage and backup may be less than already exists to manage big thermal plants' intermittence. Utility operators are discovering, as Europeans have, that integrating many smaller and variable generators is different but no harder nor materially costlier than the way they've always coped with the 10 percent to 12 percent failure rate of big power plants and with fluctuating demand: It needs changed operating methods, but not new technologies or equipment.

8. Getting off coal is now feasible at costs ranging from negative to modest. The rough percentage of U.S. coal-fired electricity that can be displaced includes, as a partial list: 100 percent to 150 percent by using electricity efficiently (cheaper than just running an old coal plant even if the plant and grid were free); 50 percent by building the wind power now stuck in the interconnection queue; more than 400 percent by building all cost-effective wind power in available sites (firmed wind power now costs about half new coal power's price or one-third nuclear's); about 40 percent by allowing industrial cogeneration (plus more by cogenerating in buildings); and about 35 percent, immediately if desired, by running coal plants less and existing but underused combined-cycle gas plants more, at an extra cost (around 2 cents per kilowatt hour) less than one-fifth that of building new nuclear plants.

I'd prefer an economically conservative, market-based national energy strategy that allows and requires all ways to save or produce energy to compete fairly, at honest prices, regardless of their type, technology, size, location or ownership. I wonder who wouldn't be in favor of that. Why don't we find out?

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