



A STEP TOWARD A BRIGHTER ENERGY FUTURE POLICYMAKERS BREAK THE LOGJAM, BUT VIGOROUS IMPLEMENTATION IS CRUCIAL

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Trust and Verify

Congress has just passed the most dramatic shift in energy policy in more than two decades (H.R. 6 -The 2007 Energy Independence and Security Act). National policy makers deserve hearty congratulations, but state policy makers and the public deserve a pat on the back too. Such changes do not just happen, they require the demonstration of broad social support and it was pressure from the states and mounting public opinion that paved the way to this change.

A series of lawsuits and policy initiatives at the state level have demonstrated widespread support for a new energy policy, but it will take vigilance by the public and policymakers to ensure that we actually achieve the goals that have been set. Ironically, implementation of two of the most important elements of the new policy – the increase in fuel economy of cars and light trucks and improvements in the energy efficiency of household appliances, will be overseen by the very federal agencies that have been dragging their feet for decades. Both the National Highway Safety Administration and the Department of Energy¹ have lost lawsuits in the past few years that accused them of failing to do their job properly in evaluating the value of energy savings.² Well over a dozen states have adopted the California Clean Cars program, which was far ahead of the lagging federal standards and ultimately prevailed in the courts to clear the way.³

When Ronald Regan was confronted with a dramatic shift in the approach to nuclear arms reduction he coined the phrase “trust but verify.”⁴ We need to take the same approach to the federal agencies that will be in charge of implementing the new energy policy. We “trust” that they will do the right thing, but we need to “verify” that they actually do. Thus, we intend to hold their feet to the fire.

This paper makes the case for vigorous implementation by examining the policy choices in H.R. 6 in the context of the most important aspect for consumers – cost – of the most difficult part of the energy challenge – global warming. To do so we overlay the policies enacted at the

¹ *Center for Biological Diversity, et al. v. National Highway Safety Administration, 2007* (case no. 0671891); *Natural Resources Defense Council v. Abrams, 200* (Docket No. 01-4102)4; *State of New York, et al. v. Bodman, 2005* (case No. 05-7807).

² The Supreme Court recently also ruled that the Environmental Protection Agency has the authority under the Clean Air Act to regulate carbon dioxide, the most important greenhouse gas, as a pollutant (*Massachusetts, et al, v. EPA, 2007* (case No. 051120);

³ Environmental Defense, *An Overview of California's Clean Cars Law*, available at <http://www.environmentaldefense.org/page.cfm?tagID=15503>. The California program was recently upheld in federal court (see *Central Valley Chrysler v. Goldstone, 2007* (Case No. CV F 04-6663 AWI LJO)

⁴ <http://www.reaganlibrary.com/reagan/speeches/farewell.asp>

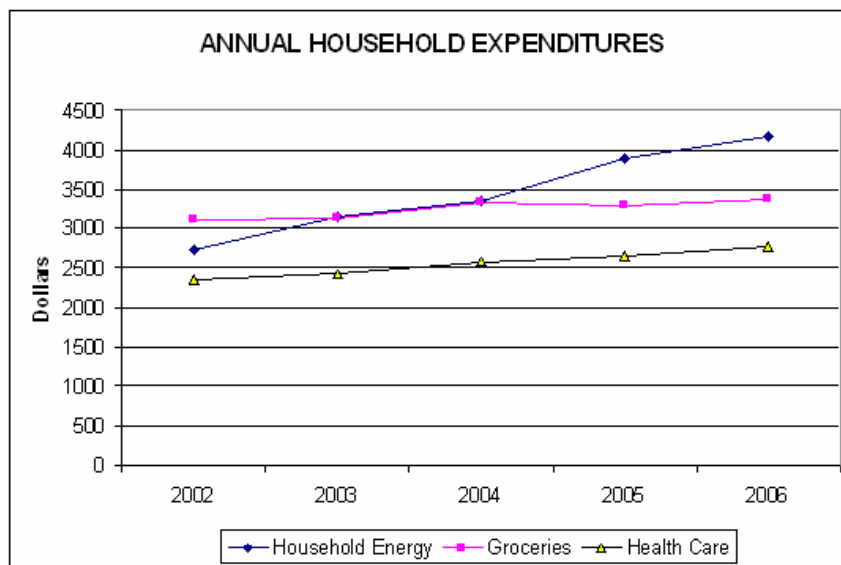
federal level on a recent analysis from McKinsey and Company and the Conference Board, entitled, *Reducing U.S. Greenhouse Gas Emissions: How Much, At What Cost?*⁵ In the study McKinsey looked at the cost of 250 different options for reducing greenhouse gases. This paper shows that the policies chosen by Congress were right on the mark. More will have to be done, but this was the place to begin.

The Urgent Need for Action

These are inherently consumer issues because they affect how much money consumers spend on energy. Indeed, while energy policy has always been an important consumer issue, lately it has become one of the *most* important consumer issues.

Between 2002 and 2006, rising energy prices drove up household expenditures on energy by well over \$2000 (see Exhibit 1). Even before the dramatic increase in gasoline and oil prices

EXHIBIT 1:



Bureau of Labor Statistics, Consumer Expenditure Survey, various years. 2006 estimated by inflating 2005 expenditures according to the Bureau of Labor Statistics, *Consumer Price Index for groceries and health care* and Energy Information Administration, *Monthly Energy Review*, August 2007, for energy prices.

economic problems posed by increasing oil imports, and the increasing concerns about the effects of global warming. While it is possible to isolate the oil import issue because of its unique national security implications, these problems actually form a tightly integrated nexus.

Rising oil prices tend to push up the prices for other fossil fuels (natural gas and coal), which drives up the price of electricity. Conservation in the electricity sector can drive down the

in 2007, consumers were spending substantially more on household energy than groceries or medical care.⁶ With prices still rising, in 2008, the typical American household is likely to spend well over \$4500 on gasoline, electricity, and home heating, far in excess of what they will spend on groceries (about \$3600) and health care (about \$3000).

The energy challenge will continue to mount for a variety of reasons – continuing pressure on oil markets, the national security and

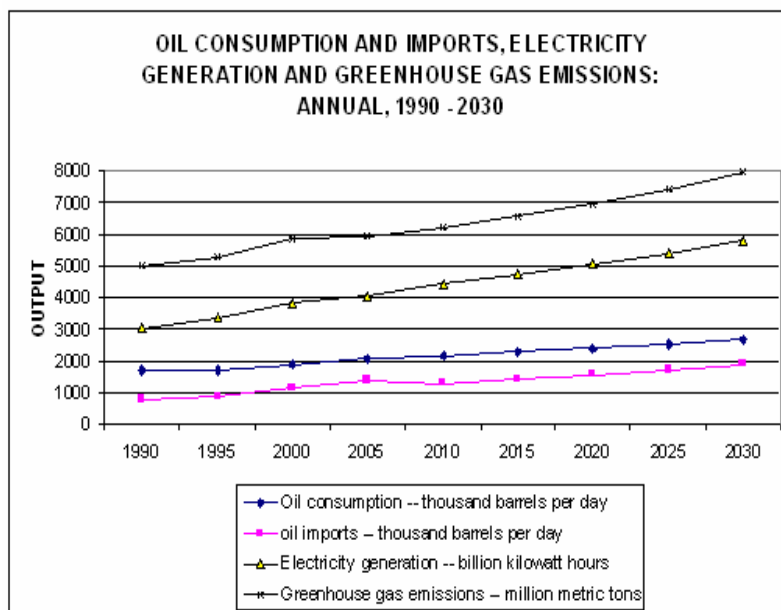
⁵ McKinsey and Company and the Conference Board, *Reducing U.S. Greenhouse Gas Emissions: How Much, At What Cost?*, December 2007.

⁶ Consumer Federation of America, *No Time to Waste*, November 2007, available at: http://www.consumerfed.org/pdfs/No_Time_To_Waste.pdf

price of coal and natural gas, which is the dominant fuel for household heating and cooking. The transportation and electricity sectors are the two largest sources of greenhouse gas emissions by far, accounting for about three-quarters of total U.S. emissions.⁷ Ultimately, whether the central concern is a pocketbook issue, a national security issue, or an environmental issue, approaching the energy challenge as a broad consumer issue makes the most sense. It certainly does not make sense to pursue policies that solve one part of the energy problem, but exacerbate another part of the problem.

Moreover, the energy problems will not go just go away. Business as usual is simply not an option. The base case projections for the Energy Information Administration show substantial growth for consumption in the transportation and electricity sectors (see Exhibit 2). This will

EXHIBIT 2:



Sources: Energy Information Administration, *Monthly Energy Review*, November 2007, Tables 3.11, 7.11, *Annual Energy Outlook: 2007: With Projections to 2030*, February 2007, Tables A8, A11, A18.

have the effect of increasing oil imports and greenhouse gas emissions. Without policy action, by 2030 EIA projects oil imports at 70 percent of total oil consumption and greenhouse gas emissions growing by about one third.

Delay makes matters worse, because it adds to the existing stock of energy consuming durables – autos, appliances, buildings and generating facilities – that are long lived. Delay is especially problematic for the global warming problem because the build up of greenhouse gases is a cumulative process.

The Growing Appreciation of the Challenge

Public opinion polls show that American consumers recognize the urgency of the problem and overwhelmingly support policies to address the energy challenge broadly.⁸ Asked about three policy options – higher fuel economy, requirements for utilities to use more renewable sources for generation and expanded use of biofuels, 85% support a package including all three, and 74% percent support the package when the pros and cons are discussed (see Exhibit 3). Opposition is meager (between 13 and 22 percent).

⁷ Energy Information Administration, *Emissions of Greenhouse Gases in the United States 2005*, November 2006, pp. 14, 16.

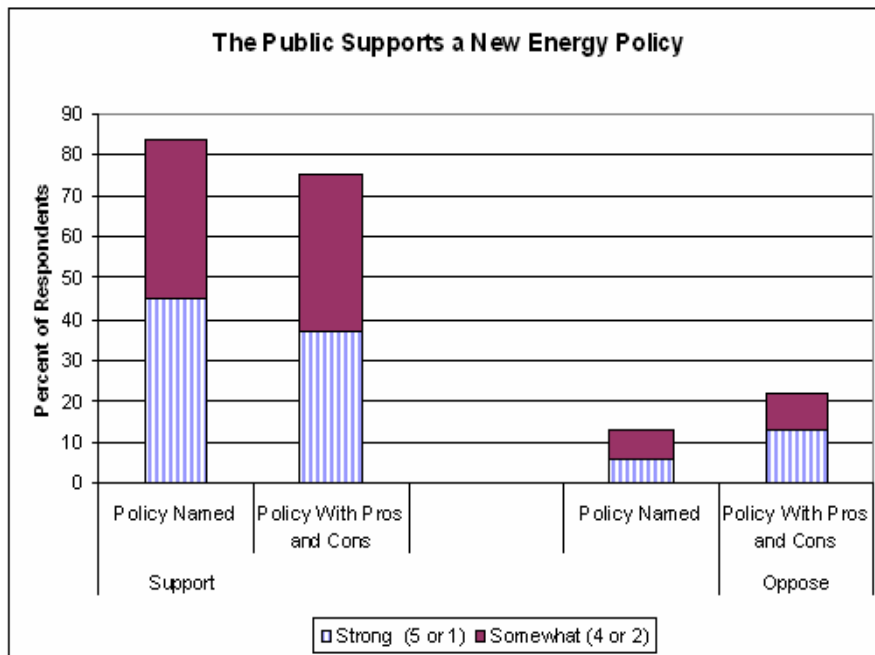
⁸ New CFA Report: Consumer Energy Costs Skyrocket: Strong Support for Congressional Action, Poll Shows, available at: http://www.consumerfed.org/pdfs/Press_Release_No_Time_To_Waste_10-30-07.pdf

Businesses too are recognizing the urgency of the energy problem. As the Conference Board stated in joining with McKinsey in publishing a major evaluation of options for greenhouse gas reduction “[s]ustainability, which includes meeting the challenge of greenhouse gas emissions (GHG) and other aspects of environmental preservation, is rapidly becoming a priority for American business and public policy.”⁹ Similarly, the National Petroleum Council called for a doubling of the fuel economy of vehicles in a report entitled “*Facing the Hard Truth About Energy*.”¹⁰

Congressional Activity on Energy Policy

Congress seems to be getting the message. Last spring, the Senate passed a major increase in the fuel economy standards affecting cars and light trucks, which account for almost half our oil consumption, as well as a major increase in the production of biofuels to replace

EXHIBIT 3:



Source: Consumer Federation of America, *No Time to Waste*, November 2007, available at: http://www.consumerfed.org/pdfs/No_Time_To_Waste.pdf

gasoline. Last summer, the House of Representatives passed legislation to require utilities to increase the share of renewable sources of energy as a source for power generation, to promote high efficiency standards for appliances, to provide incentives for efficiency and renewable sources of energy, and to fund research and development for conservation, alternative fuels, and promising carbon reducing technologies. The House then combined the two bills into a compromise bill (H.R. 6 *The Energy Independence and Security Act*) with some modification and passed it with a large majority (57% of those voting). In the Senate, a filibuster and veto threat blocked passage by narrow margins, but the Senate passed a further modified bill (H.R. 6, *The Renewable Fuels, Consumer Protection and Energy Efficiency Act of 2007*).

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⁹ McKinsey and Company and the Conference Board, *Reducing U.S. Greenhouse Gas Emissions: How Much, At What Cost?*, December 2007.

¹⁰ National Petroleum Council, *Facing the Hard Truth About Energy: A Comprehensive View to 2030 of Global Oil and Natural Gas*, July 18, 2007.

The key elements that emerged from this process in *The 2007 Energy Independence and Security Act*, passed by both Houses are

- an increase of fuel economy for autos and light trucks to 35 miles per gallon by 2020;
- an increase in production of biofuels to 36 billion gallons by 2022, with a major emphasis on expanding production of cellulosic sources;
- adoption of higher energy efficiency standards for household appliances, and
- programs to improve the efficiency of buildings.

Two major sets of policies were dropped from the compromise bill. One was the renewable portfolio standard for utilities. This set a target of 15% of total generation to be derived from renewable resources by 2020. Ironically, while the Senate had passed a renewable portfolio standard of 10% in 2002 and 2004¹¹ and the House passed a 15% standard in 2007, they could not agree on adopting a standard at this moment. The second involved a variety of financial incentives for renewable and new carbon reducing technologies.

This paper conducts an assessment of the major provisions of the energy bill by comparing them to a recent analysis prepared by McKinsey and Company with the support of the Conference Board. We show that in many respects the policies adopted follow the McKinsey recommendations. They take a broad approach; send a strong signal for industry to adopt abatement measures, use a mix of policy instruments and target many of the lower cost options available as identified by McKinsey and Company as available to achieve to address the greenhouse gas emissions. Simply put, this is where a new national energy policy should start.

The Recommendations of the McKinsey Report

The McKinsey report offered a series of broad recommendations in addition to considering 250 specific greenhouse gas (GHG) abatement policies.

The U.S. will need to develop and implement a strong, coordinated program of economy-wide abatement action in the near future, if it is to achieve emissions reductions proposed (in bills currently before Congress) for 2030 at the lowest cost to the economy...

1. Stimulate actions through a portfolio of strong, coordinated policies to capture GHG reductions efficiently across industry sectors and geographies. These policies would need to support development of:

Visible sustained signals to create greater certainty about the price of carbon and/or required emissions reductions: this will help encourage investment in options with long lead times and or/or lifecycles.

¹¹ Union of Concerned Scientists, *The Senate Renewable Portfolio Standard*, January 2004, available at: http://www.ucsusa.org/assets/documents/clean_energy/Senate_RPS_fact_sheet.pdf

A coordinated economy-wide abatement program or set of programs. Because abatement options are highly fragmented and widely distributed across sectors and geographies, any approach that does not simultaneously unleash a full range of abatement options risks missing proposed 2030 reduction targets and/or driving up total costs.

2. Pursue energy efficiency and negative-cost options quickly. Many of the most economically attractive abatement options we analyzed are “time perishable”: every year we delay producing energy efficient commercial buildings, houses, motor vehicles, and so forth, the more negative cost options we lose. The cost of building energy efficiency into an asset when it is created is typically a fraction of the cost of retrofitting it later, or retiring an asset before its useful life is over. In addition, an aggressive energy efficiency program would reduce demand for fossil fuels and the need for new power plants. These energy efficiency savings are not being captured today, however, suggesting that strong policy support and private sector innovation will be needed to address fundamental market barriers. Policy support might consist of standards, mandates and/or incentives to promote carbon-efficient buildings, appliances, and vehicles.

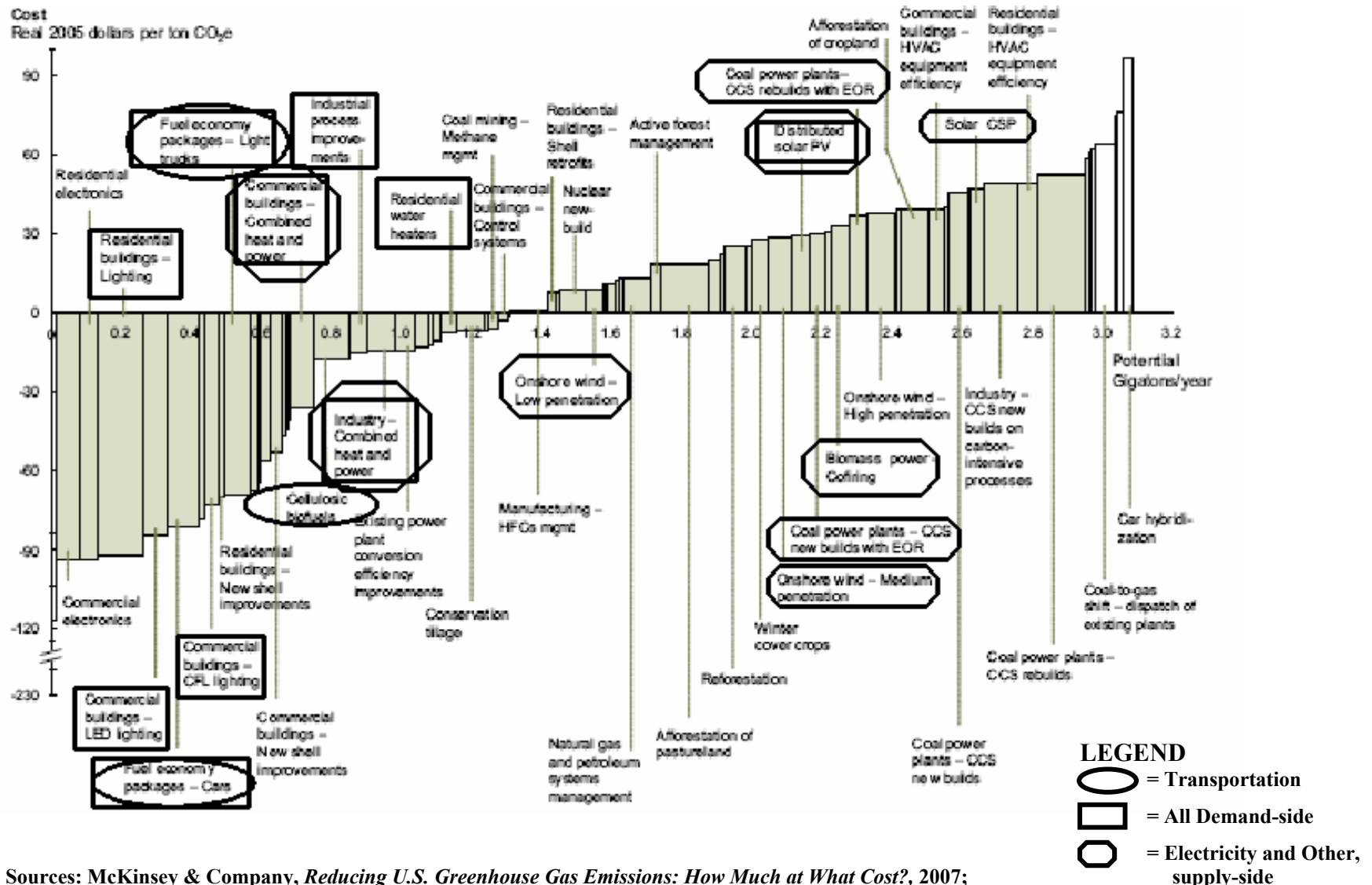
3. Accelerate development of a low-carbon energy infrastructure. Transitioning to a lower-carbon economy will require significant changes in the country’s energy infrastructure. To accelerate development of a lower-carbon energy infrastructure, the U.S. would need to:

Encourage research and development of promising technologies and stimulate deployment. Of the options we analyzed, some 25 percent (e.g. solar photovoltaics, plug-in hybrids vehicles, cellulosic biofuels, CCS) would require additional R&D investment or cost compression to achieve the learning rates and scale required to accelerate widespread adoption.

McKinsey identified a set of policies that would make a substantial (mid-range) reduction in greenhouse gas emissions of 3 megatons at a cost of less than \$50 per ton. McKinsey recognized that greater reductions could be achieved (up to 4.5 megatons) at a higher cost. All of the options promoted in the compromise bill fall in the mid-range case, as shown in Exhibits 4 and 5. We evaluated all the policies that passed one house of Congress in the current session.

Exhibit 4 is the centerpiece of the McKinsey Study – the abatement cost curve. We have identified the policies and sources of gains promoted in the compromise bill laid over the McKinsey figure. It shows the cost and quantity of greenhouse gas reductions for each abatement strategy. The cost of the option is represented by the height of the bar. The quantity it could supply is represented by the width of the bar. We have identified the policies in the compromise bill with ovals for transportation fuels, rectangles for demand-side approaches to conserving electricity and other fuels, and triangles for supply-side approaches to conserving electricity and other fuels. There are a couple of options that impact both the supply-side and the demand side.

EXHIBIT 4: Mid-Range Abatement Options in the Compromise Energy Bill (HR 6)



Sources: McKinsey & Company, *Reducing U.S. Greenhouse Gas Emissions: How Much at What Cost?*, 2007; Office of Speaker Nancy Pelosi, *A New Direction for Energy Security*, December 6, 2007.

Exhibit 5 shows the McKinsey data in a different way. The options are ranked according to their cost on the x axis and the cumulative greenhouse gas reduction is shown on the y axis. We then show the specific policy instruments used in the compromise bill – standards (s), targets (T), incentives (\$) and research (R) – to promote each option. Standards are specific requirements to accomplish a specific goal. Targets are broad goals to be met, leaving the choice of options to the private sector. Incentives include tax incentives of pools of money to be used to implement specific options. Research involves funds to study options.

Taken together, the two exhibits show an orderly supply curve of abatement, which is important to accomplishing the goal over time. More important for this analysis, the compromise legislation triggers these options in a responsible manner. It applies standards to several of the key lower cost options. Targets are applied generally in the mid-range. Incentives are offered for several options across the board, primarily for entities that may be cash strapped and sensitive to the initial cost of the options – e.g. residential appliances, low income households, city governments. Research is targeted at the more expensive options.

We note also that many of the options to reduce the emission of greenhouse gases have negative costs in the McKinsey analysis. This means that the operating cost savings by making the investment in energy efficiency is larger than the cost of the new technology. We have documented this for the fuel economy standards in a number of earlier analyses.

Over the period to 2020, the fuel economy and biofuels components of the bill could save consumers over \$160 billion dollars in reduced gasoline consumption, cut gasoline consumption and oil imports by 60 billion gallons, and cut greenhouse gas emissions by over 650 million tons.¹² Over that period, the appliance efficiency improvement included in the bill could save consumers over \$80 billion and reduce greenhouse gas emissions by over 350 million tons.¹³

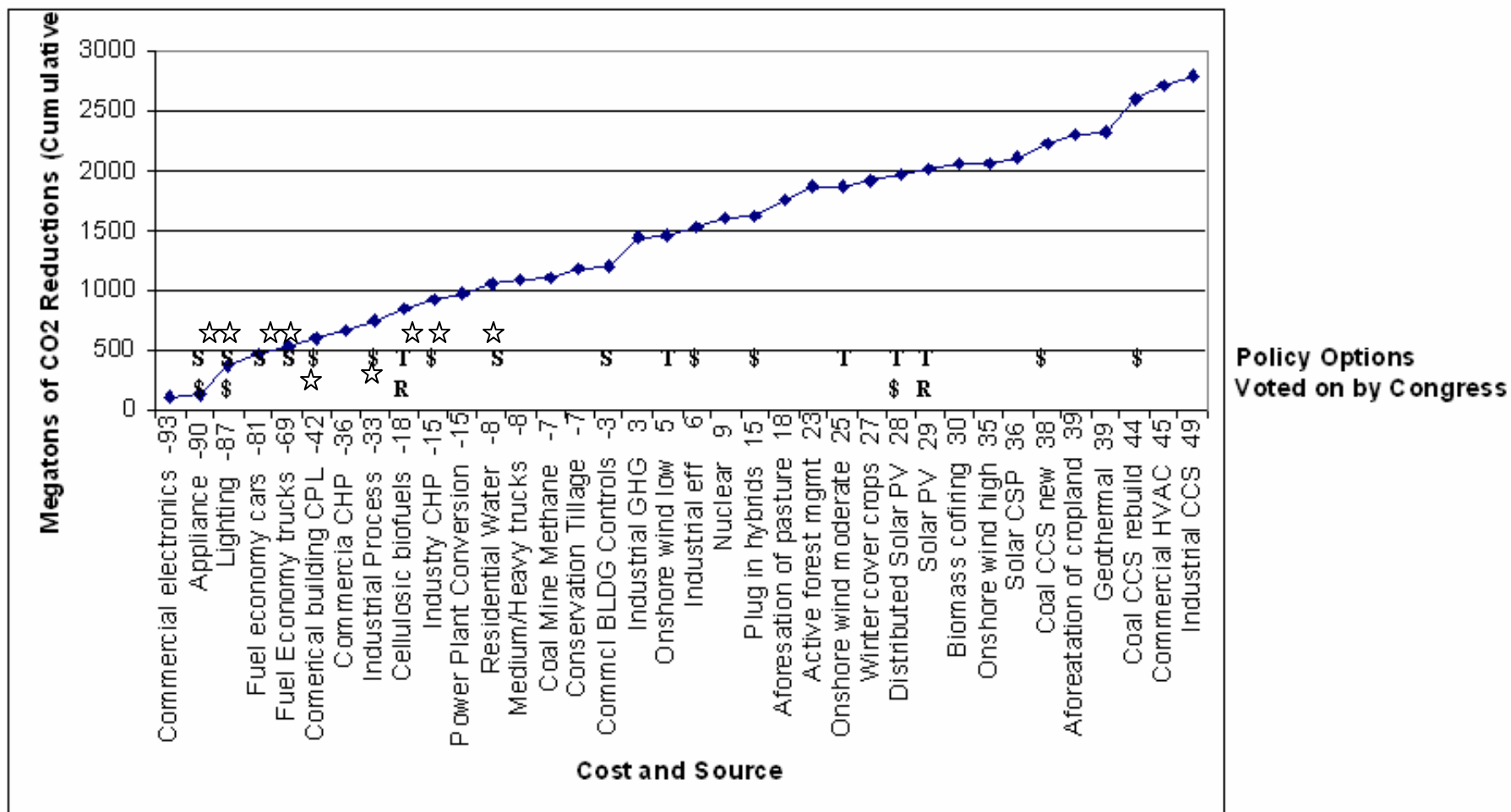
The average cost of the approximately 2.7 megatons of reduced greenhouse gas emissions included in Exhibit 4 is slightly negative \$-5/ton. For the options that are mandated in the compromise energy bill, the average cost is \$-62/ton. For all the options included in the comprehensive energy bill the average cost is \$-31/ton.

The two exhibits also show that the compromise bill takes the first steps on what may prove to be a long march to a brighter energy future. The mandates in the bill address the obvious low cost options in what will have to be a multifaceted approach to responding to the complex energy challenge.

¹² These estimates are derived from Consumer Federation of America, *No Time to Waste*, adjusting for the modifications made in H.R. 6.

¹³ Estimated from American Council for an Energy Efficient Economy, *Preliminary Estimates of Energy and Carbon Savings from Energy Bill Passed in Senate*, December 14, 2007. The carbon savings for 2020 are estimated at 363 million tons. Consumer cost savings are assumed to be proportionate to the 2030 savings based on carbon savings. Current dollars are used to be consistent with the fuel economy and biofuels components of the legislation.

EXHIBIT 5: McKinsey Cost and Source of Greenhouse Gas Emissions Compared to Policy Instruments in the Energy Compromise Bill (HR 6)



Key: S = Standard; T=Target with options; \$ = Tax credit; R= R&D support; ☆ = enacted

Sources: McKinsey & Company, *Reducing U.S. Greenhouse Gas Emissions: How Much at What Cost?*, 2007; Office of Speaker Nancy Pelosi, *A New Direction for Energy Security*, December 6, 2007.

The Continuing Challenge

We conclude that the compromise energy bill is not only good for the environment, it is good for consumers and it is exactly the approach the nation needs. It sends strong signals with mandates for fuel economy and efficiency, which are the obvious first steps on the demand-side, and targets a key supply-side option, cellulosic ethanol. The other more challenging supply-side options will have to be pursued if the U.S. is going to accomplish the overall goals, so there is no reason to wait on those approaches. The spending on incentives is well targeted.

Standing alone, each of the major elements of the compromise bill makes good sense. Taken together they are an impressive and comprehensive policy. While the policies that were enacted are sound, it is unfortunate that many important policies that passed one of the houses were dropped on final passage. The more of the total package we do adopt sooner, the better off consumers and the nation will be. Thus, while the compromise bill is a good start, there is still a great deal of work to be done.

- The heart of the package is regulatory – writing standards for vehicles and appliances – but previously energy policy has stumbled badly in the regulatory process. The nation cannot afford to let that happen this time.
- Policymakers should also revisit the renewable portfolio standard for electric utilities. Electricity is too large a source of greenhouse gas emissions to be ignored and the overwhelming majority of the studies of renewable standards show they will lower the consumer total utility bill because they reduce demand for fossil fuels used by utilities to generate energy and by consumer to heat their homes.¹⁴
- The balance of tax breaks and financial incentives must be shifted away from conventional fuels to alternative sources of energy, efficiency, and new carbon sequestration approaches and technologies.

We applaud the historic step the Congress has taken toward increasing our energy independence, reducing consumer energy costs and protecting our environment by enacting the Energy Independence and Security Act of 2007, and we stand ready to ‘trust and verify’ that the regulatory agencies will act in good faith to implement aggressively the spirit and intent of the legislation. We also strongly recommend that additional action be taken to further ensure our nation’s energy independence and look forward to building upon what the Congress has just accomplished.

¹⁴ In 2005, 12 of the 15 studies on the impact of a federal renewable standard presented to the Senate Energy and Natural Resources Committee found a federal standard would result in a net reduction in overall energy bills for American consumers. The studies are reviewed and compared in Ryan Wiser, Mark Bollinger and Matt St. Clair, *Easing the Natural Gas Crisis: Reducing Natural Gas Prices through Increased Deployment of Renewable Energy and Energy Efficiency* (Ernest Orlando Lawrence Berkeley National Laboratory, January 2005). Wood Mackenzie, *Impact of 1 15-Percent Renewable Portfolio Standard* (June 2007), estimates price reductions, while Energy Information Administration, *Impact of 1 15-Percent Renewable Portfolio Standard* (June 2007) does not.