



A National Dialogue on Energy Security:

The Shell Final Report



Nearly two years ago, Shell began a journey across America. We crisscrossed the country, traveling to 50 cities over 18 months and meeting face-to-face with thousands of people who are concerned about our energy future.

The dialogue was a transforming experience. We had hoped to build some bridges of understanding between the public and our industry. We succeeded. That meant that we educated some people about energy issues, but we also learned from what we heard and were changed – as individuals and as a company – in the process.

In this report, we want to share with you what we did and why, what we heard from Americans and what we learned in the process. Most importantly, we want to put some meaning around the experience – for Shell, for the energy industry, for policymakers and for everyone whose life is touched by energy. And finally, we want to issue a call to action for each American to find a role and a voice in shaping our energy future.

Listening to America's Concerns

"A National Dialogue on Energy Security," like many transforming ideas, was born out of frustration.

When already-rising oil prices spiked after the 2005 hurricane season, Americans were frustrated and openly hostile toward the oil industry. We were frustrated, too, by the level of misinformation and mistrust in the marketplace. Not just customers, but regulators and policymakers seemed to believe we were manipulating the market for our own purposes. Recognizing that our industry's ineffectiveness in communicating the key role we play in the global economy for the last decade had contributed to the situation, we decided to take action.

If lack of communication helped create the problem, we believed openness and transparency would help solve it. We created the dialogue with two goals: to build Americans' awareness of the energy issues we face, and to gain a better understanding of their perceptions and priorities. For us, listening was far more important than telling. Ultimately, we wanted to find a way that together we could work toward a secure and environmentally responsible energy future.

We visited 50 cities between June 2006 and November 2007. We delivered speeches at 53 events – luncheons, dinners, breakfasts – and hosted 38 town hall sessions where we asked community leaders to give us their priorities on energy resources and energy policies. We held smaller meetings with elected officials, non-governmental organizations (NGOs), students and educators. In all, we met with more than 15,130 Americans and conducted more than 100 local and national media interviews – potentially reaching a total of nearly 150 million people.

We asked audiences what we should be doing to increase domestic oil supply. We asked them what we should be doing as a nation to manage energy demand/consumption. And we asked them to describe their vision of the U.S. energy portfolio in the coming decade and beyond.

We listened – and listened – and listened.

We heard Americans in every city say that they are struggling to come to terms with the new energy reality. The swing, within less than a decade, from \$10 oil to \$100 oil has clearly had a financial impact.¹ Yet few people were focused solely on bringing down the price at the pump. In fact, a surprising number of people suggested that the federal government should increase gasoline taxes to fund accelerated research into alternative fuels.² As one Philadelphia participant put it: "There's not enough pain to drive the market toward change... [we] need legislation, taxation and incentives."

And more people than we expected were aware of and concerned about environmental issues such as greenhouse gas emissions and climate change. "If we can't manage emissions," said one Fort Worth participant, "we need low emissions alternatives like renewables and nuclear." There was isolated support for concepts such as a carbon tax,³ but little understanding of how approaches such as cap-and-trade might lead to emission reductions.

However, we found few who were ready to give up the comforts of an energy-fueled lifestyle. Most were hopeful that the solution could be found without forcing them to give up their SUVs, their solo commutes and the convenience of instant and unfettered mobility.⁴

We agree with the many Americans who told us that technology will provide the ultimate solution to balance energy and environmental concerns.⁵ We heard high interest in and curiosity about hybrid and plug-in technology, hydrogen fuel cell vehicles and other high-tech solutions. As one Portland community



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leader told us: “We need more energy engineers to achieve the correct balance between the need for more energy and the need to reduce CO₂ emissions.”

But many people were overly optimistic about how quickly we can make the technology leaps that are needed. When asked to envision the energy mix in a decade from now, estimates of the percentage of alternative fuels in the portfolio ranged from 10 percent to 100 percent.⁶ Reflecting the same optimism, one Atlanta participant said, “With a Manhattan Project to develop this technology, the U.S. can be energy independent.”

Regional Priorities

While priorities varied by region, nowhere in the United States did we find people who were indifferent to or unaware of the U.S. energy challenge. Clearly, the concerns are universal, regardless of where Americans live and work. But the regional “slants” to the energy challenge brought home to us even more the importance of

understanding the day-to-day realities of the people we met:

- **Northeast.** Northeast residents emphasized conservation through utilizing new technologies, increasing the use of mass transit systems and educating Americans on measures to decrease their energy consumption. In the Northeast, we repeatedly heard the desire for increased government involvement and energy security policies: incentives and taxes and mandates to encourage individuals to conserve. There was also concern about the regions from which we receive oil imports, especially those from Middle Eastern sources, and we heard that residents wanted to increase our domestic energy independence.
- **Northwest.** In the Northwest, residents were strongly focused on conservation and new technology. Reducing demand was a priority, especially in Portland, where a “Peak Oil Task Force” has been formed by the city. In an area served by the Alaska pipeline, we did find support for increased access to Alaskan resources, with the caveat that environment and safety must be paramount.
- **West Coast.** Californians support diversifying the energy portfolio by further utilizing technology, an area in which the state has particular expertise, to solve the energy challenge, with a particular emphasis on renewables such as solar and hydrogen. To achieve this, they cited increasing renewable research and development activities in the public and private sectors, as well as looking at other alternative sources such as nuclear power. Residents focused on managing demand of fossil fuels through conservation, rather than increasing reserves to achieve energy security.
- **Southwest.** In the Southwest, we heard support for renewables such as wind and solar energy, resources that are abundant in the region. Nuclear energy was also a hot topic – some love it, some hate it. We also found high levels of interest in social action: energy education, energy-efficient communities, incentives to encourage conservation and use of mass transit. Residents also were interested in unconventional energy sources closer to home, such as oil shale, if they can reduce dependence on foreign oil.
- **South Central.** South Central residents, who are closest to the nation’s oil-producing epicenter in the Gulf of Mexico, also seemed most pragmatic about the need to continue using fossil fuels in the near future. They were most likely to support increased domestic exploration and production. These residents also supported alternative fuels, clean coal technologies and stronger public policies on energy.
- **Southeast.** Further along the coast, in the Southeast, we found a focus on education. Residents want the public to be more aware of the current energy situation – and they also emphasized the need to educate elected officials. We found considerable support for increased access to domestic resources and greater refinery output, again balanced by a concern for safety and environmental protection. Clean coal and carbon sequestration were in the mix. We also heard a call for greater fuel efficiency,

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through automotive technology improvements and Corporate Average Fuel Economy standards, commonly referred to as CAFE standards. Throughout the state of Florida, residents told us that they did not want, and would fight, new exploration and production off the Florida coast.

- **Mid-Atlantic.** In the Mid-Atlantic region, there was considerable emphasis on incentives for conservation and use of alternatives: higher gasoline taxes, legislated energy efficiency and promotion of hybrid vehicles. At the same time, we received support for increased domestic access to reduce our dependence on foreign oil.
- **Rocky Mountains.** Among Rocky Mountain residents, we found support for development of the region's oil shale resources with environmentally friendly technology. We also heard a call for incentives, taxes or "punishments" to promote efficiency and conservation. From elected officials, support for oil shale was mixed. Some described its development with enthusiasm, others more cautiously, but officials universally expressed the need to ensure environmental caution.
- **Midwest.** Midwesterners chose a middle ground. While there was slightly more emphasis on ethanol and biodiesel as an alternative to oil, in general participants were focused on educating both students and the general public and encouraging conservation. We heard support both for increasing domestic oil production and for diversifying the energy portfolio through alternative fuels.



A Life-changing Experience

When we chose to conduct a face-to-face tour, we understood the power of human interaction to break down barriers and change people. What we didn't expect was that we would be changed as much as our audiences were.

In room after room, we saw people respond to seeing the human side of "Big Oil." And it wasn't just the power of one person – there were 250 Shell leaders and professionals who participated in the tour in one way or another over its 18-month duration. People told us that they were surprised both by what we had to say and the effort we were making to reach out.

Over and over, skepticism ... "When are you going to try to sell us something?" ... turned to appreciation, and cynicism turned toward problem-solving. In Little Rock, one middle-aged man with a long gray ponytail came into the presentation clearly skeptical. His arms were crossed and his face was closed. But he listened. And when he heard what we had to say, the effect was visible in his entire demeanor. By the end of the question-and-answer period, he was smiling and nodding his head in agreement.

When tour attendees brought up climate change, we stated our response: "The debate is over. We are making changes in our business practices, and we are ready to work within a government-led framework that addresses greenhouse gas management, enabling markets to operate." It was a welcome message. Even a member of an environmental non-governmental organization in Tucson, who acknowledged that his organization was suing the U.S. government to stop Arctic development, also acknowledged his belief that the environmental behaviors exhibited by Shell are credible. As they left the town halls, people shook our hands and said, "This was time well spent."

We felt the same way. The experience was humbling – if anyone at Shell had ever considered that we could just tell our story and prescribe the answers to the American people, that mindset has now evaporated. The American people want to think through the issues themselves and apply their own reason and experience to the solutions. The experience reinforced for us how critical it is to get public policy right so that we can move forward in ways that Americans can feel good about.

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We started out believing that we were on the right track with our plans, and we still believe that. The message that we heard is that people are so greatly concerned about greenhouse gases and want energy companies to care about this as much as they do. This message reaffirms our commitment to this issue. We have signed on to the U.S. Climate Action Partnership to join our voices with others in establishing a national greenhouse gas management framework.

We also became more committed to the importance of a comprehensive national energy policy that addresses all facets of our energy path, from access to domestic resources to maintain our supply for the short term, through investments in the science and technologies that will meet our long-term needs. We heard a call for public policy to create a consistent framework within which individuals and businesses can operate. The Energy Independence and Security Act of 2007, which passed after the tour ended in November, is a partial move in the right direction, just as energy bills in 2005 and 2006 reflected partial steps. But there is much more that needs to be done.

What It Means

The message we heard from our conversations across the country was both heartening and frightening.

It was heartening to see that Americans are taking energy issues seriously. Attendance at events was high, and those who came were very engaged on the issue. After almost every speech, we spent almost as much time in questions and answers as in the presentation itself, and the questions, although sometimes quite pointed, were probing, legitimate queries from people seeking answers to a complex issue: “If the U.S. can’t achieve energy independence, why push for more domestic production?” “Why aren’t you investing more in alternative fuels?” “What is the timetable for oil shale?” People wanted to learn more about such areas as nuclear energy, unconventional oil and gas, and clean coal technology.

The practical recommendations we heard – from using education to help Americans understand the costs and consequences of energy choices, to providing incentives for energy efficiency – reinforced our faith in the common sense of American consumers and voters.

There was a futuristic bent, expressed best by one Louisville participant: “Realistically, what are the probabilities that new, cutting-edge research and technology will come along and create new sources of energy where none existed before, such as quickly and efficiently converting carbon waste back into crude oil or developing an efficient process for creating hydrogen?”

What was most frightening? The overwhelming disconnect between the perceptions of many consumers and the hard realities of the energy picture. This is the crux of our dilemma as a country in determining an energy path forward – the belief that there are easy answers that are readily available, when in reality the choices we have to make will not come easily or swiftly.



If we in America fail to differentiate between short-term and long-term situations, we will find ourselves at a crisis point while we wait for the long-term solutions to develop from experimental stages to commercialization. One insightful Portland participant realized that the question to ask is, “What energy bridges are we building today to get us from short-term to long-term solutions?”

This disconnect between future vision and current reality emerged in town hall comments such as the one we heard in Philadelphia. When we asked what we should be doing to increase domestic oil supplies, one response was, “Do nothing – we don’t want more oil supply. We want to drive markets toward non-fuel energy sources.” Yet of all the available solutions, doing nothing is potentially the most dangerous.

Unrealistic expectations were more the norm than the exception. This Minneapolis resident’s vision of the energy mix a decade from now was not isolated: “We need to decrease our use of fossil-fuel-based sources by 70 percent to stem the trend toward global warming. I see a mix of solar, wind, biomass, along with greater efficiencies allowed through new technologies.”

The anxiety around imported oil was clear. Those we spoke with recognized the risk that can come with dependence on sometimes hostile or unstable regions of the world for such a critical commodity. They see that the more than \$2 trillion that importing nations, such as the United States, have paid to exporting nationals in the past five years for imported oil is a high price – especially when much of that money could be otherwise pumped into the U.S. domestic economy.⁷

Linked with this is a deep-seated fear of seeing the quality of life degrade for our children and their children if our ability to use energy is significantly constrained. In spite of this fear, there is still hesitation to embrace additional oil and gas infrastructure in our own country. “Nimbyism” (“Not In My Backyard”) was present nearly everywhere.⁸

We also found a strong streak of visceral anger and zero sympathy toward the oil industry. We were somewhat prepared for this, based on the “hate mail” we had been receiving since prices first spiked in the post-hurricane supply shortage. However, when we probed, we found the anger stemmed from two sources: first, a simplistic view of the industry, based on the “Big Oil, big profits” image in the media; and second, a sense that the current situation was our fault – that if we had anticipated this demand, we could have increased the supply or pushed alternative technology faster. As one cynic in Portland put it, “Conservation could allow a new source of supply, but what’s in it for Shell?” Many view alternatives as a way to curtail their uncomfortable dependency on the oil industry.

There was little confidence in the ability of either elected officials or corporate leaders to develop an effective solution. We found people more willing to trust non-governmental organizations – not necessarily as the possessors of the right answers, but as watchdogs that would keep government and business honest.

Anger also was directed against those perceived as using excessive energy. Participants in many cities spoke of “...punitive taxes for those driving gas-guzzling vehicles like SUVs.” There was a sense of righteousness around this issue that was sometimes disturbing. One El Paso resident suggested that we should “force town hall attendees to arrive by bicycle, even in the rain.”

This anger toward the industry and toward their fellow energy consumers can be a barrier to finding common solutions and can create a division between the energy “haves” and “have nots.”

Fortunately, we found that open communication can alleviate some of the anger. Those who attended our presentations and town halls often left with a better sense of how global markets drive prices and how we have been working on technology solutions for years, even when prices were low. Governor after governor and mayor after mayor, while acknowledging infrastructure and permitting obstacles, invited new projects for their state or city for the jobs and economic improvements they could deliver.

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The Disconnects – Seven Energy Myths

In our travels and discussions, we found seven major disconnects – areas where myths and misperceptions stand in the way of real solutions:

MYTH ▶▶▶

1. **The Myth: Oil prices are artificial.** We found this idea accepted among both individuals and government officials with whom we met. There is a belief that energy companies such as ours can set or even manipulate the price of oil higher or lower at will.⁹ This leads to either expectations that oil companies acting independently can solve the energy problem (one participant suggested we “...raise the price of crude to enable unconventional sources”), or resistance to seeing the oil companies as participants in the solution. This attitude was reflected in one Charlotte resident’s comment that, “The energy mix will not change – oil companies will reduce prices to keep alternatives out.”

REALITY ▶▶

The Reality: Oil trades on a global market. Price is affected by supply, demand, fears and speculation like any other trading market. The price is very transparent. The major oil companies (including Shell), despite being large, have relatively small shares of global oil reserves and production. Approximately 77 percent of proven oil reserves are under the control of national oil companies with no equity participation by foreign, major oil companies. The major oil companies control less than 10 percent of the world’s oil and gas resource base.¹⁰ These small shares ensure that private oil companies must behave competitively in the world oil market and cannot individually cut output and influence world oil prices. The Organization of Petroleum Exporting Companies (OPEC), an international cartel of oil-producing countries, is the single most important production-related entity. OPEC’s objective has been to manage its members’ collective supply through individual producer quotas in order to influence world oil prices.¹¹ The 13 OPEC member countries collectively hold more than 70 percent of proven oil reserves and produce about 40 percent of the world’s daily consumption of crude oil.¹²

MYTH ▶▶▶

2. **The Myth: We’re running out of oil.** The “peak oil” theory came up in nearly every market. While this wasn’t necessarily surprising, the pervasive nature of this strongly held belief was. Similarly, in a related survey that we conducted, more than half of the respondents said global oil production will peak within the next 20 years.¹³ This leads people to dismiss oil and gas from being part of the future energy portfolio. Also not surprisingly, we found that few people were aware of the scale of untapped domestic resources on the Outer Continental Shelf, or of the huge undeveloped unconventional resources, such as oil shale, oil sands and heavy oil.

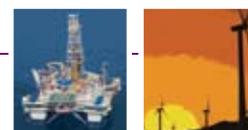
REALITY ▶▶

The Reality: Oil resources are out there, should we choose to develop them. When individuals think of peak oil, they tend to think that a sudden drop in global production follows soon thereafter. We don’t expect to see this on a global level. It is possible, though, that we will reach a plateau in the next few decades, followed by a gradual decline of conventional oil and gas production.

There is no shortage of molecules of oil and gas in the ground. However, there are multiple influences that will affect the pace at which this can, and will, be developed.

On the demand side, we are seeing a step-change in the growth of demand for energy, particularly as emerging economies, such as China and India, enter more energy-intensive phases in their economic development.¹⁴ It will be vital to become more efficient in how we use energy and to develop unconventional sources of oil and gas (such as oil sands), biofuels and vehicle electrification to meet this surge in demand. All energy sources added together will struggle to match demand – we will need all of the energy we can get.

On the supply side, many existing reservoirs are facing a natural decline in production. This means that high levels of continuous investment are required just to maintain status quo or to invest in enhanced oil recovery (EOR) techniques. In addition, ever-increasing levels of investment are required as smaller fields are developed and more complex frontier environments become the targets for hydrocarbon exploration and production, alongside the development of unconventional oil and gas supply. There are also uncertainties about the pace of investment in sensitive regions such as the Middle East and Latin America. Naturally, major resource-holding governments seek also to develop their sovereign reserves at a pace that matches their own economic goals.



There are plenty of uncertainties, which is why we explore future possibilities through scenarios. Looking at the oil picture, we find it misleading to think in terms of concepts like peak oil or try to put a timeframe to it. The significant economic point comes when tensions arise between the growth of global demand for energy and the pace of investment, production and supply. We believe we are entering such a period and will face this increasingly for some time to come.

3. **The Myth: We have to choose between energy and the environment.** There is an assumption that we can't have conventional energy *and* a clean environment. As a result, we found that many policymakers want to block nearly all new access to existing resources on environmental grounds. One town hall participant shared this perspective: "We should not increase supply. We need to help find ways to reduce demand."

◀◀◀MYTH

The Reality: The energy industry has made tremendous advances in finding ways to reduce the environmental impact of oil and gas production. Few people realize the level of energy efficiency and environmental stewardship Shell and others have incorporated into every facet of exploration and production. Technology developed for offshore exploration and production has enabled us to reduce the environmental footprint of onshore operations. New construction techniques applied in the Gulf of Mexico enabled us to survive the 2005 hurricane season without a single major offshore oil spill. And improved emissions control technology has benefited the air quality around our refineries. New technologies such as "clean coal" can do even more to protect the environment, if we are willing to make the upfront investment.

◀◀REALITY

4. **The Myth: Importing energy is better than dirtying our own backyards.** In meeting after meeting, we heard resistance to new infrastructure from both community members and government officials. Especially in the Northeast, we heard complaints about high supply prices, and in the next breath a refusal to consider new infrastructure that would alleviate the supply bottleneck. The same infrastructure phobia has been applied to accessing domestic oil and gas resources. In several town halls as well as government meetings, we heard comments like this one: "Use foreign oil, and save ours for as long as possible."

◀◀◀MYTH

The Reality: Environmental issues, especially issues of greenhouse gases and climate change, are global issues. By using foreign supplies, we reduce our ability to manage and control the environmental impact. As one participant said, we need to "get rid of the 'not in my backyard' syndrome with regard to infrastructure and facilities." The United States is the only country in the world that restricts the use of its own energy resources while transferring trillions of dollars of wealth to other countries in order to import energy. In doing so, we demonstrate a narrow view of environmental protection. People we spoke with were shocked to discover the perverse nature of our public policy in this regard. For example, while the United States bans drilling within 125 miles off the coastline, Cuba is able to drill within 45 miles off the coast of Florida.¹⁵ We agree with the many people we spoke with who urged us to move forward with "safe and environmentally friendly methods of tapping into the U.S. oil supply."

◀◀REALITY

5. **The Myth: Alternative fuels are a "magic bullet."** As noted above, the belief that alternative fuels can be widely available in the next decade presents a serious challenge to finding realistic short-term solutions. More than two-thirds of people we surveyed in a recent poll said that increasing the use of alternative fuels was the best way to ensure adequate supply while keeping the economy going.¹⁶ Biofuels are viewed as an immediate possibility, hampered only by resistance from "Big Oil." At presentations and town halls, we heard John F. Kennedy's challenge to put a man on the moon quoted more times than we could count. We also heard recommendations from "...put a solar panel on every roof" – to achieve "...100 percent energy use from solar and wind and wave" – and to "...take the money that is currently being used to search for oil and use it to develop better alternatives to oil."

◀◀◀MYTH

The Reality: We believe in alternative fuels – but not in magic. The International Energy Agency estimates that under a "business-as-usual" scenario, alternative energy will account for 8 percent of U.S. energy use in five years. It concludes that aggressive policies promoting alternative energy use could raise the percentage to 9.5 percent in the near term – well below what many respondents projected.¹⁷

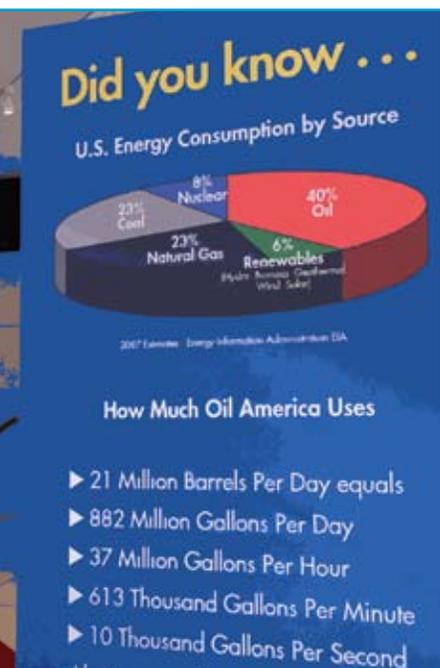
◀◀REALITY



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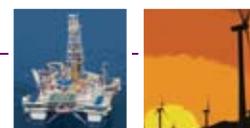
Shell has been investing significantly in alternative technologies since 1997, and we know that technology can be accelerated only so much. Some of the examples of the challenges:

- Solar.** We had been in the silicon solar photovoltaic cell business since 1997, and we eventually realized that for Shell, the commercial feasibility of developing a material business in a reasonable time frame was doubtful. That business was sold. Now we are pursuing a new thin-film technology that promises to be much more efficient, but we – and others in this field – are far from being able to put a solar panel on every roof. Nor are consumers ready to pay the cost. Right now, solar energy costs between 20 and 30 cents per kilowatt-hour, up to three to four times the cost of other existing fuels for electricity generation.¹⁸
- Ethanol.** In 2006, the United States produced 319,000 barrels a day (4.9 billion gallons a year) of this biofuel, mainly from corn. That is just a small fraction (3 percent) of the 9.7 million barrels a day of gasoline fuel consumers used in the United States during peak summer time. Ethanol production rose 19 percent between 2005 and 2006.¹⁹ It is expected that 2007 data will show an even greater increase. But growing domestic ethanol production at this pace over the next five to 10 years will prove highly challenging. Food and other agricultural prices skyrocketed this past year in response to this new demand for corn. Cellulosic technology will produce more ethanol for sure, but the technology and timing, while legislatively demanded, are less certain.
- Wind.** Audiences frequently cited wind power as a promising alternative. Shell has been heavily involved in wind as an energy source. We also view it as a viable alternative, but scaling it up to a significant level is a challenge. The American Wind Energy Association estimated in 2007 that the industry would install more than 3,000 megawatts of new wind generation infrastructure by year-end, and that about 31 billion kilowatt-hours (kWh) would be generated by wind power in the U.S. in 2007. While this is enough electricity to power the equivalent of nearly 3 million average homes, wind power currently accounts for less than 1 percent (0.65 percent) of U.S. electricity usage.²⁰ Scaling up is also challenged by the fact that many appropriate sites for wind turbines are located far from existing energy infrastructure, requiring development of additional transmission capacity as well.
- Hydrogen.** Hydrogen is the world’s most plentiful element, and is part of the Shell portfolio of future low-carbon fuels. As a fuel, hydrogen offers the potential to substantially reduce emissions and increase energy security. There are obstacles to be overcome, but hydrogen could become a commercially viable transport fuel in the coming years. Building on its strong technology platforms, we are developing low-carbon hydrogen supply chains, which in the longer term may rely increasingly on renewable sources of energy. We already have hydrogen fueling stations in the U.S., Europe and Asia and are working to develop mini hydrogen networks. We partner with car manufacturers and local governments to coordinate the building of hydrogen fueling stations in areas where fuel cell vehicles are being introduced such as the Los Angeles and New York City metro areas. Since 2004, Shell has operated an integrated gasoline/hydrogen station in Washington, D.C. and opened two new hydrogen stations in 2007: one in White Plains, New York, and another in Shanghai, China. We plan to open our first hydrogen station in Los Angeles in the spring of 2008.



Alternative fuels also require corresponding technology changes. Historically, it has taken 15 to 20 years for new automotive technology to move from concept to widespread commercial production.²¹

Plug-in electric cars or hydrogen fuel could play an increasingly important role in diversifying fuel choices in the transportation sector. Today, however, they only represent a small experimental place in the market. And in the meantime, many of the cars and trucks on the road today, and those that will be built in the next five to 10 years, will still be in use a decade from now or longer and will still rely on conventional fuels.



6. **The Myth: We can conserve our way to energy security.** Many people cited conservation as the most important strategy. As one Pittsburgh resident saw the answer: “Penalties and sanctions for those who waste...incentives for those who conserve.” Solutions ranged from adjusting thermostats and encouraging mass transit to “draining the last drop of oil from an oil can.”



The Reality: In our discussions, we have advocated a “culture of conservation” that relies on energy-efficient technologies, but that cannot be the full solution. Even to hold gasoline consumption at 2005 levels by 2020, assuming implementation of the new CAFE standards, will require the average American driver to reduce fuel consumption by about 20 percent – for example, by taking mass transit once a week.²² That does not reduce our dependence on oil – it just maintains the line. And yet, as one Cincinnati town hall participant asked: “Who among us is willing to lay down their car keys and take mass transit?” Few hands went up when we asked for volunteers.



7. **The Myth: Oil and gas companies make huge profits and are sitting on mountains of cash.** Oil and gas company profits are routinely front-page news after quarterly earnings announcements are published, leading to questions about what happens to all of that money and why energy prices are so high.



The Reality: Oil industry profits are in line with other major manufacturing industries. In the U.S., for example, data compiled by the American Petroleum Institute (API) for the third quarter of 2007 shows the oil and natural gas industry earned 7.6 cents for every dollar of sales, compared to other industries such as beverage and tobacco products (21.6 cents earned for every dollar of sales) and pharmaceuticals and medicines (18.8 cents earned for every dollar of sales).²³ Additionally, over the course of the year Shell invested nearly as much as it earned in important new projects around the world to secure a sound energy future.



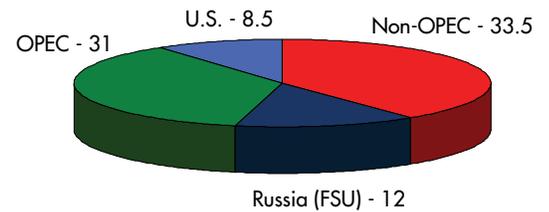
The “Razor’s Edge” of Oil Supply and Demand – the Three Hard Truths

If the disconnects between energy myths and realities are the crux of the dilemma we currently face, the “Three Hard Truths” point us toward that razor’s edge of energy supply and demand, adding even greater urgency for realistic solutions to our energy challenge for the short term, medium term and long term.

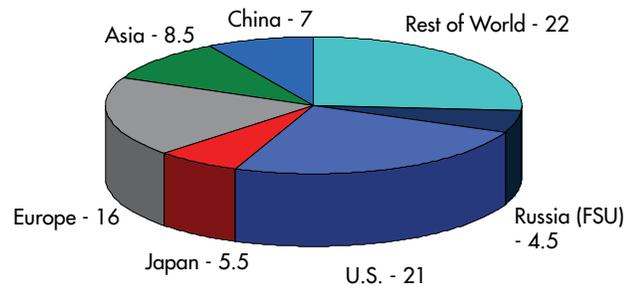
One: Global demand for energy is accelerating. A recent report by the National Petroleum Council looked at energy data and projections made by the U.S. Energy Information Administration and the International Energy Agency. From 1980 to 2000, world energy demand grew at about 1.7 percent per year. Since 2000, that trend has accelerated, driven by development in China and India coupled with continued expansion in developed economies.²⁴ The United States, however, still accounts for a quarter of global demand. We use 10,000 gallons – enough to fill a backyard swimming pool – every second of every day,²⁵ and 20 railcars of coal every minute.²⁶ Looking forward and assuming adoption of alternative policies, even the lowest projection shows that energy demand will continue to grow at 1.4 percent, while the highest projection is that demand will grow 2.5 percent.²⁷ At that rate, demand in 2030 will be more than double what it was in 2000.

Two: “Easy oil” will not keep up with demand. While we do not subscribe to the peak oil theory, the truth is that, particularly outside the Middle East, the readily accessible sources of conventional oil are being depleted.²⁸ To tap new resources requires hard choices. In some cases, that means spending more on exploration and development to find and tap ultra-deepwater resources as we are doing in the Gulf of Mexico. It means technology investments to convert oil sands to useable oil fluids as we are doing in Canada. And it means making the policy decisions necessary to grant access to areas where federal restrictions currently limit exploration and drilling.

2007 Est. World Supply: 85 Million Barrels/Day



2007 Est. World Demand: 84.5 Million Barrels/Day



2007 Estimates - Energy Information Administration EIA



Three: Using more energy now means more carbon dioxide. We believe that by 2100, the world will have a radically different energy mix. The challenge is how we get there. Over the short term, most available energy sources are fossil-fuel-based. No matter where we obtain domestic or imported resources, our growing appetite for energy comes at a cost to the environment in the form of carbon dioxide emissions from both mobile and non-mobile sources. Without intervention, current government projections show that U.S. greenhouse gas emissions will rise 35 percent by 2030.²⁹ Around the world the rise will be as great, if not greater. Any path forward needs to include greenhouse gas management as part of the equation – thus the Shell position to support a comprehensive cap-and-trade policy led by government.

How Did We Get Here?

Over the 18 months that we conducted our dialogue, we were able to observe a growing understanding among Americans of some of the factors driving today's energy situation. In June 2006, audiences were still coming to grips with the reality of higher prices, and many were looking for someone to blame. Now, more of those we meet with are aware of some of the dynamics behind oil prices, as well as prices at the pump. But many still wonder how we reached this tipping point between supply and demand with so little warning.

Energy companies have to take some blame, primarily for a failure to communicate. One town hall participant asked bluntly, "How come we're not being informed about the problem and the alternatives?"

As an industry, we have not done a good job of building public awareness of energy issues.

We have also been taken to task for not investing in alternatives long ago, but it was difficult to fund research and defend it to our investors when oil prices were so low that few would want to pay the high price for an alternative fuel.

The factor that was not readily predictable was the pace of industrialization and associated oil-demand growth in developing countries, most notably China and India. As the National Petroleum Council report points out, these countries are just reaching the point where individual wealth and energy consumption start to accelerate. For example, the number of cars in China more than doubled between 2000 and 2006, although even with that increase, there is just one car for every 40 people. (Compare this to the United States, where we have one car for every two people.)³⁰ Oil trades on a global market so as these new demands put pressure on the supply, prices inevitably rise.

Geopolitical issues have also contributed to supply and pricing issues. Much of the world's oil resource is concentrated in countries that U.S. consumers consider unstable or sometimes even hostile. When the supply situation is already tight, as now, any supply disruptions – or the anticipation of supply disruptions – can push trading prices higher.

In the United States, partisan politics also have played a role by restricting access to otherwise produceable resources and making it difficult to build new infrastructure to address growing demand. Fortunately, Congress has begun to take action in some areas:

- In 2005, it passed the first energy bill in 13 years, which included incentives for increased oil and gas production in the Gulf of Mexico and a pilot program to cut the red tape for onshore exploration in approved areas of the western states.



“We have also been taken to task for not investing in alternatives long ago, but it was difficult to fund research and defend it to our investors when oil prices were so low that few would want to pay the high price for an alternative fuel.”



- In 2006, Congress passed the Gulf of Mexico Energy Security Act, which opened 8.3 million acres on the Outer Continental Shelf off the coast of Florida for oil and gas leasing. The estimated resources in this area include 1.26 billion barrels of oil and 5.8 trillion cubic feet of natural gas. Although this area of the Gulf of Mexico is equivalent to a postage stamp on a newspaper page, it is the biggest area of the Outer Continental Shelf to be opened in more than 20 years.
- In December 2007, the President signed into law another energy bill. The Energy Independence and Security Act addresses fuel efficiency, renewable fuels, electric light bulbs and energy-efficient buildings, and begins to tackle greenhouse gas emissions. We believe there is still much more Congress can do, but the Bush Administration and legislators are to be congratulated for the positive steps they have taken.

We also commend groups such as the American Petroleum Institute (API), National Petrochemical and Refiners Association (NPRA), U.S. Chamber of Commerce, the National Association of Manufacturers (NAM), the American Chemistry Council, the United States Energy Association (USEA) and others that have been working to help develop solutions and educate the public about this issue.

The legislative actions mentioned above are important steps. But we must make it clear that they still fall short of a comprehensive, holistic, coherent national energy strategy that addresses short-, medium- and long-term solutions. Of the Outer Continental Shelf, 85 percent remains off limits.³¹ We have moved forward on a \$7 billion investment to expand domestic refinery capacity. However, the regulatory and permitting process is still a major barrier to refinery construction. The current policy also fails to address the promising area of unconventional fuels such as oil sands and oil shale.

Moving forward will require policymakers who are even more willing to take a tough stance on complex issues. We hope that we will not see one town hall participant's view proven right: "We may need more 'panics' to get people to act."

Solutions – A Twelve-point Plan

We've said before that we don't believe there is a magic bullet that will solve our energy challenges. In our view, the solution will require a coherent, comprehensive policy that addresses the full range of possibilities and finds the right balance among the options.

We need to think of energy security as one of three major security issues that we face and give it the same degree of attention we give to economic security (such as measures to address foreclosures due to subprime mortgage lending) and homeland security (such as heightened security measures following 9/11). Like these parallel issues, energy security warrants Presidential leadership, bipartisan congressional support, and a focus on solutions at the federal level rather than a patchwork of state programs.

Shell advocates a twelve-point plan that addresses three key areas: supply, demand and environment. As with many other 12-step initiatives, the first step is accepting that we have a problem. What we heard in our dialogue with Americans indicates that we have reached that point of acceptance.

Point 1: Allow more access to conventional oil and gas. A Louisville town hall participant summed up the feeling we heard from many we met: "Keep pushing ahead on exploration and drilling technology; do whatever is necessary to protect the environment but do not give up on extraction from sensitive regions." In a survey conducted for us recently, more than seven in 10 people supported some degree of increased access to drilling in areas off limits to production.³²

At Shell, we are convinced that conventional oil and gas must be part of the solution in the short term, in the medium term, and in the long term. Having access to the more than 100 billion barrels of technically recoverable oil and gas in this country, with the responsibility to develop it using environmentally sensitive technology, can play a significant role in reducing our dependence on foreign oil sources.

"In our view, the solution will require a coherent, comprehensive policy that addresses the full range of possibilities and finds the right balance among the options."



“The new energy bill calls for expanding use of renewable fuels progressively from the current 4.7 billion gallons a year to 36 billion gallons in 2022. It will be a challenge for the industry to meet that standard, and it will require diversifying renewable fuels beyond corn-based ethanol.”

Point 2: Develop domestic unconventional oil and gas resources. Canada already produces a million barrels a day of oil from the tar sands of Alberta.³³ In the United States, a trillion barrels of oil remain trapped in shale in Colorado, Wyoming and Utah.³⁴ Shell has been researching environmentally sensitive and commercially feasible ways of developing that resource, but our efforts are hampered by lack of a federal program that clearly defines regulations, policies and a royalty framework for development of this vast resource.

Point 3: Move to clean coal technology. The United States is rich in coal resources, but traditional coal generation produces high greenhouse gas emissions. Clean coal technology, otherwise known as coal gasification or IGCC (integrated gas combined cycle) technology, can allow us to use coal for electricity generation while capturing and sequestering carbon dioxide. This technology requires a larger upfront capital investment than traditional coal-fired electricity generation. Utilities and public utility commissions are challenged to define new ways of funding those investments that do not put an undue burden on shareholders or utility customers. National leadership in this regard can create the enablers to use clean coal and reduce carbon dioxide emissions.

Point 4: Supplement our natural gas supply with imported liquefied natural gas (LNG). Most of the energy discussion focuses on lessening our dependence on imports, but natural gas demand is predicted to grow faster than our ability to develop further domestic production. Natural gas is becoming an increasingly preferred fuel for heating and electricity generation because of its clean-burning qualities.

Traditionally, natural gas has not been transported from one part of the world to another because of the difficulty of shipping a gas. Technology now allows us to store and ship the gas safely at extremely low temperatures in a liquid state. Imported liquefied natural gas is regasified at coastal terminals and transferred to existing pipeline systems. The challenge: resistance to infrastructure means that we face enormous difficulty in siting LNG regasification terminals, especially on the East and West Coasts. It will take ongoing education and forward-looking policymakers to make this clean energy source accessible.

Point 5: Move biofuels beyond corn. The new energy bill calls for expanding use of renewable fuels progressively from the current 4.7 billion gallons a year to 36 billion gallons in 2022. It will be a challenge for the industry to meet that standard, and it will require diversifying renewable fuels beyond corn-based ethanol. Already, the use of corn for fuel is affecting agricultural and food prices. We need to invest in the new infrastructure required to move, blend and distribute these billions of gallons of fuel, and governments – federal and local – need to assist with timely permitting. We need to pursue alternatives such as cellulosic ethanol, made from the stalks and other non-food parts of corn and other grains. Cellulosic technology is not yet ready for large-scale use, but it must be pursued aggressively to meet future demand without throwing other parts of the economy off balance.



Point 6: Create the distribution systems to take advantage of wind energy. Wind is one of the world's most benign energy sources. Shell now has interest in or operates seven wind farms in five states. But this technology is limited by lack of transmission systems to move the wind energy from remote hills and potential offshore wind farms to connect with the electric grid. These new systems need local permitting approval, which can be difficult to obtain – again, “Nimbyism” prevents the infrastructure. Federal and state policies supporting new transmission systems would enable this technology to be adopted more widely.

Point 7: Push solar research to make it commercially viable. After ten years in the solar business, Shell has learned a lot – mostly about what doesn't work or isn't commercially feasible. Available solar panel systems are too expensive and inefficient for wide usage. We are now looking to



nanotechnology for a solution, but the right mix of efficiency, cost and availability remains elusive. Because the potential reward – readily available, zero-emission energy – is so high, this area deserves an intensive research and development push.

Point 8: Develop the hydrogen fleet and fueling infrastructure.

Hydrogen as an automotive fuel is real today, but in a very small way. Shell is involved in a partnership with General Motors for hydrogen fuel cell vehicles, but it is still in the pilot stage, with demonstration projects in Washington, D.C., New York City and soon in Los Angeles. There are still technical and policy questions about permitting and regulation of a hydrogen fueling network. Hydrogen fuel cells also offer potential as a power source for electricity in buildings and homes. It will probably take a decade or more to make hydrogen a commercially available option. However, for our grandchildren's children, it may become the standard fuel of choice.



Point 9: Focus on energy-efficient design. Two-thirds of those we asked supported higher fuel efficiency standards and other government requirements for more energy-efficient products.³⁵ The national efficiency standards for light bulbs included in the 2007 energy bill are a significant step toward advancing energy efficiency. Ordinary incandescent bulbs use only 3 percent of their energy to create light – the rest is wasted as heat.³⁶ In the same way, automobile engines use only 20 percent of the energy they consume to move the car forward – the rest is wasted as heat.³⁷ The new CAFE standards call for greater fuel efficiency. Over the long term – not the short term – we may be able to achieve greater efficiency from a radical redesign of the power source than from shifts in fleet size and weight.

Energy efficiency also can be applied on a larger scale in urban planning. Many of our town hall participants stressed the need for development of “energy-efficient communities” or “smart growth” strategies designed around minimizing commuting.

Point 10: Develop a federal framework for measuring and controlling greenhouse gases.

The energy bill of 2007 addresses some of the greenhouse gas emissions issues by adopting a stricter fuel economy standard for cars and light trucks, speeding up the use of energy efficiency technologies and increasing federal research for carbon capture and sequestration. These are important measures, but we believe a national climate change policy makes much better sense than dozens of regional policies or 50 state policies. On the present path and left unchecked, annual U.S. greenhouse gas emissions are projected to increase by 35 percent.³⁸

A new report by McKinsey & Company identifies opportunities to reduce these projected emissions by between one-third to one-half in 2030 at manageable costs to the economy, using proven and emerging high-potential technologies – but only if the U.S. pursues a wide array of options and moves quickly to capture gains from energy efficiency. However, the report warns that private sector innovation and policy support will be necessary to unlock even the most economically beneficial abatement options.

Shell believes an effective U.S. climate change policy should:

- Include a workable cap-and-trade program for carbon emissions from stationary sources such as power plants and large industrial facilities and a separate program for reducing carbon emissions in the transportation sector,
- Encourage more renewable energies and the capture and storage of carbon dioxide emissions, and
- Work with existing international systems to reduce greenhouse gases around the world.

“Ordinary incandescent bulbs use only 3 percent of their energy to create light – the rest is wasted as heat.”





Point 11: Educate our children and ourselves on energy issues. In our national dialogue, we emphasized the need for both adults and children to be more educated about energy issues. More than two-thirds of those with whom we met supported funding for increased education and conservation awareness.³⁹ We cannot make the hard choices ahead of us without a broad understanding of the basic issues of energy security.

School curricula should include more study of energy – where it comes from, how it is used and the impact of the energy choices we make. And these lessons should begin at an early age, to shape consumer behavior and to encourage curious young minds to become the energy engineers of the future who will tackle these challenges.

Point 12: Keep the door open for other technology solutions. There are other viable energy alternatives, each with its own current limitations: nuclear power, geothermal energy and hydropower, for example. Nuclear power is a proven but controversial technology. For every town hall comment we received saying “more nuclear,” there was a corresponding comment saying “no more nuclear.” We need to keep pursuing these alternatives and look for other as-yet-undiscovered solutions.

Moving forward will require national political will, technological and human energy and major financial investments. But it can be done if we commit to act.

“We believe a national climate change policy makes much better sense than dozens of regional policies or 50 state policies.

On the present path and left unchecked, annual U.S. greenhouse gas emissions are projected to increase by 35 percent.”



A Call to Action

In Philadelphia, one town hall participant responded to our dialogue with “a call for Shell to take the lead in an effort to support global energy policies that are not self-serving.” This report begins a larger call to action for all of us: the energy industry, policymakers, business and community leaders and individual citizens.

It is critical that we continue to engage and participate in the debate around our energy priorities. There are hard choices to make to balance our energy needs, our economic well-being, our quality of life and our respect for the environment, not the least of which is an immediate and sustained need to embrace and accept new and updated infrastructure. We heard that no one wants solutions imposed upon them – they want to be engaged in the decision-making process. That requires ongoing education from leaders and experts, with an active response from communities and policymakers.

It will require government action to establish a legal framework that addresses:

- Access,
- Rights of ways,
- Permits,
- Regulations,
- Environmental stewardship,
- Appropriate safeguards, and
- Royalty structures.

Congress has made a positive start with the energy bills of 2005, 2006 and the Energy Independence and Security Act of 2007. There will be a cost to achieving our energy security, and it must be shared fairly among all involved. For businesses and shareholders, this will mean making appropriate investments in technology and pushing innovation that can advance our energy security.

Every American has a stake in this issue and a role to play. We each must look at our own carbon footprint and determine if we are making the best use of the energy we consume. Each of us as individuals must make our voice heard to shape a future path that reflects our values and priorities.

In this presidential election year, we all have a responsibility to understand the dilemma we face, the complexity of the choices and the fact that there are no easy answers. We must ask our candidates about their stands on energy security in the short, medium and long term and push for comprehensive energy solutions that make sense for the economy and the environment.

As one Cincinnati participant said, “The time is now and the American public is ready to take action.” Shell agrees.

John D. Hofmeister, President
Shell Oil Company

February 14, 2008

For more information on what is required to ensure energy security, visit: www.usenergysecurity.shell.com

“The time is now and the American public is ready to take action.’ Shell agrees.”



A National Dialogue on Energy Security: The Shell Final Report

Endnotes

¹U.S. *Energy Information Administration*. “World Crude Oil Prices,” weekly histories (Feb. 2008).

²Thirty-four percent of Shell town hall attendees “strongly supported” increasing the tax on gas and using the money to invest in energy conservation and alternative energy options. (October – November 2007 follow-up phone survey) This concept also appeared frequently in verbatim town hall comments. Town hall comments are posted at www.usenergysecurity.shell.com.

³Town hall comments.

⁴When forced to choose one of two statements, 61 percent of town hall attendees agreed that “even if it means significant changes to our lifestyles, we need to reduce our dependence on oil”; 39 percent agreed that “we will never really change our lifestyles, so we need to find new sources of energy, whether fossil fuels or something else.” Yet in a separate question, only 31 percent identified “conserving energy” as the most important action to help ensure adequate energy supply. Forty-seven percent supported increasing alternative energy use; 22 percent supported increasing energy supplies. (Source: follow-up phone survey)

⁵Based on town hall comments. In addition, a survey of the general population conducted in October–November 2007 paralleling the town hall follow-up survey showed that 67 percent identified alternative energy use as the most important action to ensure an adequate energy supply in the future.

⁶Town hall comments.

⁷U.S. *Energy Information Administration*. “EIA Short Term Energy Outlook.” Updated January 2008.

⁸Based on town hall comments and meetings with government officials.

⁹Based on town hall comments. Profits/price gouging was also identified as the “biggest issue facing the oil industry today” by 7 percent of the general population surveyed.

¹⁰Jaffe, Amy Myers. “The International Oil Companies” (The James A. Baker III Institute for Public Policy, Rice University) (2007).

¹¹Jaffe, Amy Myers, et al. “U.S. Energy Policy FAQ: The U.S. Energy Mix, National Security and the Myths of Energy Independence” (The James A. Baker III Institute for Public Policy, Rice University) (2008).

¹²*Organization of the Petroleum Exporting Countries (OPEC)*. Annual Statistical Bulletin 2006 (2007).

¹³In the town hall survey, 30 percent of respondents predicted global oil production would peak in less than 10 years; 28 percent predicted it would peak in 10–19 years. The general population responses were even higher: 33 percent and 35 percent respectively.

¹⁴*International Energy Agency*. “World Energy Outlook 2007: China and India Insights, Executive Summary” (2007).

¹⁵Snow, Nick. “Bush asked to recall US-Cuba boundary delineation note.” *Oil & Gas Journal* (volume 106, issue 5, 4 Feb 2008): citing the 1977 U.S.-Cuba Maritime Agreement.

¹⁶See endnote 4 above.

¹⁷*International Energy Agency* data cited in Jaffe, Amy Myers, et al. “U.S. Energy Policy FAQ: The U.S. Energy Mix, National Security and the Myths of Energy Independence” (The James A. Baker III Institute for Public Policy, Rice University) (2008).

¹⁸Jaffe et al., *op. cit.*

¹⁹*Ibid.*

²⁰*Ibid.*



- ²¹Ibid.
- ²²Ibid.
- ²³*American Petroleum Institute*. “America’s Oil and Natural Gas Industry: Putting Earnings into Perspective” (2008).
- ²⁴*National Petroleum Council*. “Facing the Hard Truths about Energy: A comprehensive view to 2030 of global oil and natural gas” (2007).
- ²⁵Lovins, Amory B., et al. “Winning the Oil Endgame: Innovation for Profits, Jobs, and Security” (Rocky Mountain Institute) (2004).
- ²⁶*U.S. Energy Information Administration*. Total U.S. coal production in 2006 (latest data) was 1,112.3 million tons. A railcar holds 100 tons.
- ²⁷*U.S. Energy Information Administration*, “International Energy Outlook 2006,” and *International Energy Agency*, “World Energy Outlook 2006,” cited in “Facing the Hard Truths about Energy.”
- ²⁸*International Energy Agency*, “World Energy Outlook 2004,” cited in “Facing the Hard Truths about Energy.”
- ²⁹*McKinsey & Company*. “Reducing U.S. Greenhouse Gas Emissions: How Much at What Cost?” (2008).
- ³⁰*NPC*, op. cit.
- ³¹*American Petroleum Institute* estimate based on data from U.S. Minerals Management Service, U.S. Geological Survey, Bureau of Land Management, and National Petroleum Council.
- ³²In the October-November 2007 general population survey, 15 percent of respondents supported “significantly reducing restrictions” in Alaska, 15 percent in U.S. coastal waters, 11 percent on federal lands and 44 percent on “all of the above.”
- ³³*Alberta Energy*, Government of Alberta, (<http://www.energy.gov.ab.ca/OurBusiness/oilsands.asp>) (8 Feb. 2008).
- ³⁴“Oil Shale Development in the United States: Prospects and Policy Issues.” Rand Corporation study for the National Energy Technology Laboratory of the U.S. Department of Energy (2005).
- ³⁵In the October-November 2007 surveys, 64 percent of town hall attendees and 63 percent of the general population “strongly supported” requiring more energy-efficient products. Requiring automakers to produce cars and light trucks that get better fuel mileage was strongly supported by 64 and 67 percent respectively.
- ³⁶*Wikipedia*. Incandescent light bulb entry, (http://en.wikipedia.org/wiki/Incandescent_light_bulb) (8 Feb. 2008).
- ³⁷*FuelEconomy.gov*, United States Department of Energy, (<http://www.fueleconomy.gov/feg/atv.shtml>) (8 Feb. 2008).
- ³⁸*McKinsey & Company*, op cit.
- ³⁹In the town hall survey, 69 percent “strongly supported” increasing conservation awareness and education for citizens.



“If lack of communication helped create the problem, we believed openness and transparency would help solve it. We created the dialogue with two goals: to build Americans’ awareness of the energy issues we face, and to gain a better understanding of their perceptions and priorities.”



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