



Chapter Ten

American Energy Policy and the Future of Offshore Drilling

Introduction

The BP *Deepwater Horizon* disaster undermined public faith in the oil and gas industry, in government regulators, and even in America's ability to respond to crises. The disaster raised serious questions about our nation's ability to manage and protect for current and future generations the invaluable natural resources of the outer continental shelf and the multiple uses they sustain—the patrimony of all Americans. Based on the Commission's thorough and vigorous accounting of this tragedy, the central lesson to be drawn from the catastrophe is that no less than an overhauling of both current industry practices and government oversight is now required. The changes necessary will be transformative in their depth and breadth, requiring an unbending commitment to safety by government and industry to displace a culture of complacency. Drilling in deepwater does not have to be abandoned. It can be done safely. That is one of the central messages of this report. The reforms proposed herein are intended to do for this industry what new policies and practices have done for other high-risk industries after their disasters.

It was clear sailing for a fleet of oil rigs off Louisiana in April 2009. The *Deepwater Horizon* disaster a year later was a tragic wake-up call. Moving forward, offshore drilling in the Gulf of Mexico or in new U.S. frontiers will require, in the words of the report, "unbending commitment to safety by government and industry."

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The potential for such a transformation to ensure productive, safe, and responsible offshore drilling is significant, and provides reason for optimism even in the wake of a disaster.

The significance of the *Deepwater Horizon* disaster, however, is broader than just its relevance to the future of offshore drilling. The disaster signals the need to consider the broader context of the nation's patterns of energy production and use, now and in the future—the elements of America's energy policy. The explosion at the Macondo well and the ensuing enormous spill—particularly jarring events because of the belief they could never happen—force a reexamination of many widely held assumptions about how to reconcile the risks and benefits of offshore drilling, and a candid reassessment of the nation's policies for the development of a valuable resource. They also support a broader reexamination of the nation's overall energy policy.

Offshore oil and gas will continue to be an important part of the nation's domestic energy supply for many decades. Offshore wells yield one-third of current U.S. oil production,¹ and in recent decades helped offset declines in production elsewhere in the United States (U.S. production peaked in 1970).² That already-crucial role is likely to increase. The area of federal jurisdiction, the outer continental shelf, contains an estimated 85 billion barrels of oil in technically recoverable resources³—more than all onshore resources and those in the shallower state waters *combined*.⁴ The future of domestic oil production will rely to a substantial extent on current outer continental shelf sources and further development of deposits there—in progressively deeper, more distant waters, and perhaps in such challenging environs as the Alaskan Arctic. Whether we explore for and produce oil and gas from those prospective reserves, and if so, under what conditions, depends crucially on taking to heart the lessons we learn from the *Deepwater Horizon* disaster and the energy policies we put in place.

Important decisions about whether, when, where, and how to engage in offshore drilling cannot be made wisely if they are made in a vacuum. Policies about offshore drilling should be powerfully shaped by economic, security, pace of technology, safety, and environmental concerns. Offshore drilling will certainly be an important part of any national energy policy. But it is only a part of the picture, and its relative importance today will not, and should not, be the same a half-century from now. The nation must begin a transition to a cleaner, more energy-efficient future. Nonrenewable oil and gas resources are just that—nonrenewable—which means any nation forging an energy policy for the future must develop the technologies that provide maximum energy efficiency and create renewable substitutes. Otherwise, the nation's security and well-being will be increasingly dependent on diminishing supplies of nonrenewable resources, and even more dependent on supplies from foreign sources.

Domestic consumption of oil has exceeded domestic production since the late 1940s, making the country increasingly dependent on imports, which now supply about 52 percent of U.S. needs compared to 42 percent in 1990. In the near term, oil from federal offshore lands helps moderate America's dependence on imported supplies, lessening the current trade deficit and contributing to national security.

The government also reaps significant revenues from the leasing of federal lands and the collection of royalties on production—typically, billions of dollars per year. The development of offshore energy resources contributes substantially to local economies, supporting businesses small and large and employing tens of thousands of workers. But any sensible energy policy must recognize the substantial risks that accompany these real benefits, in addition to the dangers of an economy and national security dependent on nonrenewable energy supplies. The impressive technologies developed for offshore drilling and production have not been accompanied by comparable improvements in safety and environmental protection. As Americans now know, three major companies failed to apply rigorous process safety measures to their drilling operations in the Gulf of Mexico: Halliburton and Transocean, which service drilling operations throughout the Gulf, along with BP—underscoring the systemic nature of the offshore industry’s problems.

This Commission has documented and explained these tragic failures, and in this report has recommended a comprehensive, integrated set of reforms required to improve the performance of the offshore oil and gas industry, as appropriately overseen by an effective regulatory authority. A safe offshore oil and gas industry matters—both because the costs of needlessly risky behavior are so high, and because the nation is so dependent on offshore energy supplies. In light of present knowledge, inaction is a policy of dangerous default—of continuing to rely on chance and luck to avoid a “next time.” American citizens will demand and will hold the oil and gas industry and government officials responsible for creating the conditions under which a robust offshore oil and gas industry can operate safely and co-exist with human health, environmental protection, and other economic activities.

Weighing National Security, the Economy, Human Safety, and the Environment

In contemporary America, petroleum is woven into every aspect of our lives. The continuous availability of oil products—gasoline, diesel, and jet fuel—powers the mobility that has become key to a strong economy. Military operations, the movement of food and other commercial products, and personal travel would all grind to a halt without oil—at least as our society is organized today. Yet growing demand for oil around the world, particularly in the huge and rapidly developing economies of Asia, ensures heightened competition for supplies, putting upward pressure on oil prices. That poses a long-term challenge for the United States, which is not and cannot be self-sufficient in oil supply. At the same time, scientific evidence has continued to mount on the interconnections among the use of all carbon-based fuels, including oil and natural gas, the growing concentrations of greenhouse gases, and global climate change.⁵ Energy policy thus embraces considerations of national security, the economy, environmental protection, the need to limit climate change, the pace of development of renewable energy sources and nonpetroleum dependent vehicles, human health and safety, and unique regional conditions.

Security and petroleum resources. The major American security risk derives from oil’s predominant role in transportation: 72 percent of oil consumed in the United States in 2009 was used for transportation—and 94 percent of transportation relied on oil.⁶ As the National Academy of Sciences recently concluded, the nation “needs to lower its

dependence on fragile supply chains for some energy sources, particularly petroleum at present and possibly natural gas in the future, and to avoid the impacts of this dependence on our nation's economy and national security."⁷ The good news is that energy-efficient technologies exist today that can in the near term moderate the nation's demand for oil and change the mix of supplies of electricity and energy over time. But changing existing reliance on oil in general and oil imports in particular will require a major overhaul of our energy and transportation systems, a challenging shift that would require strong public leadership, and would take decades to effect even if we agreed on the course of action tomorrow.

Recent events have made clear the magnitude of the stakes. The United States has repeatedly been surprised by sudden interruptions in the oil supply from various unexpected events—underscoring the nation's potential vulnerability. These include politically motivated production cuts by oil-exporting countries (the oil embargo of 1973–1974); border wars between oil exporters (between Iraq and Iran in 1980–1988, and Iraq and Kuwait in 1990–1991); strife and unrest within several oil-exporting countries; and severe weather events affecting offshore oil production or coastal refineries (Hurricanes Katrina and Rita in 2005 and Ike in 2008—all in the Gulf of Mexico). Energy planners also worry about the possibility that the Straits of Hormuz—the only sea passage to the open ocean for the bulk of Persian Gulf petroleum exports—could be closed, or that a major oil pipeline somewhere in the world could be ruptured by accident or attack.

Even absent an actual interruption in supplies, our reliance on foreign oil is a national security concern. Hostile exporting nations can use the threat of interrupting supplies to pressure the United States. Money spent on foreign oil can also end up in the hands of terrorists or be used to build nuclear or develop biological weapons in nations flouting the international atomic and biological regulatory regimes. The ultimate nightmare would be an America depleted of petroleum, which has failed to make a sufficient transition to alternative sources, facing another Pearl Harbor or the aftershocks of 9/11.

Since "Colonel" Drake first struck oil at his Pennsylvania site in 1859, the United States has already extracted over 200 billion barrels of oil from its territory⁸—more than our estimated remaining reserves. The United States did not relinquish its position as the world's leading producer until 1974⁹—but now it finds itself credited with only 1.4 percent of the world's proved oil reserves, while consuming 22 percent of the global supply annually.¹⁰ (The use of advanced extraction technologies and a relatively favorable investment climate have enabled the United States to remain the world's third-largest oil producer, despite its relatively meager reserves.)

Would the country's security interests be better served by developing domestic oil resources as rapidly as possible—or by reserving some for future generations? President Harry Truman argued that federal offshore oil resources should become part of the naval petroleum reserve system, leaving the oil in the ground for later development (see Chapter 3). In recent decades, the concept of the Naval Petroleum Reserve has been superseded by a more readily accessible Strategic Petroleum Reserve, which currently contains more than 700 million barrels of unrefined crude oil stored in Louisiana and Texas salt caverns along

the Gulf coast where it is available for national emergencies (such as sudden disruptions of supply).¹¹ That provides some insurance—but only about 75 days of supply at the current rate of U.S. imports, and clearly not sufficient to displace any long-term decline in domestic production or respond to a spike in demand. The United States has kept some areas of the outer continental shelf off-limits for oil and gas production: to protect their unique and valuable environmental characteristics, to avoid incurring risks to major industries such as fishing and tourism, or to maintain open waters for testing of military armaments and training exercises over the Gulf. One way of viewing these areas where drilling is prohibited—Atlantic Coast, Eastern Gulf of Mexico and Florida coast and the coasts of Northern California, Oregon, and Washington—is as energy sources held in reserve.

National economic implications. The domestic oil and gas sector is a major employer, particularly in fuel-producing regions. Fluctuations in oil and gas prices generally pass quickly through to energy-intensive sectors of the economy: trucking, airlines, agriculture, and petrochemicals such as plastics. Although energy's share of the economy has diminished in recent decades, Americans paid \$740 billion for oil and gas products in 2007,¹² and energy prices still have a major impact on inflation. Because oil and gas behave and are traded as commodities, their prices can undergo large changes even apart from immediate supply and demand factors. This volatility, from all sources, can make it difficult for businesses and individuals to plan and adhere to their budgets for energy costs. Price jolts stemming from undependable supplies can have major, adverse effects on the whole economy. Economists Hillard Huntington and Stephen Brown have found that "Historical experience shows that the Gross Domestic Product (GDP) losses associated with oil supply shocks can be considerable."¹³ Most strikingly, they noted that 10 of the 11 U.S. recessions since World War II were preceded by sharply rising oil prices.

Given Americans' consumption of petroleum products in excess of domestic supply, the country runs a staggering trade imbalance. Between 2004 and 2009, the U.S. trade balance for oil and gas ranged between negative \$186 billion and negative \$414 billion per year—typically exceeding the much-publicized trade deficit with China.¹⁴ Economic theories of comparative advantage may suggest that particular trade deficits are not worrisome—but the large, sustained trade deficit incurred to import petroleum, particularly, makes energy a significant factor in America's overall trade, deficit, and financing strategies and challenges.

Environmental and safety challenges. This report has documented in painful detail the far-reaching environmental consequences of catastrophic accidents involving the extraction of oil from offshore sources, and the associated risks to workers' safety from drilling, refinery operations, and the emergency clean-up of spills. Further environmental damage occurs when oil products are used as transportation fuels. Emissions released when fuel is burned are generally controlled under federal law, but can still (in combination with emissions from combustion to generate electricity) create conditions that can cause serious health consequences for the American public and serious ecological consequences for our natural systems, forests, and waters. And the combustion of all fossil-based carbon fuels (oil, gas, and coal) has long-term impacts on the increasing volume of greenhouse gases in the atmosphere and the warming climate. Transportation fuels contribute one-third of U.S.

carbon emissions, making them the nation's second-largest source contributing to climate change.

Criteria for balanced energy policy. Reconciling the multiple, sometimes conflicting aims that underlie any transportation-related American petroleum energy policy depends on six criteria:

- Maintaining a sufficient reserve of petroleum to protect American national security should access to foreign sources be lost or become unreliable;
- Requiring energy-efficient automobiles and other vehicles (among other sources of consumption) to reduce fuel use, and promoting energy-efficient transit alternatives;
- Promoting the development of clean and domestically produced alternative fuels or sources of power for transportation;
- Managing the inherent risks of domestic production of oil and gas—including from offshore areas—while considering the short- *and* long-term availability of these fuels;
- Requiring safe operations to protect human health; and
- Protecting the natural environment, including steps to limit climate change.

Reasonable people can disagree about the relative importance of these criteria—and have over time. President Truman ordered a postponement of mineral development on the outer continental shelf in order to ensure oil and gas would be there later for strategic purposes. During the 1970s, Congress adopted legislation to maximize environmental protection, and then to expand energy production (as discussed in Chapter 3)—but over the long term, none can be pursued to the exclusion of the others. It is notable, moreover, that various policies *have* had significant effects on U.S. energy use and production. For example, the country has achieved intermittent but sizable increases in automobiles' fuel efficiency; major reductions in tailpipe emissions from gasoline-fueled vehicles; and less reliance on oil to generate electricity.¹⁵ At several points during the past four decades, consumption of oil in the United States actually *declined* for several years (in some cases reflecting adverse economic conditions, and in others successful public policies and adoption of technological advances).¹⁶

The United States today pursues many discrete policies bearing on all of these issues: vehicle-fuel efficiency standards, subsidies for ethanol production for fuel, research into alternative fuels, varying incentives for production of electricity by wind and solar power, and so on. In the aggregate, they are, *de facto*, the nation's energy policy. But they do not constitute a comprehensive, coherent strategy—such as recently called for by both the National Research Council¹⁷ and the President's Council of Advisors on Science and Technology¹⁸—one that encompasses *all* of these elements, identifies tradeoffs and priorities, and implements them through incentives, investments in research and development, regulations, and tax policy. Difficult though it may be to arrive at such a consensus, it would provide guidance on balancing the risks and rewards of oil and gas development in especially challenging or sensitive locations, offshore or elsewhere. It is possible—and imperative—to manage that balance over time for offshore development of oil and gas as part of that overall policy.

Learning from the Macondo Disaster: The Gulf of Mexico

This report describes in great detail what went wrong on the *Deepwater Horizon* and in the drilling of the Macondo well, and the well blowout's staggering cost. As the nation considers exploring for and producing energy from offshore frontiers, we have a new opportunity to do things right. Some of those frontiers are in deeper waters or unexplored areas of the Gulf of Mexico. Others are at the far extreme of the country, in both distance and climate in Alaska.

Improving safety and environmental integrity immediately. It will take several years to fully implement the stringent new safety regime this Commission has recommended—essential changes from doing business as usual in the Gulf of Mexico. But it is not necessary to put deepwater drilling on hold until all the changes are in place. The national and regional energy and economic imperatives can be reconciled effectively with the equally urgent needs to assure human safety and environmental integrity in the Gulf context, now and in the long term.

Several benchmarks must be met for exploratory drilling to resume on existing leases, and for operations to begin on new ones. Operators must assure that better practices for maintaining well integrity and the isolation of hydrocarbons are used at all times. And they must insist upon heightened vigilance throughout all the steps from the inception of well design to the consideration of changes during drilling operations. Similarly, protocols for testing of blowout preventers must be put in place and enforced. The industry must also demonstrate that it is deploying readily available and effective systems for containment and response.

As the energy industry works to satisfy these requirements, the Department of the Interior must work promptly to reorganize its divisions, augment its regulatory staff, and enhance their skill. The American public has every reason to insist that Congress provide regulators with adequate resources to do their vital job—and that the industry apply its resources and expertise to improving practices. Both must focus on the substantial challenges of making offshore drilling safe, reliable, and productive. The circumstances demand a shared commitment by government and industry to work for immediate and long-term reforms that allow deepwater exploratory drilling to resume quickly and safely. And, to that end, industry should be ready to pay fees as part of their lease agreements in order to ensure that government overseers have the resources required to get the job done in a rigorous and timely fashion.

Emerging challenges from ultra-deepwater drilling. That shared commitment must extend beyond current conditions. While correcting the many problems revealed at the Macondo well, both industry and government must anticipate and adjust to new challenges arising in the Gulf. Current technology enables drilling in water *twice as deep* as Macondo. Drilling at such depths requires all parties to set their standards still higher for difficult issues such as remote containment systems in water depths with extreme pressures and very limited human access, as well as different geological pressures and formations and mixes of hydrocarbons. Desire to tap resources in deeper waters should be accompanied by equivalent investments in subsea equipment, operator training, research and development

for containment and response technologies, demonstrated financial capacity, and continuous improvement in and communication of industry practices devoted to safety.

The emerging international challenge. Drilling for oil in the Gulf of Mexico is not solely a matter for U.S. consideration. Both Mexico and Cuba have expressed interest in deepwater drilling in the Gulf in the near future. Pemex, Mexico's state-owned petroleum company, and Cuba, through both the Spanish company Repsol and the large Russian oil and gas production company Gazprom, in which the Russian government maintains a controlling stake,¹⁹ have either actually drilled exploratory and production wells or are likely soon to do so.²⁰ Potential drilling sites are close enough to waters and land within U.S. jurisdiction—Cuba's mainland lies only 90 miles from Florida's coast and the contemplated wells only 50 miles—that if an accident like the *Deepwater Horizon* spill occurs, fisheries, coastal tourism, and other valuable U.S. natural resources could be put at great risk.

It is in our country's national interest to negotiate now with these near neighbors to agree on a common, rigorous set of standards, a system for regulatory oversight, and the same operator adherence to the effective safety culture called for in this report, along with protocols to cooperate on containment and response strategies and preparedness in case of a spill. Though some precedent exists for a direct agreement between the United States and Cuba, Mexico may prove an important partner in developing such an agreement covering the entire Gulf of Mexico. In any event, the U.S. objectives should be to prevent drilling by companies unwilling or unprepared to meet the high safety standards essential to extracting oil and gas resources responsibly and to have a verification process to ensure compliance.

Beyond the Gulf of Mexico: Frontier Regions

The nation's demand for domestic oil production will push the boundaries of technology and geography. The industry will develop new exploration and extraction techniques and equipment in new areas in the decades ahead. Drilling safely in the Gulf of Mexico requires a new industry safety culture and significantly improved regulatory oversight. Those reforms, and further heightened vigilance, will be required for oil exploration and production in frontier offshore regions. When the Macondo blowout dumped enormous volumes of oil into the Gulf waters, scientists and policymakers realized how little was known about biological systems, environmental conditions, and even key aquatic and coastal species. Leasing of vast acreage combined with weak policies and limited funding had resulted in inadequate studies of unique habitats and sensitive environmental features where greater caution should be exercised. What information was available was often not shared, or was disregarded, in leasing and permitting decisions. And little, if any, research or policy existed to address human health impacts and the risks to responders from a major spill, or the far-reaching effects of such a disaster on other businesses dependent on the region's resources.

In addition to these challenges, each frontier area presents important differences in implementing any drilling program—different geologies, hydrocarbon formations, coastal communities and environments, and climate conditions, to mention some. Federal waters of the United States other than the central and western Gulf of Mexico, parts of

Southern California, and the Lower Cook Inlet in Alaska would be regarded as frontier territory. In the late 1970s, attention turned briefly to areas off of northern California and Massachusetts (Georges Banks), and in the early 1980s, the potential of the outer continental shelf off Alaska attracted considerable investment (see Chapter 2). In recent years, the focus has turned to exploring in the Atlantic Ocean off the state of Virginia; in the eastern Gulf of Mexico; and, most notably, to taking another serious look at offshore regions in the Alaskan Arctic. Drilling water depths of 10,000 feet or more anywhere in the Gulf of Mexico might also be considered opening a new frontier, given the new technologies required.

In March 2010, President Obama and Interior Secretary Ken Salazar announced a plan to open the eastern Gulf and parts of the Atlantic coast—including offshore Virginia—to oil and gas exploration (subject to studies of the suitability of doing so in each area, and to the lifting of a congressional moratorium restricting drilling in the eastern Gulf). But on December 1, in the wake of the *Deepwater Horizon* experience and the resulting broad restructuring of regulations and the federal oversight capabilities, Secretary Salazar announced that the Administration would not proceed with drilling in areas where there are “no active leases” during the next five-year leasing plan. As a result, exploration and production in certain frontier areas—the eastern Gulf and off of the Atlantic and Pacific coasts—are deferred. The Secretary also indicated that plans for 2011 drilling in Alaska’s Beaufort Sea would be subjected to additional environmental assessments. There will consequently be a continuing examination of the various stages of drilling, if pursued, consistent with national energy policy and with a full awareness of the risks and of the values that must be balanced in each region, and with assurance that operators rigorously adhere to the best practices of a functioning safety culture.

By their very location and nature, these frontier areas differ from the Gulf of Mexico and in important respects from each other. Environmental and biological conditions are at least as well understood along the Atlantic coast as in the Gulf—and there are also important facilities, such as Coast Guard installations in place; in contrast, equivalently detailed geological and environmental information does not exist for the Arctic exploration areas of greatest interest for energy exploration—and industry and support infrastructures are least developed, or absent, there. In the near term, the Alaskan frontier is likely to attract the greatest attention, and to require the closest scrutiny, given the potential energy resources and the physical and environmental challenges of pursuing them safely.

Large prospects in offshore Alaska. The interest in offshore Alaska reflects the likelihood of finding significant new sources of oil:²¹ the Chukchi and Beaufort Sea areas off Alaska’s north coast rank behind only the Gulf of Mexico in estimated domestic resources.²² The most recent federal lease sales for the Beaufort Sea, from 2003 to 2008, netted \$98 million, reflecting high levels of industry interest. And despite its remoteness and harsh conditions, the Chukchi Sea—with vast potential resources—attracted over \$2.6 billion in high bids for almost 2.8 million acres, including \$2.1 billion from Shell Oil Company, during a 2008 lease sale.²³

If deemed feasible, new offshore Alaskan oil production may be well-timed to offset the sustained decline in output elsewhere in Alaska. Oil production in the state (primarily from the onshore field at Prudhoe Bay) has decreased by more than two-thirds, from the 1988 peak of 2 million barrels per day to 645,000 barrels per day in 2009.²⁴ Depending on future prices, this decline could constitute a threat to the state's economy, which is highly dependent on oil and gas revenues and related employment. The Energy Information Administration projects that Alaska's production will continue to decline, to just 420,000 barrels per day by the end of this decade.²⁵ Such declines could threaten the viability of the Trans-Alaska Pipeline System, which transports oil from the North Slope to the port at Valdez.

Despite the Energy Information Administration's pessimism about long-term production trends in Alaska, other projections show a potential upswing²⁶ An optimistic scenario developed in 2009 study by Northern Economics for Shell Exploration and Development projects production from multiple Alaska outer continental shelf sites beginning in 2018 and eventually peaking at 1.8 million barrels of oil per day.²⁷ (New pipelines would need to be built to connect these reservoirs, if brought into production, to the Trans-Alaska Pipeline System.)

But finding and producing those potentially important supplies of oil offshore Arctic Alaska requires the utmost care, given the special challenges and risks associated with this frontier. Many of these challenges also arise elsewhere in the world, as Russia, Norway, Canada, and Denmark (Greenland) evaluate their Arctic oil and gas resources. The Alaskan Arctic is characterized by extreme cold, extended seasons of darkness, hurricane-strength storms, and pervasive fog—all affecting access and working conditions. The Chukchi and Beaufort Seas are covered by varying forms of ice for eight to nine months a year. These conditions limit exploratory drilling and many other activities to the summer months. The icy conditions during the rest of the year pose severe challenges for oil and gas operations and scientific research. And oil-spill response efforts are complicated year-round by the remote location and the presence of ice, at all phases of exploration and possible production.

The geological pressures in hydrocarbon deposits in shallow seas off Alaska are likely to be substantially below those encountered at Macondo, reducing some of the risks of a major blowout and challenges of containment. But oil spilled off Alaska (from blowouts, pipeline or tanker leaks, or other accidents) is likely to degrade more slowly than that found in the Gulf of Mexico because of lower water temperatures, reduced mixing of the oil into the water due to the presence of ice, and the shallower depths through which oil would travel from the wellhead to the surface. Some think the slow weathering could facilitate the skimming and in situ burning of escaped oil under ideal weather conditions, but the slow pace of natural dispersion means that oil would linger much longer in the marine environment. And serious questions remain about how to access spilled oil when the area is iced over or in seasonal slushy conditions.

The Arctic ecosystem, the need for scientific information and informed decision-making, and Alaska native peoples. The stakes for drilling in the U.S. Arctic are raised by the richness of its ecosystems. The marine mammals in the Chukchi and Beaufort are among the most diverse in the world, including seals, cetaceans, whales, walrus, and bears. The Chukchi Sea is home to roughly one-half of America's and one-tenth of the world's polar bears.²⁸ In November 2010, the U.S. Fish and Wildlife Service ruled that a large part of the polar bears' "critical habitat" included sea ice in the Beaufort and Chukchi Seas.²⁹ The Chukchi and Beaufort Seas also support millions of shorebirds, seabirds, and waterfowl, as well as abundant fish populations.

It is known that these are vibrant living systems, but scientific research on the ecosystems of the Arctic is difficult and expensive. Good information exists for only a few species, and even for those, just for certain times of the year or in certain areas. As a result, the Commission recommends an immediate, comprehensive federal research effort to provide a foundation of scientific information on the Arctic (with periodic review by the National Academy of Sciences), and annual stock assessments for marine mammals, fish, and birds that use the Beaufort and Chukchi Seas. This initiative should be coordinated with the state of Alaska, native organizations, academic institutions, non-governmental organizations, the private sector, and international partners. The information generated should be capable of informing decision-making related to oil and gas leasing, exploration, and development and production in the Arctic; measuring and monitoring impacts of oil and gas development on Arctic ecological resources; natural resource damage assessment should an oil spill occur and protocols in any treaty negotiated among the Arctic nations. The existing gaps in data also support an approach that distinguishes in leasing decisions between those areas where information exists and those where it does not, as well as where response capability may be less and the related environmental risks may therefore be greater. The need for additional research should not be used as a *de facto* moratorium on activity in the Arctic, but instead should be carried out with specific timeframes in mind in order to inform the decision-making process.

The Inupiat Eskimos of Alaska's remote arctic and subarctic communities rely heavily for their subsistence on resources from the marine environment, particularly bowhead whales. Bowhead whales can reach 60 feet in length and weigh more than 120,000 pounds. They migrate from Russian to Canadian waters and back through the Chukchi and Beaufort Seas.³⁰ They are the most important subsistence animal for the coastal communities of northwest and northern Alaska.³¹ Whale hunting and the customs surrounding it are also an important part of their cultural heritage. Oil and gas development has the potential, directly or indirectly, to affect hunting success or the habitats of species important to subsistence. (Of course, offshore oil development could play a positive economic role in the native communities; some Inupiat whaling captains also work in the oil industry, for instance.) An Arctic Regional Citizens Council could help assure the active participation of the people who know this region the best in planning and response.

Arctic spill response and containment. The remoteness and weather of the Arctic frontier create special challenges in the event of an oil spill. Successful oil-spill response methods from the Gulf of Mexico, or anywhere else, cannot simply be transferred to the Arctic.

Industry and academic organizations are conducting research on response to oil on ice, but more needs to be done. A comprehensive interagency research program to address oil-spill containment and response issues in the Arctic should be developed, funded, and implemented within the federal government. Spill trajectory and weather models based on Arctic conditions must also be developed. This research should be funded promptly by the Oil Spill Liability Trust Fund, and the resulting analysis should inform when and where leasing occurs.

The National Contingency Plan requires the Coast Guard to oversee oil-spill planning and preparedness, and to supervise an oil-spill response in coastal waters. Current federal emergency response capabilities in the region are very limited: the Coast Guard operations base nearest to the Chukchi region is on Kodiak Island, approximately 1,000 miles from the leasing sites. The Coast Guard does not have sufficient ice-class vessels capable of responding to a spill under Arctic conditions: two of its three polar icebreakers have exceeded their service lives and are non-operational.³² In addition to overseeing spill response, the Coast Guard provides search and rescue capabilities in other areas. Without a presence in the Arctic, it would be very difficult for the Coast Guard to conduct any emergency search and rescue operations.

To deal with these serious concerns about Arctic oil-spill response, containment, and search and rescue, the Commission recommends three approaches before the Department of the Interior makes a fully informed determination that drilling in a particular area is appropriate. First, the Department of the Interior should ensure that the containment and response plans proposed by industry are adequate for each stage of development and that the underlying financial and technical capabilities have been satisfactorily demonstrated in the Arctic. Second, the Coast Guard and the oil companies operating in the Arctic should carefully delineate their respective responsibilities in the event of an accident, including search and rescue, and then must build and deploy the necessary capabilities. Third, Congress should provide the resources to establish Coast Guard capabilities in the Arctic, based on the Coast Guard's review of current and projected gaps in its capacity.

International standards for Arctic oil and gas. The Arctic is shared by multiple countries, many of which are considering or conducting oil and gas exploration and development. The extreme weather conditions and infrastructure difficulties are not unique to the U.S. Arctic. The damages caused by an oil spill in one part of the Arctic may not be limited to the waters of the country where it occurred. As a result, the Commission recommends that strong international standards related to Arctic oil and gas activities be established among all the countries of the Arctic. Such standards would require cooperation and coordination of policies and resources. The Arctic Council³³ has begun work in this direction, updating its voluntary Arctic Offshore Oil and Gas Operation Guidelines in 2009. The International Standards Organization is also developing international standards for Arctic offshore structures that would apply to the activities of petroleum and natural gas industries in Arctic and cold regions. These guidelines are expected to specify requirements and provide recommendations and guidance for the design, construction, transportation, installation, and removal of offshore structures in the Arctic. Additional work is needed to strengthen

these guidelines and standards, ensuring that they are both consistent and mandatory across the entire Arctic, and the United States could play an important leadership role in securing these vital safeguards.

Bringing the potentially large oil resources of the Arctic outer continental shelf into production safely will require an especially delicate balancing of economic, human, environmental, and technological factors. Both industry and government will have to demonstrate standards and a level of performance higher than they have ever achieved before. One lesson from the *Deepwater Horizon* crisis is the compelling economic, environmental, and indeed human rationale for understanding and addressing the prospective risks comprehensively, before proceeding to drill in such challenging waters.

Conclusion

Creating and implementing a national energy policy will require enormous political effort and leadership—but it would do much to direct the nation toward a sounder economy and a safer and more sustainable environment in the decades to come. In the meantime, decisions about offshore drilling—one crucial element in any discussion of energy supply—remain controversial. The reaction to the December 1 decision to defer offshore exploration and production in the eastern Gulf of Mexico and along the Atlantic and Pacific coasts illustrates the polarization of opinion. Energy companies, seeking to pursue potential reserves in brand-new frontiers, criticized the announcement for closing off too many areas. Others, more concerned about environmental protection and national security, however, questioned why the Secretary was even considering allowing future drilling in these areas at all. And there were sharp differences in response among public officials in different regions, reflecting their local economies and sources of revenues.

These reactions echo the divided opinions presented to this Commission throughout its work. Though the Commission heard many ideas for improving safety and other aspects of offshore drilling, we also heard from Americans who advocate no future drilling whatsoever; they cited the adverse effects of fossil fuels on the climate, environmental damage, safety, and other factors.

Whether additional offshore drilling proceeds soon, in the longer term, or never depends on evolving public opinion. Given Americans' consumption of oil, finding and producing additional domestic supplies will be required in coming years, no matter what sensible and effective efforts are made to reduce demand—in response to economic, trade, and security considerations, and the rising challenge of climate change.

The extent to which offshore drilling contributes to augmenting that domestic supply depends importantly on rebuilding public faith in existing offshore energy exploration and production. That rebuilding begins with a clear, independent explanation of what happened at the Macondo well in April 2010, and of the reforms required in the wake of that terrible tragedy. That has been the work of this Commission, published in this report; the forthcoming separate report of the Commission's Chief Counsel; and background materials available on the Commission's website. Together, they present a clear, independent,

unvarnished picture of what happened and why—and of the major reforms the nation must adopt.

This Commission proposes in this report a series of recommendations that will enable the country and the oil and gas industry to move forward on this one critical element of U.S. energy policy: continuing, safe, responsible offshore oil drilling to meet our nation's energy demands over the next decade and beyond. Our message is clear: both government and industry must make dramatic changes to establish the high level of safety in drilling operations on the outer continental shelf that the American public has the right to expect and to demand. It is now incumbent upon the Congress, the executive branch, and the oil and gas industry to take the necessary steps. Respect for the 11 lives lost on that tragic day last April requires no less.