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Good morning, Chairman Costa, Chairwoman Bordallo, Congressman Lamborn, Congressman Brown, and members of the Committee. I would like to thank you for giving me this opportunity to speak to you regarding one of the great challenges facing our country today: providing secure, sustainable and affordable energy to power the American economy.

As you know, I come before you today as the President of Securing America's Future Energy (SAFE). SAFE is action-oriented, non-ideological, and focused on results. We are committed to advocating for an effective package of energy policy reforms, believing that the path forward will be defined by a combination of solutions that address both the supply and demand sides of the energy equation.

SAFE's central message can be summed up as follows: there is no silver bullet for addressing America's formidable energy challenges. Even the most promising policy responses entail difficult trade-offs, and improving U.S. energy security will require a massive disruption of the status quo in many respects. Too often in Washington, however, meaningful changes in important and longstanding policies are obstructed by parochialism, influential industries, and ideological interest groups that see success in the maintenance of the status quo.

To be effective in this environment, SAFE has enlisted the vocal support of a group of prominent business leaders and retired senior military officers known as the Energy Security Leadership Council (Council). The Council is co-Chaired by Frederick W. Smith, Chairman, President, and CEO of FedEx Corporation, and General P.X. Kelley (Ret.), 28th Commandant of the United States Marine Corps. The Council represents a substantial effort to support comprehensive, long-term policies to reduce U.S. oil dependence and improve energy security. Its members have worked aggressively to build bipartisan support, and their track record speaks for itself.

In December 2006, the Council released a report entitled *Recommendations to the Nation on Reducing U.S. Oil Dependence*. The report laid out a comprehensive blueprint for energy security, including: demand reduction through reformed and increased fuel-economy standards; expanded production of alternatives; and increased domestic production of oil and natural gas. The Council collaborated with Senators Byron Dorgan (D-ND) and Larry Craig (R-ID) to design legislation incorporating the principal elements of the *Recommendations*. This resulted in the "Security and Fuel Efficiency Energy Act of 2007 (SAFE Energy Act)."

In December 2007, Congress passed and President Bush signed into law an energy bill that honored the *Recommendations* by (1) dramatically reforming and strengthening fuel-economy standards and (2) mandating a Renewable Fuel Standard that will displace significant quantities of gasoline using advanced biofuels such as cellulosic ethanol.

That was a significant accomplishment, but was only a first step. There is much more to do. The reality is this: our nation's dependence on oil—much of it imported and the majority used in our transportation sector—still represents a grave threat to our economic and national security. Now that we are, as a nation, pointed in the correct direction, it is time to help facilitate the transformation to the next generation of transportation technology that is as inevitable as it is necessary.

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SAFE was founded in 2004 to deliver an urgent call to action: the nation's energy security is at risk, and leadership, ingenuity, and commitment are required to protect current and future generations. In the five years that have passed since then, Americans have been reminded of the very real consequences of oil dependence and the threats to this nation's economic and national security. If we continue down the current path, economic weakness and decay at home will continue to threaten American power and influence abroad.

Recent events provide a useful benchmark for gauging both the vulnerability of our transportation system and the consequences of an actual energy crisis. Between January 2003 and July 2008, benchmark crude oil prices increased nearly five-fold, from about $30 per barrel to almost $150 per barrel. The run-up in prices was made worse by significant short-term price volatility. Between May 2 and July 3, 2008, oil prices spiked by $30 per barrel—an increase of 25 percent.

Indeed, while we are all aware of the sharp financial burden on U.S. households that face resets in their adjustable rate mortgages—a legitimate and significant concern—the increases in energy costs have been on the same, or even a greater, order of magnitude.

A typical subprime borrower with a poor credit history who bought a $200,000 house in 2006 with a 2 year/28 year ARM with a 4 percent teaser interest rate for the first two years would have seen monthly mortgage payments increase from about $950 a month before the reset to about $1,330 after the reset—an increase of about $4,500 a year. Meanwhile, the median household in America saw its household energy costs increase by roughly $1,600 a year during the same two-year period. But this type of increase in energy costs affected *all* U.S. households—not just the one household in 20 that held a subprime mortgage.

All of these developments stemming from higher oil prices caused a noticeable slowing of economic growth. The U.S. economy lost more than 700,000 jobs between December 2007 and the beginning of September 2008, and the unemployment rate increased from 4.5 percent to 6.1 percent—all before the financial crisis truly hit later in September. In fact, as early as last August, many economists believed the U.S. economy was already on the verge of recession, largely driven by sharply rising and volatile oil prices. This put banks and Wall Street firms in a weakened financial state, with sharply eroded profit positions, even before the credit situation reached its crisis point.

Despite these well-known dangers, the American economy continued to operate at risk, with almost no substitutes for petroleum products and very few alternatives to driving. Today, 97

percent of our transportation energy needs are met by petroleum, and the transportation sector accounts for 70 percent of U.S. oil consumption.

Our mistakes have been costly. Sharply higher oil prices had a devastating effect on household, business, and public sector budgets, and effectively functioned as a tax on the economy. One recent estimate by researchers at the Oak Ridge National Laboratory placed the combined cost of foregone economic growth and economic dislocation at nearly $300 billion in 2008. Rising fuel prices also significantly weakened U.S. automakers, whose relatively inefficient but high-margin large vehicles were virtually unsellable for a period of several months.

Finally, the U.S. exported hundreds of billions of dollars to pay for imported oil. Based on initial estimates, the U.S. trade deficit in petroleum products reached an all-time high of $383 billion in 2008—56 percent of the total deficit in goods and services and more than the combined cost of the wars in Iraq and Afghanistan. This massive financial burden accelerated the deterioration of the American balance of payments and contributed to a weaker U.S. dollar.

Today, oil prices are near the bottom of a record slide. One hundred and fifty dollar oil and U.S. gasoline prices over $4.00 per gallon led to demand destruction, which was reinforced by the financial and economic crises and the resulting recession in which we today find ourselves. What is absolutely crucial to remember, however, and what history has taught us time and again, is that these economic conditions are temporary. As the economy recovers, and drivers return to the roads, our dependence will once again put us at the mercy of rising oil and gas prices—particularly if the existing vehicle fleet is fundamentally the same as it is today.

Despite some initial signs that consumer behavior had changed over the summer of 2008, this country will most likely return to its historical oil consumption pattern with prices back at a more palatable level. Indeed, anecdotal evidence supports that assertion. New vehicle sales once again shifted in favor of SUVs in December of 2008—for the first time since February of 2008. On New Year's Day, the *Financial Times* reported that U.S. sales of hybrid vehicles were down 53 percent in November compared to one year ago, and the decline steepened over the following months.

To be blunt, we can no longer be slaves to the boom and bust cycle of oil prices. Mr. Chairman, members of the Committee: what is required here is a dramatic transformation, and what that transformation requires is leadership from Washington. The dynamism, ingenuity, and entrepreneurial spirit of the American economy can take us wherever we want to go, but government has to set the priorities.

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In September, SAFE and the Council released a comprehensive new plan that presents a long-term vision for the dramatic transformation that our energy system requires. *A National Strategy for Energy Security* offers a pathway toward a transportation system that draws on a diverse range of fuel sources; an electrical grid that is flexible, clean and robust; reduced import dependence through expanded domestic energy production; and an American research and development apparatus that sets the standard for the rest of the world. The plan will reduce the

oil intensity of the U.S. economy, secure American manufacturing jobs, reduce the U.S. trade deficit, enhance the resiliency of the overall economy, and reinforce our foreign policy priorities.

The *National Strategy* establishes as a goal the electrification of the short-haul transportation system in the United States and provides a multifaceted set of proposals to help achieve that long-term goal. America's cars and SUVs consumed approximately 8 million barrels of oil per day in 2008—about 40 percent of the U.S. total. Aggressively transitioning this segment of the vehicle fleet to electrification has the potential to dramatically reduce U.S. oil consumption and fundamentally alter our energy profile. But that will require our national political leaders to embrace electrification not as a discrete and narrow initiative, but rather as a *dominant policy theme* to address our dependence on oil. And it will require a comprehensive, well-integrated approach.

Deteriorating U.S. energy security is largely due to the nearly complete absence of transportation fuel diversity. Not only are ever-greater amounts of oil required to fuel the U.S. transportation system, which is almost entirely dependent on oil, but the world oil market increasingly relies on supplies from hostile and/or unstable foreign producers. Electrification of transportation would allow cars and light trucks to run on energy produced by a diverse set of sources—nuclear, natural gas, coal, wind, solar, geothermal and hydroelectric. The supply of each of these fuels is secure, and the price of each is less volatile than oil. In the process, electrification would shatter the status of oil as the sole fuel of the U.S. ground transportation fleet. In short, electrification is the best path to the fuel diversity that is indispensable to addressing the economic and national security risks created by oil dependence.

Central to the success of such an approach will be the manner in which we, as a nation, manage the consequences of oil dependence while we transition to electrification. The upgrades in infrastructure and technology that are required are on the order of trillion dollar investments. Our ability to finance this decades-long commitment will be directly related to our economic well-being and national security. Therefore, what SAFE and the Council have put forward is not simply a laundry list of energy policy items. It is, instead, a strategy for mitigating oil dependence through practical measures in the short- and medium-term while we simultaneously invest in a post-oil transportation system for the long-term.

Increasing the domestic production of oil and natural gas is among the most effective near-term steps for improving American energy security. A high trade deficit—which has recently been directly fueled by petroleum imports—weakens the U.S. dollar and can act as a drag on total employment. Countries that run long-term deficits also tend to save less and borrow more. By moving forward with an expanded range of production areas on the Outer Continental Shelf (OCS), the U.S. can reduce its economic exposure to future prices spikes. Of course, ongoing improvements in efficiency and fuel diversification are critical as well. But to the extent that we will need some oil for the next several decades, there is a powerful case for producing more of it at home.

To be sure, the U.S. cannot solve its energy security dilemma through enhanced domestic oil production alone. Existing economically recoverable reserves are not comparable to projected demand, and U.S. oil production will not likely impact international energy prices in any

substantial way in the short-term. However, by responsibly developing our own resources, we can reduce the impact of global oil prices on the current account balance and the national economy. We can also keep more currency at home, where it can be invested in productive domestic industries.

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While it is often noted that the United States holds just three percent of the world's proved oil reserves, this figure incompletely represents our production potential. In fact, the U.S. possesses substantial reserves of oil that have yet to be exploited. Current undiscovered technically recoverable reserves are at least 100 billion barrels, according to numerous U.S. government reports. Just as the U.S. possesses vastly greater natural gas reserves than conveyed by proved reserves data, we have access to a large quantity of oil resources that currently sit undeveloped.

In some cases, the constraints on U.S. oil and gas development are economic and technical. In the Deepwater Gulf of Mexico, for example, projects take years to develop and rely on a global infrastructure chain that was overburdened during the run-up in oil prices that began in 2003. In other cases, however, the government has constrained the oil and gas industry's access to reserves on Federal lands. In particular, the ability of the industry to access high-potential areas of the OCS has, until recently, been restricted by long-standing congressional moratoria and presidential withdrawals. Proponents of these restrictions historically justified them on environmental grounds, but the most accurate and up-to-date data suggest that this position is no longer accurate.

According to the Minerals Management Service (MMS), the offshore oil and gas industry produced 10.2 billion barrels of oil between 1985 and 2007 with a spill rate of just .001 percent. In recent years, as standards and technology have improved, the rate of incidents has steadily declined. A recent report by the Congressional Research Service found that the annual number of oil spills in U.S. coastal waters declined by 50 percent from 1995 to 2004. In fact, nearly two-thirds of the oil that enters the North American coastal waters each year comes from natural seeps, with only 5 percent coming from oil extraction and transportation.

During the turbulent 2005 Atlantic hurricane season, when Hurricanes Katrina and Rita tore through the Gulf of Mexico, approximately 75 percent of the 4,000 federal OCS oil and gas facilities in the Gulf of Mexico were subjected to 175 mile-per-hour winds and other hurricane conditions. Despite serious damage to 168 platforms, 55 rigs, and more than 560 pipeline segments, the U.S. Coast Guard and MMS reported no "major oil spills." Total OCS petroleum spillage from the two storms has been estimated at 14,676 barrels—about the size of a single Olympic swimming pool.

Now that Congress has allowed the OCS moratoria to expire, it is time to put in place a rational offshore energy development program that leverages advances in technology to produce the most cost-effective oil supplies while safeguarding the environment. There have been remarkable advances in offshore oil and gas production technology in recent decades, and these advances should help to reframe the debate about the safety of offshore development. Subsea well heads,

long distance tie-backs, and sea-floor separation units allow for a minimum surface presence throughout the life-cycle of a project and also provide more flexibility to site infrastructure.

Today, a single platform can produce oil and/or natural gas from a number of wells over substantial distances. A temporary surface presence is required for installation and maintenance, but current technologies offer the possibility of oil and gas production without the burden of numerous surface-level platforms. Consider the development plan recently announced by Total for its Pazflor deepwater project offshore Angola.

According to the Journal of Petroleum Technology, "the total subsea production system, linked by a network of 109 miles of pipelines and 51 miles of umbilicals, will be spread over a vast expanse of 232 square miles—some seven times larger than the city of Paris." Incredibly, a single floating processing, storage, and offloading (FPSO) unit will manage this system, which is expected to produce 220,000 barrels of oil per day. Also of note is that the size of the surface facility will be minimized by nature of the fact that Pazflor will feature cutting edge subsea separation units. These units will remove produced water and natural gas from oil on the sea floor, and then inject the produced water back into the reservoir.

Projects like this and others around the world are demonstrating that existing and emerging technologies can be leveraged in order to access significant resource volumes while maintaining a minimal environmental footprint. For fields close to the shore, for example, extended-reach drilling allows many different deposits to be drilled from a single onshore pad by drilling wells horizontally under the seabed. The longest such wells—over seven miles long—have been drilled by ExxonMobil on Russia's Sakhalin Island. Because the drilling does not puncture the seabed, it dramatically reduces the already exceptionally low possibility of oil spills. This technique has also been used in the United Kingdom to develop Poole Harbor—an ecologically sensitive and archeologically important area—from a disguised onshore drilling pad.

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By maintaining a strong record on spills and developing improved technologies to minimize its environmental footprint, the offshore oil and gas industry has taken important steps toward earning public confidence. However, there are likely additional political and institutional challenges that remain to be addressed before access to undeveloped resources proceeds at an ambitious pace.

With this in mind, SAFE has recently examined the energy production policies of other developed nations around the world. In particular, the Norwegian model stands out as highly successful in balancing energy production with sustainability. Norway is currently the world's third largest exporter of natural gas and seventh largest petroleum exporter. Oil production was 2.5 mbd in 2007 and exports were 2.3 mbd. Gas production in 2007 was 8.7 bcf/d, with exports standing at 8.3 bcf/d. At the same time, Norway is often recognized as an environmentally progressive nation.

In 1991, Norway was among the first countries in the world to enact a carbon tax. Initially a pure tax, since Norway integrated its policy with the European Union's Emissions Trading Scheme

(ETS) in 2006, half of the cost today comes from the fee for a required ETS permit. Because of these factors, the average emissions-per-barrel of oil produced in Norway is 7.1 kilograms. The EU average is 10.1 kg. The average in North America is 24.1 kg. As a company, StatoilHydro emits only 37 percent of the global average CO2 emissions-per-barrel of oil equivalent produced.

Most of Norway's oil and gas resources are located offshore on the Norwegian Continental Shelf (NCS). Increasingly, commercially viable resources are being discovered above the Arctic Circle in areas with seasonal sea ice and sub-freezing temperatures. Coupled with strict governmental regulations on emissions and other discharges, operational complexity has forced companies like StatoilHydro to develop effective technologies for accessing new resources.

Norway's StatoilHydro is among the international oil companies that generally operate at the frontier of advanced offshore operations. At its Snohvit field in the Barents Sea, subsea structures have been tied to onshore facilities nearly 100 miles away. The project utilizes no surface-level structures offshore and separates and sequesters CO2 from produced natural gas. A key reason the Norwegian process works so well is that Norway has a very collegial approach to petroleum regulation. Generally, the government and industry consult on establishing long-term targets for development, and they work together to achieve those goals in a way that fits within the Norwegian national/social framework. In practice, this means that government and industry consult on establishing desired outcomes not just for resource development/output, but also for environmental impact, technological standards, and performance metrics.

In the U.S., such an inclusive approach might mean that states would share the benefits from development. For environmental groups, a stake in the process could mean an opportunity to help set performance standards in environmentally sensitive areas. Perhaps this could be done through a limited pilot program that aims to take a consultative approach to develop a bounded area with participation by a limited number of companies. The companies and agencies involved would have two goals: to develop the area and to refine the consultative methodology. In these limited areas, perhaps technology and environmental footprint could supplant monetary value as the metrics by which successful bids are identified.

Of course, there are real differences—cultural, political, and economic—between Norway and the United States. There are a relatively small number of operators in the Norwegian oil industry, and the government owns a 66.86 percent share of StatoilHydro—the most dominant player in the nation, accounting for 40 percent of total operatorships on the NCS. The size of the Norwegian economy makes the role of petroleum exports in social welfare crucial. Oil and gas production account for 48 percent of national export revenue and 24 percent of total GDP. Seventy-six percent of the revenue from NCS oil production accrues to the government. This stream of funding has allowed Norway to maintain the world's second largest sovereign wealth fund, the Norway Government Pension Fund. The Fund, valued at more than $370 billion, recently allowed the government to finance an ambitious economic recovery package, estimated at 2.3 percent of GDP.

To be sure, state revenues are high because the petroleum industry tax structure is extremely aggressive. The Norwegian corporate income tax rate is currently 28 percent, less than the United States. However, Norwegian companies also pay a Special Petroleum Tax on profits

derived from production and pipeline transportation on the NCS. The Special Petroleum Tax is currently 50 percent, making the marginal tax rate on NCS petroleum income 78 percent. Other levies include a CO2 emissions tax, a nitrous oxide fee, an abandonment fee, and area fees incurred after initial exploration.

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A frequent criticism of planned OCS development in general is that new production will take many years to come online and that only marginal volumes can be expected from existing resources. Proponents of this view conclude that opening new federal areas for development is unnecessary. As noted above, SAFE recognizes that the overarching objective of any national energy policy must be to reduce U.S. oil consumption and therefore oil intensity. However, all solutions—whether one considers fuel-economy improvements, electrification, or advanced biofuels—will take time to implement. The technologies and processes for producing oil and gas are well understood and mature in their development. As the nation transitions to dramatically reduced oil consumption, it is critical that the oil we do use is produced at home to the maximum extent feasible.

It is also important to remember that resource estimates for many areas in question are based on data from the 1970s and 1980s. In its 2006 National Assessment, the Minerals Management Service noted:

> There is much uncertainty in the resource estimates due to a lack of adequate data, especially in those OCS areas which have been unavailable for exploration and development for many years. For example, outside of the active OCS producing areas, significant quantities of oil and gas resources are known to exist in part of the Eastern GOM and the California OCS, but in other areas, less is known about resource potential due to the availability of scarce or older data. In Alaska, there has not been any commercial exploration activity for many of the areas outside the Beaufort and Chukchi Seas for the past two decades.
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> Due to subsequent access restrictions, there has been little or no opportunity to follow-up on the initial round(s) of exploration activity in many of these frontier areas. Yet, in the interim, there have been enormous advances in exploration, formation evaluation and exploitation technologies that could be utilized in these frontier areas today. Industry has made huge advancements in the technology of seismic data acquisition and processing, which allows for use of these data to create high resolution images of the subsurface to great depths.

Advances in technology have allowed for two critical developments in oil and gas recovery. First, 3D and 4D seismic have allowed geophysical data to be collected in a more precise manner that captures a more accurate snapshot of potential resources compared to older technologies. Moreover, when contrasted to technology from the 1970s and 1980s, the IT revolution has enhanced the speed, accuracy, and intricacy with which that data can be analyzed. As this process has occurred, MMS estimates of undiscovered technically recoverable resources in OCS areas have increased, most notably in the Gulf of Mexico where access has not been restricted.

Secondly, advances in offshore production techniques have allowed higher rates of resource recovery from resource plays that are father from shore, in deeper water, and in deeper geological formations. In short, there is simply no way to fairly assess potential resource production from existing data. As noted above, MMS and the administration must take the lead

in offering leases in new areas, which will compel interested parties to contract for new seismic data. In contentious areas, MMS should employ alternative strategies, including acquiring the data itself.

Assuming commercial discoveries are made in the Atlantic, Pacific or Eastern Gulf planning areas, a logical and fair question is whether these resources can be produced in a time frame that will be useful. The answer is yes. According to a 2008 MMS report (*Deepwater Gulf of Mexico 2008: America's Offshore Energy Future*), as advanced technologies have become the mainstream, and as fuel transportation infrastructure has been installed, the timing for first production from new leases has decreased dramatically in recent years. Specifically, the report notes that "as industry gains experience in the deepwater areas of the Gulf, the time between leasing and production is reduced." This significant trend suggests that in well known areas close to existing infrastructure, such as the Eastern Gulf and some areas on the West Coast, first production can be expected by 2014-15.

To be clear, the long-term goal of any U.S. energy policy should be to replace our nation's heavy reliance on petroleum for transportation with a more diverse range of domestic energy sources. This can be accomplished through widespread electrification of short-haul travel, which will deliver energy to light-duty vehicles from a range of feedstocks, including wind, solar, hydro, nuclear, natural gas, and coal with carbon capture and storage. However, U.S. oil demand will continue at near current levels until electric vehicles have sufficiently penetrated the overall passenger vehicle fleet, and low-carbon alternatives have been developed for long-haul travel and air transport. In other words, even if one is very bullish about electric vehicles and the ability of the U.S. to generate low-carbon electricity to power them, the country still needs to come up with adequate oil supplies for at least the next 20 years.

In its January 2009 Draft Proposed Program, the U.S. Minerals Management Service (MMS) reported alternative energy and import substitution findings from its Market Simulation Model. The report notes that "according to the research supporting the model, oil lost from OCS production would be replaced by 88 percent greater imports, 4 percent increased onshore production, 3 percent switching to gas, and 5 percent reduced consumption." Based on current oil market dynamics, in the event that the OCS is not opened, incremental imported oil will come from four main sources: Brazil, the Middle East, West Africa, and the Canadian oil sands, in order of increasing climate footprint.

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In addition to the economic and energy security benefits of domestic energy production, it is important to acknowledge the substantial fiscal benefits. Today, the U.S. federal government collects significant royalties from the extraction of oil and gas resources in federal waters. In 2008, the Minerals Revenue Management Service reported $8.3 billion in offshore royalty receipts plus an additional $9.7 billion in lease rents and bonuses associated with bids.

While estimates vary widely depending on assumptions, expanding access to the OCS areas currently off-limits should significantly increase government revenue from royalties. One recent study, which assumed full access to all OCS waters by 2012, estimated cumulative increased

royalties at $41 billion through 2025. Another study, carried out by ICF International, estimated lifecycle government revenue of over $300 billion for opening the full OCS.

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In closing, SAFE and the Council believe that by leveraging technology and smart public policy, the U.S. can produce more domestic oil and gas in the coming decades in an environmentally sensible manner. At the same time, we are acutely aware of the limitations of a strict supply-side approach to energy security. We believe that increased domestic production must only be viewed as a tactical component of a long-term strategy to aggressively move away from our reliance on petroleum.

We cannot continue to react to events as they happen, risking our economy every time an insurgent attacks a pipeline or a hurricane threatens the Gulf. Continued delay carries unacceptable risks. I believe that we are at a unique moment, where the recent run-up and collapse of the price of oil, and its consequences for consumers, the automakers and the economy, has left Americans thirsty for bold and transformative policies to address our addiction to oil. We must take advantage of this moment in time and act together while this priority remains prominent in our collective consciousness.

Our challenges are great, but so are our opportunities. It is time for America to act.