

Energy & Climate Security

America must reduce its demand for oil, combat climate change, and secure energy infrastructure. Oil dependence puts our security at risk no matter how much we pump here at home. We must also encourage cleaner energy technologies to combat global climate change, which military and security leaders say makes the world a more dangerous place. Finally, we must



secure our nation's power grid against attacks and disruptions that threaten our economy.

The energy landscape is changing rapidly, with new technologies that increase production of clean energy and fossil fuels. But when it comes to assuring affordable and reliable energy for our economy and our military, we cannot simply drill our way to the solution. We need to diversify our resources and invest in the technologies that best achieve our strategic interests.



If you read only one thing 5 National Security Reasons for Clean Energy

Our oil dependence puts us at risk. Our demand keeps prices high, which funds countries that don't share our values.

Energy independence is a myth. No matter how much oil we produce, the prices we pay will be determined by the volatile global oil market.

The military is taking the lead to develop clean energy and energy productivity technologies through private-public partnerships with the energy industry.

The DoD and CIA say climate change makes the world a more dangerous place.

Clean technology creates jobs here at home and reduces our dependence on oil.

Transportation and Oil: Key Issues

America's single-source dependence on oil puts us at risk. 93% of our transportation sector relies on oil. That means when it comes to our cars, planes, and ships, we are at the mercy of the global oil market, which sets oil prices even here in America regardless of how much we pump at home. Without an alternative, oil is more than a mere commodity – it is a vital strategic commodity, a substance without which our national security cannot be sustained.

The energy world is changing rapidly, and the U.S. is producing more oil and gas. New extraction technologies have opened up huge reserves of oil and natural gas in the U.S. and other markets. According to the International Energy Agency's World Energy Outlook: 2012 report, the U.S. is on track to become the world's largest oil producer by around 2020. This increase in supply from shale oil—combined with substantial reductions in oil demand due to higher fuel efficiency standards—will make the North American continent a net oil exporter by about 2035.

But as long as we rely on one source of energy – oil – for most of our transport sector, energy independence is a myth. America relies on one source of energy – oil – for almost all of our transportation, from family cars to goods shipped around the country. Oil is a global commodity, so the price is set internationally. That means that even if our oil comes from North Dakota, our economy is still vulnerable to price



Key Fact

93% of our transportation sector relies on oil.



Our economy will always be vulnerable to oil's price shocks and volatility as long as we are dependent on it.

shocks and influence from events in the Middle East and other volatile regions.

Our oil demand funds our enemies, regardless of who we buy it from. America’s largest foreign provider of oil is Canada, but oil prices respond to global demand. By consuming about 20% of the world market, we inflate global prices regardless of who we buy oil from – even if we buy it at home. Our oil demand generates larger profits for Iran, Russia, and other oil-rich countries that don’t share our values.

See also: Iran

U.S. foreign policy will still be tethered to oil. As long as we use oil, we must care about the global market. That means we will continue to have our hands tied in foreign policy in the Middle East. Oil exporters such as Saudi Arabia, Russia, and Venezuela will continue to enrich themselves with oil revenues, and use that money to fight U.S. interests and deepen their autocracies. And we must still keep sea lanes open from the Strait of Hormuz to the South China Sea.

The global oil supply is vulnerable to attacks that threaten military supply and disrupt our economy. Oil infrastructure is an easy target for terrorists and rogue regimes. Osama bin Laden called oil our “Achilles’ heel” and called upon his followers to attack supply lines. Transcontinental pipelines, in places like Iraq, stretch for thousands of miles and are easy targets. Oil often travels through choke points such as the Straits of Hormuz and Malacca—narrow shipping lanes that can be easily disrupted. That means we have to spend enormous resources to project military power and presence to keep these vital supply lines open



Oil funds our enemies, regardless of who we buy it from. Oil is traded on a global market, so when we use oil we raise demand—which raises prices and enriches our adversaries.



Key Fact

20% of the world’s oil travels through the Strait of Hormuz, which Iran has threatened to close.



The hidden cost of oil is in our defense budget, where we spend billions protecting vulnerable shipping lanes with our Navy.

and the price of oil relatively stable.

Our military is particularly dependent on oil: the U.S. Department of Defense is the single largest consumer of fuel in the world. The Department of Defense spends billions every year to power our tanks, planes, and generators at home and overseas. Every time the price of a barrel of oil increases by \$10, it costs the Department of Defense an additional \$1.3 billion. That budget shortfall must be bridged by reprogramming money away from essential training, readiness, and acquisition programs.

And it costs lives. In Iraq and Afghanistan, 50% of what our military convoys carried was fuel. From 2003-2007, for every 24 fuel convoys in Afghanistan, the military suffered one casualty. Oil convoys are easy targets for our enemies because they often have to travel predictable routes, such as through mountain passes in Afghanistan. Further, resupply of ships and planes in theater requires the diversion of tactical assets to protect tankers and logistical supply lines. New technology that reduces oil demand in ships, aircraft, and vehicles can save American lives and increase the effectiveness of our forces.

Climate Security: Key Issues

Climate change is an “accelerant of instability.” According to the Department of Defense, climate change makes already combustible situations worse. It will cause more frequent and severe weather events that threaten to destabilize some of the most dangerous regions of the



The changing cost of oil has a huge impact on the military, where increases pull money from training, maintenance, and weapon purchases.



We trust the military to keep us safe and they say that climate change is a threat to our security.

world, exacerbate existing national security threats, and push those states with weak infrastructure and political instability to near constant crisis.

Our energy sources for both transportation and electricity contribute to climate change. When fossil fuels like oil, gas, and coal are burned, they emit carbon dioxide (CO₂) into the atmosphere. Coal and oil are the largest contributors to our carbon emissions. That means any conversation about climate change starts with our energy choices.

Natural disasters will increase, causing death and costing money. Changing weather patterns are increasing the intensity and frequency of extreme weather events such as floods, droughts, and violent storms. In 2012, the U.S. experienced our worst drought in 50 years, and natural disasters cost the U.S. \$160 billion and claimed the lives of more than 500 Americans. Violent storms also cause humanitarian crises abroad—and often our military is the only institution with the resources and capabilities to respond. This costs billions of dollars to U.S. taxpayers and diverts the military from its primary mission: fighting and winning wars.

Mass migration will undermine already-volatile countries. As temperatures change and extreme weather events destroy farmlands, more people have to compete over a diminishing supply of arable lands. This is particularly likely in some countries in Africa, where competition over finite resources will exacerbate existing tensions between tribes and ethnicities. For example, one instigating factor of the genocide in Darfur was the severe drought that ravaged the land historically shared between nomadic Arab herders and indigenous farmers. The competition over shrinking resources for grazing and farming contributed to conflict to the massive humanitarian crisis in Darfur.



Key Fact

The Department of Defense, the Department of State, the CIA, and the National Intelligence Council all acknowledge that climate change is real and that it's a threat to our national security.



Sea levels will rise, destabilizing coastal regions and eliminating U.S. military bases. As sea levels rise, those who live along coastlines will have to move. By 2050 there may be as many as a billion climate refugees across the world, destabilizing nearby countries.

The Department of Defense predicts that 30 military installations are at-risk from rising sea levels. Diego Garcia—a military base in the Indian Ocean—has an elevation of only 9 feet. As sea levels rise, key bases may be lost.

Health hazards will spread. As temperature changes, the world will begin to have a climate in which tropical diseases such as malaria, dengue fever, and the West Nile virus thrive within greater swaths of America. These diseases do not stop at borders. Climate change will also cause strong heat waves—like the one in Europe in 2003 that killed 35,000 people—and make extreme weather events more prevalent. Heat waves tend to kill the most vulnerable members of society: children and the elderly.

Electricity: Key Issues

A reliable source of electricity is a national security imperative. Reliable electricity is a basic foundation of America’s economy and society. We have many different power sources—from coal and natural gas, to nuclear, to renewables like wind and solar.

Assured access to electricity is especially important for our military



Key Fact

August 2011 to July 2012 was the warmest 12-month period that the continental U.S. has experienced since the beginning of record-keeping in 1895.

installations. Troops on bases in the United States, like those piloting unmanned aerial vehicles from Nellis Air Force Base in Nevada, are directly supporting our servicemembers in combat areas around the world. But our military installations are reliant on the fragile civilian grid for 99% of electricity requirements. The military is turning to microgrid technologies and renewable distributed generation to ensure installations stay operational in case the civilian grid goes down.

Renewable sources like wind and solar offer a way forward.

Energy from wind and from the sun doesn't contribute to climate change or produce any other emissions, and it isn't going to run out; the only question is how we harness it. Wind and solar technology have experienced explosive growth over the past several years, and these industries employ hundreds of thousands of Americans. Storage technology has also been improving rapidly, which will ensure steady reliability and base load functionality.

The wind and solar industries have experienced explosive growth over the past decade. The solar industry now employs more than 143,000 Americans, while average prices for solar power have fallen by more than half in just two years. Wind production capacity has doubled in just the past four years, and wind power now supplies enough electricity to power approximately 15 million homes. Nevertheless, true renewables like solar and wind still account for a small fraction of our total energy production, and cheap hydrocarbons, like shale gas, could still delay or even halt their growth without investment and legislative action to strengthen these critical industries.

Fossil fuels like coal and gas contribute to climate change. We



In 30 seconds...

The U.S. military is leading the way toward clean energy research as a way to decrease combat casualties from fuel convoys. Marine Corps units are currently testing portable solar power systems in Afghanistan.

burn an estimated 1 billion tons of coal every year, emitting more than 2 billion tons of CO₂. Burning coal also releases dangerous toxins into the atmosphere that can cause disease or even death in the surrounding populations. “Clean coal” technology has not proven to be an economically viable way to store or get rid of the CO₂.

Natural gas is reducing coal use. Natural gas recovered through a process known as hydraulic fracturing (“fracking”) is replacing coal in the United States. This is better for climate change, but still not as good as renewables. Moreover, American coal is being sold to other markets like Europe, and China and India continue to build new coal facilities, negating some of the emission reductions achieved in the United States.

Nuclear power creates its own national security hazards. Nuclear power plants do not emit CO₂, but they require enriched uranium and produce radioactive nuclear waste. Right now, we have no good way of storing or disposing of that waste; it is currently kept on-site at 104 different nuclear plants across the country, where it is vulnerable to natural disasters and even theft. Nuclear plants are also extremely expensive to construct, and the federal loan guarantees and other subsidies required to assure their construction are less viable today, given our current budget constraints.

Electrical Grid: Key Issues

Our power grid is old and vulnerable. Much of our energy infrastructure was built before World War II, and the grid is vulnerable

to natural disasters, physical attacks, and cyber attacks. According to the Secretary of Energy, more than half of cyber attacks in the United States have involved energy infrastructure.

A cyber attack against the grid could be devastating. Former Secretary of Defense Leon Panetta warned that such an attack could “shut down the power grid across large parts of the country” with potentially devastating effects to our economy. Because the grid also relies on key “bottlenecks,” physical attacks on those bottlenecks could also have domino effects across large regions. President Obama recently signed an Executive Order aimed at improving security on American critical infrastructure by sharing cyber threat information with private entities and developing cybersecurity best practices in consultation with the private sector.

See also: Cyberspace & Security

Lapses in the power grid already cost us billions every year. The Department of Energy estimates that disruptions to the power supply, caused by weather incidents or technical malfunctions in our old, brittle grid, cost Americans more than \$100 billion annually in economic losses.

The Policy Landscape and Recommendations

America’s national security leaders are past the stage of debate on



Our brittle, outdated electrical grid is vulnerable to physical and cyber attack. Imagine what would happen if the power went out in half the country.



Key Fact

Making our grid just 5% more efficient would be the equivalent to taking 53 million cars off the road.

climate change. The Department of Defense, the Department of State, the CIA, and the National Intelligence Council all acknowledge that climate change is real and that it's a threat to our national security. They are already leading the way by investing in resources to both mitigate and adapt to climate change and make America safer.

Investing in innovative technologies is the long-term solution. The Departments of Defense, Energy, and Agriculture are leading the charge in this effort, but more must be done. By investing in fuel efficiency technology, advanced biofuels, and electric vehicles, we can replace oil in much of our transportation sector. We can also develop our solar and wind capacity and maximize our energy productivity to provide better ways of lighting our homes and buildings. Other countries, like China, are already making heavy investments in these areas. We need to lead so that we can sell these technologies to the world. Investments like these make America safer, keep our environment cleaner, our economic workforce happier, and create jobs in the United States.

Increasing productivity will reduce oil dependence and slow climate change. America is now a leader in making our cars more efficient. This saves consumers money, requires us to purchase less oil, and makes it more difficult for our adversaries to generate profits from our single-source dependence on oil. The Obama Administration has set standards that will require automobiles to average 54.5 miles per gallon by 2025. That should cut back our oil consumption by 2.2 million barrels per day and save Americans \$1.7 trillion in fuel costs. The International Energy Agency concluded in its 2012 Outlook Report that this decrease in demand will be a substantial driver—and eventually the primary driver—of America's drop in net oil imports during the coming decades.



By 2025, new fuel efficiency standards (also known as “CAFE standards”) will cut oil consumption by 2.2 million barrels per day and save Americans \$1.7 trillion dollars in fuel costs.



The military is leading the way with new energy technology. Modern energy sources mean a stronger military and new technology jobs.

We must also continue to invest in advanced biofuels technology.

Military experts agree that relying on oil alone for its fuel supply is an operational, tactical, and strategic risk. That is why the Department of Defense has been investing in renewable energy sources, like advanced biofuels, which are a dependable, domestically produced alternative resource. We should continue to support these promising innovations. They could reduce long-term costs, and they will definitely reduce long-term price and supply volatility.

“Smart grid” technology can make electricity use more efficient and reliable. Our grid needs 21st century information technology that will give customers greater choices for saving money and electricity. A “smart grid” would also enable real-time monitoring by utility companies, so they could better defend against disruptions and attacks. Finally, a 21st century grid would connect more power suppliers, like solar panels on individual homes, to provide backup in the event of an outage and to make the grid more cost effective. Whatever technology we adopt, we must make sure that is secure against unauthorized intrusion, so that it makes our network more resilient against attack, rather than less.

Key Players

OPEC. As the owners of 70% of global oil reserves and 40% of daily oil supply, OPEC countries, including Iran and Venezuela, are the true profiteers in the global oil economy. And they know that controlling a large market share allows them to collectively control pricing. In 1999, OPEC cut oil supplies to raise global prices. They also refused to increase



OPEC still holds most of the cards when it comes to oil prices, meaning we are still vulnerable to their whims.

their production in 2008 as oil approached \$150 per barrel.

Oil Industry. The oil industry has been reaping enormous profits from global oil dependence. In 2013, the five largest oil companies made a combined profit of \$93 billion dollars. It is in their financial interest to maintain the status quo and they are committed to doing so.

Natural Gas Industry. Much of America's natural gas is also produced by oil companies like Exxon Mobil, BP, and Chevron. The oil and gas industry spent nearly \$150 million on lobbying activities in 2013 just to maintain the current system of subsidies.

Coal Industry. Historically, coal has dominated the market as a source of our electricity supply. However, as coal production has started to decline due to competition from natural gas, industry leaders have ramped up lobbying expenses, spending more than \$11 million in 2013.

Nuclear Industry. The nuclear industry has also spent millions over the past several years to lobby for benefits such as billions of dollars in loan guarantees. Parochial politics and enormous subsidy requirements tend to prevent nuclear plants from being built; making it unlikely that nuclear fuel is going to be a realistic path towards the future.

The U.S. Military. The military understands that energy efficiency and security are strategic imperatives and each branch is pursuing an ambitious agenda. The Army and Air Force have adopted Net Zero initiatives that aim to reduce consumption of energy, water, and waste on their installations to a rate of zero. The Navy will get half its energy, ashore and afloat, from renewable sources by 2020. The Marines are

reducing their energy use 30% by 2015 and are increasing their renewable electric energy to 25% by 2025. And the Air Force is reducing the amount of aviation fuel it consumes by 10% by 2015, increasing the amount of renewables consumed at facilities by 25% by 2025. The Air Force is also set to certify all of its 40-plus aircraft models to burn fuels derived from waste oils and plants by 2013, and has implemented an energy curriculum at the Air Force Academy and the Air University.

Clean Energy Industry. Reducing subsidies to oil, bringing more renewable sources onto the grid, and mandating more energy efficiency can open up new business opportunities. From blue-collar jobs retrofitting ventilation systems and installing solar panels to farmers producing switch-grass for biofuel, the new energy economy can create opportunities for every segment of America's workforce.