

# **Foundations of Modern U.S. Energy Policy**

**Testimony of**

**Jay Hakes**

**Before**

**U.S. House of Representatives**

**Energy & Water Appropriations Subcommittee**

**February 7, 2019**

I would like to thank Chairwoman Kaptur and the other members of the committee for their invitation to discuss historical perspectives on the state of energy in America today.

My federal experience on energy issues goes back to the Carter administration and later included seven years as Administrator of the U.S. Energy Information Administration, the government's premier source of energy data and analysis. More recently, I have spent considerable time relooking at major data series and visiting numerous presidential libraries to better understand the links between the country's energy past, present and future. Some of my findings are presented in my book *A Declaration of Energy Independence: How Freedom from Foreign Oil Can Improve National Security, Our Economy, and the Environment* (SLIDE 1) and numerous articles.

### **U.S. Energy Policy After the Arab Oil Embargo**

Many energy experts trace modern energy policy to the Arab Oil Embargo, which lasted from October of 1973 to March of 1974. This period evokes memories of frustrated motorists having to wait in line for hours to purchase gasoline, if they could find it at all. Some people were even placing their personal storage tanks in their yards or car trunks. On another level, the image of America held hostage by a newly empowered oil cartel reflected a perceived decline in U.S. global influence, which had rested, in part, its ample energy resources and the ownership of massive reserves abroad through major international companies.

Moreover, numerous other disruptions in the Middle East during the decade, either directly or indirectly, impacted the supplies and prices of gasoline in the United States (SLIDE 2). As the Organization of Petroleum Exporting Countries (OPEC) continued with lower levels of production, even after the embargo ended, the upward pressure on oil prices contributed to high rates of inflation and economic turmoil around the world.

These challenges helped focus the attention of the White House, the Congress and the public on the need to address the national security, economic and (as the historic clean air legislation of 1970 took effect) environmental challenges of energy. Energy became a major topic in the news. Presidents gave nationally televised addresses on the need for “energy independence” (Richard Nixon and Gerald Ford) and declaring energy “the moral equivalent of war” (Jimmy Carter). How to deal with energy was not without controversy, especially during the clash over deregulation of natural gas prices. Still, Congress passed the Energy Policy and Conservation Act of 1975 (under President Ford), President Carter’s energy package of 1978, and the Energy Security Act of 1980 with overwhelming bipartisan support. In addition, Congress created the Department of Energy in 1977 and broadened the mission of the national nuclear labs to include other forms of energy, such as wind and solar. Motorists, at least for a while, complied with a federal speed limit of 55 mph.

Some federal policies during this period produced more problems than they solved. Price controls and federal allocation of fuels, for instance, inhibited the flexibility of energy markets and made the energy crises of the 1970s worse than they would have been without such federal intervention. Ford and Carter started the process of decontrolling oil prices. Ronald Reagan quickly finished the job of deregulation.

Less recognized, the actions of the 1970s left numerous legacies that proved valuable in later years. A partial list would include:

- An expansion of federal spending on energy research & development to record levels (before or since) that advanced many important technologies (SLIDES 3 and 4).
- The Strategic Petroleum Reserve, which provides stocks of crude oil available for emergencies (with most additions to the reserve coming during President Reagan’s administration).
- Better insulation of buildings, which sharply reduced the waste of energy.

I would also include:

- Automobile efficiency (Corporate Average Fuel Efficiency or CAFE) standards that reduced the amount of oil needed for transportation (SLIDE 5).
- Cooperative arrangements with other industrialized nations to reduce dependence on Middle Eastern oil.
- Backing out oil from most electric generation.
- Allowing motorists to turn right on red lights (traffic permitting) to reduce fuel consumption from idling, a practice taken for granted today.

These new approaches to energy, along with higher energy prices, led to major results that for a long time were overlooked by historians. Most strikingly, from 1977 to 1982, the United States slashed its net imports (imports minus exports) of oil from 8.6 million barrels per day to 4.3 mbd (SLIDE 6). Due to big cuts in oil consumption in the U.S. and other industrialized nations, in tandem with added production in Mexico and the North Sea, OPEC lost its clout in world markets. The United States, with much lower imports and a growing petroleum reserve, achieved (for a time) a considerable measure of energy independence.

The years of heightened interest in energy also planted many seeds – some of which bore no fruit at all and others that led to major advances decades later. In June 1979, Carter dedicated an array of old-fashioned solar thermal panels on the roof of the White House (SLIDE 7) and set a national goal of 20 percent renewable energy by the year 2000. Moreover, he and the Congress established strong tax incentives and research programs for all forms of renewable energy help reach that goal. For the many years, however, the dream that more advanced photovoltaic solar panels would play a major role in U.S. energy supply remained “a road on taken.” In recent years, though, we have seen the arrival of a solar boom (and an even bigger boom in wind). The growth in solar in the past eight years has been, after decades of delayed market penetration, has been dramatic (SLIDE 8). EIA projects this trend will continue in the coming years. In 2017, Carter, at the age of 92, dedicated a ten-acre solar farm on ten acres of formerly agricultural land. That project now feeds 1 MW into the Georgia Power (Southern Company) grid (SLIDE 9). The former president was obviously very pleased to be part of the belated solar revolution.

The growth of hydro fracturing (fracking) of oil and gas followed a similar path. During the Ford and Carter administrations, the federal government provided technical geological assistance, R&D, and tax incentives to encourage the development of “unconventional resources.” These early actions helped the brilliant Texas entrepreneur George Mitchell persevere in his long struggle to make fracking market competitive. It was not until the 21st century that we witnessed the oil and gas boom that revolutionized American energy production.

### **Later Developments in Energy**

After 1985, low energy prices and stable supplies led to a decline in American interest in energy policy. Reliance on foreign oil began to rise once again. Indeed, a big boost in production by Saudi Arabia during the first war with Iraq was needed to avoid a major oil shortage. Net oil imports – at a low point of 27 percent in 1985 later reached 60 percent after the turn of the century. During this period of some complacency about energy, there were, nonetheless, several important adjustments in U.S. energy policy. A few of these (SLIDE 10) were:

- Appliance efficiency standards began in the late 1980s and helped reduce the tie between economic growth and energy consumption.
- In the early 1990s, the U.S. Energy Information Administration became one of the first federal agencies to put its data and analysis on the web, which contributed to greater accessibility of its information by policymakers and the public and to the more efficient operation of energy markets. (Some in the Congress wanted to put EIA behind a pay wall, but the House Appropriations Committee played a major role in stopping the idea.)
- The Environmental Protection Agency phased in higher standards for clean air, which had important ramifications for energy industries.
- In 2005, the Congress passed legislation to encourage a revival of the nuclear industry and expanded use of biofuels.

It was not until 2007, however, that Congress passed another broad-based energy bill with strong impacts. Security issues after 9/11, the revived clout of OPEC, high oil prices and environmental concerns all contributed to a renewed focus on energy. One feature of the Energy Independence and Security Act was its rejuvenation of auto efficiency standards, which had not been increased

since the late 1980s. Another provision was escalating efficiency standards for lighting that would phase out traditional incandescent bulbs, invented by Thomas Edison in 1880. As a result, more efficient, longer lasting Light-Emitting Diode (LED) bulbs now dominate the lighting market. This energy legislation passed the Senate by a comfortable vote of 86 to 8 and the House 314 to 100.

The years of Barrack Obama and Donald Trump have experienced energy issues as a frequent source of contention. This period is, perhaps, a topic best left to a separate analysis. In short, President Obama promoted aggressive R&D across a broad range of fuels (“all of the above”) and used his rule-making authority, often under the Clean Air Act, to expand environmental protection. President Trump has moved to repeal or weaken many of the regulations of recent years and stressed his commitment to protect the American coal industry against the forces that have led to its rapid decline.

It would be a mistake to focus entirely on federal policies when examining energy trends in recent decades. States have been active in adopting many of their own responses to the modern challenges of energy. The most noteworthy has been the adoption of renewable portfolio standards that require a minimum percentage of electric power come from (generally) wind and solar (SLIDE 11). Iowa was the first state to establish an RPS and Hawaii has the most aggressive standard of 100 percent renewables by 2045. RPS policies exist in 29 States and the District of Columbia. Many adopting this strategy are part of the “wind belt” in the central part of the country. Texas generates the most wind power, with Iowa and Oklahoma ranking second and third. Other states are located where solar resources are abundant. California, North Carolina, and Arizona have installed the most solar capacity.

### **The Modern Energy Revolution and an Agenda for the Future**

As mentioned previously, the past dozen years have seen the most dramatic reversals in energy trend lines in American history. Most have delivered important benefits for national security, the economy and the environment. Most experts failed to anticipate the extent of these changes or even the direction of the change.

The major barometer of this change is the decline in net energy imports (SLIDE 12). As late as 2007, net imports stood at 60 percent. As of last year, they had fallen to 13 percent – back to the level of the late 1950s! My book, published in 2008, suggested that it was in the national interest to get net imports out of the danger zone of 60 percent to something in the range of 30 percent. A few commentators viewed my scenario as “Pollyannaish.” In fact, I had not fully understood how low imports could go. The new situation depends on the free trade of imports and exports and does not remove the United States from international market and political forces. It does, however, reduce the chances that the American economy can be held hostage by a foreign power.

During this same period, the country experienced a boom in the production of oil and gas that has led to exports of oil (a ban on the export of crude oil was not lifted until December 2015) that helped offset supplies that were still imported. The increases in U.S. production (with estimates for 2018) have been:

- Natural gas up 45 percent.
- Oil up 115 percent.

As these historic surges began, the book market was flooded with warnings of “peak oil.” They argued that the production of oil was in a steady decline that could not be reversed. With rapid advances in technologies, these dire forecasts were rendered inoperative.

The energy boom has included wind and solar power. These resources started from a tinier base than oil or gas. The increases since 2007 are, nonetheless, extremely impressive (again, with estimates for 2018):

- Wind up 660 percent.
- Solar up 1,380 percent.

Ironically, the documentary film “A Road Not Taken” about the failure of solar energy to match the aspirations of the 1970s was released in 2010.

Meanwhile, energy consumption has plateaued since 2007, suggesting that sustained energy efficiency can help break the link between economic growth and energy use.

As is often the case, the past provides insights on future directions. Solar power, batteries for storage of intermittent energy, and electric vehicles are, to various degrees, penetrating the market. These three technologies benefit national security, the economy and the environment (including the atmosphere). Fortunately, each of these are still “immature” technologies, meaning there is plenty of room for sustained improvements in efficiencies and cost. One goal of national energy policy should be to build on the momentum that already exists and expedite deployment of these technologies to the extent possible.

I would add another technology to the list of those that merit extra support. Long-time observers of electric generation often advise against “putting all our eggs in one basket.” Recognizing that renewables with storage will be able to play a much greater role as technology progresses, maximizing the reliability of the grid probably will require at least one other source of power. One option might be natural gas plants with sequestration of carbon emissions. This is certainly feasible technically. However, it will take more R&D and considerable time before it can penetrate the market at significant levels.

I am, of course, happy to answer any questions from the committee today or later.

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**Bio:** Jay Hakes is a writer and speaker based in New Orleans specializing in the history of U.S. energy policy, climate change and the American presidency. He is the author of *A Declaration of Energy: How Freedom from Foreign Oil Can Improve National Security, Our Economy, and the Environment* and numerous articles. During his career in government, he held numerous positions dealing with energy: Assistant to the Secretary of Interior, Director of the Florida Governor’s Energy’s Energy Office, Administrator of U.S. Energy Information Administration, and Director of Research and Policy for the report *Deep Water: The Gulf Oil Disaster and the Future of Offshore Drilling*. He also served for thirteen years as Director of the Jimmy Carter Presidential Library in Atlanta. Hakes holds a PhD from Duke University.

(Slides 1-12 on following pages)



"This book and its message are long overdue."  
— Former President Jimmy Carter

JAY HAKES

A DECLARATION OF  
**ENERGY**  
INDEPENDENCE



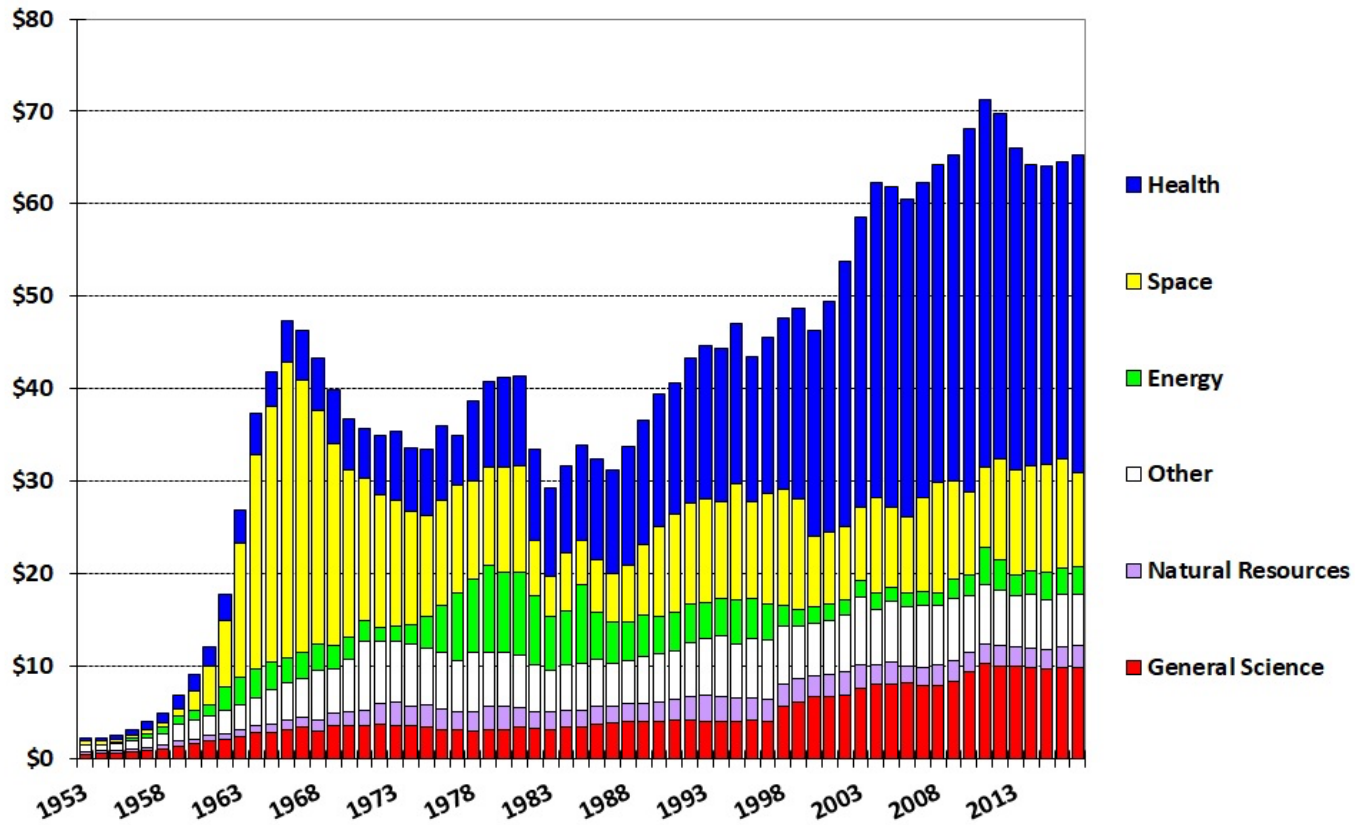
How Freedom from Foreign Oil  
Can Improve National Security,  
Our Economy, and the Environment

## Major Disruptions of 1970s in Middle East:

- Arab Oil Embargo/Gasoline Lines
- Transfer of Ownership of Oil Companies to Host Countries
- Fall of the Shah of Iran
- Russian Invasion of Afghanistan
- Outbreak of Iran-Iraq War (1980)

## Trends in Nondefense R&D by Function

outlays for the conduct of R&D, billions of constant FY 2018 dollars



Source: AAAS, based on OMB Historical Tables in *Budget of the United States Government FY 2019*. Some Energy programs shifted to General Science beginning in FY 1998. © 2018 AAAS

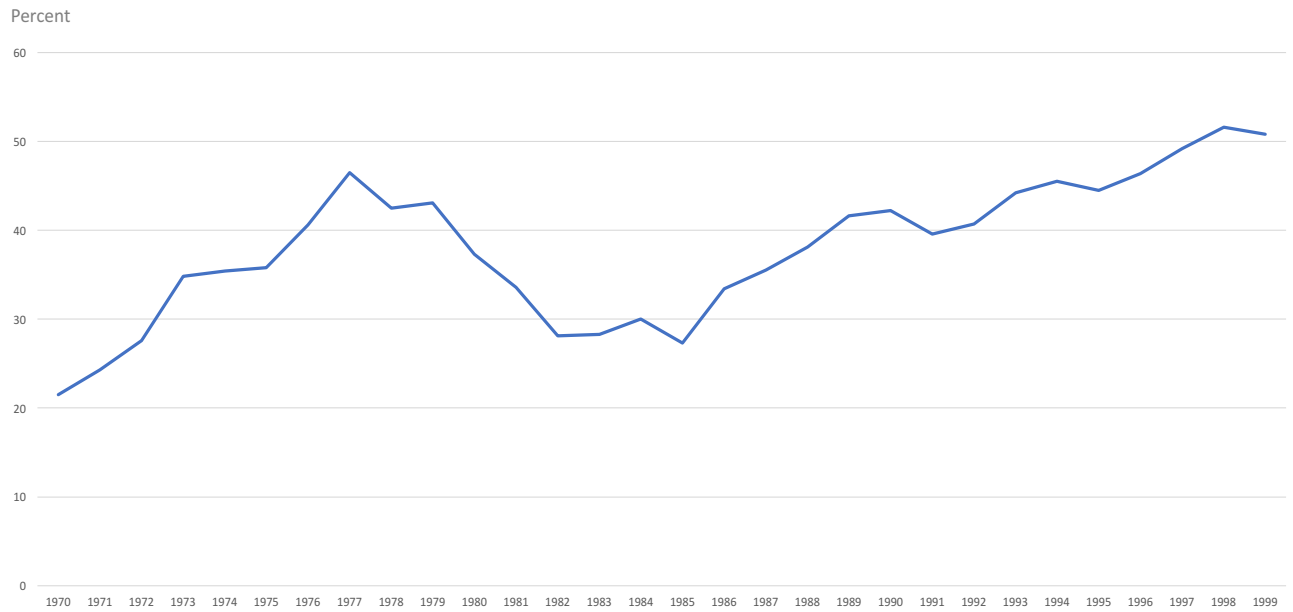
## Legacies of 1970s:

- Expansion of federal spending on energy research & development to record levels (before or since) that advanced many important technologies.
- Strategic Petroleum Reserve available for emergencies (most purchases coming under Reagan).
- New approaches to the insulation of buildings that sharply reduced the waste of energy.

## More Energy Legacies from the 1970s

- Automobile efficiency standards (CAFE) that reduced the amount of oil needed for transportation.
- Cooperative arrangements with other industrialized nations to reduce dependence on Middle Eastern oil.
- Backing out oil from most electric generation.
- Allowing motorists to turn right on red lights (traffic permitting) to reduce fuel consumption from idling, a practice taken for granted today.

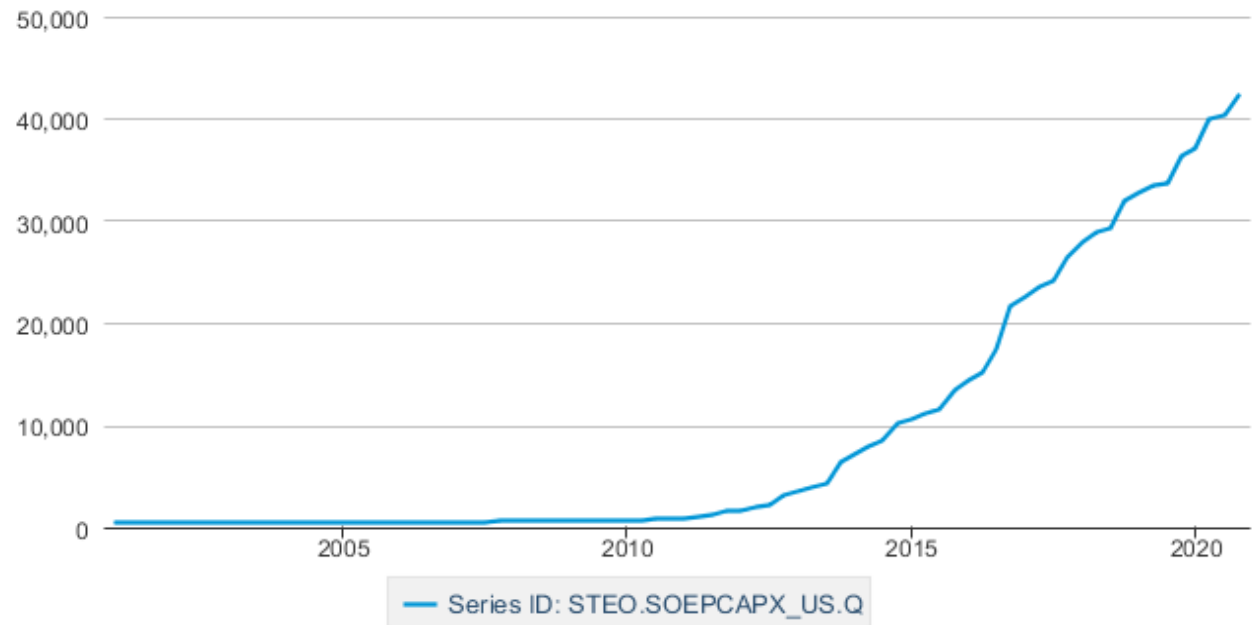
## Net Petroleum Imports, 1970-1999





### Electric Power Sector Large-Scale Solar Net Summer Capacity, Quarterly

megawatts



Source: U.S. Energy Information Administration

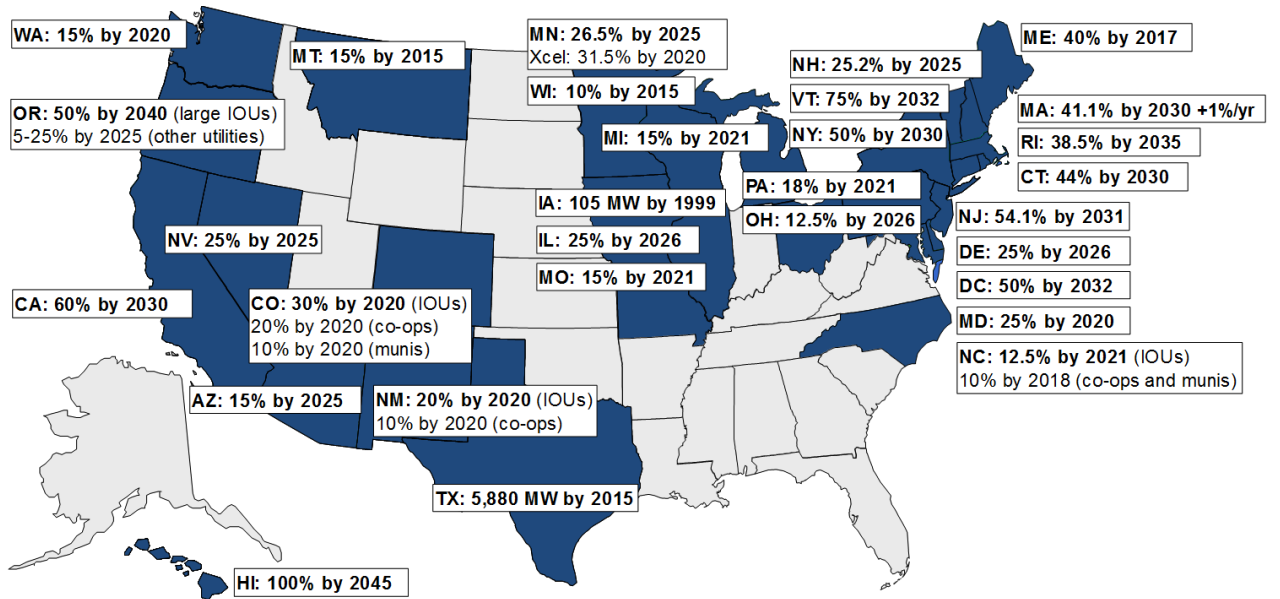




## Select Additions to U.S. Policy, 1987-2007

- Appliance Efficiency Standards.
- U.S. Energy Information Administration Web Site.
- Higher Standards for Clean Air.
- 2005 legislation to encourage greater use of nuclear power and biofuels.
- Energy Independence and Security Act of 2007.

## Renewable Portfolio Standards (2018)



Source: Berkeley Lab (November 2018)

**Table 3.3a Petroleum Trade: Overview**

Percent



Source: U.S. Energy Information Administration