Season 24

Debating the 2023-2024 Stoa Policy Resolution

Policy debaters always benefit by understanding the history of the year's topic of study. The purpose of this article is to give competitors some background on the resolution:

> ***Resolved: The United States Federal Government should substantially reform its energy policy***

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History of U.S. Energy Policy

Stoa's 2023-2024 Policy Resolution:

Resolved: The United States federal government should substantially reform its energy policy.

Energy policies are a frequent topic in competitive debate. Energy policies also overlap onto numerous other types of policies, like transportation policies, foreign trade policies, agricultural policies, and environmental policies. These policies are not mutually exclusive. It is quite logical that policy-makers might, for example, change an energy policy for the express purpose of safeguarding the environment, thus making that policy both an energy and environmental policy at the same time.

In this chapter we will define the resolution, then trace some of the highlights of the background events of the topic throughout US history. In the upcoming second chapter, we will survey Status Quo issues and proposals for change and debate that are common in the literature today.

Defining Key Terms

Energy Policy

There are several useful definitions of "Energy Policy" that could be useful for debating this resolution. For example, consider the "Energy Policy Act":

"The Energy Policy Act (EPA) addresses energy production in the United States, including: (1) energy efficiency; (2) renewable energy; (3) oil and gas; (4) coal; (5) Tribal energy; (6) nuclear matters and security; (7) vehicles and motor fuels, including ethanol; (8) hydrogen; (9) electricity; (10) energy tax incentives; (11) hydropower and geothermal energy; and (12) climate change technology. For example, the Act provides loan guarantees for entities that develop or use innovative technologies that avoid the by-production of greenhouse gases. Another provision of the Act increases the amount of biofuel that must be mixed with gasoline sold in the United States."[1]

But keep in mind that the Energy Policy Act does not purport to include all federal energy policies nor would it be logical to argue that a federal policy not mentioned in that Act is prima facie not topical. There's no rule that says Congress has to put all energy policies into one law, and there could be any number of others elsewhere. For example, consider:

"Energy policies are the actions governments take to affect the demand for energy as well as the supply of it. These actions include the ways in which governments cope with energy supply disruptions and their efforts to influence energy consumption and economic growth. The energy policies of the United States government have often worked at cross purposes, both stimulating and suppressing demand. Taxes are perhaps the most important kind of energy policy, and energy taxes are much lower in the U. S. than in other countries. "[2]

Taxes (or their inverse, subsidies) on various types of energy are important "energy policies" that may not be part of the Energy Policy Act.

Fossil Fuels

These are sources of energy derived from organic (carbon-based) compounds deposited in the earth in the ancient past. Examples include petroleum, coal and natural gas. Since no one was around back then to observe it, no one can state definitively their origin, but the available theories depend in part on the worldview of the observer.

Evolutionary view (most commonly seen in the literature on energy policy): Such fuels are the result of decaying plant and animal materials subjected to slow geologic processes and pressure of rock layers over millions of years.

Creation view #1: Widespread destruction of plants and animals during the Genesis flood leaves decaying organic material trapped in rock layers. It subsequently underwent

[1] Environmental Protection Agency 2018. https://www.epa.gov/laws-regulations/summary-energy-policy-act
[2] https://www.encyclopedia.com/environment/encyclopedias-almanacs-transcripts-and-maps/energy-policy

metamorphosis into its present form quickly, over centuries or at most millennia, and did not require millions of years.

Creation view #2: The earth may have been created in the beginning with vast quantities of these materials in place as-is, and they didn't develop from anything (although future decay of plants and animals could generate more of them). Since methane (natural gas) has been found in the atmospheres of Mars and Jupiter, and it surely did not come from dead plants and animals there, the same could have happened on Earth as well.

Biofuels

Biofuels are sources of energy derived from organic sources that can be regrown continually. Examples include wood and ethanol (alcohol made from corn, sugar cane, switchgrass, etc.).

Renewable Fuels

Fuels considered "renewable" include the biofuels mentioned above, plus solar energy, wind, geothermal, hydro power, and ocean wave or tidal energy. Renewable fuels are considered desirable because, since they continuously regenerate themselves, they cannot be exhausted and might not be subject to wide market swings in supply as commonly happens with fuels that must be explored, found, and then depleted.

Nuclear Energy

This is energy derived from the bonds that hold together the nucleus (protons and neutrons) of the atoms of certain elements. There are two types of nuclear energy commonly discussed in the literature:

Fission – energy released from splitting heavy element atoms (like uranium or plutonium) into lighter elements. This is currently used by nuclear reactors around the world today, and it was the type of energy whose power was first demonstrated in the atomic bombs used against Japan in 1945 at the end of World War II.

Fusion – energy released when fusing a light element (hydrogen) into a heavier element (helium). This is what fuels the sun and stars, and was reproduced by man in the hydrogen bomb (massively more powerful than the Hiroshima bomb and still, happily, so far never used in combat). Fusion is still under scientific research to obtain a controlled reaction under repeatable and safe conditions. As of now it is not yet commercially available, but large amounts of money

are being invested in research and development. As more than one sage has said, "fusion is the energy of the future… and always will be."

Energy Conservation

Conservation is sometimes treated as an energy source because, although it can only go so far before economic development and standards of living are compromised, a reduction in energy usage can replace or prevent the need for bringing online new power plants or new sources of energy.

Conservation can be market driven – that is, consumer goods are less expensive in the long run if they use less energy to operate and consumers thus have an incentive to shop for more energy efficient products. For example, a consumer might choose a 40-watt light bulb instead of a 60-watt bulb because it will cost less to power it.

Conservation can be government directed – that is, government may set standards and require manufacturers to meet them. For example, fuel economy standards on automobiles, which require car manufacturers to develop and sell more fuel-efficient cars, because Congress said so.

Conservation can be government nudged – that is, the government may enact regulations that tell markets to disclose energy efficiency information on the packaging. For example, you may have seen stickers on large appliances that disclose how much energy they use over a period of time. If all of these appliances are required to have the same information disclosed on the same sticker, the consumer can make an informed decision based on energy savings.

Early Energy Use in America

There were only a few primitive sources of energy (other than human manpower[3]) available in North America in colonial times. Work animals pulled farm equipment and horses transported passengers. Wind was captured by sailing ships and by windmills. Water flowing in rivers propelled water wheels and river boats. But wood was the most abundant, storable, and concentrated source of energy, and it was commonly used for household and industrial purposes in great quantities. In fact, it was not until the 1880s that total energy generation from wood was surpassed in the United States by another source.

Wood was abundant in the untapped forests of the newly discovered North American continent, so its cost and availability were not issues in those days. But as the 1800s wore on, and particularly after the Civil War (1865), the burgeoning Industrial Revolution found it less convenient to derive its growing thirst for energy from the heavy and bulky commodity of wood. Fortunately an inexpensive and more concentrated form of energy was also found in abundant quantities in America: coal.

The development of technology for the harnessing of energy to do mechanical work, in the U.S. and in Europe, was the key to the Industrial Revolution and the rapid rise in human standards of living in the last three centuries. The most important early technology was the steam engine.

"Steam power was developed in the 1600's in conjunction with coal mining to help pump water out of the mines. It had been known since ancient times that heat could be used to produce steam, which could then do mechanical work. However, it was only in the late eighteenth century that commercially successful steam engines were invented. The first commercially successful steam engine was invented by Thomas Savery (1650-1715), an English military engineer. In 1712, this engine was refined by Thomas Newcomen (1663-1729), another Englishman. The Newcomen engine was widely used in Britain and Europe throughout the eighteenth century, but had very low energy efficiency. A greatly improved steam engine was designed and built in 1763 by James Watt who was asked to repair a Newcomen engine. Watt built and then sold or rented his engines to mining companies, charging them for the "power" in the rate of work the engine produced. Today, the unit for power is called a Watt."[4]

[3] And the shortage of human manpower and absence of industrial technology are what motivated the English settlers to begin the introduction of slaves on plantations in Virginia in 1619. African slavery may well have been the first "energy policy" in our nation's history.

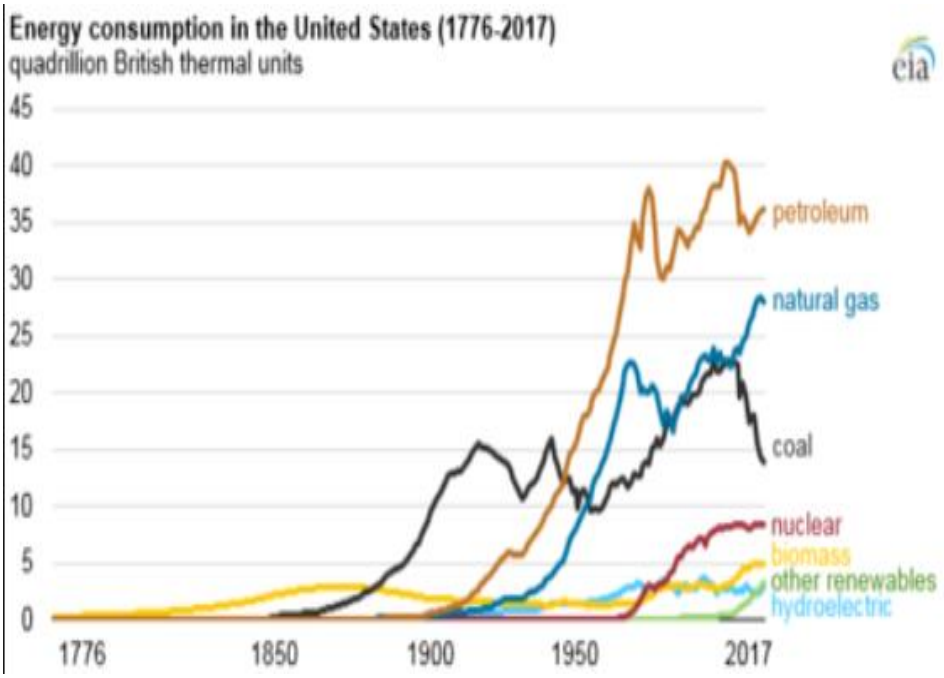
[4] http://environ.andrew.cmu.edu/m3/s3/01history.shtml

The Rise and Fall of Coal

In the 1880's, energy produced in the United States from coal began to exceed wood as the energy needs of industry expanded rapidly.

"In the early 1800s some of the first commercial coal mines were operating in several parts of the country. Coal provided more heat per pound than wood and occupied a smaller volume. It was a much more portable fuel. Steadily coal consumption climbed, and in the late 1800s the amount of energy produced from coal exceeded the amount produced from wood. Industrialization, the use of coal to power machinery, and the use of coal in electric power generation supported a strong demand for coal."[5]

Energy needs during the Civil War and the acceleration of American industry after the war drove the development of America's coal resources at a rapid pace. New coalfields were discovered and exploited, and the railroads became both major consumers of coal and major owners of the coalfields, which they leased out to mining companies.



"The railroads opened the coalfields of West Virginia by connecting them with industrial outlets. The coast-to-coast railroad built immediately following the Civil War provided access to coalfields west of the Mississippi River. New technology drove the evolution of the industry. Extraction of coal went underground, requiring pumps and new machinery to obtain the coal. The industry also developed methods to clear bituminous coal of its impurities by producing coke, a fuel with few impurities and a high carbon content, crucial to making iron and steel."[6]

But times changed and coal began to decline. Oil and natural gas began to replace coal, and problems in the coal industry began to mount.

[5] Dr. Hobart M. King https://geology.com/articles/history-of-energy-use/

[6] https://www.arcadiapublishing.com/Navigation/Community/Arcadia-and-THP-Blog/October-2017/%E2%80%8BEvolution-of-the-Coal-Industry-in-America

Contentious labor relations continued into the 1900s, even as the industry grew. Soon, however, the oil boom began in earnest; primarily due to refinement improvements and the expanded use by the public of the automobile as a primary means of transportation. Technology helped make hydroelectric power more efficient. By the mid-20th century, oil and natural gas began to overtake coal as the leading fuel source for energy production … The coal industry reached peak employment in 1924, with over 860,000 miners employed[7]. That number fell consistently until the late 1960s — though with several slight upticks around World War II. …the coal industry, as of September 2016, employs just over 75,000 mineworkers. Most of the mining jobs disappeared as a result of technological advances: machines can extract coal more efficiently than a human can. Competition from natural gas, solar, wind, and other sources also bedevil the industry. As solar and wind power become both more efficient and prevalent, the need for coal-fired power plants will decrease even further.

Today, coal is widely decried as a "dirty" fuel that, although generating a large percentage of the electricity used in the country, some believe needs to be shown the exit from America's energy landscape. Despite extensive and expensive regulations involving cleaning of the emissions and disposal of the ash, coal still has serious pollution concerns compared to other fuels used for electricity. And in addition to the particulate matter deposited in the air and ground, concerns about coal's high carbon dioxide emissions as a key cause of climate change raises further public demand for coal's demise.

The Rise of Oil

The first oil well in the United States was drilled in Titusville, Penn., in 1859. Crude oil, petroleum, refined into kerosene, rapidly came into the US economy as a replacement for (increasingly scarce and higher priced) whale oil for home lighting.

The first oil well in the U.S. was this one, near Titusville, Penn., drilled in 1859.

Further discoveries of oil (in Texas, for example), and discoveries of new uses for oil as an industrial and motor vehicle fuel when refined into various end products, led to oil's rise as the fuel of the 20th cetury.

"The 19th century was a period of great change and rapid industrialization. The iron and steel industry spawned new construction materials, the railroads connected the country and the discovery of oil provided a new source of fuel. The discovery of the Spindletop [Texas] geyser in 1901 drove huge growth in the oil industry. Within a year, more than 1,500 oil companies had been chartered, and oil became the dominant fuel of the 20th century and an integral part of the American economy. …Other oil strikes followed in Oklahoma, Louisiana, Arkansas, Colorado, and Kansas. Oil production in the United States by 1909 more than equaled that of the rest of the world combined."[8]

[7] Keep that statistic in mind any time someone tells you they have a plan to restore jobs in the coal industry. Coal jobs have been declining for almost 100 years now, and 90% of them are already gone (860,000 in 1924 versus 75,000 today).

[8] https://www.history.com/topics/industrial-revolution/oil-industry (brackets and ellipses added)

In the 1870s, a businessman named John D. Rockefeller[9] began growing the oil industry dramatically by consolidating oil production, marketing, refining, and other related businesses under his control. His Standard Oil Co. came to control 33% of the U.S. oil market and Rockefeller became the richest man in America. The Supreme Court in 1911 found Standard Oil to be a monopoly under the definition of anti-trust law[10] and ordered it broken up into smaller companies. Perhaps you have heard of some of Standard's descendent companies, such as Exxon, Chevron, and Marathon.

Between 1911-1914, the U.S. and British Navies both switched their ships from being fueled by coal to using oil instead. This motivated first the British and later the Americans to begin making foreign policy decisions based on the location of oil in foreign countries. Ensuring the availability of oil was now not only an economic advantage but a national security imperative.

Oil began replacing coal during this time period as it was found to be more efficient and provided more energy per unit of weight. There were also labor strikes and conflicts in the nation's coal mines over work conditions, safety, and pay, which reduced coal production.

The rise of the automobile in the 1920s and its penetration into virtually every family and daily routine after World War 2 made oil essential to the American way of life. By 1950, oil replaced coal in total energy production in the U.S. economy, and regular purchases of gasoline tied every American family to the fortunes of the oil industry. In the 1950s, taxes on gasoline were increased to pay for the Interstate Highway System, which today connects all parts of the country with high-speed roads.

We should note the rise of Alaska, which achieved US statehood in 1959, as a major player in the oil industry:

[9] Some say his efficiency at providing oil to the American economy, making kerosene widely available to replace whale oil, made John D. Rockefeller the greatest environmentalist of all time. He may have done more than anyone in history to save whales from extinction, though that was never his goal.

[10] For more background, research the Sherman Anti-trust Act of 1890. It is still on the books and affects our economy today.

1957-1968: Infancy on the Kenai Peninsula

The Swanson River field, discovered in 1957 on the Kenai Peninsula, was the initial site of commercial production of Alaska oil and gas. Four offshore fields came online in the early 60s which brought Alaska's crude oil production to more than 200,000 barrels per day. (See Table 1.) By 1968, Alaska was a significant oil producer, and the industry was contributing more than 20% of the total revenue to the state's treasury.

1968-80: Prudhoe Bay Transforms Alaska into Oil Giant

In 1968, a super giant oil field was discovered at Prudhoe Bay. In 1969, $900 million in bids for Prudhoe oil tracts signalled the beginning of the black gold rush.

The remaining obstacle was finding a way to get Prudhoe Bay oil to market. A pipeline was proposed. Although many roadblocks materialized, the Arab oil embargo of 1973 spurred Congress into passing legislation enabling pipeline construction to begin.

Construction of the Trans-Alaska Pipeline System (TAPS) began in 1974 and was completed in 1977 at a cost of over $9 billion. In June 1977, the first barrel of North Slope crude flowed from the Trans-Alaska pipeline, and Alaska stepped into the big leagues of oil producers. By 1980 more than 1.5 million barrels of oil a day were flowing to Valdez.

John Boucher, Brian Rae and James Wilson
http://laborstats.alaska.gov/trends/nov89art2.pdf

The Crisis of Oil

After World War 2, as the U.S. economy grew, its demand for oil began outpacing domestic supplies. Imports from around the world were brought in to supply the demand. This is not a unique situation, since there are many products and raw materials imported into the United States every day that are not produced at all or not in sufficient quantities within this country. But in the early 1970s, a confluence of events happened that began to raise public awareness of issues related to geopolitics, trade policies, and oil, as Americans discovered what happens when something they took for granted (gasoline for their cars) suddenly wasn't there anymore.

Inflationary pressures were building in the US economy in the late 1960s and early '70s, coming from increased spending on social welfare programs, the expensive escalation of the Vietnam War, and Pres. Nixon's decision in 1971 to cut the US dollar from its remaining link to the gold standard. Nixon's solution to these inflationary pressures was to impose wage and price controls and simply declare by federal fiat that prices would not rise. Though the controls were later removed after predictable bad side effects began occurring, they were not removed for oil and natural gas.

Anytime a price ceiling is imposed upon a commodity, when that price limit is higher than the market price, it has no impact. Nobody is trading at that price level, so it doesn't come into play. But when the price ceiling is imposed below the market price, the result is inevitably shortages. Consumers (at the artificially low price) will demand more (because low prices attract buyers).

Suppliers will supply less (because some of their supplies cannot be brought onto the market at the artificially low price, since the cost of production may exceed the allowed sale price). Supplies shrink and demand grows under a price-control scheme, leading to shortages and confusion in the markets.

Cars lined up waiting to buy fuel at a Portland, Oregon, gas station. December 1973

On top of the price control scheme, international events created the perfect storm for a crisis. In October 1973, a war broke out between Israel and its Arab neighbors. The Arab countries, angry at US support for Israel, declared an oil export boycott against the U.S., reducing supplies and driving up prices. But US markets could not respond to the higher prices due to price controls. While prices did rise, they did not rise fast enough or far enough to bring in new supplies of oil (or to induce enough third parties to buy Arab oil and re-sell it back in the U.S. and bypass the boycott). The result was the worst of both worlds: higher prices and widespread shortages of oil and its resulting products, most notably, gasoline. Gas stations ran out of fuel, long lines of cars queued up at whatever stations had remaining supplies, and the US economy suffered dramatically. The phrase "energy crisis" entered the US vocabulary and public awareness of energy prices and the need for energy conservation suddenly became top priority. Anger was directed at foreign countries and calls for "energy independence" came from politicians and voters alike. Few understood that the root cause of the crisis was government intervention in setting prices, and many blamed greedy oil companies, or lazy consumers, or foreign governments, or geologic limitations on the total quantity of oil in the ground.

The federal government enacted various schemes to reduce US oil consumption. In 1974, Pres. Nixon announced a mandatory lowering of the speed limit on highways to 55 mph. In 1975, Congress enacted CAFÉ (Corporate Average Fuel Economy) standards, requiring that car manufacturers increase the fuel economy of cars sold in the U.S. The federal government also began funding research and providing subsidies for alternative fueled vehicles that could replace demand for oil on our nation's highways.

In 1977, Pres. Carter created the cabinet-level Department of Energy, partly in an attempt to solve the ongoing issues that energy supplies were creating in the US economy. Some of what the Dept. of Energy was assigned to do was merely consolidation of functions from other

agencies, such as control of the nation's nuclear weapons and environmental cleanup of nuclear sites. But it was also assigned responsibility for researching energy technology, developing comprehensive national energy planning, and eventually it even got the Human Genome Project!

Pres. Carter began the process of lifting price controls on oil in 1979 and it was completed by Pres. Reagan shortly after he took office in January, 1981. Since then, there have been no more national shortages of gasoline or other petroleum products. There have been, however, wide variations in prices with large percentage swings both up and down during the years since.

Another potential oil crisis was predicted in the mid-2000's as oil prices again began rising. Often referred to as the "Peak Oil" problem, the theory was that the world would reach a point at which oil extraction could not expand, due to the physical limitation of the total quantity of oil in the ground. After the peak is reached, oil production would gradually drop and prices would inevitably rise. Some evidence supporting this theory was found in the graph of oil production in the United States, which rose gradually from 1859, peaked around 1970, and then gradually declined.

Congress took further steps to reduce US oil consumption by enacting Renewable Fuel Standards (RFS) in 2005. These regulations require blending of renewable fuels (mostly ethanol) with gasoline, in the hope that gasoline consumption could be reduced by the quantity of the alternative fuel. Experts are divided on whether RFS has accomplished anything good, and we will discuss it more in the next chapter. Oil imports did not noticeably go down immediately after RFS was implemented.

But then something unexpected happened that did begin driving down oil imports. US domestic oil production turned around and began increasing in 2010 thanks to the newly expanded use of hydraulic fracturing, better known as "fracking."

"…the fracking process starts with a well that is drilled vertically or at an angle …to a depth of 1 to 2 miles …The vertical well is then encased in steel and/or cement to ensure the well doesn't run the risk of leaking into any groundwater. Once the vertical well reaches the deep layer of rock where natural gas or oil exists, the well curves about 90 degrees and begins drilling horizontally … fracking fluid is pumped down into the well at extremely high pressure… The pressure is powerful enough to fracture the surrounding rock, creating fissures and cracks through which oil and gas can flow. The fluid …is mostly water, though it also can contain a wide range of additives and chemicals that serve an engineering purpose. Additives can include detergents, salts, acids, alcohols, lubricants and disinfectants."[11]

[11] https://www.livescience.com/34464-what-is-fracking.html

Fracking has resulted in a dramatic increase in the availability of oil and natural gas in the United States and eased some of the concerns of the past generation about imported energy.

"Prior to the development of fracking technology, these oil and gas deposits found in shale were considered essentially useless because the cost to extract them was prohibitively expensive. Fracking changed that equation and led to a new boom in oil and gas production in the U.S. As a result, total U.S. crude oil production increased by more than 50% in less than a decade. Over the same time period, the amount of total U.S. oil consumption provided by imports fell from roughly 60% down to 45%. While that still leaves the U.S. heavily dependent on foreign oil, it is nonetheless a very significant reduction in the level of dependence since it means the country is capable of providing over half of its fuel needs. … The natural gas industry that once voiced concerns over eventually exhausting the domestic supply of natural gas has such a massive excess of supply, it is rapidly expanding its business to include exporting natural gas to Europe and Asia. Shipping terminals built to facilitate the receiving of liquefied natural gas imports are being reworked to support exports."[12]

While we don't have a separate section on natural gas, we can use this spot to talk about its rise as well. The vast expansion of natural gas supplies in the U.S. led to a dramatic reduction in its price. Natural gas also has fewer (though not zero) carbon emissions compared to coal and is highly competitive in price compared to nuclear energy. More and more power plants are turning to natural gas as a result, leading to further doubts about the future of coal and nuclear for electricity generation.

[12] https://www.investopedia.com/ask/answers/012915/how-has-fracking-helped-us-decrease-dependence-foreign-oil.asp

Oil and Foreign Policy

As more oil came into the US from abroad, and as it became more and more critical to the economy and national security, US foreign policy makers began to take active efforts to ensure its flow to America and our allies. One of the first key efforts was a meeting in 1945 between Pres. Franklin Roosevelt and King Abdul Aziz bin Saud, in which FDR assured the Saudi king of US military protection in return for the King's assurance of oil to the US and its allies.

Pres. Franklin D. Roosevelt (far right) meets King Abdul Aziz bin Saud to negotiate for oil supplies. 1945

In 1953, the US and Britain covertly arranged for the overthrow of the democratically elected government of Iran in favor of supporting rule by Shah (king) Mohammad Reza Pahlavi. They did so because the previous Iranian government had interfered with foreign oil companies' activities in Iran. This decision came back to haunt US policy makers, as hatred for America and the Shah erupted in the Islamic Revolution in 1979 and his replacement with a radical Shi'ite religious government that continues in power today.

In the mid-1970s, Pres. Nixon negotiated with the Saudis to arrange international trade in oil to America's advantage by having them price oil only in US dollars. The Saudis could then invest those dollars in the safest dollar-denominated asset in the world: US Treasury bonds. This "petro-dollar" arrangement accomplished several things. First, it assured the US that there would be no currency exchange risk for the US on world oil markets. Other nations might find the price of oil rising and falling simply due to changes in the value of their currency relative to the US dollar, but the US would face no such risk. Second, it created artificial demand for US dollars, propping up their value, since everyone else would need to first buy US dollars before they could buy oil. And third, it expanded the market for US Treasury debt, allowing the federal government to run higher deficits without raising interest rates, since more willing buyers were now available to buy the bonds.

In 1980, after the Soviet invasion of Afghanistan in December, 1979, Pres. Carter announced in his State of the Union Address that the United States considered the oil rich nations of the Middle East to be a vital strategic interest that would drive American foreign policy.

"An attempt by any outside force to gain control of the Persian Gulf region will be regarded as an assault on the vital interests of the United States of America and such an assault will be repelled by any means necessary, including military force. "[13]

This commitment, also known as the "Carter Doctrine," has arguably been behind the large US military interventions in the Middle East over the last generation. For example, Pres. George H. W. Bush's decision to intervene with military force to rollback the Iraqi invasion of Kuwait in August, 1990, would likely never have happened had there been no oil in Kuwait.

Oil is priced on world markets, so a barrel of oil from Texas will not be significantly less expensive than a barrel from the Middle East just because it is domestic. Events happening in oil producing nations overseas can have effects on consumers in the U.S. if the world price of oil goes up due to a war, terrorism, revolution, or some other crisis. Even if we import exactly zero drops of oil from the Middle East, a war or revolution there will raise the price of oil (gasoline) in the U.S., as it will for all countries in the world, because oil is priced on world markets. Oil flows to whoever is willing to pay the highest price for it as a commodity on the world market. The global price of oil determines the ultimate price of products that use it. Where that oil comes from (imported or domestic) is irrelevant.

"It is not too much to expect that our children will enjoy in their homes electrical energy too cheap to meter…"
Atomic Energy Commission Chairman Lewis Strauss 1954

The Rise & Fall of Nuclear Energy

Early research on the nature and behavior of the atom from the 1890s to the 1930s laid the theoretical foundations for important discoveries that would play an important role in world history in the decades that followed. Scientists in the 1930s came to believe that immense power was stored in the bonds holding together the nucleus of the atom, and that this power could be unleashed with stunning effects. The US government was persuaded to research this potential during World War 2 (in part because it feared hostile nations were doing the same) and the result was the atomic bomb, which ended the war with Japan in 1945.

But explosions are not the only possible use of nuclear fission, and along the way to inventing the bomb, scientists developed controlled nuclear reactions that generate energy that can be used productively for industrial purposes. In the 1950s, the Navy used nuclear power to operate large ships, and in the 1960s the first commercial nuclear reactors in the United States came online to

[13] Pres. Jimmy Carter, January 1980

generate electricity. By 1991, 20% of all electricity in the US was generated by nuclear power plants. But there were storm clouds on the horizon.

Americans were startled by a partial meltdown at the Three Mile Island nuclear reactor near Harrisburg, Penn., in 1979. A radiation leak led to the evacuation of 140,000 people, and public fear and confusion, fueled by conflicting and sometimes erroneous official information put out by utility officials and government leaders, made the public begin questioning the wisdom of expanding the use of nuclear energy. Orders for new reactors began to slow.

In 1986, a much worse accident happened at the nuclear power station in Chernobyl, Ukraine (then part of the Soviet Union). Dozens were contaminated with radiation and died immediately, while thousands of others in the surrounding areas are estimated to have died later as a result of long-term illnesses. In 2011, the nuclear reactor at Fukushima, Japan, melted down and released radiation after being flooded by a tsunami triggered by an earthquake, fueling further questions about the long-term viability of nuclear energy.

Between 1977-2013 there were no new construction starts of nuclear power plants in the United States. Nuclear energy generation still grew during that time as the existing reactors produced more power more efficiently, and plants started before 1977 were completed and came online. A number of plants were proposed and then canceled during that time. Very few new units are expected to come online in the near future, even as older plants are aging and being decommissioned.

"The US Energy Information Administration forecast in April 2014 that the country will lose 10,800 MWe of nuclear generation by 2020 because of lower prices of natural gas and stagnant growth in electricity demand. This will have significant implications for CO2 emissions, and it projected that early retirement of nuclear capacity, instead of coal, could see annual CO2 emissions be 500 million tonnes higher by 2040."[14]

In addition to competition with lower-priced natural gas and concerns about operational safety, nuclear energy in the U.S. has yet to resolve another hindrance: waste disposal. Nuclear fuel, once it has completed all its reactions and becomes depleted, is still dangerously radioactive and will be for thousands of years. Currently there is no approved storage site for the waste coming from commercial reactors in the United States, so the waste is simply kept on site at the power plants.

Congress approved a deep underground burial site in the 1980s, to be constructed at Yucca Mountain, Nevada. Work progressed on the site until 2011, when Congress and Pres. Obama

[14] World Nuclear Association 2019. http://www.world-nuclear.org/information-library/country-profiles/countries-t-z/usa-nuclear-power.aspx

terminated it. As of today, Yucca Mountain remains closed and unused for any waste storage. Meanwhile, nuclear energy's future within the United States remains uncertain.

The Rise of Renewable Energy

The combination of shortages and higher prices for fossil fuel energy in the 1970s and concerns about nuclear energy in the 1980s along with new concerns about "climate change" in the 1990s (about which, more in the next chapter) began converging into advocacy for public policies to encourage renewable sources of energy. The sun and wind cannot be embargoed by a hostile foreign power, cannot be monopolized by a greedy corporation and do not pollute. Plants can be grown and regrown without using up finite resources. Ocean waves and tides are inexhaustible and pollution-free potential sources of energy waiting to be tapped.

A brief history of public policy on renewable energy is outlined below[15], and you should note the important role of state governments in the experimentation and innovation process. This could potentially play some role in your debates on the Negative side (states can do policies as a possible better alternative to federal action).

[15] Eric Martinot, Ryan Wiser and Jan Hamrin "RENEWABLE ENERGY POLICIES AND MARKETS IN THE UNITED STATES" http://www.martinot.info/Martinot_et_al_CRS.pdf

ENERGY POLICIES: HISTORY & BACKGROUND

This chapter provides an overview of the history of renewable energy policies and markets in the United States and how they evolved over time. There have been three distinct phases in that history (Table 2). The first phase, from 1978 to 1990, was the so-called "PURPA era." Prior to 1978, electric utilities had no obligation to purchase power from third parties and were not interested in investing in non-hydro renewable energy themselves.

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The second phase following the PURPA era was not so favorable, however. Several factors caused renewable energy markets to stagnate, including a long period of electric power sector restructuring, repeal of federal and state incentives, and sharply lower natural gas prices. Very little capacity was added. This "stagnation era" lasted until around 1997.

The third phase, starting around 1997, represented a new era for renewable energy in the United States. By then, some of the uncertainty surrounding electricity reform had begun to lessen, and state renewable energy policies that were enacted during restructuring started to take effect. These state policy innovations included:

- "Renewables portfolio standards" (RPS), which require utilities to generate or purchase minimum levels of renewable energy, were enacted in 18 states and Washington DC.
- "Public benefit funds" (PBF) were enacted in 14 states. These funds typically collect a small surcharge on electricity sales. The funds were expected to collect more than $4 billion for renewable energy through 2017 and were investing over $300 million annually on renewable energy in 2004.
- "Net metering" policies were enacted in 33 states between 1996 and 2004, bringing the total number of states with net metering to 39. These policies allow two-way power exchange between a utility and individual homes and businesses with their own renewable power sources.
- Programs to subsidize rooftop solar photovoltaic systems for households and businesses in California, supported by the state's public benefit fund, resulted in 15,000 homes and government and commercial installations of grid-connected solar photovoltaics, totaling more than 90 MW by 2004.
- Voluntary "green power" purchases began through a variety of state and utility programs. Between 1999 and 2004, more than 500 utilities in 34 states began to offer their retail customers the option to buy green power. Mandates that required utilities to offer green power products were enacted in 5 states between 2001 and 2003.
- Tax credits, rebates, low-interest loans, and many other financial incentives came into force at the state and local levels.
- During this third phase, federal policies also contributed to renewable energy development. These policies included a favorable production tax credit (PTC) for wind and other renewable resources, initially set at 1.5 cents/kWh. Indexed to inflation, the tax credit rose to 1.8 cents/kWh by 2004. There was also a 10% investment tax credit for solar and geothermal, favorable tax depreciation schedules, and new biofuels policies.

Foreign trade policy

Numerous foreign policies involve supplies of energy that we are either importing or exporting or sanctioning based on events in other nations.

The United States today both imports and exports petroleum and its related products. Exports of U.S. crude oil, banned in 1975, were legalized again by Congress in 2015. But why are we both importing and exporting at the same time? First, the infamous Jones Act[16], well known to experienced debaters and coaches as a perennial topic of debate under multiple resolutions. It requires boat transportation of goods between two U.S. cities to be provided only by vessels that were manufactured in the U.S., registered in the U.S. and crewed by U.S. citizens. There are not very many vessels that are Jones Act compliant, so the price of such transportation is raised higher than it would be if open competition were allowed. In some cases, obtaining crude oil as an input to a refinery located on the Gulf Coast is cheaper if it is imported (using a foreign vessel, directly from a foreign city) rather than transporting it from point to point within the U.S. on a more expensive Jones Act ship. Likewise, in some cases it is cheaper to simply export US crude oil than it is to transport it to a US refinery.

In other cases, limits on refinery and pipeline capacity (along with the Jones Act), play a role. For example, crude oil is now being exported from the US to a refinery in the Bahamas, refined into gasoline, and then imported back to the US east coast. This is happening because domestic pipelines are full and US refineries are operating at capacity. Ships moving supply between the US and the Bahamas or the reverse are not subject to the Jones Act, since they are not traveling between two US cities. When all the imports and exports are netted out, the U.S. is a net exporter of oil.

And while we're talking about refineries, note that US refineries are operating at or near maximum capacity. Increasing US supplies of crude oil would have little impact on "domestic" energy or "energy independence" because the crude oil would have to be sent somewhere else to be refined into any usable fuel. Unrefined crude oil is merely sludge, not a useful product. The option of modifying US policies to allow for building more refineries, if there are federal policies that are impeding their construction, might be fertile ground for Affirmative research.

[16] Although the Jones Act affects the movement of oil, it is not an energy policy. It covers the movement of all goods by boat between US cities regardless of whether they are energy-related.

In 2022, the United States exported about 9.58 million b/d of petroleum to 180 countries and 4 U.S. territories. Crude oil exports of about 3.60 million b/d accounted for 38% of total U.S. gross petroleum exports. The resulting total *net petroleum imports* (imports minus exports) were about -1.26 million b/d, which means that the United States was a *net petroleum exporter* of 1.26 million b/d in 2022.

The top five source countries of U.S. gross petroleum imports in 2022 were Canada, Mexico, Saudi Arabia, Iraq, and Colombia.

Top sources and amounts of U.S. petroleum imports (percentage share of total), respective exports, and net imports, 2022

million barrels per day

Import sources	Gross imports	Exports	Net imports
Total, all countries	8.32	9.58	-1.26
OPEC countries	1.25 (15%)	0.03	-1.21
Persian Gulf countries	0.98 (12%)	0.02	0.96
Top five countries[1]			
Canada	4.35 (52%)	0.84	3.52
Mexico	0.81 (10%)	1.17	-0.36
Saudi Arabia	0.56 (7%)	0.01	0.55
Iraq	0.31 (4%)	<0.01	0.31
Colombia	0.24 (3%)	0.15	0.09

https://www.eia.gov/tools/faqs/faq.php?id=727&t=6#:~:text=Crude%20oil%20exports%20of%20about,million%20b%2Fd%20in%202022.

The United States has imposed foreign trade sanctions related to oil numerous times. Oil import restrictions against Iran were implemented in 1979 and remain to this day. The U.S. imposed oil import sanctions against Venezuela in 2019, although the Biden administration recently (Dec. 2022) began making some exceptions in response to tightness in world oil supplies. That tightness was caused by sanctions against Russia, which were imposed in 2022 in response to its invasion of Ukraine. It might be noted that Iran, Venezuela and Russia all continue to have the same forms of government pursuing the same policies as they did before sanctions were imposed.

