



our energy sources

We consume energy in many forms. Most of our energy supply comes from fossil including coal, oil, and natural gas, and the rest is generated from nuclear power and renewable sources, such as hydropower, wind, solar, biomass and geothermal. All of these energy sources can be used directly as primary energy sources by converting them into heat or mechanical applications. They are also used as secondary energy sources by converting them into electricity. The table below shows how these sources produce energy and how they are used in our country.

Type of energy sources	Production	Uses
Non-Renewable Energy Sources		
Coal	Coal, a fossil fuel, is mined and transported by trains, barges, ships, and trucks. Coal is mined in 25 states, and Wyoming produces the largest amount of coal. Indiana produces the eighth most.	Over 90% of the coal consumed in this country is burned to produce electricity at coal-fired power plants.
Oil (Petroleum)	Oil is a fossil fuel and usually found underground and extracted by drilling and creating wells and pipelines. About 31% of oil we consume is produced in Texas, and 20% is produced in the Gulf of Mexico. Our country depends on about 40% of our oil consumption from imports.	Our country is the world's largest oil consumer. About 70% of our oil is used in transportation as gasoline, diesel, and jet fuel, while about 1% of oil is burned to generate electricity. The remainder is used in industrial, commercial, and residential sectors.

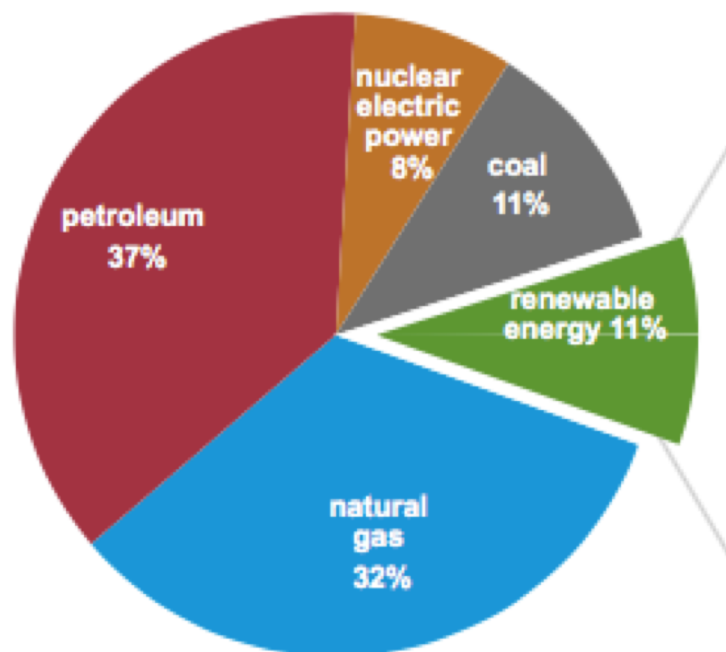
	often chilled and stored as liquid—liquid natural gas (LNG). About 29% of the natural gas we consume is produced in Texas.	household appliances such as stoves and clothes dryers. Natural gas is also used in transportation.
Nuclear Energy	Uranium is a fossil fuel and the most widely used fuel to produce nuclear energy. Most uranium used in our country is mined in the western United States.	When bonds of uranium atoms are broken, enormous energy, in the power of nuclear power, is released. All of the nuclear energy produced in the U.S. is used to generate electricity.
Renewable Energy Sources		
Hydropower	Hydropower is produced from the flow or fall of water. About 29% of the total U.S. hydroelectricity is generated at the Grand Coulee Dam in Washington—the largest dam in the U.S. Most hydropower is produced at large plants built by the federal government.	Hydropower has been used for irrigation and operation of mechanical devices, such as watermills. At the same time, hydropower is used for electricity generation.
Wind energy	Wind energy generates electricity, and our country produces the second most wind electricity in the world. The largest amount of wind electricity, about 20% of the total wind electricity generated in the United States, is generated in Texas. The world's largest wind farm is located in California.	Wind energy can be used for operation of mechanical devices such as the windmills for water pumping or drainage. Wind energy is also used to generate electricity by using wind turbines.
Solar energy	Solar energy generates electricity through solar panels (photovoltaics or PVs) or solar thermal power generating plants. Arizona has the world's largest solar electricity generating facility through PVs, and California has the world's largest solar thermal power plant.	Solar energy can be used for heating spaces (e.g., greenhouse) and water (e.g., shower water and swimming pool) with solar thermal collectors. Solar energy can also be used to generate electricity by using solar panels.
Biomass energy	Biomass is organic material made from plants and animals.	Biomass is burned as fuel to produce energy for heating and cooking. Biomass is also converted to methane gas for electricity generation and space heating. Biomass energy in the forms of ethanol and biodiesel is used as transportation fuel.
Geothermal energy	Geothermal technology uses heat generated in the Earth's core—geothermal energy—as an energy source. The United States produces the largest amount of geothermal power in the world.	Geothermal energy can be directly used for heating/cooling spaces. It can also be used to generate electricity.

Energy sources in our nation

Our country produces and consumes the world's second largest amount of energy, second only to China. Primary energy consumption in the United States in 2019 was 100.2 quadrillion BTUs ([U.S. Energy Information Administration, 2020](#)).

About 80% of our primary energy sources come from fossil fuels, including petroleum, natural gas, and coal. Of fossil fuels, petroleum makes up the largest portion, and natural gas and coal follow.

The portion of renewable energy account for 11% of total energy.



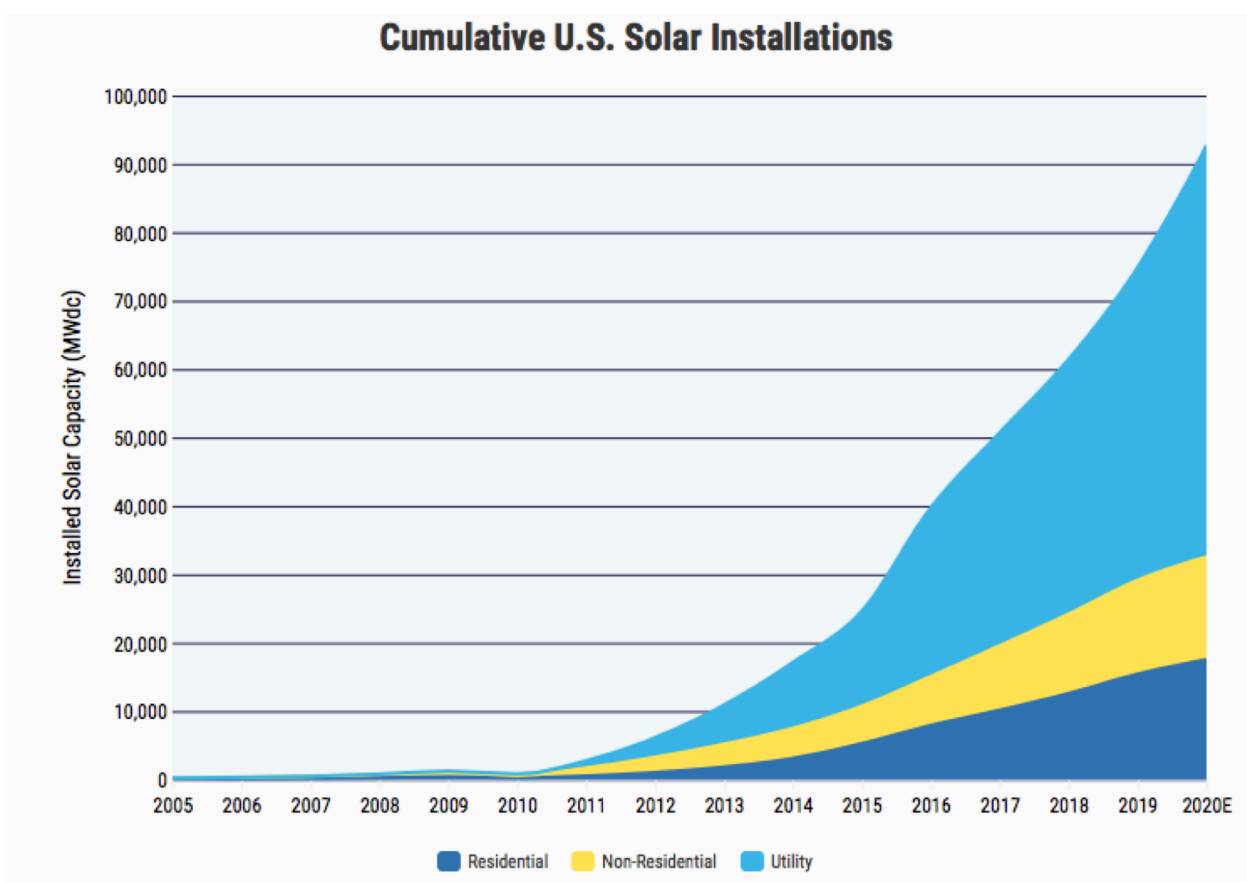
Primary energy consumption by source
in 2019 (Total: 100.2 Quadrillion BTUs)

Source: [U.S. EIA, 2020](#)

Solar power in our nation

The United States has the world's second largest generation capacity from solar PV (photovoltaic) systems at 81,000 megawatts, only after China in 2020 ([Solar Energy Industries Association \(SEIA\), 2020](#)). It is big enough to power 15.7 million homes. The solar power capacity has increased significantly since 2010 (Figure 1). The U.S. solar market has kept growing, and solar power makes up the largest portion--40% of 2020 new electric generating capacity ([SEIA, 2020](#)).

Among states, California has the largest solar market at 27,897 megawatts, which accounts for 34.4% of the national market ([SEIA, 2020](#)). California mandates all new low-rise residential buildings to have a PV system beginning in 2020. It is estimated that the implementation of the rule invites 800MW additions of residential PV systems in California during 2020 and 23 ([SEIA, 2018](#)).

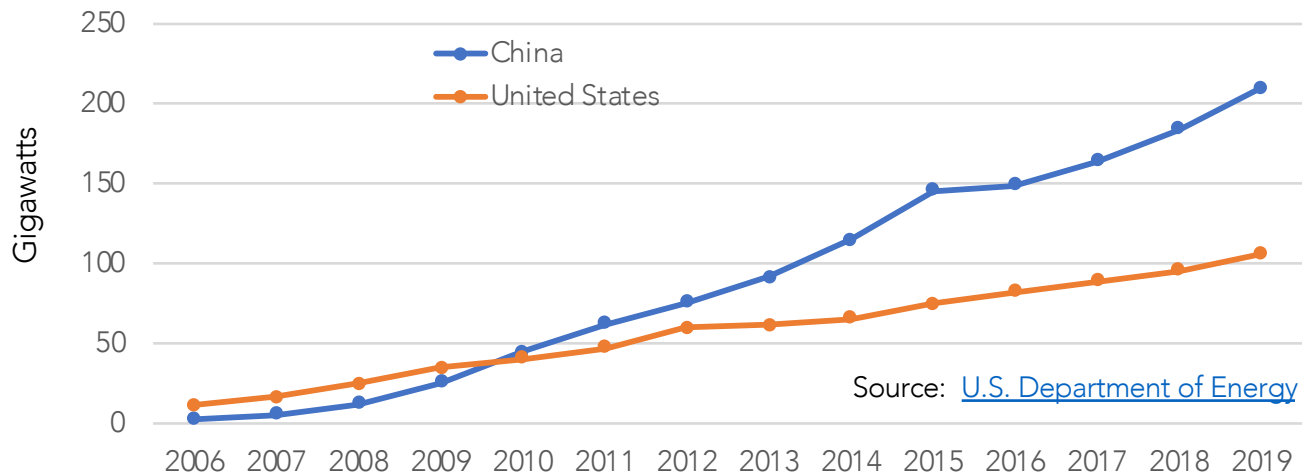


Cumulative solar PV capacity in the United States
(Source: [SEIA, 2020](#))

Wind power in our nation

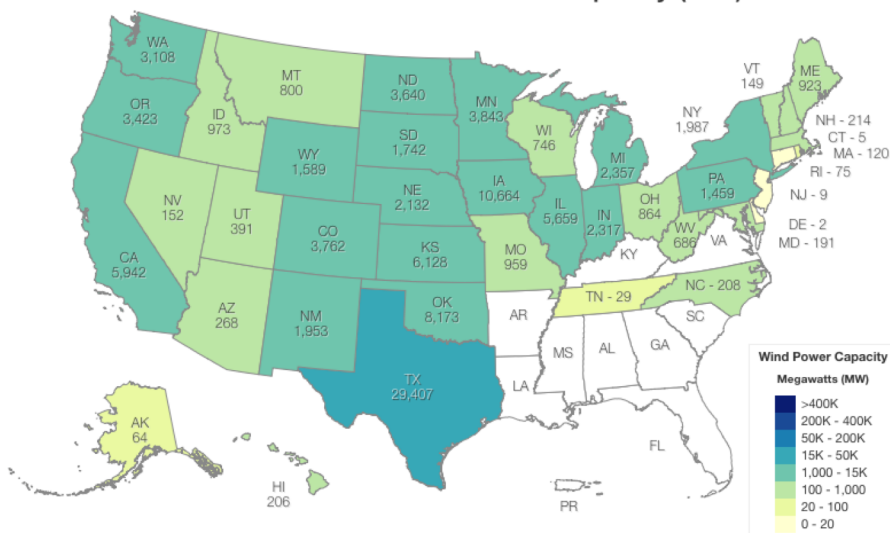
The United States and China are the two countries with the largest wind power generation capacity in the world.

Wind Capacity in the US and China



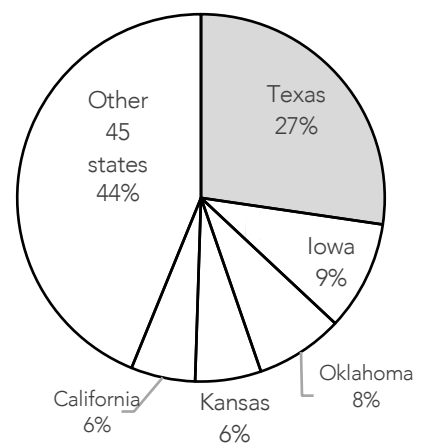
Texas has the largest wind power capacity, generating $\frac{1}{4}$ of the total wind power in our nation. It is big enough to power more than 8 million families.

Q1 2020 Installed Wind Power Capacity (MW)



Total Installed Wind Capacity: 107,319 MW

Wind power capacity by state 2019



(Source: U.S. Department of Energy, 2020)

Source: [U.S. Department of Energy](https://www.energy.gov/eere/energy-efficiency-and-conservation/wind-energy)

ENERGY IN INDIANA

Energy plays one of the most essential roles in many aspects of our lives. Without energy, cities won't light up during the night and cars won't move.

In our state, we depend largely on coal as an energy source. Indiana ranked 2nd in coal consumption only after Texas ([U.S. EIA](#)), and coal-fired electric power plants supplied about 50 percent of our state's electricity in March 2020 (natural gas: 39%) ([U.S. EIA](#)). Dependence on coal is not without problems. About 50% of greenhouse gas emissions in our state come from burning fossil fuels (coal, natural gas, and petroleum) contributing to climate change. Indiana generated about 90% of electricity by burning fossil fuels and released the 7th largest amount of carbon dioxide in the United States in 2018.

To solve these problems associated with the fossil fuel use, our nation strives to increase clean electricity production. Due to those efforts, the United States has the world's second largest capacity in both wind and solar power as of the end of 2019 ([REN21, 2020](#)). Indiana ranked 13th in the United States in wind power generation in the Q1 2020 ([Department of Energy](#)). Our state also built the largest geothermal heating and cooling system in the United States at Bell State University in 2012 ([Department of Energy](#)). Indiana has moderately good potential for solar power production, especially in the southern part of the state.

Coal production in Indiana

Indiana ranked 7th in coal production and 2nd in coal consumption, after Texas in 2018 ([U.S. EIA](#)). There were 18 coal mines in 7 counties in Indiana, and 15 of which are located in Southwest Indiana. There are 6 underground coal mines and 12 surface coal mines in our state. Indiana produced 34.6 million short tons of coal in 2018 ([U.S. EIA](#)), of which 78.2% of the coal was mined in Southwest Indiana ([U.S. EIA](#), 2019. Annual coal report, table 1 & 2).

Coal mining involves the displacement of large volumes of soil and rock and severely alters the environment as a result. This raises a number of environmental problems, including soil erosion, destabilization of land, water pollution, and destruction of the local ecosystem.

Coal mine reclamation is required under the federal law, Surface Mining Control and Reclamation ACT of 1977As, to rehabilitate the land after coal mining operations have stopped. Reclamation must return the mined land to land that can be used for agriculture, forestry, wildlife habitation, or recreation. The cost of the rehabilitation of the mined land is included in the mine's operating costs.



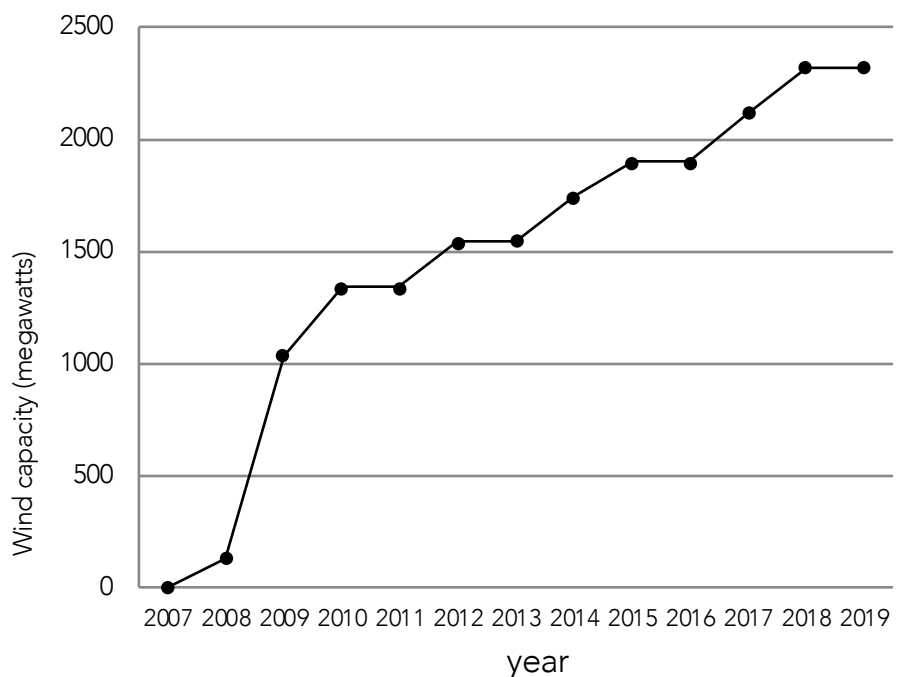
Surface mining ([Indiana University](#))

Wind power in Indiana

Wind power in the United States has developed quickly over the last decade and has led the world in power generation capacity along with China. Wind power generation in Indiana started in 2008 with construction of Indiana's first utility-scale wind power facility called Goodland. Capacity increased eightfold in 2009, with the construction of three more wind farms, Fowler Ridge, Meadow Lake, and Hoosier. Fowler Ridge is the largest wind farm in the Midwest and one of the largest farms in the world. The wind industry supports 6,000-7,000 jobs in Indiana ([Inside Indiana Business, 2020](#)).



Indiana has 2,317 megawatts of wind power capacity and ranked 13th in the United States in wind power generation in the first quarter of 2020. The amount is large enough to power about 500,000 households in the state. Most of the suitable sites to develop wind power are located in the northern part of Indiana.

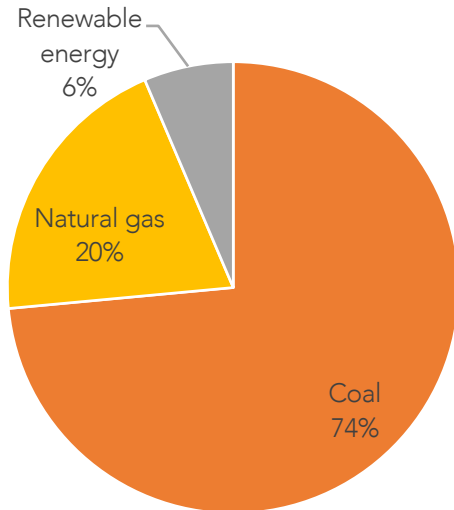


Total wind power capacity in Indiana
(Source: [U.S. Department of Energy](#))

Energy sources in Evansville

VECTREN CORPORATION

Our energy is provided by Vectren Corporation, which is an energy holding company headquartered in Evansville, Indiana. One of the three Vectren operating utilities, called Vectren Energy Delivery of Indiana—South, is in charge of providing electricity and natural gas in Southwest Indiana.



Vectren's power capacity by energy sources
Sources: [Vectren](http://www.vectren.com)

ENERGY SOURCES

Electricity provided by Vectren is mostly generated by burning coal. Coal makes up 74% and natural gas makes up 20%. Vectren also uses renewable energy. The company has 4MW solar power system and 3.2MW landfill gas system at Blackfoot Clean Energy Facility at Veolia's landfill in Winslow, Indiana. Although wind energy is not directly generated by Vectren, the equivalent of 80 MW (mega watts) of wind energy is purchased from wind farms in Northern part of Indiana to increase environmental attributes of electricity generated from renewable energy.



Landfill gas, gas emitted from landfill, is captured and used as a fuel source to power two generators at Blackfoot Clean Energy Facility