

# Petroleum

## What Is Petroleum?

**Petroleum** is a **fossil fuel**. Petroleum is often called **crude oil**, or **oil**. It is called a fossil fuel because it was formed from the remains of tiny sea plants and animals that died hundreds of millions of years ago. When the plants and animals died, they sank to the bottom of the oceans.

Here, they were buried by thousands of feet of sand and sediment, which turned into **sedimentary** rock. As the layers increased, they pressed harder and harder on the decayed remains at the bottom. The pressure and some heat changed the remains and, eventually, petroleum was formed.

Petroleum deposits are locked in **porous** rocks almost like water is trapped in a wet sponge. When crude oil comes out of the ground, it can be as thin as water or as thick as tar. Petroleum is called a **nonrenewable** energy source because it takes hundreds of millions of years to form. We cannot make new petroleum reserves.

## History of Oil

People have used petroleum since ancient times. The ancient Chinese and Egyptians burned oil to light their homes. Before the 1850s, Americans used whale oil to light their homes. When whale oil became scarce due to overfishing, people skimmed the oil that

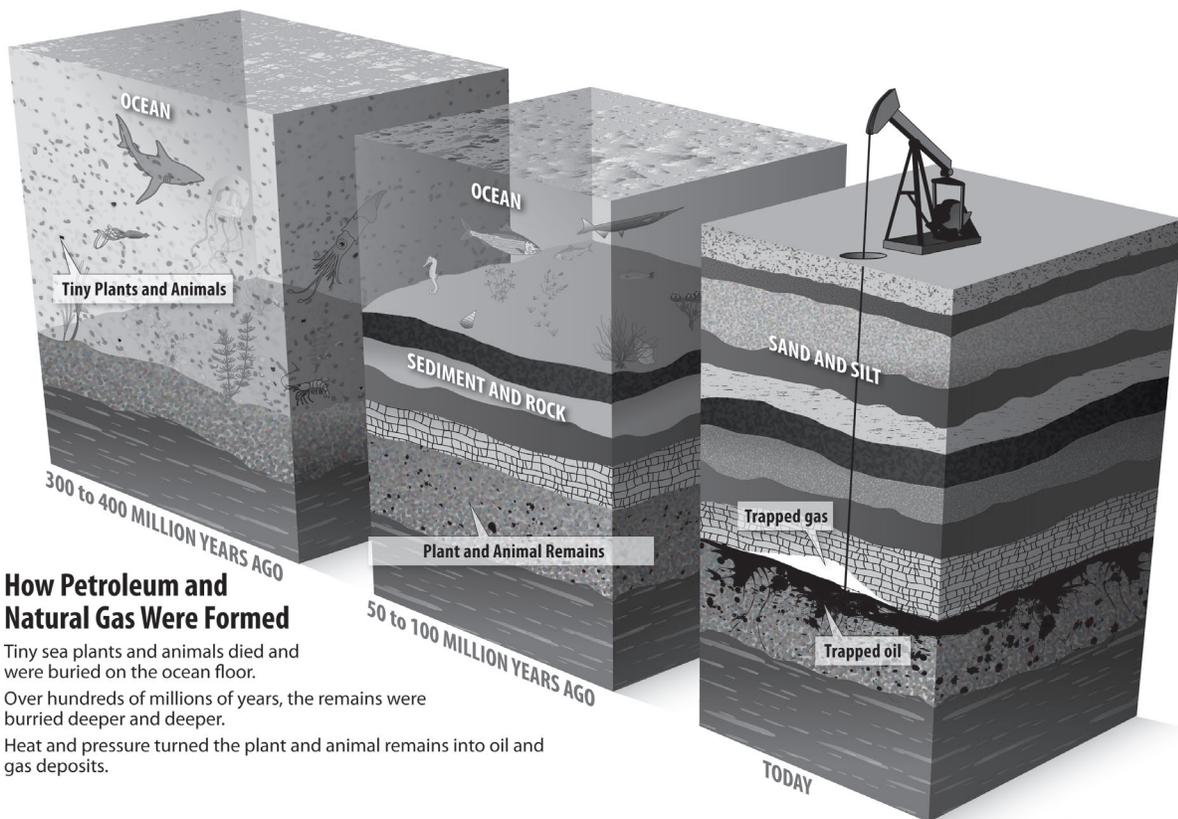
seeped to the surface of ponds and streams. The demand for oil grew and, in 1859, Edwin Drake drilled the first oil well near Titusville, Pennsylvania.

At first, the crude oil was refined or made into kerosene for lighting. Gasoline and other products made during refining were thrown away because people had no use for them. This all changed when Henry Ford began mass producing automobiles in 1913. Everyone wanted an automobile and they all ran on gasoline. Gasoline was the fuel of choice because it provided the greatest amount of energy in relation to cost and ease of use.

Today, Americans use more petroleum than any other energy source, mostly for transportation. Petroleum provides 37.0 percent of the energy we use.

## Producing Oil

Geologists look at the types of rocks and the way they are arranged deep within the Earth to determine whether oil is likely to be found at a specific location. Even with new technology, oil exploration is expensive and often unsuccessful. Only about 60 percent of **exploratory wells** produce oil. When scientists think there may be oil in a certain place, a petroleum company brings in a **drilling rig** and raises an oil **derrick** that houses the tools and pipes they need to drill a well. The typical oil well is over one mile deep. If oil is found, a pump moves the oil through a pipe to the surface.



### How Petroleum and Natural Gas Were Formed

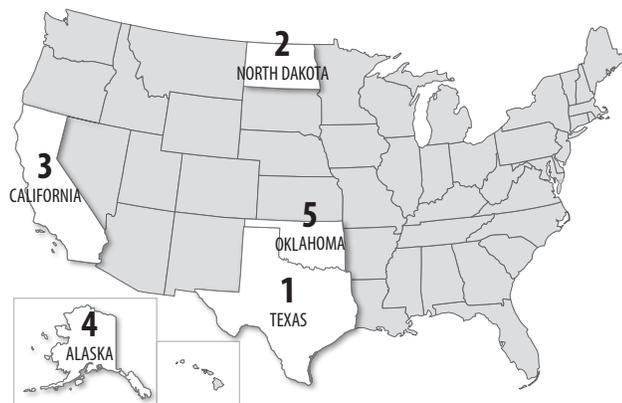
Tiny sea plants and animals died and were buried on the ocean floor.

Over hundreds of millions of years, the remains were buried deeper and deeper.

Heat and pressure turned the plant and animal remains into oil and gas deposits.

Note: not to scale

## Top Petroleum Producing States, 2016



Data: Energy Information Administration

About one-sixth of the oil the U.S. produces comes from **offshore** wells. Some wells are a mile under the ocean. Some of the rigs used to drill these wells float on top of the water. It takes a lot of money and technology to drill and find oil in the ocean.

Texas produces more oil than any other state, followed by North Dakota, California, Alaska, and Oklahoma. Americans use much more oil than we produce. Today, the U.S. imports about 51 percent of the oil it consumes from other countries.

## From Well to Market

We can't use crude oil as it comes out of the ground. We must change it into fuels that we can use. The first stop for crude oil is at a petroleum **refinery**. A refinery is a factory that processes oil.

The refinery cleans and separates the crude oil into many fuels and products. The most important one is gasoline. Other petroleum products are diesel fuel, heating oil, and jet fuel. Industry uses petroleum as a **feedstock** to make plastics and many other products.

## Shipping Petroleum

After the refinery, most petroleum products are shipped out through **pipelines**. There are about 95,000 miles (153,000 km) of underground pipelines in the United States transporting refined petroleum products. Pipelines are the safest and cheapest way to move big shipments of petroleum. It can take 15 days to move a shipment of gasoline from Houston, Texas, to New York City. Petroleum can also be moved over water in a tanker.

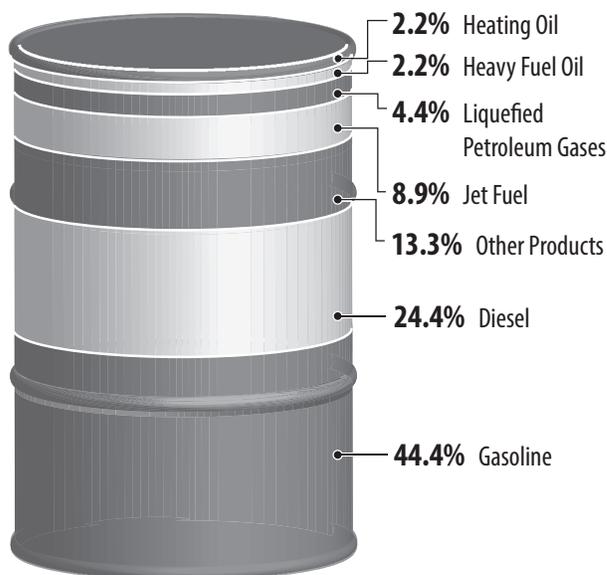
Special companies called **jobbers** buy petroleum products from oil companies and sell them to gasoline stations and to other big users such as industries, power companies, and farmers.

## Oil and the Environment

Petroleum products—gasoline, medicines, fertilizers, and others—have helped people all over the world, but there is a trade-off. Petroleum production, exploration, and the use of petroleum products cause air and water pollution.

Drilling for and transporting oil can endanger wildlife and the environment if it spills into rivers or oceans. Leaking underground storage tanks can pollute groundwater and create noxious fumes. Processing oil at the refinery can contribute to air and water pollution. Burning gasoline to fuel our cars contributes to air

## Products Produced From a Barrel of Oil, 2017

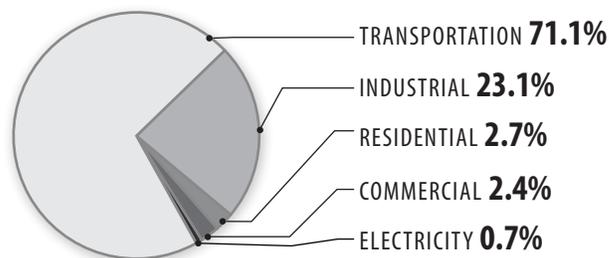


Data: Energy Information Administration

## Other Petroleum Products

Ink	Enamel	Pantyhose	Fishing rods
Hand lotion	Movie film	Artificial limbs	Dice
Nail polish	Balloons	Antihistamines	Fertilizers
Heart valves	Antiseptics	Oil filters	Electrical tape
Toothbrushes	Aspirin	Ballpoint pens	Trash bags
Dashboards	Paint brushes	Skis	Insecticides
Crayons	Purses	Pajamas	Floor wax
Toothpaste	Sunglasses	Golf balls	Shampoo
Luggage	Football	Perfumes	Cold cream
Parachutes	Deodorant	Cassettes	Tires
Guitar strings	Glue	Contact lenses	Cameras
DVDs	Dyes	Shoe polish	Detergents

## U.S. Petroleum Consumption by Sector, 2016



Data: Energy Information Administration

pollution. Even the careless disposal of waste oil drained from the family car can pollute rivers and lakes.

The petroleum industry works hard to protect the environment. Gasoline and diesel fuel have been changed to burn cleaner. And oil companies work to make sure that they drill and transport oil as safely as possible.