

# Petroleum

## What Is It?

Oil is a naturally occurring liquid mixture of hydrocarbons that can be extracted from geologic formations, refined, and combusted as a fuel and energy source.



## How Clean Is It?

Oil is mainly made up of hydrocarbons, so it releases a mixture of methane, carbon dioxide, and smaller amounts of other emissions. Approximately 160 pounds of carbon dioxide are released per million BTU. It also has many non-combustion applications.



## What Does It Cost?

Using oil to produce electricity is expensive, and it is mainly used as fuel in the transportation sector. A barrel of oil may cost anywhere from \$20 to \$120, dependent on global production. Refined petroleum products like gasoline vary in price by region, supply, and refinery margins.

## Space



The size of a well pad is between at 3.5 to 10 acres. Support facilities, refineries, and pipelines combined with well pads take up over 3.5 million acres total in the U.S.

## Point

- Oil is an easily stored energy source, which has made it the fuel of choice for the transportation sector.
- Oil serves as a feedstock or additive to thousands of products, including cosmetics and plastics.
- Oil can be refined into several types of fuel including gasoline, motor oil, heating fuel, and jet fuel.
- Technology for oil extraction is easily scalable if large deposits are discovered.
- Depleted oil fields can be used as a storage area for captured carbon dioxide by injecting carbon into geologic formations.

## Counterpoint

- ↔ ○ Oil is highly flammable and spills can easily catch fire if not properly contained.
- ↔ ○ Disposable plastics and other oil products take hundreds of years to break down in the natural environment and can easily build up in bodies of water.
- ↔ ○ Supplies of these different types of fuel are subject to market swings and imbalances at oil refineries depending on which fuel is more economical to produce.
- ↔ ○ Byproducts generated by oil extraction can contain radioactive waste.
- ↔ ○ The viability of carbon sequestration technology is still in the process of scaling and other infrastructure dependencies, like carbon dioxide pipelines, need to be addressed.

## How Does It Work?

1. Oil is placed into a pressurized container and combusted.
2. Exhaust gases are created that are transported to a turbine.
3. The exhaust gases push the turbine to generate electricity that is transported onto the grid.
4. Exhaust gases are either recovered and placed back into the system to push the turbine or disposed of.
5. Exhaust gases can be used to heat additional containers of water to produce steam.
6. Steam is transported to a turbine that is turned using the pressurized steam.



\*This process describes electricity generation from petroleum, which is rare. Petroleum is one of the most versatile energy resources. As a transportation fuel, it is used to produce gasoline (and other fuels), which burned in an internal combustion engine. As a feedstock, it is used to produce other critical materials.

## Did You Know?

Oil is measured in barrels, which is equivalent to 42 U.S. gallons or 159 liters.

## What's Next?

More efficient storing and transportation options available to drillers have reduced the practice of flaring excess natural gas from oil wells. The excess natural gas can be captured and utilized as an energy source alongside the crude oil extracted from wells.