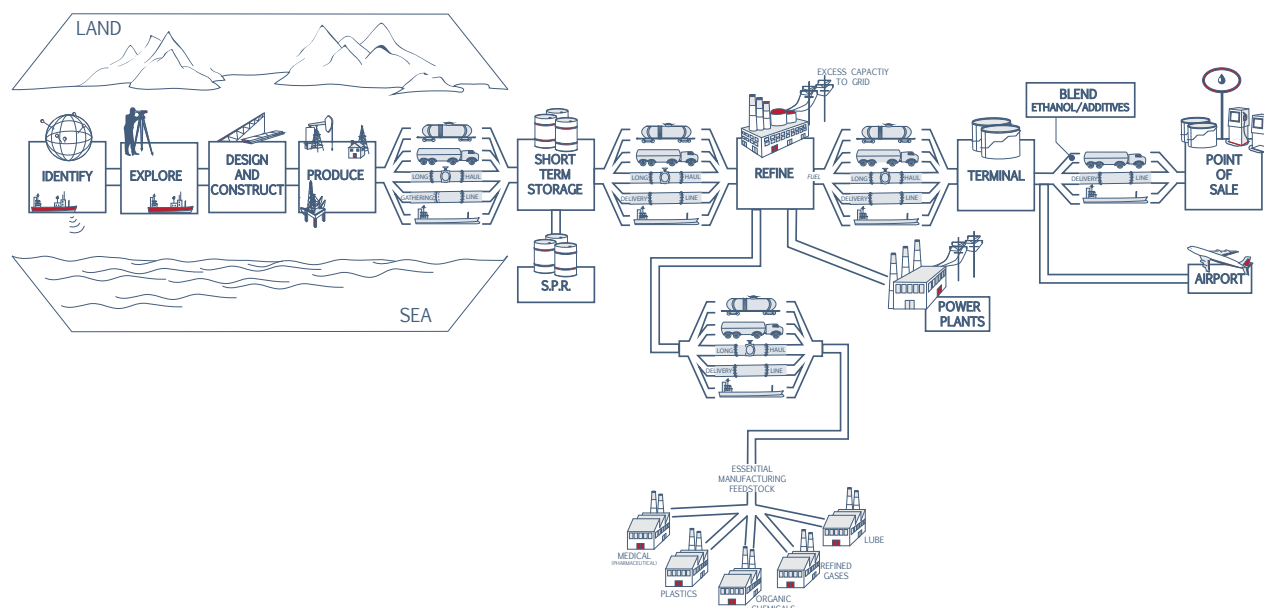


America's Energy Revolution

Oil Supply Chain



Identify

Modern oil geologists examine surface rocks and terrain, with the additional help of satellite images. However, they also use a variety of other methods to find oil. They can use sensitive gravity meters to measure tiny changes in the Earth's gravitational field that could indicate flowing oil, as well as sensitive magnetometers to measure tiny changes in the Earth's magnetic field caused by flowing oil. They can detect the smell of hydrocarbons using sensitive electronic noses called sniffers. Finally, and most commonly, they use seismology, creating shock waves that pass through hidden rock layers and interpreting the waves that are reflected back to the surface.



Explore

When a prospect has been identified and evaluated and passes an oil company's selection criteria, an exploration well is drilled in an attempt to conclusively determine the presence or absence of oil or gas. Five geological factors have to be present for a prospect to work and if any of them fail neither oil nor gas will be present:

- A source rock
- Migration
- Trap
- Seal or cap rock
- Reservoir

Hydrocarbon exploration is a high risk investment and risk assessment is paramount for successful exploration portfolio management. Exploration risk is a difficult concept and is usually defined by assigning confidence to the presence of five imperative geological factors, as discussed above.



Design and Construct

Although there is some variability in the details of well construction because of varying geologic, environmental, and operational settings, the basic practices in constructing a reliable well are similar. The ultimate goal of the well design is to ensure the environmentally sound, safe production of hydrocarbons by containing them inside the well, protecting groundwater resources, isolating the productive formations from other formations, and by proper execution of hydraulic fractures and other stimulation operations.



Produce

The first step in the oil supply chain is production. During production, crude oil is produced on both land and at sea. Oil production includes drilling, extraction, and recovery of oil from underground.



Transport

At multiple stages of the oil supply chain process, oil is transported to storage, refineries, terminals, and finally to the point of sale. There are four basic modes of transportation of crude oil from production to the point of sale: trains, trucks, ships, and pipelines.



Storage

Once the oil has been produced, it is transported to short-term storage. Short-term storage serves as the staging area for crude oil distribution throughout the entire supply chain. Storage facilities allow for adjustments in supply and demand throughout the entire supply chain. The Strategic Petroleum Reserve (SPR) is an emergency fuel storage of crude oil maintained by the United States Department of Energy used to mitigate supply disruptions.



Refine

Refineries act as the main transformation point for all crude oil into various consumer products. After receiving oil from storage facilities, refineries use various chemical separation and reaction processes to transform crude oil into usable products such as: fuel oil, diesel oil, jet fuel, and multiple essential manufacturing feedstocks.



Feedstocks

From the refineries, feedstocks are transported to manufacturing facilities where they play a critical part of many manufacturing supply chains, such as medical equipment, plastics, organic chemicals, refined gases, and lubricants.



Terminal

Refined fuel that is ready for use is transported to terminals. Terminals are located closer to transportation hubs and are the final staging point for the refined fuel before the point of sale. After entering the terminal ethanols and additives are added to the final refined product before fuel is transported.



Point of Sale

Once the refined fuel leaves the terminal, it is transported to its final point of sale, which includes fuel stations and airports. Trucking, shipping, and delivery lines provide the final, finished product which can be delivered across the country.