Find Out How Gasoline Gets to Your Tank

Narrator

That gas you're about to put in your car, where does it come from? In about the time it takes to fill your tank, let's find out.

We begin far from your neighborhood gas station with the raw material used to make gas – crude oil, the remains of prehistoric plants and animals buried underground. Over millions of years, heat and pressure convert that ancient material to a concentrated source of energy. Crude oil was once abundant on dry land, known as *onshore* in the industry. Now it's a lot harder to find than it used to be.

James Cearley, Petroleum Geologist

If you look at the onshore production in the U.S., it started over 100 years ago. The bulk of the easy oil has already been found and produced.

Narrator

Finding new supplies of oil now often requires moving into very challenging environments like the deep waters of the Gulf of Mexico.

James Cearley

The opportunities for finding impact reserves – fields that are larger than 100 million barrels – they exist largely in the deep water offshore.

Narrator

Just how deep is this deep water?

James Cearley

If you were in a plane flying 36,000 feet [10,973 m] above the surface, you're 7 miles [11 km] above the interval that you're drilling down to, and we're targeting an envelope that's about the size of a baseball diamond.

Narrator

Even using advanced technology, locating an area beneath the ocean that may contain a significant amount of oil takes a long time and costs a lot of money.

James Cearley

Typically it takes between 10 to 15 years from the initial exploratory well to first production and will cost anywhere from $1 billion up to $4 billion for that floating production system.

Narrator

Large energy companies usually have dozens of huge projects like this under way at the same time.

Don Stelling, Operations Manager

It takes a lot to run the big platforms, and you have to have all the infrastructure for a small city there. All that infrastructure costs money to get that oil out of the ground.

Narrator

The workers are a long way from home.

Don Stelling

When you take off here from on shore, that's more than an hour to fly straight out into the ocean in a helicopter before you get out there. It is a huge expanse of ocean. You're remote.

Narrator

Getting the oil out of the ground isn't easy.

James Cearley

It's not a big pool of oil sitting down there in a big crack.

Narrator

An oil field is often more solid than liquid.

James Cearley

Think of a sponge, if you want the right analogy for that, and this sponge has interconnected pore spaces that allow the oil to be both stored and to flow through it.

Narrator

The bottom of the ocean is a difficult place to earn a living.

James Cearley

You're over 100 miles [161 km] from land, you're operating in 10,000 feet [3,048 m] of water depth and you're drilling down 7 miles beneath the ocean's surface.

Don Stelling

You're dealing with pressures on the seafloor that may be more than 10,000 pounds per square inch. So that's every single one-inch by one-inch, you have 10,000 pounds of pressure pushing on that, 5 tons pressing on that one, single little point.

Narrator

The oil flows through pipelines to refineries onshore, vast facilities often covering hundreds, even thousands, of acres where heat and a variety of complex chemical processes are used to manufacture products like diesel, jet fuel and gasoline.

Ken Mertes, Refinery Engineer

The equipment that we have here is very large in scale. It's very complex, and it's very expensive to upgrade and maintain. A refinery like this one can process 240,000 barrels of crude oil a day. That's 10 million gallons [38 million liters]. And to put that in perspective in terms of volume, that's like taking a football field from end zone to end zone, sideline to sideline, and that's about 30 feet [9 m] deep in oil. It costs hundreds of millions of dollars to build and maintain a complex refinery. It takes skilled and trained workers to keep the refinery running safely and reliably. That's 24 hours a day, 7 days a week, 365 days a year.

Narrator

From the refinery, fuel moves by pipeline or tanker truck back to where our journey began – the gas station, where fuel is stored in underground tanks.

Debbie Gold, Sales Manager

In retail, we focus on some core goals – to operate in a clean, safe and reliable manner. So that takes a lot of time and effort in addition to a significant financial investment.

Narrator

How much does it cost to open a gas station? In the United States, an average of $3 million.

Debbie Gold

Most gas station facilities are not owned by large corporations but rather independent business people. Owning and operating a gas station facility is very challenging. Realistically speaking, the margin on fuel is very slim, and it's been that way for a long time.

Narrator

Even when fuel prices rise, many gas station owners must work hard just to stay in business.

Debbie Gold

Earnings from fuel sales are fairly modest, and that's why many operators choose to have a convenience store location as well as alternate offerings such as a car wash. A typical gas station can earn just as much on a cup of coffee and a doughnut as they can on a 15-gallon fill-up.

Narrator

Now your tank is full, and you know what goes on behind the scenes to make sure gas is there when you need it.