America's Oil and Natural Gas Industry

Offshore Access to America's Oil and Natural Gas Resources

June 5, 2009

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On October 1, 2008, Congress lifted the federal ban on offshore drilling that had kept 75 percent of U.S. coastal waters in the lower 48 states off limits to development for nearly three decades. Another 10 percent of the U.S. coastal waters remains off limits in the Eastern Gulf of Mexico. Policymakers and consumers alike have many questions about offshore drilling, so API has assembled this primer to foster an informed, constructive public policy debate and to demonstrate how the safe, efficient and environmentally conscious development of America's vast oil and natural gas resources will help meet our growing energy needs, create new jobs, provide more revenue to federal and state governments and enhance our energy security.

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Increasing access to domestic sources of oil and natural gas would create new high paying jobs, bring billions of dollars to federal and state treasuries, reduce our balance of payments and enhance America's energy security.

Production of oil and natural gas on federal lands has brought billions of dollars of revenue into federal and state treasuries. These royalties are one of the largest sources of income to the federal government.

According to the Department of the Interior, in fiscal year 2008, the agency distributed a record $23.4 billion to the federal government, states and American Indian tribes from onshore and offshore energy production. Nearly $22 billion of that amount came from oil and natural gas production.

- A part of this revenue included $10 billion in bonus bids paid by companies to lease tracts for offshore energy exploration on the Outer Continental Shelf in the Gulf of Mexico and Alaska.
- A total of 35 states received $2.6 billion from these revenues.[1]

According to an ICF International study commissioned by API, developing America's vast domestic oil and natural gas resources that were kept off-limits by Congress for decades could generate more than $1.7 trillion in government revenue, including $1.3 trillion in revenues from offshore development alone. These revenues would be earned over the life of the resource.[2]

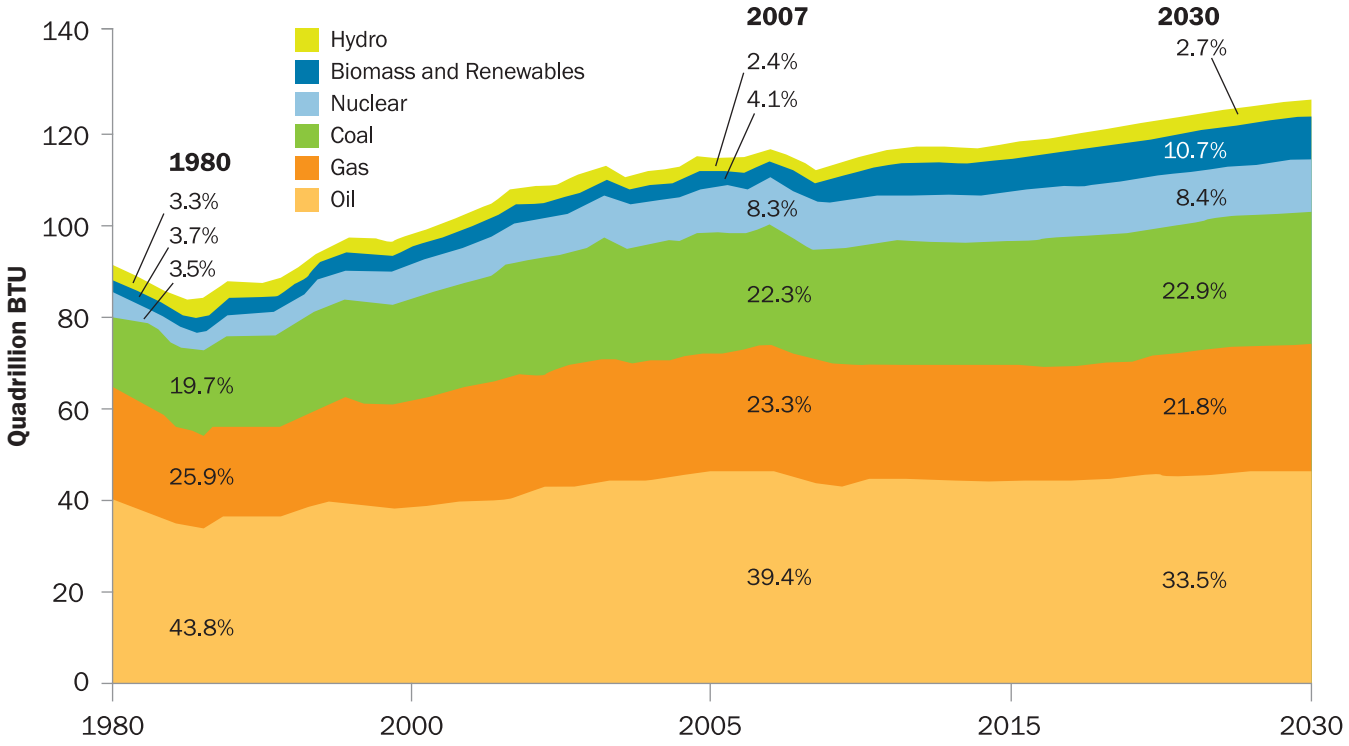
Increased federal leasing could bring additional high paying jobs to Americans. Our industry directly employs 1.8 million Americans, with another four million jobs supported by the industry.[3]

- Oil and natural gas industry exploration and production wages in 2008 were more than double the national average.
- New manufacturing jobs would be created to develop and install the infrastructure to bring new resources to market.
- Local employment also would benefit with the addition of construction jobs as well as service and support positions.
- In 2030, 160,000 jobs would be created.

1 MMS press release, November 29, 2008
2 ICF International Study, "Strengthening Our Economy: The Untapped U.S. Oil and Gas Resources," December 2008.
3 ICF International Study, "Strengthening Our Economy: The Untapped U.S. Oil and Gas Resources," December 2008.

Future U.S. Energy Demand

The U.S. will require 9 percent more energy in 2030 than in 2007.



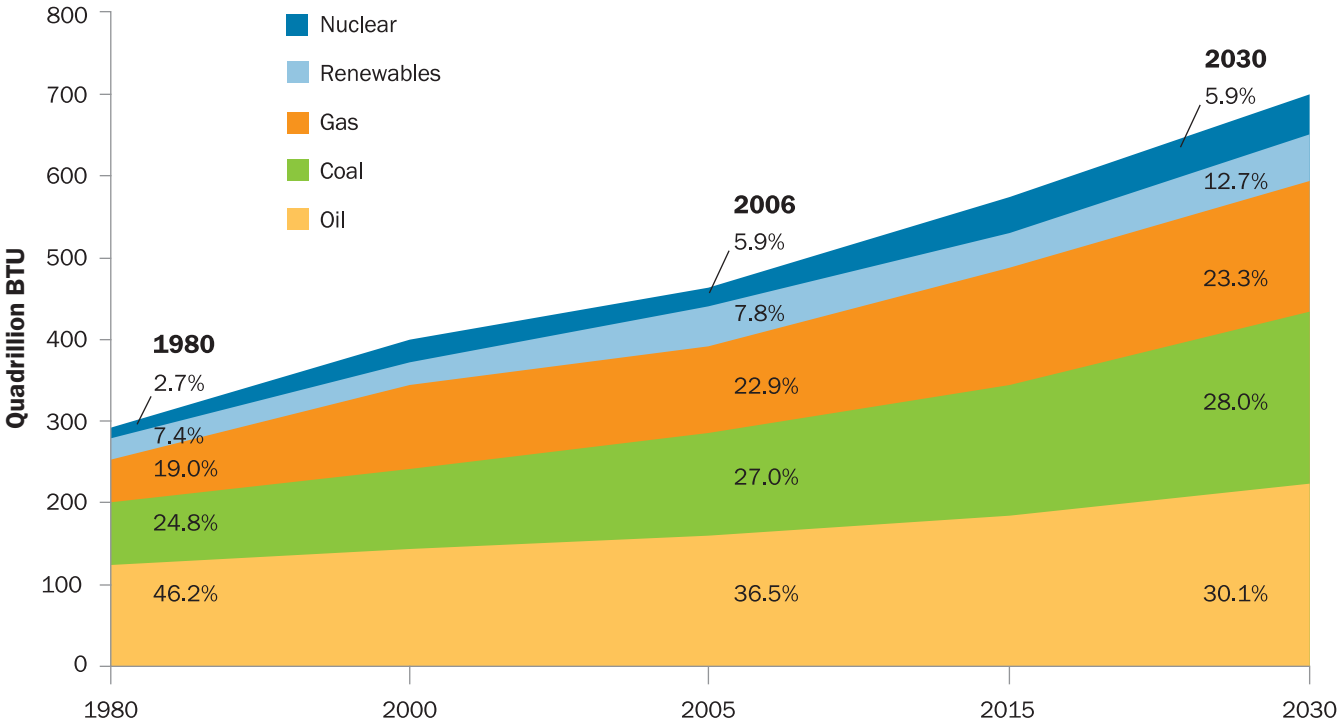
Source: EIA, Updated AEO 2009 Tables A1 and A17

Although the share of non-fossil fuels is growing rapidly, fossil fuels – oil, natural gas and coal – will continue to play leading roles through 2030.

Given expected global economic and population growth, energy efficiency improvements alone will not be enough in the future. More total energy will be needed both in the United States and globally.

The U.S. Energy Information Administration (EIA) forecasts U.S. energy demand will grow by 9 percent between 2007 and 2030, with more than half of the energy demand expected to be met by oil and natural gas, as is the case today.

Future Global Energy Demand (The world will require 44 percent more energy in 2030 than in 2006.)



Source: EIA, International Energy Outlook 2009

Most energy analysts agree that sustaining even modest economic growth worldwide for the next several decades will require massive new investments in oil and natural gas.

Recent forecasts by the U.S. Energy Information Administration (EIA) estimate that sustaining a 3 percent rate of annual growth in the global economy from 2006 to 2030 (measured in market exchange rates) will require an expansion of about 16 million barrels per day in global oil supplies. That is an increase equivalent to doubling the current consumption of China, India and Southeast Asia.

The growth in demand for natural gas worldwide is expected to be even larger, increasing by 46 percent from 2006 by 2030. Despite significant growth of renewables and improvements in energy efficiency, more than half of the world's energy demand will be met in 2030 by oil and natural gas, as is the case today.

Where can we find new resources? Right here in the United States.

New resources could be found in the federal waters off the United States, if the government allows access to them.

- Congress has allowed the decades-old moratoria banning leasing on most of the Outer Continental Shelf (OCS) off the lower 48 states to expire.

- A new ICF International Study, "Strengthening our economy: The Untapped U.S. Oil and Gas Resources," estimates if the federal government allowed leasing in all federal waters in the lower 48, the resulting production by 2030 would be 900,000 barrels per day of oil and 1.073 trillion cubic feet of gas per year.[1]

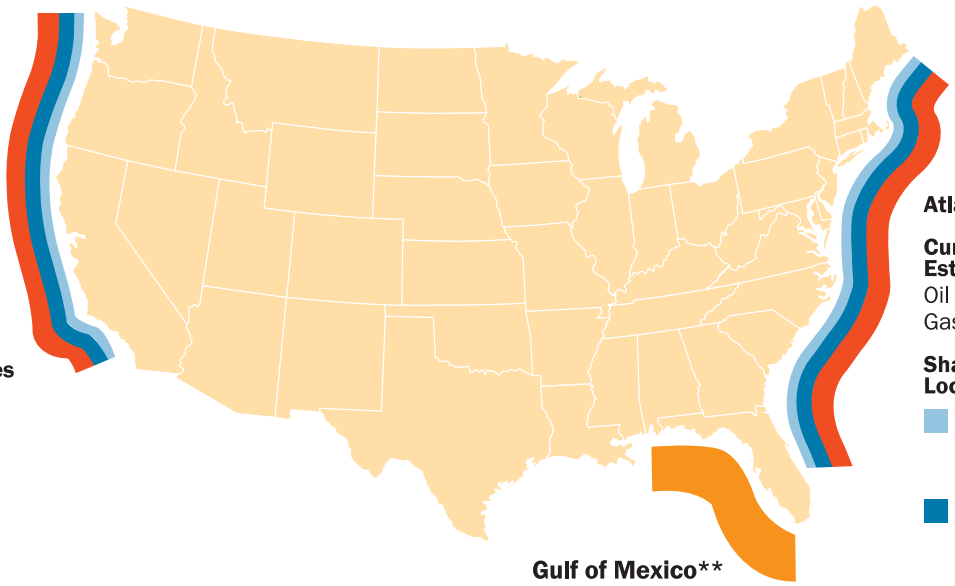
- The Interior Department's Minerals Management Service, the federal agency responsible for regulating oil and natural gas leasing in federal waters, still needs to set out a leasing schedule before any oil and natural gas development offshore the East and West coasts can take place.

- In February 2009, Interior Secretary Ken Salazar announced he would extend the comment period by six months for a proposed plan and leasing schedule to open up additional offshore areas for leasing from 2010 to 2015.

- Any proposed plan goes through an extensive review before any final decision.

1 ICF International Study, "Strengthening Our Economy: The Untapped U.S. Oil and Gas Resources," February 2009.

OCS Lower 48 "Moratoria" Resources (Undiscovered, Technically Recoverable Federal Resources)



Pacific Coast*

Current Resource Estimate:
Oil (Bbbls) = 10.53
Gas (Tcf) = 18.29

Share of Resources Located:

0–50 miles
Oil = 90.8%
Gas = 91.7%

50–100 miles
Oil = 6.4%
Gas = 6.3%

Over 100 miles
Oil = 2.8%
Gas = 2.1%

* Moratoria removed as of October 1, 2008
** Off limits until 2022

Gulf of Mexico**
Oil (Bbbls) = 3.7
Gas (Tcf) = 21.5

Atlantic Coast*

Current Resource Estimate:
Oil (Bbbls) = 3.82
Gas (Tcf) = 36.99

Share of Resources Located:

0–50 miles
Oil = 27.5%
Gas = 25.9%

50–100 miles
Oil = 33.6%
Gas = 32.2%

Over 100 miles
Oil = 38.9%
Gas = 42.0%

Source: API projections based on MMS resource estimates by water depth for the Outer Continental Shelf.

Congress should allow the U.S. oil and natural gas industry to do what it does best – produce the energy America needs.

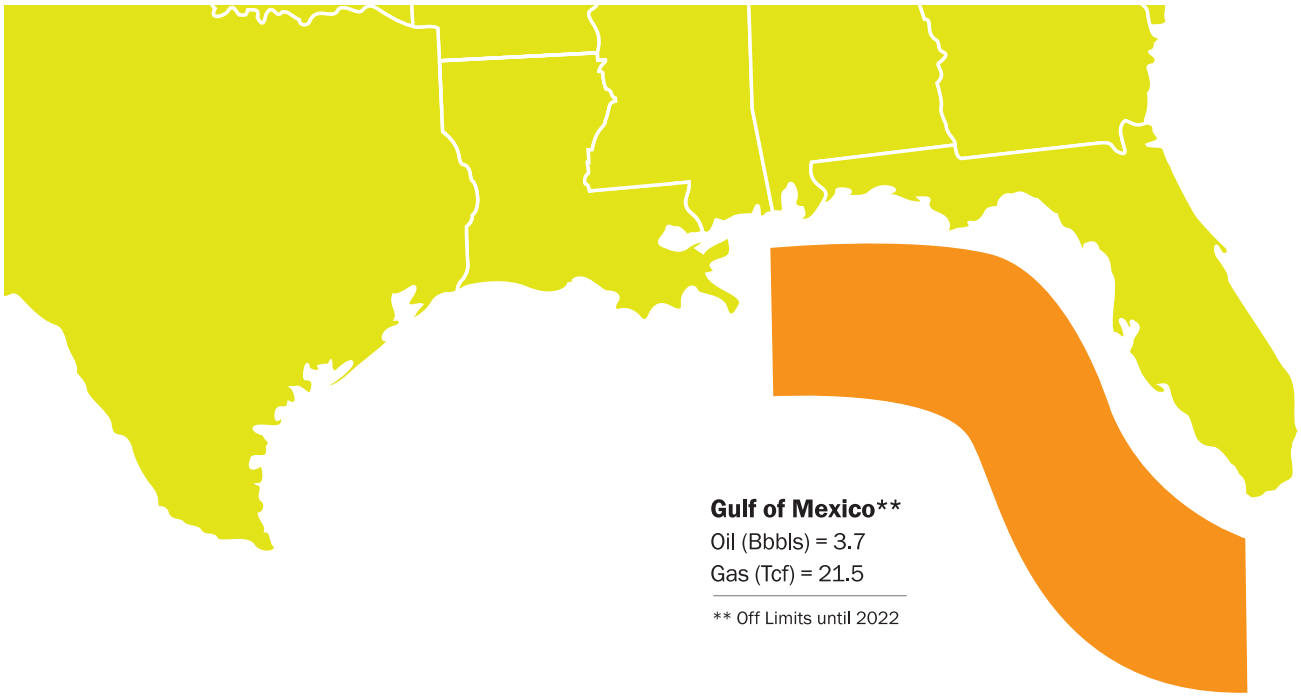
With energy consumption expected to grow in the coming decades, America needs access to its untapped domestic resources. These resources can replace output from maturing fields and strengthen our energy security.

- According to the U.S. Minerals Management Service (MMS), the Atlantic and Pacific Outer Continental Shelf (OCS) that had been subject to moratoria contain an estimated 14.3 billion barrels of oil and 55 trillion cubic feet of natural gas.
- 74 percent of the undiscovered oil resources offshore and 48 percent of the natural gas resources in the Atlantic and Pacific oceans are located within 50 miles of the shore.
- For the Pacific OCS, more than 90 percent of the oil and natural gas resources are located within 50 miles of the shore.

All areas of the OCS should be available without buffer zones, since these areas can be developed in an environmentally safe manner with a minimal impact on coastal communities.

- Some of the most promising, and known reserves, including 12 fields offshore California, would be off-limits if an arbitrary coastline buffer zone were established.
- Advances in drilling and production technology have allowed the industry to develop fields close to existing infrastructure without the installation of additional platforms. Off the coast of California, this has allowed industry to use a single platform to access supplies from four miles away, resulting in additional production of 10,000 barrels a day.

Eastern Gulf of Mexico Resources



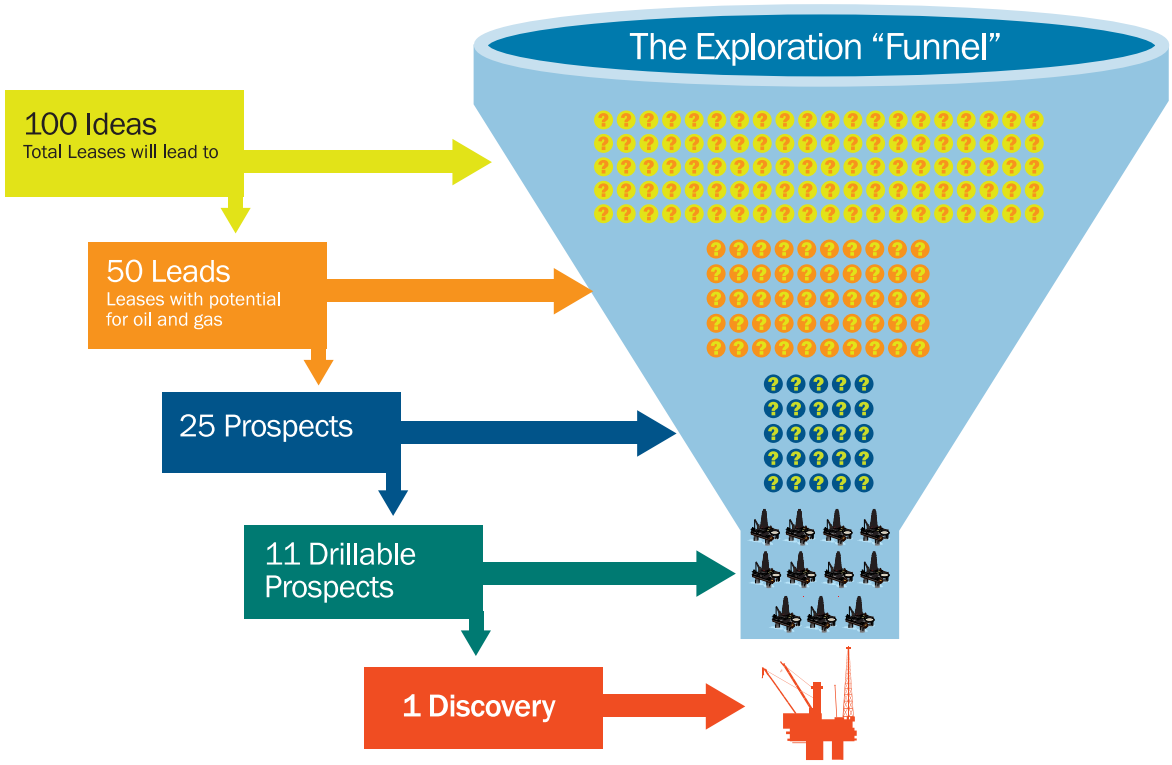
Source: API projections based on MMS resource estimates by water depth.

While Congress in late 2008 lifted the moratoria on oil and gas development in the Atlantic and Pacific oceans, promising areas in the Eastern Gulf of Mexico remain off limits.

The federal government continues to prohibit oil and natural gas exploration in the majority of the areas in the Eastern Gulf of Mexico. According to the Minerals Management Service, the federal agency responsible for overseeing federal offshore lands, there are several known fields with discovered oil and natural gas resources in the Eastern Gulf of Mexico.

For example, the Destin Dome, a discovery located 25 miles from shore off Pensacola, Florida, could produce anywhere from 110 to 165 billion cubic feet of gas a year for the next 20 years, according to exploration plans filed with the agency.

The Myth of Idle Leases



The purchase of a lease is always a gamble. Exploration is not a risk-free proposition, but it is an essential part of the energy business. There is nothing idle about it.

Sometimes when a lease is not producing, critics claim it is "idle." Much more often than not, non-producing leases are not idle at all; they are under geological evaluation or in development and could become an important source of domestic supply.

Companies purchase leases hoping they will hold enough oil or natural gas to benefit consumers and become economically viable for production. Companies can spend millions of dollars to purchase a lease and then explore and develop it, only to find that it does not contain oil and natural gas in commercial quantities. It is not unusual for a company to spend in excess of $100 million only to drill a dry hole. The reason is that a company usually only has limited knowledge of resource potential when it buys a lease. Only after the lease is acquired will the company be in a position to evaluate it, usually with a very costly seismic survey followed by an exploration well.

If a company does not find oil or natural gas in commercial quantities, the company hands the lease back to the government, incurs the loss of invested money and moves on to more promising leases.

If a company finds resources in commercial quantities, it will produce the lease. But there sometimes can be delays – often as long as 10 years – for environmental and engineering studies, to acquire permits, to install production facilities (or platforms for offshore leases) and to build the necessary infrastructure to bring the resources to market. Litigation, landowner disputes and regulatory hurdles also can delay the process.

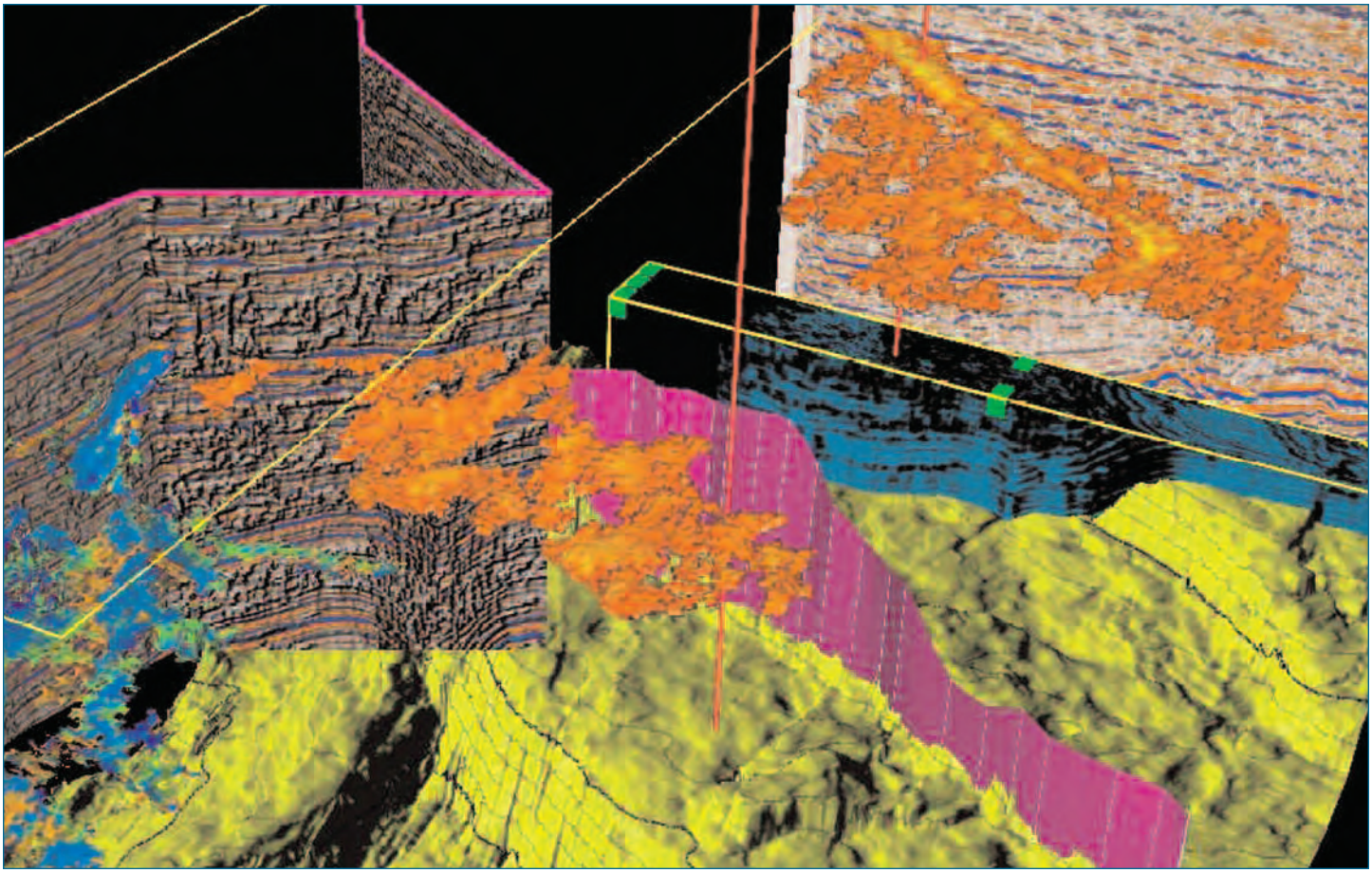


Image courtesy of Halliburton

Seismic technology has revolutionized the search for oil and natural gas.

Advanced technology, such as 3-D seismic surveys, has revolutionized the exploration process for oil and natural gas, allowing the industry to have eyes underground.

This technology improves the industry's ability to locate potential oil and natural gas reserves with greater accuracy. More precision in locating the resources can optimize field development and the location of drilling sites and production facilities. These steps can help to reduce a project's environmental footprint.

Seismic surveys send high-energy sound waves into the ground and reflect information on underground rock layers back to the surface. Since sound travels at different speeds as it passes through various types of rocks, computers can use the seismic data to create a 3-D map of what lies below the surface. This is especially helpful as engineers plan the most efficient way to produce resources from the reservoir.

Geophysicists and engineers also use 4-D seismic technology, which adds the dimension of time to the survey process. By combining several 3-D seismic surveys taken as the field is producing over time and arranging them in a sequence, they can create images that show where oil or gas deposits may remain.

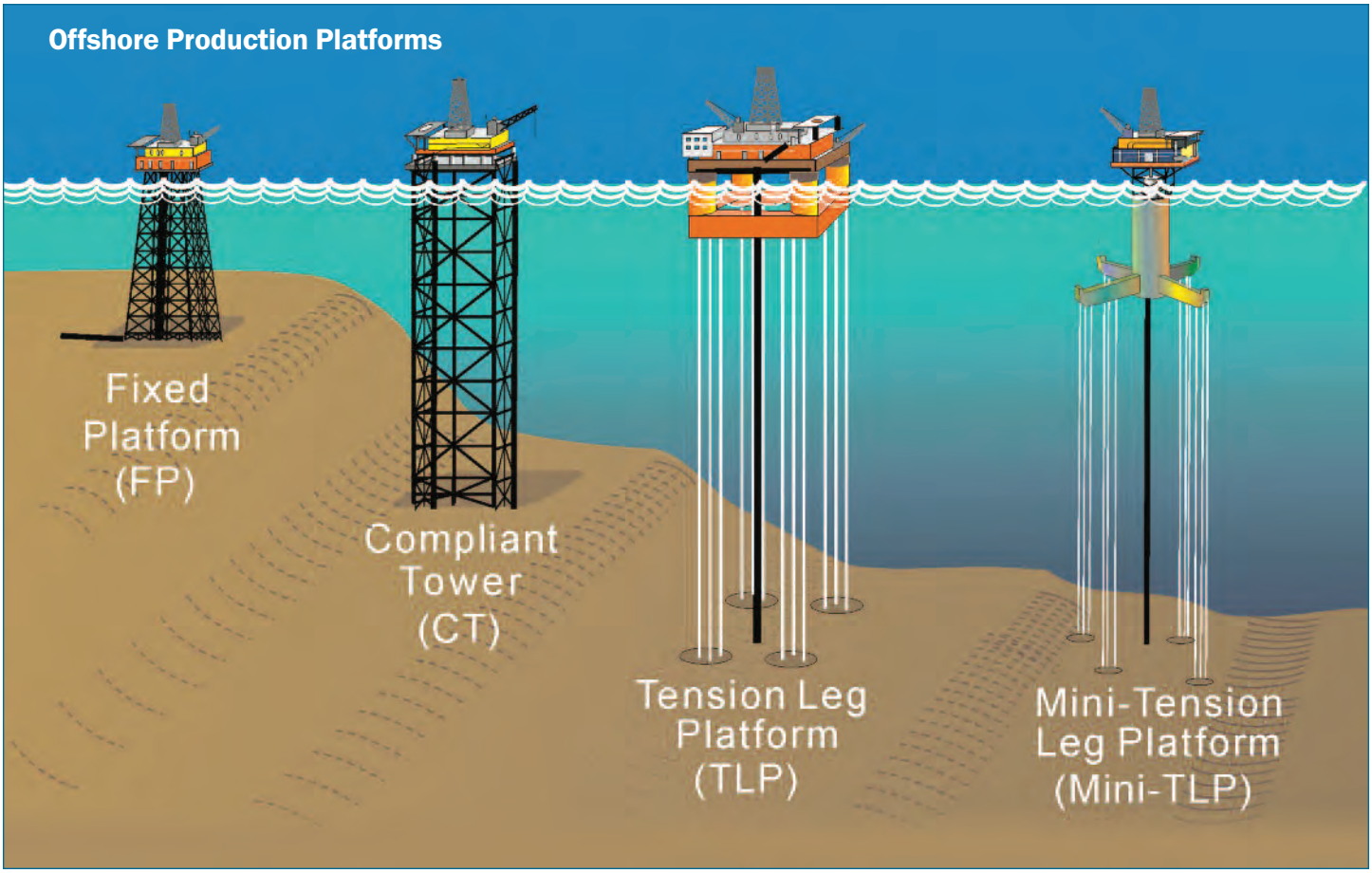
By using 4-D models, engineers and geologists can gauge how many wells a reservoir might need and where to place them. This "virtual drilling" can help protect the environment by reducing the number of wells needed for exploration and production.

Image courtesy of Shell

The deeper the water, the more technologically advanced the equipment must be.

In the search for oil and natural gas under the ocean, three general types of drilling rigs are used:

- A 'jackup' drilling rig is a floating barge with drilling equipment on its deck and long support legs, and is used in shallow waters up to 300 feet.
- A semi-submersible is the most common type of offshore drilling rig, used for drilling in waters more than 300 feet. Semi-submersibles are floating vessels supported on large pontoon-like structures submerged below the sea surface. Semi-submersibles are attached to the ocean floor using strong chains or wire cables.
- Farther offshore, specially designed rigs mounted on ships can drill a well in waters 10,000 feet deep. These rigs float and can be attached to the ocean bottom using traditional mooring and anchoring systems or they maintain their position by using thrusters to counteract winds, waves and currents.



There are also different types of production facilities, based on the depth of water. Each of these platform systems is designed to withstand the wide range of wind and wave forces that can be expected at its offshore location, including severe winter storms or hurricanes.

- **Fixed Platforms** consist of a jacket (a tall vertical section made of tubular steel members supported by piles driven into the seabed) with a deck placed on top. The deck provides space for crew quarters, a drilling rig and production facilities to separate the oil, gas and produced waters from the wells drilled from the platform. A fixed platform is economically feasible in water depths up to 1,500 feet.
- **Tension Leg Platforms** (TLPs) are used in depths too great for conventional platforms – up to 7,000 feet – and consist of a floating structure with facilities and equipment much like that of a fixed platform, anchored to the seafloor with vertical tendons. Semi-submersible platforms also can be used in these water depths.
- **Spar Platforms** consist of a large single vertical cylinder supporting a deck. These platforms have typical fixed platform topside, with a surface deck and drilling and production equipment. Spar platforms are moored using a system of lines anchored into the seafloor. Spars are used in water depths up to 5,500 feet, although existing technology can extend its use to water depths as great as 7,500 feet.

Image courtesy of Shell

The search for resources deep below the ocean has spurred tremendous technological innovation, including the ability to produce and transport these resources using equipment installed on the floor of the ocean.

Subsea production systems include a series of gathering lines that connect the production from multiple wells into a single processing hub, allowing the production from the wells to be transported to a platform, where the oil, gas and produced water are separated for transport to shore through a pipeline. The most sophisticated systems operate as a processing system underwater, separating the oil, gas and produced waters so the product can go directly into pipelines to shore.

The equipment on the seafloor is maintained using robots, known as Remote Operating Vehicles (ROVs), which are tethered to a vessel. ROVs serve as eyes underwater for these operations, and are designed to connect to the subsea equipment.

These systems are being installed at depths of almost 10,000 feet of water in the Gulf of Mexico, where deepwater development plays a significant role in current and future energy production.

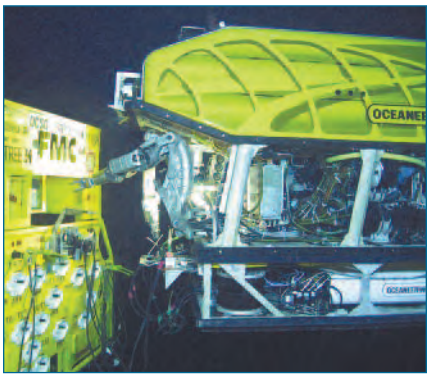


Image courtesy of Shell

Technology allows us to explore safely while protecting our oceans.

Specialized equipment, such as blowout preventers and subsurface safety valves, safeguard the ocean waters.

Industry standards are designed to ensure that both the design of the platform and the equipment protect the ocean waters. These design standards were strengthened again following Hurricanes Katrina and Rita in 2005.

According to the Minerals Management Service (MMS), offshore leases produce about 1.4 million barrels of oil per day. MMS calculates that since 1980 less than 0.001 percent of the oil produced in the federal waters offshore has been spilled.

Companies operating in these federal waters must comply with a rigorous set of preparedness and planning requirements. Federal agencies, including MMS and the United States Coast Guard, perform numerous drills and inspections throughout the year to test oil and natural gas companies' response and action to appropriate situations. Between 2000 and 2007, the number of spill drills and exercises has increased from 669 to 1,584.

Spills prevention is key to the protection of the ocean and marine environment. Well planning and engineering, drilling practices and standards, the design of offshore rigs and other facilities, and the training of personnel – each play a critical role in achieving prevention of oil spills.

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