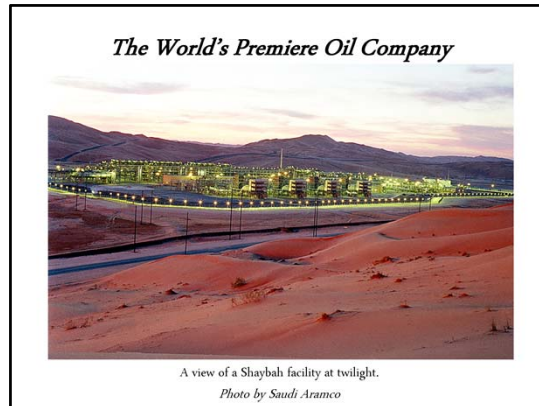


Saudi Aramco: Fueling Progress Since 1933



Photo by Saudi Aramco

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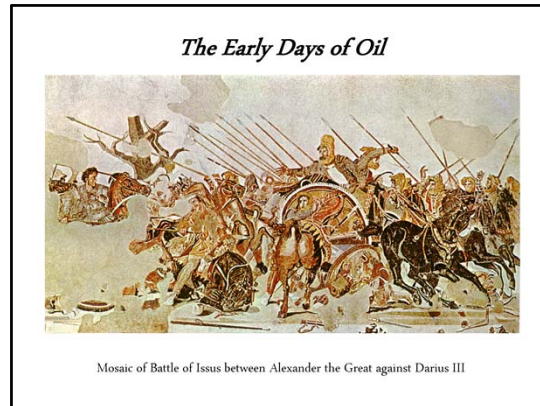


Mention Saudi Arabia and the response will likely reference oil. The discovery of rich deposits of crude on Saudi territory in 1938 and the flourishing of related industries since have transformed the nation, its people and the world over the span of a few generations. In that time, oil has become the indispensable lubricant that keeps the global economic engine running smoothly with Saudi Arabia playing a pivotal role as a leading oil producer with the largest proven reserves.

A key force in the development of the Kingdom's petroleum resources is an enterprise known today as Saudi Aramco. The history of Aramco's climb from a speculative venture facing an uncertain future to its place at the top of the oil industry is the latest chapter in the story of Saudi Arabia.

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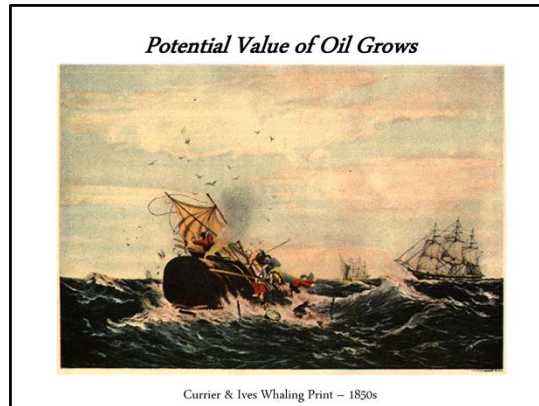


Oil has been a part of human life for over five millennia. Early known uses include as a fuel for fires, as a weapon, as a medicine, as a source of lighting, and as a sealant and mortar. In the Book of Genesis in the King James Bible, God commanded Noah to “Make thee an ark of gopher wood; rooms shalt thou make in the ark, and shalt pitch it within and without with pitch.”

In the fifth century BCE, the Greek historian Herodotus wrote that ancient Babylonians built the great walls of their city “using for their cement hot bitumen.” The armies of Alexander the Great used oil in the fourth century BCE in flaming torches to frighten enemy forces while the Chinese allegedly plumbed for it as far back as the second century BCE.

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Despite oil's many documented uses, it was not universally praised. When oil fouled a water well, farmers and shepherds considered it a nuisance with little practical value. With supply exceeding demand through the ages, there were insufficient reasons to search widely for more.

In the nineteenth century, appreciation of crude oil's potential value began to grow. A dependence on whale oil for lighting turned problematic as populations plummeted due to over-hunting. When the process to distill kerosene from petroleum was discovered in the 1840s, along with the invention of the kerosene lamp a decade later, demand increased for affordable petroleum-based kerosene as an alternative to increasingly scarce and expensive whale oil. In a classic market response, a scramble ensued to find new supplies.

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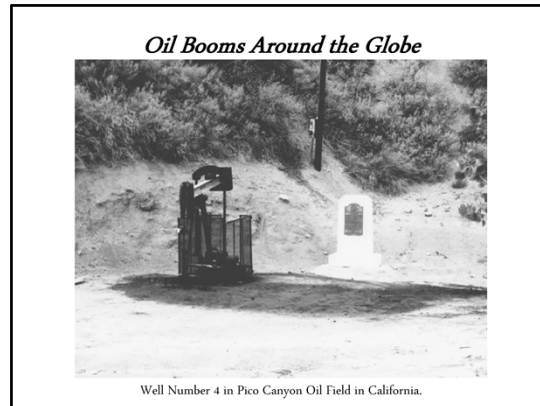


The world's first commercial well was drilled in Poland in 1853 and the world's first refinery was built in Ploiești, Romania mere months later.

“Colonel” Edwin Drake’s landmark discovery at Titusville, Pennsylvania in 1857 is generally regarded as the birth of the modern oil industry. When searching for a source of kerosene, Drake used cable-tool percussion techniques that were normally employed when digging for water or driving piles. For his well, Drake chose a spot close by visible tar-like bituminous seeps adjacent to an aptly-named rivulet, Oil Creek. For the rest of the nineteenth century, locating visual signs of oil seepage, à la Drake, remained the favored technique employed by oil prospectors.

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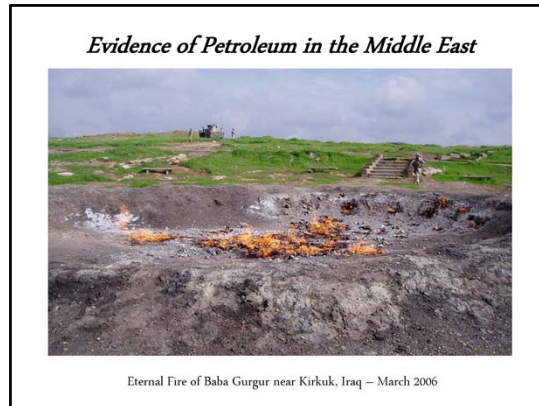


As the world's appetite for oil grew, exploration spread across the globe. The first wells at Lake Maracaibo, Venezuela came in the 1870s. In 1885, the Royal Dutch Petroleum Company struck crude in Sumatra. One year later, the Burmah Oil Company Ltd. was formed in England and began developing oil fields in Southeast Asia. Other discoveries of oil were others scattered around the planet, many of them on U.S. soil.

Following the Pennsylvania model, a boisterous procession of oil booms arrived in Ohio, Texas, Oklahoma, California, and a smattering of other states. The first well in the western United States with commercial success was sunk at Pico Canyon, 35 miles northwest of Los Angeles, in 1876. The owner of the well, Pacific Coast Oil Company, later became Standard Oil of California (Socal)—today's Chevron. Several Southern California "bonanza fields" rank among the most productive per acre in history. The 2007 Academy Award-winning movie *There Will Be Blood* is loosely based on Upton Sinclair's novel *Oil*, a vivid portrayal of conflict during the California oil boom.

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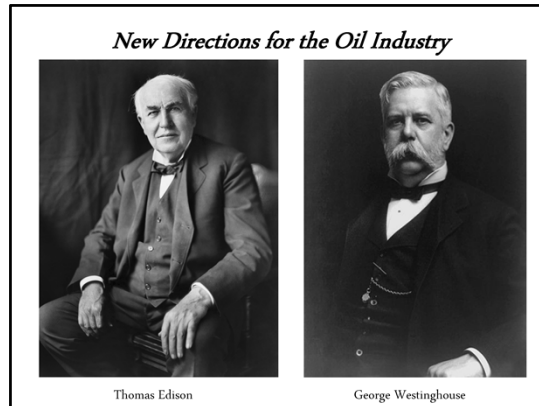
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Evidence of petroleum deposits in the Middle East date back to ancient times. By the start of the twentieth century, oil-hungry explorers had taken notice. In 1908, the first discovery of crude in the region was located in western Persia (Iran). The next year, the Anglo–Persian Oil Company (forerunner of today’s BP) was formed to develop the field. England moved quickly to secure control, hoping to outflank Czarist Russia, Persia’s northern neighbor, in a duel between two empires vying for oil supremacy. In northern Iraq, near the city of Kirkut, a flaming gas seep known as “Eternal Fire” had been burning for at least 4,000 years. In 1927, a huge oil field was finally located near the city at Baba Gurgur.

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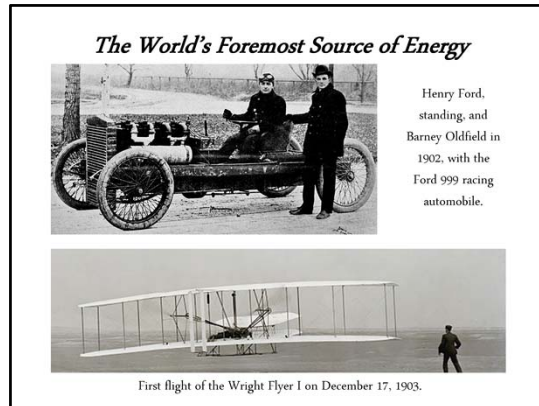
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Scientific advancements paired with human ingenuity helped shape the pattern, pace and direction of the oil industry's growth. By the turn of the century, thanks to Thomas Edison's invention of the light bulb in 1879 and the pioneering breakthroughs of inventor George Westinghouse, electricity had replaced kerosene and coal gas as the main source of lighting. A steady parade of new applications for petroleum-based products offset the loss, and oil consumption maintained its upward climb, surpassing wood and hydroelectric power as an energy resource by the outbreak of World War I.

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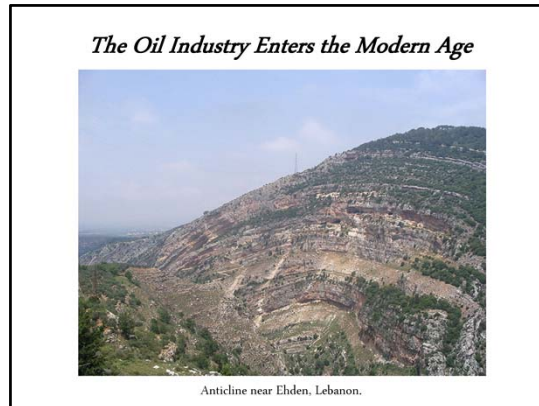


In 1903, Henry Ford founded his motor company in Detroit, Michigan and the Wright Brothers flew their first motor-driven airplane at Kitty Hawk, North Carolina. The automobile and the airplane revolutionized travel, exponentially increasing demand for oil. In 1900, there were an estimated 8,000 registered vehicles in the U.S.; by 1927, there were over 20 million.

While coal remained the world's foremost source of energy in 1920, second-place oil was inexorably closing the gap. Coinciding with the arrival of the baby boom generation after World War II, oil surpassed coal for the top spot in 1947–8. It hold that distinction today, followed by natural gas.

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The hunt for new oil fields intensified in the wake of Drake's discovery. Geology became a prime tool in solving the mystery of where to look for elusive deposits. A revealing subplot involved anticlines, geological formations composed of upward-thrusting folds or domes in the earth's crust where older underlying rock layers have been exposed due to the erosion of younger top layers that originally comprised their bulging crests.

In the mid-1800s, the first director of the Geological Survey of Canada noticed that oil seeps often occurred near anticlines in Canada. He speculated that similar formations might also signal accessible accumulations of trapped hydrocarbons. He sent a geologist to confirm his hunch and history proved them right, but not right away. In hindsight, the clues were there, but nobody was yet able to connect them into a convincing package.

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In the oil business, new ideas must first pass muster before acceptance and application. Drake's methods were simple to understand and produced indisputable results. Until the novel, more nuanced anticlinal theory did something comparable, skeptics scoffed. Insights gleaned from the Oil Creek example, loosely coupled with an instinct-based method of prospecting, constituted an approach to oil exploration for decades. The industry needed time to sufficiently mature. Eventually, companies with the requisite vision, like Saudi Aramco, led the way with success based on fresh, scientific approaches that their competitors would belatedly emulate.

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All doubts about the significance of anticlines vanished when the first great American gusher “roared in like a shot from a heavy cannon and spouted oil a hundred feet over the top of the derrick,” as one writer put it, in January 1901. This eureka moment took place on the crest of an anticlinal hummock called Spindletop outside Beaumont, Texas. Ramshackle huts housing oil companies soon blanketed the area. One of those sheds belonged to a newly-founded concern calling itself The Texas Company, the forerunner of Texaco. Events at Spindletop signaled the start of the Texas oil industry, securing permanent leading roles for America and the Lone Star State in the saga of modern oil.

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Top Oil Powers of the Early 20th Century



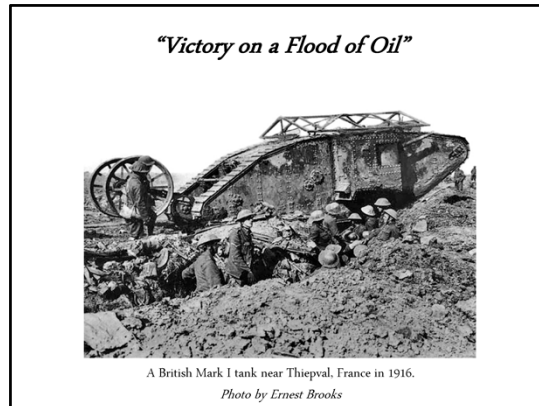
Signal Hill, California in 1923.

Anticlinal theory dominated exploration efforts for the first three decades of the twentieth century. Matched with comprehensive geological mappings, its application led directly to the discovery of new fields in the United States, Mexico, Venezuela and elsewhere. One of the great American finds came in 1921 at the anticlinal geological formation known as Signal Hill in present-day Long Beach, California. Soon, a densely-packed grove of over 100 derricks sprouted atop the hill.

Thanks to a string of U.S. discoveries, America had overtaken Russia as the leading oil-producing nation in the world by the outbreak of World War I in August 1914. The British and Dutch, also top oil powers, owed their oil output to their overseas colonial possessions. Like the United States, Mexico and Venezuela won their spots in that elite group with oil fields located on their own territory. Until the ascendancy of Middle Eastern oil at mid-century, the outputs of those three countries maintained the Western Hemisphere's northern half lead in oil production.

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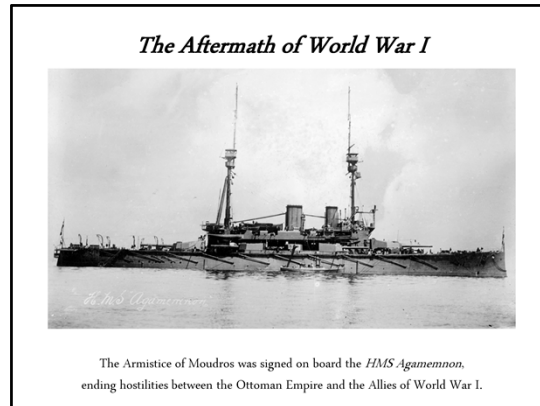


British Foreign Secretary Lord Curzon said of World War I that “the Allies rode to victory on a flood of oil,” not on the backs of horses like previous conquering armies. At the onset of the hostilities, military leaders still planned their campaign logistics around horses and mules. Fifty-one months of machine-driven slaughter “in Flanders Fields” upended their calculations. At the Armistice signing November 1918, the need to fuel trucks, tanks, ships and planes put horses permanently out to pasture in the minds of military strategists.

Oil became a powerful catalyst for change with universal influence, altering geopolitical dynamics forever. A modern nation’s economic self-preservation now hinges on the vagaries of energy supply. Events in an oil-producing region affect the rest of the world. Competition among companies and countries for secure and reliable long-term sources of oil continues to be understandably fierce.

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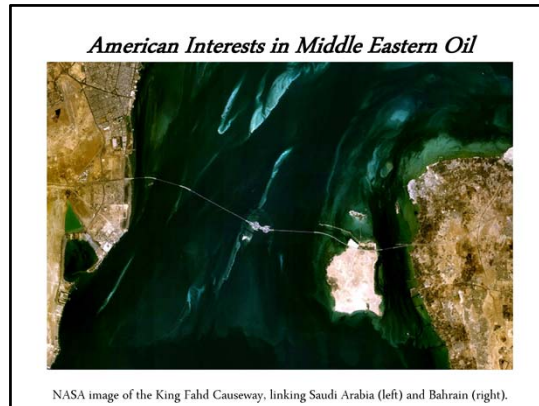
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In World War I's aftermath, the triumphant European powers recognized the importance of controlling production in potentially petroleum-rich areas. At an international conference in San Remo, Italy in 1920, the British and French signed a bilateral oil treaty carving up "Rumania, Asia Minor, territories of the old Russian Empire, Galicia, French Colonies, and British Crown Colonies" into defined spheres of influence. In a separate treaty, also signed at San Remo but under the umbrella of the newly-formed League of Nations, the territories of the former Ottoman Empire were divided into mandates, which would be administered by Britain and France until full independence was granted to the new nations they planned to cobble together from the Turkish remains. Britain took on the mandates for Persia and Palestine, while the French were named for Syria and Lebanon.

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American interests opposed the Anglo–French oil treaty as an attempt to exclude them from pursuing the petroleum wealth of Arabic-speaking lands. Driven by uncertainty and self-interest, American companies sought to counteract the treaty’s “unfair” provisions by forming the Near East Development Corporation to protect their interests in the region. In 1928, their consortium recorded a practical success when it gained a 23.75 percent share in the Iraq Petroleum Company (IPC). British, French and Dutch interests held similar shares.

With the Great Depression in 1929, the global economy staggered. Businesses failed, production halted, tens of millions lost their jobs, and investment capital dried up. But oil exploration in the Middle East went on. In 1932, Standard Oil of California (Socal), working through a Canadian subsidiary, made a major discovery on the Arabian Gulf island of Bahrain, a short distance from the Arabian Peninsula mainland. Socal was able to secure drilling rights after IPC’s scientists recommended that the British-dominated company pass on the Bahrain concession; based on geological preconditions, they argued that exploration was not worth the risk.

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On September 23, 1932, the former Kingdom of Hejaz and Hejd became the Kingdom of Saudi Arabia under the leadership of King 'Abd al-Aziz ibn 'Abd al-Rahman Al Faysal Al Saud (known to history as Ibn Saud). This nation remained outside the control of England and the only regional option that allowed American companies to operate unencumbered by the British empire. Saudi Arabia proved to be the best choice for drilling, which no one could predict.

In Jiddah, the historical port of entry for pilgrims visiting Makkah, the Saudi government signed a concession agreement with Socal, concluding months of negotiations in May 1933. In 1934, Socal passed the concession to a wholly-owned subsidiary it created the previous November: the California–Arabian Standard Oil Company (Casoc).

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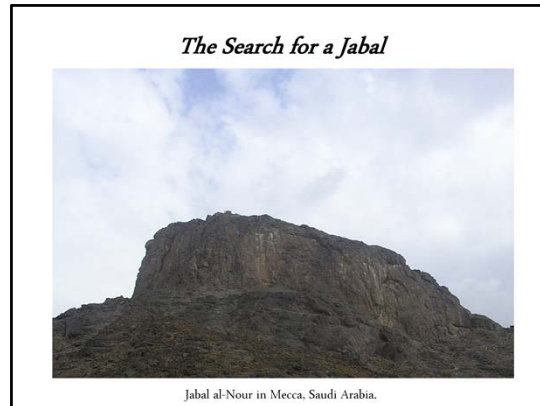
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Oil's potential as a valuable export commodity was clear to the Saudis, who needed revenue to invest in their new nation. Reviewing long-term prospects for mutual cooperation, they believed their new American partners would be equitable in their dealings with the Kingdom and less consumed by political interests and nonbusiness issues than other suitors, specifically the British and French. U.S. oil interests found a loyal friend and lasting partner in the House of Saud. The Americans positioned themselves as the anti-imperialist alternative, in part because they had little choice given the determination of their former war allies to exclude them from post-war oil competition beyond their shores.

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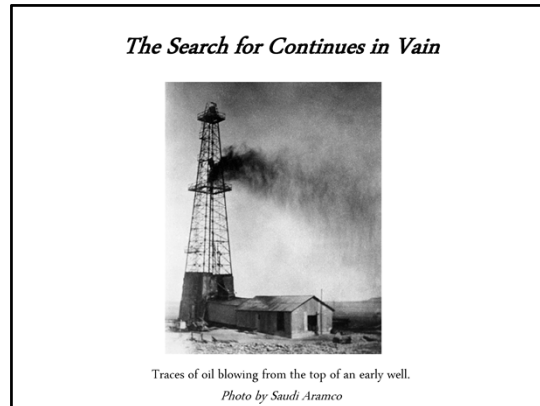


Three months after the signing of the concession, two American geologists, Robert “Bert” Miller and Schuyler “Krug” Henry arrived on the Arabian Gulf coast to begin a hunt that would change history. In September, they set up camp at the “humpy” limestone hills known as Jabal Dhahran, an archetypal anticlinal geological formation they had spotted while drilling on Bahrain. In the coming months, a pared-down Casoc variation of the anticlinal theory was formulated: find a *jabal* in Arabia and look for signs of oil in the vicinity.

For the next few years, a team of Casoc geologists conducted exhaustive geological reconnaissance across the Eastern Province, an area larger than the state of Texas, adding a Fairchild airplane to their arsenal in March 1934. After several disappointing years of drilling, Socal formed a fifty-fifty joint venture with The Texas Company, later known as Texaco, to manage their collective assets in the Middle East in 1936. They named their new company Caltex. Caltex took over Casoc, giving each upstream parent company an equal interest in the Saudi concession.

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A return on their investment was anything but guaranteed at the time. Due to the worldwide economic malaise, the price of crude had plummeted to under 50 cents a barrel. The American speculators had already spent many millions of dollars and would spend many millions more if they continued further.

With a skilled Bedouin named Khumayyis ibn Rimthan guiding them, Casoc geologists dismissed the setbacks and continued to scour the Concession Area—320,000 square miles of mostly unmapped desert—looking for signs of oil. Liking much of what they saw, they opted to take the odds and press on with their quest, sticking to their belief in the likelihood of hydrocarbon riches lying buried beneath the Kingdom's sands, knowing that time was running out.

As a fortuitous by-product of their labors, they opened several sweet water wells while searching for oil, benefiting farmers and Bedouin nomads, which pleased the Saudi government. Such discoveries could not, however, compensate for the fact that they had not come remotely close to achieving their ambition.

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By early 1938, the team had spent a year and a half drilling a deep-test well named Dammam No. 7 through stubborn layers of rock and sediment. On March 4, as they approached a depth of nearly 5,000 feet, their refusal to quit paid off. For weeks after the well first produced oil, its volume of flow remained steady until no doubts remained. Delighting anxious investors in California, the team reported with absolute confidence that Dammam was a commercial field. Two other wells deemed unproductive at the time—Dammam No. 2 and Dammam No. 4—were reopened and deepened to reach the Arab Zone where No. 7 had hit pay dirt, with the same welcome result.

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World War II Alters Oil Development in Saudi Arabia



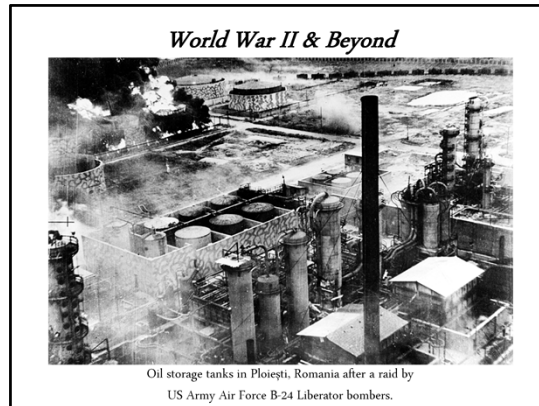
Wielun, Poland Destroyed by *Luftwaffe* bombing in 1939.

Casoc reported to Ibn Saud their success at Dammam and gladly handed over a previously-agreed-to advance of 50,000 pounds in gold, holding up their end of the Saudi–American partnership. Known forever after as Lucky No. 7, that one well produced 32 million barrels of oil before it was removed from service in 1982. In recognition of Dammam’s uniqueness, it became known as a “supergiant” field. The neighboring Kuwait field is rated as another supergiant.

In April 1939, Ibn Saud traveled from his capital at Riyadh to the port city of Ras Tanura to personally turn the valve that loaded the first Saudi crude oil for export onto the Socal tanker *D. G. Scofield*. Four months later, Adolf Hitler sent German troops into Poland, starting World War II and altering the development of oil fields everywhere. In 1940, oil production from the Middle East accounted for less than 5 percent of total world production, while the U.S. accounted for nearly two-thirds. The full realization of the region’s oil potential came only after the defeat of Germany and Japan.

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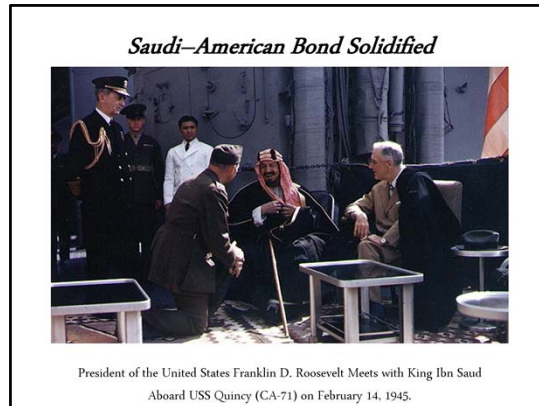


Many major strategic decisions of the Second World War centered on oil. Hitler invaded Russia with the hope of capturing the oil-rich Caucasus region. A primary objective of the joint German–Italian campaign in North Africa was the seizure of the Suez Canal, providing direct access to Middle Eastern oil. Japan’s invaded Indonesia in an effort to seize control of Dutch oil fields. To cripple the Nazi war machine, the Allies launched bombing raids on the German-controlled oil facilities at Ploiești, Romania. Both the Allies and Axis Powers realized that adequate oil supplies would be a determining factor in winning the war.

Despite the battles elsewhere, new discoveries were made in Saudi Arabia. Oil was struck at Abu Hadriya north of Dammam in early 1940 and at Abqaiq southwest of Dammam later that year. The construction of a major oil refinery at Ras Tanura began in 1943 and opened for operation in 1945; it has grown into the largest oil refinery in the world. On January 31, 1944, Casoc changed its name to Arabian American Oil Company, which people were soon calling Aramco.

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With the latest world war entering a climax, American president Franklin Roosevelt sailed on the cruiser *U.S.S. Quincy* into the Great Bitter Lake of the Suez Canal in February 1945. After negotiations with Winston Churchill and Josef Stalin at the Yalta Conference, FDR planned to meet with Ibn Saud, an event that proved to be a critical moment for U.S.–Saudi relations.

In 1948, Socal and The Texas Company were joined by two new partners. Standard Oil of New Jersey (the predecessor of Exxon) purchased a 30 percent share and Socony Vacuum (the predecessor of Mobil) purchased a 10 percent share. Later that year, the Ghawar Field, the largest onshore oil field in the world, was discovered east of Riyadh with estimated reserves of 80 billion barrels. Since this discovery, Aramco's rate of growth has accelerated at a daunting pace.

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Asserting his Kingdom's right to a fair share of the oil bounty, Ibn Saud convinced Aramco to split all profits equally in 1950. Recognizing the new reality, Aramco moved its headquarters from downtown New York City to a location in Dhahran not far from the site of Lucky Number 7. That same year, the 1,200 mile (1,700 kilometers) Trans-Arabian Pipe Line (Tapline) was completed, linking the Eastern Province oil fields to Lebanon and the Mediterranean.

Six years later, Aramco officially confirmed Ghawar as the largest onshore field and the Safaniya as the largest offshore field in the world. In 1961, Aramco began processing liquefied petroleum gas (LPG) at its Ras Tanura facility. A decade later, again at Ras Tanura, Aramco opened its "Sea Island" offshore crude oil loading program.

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In 1973, the Saudi government began a seventeen-year-long move to assume full control of its petroleum resources by purchasing a 25 percent interest in Aramco. By 1980, virtually 100 percent of Aramco's assets were owned by the Kingdom. Saudi Arabia did not nationalize or expropriate the American's assets, leaving its former partners with essentially nothing, as some governments had done. Instead, the Saudis paid a fair market price.

Aramco's previous management team continued to operate the company's assets on behalf of the Saudi government until November 1988. In that year, the Saudi Arabian Oil Company was created by royal decree and the Saudis took full operational control. The company's name was formally changed to its current moniker: Saudi Aramco.

In 1984, Saudi Aramco began operating its first four supertankers, working through its wholly owned subsidiary, Vela International. In 1989, high-quality oil and gas were discovered south of Riyadh, the first such find outside the operating area established in the 1933 concession agreement.

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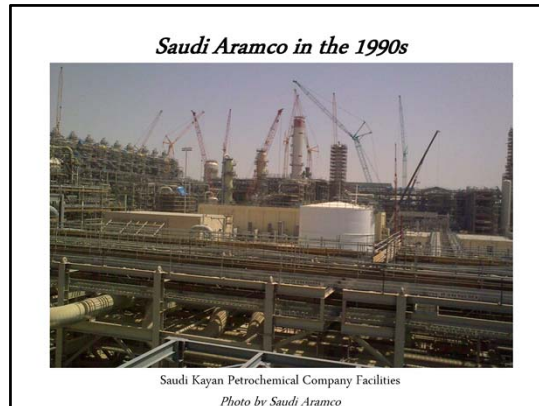
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In August 1990, Iraq invaded Kuwait. Allied forces led by America moved en masse to the Arabian Peninsula in a defensive operation as Desert Shield. In January 1991, the Gulf War broke out, and Desert Shield became an offensive operation called Desert Storm. Retreating Iraqi forces set fire to Kuwait's oil fields, creating a massive economic and environmental disaster. Saudi Aramco played a major role in the response to the Gulf War oil spill, the largest in history.

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In 1993, Saudi Aramco took complete charge of the Kingdom's domestic refining, marketing, distribution and joint-venture refining interests. By end of the next year, maximum sustained crude-oil production capacity sat at 10 million barrels per day. In 1995, the company completed a program to build 15 crude carriers, operated by Vela.

Throughout the 1990s, Saudi Aramco pursued a steady policy of global acquisitions, expanding into Korean, Philippine and Greek markets. Throughout its expansion plans, the company works with major oil companies, like Texaco and Shell, in establishing new refineries and marketing initiatives.

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The company also formally opened the Shaybah field in the Rub' al-Khali desert, Saudi Arabia's mythic Empty Quarter. An aggressive program of upgrades and expansions for its pipelines and refineries on Saudi soil is currently being pursued. In 2000, *Petroleum Intelligence Weekly* ranked Saudi Aramco first in the world among all oil companies for the eleventh straight year, judged by the country's crude oil reserves and production. A full listing of Saudi Aramco's accomplishments and initiatives would go on for pages. The clear conclusion from even a brief overview is that they are indisputably one of the great oil companies in the world.

The rich rewards of Saudi Arabia's petroleum bounty has been shared with its inhabitants. The company is directly responsible for a wide range of social, medical and educational initiatives that have transformed the country. Schools, hospitals, roads, sanitation systems, and communication systems bear witness to Saudi Aramco's commitment to the nation and people of Saudi Arabia.

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Throughout the long history of oil, a delicate balance has persisted between supply and demand. Increases in demand have somehow always been followed by successful exploration for new supplies. Thanks to the on-going succession of new discoveries, and to the development of new technologies to extract still more oil from previous discoveries, the industry maintains sufficient supplies to last another 50 years. A significant part of that cushion comes from new fields in areas that are more expensive to develop and operate due to higher extraction and transportation costs.

A good example is the Russian Arctic shelf. For many years, the Russians touted their oil and gas resources in the far north, but an American speaker at a 1994 international conference in Norway pointed out to that the existing market for oil could not support development in this arctic zone anytime soon. The speaker concluded that the price of oil would have to pass \$100 a barrel and the Arctic ice cap would have to melt considerably before the commercial development of Russia's Arctic oil fields would become feasible. Eighteen years later, serious efforts have finally been launched in that direction.

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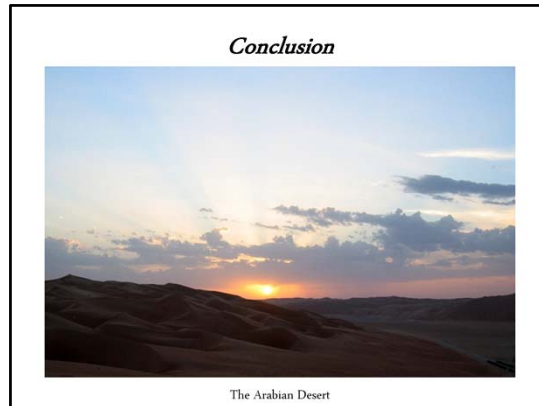


Unlike many oil companies in the world, Saudi Aramco has nurtured its petroleum resources carefully. As far back as the 1980s, it opted to save and use the natural gas by-products that many oil companies in the Middle East simply burned off. Given the oil-based mutual interdependence of the Saudi economy with other nations of the world, Saudi Aramco carries a great responsibility as it plans for the future. How successfully the company manages its resources in the coming years will affect the Kingdom itself and the world at large for another half century.

The end of the petroleum age is at least two generations away. If the history of oil exploration continues on the path it has followed since Titusville, more discoveries and new breakthroughs will continue to extend that date. Perhaps the greatest example of that trend is the development of shale oil resources in places like Alberta, Canada and North Dakota, U.S.A. New and unexpected breakthroughs may be announced tomorrow, or next year. History tells us that those announcements will come. And, very likely, Saudi Aramco will make a share of them.

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The history of Saudi Aramco is one element in the ongoing story of Saudi Arabia. Other Speaker's Bureau presentations explore the history of Saudi Arabia, the geography of Saudi Arabia, King Abdullah University of Science and Technology and an overview of Saudi Arabia. We look forward to sharing these presentations with you in the future.

Thank you.

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End of Presentation