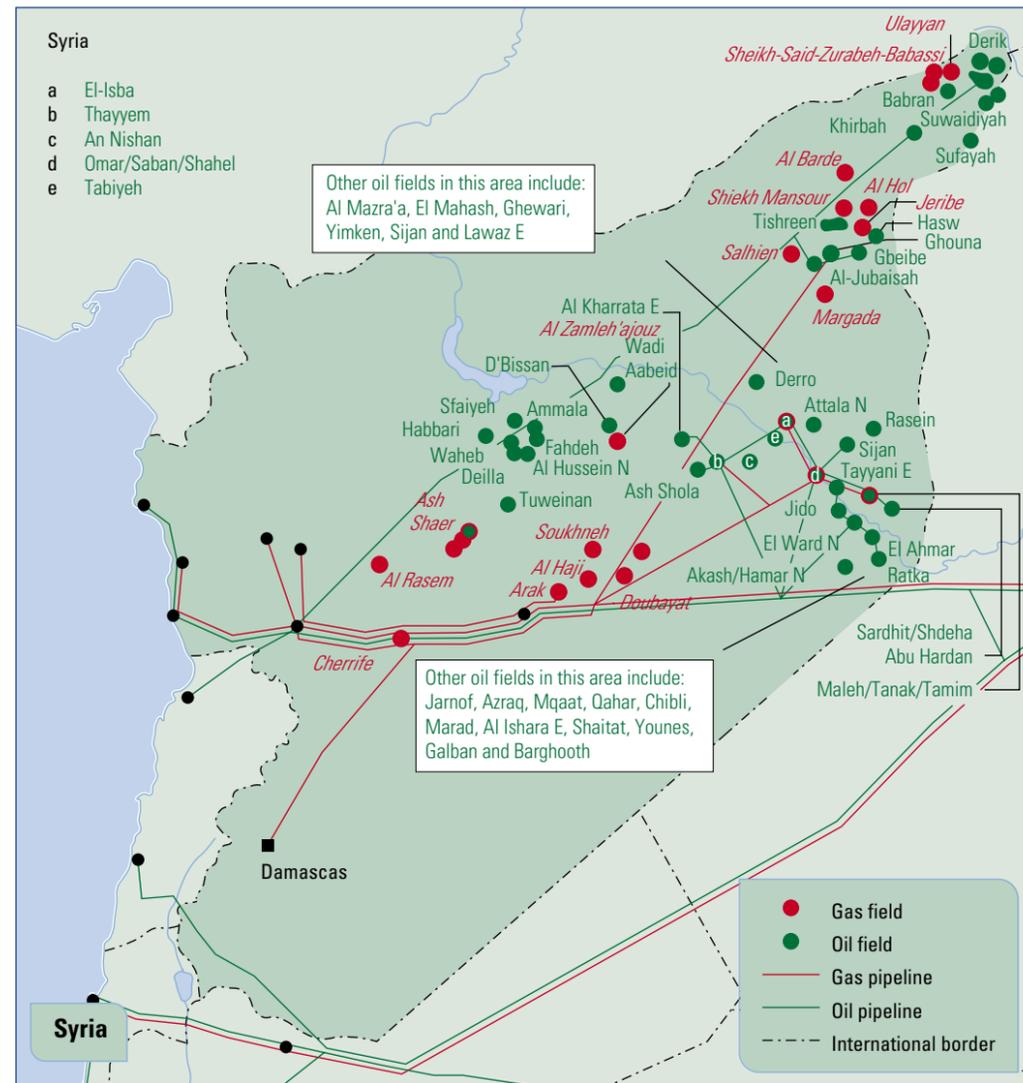


Gearing up for gas



Although exploration for oil and gas in Syria continues, the country's proven oil reserves are not expected to last beyond the next 10 years. During this time, the country will once again become a net oil importer.

Attentions are now turned to the country's substantial gas reserves and setting up an infrastructure to process and distribute gas for the domestic market, freeing up as much oil as possible for export. Other uses for gas include feedstock for fertilizer, produced from Syria's rich resources of phosphates, and the supply, by pipeline, of power plants in Lebanon.



The search for oil in Syria was started in 1932 by Compagnie Française des Pétroles, the French partner of Iraq Petroleum Company (IPC) that had been granted a 75-year concession to explore the Karatchok anticline in the remote northeastern tip of the country. This was extended in 1938 to cover the country north of Damascus. IPC's subsidiary, Syria Petroleum Company (SPC), drilled 11 wells at a total cost of over \$30 million before giving up the concession in 1951. The rig camp and permit passed in 1955 to J.W. Marshall, who spudded Karatchok No. 1 on March 31, 1956 at a location made on a cross section by R. Wetzell in 1936. The well came in at 1,965 m in October, producing 1000 B/D of 20° API oil.

In 1964, a legislative decree restricted development and production of oil to the Syrian Government, and Marshall's permits were among the nine petroleum marketers nationalized within the next two years. The national company, Syrian General Petroleum Authority (SGPA) continued drilling until, in 1964, there were nine producers out of 15 wells. SGPA, with technical assistance from the USSR, became responsible for the whole of Syria's petroleum industry, announcing the discovery of new fields at Tel Rumailan, Suwaidieh, Jebisseh, Hamzah, Kirbah and Ulayan (of which the latter two proved to be unproductive) in 1962. Many of today's horizontal wells are being drilled in the Suwaidiyah field.

Development of these fields (Figure 15.1), accompanied by much wildcat

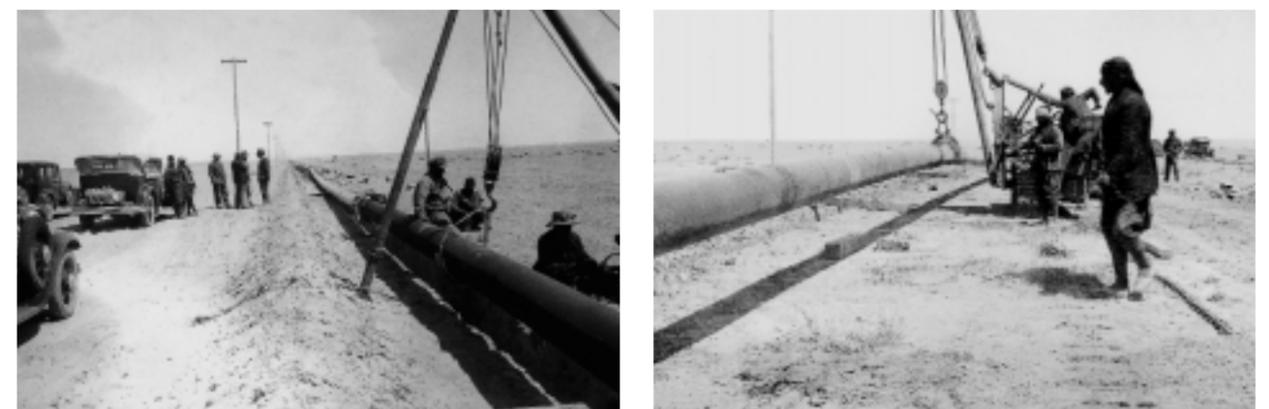
drilling, remained the flavor of oil operations during the 1960s.

A pipeline from the government-owned refinery at Homs to Tartus on the Mediterranean was completed in 1968, and by 1970 24.45 million of the annual 29.5 million barrels produced were being exported. By 1974, annual production had increased to 45 million barrels.

In 1973, the government divided SGPC into five state-owned operating companies attached to the Ministry of Petroleum and Mineral Resources: Syrian Petroleum Company (SPC), responsible for upstream operations (exploration, field development and production); Homs Refinery Company and Baniyas Oil Refining Company, which run the country's two refineries; the Syrian Company for Oil Transport



Figure 15.1: Some of the machinery and techniques used in the early days for laying a pipeline below ground near Palmyra



(SCOT), which operates the country's domestic oil and gas pipeline network; and the Syrian Company for the Storage and Distribution of Petroleum Products (Mahruqat), which handles the domestic marketing and distribution of oil and gas products. With the later addition of Sytrol, which was set up to manage the export of crude oil and refined products, this remains the structure of the Syrian oil industry.

To encourage exploration and development by international companies in Syria, the government adopted an open-door policy in 1974, reserving an area of 25,000 km² for SPC and allocating the remaining 50,000 km² to foreign contractors under the terms of service agreements. Between 1974 and 1977, SPC announced the discovery of three new oil fields at Tishrin, Habari and Salhieh, and a nonassociated gas field at Al-Hol.

Deminex made a series of major finds in the mid-1980s on its 15,750 km² concession in the Deir ez-Zor region, after the Syrian American Oil Company (Samoco) had sold its 65% holding to Pecten, a subsidiary of Shell. Samoco had reprocessed many seismic data and drilled four wells before leaving Syria in 1982, after which Shell Syria took over Pecten's interest in the old Samoco concession. Some of the other companies subsequently relinquished their contracts after disappointing results, but the successes of the Shell/Pecten/ Deminex group attracted a number of other foreign companies and consortia to Syria, such as Marathon, Repsol, Unocal during the mid-1980s to early 1990s. By the end of 1994, however, 10 foreign groups that had been awarded exploration tracts between 1987 and 1990 had relinquished them, and only Elf Aquitaine was still operating in the country by 2000.

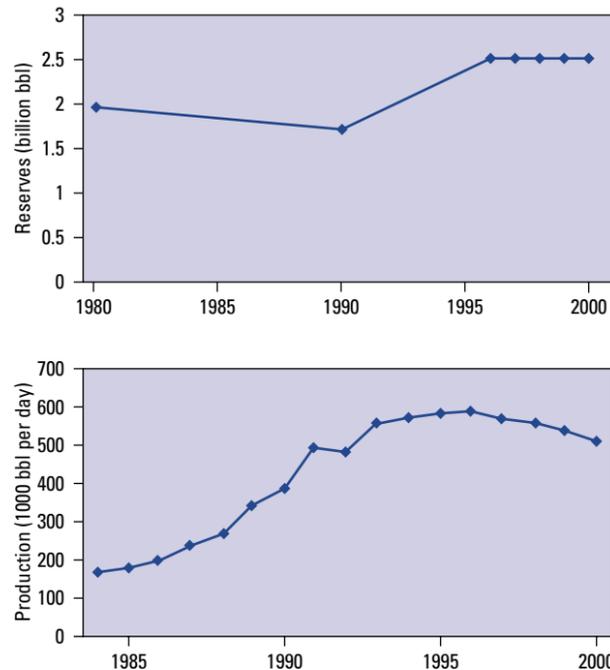


Figure 15.2: Production and reserves for Syria

Ireland's Tullow Oil acquired a license in 1992 and developed a small oil field, but pulled out of the country completely in 1998. Marathon Oil still holds a license for its concession at Palmyra in central Syria, where it discovered two gas fields in the late 1980s. The company is still negotiating with the Syrian Government over the terms for bringing them into production.

Since 1992, only five exploration licenses have been awarded. The 3800-km² Al-Waleed tract and the 4800-km² Zenobia acreage went to the Pecten Group in 1994 and 1997 respectively. Pecten relinquished the Al-Jazira tract that was assigned to it in 1985. Elf Aquitaine, which retains its Deir ez-Zor acreage that was assigned in 1988, was awarded a license for the 4200-km² Tishrin tract in 1997. In addition the Hungarian company, Mol, was awarded a nine-year exploration license for the 4,900-km² East Palmyra block in December 1996. In February 1998, the Croatian company, INA Industries Nafta, was assigned a 4900-km² acreage in Hayan, south of Palmyra.

The level of exploration activity and new exploration agreements dropped due to the dissatisfaction of the foreign companies with contractual agreements in the early to mid-1990s. As a result, since 1996, the government has

improved the grant structure for cost recovery by the companies.

Oil production in Syria peaked in 1996 at 604,000 B/D (see Figure 15.2). It then fell steadily to an estimated 546,000 B/D for 1999 as older fields, such as the 140,000 B/D Jebisseh field reached maturity. Today, the country's main oil producer is al-Furat Petroleum Company (AFPC), which was established in May 1985 between state-owned SPC (50%), Pecten Syria Petroleum (15.62%), Royal Dutch/Shell (15.62%) and Germany's Deminex (18.75%). AFPC began a cutback schedule of 10,000 B/D annually in 1996, to run for five years, although production actually fell even faster. The company's fields in northeastern Syria are producing about 400,000 B/D of high-quality, light crude.

The decline in oil production is expected to continue while consumption rises, leading to a net reduction in oil exports. Syria is concentrating on new development and production initiatives, and these have picked up somewhat since 1996, but, because of poor results and unattractive contract terms by SPC, these activities are slow to progress.

SPC has adopted horizontal drilling on some fields, drilling at a rate of 10 to 15 wells per year.

Logistical problems

Syria's proven natural gas reserves are estimated at 8.5 Tcf. Around 75% of these are owned by SPC, with 3.6 Tcf in the Palmyra area, 1.6 TCF at the al-Furat fields, 1.2 Tcf at Suwaidiyah, 0.8 Tcf at Jibsa, 0.7 Tcf at Deir ez-Zour and the remainder at al-Hol, al-Ghona and Marqada. About half of these reserves are associated gas. In 1998, Syria produced about 208 Bcf of natural gas and is keen for this resource to be used for domestic power generation to free up oil for export. There are logistical problems associated with this, since most of the gas reserves are in the northeast of the country, while the population is centered in western and southern Syria.

Several projects are in hand to overcome these geographical problems, including development of the Al Arak, Al Hail, Al Dubayat, Najib and Sokhne fields in the central Palmyra region. Also, in October 1997, a large new field in the Abi Rabah area of the Palmyra region was discovered. The Palmyra fields supply a 375-MW power plant at Zaisoun in central Syria and are to be linked to a new pipeline to Aleppo in the west, the Tishreen power plant in Damascus and the Mhardeh power plant in Homs. In August, 1998, the Arab Petroleum Investments Corporation announced that it would lend \$50 million to the development of a new gas field in the north Palmyra area, as well as offering partial financing for a new gas plant at Najib and Zara.

The Jibsa gas treatment plant's capacity was increased by 88% in 1997 to 60 MMcf/D and is currently being upgraded to 105 MMcf/D. The Deir ez-Zour gas treatment plant was built in 1991, the Jafra gas separation and the Palmyra gas processing plants in 1996.

A project is in hand to harness the associated gas that is at present flared at the Deir ez-Zour oil fields. In November 1998, SPC signed a \$430-million agreement with Conoco and Elf Aquitaine, who awarded Kvaerner ENC a \$160-million contract to construct the infrastructure for the project. The scheme will include a gas-gathering system and gas processing plant delivering gas to the national grid near Palmyra at the rate of 150 MMcf/D via a 155-mile pipeline.

Syria's refineries

There are two refineries in Syria. Baniyas refinery produces 135,000 B/D and Homs refinery produces 107,140 B/D. Plans for a third refinery at Deir ez-Zour, which will supply the eastern parts of the country with an initial output of 60,000 B/D, and upgrades to the existing refineries are currently on hold.

Sytrol, the state marketing company, markets all of Syria's crude oil and has contracts with more than 20 oil companies. In November 1999, Royal Dutch/Shell contracted to purchase at least 16,000 B/D from Syria, starting in 2000. Major exports leave terminals operated by the Syrian Company for Oil Transport (SCOT) at Baniyas and Tartous on the Mediterranean, and a small tanker terminal at Latakia.

A 250,000-B/D export pipeline links SPC's northeastern fields to the Tartous terminal, with a connection to the Homs refinery. A 500,000-t/yr refined products pipeline links Homs refinery to Damascus, Aleppo, and Latakia. A 100,000-B/D spur line links al-Thayyem and other fields to the T-2 pumping station on the old Iraqi Petroleum Company (IPC) pipeline, and a spur line connects the al-Ashara and al-Ward fields to the T-2 pumping station.

Future as a net oil importer

Syria's proven oil reserves are estimated only to last for about another 10 years. Combining this decline with a current annual population growth of 4%, the country is expected to become a net oil importer again within a decade. There are moves to interest international oil companies in taking over some SPC oilfields for enhanced production, but the main priority now is to exploit the country's substantial reserves of natural gas, and the necessary infrastructure for the processing and transport of gas for the domestic market is being put into place.

It is also planned to use gas as feedstock for fertilizer production since Syria is rich in phosphates, and to supply gas by pipeline to power plants in Lebanon.

