ENERGY COUNTRY REVIEW

Austria

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Country Review Austria

Bordering eight countries in Europe's center, Austria is mountainous in the south and west. Fertile lowlands in the east are part of the Danube River basin. Accepted in 1995 as a member of the European Union (EU), Austria has increased its competitiveness by privatizing industries and reducing subsidies. Manufacturing, powered by hydroelectricity, drives the nation's export trade; Austria also profits from iron ore, oil, and timber.

Austria was occupied by Celts of the kingdom of Noricum before being included in the Roman Empire in 100 AD. After repeated invasions it was incorporated into East Francia in 788 AD under the Babenbergs. Elevated to a duchy, the Babenberg line ended in 1246. It was taken by the Habsburgs in 1276 who expanded into many parts of Europe. From 1438 all but one emperor of the Holy Roman Empire was a Habsburg. The Napoleonic wars saw the end of this empire in 1804 and in 1815 it became part of the German Confederation. Defeated by Prussia in 1866, the empire was then reformed into Austria-Hungary.

In 1914 the Austro-Hungarian Empire declared war on Serbia that triggered World War 1, which ultimately led to its dissolution. In 1919 it reverted to the Republic of Austria after being forbidden to unite with Germany by the victors of World War 1. However, it was annexed by the Nazis in 1938. At the end of World War 2 the Allies took over until 1955 when it became independent again, declaring neutrality. It now has a diverse economy with a significant tourist sector.

History of Oil and gas in Austria

At the beginning of the 20th century, the Austro-Hungarian monarchy was the third-largest oil producer in the world, and in 1909 the maximum output was 2.077,000 tons,

Country Key Facts

Official name:	Republic of Austria
Capital:	Vienna
Population:	8,744,060 (2017)
Area:	83,871 km² (32,382 sq. mi.)
Form of government:	Federal parliamentary republic
Language:	German, Turkish, Serbian
Religion:	Roman Catholic
Currency:	Euro
Calling code:	+43

Government

Austria is a federal democratic republic. The head of state is the directly elected President. The Chancellor (chairman of government) is appointed by the President. Parliament is bicameral. The elected 183-member Nationalrat (National Council) is the dominant legislative chamber. The upper house of parliament, the 61-member Bundesrat (Federal Council) has members who are elected by state legislatures. It has a limited right of veto. Austria joined the EU in 1995.

The oil industry is overseen by the Federal Ministry of Science, Research and Economy.

Source: GlobalShift

which came mainly from the eastern part of the monarchy (Galizia). The first gas pipeline was constructed in 1916/17 in Transsylvania to bring natural gas from the Magyarsaros are to Thorenburg and Marosujvar.

After Word War I and the peace treaty of Trianon, Austria remained without any oil or gas production; Galizia became part of Poland, Transsylvania came to Romania and the small oil field in Gbely, discovered in 1914, came to newly formed Czechoslovakia. Already during World War I the army tried to find an extension of the geological trend in Austria proper - without any success, mainly because the drilling locations were selected not by qualified geologists but by applying the divine rod as the preferred tool. After the war there was no capital available for any oil exploration. In 1925 Socony Vacuum started a geological survey in the northeastern part of Lower Austria, the Vienna Basin. However, when the studies were completed by the Geologist Dr. Friedl, Socony Vacuum withdrew from Europe but allowed Dr. Friedl to make use of his findings. In 1930 Raky Danubia reported oil shows in their well "Windisch Baumgarten 1a", but it was not until 1934 that the well "Goesting 2" came in with a daily production of 40 tons; Austria became an oil-producing country.

Socony Vacuum came back to Austria, formed a 50/50 % joint venture with Shell (RAG) and secured large areas in the Vienna Basin for oil and gas exploration in 1935. At the end of 1937 total annual oil production in Austria was 32.858 tons. When Austria became a part of Germany (through the annexation of March 13, 1938) the bitumen law was issued which stipulated that exploration licenses were to be terminated by July 31, 1940, except a production license had been issued by this date. Thus a substantial part of the RAG exploration acreage was returned to the state, now the owner of the mineral rights for oil and gas. Because of the war situation the open exploration areas were licensed to German companies, which started extensive exploration activities. In 1943, 102 drilling rigs were in operation in the Vienna Basin area, as a consequence oil production rose to more than 1,3 million tons per year.

After World War II the allies decided that the German property in Austria was to belong to the occupation forces, thus the whole Austrian oil industry came under the control of the USSR. After extensive disassembly of available oil field equipment, SMV (Soviet Mineral Oil Administration in Austria) started production and exploration activities in

the Vienna Basin, and in 1949 the largest oil field in Europe was discovered : Matzen.

The development of this discovery brought the oil production in Austria to a record high of 3,665.91 tons in 1955. As a consequence of the Austrian State Treaty, signed in Vienna on May 15th 1955, all the operations of SMV were handed over to the Republic of Austria on August 13th, 1955, which on June 18th, 1956, formed the Oesterreichische Mineraloelverwaltung (OMV) to manage the oil and gas properties. The task to bring the operations from Russian to Western standards was enormous. Installations had to be improved to fulfill Austrian laws and regulations, an extensive road construction program was initiated (as the Russians had preferred to use crawler tractors to transport oilfield machinery), and step-by-step the outdated equipment was replaced by new machinery mainly from the US or their licensees in Europe. Great efforts were made to reduce the losses of natural gas, which were about 40 % in 1955.

With modern geophysical and drilling equipment now available, OMV started its own exploration programs, and intensively pursued the search for oil and gas in ever deeper targets. The deepest wildcat - Zistersdorf ÜT2 - reached a TD of 8.553 m on May 31st, 1983. To increase the recovery rate of existing oil reservoirs, secondary recovery methods were applied - even EOR tests were performed when the oil price allowed it.

As it became evident that the indigenous production would not satisfy the ever increasing demand for natural gas in Austria, OMV started to import natural gas from the USSR in 1969 and became a pioneer for the European gas pipeline network. Similar was the development on the crude oil sector, the continuously increasing demand led to the construction of a supply pipeline from Triest to the now 10 Million Ton Refinery in Schwechat near Vienna. To stabilize the domestic share of the Austrian crude oil demand, OMV started participating in foreign exploration ventures, today OMV has interests in the North Sea, in Libya, Pakistan, Sudan and Australia.

Source: SPE International, National Geographic

Geology

The most important hydrocarbon provinces of Austria are the Vienna basin, the Molasse Zone and the Northern

Alps. The first of these areas, the intramontane Vienna Basin, has produced by far the largest volumes of hydrocarbons and also provided Austria's earliest production. Oil and gas production in the Vienna basin has come from Neogene basin-fill sandstones (termed the First Floor) and from underlying allochthonous Upper Triassic dolomites of the Calcareous Alpine Zone and Flysch sandstones (Second Floor). Whilst some exploration of deep, autochthonous, mainly Jurassic-age, sub-thrust reservoirs under the Neogene of the Vienna Basin (Third Floor) has been conducted this had to be abandoned on economic grounds.

60 years of exploration has provided detailed knowledge of the structural and sedimentological history of the Vienna Basin. In the past structural traps, associated with the Steinberg fault (maximum displacement 6,000 m) and large intra-basin highs (Matzen, Aderklaa) were targeted. More recently, stratigraphic traps have been successfully explored. The primary targets within the second floor are dolomitic reservoirs sealed either by overlying Neogene marls (relief deposits) or by tight Calcareous Alpine sequences (internal deposits). The main source rock for the hydrocarbon accumulations of the Vienna Basin is thought to be autochthonous Malmian-age marls.

No commercial discoveries have yet been made in other Austrian intramontane basins e.g. the Pannonian or Styrian basins.

The frontal Alpine Molasse Zone is Austria's second most important hydrocarbon province containing many oil and gas fields mainly reservoired in Tertiary sandstones. Oil discoveries are confined to Eocene shallow marine sands trapped against southerly dipping non conformable faults. Gas has been found in Oligocene and Miocene deep marine fan deposits, within stratigraphic traps and compactionrelated closures. Minor amounts of hydrocarbons have been recovered from Cretaceous sandstones and Jurassic carbonates beneath the Molasse Zone. Imbricated Molasse sequences close to the Alpine thrust front provide additional targets. Source rocks within the Molasse Zone are Oligocene fish shales in Upper Austria and Salzburg and Malmian-age marls in Lower Austria. The extensive exploration of the area including the acquisition of a dense seismic grid allowed for detailed geodynamic and sedimentological models of the Molasse Zone.

Within the Northern Alps, the main exploration targets have been the thrust units of the Northern Calcareous Alps and the sub-thrust floor. Fractured dolomite reservoirs within the

Northern Calcareous Alps provide a reservoir target sealed by tight sequences of Cretaceous Gosau Group, Lunz and Werfen Formations.

The Helvetic unit and the Rhenodanubian Flysch unit are viewed as marginally prospective. Reservoirs within the subthrust zone comprise Jurassic carbonates and Cretaceous sandstones. A commercial gas field (Höflein) reservoired in Middle Jurassic cherty sandstones has been discovered beneath the Flysch Zone. The distribution of source rocks for the sub-thrust zone is similar to that described for the Molasse Zone.

Oil's share of the energy mix in Austria has fallen from around 50 percent in 1970 to 38 percent today, while natural gas has made major inroads over the same period - it now accounts for 23 percent of total energy consumption compared with only 10 percent in 1970.

Source: Walter Hamilton(1), Ludwig Wagner(2), Godfrid Wessely (3)

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