



75 years of successful
energy production Zistersdorf



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Foreword

Zistersdorf – at the heart of oil production in Austria

Oil production at the Gaiselberg field in Zistersdorf began 75 years ago, on 25 July 1938. Jet-black crude oil gushed from what is now one of the world's oldest active oil wells: Gaiselberg 1. To mark this special anniversary, we would like to look back over the fascinating history of oil production in the area around Zistersdorf – a fruitful 75-year partnership which is still based on a strong sense of responsibility for the region, the environment and the local community.

This jubilee highlights once again the vision that the pioneers of oil exploration displayed all those years ago. Driven by their fascination with oil, they quickly racked up a number of major successes. Looking back, the technology used appears more than a little risky, although in those days it was ahead of its time. Unconventional technology and methods – such as steel drilling rigs, specially constructed drill bits and deviated wells – were the key to RAG's success.

More than 6,660,000 tonnes of crude oil have been produced from the subterranean reserves around Zistersdorf, 180 wells have been drilled and hundreds of millions of euros have been invested in the region, creating jobs both directly and indirectly. The RAG and Gaiselberg fields in the Zistersdorf area underpin Austrian oil production, and are symbols of the abundance of oil in the Vienna Basin. Thanks to their extraordinary geological features, oil is still being extracted at both fields. Zistersdorf is RAG's oldest facility in Austria, and this pioneering site will remain a

vital source of oil for the country in years to come. The large, colourful pump jack in the centre of the roundabout at Bundesstrasse 40 in Zistersdorf is evidence to the importance of oil production for the region. RAG's close ties with the people of Zistersdorf are reflected in a wide range of partnerships, as well as support for the local fire brigade, and various associations and community organisations.

During a visit to the area in 2011, HE Abdalla Salem El-Badri, the Secretary General of OPEC, paid tribute to the harmonious landscape, with numerous inconspicuous pump jacks working ceaselessly alongside vineyards and cornfields. He was also impressed by the fact that eco-friendly, sustainable oil production takes place in the heart of one of Austria's oldest wine-growing areas, showing a keen interest in the high-efficiency, low-impact methods used – methods which could serve as a model for the major oil-producing countries. Providing environmentally friendly, safe and affordable energy for the future is RAG's prime objective, its greatest challenge and the focal point of its operations. The steady rise in global energy demand means that responsible use of the valuable energy resources at our disposal, as well as environmental protection and gaining acceptance as a good neighbour, are more important than ever. RAG has a long track record of shouldering its responsibilities all along the value chain – an approach that forms the basis of all of our activities and is the cornerstone of our success.

Kurt Sonnleitner
Chief Technical Officer

Markus Mitteregger
Chief Executive Officer

Michael Längle
Chief Financial Officer

A long tradition of oil production

The oil and gas industries have left their mark on history like no others. Over the past 150 years, few other industries have been so closely interlinked with global political and economic events.

There is a long tradition of oil production and processing in Austria. During the time of the Austro-Hungarian Empire, significant quantities of oil were produced in what was then Galicia, and in Poland. Small discoveries were also made in Upper Austria and the Vienna Basin. 1909 was a record year, with more than two million tonnes of oil produced, accounting for about 5 % of global production. At that time Austria was the third-largest oil producing nation, behind the USA and Russia.

Domestic production stopped following the First World War. However, in the mid-1920s a pioneering spirit took hold and exploration resumed. There was great hope for the Vienna Basin area, which had been geologically mapped for the first time.

*“Sensation in Zistersdorf”
Wiener Allgemeine Zeitung, 1932*

In the early 1930s initial drilling in the Vienna Basin produced some short-lived, minor successes, including at Gösting I in the Steinberg area near Zistersdorf, Lower Austria in 1932. The first well to become profitable was Gösting II, which was drilled in 1934 by Erdöl-Produktions-Gesellschaft (EPG). This was the beginning for systematic field development in Austria and oil production started to rise sharply.



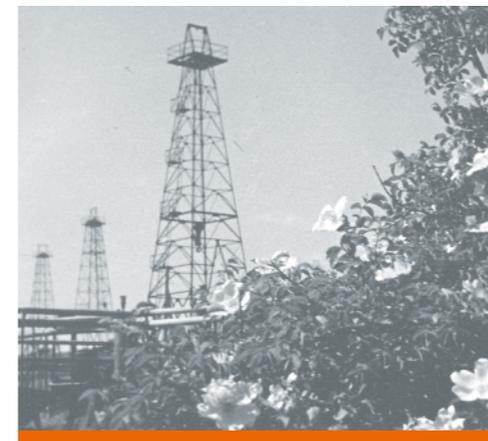
1935 – The formation of RAG

The commercial success of the Gösting II well underlined the potential rewards of investing in oil production in Austria. This prompted the establishment of RAG. Two international companies, Socony Vacuum Oil Company, Inc. (Mobil Oil) and N.V. de Bataafsche Petroleum Maatschappij (part of the Royal Dutch Shell Group) founded Rohöl-Gewinnungs Aktiengesellschaft (RAG) in 1935, each taking a 50 % stake. RAG was set up to secure oil supplies for the companies’ refineries in the Vienna area, and to reduce dependence on imports. This key strategic objective still applies today.



“Respected geologists and leading international oil companies were convinced that there was oil to be found in Lower Austria. They had the necessary experience and equipment, and were prepared to invest millions in exploration in Austria.”

*Markus Mitteregger,
RAG Chief Executive Officer*



The history of oil and gas is closely tied up with the successful development of the western industrialised countries. Major technological breakthroughs of the 19th and 20th centuries, the emergence of the automotive and aviation industries, and innovations in the chemical industry drove the rapid growth in demand for petrochemicals. A wealth of technological innovations went hand in hand with the increasing importance of fossil fuels – first coal, then oil, followed by gas. The dawn of the “petroleum age” was a driving force for technological advances, and also made fossil fuels the cornerstone of economic growth and prosperity, as they are today. Energy sources became the world’s most important commodities, and since then they have had a huge impact on economic development.

1938 – Success in Zistersdorf

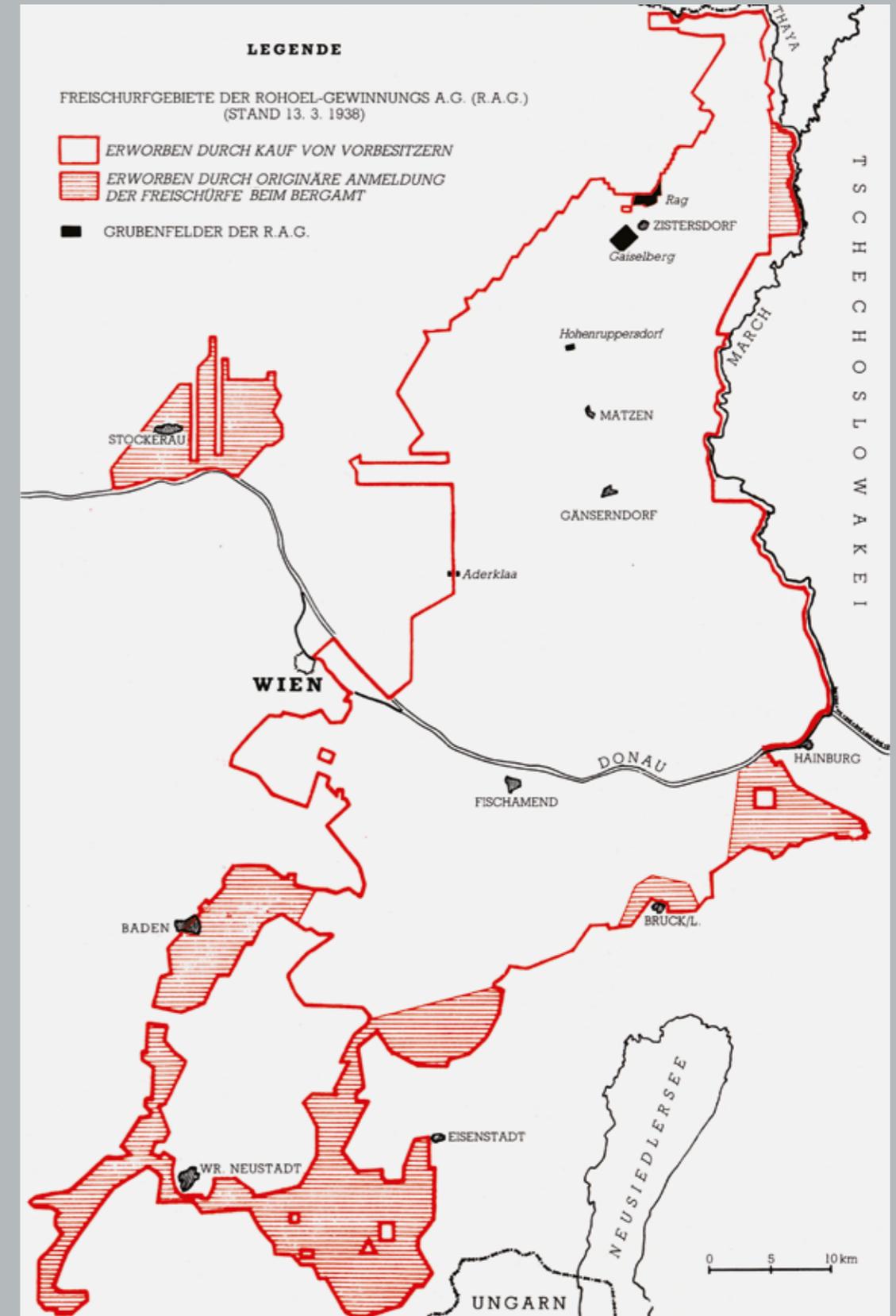
RAG quickly began to achieve success generated by state-of-the-art drilling techniques. In 1936 the company discovered the RAG field in the Zistersdorf area, directly to the south of the Gösting field. However, the breakthrough came with the discovery of the Gaiselberg field, about four kilometres south of the RAG field. The quality of both fields, consisting of numerous oil horizons on top of one another, is exceptional. This is one of the reasons why after 75 years, oil continues to flow from the original Gaiselberg 1 well, making it one of the oldest active oil wells in the world. Additional fields along the Steinberg fault, which passes through Niedersulz, Hohenruppersdorf and Wolkersdorf, were subsequently discovered.

75th anniversary of Gaiselberg 1

Operations began at the Gaiselberg 1 well in Zistersdorf on 25 July 1938, making it one of the oldest active oil wells in the world. Its longevity is the result of geological conditions, the use of modern drilling techniques, and the exceptionally eco-friendly, sustainable production methods employed. Despite measuring just two kilometres by one and a half kilometres, the Gaiselberg field has a unique geological feature – about ten oil-bearing strata formed by the Steinberg fault lie on top of one another at depths of between 1,050 and 2,400 metres.

The drilling of Gaiselberg I was a complex undertaking. It took three months to drill the 1,139 metre well, and the first 400 metres required a whole month. With modern equipment, a well this deep can be drilled in just a few hours. Initially, during what is known as the “eruptive phase”, the natural reservoir pressure brought 65 tonnes of oil to the surface per day, until a pump jack was installed a year later. Since it was drilled in 1938, Gaiselberg I has yielded over 126,000 tonnes of oil and 6.5 million cubic metres of gas. Over the years, the proportion of oil has steadily decreased. Today output is just under 100 tonnes per day. However, 97 tonnes of this is salt water, which is then treated and pumped back into the reservoirs to help maintain pressure levels.

The well’s pump jack has been working tirelessly for the last 75 years and is still going strong.



Concessions, 1938

Systematic oil exploration in the Vienna Basin

Rohoel-Gewinnungs A. G.
WÖCHENTLICHER BOHR-RAPPORT Nr. 22
 WEEKLY DRILLING REPORT No. 22

Bohrung Nr.: 01
 Feld: Salzböden
 System: Salzwasser
 Höhe ü. M.: 229,28 m

Von 22.VII. bis 29.VII. 1938

Datum	Tiefe in Metern	Formation	Bohrung	Bemerkungen
22.VII.	1139,0			Exploitation auf Normal-Verwendetes Material: 4 7/8" Liner und Linerhanger, Type 1 1/2" - 12,5 lbs/ft Bohrgestänge 2" Tubing
24.VII.				4 7/8" Liner mit Linerhanger, Lang 10,30 m wovon 19,00 m perforiert, an 2 7/8" Gestänge eingebaut und abgedrückt. 2" Tubing eingebaut bis Sohle, Liner und Spülung durch Wasser ersetzt, Tubing hochgezogen bis 1088,60 m.
26.VII.				I-mastree montiert und abgedrückt bis 100 atm. O.S. Vorbereitung zum Bohren.
27.VII.				Leer gewahrt bis 100 m, wonach Sande in Produktion. Produktion in 7 Stunden: 28.100 l, wovon 20% Spülung. Dase: 10, 8 und 7 mm.
				Produktion in 14 Stunden, von 22 ^h früh, Sande eingeschlossen. 29.700 l wovon 10% Spülung. Dase: 7 und 6 mm.
				Produktion in 12 Stunden: 22.700 l, keine Verunreinigung. Dase: 5, 6, 7, 8 mm.

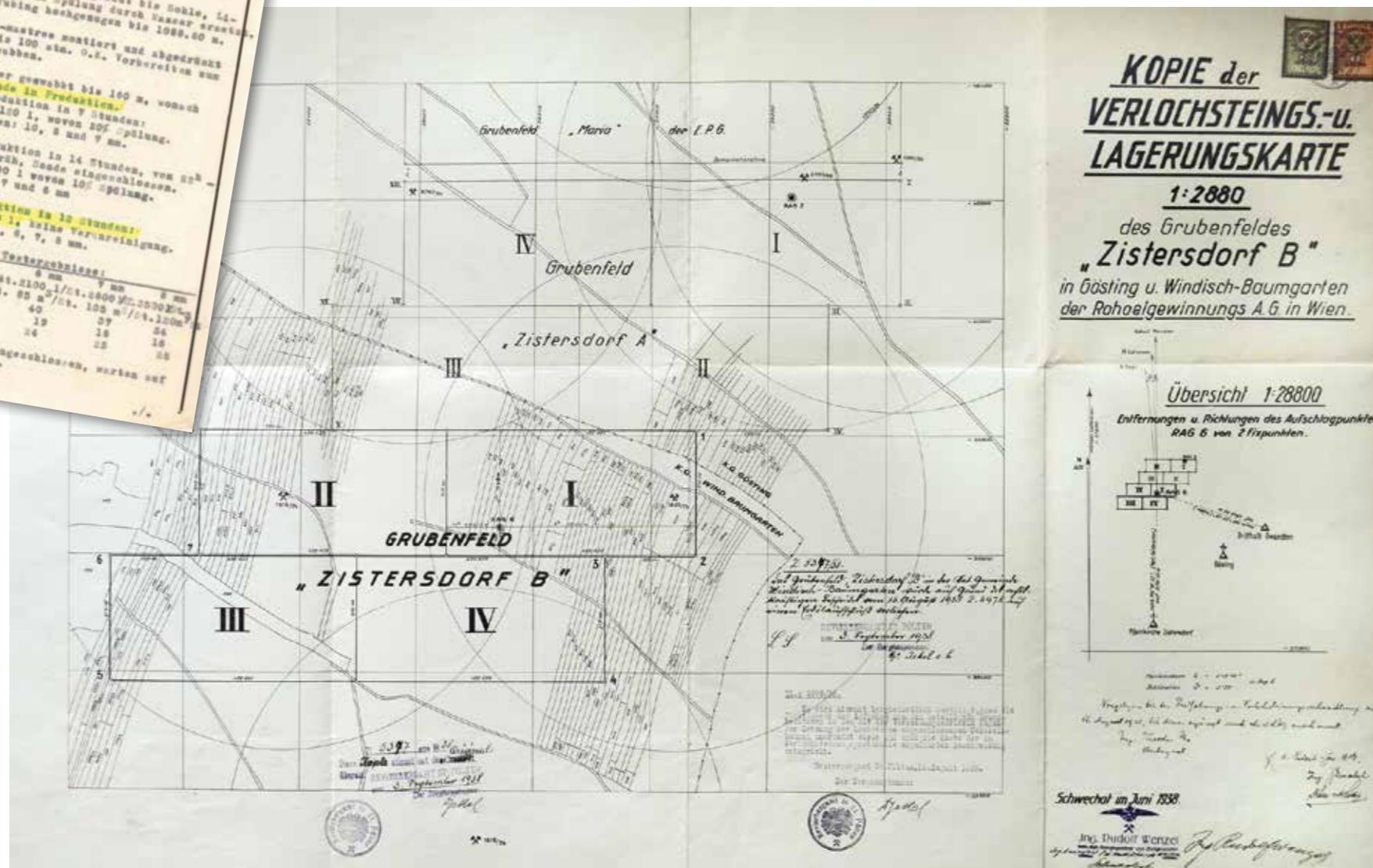
Testergebnisse:
 5 mm 1400 l/Std. 2100 m³/Std.
 6 mm 70 m³/Std. 85 m³/Std. 100 m³/Std. 1200 m³/Std.
 7 mm 19 40 37 24
 8 mm 24 19 18 16
 9 mm 34 25 25 20

Um 20^h eingeschlossen, warten auf Pipe-Lin.

Drilling report of 25 July 1938

RAG had great success with its initial foray into drilling in the central Vienna Basin. By 1938 the company had acquired around 10,000 exploration licences for the Vienna Basin, granting it the right

to search for oil in the majority of the area. Analysis by means of mapping and exploratory drilling across large sections of the central Vienna Basin between Zistersdorf and the River March led to the discovery and development of drill-ready structures in Eichhorn, Matzen-Ollersdorf and Aderklaa.

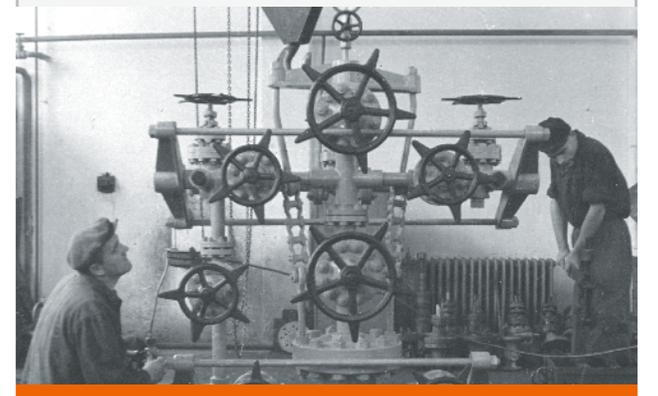


Pioneering achievements

From a technical perspective, oil production can be divided into three main activities: exploration, development and production. RAG pioneered the implementation of new technologies in all three of these areas from the outset – assisted by their international owners' wealth of know-how.

The drilling methods employed in the 1920s were principally manual. But there were limits to the depths that could be reached and progress was very slow. The key to RAG's success was the rapid adoption of mechanised techniques, and the company was the first to use the counter flush system in Austria. The drilling mud is pumped down outside the drill pipe and the cuttings carved out by the drill teeth are removed via the drill pipe.

RAG also led the way in many other areas. It was the first company to employ steel drilling rigs, of up to 35 metres in height. The wooden rig that had been used for the RAG 2 well soon became little more than an object of curiosity. Another innovation was the implementation of the whipstock technique at the RAG 3 well. Whipstocks were used for deviated drilling in order to reach otherwise inaccessible oil horizons. The development of the actual drilling tool, the drill bit, was also worthy of note. Initially RAG used fishtail and multi-wing bits before moving over to roller cone bits after the first few wells. Later, diamond core bits were developed for the drill rigs. All of these tools had to be specially made according to the type of rock.





1938–1945

German occupation and expropriation

When Austria was annexed by Nazi Germany in March 1938 and the country became part of the Third Reich, RAG was gradually expropriated without compensation. In 1940 all of RAG's assets were declared *Feindvermögen*, or enemy property.



RAG's exploration licences were transferred to four German oil companies. RAG was only allowed to keep its fields in the Zistersdorf area, Aderklaa and Hohenruppersdorf, where it drilled another 40 deep wells along the Steinberg fault before 1945. These reserves were substantial, but technically difficult to develop. By the end of the war in 1945, about 1.5 million tonnes of crude oil had been produced. However, RAG only retained a small proportion of the profits. A heavy dividend tax was imposed, and the modest profits that remained after the war were swallowed up in inflation and levies.

Maximum production

During the war Austria's oil fields took on great strategic significance and were exploited relentlessly. Annual production shot up from 15,200 tonnes in 1938 to 319,000 tonnes in 1942 – a 20-fold increase. This made Austria the most important oil producing country in the Third Reich. Exploratory drilling was halted and drilling rigs were used solely for production. Fifteen rigs were employed simultaneously during 1940 and 1941.

Storage tanks at Zistersdorf

The pipeline connecting the RAG and Gaiselberg fields with the loading facility at Zistersdorf train station, which had storage tanks of various sizes, was still in operation during the Second World War. Oil was transported to a new refinery built specifically for RAG oil in the Lobau area of Vienna, initially by railway tank wagons and then via a double pipeline. After the war these facilities were very important for the occupying allied forces, who used them to transport the majority of the crude oil produced.



1945 – Resumption of oil production at Zistersdorf



Following liberation by the allied forces and the end of the Second World War, Austria was split into four zones of occupation. This had a far-reaching impact on the economic development of individual regions and the fortunes of entire industries and businesses. And RAG was no exception. RAG's production areas in the east of the country were part of the Soviet-controlled zone. Production resumed at Zistersdorf, Aderklaa and Hohenruppersdorf in June 1945, but only under the direct supervision of the Soviet army. These circumstances made it hugely difficult for the company to continue its operations. Production facilities were guarded, and until 1955 the oil had to be delivered to Soviet Mineral Oil Administration (SMV), which later became oil and gas company OMV.

In addition to these external controls, the inadequacy of the available technical equipment was the main obstacle to RAG's development. During these months RAG employees worked exceptionally hard – often under appalling conditions – to rebuild the company and proved an incredible knack of improvisation. Two of the biggest problems were a lack of materials and faulty equipment. The wells that

had been capped at the end of the war had to be reopened and electrical cables relaid. At Gaiselberg there was only one soldering lamp for the entire field. The number of pump jacks was insufficient, and one after another the pump motors froze due to poor-quality gas oil and low temperatures. The use of open flames to thaw them out often led to fires.

Going west

After the war, the rights that had been seized by the Germans were not returned to RAG. The company was still limited to the fields at Zistersdorf, Aderklaa and Hohenruppersdorf, with a total area of 5,393,144 m². At the end of 1955 Österreichische Mineralölverwaltung (OMV) acquired the majority of RAG's former fields in Lower Austria, and as compensation RAG received permits for concessions in Upper Austria, Salzburg and Styria.

The process of mounting operations in western Austria began in the early 1950s. Sites near Ried im Innkreis (Upper Austria), Salzburg-Braunau (Salzburg/Upper Austria), Bad Hall (Upper Austria) and Feldbach (Styria) were fully mapped and surveyed with seismic reflection technology – a first in Austria. With the exception of Feldbach, which had never been surveyed before, these areas had only been investigated with shallow drilling during the war. The sites covered a total area of 5,500 km². The first well Bad Hall 1 turned out to be dry. It was Puchkirchen 1 in Upper Austria in 1955 that marked the beginning of fruitful drilling operations in Upper Austria and Salzburg, where the company has enjoyed great success right up to the present day. At the new fields in Upper Austria and Salzburg RAG profited from the know-how it had acquired in the course of production at the challenging Gaiselberg field.



Ongoing development

The company broke new ground with its mapping, seismic exploration and initial drilling in Upper Austria and Salzburg, but in the Zistersdorf area, RAG's focus was squarely on producing oil from known fields. Between 1938 and 1955, pressure from the occupying powers meant that maximising production was the primary goal, but after that, exploitation at all costs gave way to more resource-efficient operations – which are still the norm to this day. Annual output from the Zistersdorf fields at that time was as high as 319,000 tonnes (1942), but those levels would never be matched again. Indeed, production remained constant at around 110,000 tonnes between 1955 and the early 1970s. In 1963, output in Upper Austria surpassed that from the Lower Austrian permits for the first time. By the end of the 1980s production had fallen to around 60,000 tonnes. It has been decreasing steadily ever since, and is currently at about 17,000 tonnes per year. Despite the declining production in Lower Austria, the reservoirs found in Upper Austria were, compared to those in the

Vienna Basin, smaller, narrower and less permeable. They also did not extend as far, meaning that the reserves were correspondingly smaller.

Production was the focus of attention in the Zistersdorf area in the 50s and 60s. Following the drastic increase in prices brought about by the oil price shock of 1973, production at uneconomical fields and those that were hard to develop suddenly became more attractive. Technical improvements also helped, so in 1974 the exploitation successfully resumed with the drilling of the RAG 42 well. Since then, 45 wells in the RAG and Gaiselberg fields have resulted in oil discoveries.

“The storage facilities for compulsory emergency reserves ensure that stocks of this vital raw material are available in the event of supply disruptions or shortages.”

*Michael Längle
RAG Chief Financial Officer*

Zistersdorf tank farm

RAG's primary activities in Zistersdorf are exploration, development and above all the production of hydrocarbons. Tanks were built at the site in the Second World War, and these were the predecessors of the Zistersdorf tank farm, where RAG holds stocks of compulsory emergency oil reserves.

Phase one of the tank farm opened in 1979 and phase two was completed in 1982. Since then, some 65,000 tonnes of crude oil have been stored there in six tanks in fulfilment of the stockholding obligations delegated by oil importers.





Technology pioneer

RAG's innovative capabilities and leading position in instrument engineering, drilling technology and environmental protection really came to the fore during the company's "relaunch" in 1955. The make-shift solutions employed just after the Second World War became a thing of the past; investment was an option once again and production was gradually automated. Regional economic growth and the use of Austrian expertise were among the company's top priorities. RAG's success came courtesy of state-of-the-art equipment and cutting-edge technologies, coupled with the favourable geographical conditions and the high-level qualifications of the company's employees. Compared with other companies owned by the parent at that time, Mobil Oil, RAG's non-productive times following damage were the lowest of any subsidiary worldwide for many years.

Outstanding environmental protection

In terms of protecting the environment and local residents, RAG was already a pioneer in an age when this issue was not the subject of widespread public debate. The company also employed innovations and technologies developed in-house, including early-stage investments in noise protection. Natural gas from RAG's production operations was increasingly used in drilling and other activities instead of conventional fuels such as diesel oil and spindle oil. Besides the positive environmental effects, this resulted in significant cost savings.

The standards RAG applies in its operations have always been among the highest worldwide. Extremely low non-productive times, short relocation times from one drilling site to the next, the use of groundbreaking technologies, and the highest levels of safety and environmental protection are hallmarks of the company's activities.



"RAG's long-standing facilities are an excellent example of environmentally friendly, resource-efficient and sustainable oil production – and we can learn a lot from them. What's more, production is taking place in the heart of one of Austria's most picturesque winegrowing regions."

HE Abdalla Salem El-Badri, OPEC Secretary General

Zistersdorf – a model for the major oil-producing countries

Oil production and operations in Zistersdorf are an outstanding example of sustainable management at work. For more than three quarters of a century our pump jacks have been unobtrusively extracting the precious oil used to drive Austrian industries – such as plastics – in the heart of an area brimming with vineyards and crop fields.

The resource-efficient production methods developed by RAG, which have paved the way for extraction from a single well for 75 years, made a strong impression on OPEC Secretary General HE Abdalla Salem El-Badri during his visit to Zistersdorf in 2011.

A good neighbour – demonstrating our commitment to the region



Employees of RAG's Zistersdorf plant, 2013 (photo: Soos)

Zistersdorf is the birthplace of oil production in Austria. Situated in the northern part of the Weinviertel region, the town is the largest local authority in the Gänserndorf district. Zistersdorf and RAG, Austria's oldest oil exploration and production company, have been good neighbours for more than three quarters of a century. Over the years, RAG's discoveries of oil have played a significant part in the development of the town and the eastern Weinviertel. In this respect, the company has always followed one basic principle: we are at home in the places where we operate. This means that active and open dialogue, solid partnerships and responsible treatment of local residents in the areas where we operate have always been articles of faith for RAG. Constant communication with local authorities, public agencies and key local institutions are essential for building amicable relationships. RAG's close ties with the region are reflected in a wide range of partnerships, including those with fire brigades, associa-

tions and social organisations. Since its establishment RAG has created hundreds of jobs in the Zistersdorf area and invested millions of euros, making it a major employer and a key contributor to economic growth in the region.



Handover of a donation to the "Team Tafel Österreich", 2012



School donation, 2012



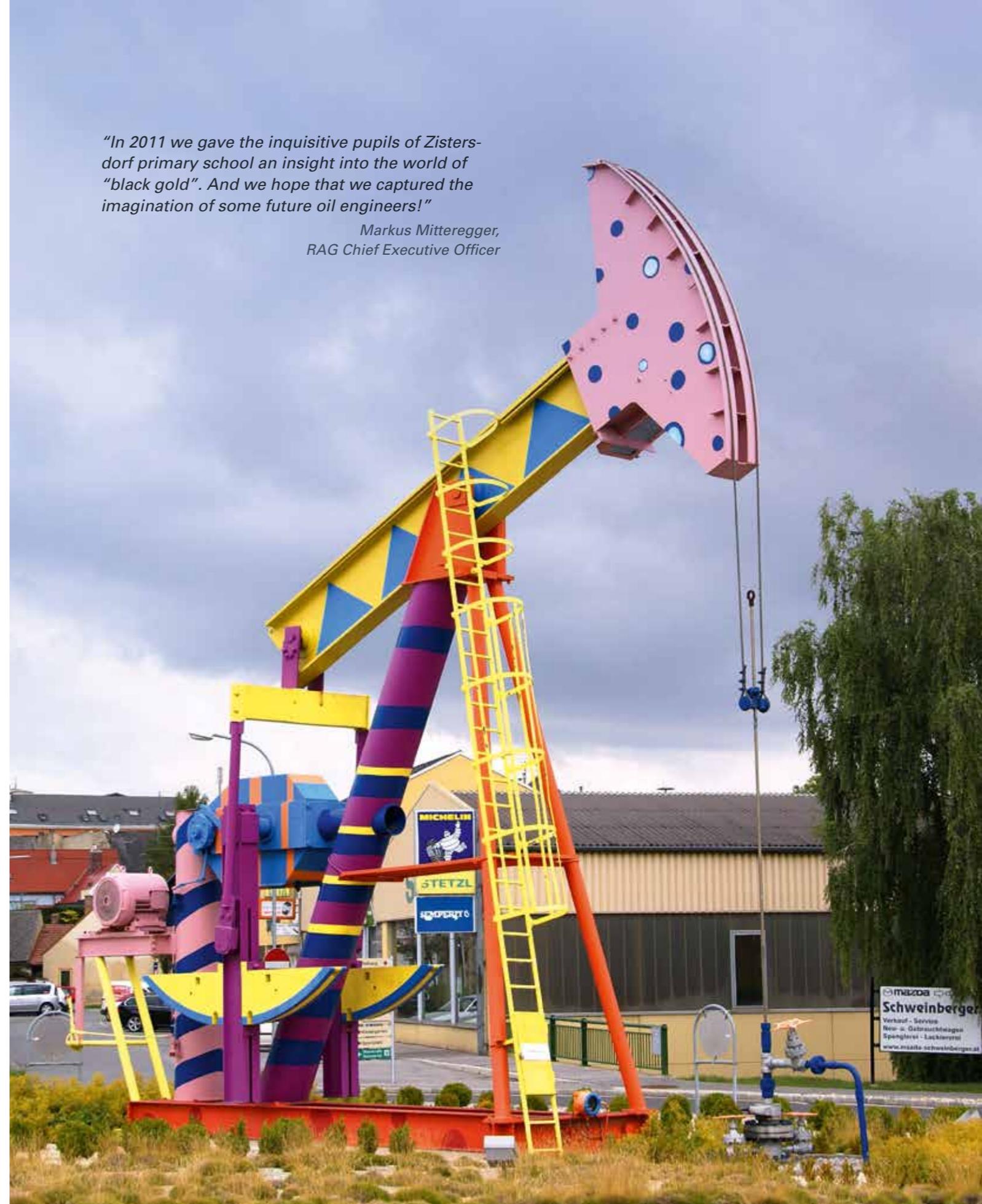
RAG donates a bell for Maria Moos church, 1950

"RAG has been an important source of jobs in the region and a reliable partner for decades now. And the company has consistently demonstrated its commitment to Zistersdorf."

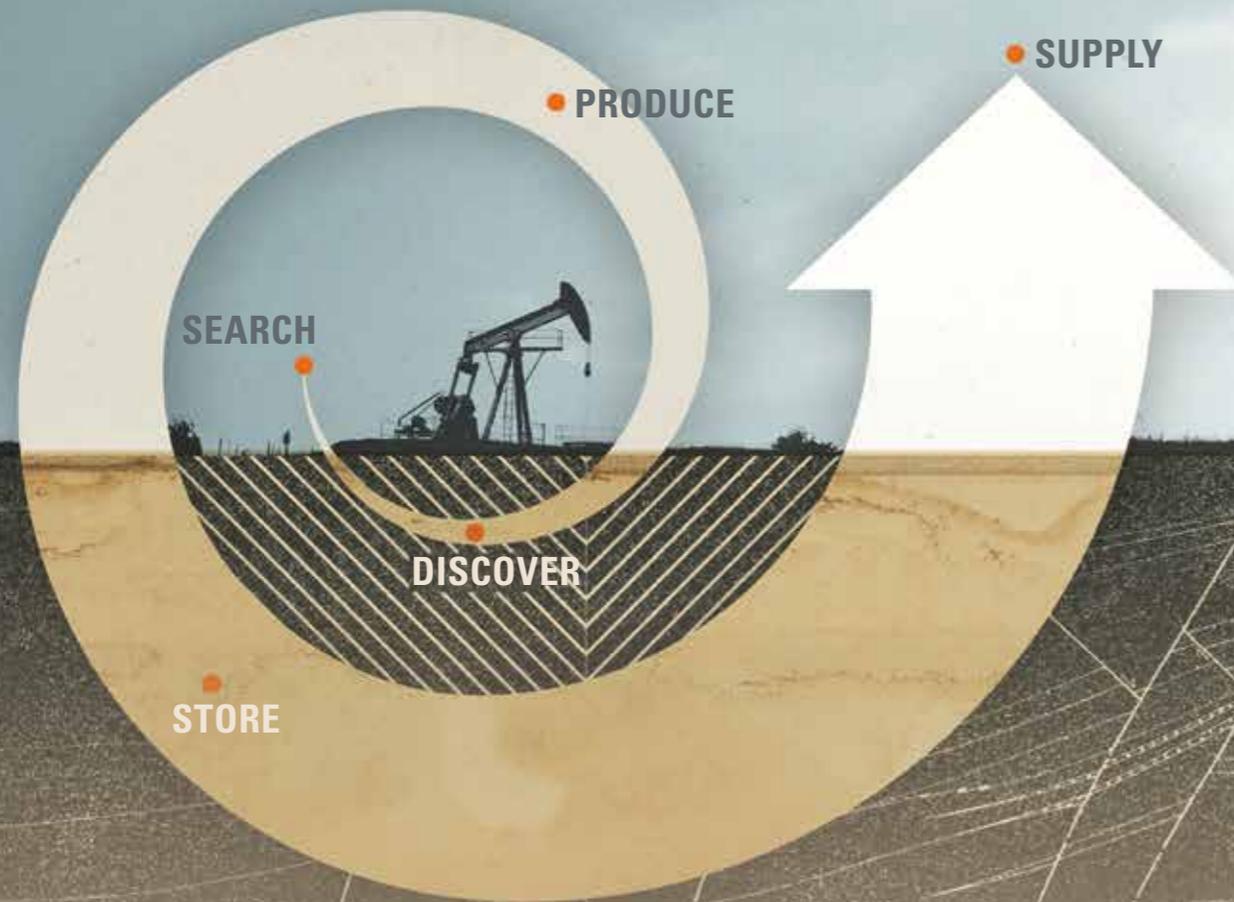
*Wolfgang Peischl,
Mayor of Zistersdorf*

"In 2011 we gave the inquisitive pupils of Zistersdorf primary school an insight into the world of "black gold". And we hope that we captured the imagination of some future oil engineers!"

*Markus Mitteregger,
RAG Chief Executive Officer*



Business Areas



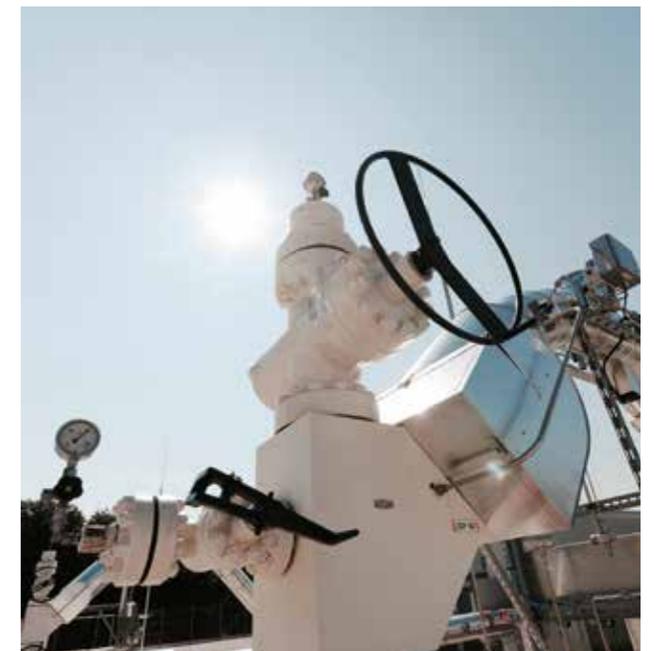
Search: when exploring for natural gas and oil, we use advanced 3D seismic technology to investigate subsurface structures. **Discover:** we confirm the presence of hydrocarbon reserves by drilling appraisal wells to depths of up to 4,500 metres. **Produce:** we deploy sophisticated technology to produce valuable oil and eco-friendly natural gas. **Store:** our gas storage facilities, with a combined capacity of over five billion cubic metres, are vital to Europe's security of supply. **Supply:** our customers can count on flexible and secure supplies of oil and gas, produced from regional reserves.



Haidach gas storage facility

RAG today

RAG's recent history has been shaped by external economic factors such as changes in the oil price and the rise of natural gas to become the world's second most important energy source. But the company's growth, capacity to innovate and ability to identify and capitalise on trends and new business opportunities have also played a part. The establishment of the gas storage business in Upper Austria and Salzburg was an important step in the company's development. Today RAG is one of Europe's five leading storage operators, making a significant contribution to supply security in Austria and across the continent. In the past decade, our attention has focused in particular on cross-border expansion, project-based collaboration with international partners, entry into new business areas such as gas trading, as well as a commitment to using sustainable, leading-edge technologies – all of which underline our strengths and our ability to adapt to the future.





“Oil will remain an irreplaceable resource, and its geopolitical importance will be even greater in future. We have been producing domestic crude oil around Zistersdorf for over 75 years now. In recent years new technologies have enabled us to boost our output of this valuable raw material for Austrian industries. We use the precious energy reserves on our doorstep responsibly and in a way that conserves natural resources.”

*Markus Mitteregger,
RAG Chief Executive Officer*

Oil production

The Vienna Basin, and the area around Zistersdorf in particular, is one of the most widely researched regions of Austria in terms of geology and drilling. However, the technical complexity and expense of producing oil and gas at “mature” fields is huge. The discovered fields need to be exhausted sustainably, right down to the very last drop of oil, using environmentally friendly methods. OPEC Secretary General HE El-Badri singled out RAG’s highly efficient technology for special praise, emphasising that it could serve as a model for current and future production by OPEC members.

Successful drilling and production

Crude oil remains unsubstitutable for many applications. RAG has been producing oil in Austria for over 75 years, and thanks to the use of 3D seismic we continue to find and develop new fields. The oil fields in RAG’s permits are small in international terms, and sophisticated technology is required to tap the reserves economically. High-tech materials, innovative and cutting-edge drilling techniques and a wealth of experience ensure that the country will remain an oil producer for decades to come.

The requirements that drilling and production operations must meet are becoming more exacting all the time. Today, thanks to new methods, it is possible to drill far deeper, further and faster, and the bit can be steered at any inclination, and in any direction. As a result, RAG has used these methods to drill horizontal wells as long as 3,500 metres in the past few years.

Outstanding environmental performance, the use of natural gas-powered drive units instead of diesel engines, and a host of other breakthroughs, as well as

Safety Certificate Contractor (SCC) certification show that RAG’s wells meet the highest standards. A highly qualified workforce ensures that we maintain our competitive edge in terms of our core competence: drilling.

Secure future of oil

The growth in oil reserves is outpacing that of oil demand – indeed global reserves have never been higher. Modern technology and an improved understanding of reservoir characteristics now enable us to tap reserves that were previously considered commercially unrecoverable. In 1960 it was assumed that global oil reserves amounted to 30 billion tonnes and would run out in 38 years, but today the planet’s 235 billion tonnes of proven reserves are expected to last for 60 years, despite the sharp rise in consumption that has taken place in the meantime. The sensible, safe, efficient and low-impact use of this valuable raw material is essential, bearing in mind the need to maximise sustainability.





Gaiselberg: a brief history

- The first documented reference to the site dates back to 1160 under the name *Poingart*. In 1311 it was referred to as *Gaiselperch* and from the 16th century onwards as *Gaiselberg*. The moated village was built around a triangular green and is now part of the cadastral community of Zistersdorf. It has around 230 inhabitants.
- There are indications of a settlement long before the site was populated by Bavarian and Franconian peoples in the Middle Ages – starting in 1928, excavations and searches of nearby fields led to the systematic collection of prehistoric artefacts, which were the subject of scientific examination after World War Two.
- The finds provide evidence of Lengyel culture settlements in the Neolithic Age (approx. 8000-1800 BC) and more recently those of the Urnfield culture in the Bronze Age (1800-800 BC). There are some signs dating back to the Hallstatt A and B phases (800-400 BC). The majority of the artefacts are now housed in the Landesmuseum Niederösterreich, and a few pieces are currently on display in the Stadtmuseum Zistersdorf.
- In the Middle Ages, Gaiselberg – the origins of the name are unclear, but it may refer to the Gaiselberger family from Passau – was the seat of various different families, and its owners over the centuries included the Kuenringer, Ronauer, Ruckersdorfer, Lamberger and Althans families, as well as the Theresian Academy of Knights.

Copy: Prof. Rudolf Streihammer

Domestic crude oil for regional supplies

When a section of a well has been drilled, casing and tubing are inserted. Ideally, during the first stage in the life cycle of a field, the oil rises to the surface of its own accord, due to the gas dissolved in it and the natural reservoir pressure. After the so-called eruptive phase a range of pumping technologies can be used, depending on the properties of the crude oil, its gas content and the pressure conditions. Where the gas content is low and the reservoir pressure is falling, the oil is brought to the surface by deep well pumps. Only the pumps' drive mechanisms – the characteristic pump jacks – are visible on the surface. RAG's long record of success has also brought about an innovation in this regard: the average service life of a pump (pipes and tubing) is over three years. Electrical centrifugal pumps (ESP) can be used to achieve higher flow rates.

In its produced state, crude oil is not suitable for transportation and refining, and it must first undergo a number of processes. After the crude oil has been produced, the formation water and sand in it must be removed by treatment systems (separators and tanks). The co-produced gas goes straight into the grid as soon as it has been dried, but the crude oil is collected in tanks before being transported to a refinery by rail or pipeline. The separated water is pumped back into the reservoirs it has come from, where it helps to maintain pressure levels and in turn increase production.

Clean transportation

RAG produces about 120,000 tonnes of crude oil a year from its Upper and Lower Austrian fields. A pipeline conveys the Lower Austrian output straight to Schwechat Refinery. The crude oil produced in Upper

“Oil production in the area around Zistersdorf reduces our dependence on imports, supports the domestic chemicals industry, drives Austrian economic growth and is a key source of jobs in the region.”

Kurt Sonnleitner,
RAG Chief Technical Officer

Austria is collected via gathering lines, and centrally loaded into tank wagons in Kremsmünster and Ried for rail transportation to refineries. It is marketed in Austria, supporting security of supply in the country. The crude oil produced is easy to process as it contains few impurities. Depending on the fields they come from, our grades are either paraffin or asphaltic base crudes, with similar quality specifications to Brent blend.

Oil – a great all-rounder

Oil is the world's number one energy raw material, accounting for 33 % of primary energy consumption – a far greater share than coal and natural gas. It is used as a fuel and for the generation of heat and electricity, and is exceptionally important as a clean base material for plastics, detergents, paints and varnishes, packaging, fertilisers and cosmetics.

Besides making a vital contribution to security of supply – some 11 % of Austria's oil demand is produced domestically – the country's oil reserves serve to bolster the national economy. Large investments in oil and gas exploration, production and storage also have a major economic impact. In the past few years RAG has invested more than EUR 1 billion into the Austrian economy by building production systems and storage facilities.



Zistersdorf: facts and figures

Production managers at Zistersdorf since 1953

Name	Period of service	Name	Period of service
Helmut Raab	1 Apr. 1953 – 31 Mar. 1983	Johannes Süß	1 Feb. 1999 – 31 Dec. 2003
Josef Hieblinger	1 Apr. 1983 – 30 Apr. 1985	Franz Wohlfart	1 Jan. 2004 – 31 Oct. 2006
Reinhold Sieber	1 May 1985 – 30 Apr. 1994	Herwig Baierl	1 Nov. 2006 – 31 Dec. 2009
Herbert Hofstätter	1 May 1994 – 30 Jun. 1997	Manfred Leitner	1 Jan. 2010 – 31 Mar. 2012
Markus Mitteregger	1 Jul. 1997 – 31 Jan. 1999	Gerald Sam	since 1 Apr. 2012

Wells drilled at Zistersdorf, 1935–2011

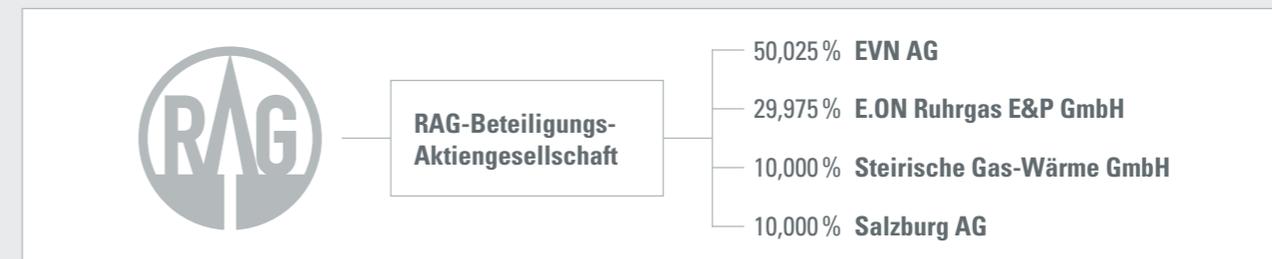
Year	Number	Year	Number	Year	Number
1935	0	1961	0	1987	0
1936	2	1962	0	1988	0
1937	5	1963	0	1989	0
1938	9	1964	0	1990	0
1939	10	1965	0	1991	1
1940	31	1966	1	1992	1
1941	17	1967	0	1993	1
1942	20	1968	1	1994	0
1943	11	1969	0	1995	0
1944	11	1970	0	1996	0
1945	3	1971	0	1997	2
1946	0	1972	0	1998	2
1947	1	1973	0	1999	0
1948	2	1974	2	2000	0
1949	2	1975	2	2001	0
1950	1	1976	3	2002	1
1951	0	1977	0	2003	0
1952	0	1978	0	2004	2
1953	1	1979	4	2005	5
1954	2	1980	1	2006	0
1955	3	1981	0	2007	0
1956	1	1982	3	2008	0
1957	0	1983	1	2009	0
1958	0	1984	3	2010	2
1959	0	1985	3	2011	2
1960	0	1986	5		

Total: 180 wells

Oil production at Zistersdorf, 1937–2012 (tonnes, incl. condensates)

Year	Production	Year	Production	Year	Production	Year	Production
1937	8.060	1956	106.755	1975	60.912	1994	41.903
1938	15.196	1957	110.230	1976	61.697	1995	41.939
1939	35.565	1958	111.005	1977	63.023	1996	41.478
1940	168.267	1959	111.325	1978	61.884	1997	40.279
1941	265.282	1960	109.800	1979	64.351	1998	44.714
1942	319.610	1961	108.125	1980	59.705	1999	41.512
1943	318.366	1962	107.696	1981	57.034	2000	38.101
1944	281.013	1963	99.300	1982	55.320	2001	31.376
1945	123.715	1964	102.375	1983	55.570	2002	33.265
1946	184.400	1965	105.264	1984	55.576	2003	28.899
1947	184.481	1966	107.571	1985	50.139	2004	24.906
1948	199.519	1967	114.101	1986	57.438	2005	21.955
1949	194.649	1968	111.643	1987	54.916	2006	22.296
1950	190.997	1969	98.045	1988	52.477	2007	22.302
1951	178.479	1970	89.339	1989	48.042	2008	24.373
1952	149.092	1971	88.958	1990	45.949	2009	22.850
1953	127.200	1972	74.773	1991	44.443	2010	18.649
1954	121.598	1973	66.421	1992	43.806	2011	19.500
1955	105.175	1974	62.201	1993	41.104	2012	17.294

Legal form and ownership



From Rohöl-Gewinnungs AG to Rohöl-Aufsuchungs Aktiengesellschaft

RAG's legal form and its ownership structure have changed several times over the years. The company was founded in 1935 as Rohöl-Gewinnungs Aktiengesellschaft. In 1973, the company became a private limited company following enactment of the Strukturverbesserungsgesetz (Structural Improvement Act) and was renamed Rohöl-Aufsuchungs Gesellschaft m.b.H. The new company retained the abbreviation RAG and was legally identical to its predecessor Rohöl-Gewinnungs Aktiengesellschaft. Six years later RAG merged with Österreichische Mineralölwerke GesmbH (ÖMW) for commercial and financial reasons. ÖMW's operations focused on fuel and oil production at the Lobau refinery. The merger enabled RAG to capitalise on ÖMW's financial resources, while the two companies' organisational and administrative structures were integrated and streamlined.

From private to public

In 1992 Mobil and Shell both sold 25 % of their shares in RAG to Energie Versorgung Niederösterreich AG (EVN AG), and RAG's legal form reverted to a public limited company, again for financial reasons. Rohöl-Aufsuchungs Aktiengesellschaft was formed. For the first time in its history, the company was majority-owned by an Austrian energy supplier. EVN sold shares to Bayernwerke AG, Steirische Ferngas AG and Salzburger Aktiengesellschaft für Energiewirtschaft (SAFE) one year later. The new shareholders established RAG-Beteiligungs-Aktiengesellschaft (RBG).

Sale of remaining shares by Mobil and Shell

In 1998 Mobil sold its 25 % stake following its merger with Exxon. The shares were acquired by RAG Holding AG, which was identical to RBG in terms of its shareholders and their interests. The logical next step was taken in 2000, when RAG Holding AG was merged into RBG. Shell sold its holding to the remaining shareholders in 2007.

Following this a series of mergers involving RAG's owners gave rise to a number of legal successors. Bayernwerke AG was merged into E.ON Energie AG, SAFE became Salzburg AG für Energiewirtschaft, Verkehr und Telekommunikation (Salzburg AG), and the shares held by Steirische Ferngas AG were transferred to Steirische Gas-Wärme GmbH.

The current ownership structure is as follows:

Rohöl-Aufsuchungs Aktiengesellschaft (RAG) is fully owned by RAG-Beteiligungs-Aktiengesellschaft (RBG). RBG is owned by EVN AG (50.025 %), E.ON Ruhrgas E&P GmbH (29.975 %), Steirische Gas-Wärme GmbH (10 %) and Salzburg AG (10 %).



History, 1935–2013

Rohöl-Aufsuchungs Aktiengesellschaft (RAG) was formed in 1935 as Rohöl-Gewinnungs AG by Socony Vacuum Oil Company, Inc. (now Exxon Mobil Corporation) and N.V. de Bataafsche Petroleum Maatschappij (now Royal Dutch Shell plc).

The new company's aim was to develop Austria's assumed oil reserves. RAG is the country's oldest oil exploration and production company.

1935

Rohöl-Aufsuchungs Aktiengesellschaft (RAG) is formed on 15 October as Rohöl-Gewinnungs AG by Socony Vacuum Oil Company, Inc. (now Exxon Mobil Corporation) and N.V. de Bataafsche Petroleum Maatschappij (now Royal Dutch Shell plc).

1936

RAG drills its first deep well, RAG 1, but it is dry

1937

RAG 2 well in Zisterndorf makes first oil discovery; production starts.

1938

13 March: Austria is annexed by Germany.

Development of the Gaiselberg oil field begins.

31 August: The German Bitumengesetz (Bitumen Act) comes into force, and RAG loses its exploration licence for the Vienna Basin as a result.

1939

1 September: Outbreak of the Second World War

1940

22 June: An "alien property custodian" is appointed to administer Royal Dutch Shell's holding Under the Bitumen Act all existing exploration licences for bitumen become void as of 31 July. RAG explores structures around Wolkersdorf, Hohenruppersdorf, Aderklaa and Maustrenk (1940-41).

1941

Germany declares war on America, resulting in the 1942 appointment of an alien property custodian for Socony Vacuum Oil Company's stake in RAG.

1942

1942-43: The German Reich makes exploration and production agreements for Austria with German oil companies, in line with the 1938 Bitumen Act. Some relate to areas for which RAG previously held exploration permits.

From 1942 onwards, RAG attempts to secure oil field services contracts from F. Koller & Sohn for the Bad Hall and Scheibbs concessions. Oil production at the Zistersdorf fields peaks at 319,610 tonnes.

1943

RAG drills its first well into the flysch (RAG 36).

RAG begins operations in the Maribor, Ljutomer and Ptuj areas in cooperation with R. K. van Sickle and Rumpel AG.

1944

RAG discontinues its exploration activities in Maribor, Ljutomer and Ptuj.

1945

Germany surrenders and the Second World War ends on 8 May. Output in RAG's Zistersdorf permits has passed the 1.5 million tonne mark by the end of the war.

2 May and 4 September: RAG applies for the restitution of its previous exploration permits.

RAG is obliged to deliver its crude oil output to the newly established Soviet Mineral Oil Administration at a price fixed by the latter.

1946

At the Potsdam Conference, the Allied leaders agree that ownership of German property in each occupation zone is to pass to the occupying power concerned. The Red Army Supreme Command issues General Order 17, placing German-owned assets (including the Lobau refinery and concession rights) under Soviet control. All oil companies, including RAG, are nationalised by an act of parliament passed on 26 July.

13 September: The Austrian government publishes a declaration in the Wiener Zeitung, stating that all assets affected by the Verstaatlichungsgesetz (Nationalisation Act) and owned by members of the United Nations will only be nationalised once the question of reparations has been settled.

1947

The Lagerstättengesetz (Mineral Deposits Act), Federal Law Gazette 246, comes into effect. Geological mapping of the Salzburg, Braunau and Ried areas begins.

1948

RAG is awarded exploration contracts in Salzburg, Braunau and Ried under section 2 Mineral Deposits Act.

1949

The Soviet Mineral Oil Administration identifies the largest oil field in Central Europe, Matzen-Auersthal. RAG had drilled close to the discovery well before the war.

1951

RAG is awarded further exploration contracts in Bad Hall and Feldbach under section 2 Mineral Deposits Act.

Modern seismic methods are used for the first time in Upper Austria; work on a cross-section of the Molasse zone is completed.

Geological mapping of the Styrian concession begins.

31 July: In a verbal note the Austrian government pledges to denationalise oil companies owned by members of the United Nations under a most favoured nation clause.

1953

RAG reaches a broad agreement with the Austrian government regarding future exploration and production agreements.

1955

29 April: RAG and the Austrian government conclude four exploration and production agreements.

10 May: Austria and the Allies sign the Vienna Memorandum.

15 May: The Austrian State Treaty is signed.

22 September: The Puchkirchen 1 well is spudded.

1956

27 May: Puchkirchen 1 is brought onstream, marking the start of the first development project in Upper Austria.

1958

RAG signs a supply agreement with Niogas for deliveries of gas from the Zistersdorf fields.

1959

The Ried im Innkreis oil field is discovered.

1960

A final settlement is reached on the issues addressed by the Vienna Memorandum. RAG and the Austrian government conclude exploration and production agreements for Pettenbach and Wels. The Kohleck Oil field is discovered.

1962

RAG strikes the Schwanenstadt oil field.

1963

Production at RAG's Upper Austrian oil fields overtakes output in Lower Austria for the first time. RAG drills its first non-associated gas well, Schwanenstadt 3.

Commercial natural gas production begins.

RAG finds the Voitsdorf oil field, the largest in the Molasse basin, with 3.4 million tonnes of recoverable reserves in place.

1964

RAG and the Austrian government sign a production agreement for the Burgau area in eastern Styria, bringing the total area of the company's exploration properties to some 6,600 km².

1965

Exploration of the Hall formation for gas begins (Lindach 2 gas discovery).

1966

RAG makes its first gas shipment in Upper Austria, from the Voitsdorf field to Kirchdorf an der Krems.

1968

RAG's annual oil production hits an all-time high of 419,118 tonnes.

RAG disbands its in-house seismology team in response to technological developments and soaring costs. Prakla-Seismos GmbH is commissioned to carry out seismic surveys.

1969

The Puchkirchen gas field is discovered.

1971

RAG identifies the Sattledt and Atzbach oil fields.

1973

9 October: RAG changes its legal form and the company name is amended by shareholder resolution from Rohöl-Gewinnungs AG to Rohöl-Aufsuchungs Ges.m.b.H.

1975

1 October: The amended Berggesetz (Mining Act) comes into effect.

RAG strikes the Trattnach oil field and the Friedburg gas field.

1976

RAG finds the Pfaffstätt gas field.

1977

RAG posts record gas sales. Own gas production hits 880 million cubic metres.

1978

Gas production rises to 882 million cubic metres.

The first stage of the Kremsmünster Krift tank farm project is completed. This is required to comply with the Erdöl-Bevorzugungs- und -Meldegesetz (Oil Stockholding and Reporting Act).

1979

RAG concludes a master agreement with Oberösterreichische Ferngas GmbH.

The first stage of the Zistersdorf tank farm project is completed.

The Kemating oil field is discovered.

18 September: RAG merges with Österreichische Mineralölwerke GesmbH (ÖMW).

1980

The second phase of the Kremsmünster Krift tank farm project is completed.





1981

Rights arising from the nine exploration and production agreements are adapted to the new legal position (Mining Act 1975). RAG concludes new exploration, production and storage agreements with the government (for Upper Austria, Salzburg and Styria).

The first North Sea gas imports start arriving.

1982

The Puchkirchen gas storage facility, with a capacity of around 40 million cubic metres of working gas, is built. The Oberhofen well near the Irrsee lake is drilled to a depth of 4,597 metres – RAG's deepest well to date. Although the well is dry it yields important geological insights.

1 January: Crude oil production royalties rise from 15 percent to 20 percent and become statutorily regulated.

16 September: The second phase of the Zistersdorf tank farm project is completed. The Ried railway loading terminal enters service.

1983

RAG begins supplying part of Kremsmünster with district heating.

RAG encounters heavy oil for the first time in Upper Austria, in its Eggerding well.

1984

A pilot CO2 flooding project begins at the Ried im Innkreis oil field.

The basis for calculating natural gas production royalties is amended to 15 percent of the average annual import price.

3D seismic imaging is used for the first time at the Voitsdorf field.

1987

RAG's Zistersdorf field celebrates 50 years of production.

1988

Gas shipments to Salzburg (SAFE) and Styria (Steirische Ferngas Ges.m.b.H.) begin. North Sea gas imports end.

1989

The Berndorf field marks the first commercial gas discovery in Salzburg.

Capacity at the Puchkirchen gas storage facility is expanded to 90 million cubic metres.

1991

Oil production in Austria reaches 100 million tonnes, of which RAG contributes 13 million tonnes. The Berndorf 1 well is brought onstream.

1992

Rohöl-Aufsuchungs Ges.m.b.H. is converted into an Aktiengesellschaft (public limited company). EVN Energie Versorgung Niederösterreich acquires 50 percent of the shares, with Mobil Oil Austria and Shell Austria AG each taking 25 percent stakes.

RAG signs a storage contract with Austria Ferngas Ges.m.b.H. for 450 million cubic metres of working gas.

3D seismic imaging becomes standard, with 2D exploration used only in exceptional cases.

The decision is taken to expand the Puchkirchen storage facility.

1993

EVN transfers its stake to the newly formed RAG-Beteiligungs- Aktiengesellschaft (RBG), in which Bayernwerke AG acquires a 40 percent holding, and SAFE and Steirische Ferngas Ges.m.b.H. each take 10 percent.

Horizontal drilling begins at the Puchkirchen storage facility.

1995

The expanded Puchkirchen storage facility comes online with a capacity of 500 million cubic metres of working gas.

1996

RAG returns its Styrian concession after drilling ten dry wells. Three of them still supply thermal and curative water to the Loipersdorf, Waltersdorf and Blumau spas.

1997

The largest ever gas discovery in the Austrian section of the Molasse basin – around 4 billion cubic metres – is made at Haidach.

RAG obtains an exploration permit from the Bavarian government for the 2,300 square kilometre Salzach-Inn concession – its first outside Austria.

1998

Mobil Oil Austria sells its 25 percent stake in RAG to RBG.

1999

1 January: The new Mineralrohstoffgesetz (Mineral Resources Act) comes into force, replacing the Mining Act 1975.

RAG takes over the 835-square-kilometre Rosenheim-Traunstein concession in Bavaria from RWE-DEA.

RAG carries out deep drilling for geothermal projects in Fürstenfeld, Styria, and Simbach-Braunau on the border between Bavaria and Upper Austria.

At the end of the year, RAG spuds its first deep well in Bavaria, Tittmoning R1. The well is dry.

2000

RAG discovers the Nussdorf West gas field.

10 August: The Gaswirtschaftsgesetz (Natural Gas Act) comes into force.

2001

RAG makes its first sales of gas to Germany and Italy.

2002

1 October: The Natural Gas (Amendment) Act comes into effect, paving the way for full liberalisation of the gas market.

Capacity at the Puchkirchen storage facility is expanded to 700 million cubic metres.

2003

RAG drills two geothermal wells for Munich municipal utility Stadtwerke München. RAG and Wintershall set up a joint venture to explore the 902-square-kilometre Chiemgau concession in Bavaria, with RAG acting as the operator.

2004

RAG sets a new company record of 805 consecutive accident-free days. The Zagling gas field is discovered.

2005

RAG extends its Upper Austrian exploration area to include parts of neighbouring Lower Austria. The new RAG Upper Austria/Lower Austria permit covers 3,991 square kilometres.

An agreement is signed for construction of the Haidach storage facility.

Work begins at the Haidach storage facility – the largest project in RAG's history. The facility is a joint venture with Gazprom Export and Wingas.

2006

RAG commissions Europe's largest ever seismic survey, with an area of more than 600 square kilometres.

Gas sales and trading reach a record 1.2 billion cubic metres.

Discovery of the Hiersdorf oil field.

2007

24 May: Inauguration of the Haidach storage facility.

Capacity at the Puchkirchen storage facility is expanded to 850 million cubic metres.

Shell disposes of its stake, which is acquired by the other owners.

2008

Work starts on the final expansion phase at Puchkirchen, bringing storage capacity to 1.1 billion cubic metres and withdrawal capacity to 520,000 cubic metres/hour.

The contracts are signed for construction of the 7Fields storage facility – RAG's largest project to date.

Phase one of the 7Fields construction project begins.

The E200 drilling rig is developed, purchased and commissioned.

The Bad Hall oil field is developed and the Aigelsbrunn gas field is discovered.

RAG moves into Ukraine, carrying out E&P activities on the Crimean peninsula.

RAG begins E&P operations in Hungary, taking stakes in two wells.

RAG and Bayerngas form a joint venture to explore the Salzach-Inn concession in Bavaria.

2009

RAG acquires a Hungarian company and establishes RAG Hungary, a wholly owned subsidiary.

RAG takes a 26 percent stake in a shale gas project in Poland.

RAG carries out a 3D seismic survey of the Attergau West area.

Work starts on the Aigelsbrunn storage facility.

The E202 drilling rig is developed, purchased and commissioned.

RAG Austria is involved in setting up the new Austrian gas exchange.

RAG completes its longest ever horizontal well, with a total length of around 3,500 metres.

The Sierning oil field is discovered.

2010

The final phase of the Puchkirchen storage facility is commissioned, bringing capacity to 1.1 billion cubic metres.

Work starts on a district heating station and network for Strasswalchen district council.

RAG carries out a 3D seismic survey of the Attergau East area.

2011

RAG commissions the Strasswalchen district heating station and network.

The Haidach II, 7Fields I and Aigelsbrunn gas storage facilities are completed. The total capacity of

gas storage facilities operated by RAG reaches 5 billion cubic metres.

19 May: The Haidach II storage facility is inaugurated.

13 October: The 7Fields I storage facility is inaugurated.

October: RAG and MOL each take half shares of the Inke licence in western Hungary.

December: RAG Hungary and NIS sign an agreement to carry out joint oil and gas exploration activities in Hungary.

Wintershall withdraws from the Chiemgau concession and is replaced by Bayerngas.

2012

The first non-associated gas production in Bavaria since 1996, in cooperation with Bayerngas, begins in Assing.

February: Withdrawals from storage reach record levels due to a severe cold spell.

RAG brings a deep geothermal well in Neukirchen an der Vöckla onstream. The town's district heating now comes from a combination of the geothermal scheme and a biomass plant.

RAG carries out a 3D seismic survey of Upper and Lower Austria.

RAG acquires interests in three exploration licences in northeastern Germany, together with Canadian partner CEP.

RAG acquires a stake in the Parta exploration licence in Romania.

Deep geothermal well project takes third place in the Fire category of the Energy Globe Award Upper Austria

2013

1 January: RAG sets up a wholly owned subsidiary, RAG Energy Storage GmbH, which is responsible for marketing capacity at the group's storage facilities.

RAG commissions the Kremsmünster district heating station and network.

25 July: RAG celebrates the 75th anniversary of the development of the Gaiselberg oil field.



Credits

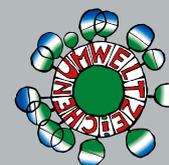
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