



## Wintershall in Argentina

- **Annual production in Argentina at approx. 26 million barrels of oil equivalent**
- **Participating in 15 fields in Tierra del Fuego, Neuquén and Mendoza**
- **Operator of Vaca Muerta formation**

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Wintershall has been producing hydrocarbons, mainly natural gas, in Argentina for four decades, and is the fourth largest gas producer in the country. The company is active in the central Argentinean provinces of **Neuquén** and **Mendoza**, as well as in the south off the coast of **Tierra del Fuego**. The wholly owned subsidiary Wintershall Energía S.A currently holds working interests in 15 oil and gas fields, and produces about 26 million barrels of oil equivalent (boe) annually.

### Tierra del Fuego: increase in production

Wintershall has been active in Tierra del Fuego in the south of Argentina since 1979. In 1989, the company began to produce oil from the Hidra field, situated in the Austral Basin in the province of **Tierra del Fuego**. Wintershall has continuously made efforts to increase the natural gas production from the offshore fields ever since. These improvements have been made possible by applying cutting edge tech-



nology combined with high investments. In 2017, about 20 million cubic meters of natural gas per day were produced from the CMA-1 area, including from the Carina, Aries and Vega-Pleyade fields where Wintershall holds a 37.5 percent participation interest. Other partners are Total as operator and Pan American Sur. Around 20% of the gas produced in Argentina today comes from the CAM-1 area.

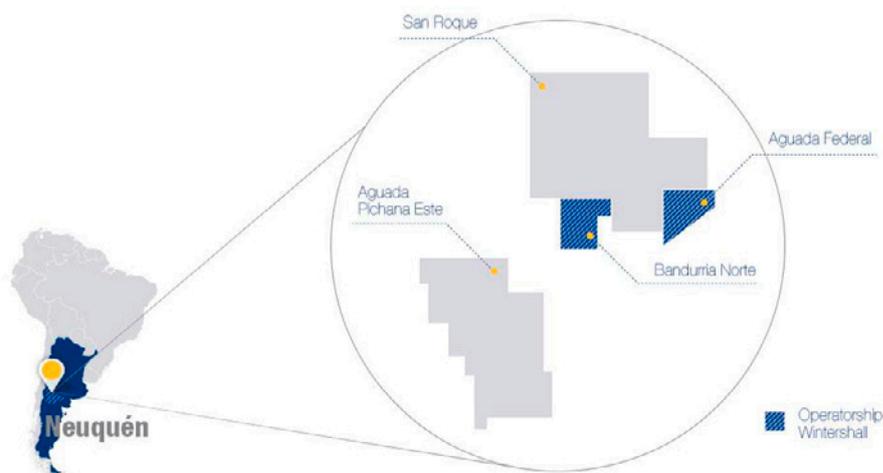
Together with Total and Pan American Sur, Wintershall put the new **Vega Pléyade** gas field, located in the Argentinean Sea off the coast of Tierra del Fuego, into production in February 2016. The Vega Pléyade project, which will significantly contribute to the provision of natural gas to the domestic market, has a daily production capacity of up to 8.5 million cubic meters. It will help to optimize supplies to the already operating gas processing facilities within the region. The offshore Vega Pléyade field is a key project for Wintershall in Argentina with 2P reserves amounting to around 19 billion cubic meters of natural gas. The new platform is the southernmost gas producing platform in the world and is connected to the onshore processing installations at Río Cullen on the Tierra del Fuego coast by a 77 kilometer subsea gas-exporting pipeline.

In April 2017, the CMA-1 partners approved the Cañadon Alfa plant expansion project, which main objective is to bring additional production and reserves from the offshore gas fields through the installation of two new Low-Pressure compressors and a third pipeline connecting the Río Cullen and Cañadon Alfa plants. This project is expected to be finished in April 2019.



## Operator in the Vaca Muerta formation

Wintershall has been active in the production of conventional natural gas and oil in the Neuquén province for more than 20 years and knows the geological conditions there. Wintershall holds shares in the blocks Aguada Federal, Bandurria Norte, Aguada Pichana Este and San Roque. The company is now harnessing its expertise and devoting its efforts to the blocks in the promising Vaca Muerta formation. Shale gas or shale oil projects are currently being conducted in all blocks.



Wintershall holds a 90 percent share in the **Aguada Federal** block in the Neuquén province and is operator (local energy company Gas y Petróleo del Neuquén S.A. (GyP) holds 10%). The companies are jointly developing the block. Within the block the promising Vaca Muerta shale formation can be found at a depth between 2,700 and 3,000 meters below ground. Following the completion of two vertical exploration wells, four horizontal wells were drilled in the so-called pilot phase. Each well has a horizontal drain of about 1,000 meters. In 2018 the wells will be tested and the results evaluated.

In July 2015, Wintershall took over the operatorship of a second license in the Neuquén province: **Bandurria Norte** (100%), where the company is conducting another shale oil project. In 2017 three horizontal wells were drilled in the 107 square kilometer block. These wells are also directed at the Vaca-Muerta formation. The results will be assessed throughout 2018 and 2019.

The exploration and production of unconventional energy resources poses major technological challenges. Wintershall is in an excellent



The first well in the Aguada Federal block in Neuquén province was drilled in 2015.

position to master these challenges owing to its many decades of experience in environmentally responsible and efficient production from complex reservoirs, and thanks to its specialist technological expertise in the production of tight gas in Germany.

## **20 years of experience in Neuquén province**

In July 2017, the Aguada Pichana concession was split into Aguada Pichana West and Aguada Pichana East, and concession right granted for the next 35 years (until 2052). Wintershall maintained its 27.3 percent share in the original development located in the Aguada Pichana East block (operator is Total 27.3%, YPF 27.3%, PAE 18.1%) and now also holds 22.5% percent share for the new Vaca Muerta shale gas developments of the same block (operator is Total 41.0%, YPF 22.5%, PAE 14.0%). Wintershall exited the Aguada Pichana West block, which has no producing well, nor any production facilities.

So far, about 330 wells have been drilled in the Aguada Pichana East block, which stretches over 761 square kilometers. Natural gas is currently being produced from about 300 of these wells. In 2017, the block has produced 7.1 million standard cubic meters of gas each day. In 2017, a shale gas development with a scope of 20 wells was launched, following the promising results from 10 wells of the shale pilot project. The first of these wells came on production in December 2017.

The **San Roque block** (Wintershall 24.7 %, operator Total 24.7 %, YPF 34.1 %, PAE 16.5 %) which stretches over 1,040 square kilometer, is situated north-east of Aguada Pichana. In 2017, an average of 3.9 million cubic meters of gas from about 50 wells were produced per day.

## **Harvesting the huge potential of unconventional resources**

Argentina has the second-largest shale gas resources in the world. According to data from the US Energy Information Administration (EIA), the country has 23 trillion cubic meters of shale gas – which is equivalent to 11 percent of the global shale gas resources. In terms of shale oil resources, Argentina ranks fourth worldwide, with 27 billion barrels of oil equivalent (boe). Hence, Argentina is one of the most important growth regions for unconventional resources alongside the USA.

The **Vaca Muerta** geological formation, situated in the Argentinean province of Neuquén, is particularly important. It is one of the largest shale gas and shale oil formations worldwide: the EIA estimates that the formation has recoverable resources amounting to 16.2 billion barrels of oil and 8.7 trillion cubic meters of gas. The formation covers an area of 30,000 square kilometers at a depth of about 3,000 meters, and generally has a thickness between 150 and 600 meters and a high content of Total Organic Carbon (TOC). All the technical features of the Vaca Muerta shale compare well with the already proven shale in the USA.

### **Mendoza province: Oil discovery in Block CN-V**

In the south of the Mendoza province, Wintershall Energía holds the exploration license for the **CN-V** block (Wintershall 50%, Geopark 50%). In spring 2013, Wintershall conducted preliminary exploration activities in block CN-V with a 3D seismic survey covering 180 square kilometers. In 2017 the first exploration well led to an oil discovery. The well is being tested to further assess the potentiality of this discovery. For Q2 2018 a second exploration well is planned, aiming at a target in a deeper formation.

### **Responsible partner with local ties**

Wintershall has been working in Argentina for four decades and has established a strong bond with the country. For Wintershall, close ties and good cooperation between industry, policymakers and the public are important for recovering the available energy resources in a sustainable manner.

Wintershall is also committed to social and cultural projects in the Argentine regions where it works, and supports numerous local projects in health, education and culture there. Wintershall therefore takes responsibility in very concrete ways as a reliable partner.

*These and other images are available for downloading in the Media Library at [www.wintershall.com](http://www.wintershall.com).*



Vibroseis truck for conducting seismic surveys in Mendoza