Vaca Muerta: the future of Argentina

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Introduction

The Argentine energy industry has undergone profound changes over the last three decades. The deregulation of the oil sector in the 1990s not only increased opportunities for private investment and boosted productivity but also led to an increase in hydrocarbon exports, which in turn drove foreign currency inflows and generated employment.

The new millennium brought about a drastic change in the game's rules. Government intervention increased, imposing all sorts of rules and restrictions, from setting export duties so as to lower domestic prices—which ended up damaging the industry—to freezing tariffs and the like. This process ended in 2012 with the expropriation of YPF effectively transferring its ownership to public hands. The consequence of this process was a significant reduction in oil and gas production, disinvestment, and unclear rules, all of which led Argentina to resume importing hydrocarbons (mainly gas).

In 2015, a new government administration took office with the primary goal of reversing a decade-long decline. They introduced various programs to support the incipient development of unconventional reservoirs, which were already on the horizon. However, the economic crisis of 2018 limited the positive impact of these measures, affecting the country's ability to sustain a steady flow of investments.

The COVID-19 pandemic deepened the already complex economic situation the next government faced. New foreign currency and market controls, along with industry changes and regulations, led to a decrease in investment flow, forcing companies to adopt a more conservative approach. Despite external and internal adversities, Vaca Muerta managed to show sustained growth, going from being just a promise at the beginning of the last decade to a clear and robust reality in the present, largely due to the geological quality of a world-class reservoir dubbed one of the most important in the world.

Finally, the current administration, which took office at the end of 2023, shifted gears one more time to a more deregulated and liberalized economy, showcasing strong support for private investment and the development of Vaca Muerta as the main unconventional area of the country. Congress approved the "Ley Bases," a crucial piece of legislation that deregulates the economy, providing significant incentives for private investment ("RIGI" for its acronym in Spanish), which is discussed below.

Vaca Muerta's unconventional oil and gas potential is attracting investor attention at home and abroad amidst the new promising political and economic scenario.

In recent months, we have witnessed significant announcements and investment commitments in this area, as the government has agreed to more transparent and attractive rules with various players.

We have included the topics we consider most relevant for investors in this report: the reasons to invest in Vaca Muerta, the main areas, and the incentives included in Ley Bases.

Why invest in Vaca Muerta?

Argentina has a very high potential for unconventional hydrocarbons development, as it ranks fourth in unconventional oil deposits and second in gas resources. Argentina is the world's second-largest producer of unconventional hydrocarbons behind the United States.

Vaca Muerta is the main unconventional hydrocarbon formation in Argentina. Located in the Neuquén basin, it was originally discovered in 1927, but it was not until 2011 that its great potential was confirmed. It occupies an area of 30,000 km^2, somewhat smaller than Switzerland or the Netherlands.

In 2013, YPF (Yacimientos Petroliferos Fiscales) entered into the first agreements to begin exploration and exploitation with several companies, including Chevron in Loma Campana, Dow in El Orejano, Petrolera Pampa in Rincón del Mangrullo, and Mulichino and Shell in Bajada de Añelo, followed by an agreement with Petronas in La Amarga Chica in 2014.

A detailed list of all the current concessions in Vaca Muerta is included in the Main areas of Vaca Muerta section of this report. There are currently 47 concessions with a committed investment amount of about USD 200 billion, covering an area of slightly under 10,000 km^2 and pending coverage of another 20,000 km^2. It is important to note that, although the concessioned area reaches less than half of the area of Vaca Muerta, there are still very few projects that are under massive development and that have reached their peak of production.

Although companies have been making very heavy investments in exploration and exploitation, the enactment of the Ley Bases, which includes the Incentive Regime for Large Investments ("RIGI"), is expected to be a fundamental pillar for the expansion of much-needed infrastructure, such as oil and gas pipelines and LNG plants.
These benefits are added to those established in the 2014 hydrocarbons law (Law No. 27007) that extends the terms of exploration (two periods of four years with an extension of five additional years) and concession (35 years with the possibility of extending ten more) for unconventional hydrocarbons. It also establishes a royalty of 12% plus 3% for each concession extension, up to a maximum of 18%.

In August 2024, Vaca Muerta's production was 403 thousand barrels per day of oil and 83 million m^3 of gas, which represents more than half of Argentina's total hydrocarbon production and a year-on-year growth of 35% and 22%, respectively. The year-on-year growth rate has maintained double-digit levels and is still in its early stages of development. Vaca Muerta's projected production of 1 million barrels of oil and 200 million m^3 of gas per day by the end of this decade hinges on the pace of future investments, estimated at approximately USD120 billion. A decade has passed since its inception, and Vaca Muerta has proven to be at the level of its peers in the United States, such as Permian and Eagle Ford.

One thing is certain regarding Vaca Muerta: it has demonstrated its geological production capacity and its unique position to take the country to levels of production never seen before. The evacuation capacity, which currently places a concrete cap on the country's productive development, stands in the way of this progress. The massive investments in infrastructure work are key to breaking the cap. Construction on the Vaca Muerta Sur pipeline began in May 2024, with an estimated investment of USD2,500 million. This pipeline will transport 500,000 barrels of oil per day. Additionally, the construction of a deep-water port in Rio Negro, which will accommodate larger ships than those currently operating in Argentina, will contribute to a reduction in transport costs.

The OldelVal Duplicate and Triplicate projects, which currently serve as the principal oil pipeline in the basin, are currently under development, along with the expansion of the Néstor Kirchner Gas Pipeline and the reversal of the TGN Gas Pipeline. These moves will set out the basis to replace gas imports from

Bolivia, supply the country's northern provinces with Vaca Muerta's output, and open an export route to Brazil. These works, which are estimated to be fully operational between 2025 and 2028, will be crucial to realizing the production plans of the formation by the end of this decade, although the productive capacity of Vaca Muerta will require more infrastructure investments. In this regard, the RIGI regime will be of utmost relevance.

In addition to potential gas exports to neighboring countries, Vaca Muerta's potential allows us to think that Argentina will enter a small group of countries that participate in the liquefied natural gas (LNG) business. In this regard, in July 2024, YPF announced its intention to build, together with Petronas, an LNG plant in the province of Río Negro. Estimates place the investment cost at USD30 billion, positioning Argentina as the world's fifth largest LNG producer.

This plant is part of the "Argentina LNG" project that includes the production of gas in Vaca Muerta, its transport to the processing terminal, and its industrialization and export. It is estimated that, once the plant is completed and at full capacity, it will allow the export of USD15,000 million per year.

But this is not the only project; additionally, PAE announced a 20-year agreement with Golar to start processing gas in a ship owned by Golar. Estimates indicate that this project will commence commercialization in 2027. Likewise, Excelerate Energy, together with TGS, have the installation of a modular LNG plant in Bahía Blanca in their plans.

These agreements will allow Vaca Muerta to continue increasing its production, whereas companies will continue making significant investments in the coming years. We also hope that concession purchase and sale transactions will continue to be carried out, allowing companies to increase investments and focus on the areas of greatest interest.

We firmly believe that Vaca Muerta will continue to attract investors and will become a key driver for the development of the Argentine economy. In summary, the development of Vaca Muerta is key to the future of Argentina, not only to its hydrocarbon sector. Here are some reasons why the development of Vaca Muerta is crucial. Currently, the country consumes 500,000 barrels of oil and 130/150 million m^3 of gas daily (depending on seasonal factors). Achieving a daily production of 1 million barrels of oil and more than 250 million m^3 of gas will have a direct impact on the generation of foreign currency inflows from the export of surpluses. Ten years ago, the sector's trade balance was in a deficit position of more than USD 6,500 million. In contrast, as of August 31, 2024, the sector's trade balance was in a surplus position, amounting to more than USD 3,000 million. The massive development of Vaca Muerta and the implementation of the aforementioned projects would increase this surplus to more than USD 30,000 million by 2030, displacing the agricultural sector as the main generator

of foreign currency for Argentina. Qualitatively, in contrast to the agricultural sector, hydrocarbon activity generally ensures a constant and reasonably projected inflow of foreign currency due to its continuous production and sale.

It is also important to consider the job-generating capacity of the industry. Private studies estimate that the massive development of Vaca Muerta could add over 500,000 direct and indirect jobs to the economy.

RIGI: Potential impact on Vaca Muerta.

The National Executive Branch, under the leadership of President Javier Milei, published Decree No. 749/2024 (the "Decree") in the Official Gazette of Argentina on August 23, 2024, approving the regulation of the Incentive Regime for Large Investments ("RIGI", for its acronym in Spanish), established by Law No. 27742. RIGI offers a number of tax, customs, and exchange rate incentives, as well as an efficient system for protecting rights and settling disputes, to encourage investment in projects considered large, long-term investments in Argentina and related to certain sectors.

This long-awaited regulation was a big step for those interested in adhering to the regime, including those who were evaluating investment projects in Vaca Muerta.

A highlight of the regulation was the definition of the economic sectors and subsectors that will benefit from the promotional regime. It is worth highlighting the exclusion of the exploration and exploitation of liquid and gaseous hydrocarbons, unless they are "offshore" activities. However, in the case of

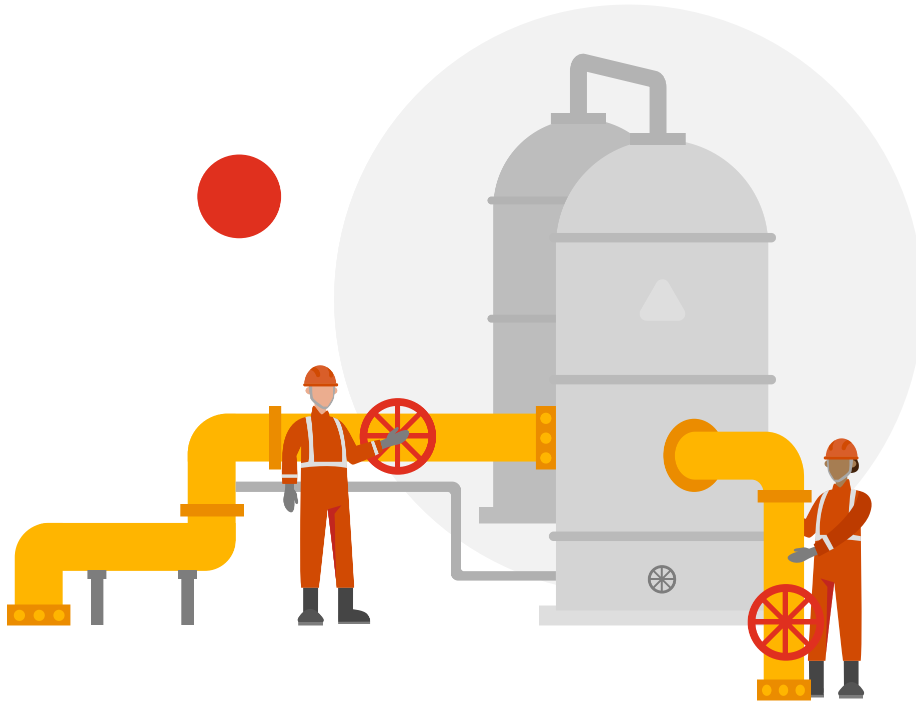
Mature areas and service companies: Another opportunity.

YPF S.A. initiated the sale and transfer of 55 conventional areas in six provinces (Chubut, Mendoza, Neuquén, Rio Negro, Santa Cruz, and Tierra del Fuego) as part of the "Andes" project. Smaller or independent oil companies will exploit these areas, contributing to the development of new players in the industry and the growth of already experienced ones. This will generate new investments in areas that large "upstream" companies no longer have in their investment focus. The relaunch of PECOM and the creation of Bentia Energy join independent companies such as Petrolera Aconcagua, PCR, and Petróleos Sudamericanos, among others, in this new niche of opportunities.

As of the date of this report, 15 areas of 6 clusters in Río Negro, Mendoza, Chubut, and Neuquén had already been awarded.

Complementing what YPF has done, other energy companies have also been analyzing their investment portfolios, generating a very active M&A market with excellent opportunities to invest in mature and more stable areas.

Finally, the oilfield services market has also been very active: DLS acquired the local subsidiary of Air Drilling Associates, Tenaris acquired the fracturing equipment of Baker Hughes, and Pérez Companc acquired the service company Bolland. We believe that there are opportunities here for investors as well.



natural gas destined for export, projects related to its production, capture, treatment, processing, fractionation, liquefaction, and transport may adhere to the regime.

Likewise, those projects related to the construction of treatment plants, natural gas liquid separation plants, oil pipelines, gas and polyducts, and storage facilities, as well as the transport and storage of liquid and gaseous hydrocarbons and the petrochemical industry, may also be eligible.

The decree also clarifies when an expansion of a pre-existing project can benefit from the RIGI. This is especially crucial for companies operating in Vaca Muerta, where they have projects at varying stages of development.

Under the regulation, companies may expand by establishing a dedicated branch, where they can transfer their tax benefits proportionate to the branch's net worth. Alternatively, they can expand using the same vehicle that currently owns the pre-existing project, but this requires separate accounting.

The regulation establishes a minimum investment amount of USD200 million for all sectors and subsectors, with the exception of oil and gas transportation and storage (USD300 million) and offshore exploitation and gas production for export (USD600 million). In the case of long-term strategic export projects, the minimum investment amount will be USD 2 billion.

The regulation also outlines the process for joining the RIGI and presenting the investment plan, which must include the amounts to be invested in each project stage, the type of assets to be invested in, and the estimated disbursement deadlines, including the deadline for minimum investments.

The plan must specify the investments in eligible assets, with a maximum calculation of 15% of the minimum investment amount, and the assumed obligations related to essential services, with a maximum calculation of 20% of the minimum investment amount. The regulation forbids the engagement of essential service providers associated with the Single Purpose Vehicle (VPU).

The investment plan must also contain an affidavit, supported by a technical report issued by an independent professional, indicating that the project will not distort the local market.

The regulation establishes a series of cases where it is presumed that there will be no distortion (e.g., projects related to the production and export of commodities or single projects that will export more than 90% of their production).

Furthermore, benefit holders must allocate at least 20% of the investment to contract local suppliers of goods and works if they are available and provided under market conditions in terms of price and quality.

Additionally, benefit holders must indicate the source of financing (internal or external) and the way in which the project will be financed, clarifying in the case of an external source whether it will be entered through the exchange market or not. In this context, customer advances will be classified as financing rather than income, especially when considering the return on investment requirement provided for in the legal framework.

Tax, customs and exchange incentives.

As a reminder, below we detail the most relevant incentives that the promotion regime contemplates for the promoted projects.

Tax incentives

I. Income Tax

a) Tax rate. The maximum rate will be 25%.

b) Accelerated depreciation. i) For depreciable movable property, depreciation may be carried out in two equal and consecutive annual installments; ii) In the case of investments in mines, quarries, forests, and similar assets or in infrastructure works, the amortization may be made in the amount of annual, equal, and consecutive installments that arise from considering their useful life reduced to sixty percent (60%) of the estimated one.

c) Tax losses. Their amount will be updated for inflation (IPIM) and will not have a time limit for their transfer to future fiscal years. If five years have elapsed without such losses being absorbed by taxable profits, they may be transferred to third parties.

d) Dividends and profits. Distributions of dividends and profits will be subject to domestic withholding tax at the rate of 7%. However, after seven years of adhesion to the regime, the dividends and profits will be subject to a rate of 3.5%.

e) Deduction of interest and exchange differences. It is provided that the limitations on the deduction of interest and exchange differences arising from financing granted by resident or non-resident related parties will not be in force during the first 5 years from the adhesion to the regime.

f) Benefits for projects classified as long-term strategic exporters by the Enforcement Authority.

- For international transport services intended for exports and for services included in engineering, procurement and construction management contracts, they shall not withhold income tax from beneficiaries abroad. In addition, in relation to payments to foreign beneficiaries not included in the previous point, they will have a taxable profit presumption of 30% provided that a lower presumption does not apply, and no grossing up would be required when the tax burden is on the VPU.

- Value Added Tax. The VPUs may pay VAT to their suppliers or to the AFIP (including collections at source) by delivering Tax Credit Certificates. Such certificates will not give rise to a tax credit for the VPU and will be treated as unrestricted balances for the supplier.

- Tax on bank debits and credits. They will be computed in their entirety as payment on account of income tax.

Customs incentives

I. Import Duties. Imports for consumption, as well as temporary imports made by the VPUs under the RIGI, consisting of capital goods, spare parts, and components, are exempt from import duties, statistical and destination verification fees, and from the system for collecting (at source or otherwise), advancing, or withholding national and/or local taxes. This exemption may also apply to the importation of goods by the VPU's suppliers of goods and services (registered in a special registry).

II. Export duties. Exports for consumption made by the VPUs will be exempt from export duties after 3 years have elapsed from the date of registration under the RIGI (a period that will be reduced to two years for projects declared long-term strategic exports).

III. Import and export restrictions. VPUs adhering to the RIGI may import and export freely without being subject to any direct prohibitions or restrictions, be they quantitative or qualitative restrictions, quotas, or restrictions of an economic nature. Official prices or any other official measure that alters the value of imported or exported goods or priorities for supply to the domestic market cannot be applied either, except as declared by the Enforcement Authority.

Exchange incentives

The VPU's collections of product exports will be exempt from the obligation to bring in and/or settle funds in the free exchange market (MLC), as these funds will be unrestricted in the following percentages: a) Twenty percent (20%) after two years have elapsed since the implementation of the VPU; b) Forty percent (40%) after three years have elapsed since the implementation of the VPU; c) One hundred percent (100%) after four years have elapsed since the implementation of the VPU. Projects classified as long-term strategic exports will have their terms shortened by one year.

Foreign currency from local or external financing obtained by the VPUs registered under the RIGI is also unrestricted if disbursed after the entry into force of the law. Any limitation on the holding of liquid or illiquid foreign assets, imposed by foreign exchange regulations, will not apply to the VPUs registered under the RIGI either. However, such external assets may be taken into account to limit access to the MLC. Notwithstanding the foregoing, any future rule may only require the use of such funds as a priority or that VPUs do not have access to the MLC, as long as they hold such foreign assets for the payment of commercial and financial debts abroad (principal and interest), the distribution of dividends/profits, and/or the repatriation of direct investments by non-residents.

Any present or future exchange rules that establish restrictions or prior authorization for access to the MLC for the repayment of loans (principal and interest) and other financial debt abroad and/or the repatriation of direct investments by non-residents shall not apply to VPUs to the extent that the amount of foreign currency brought in and settled by the VPUs in the foreign exchange market as loans and other debt abroad and/or capital contributions or other direct investments is at all times higher than or equal to the amounts in foreign currency required to access the MLC.

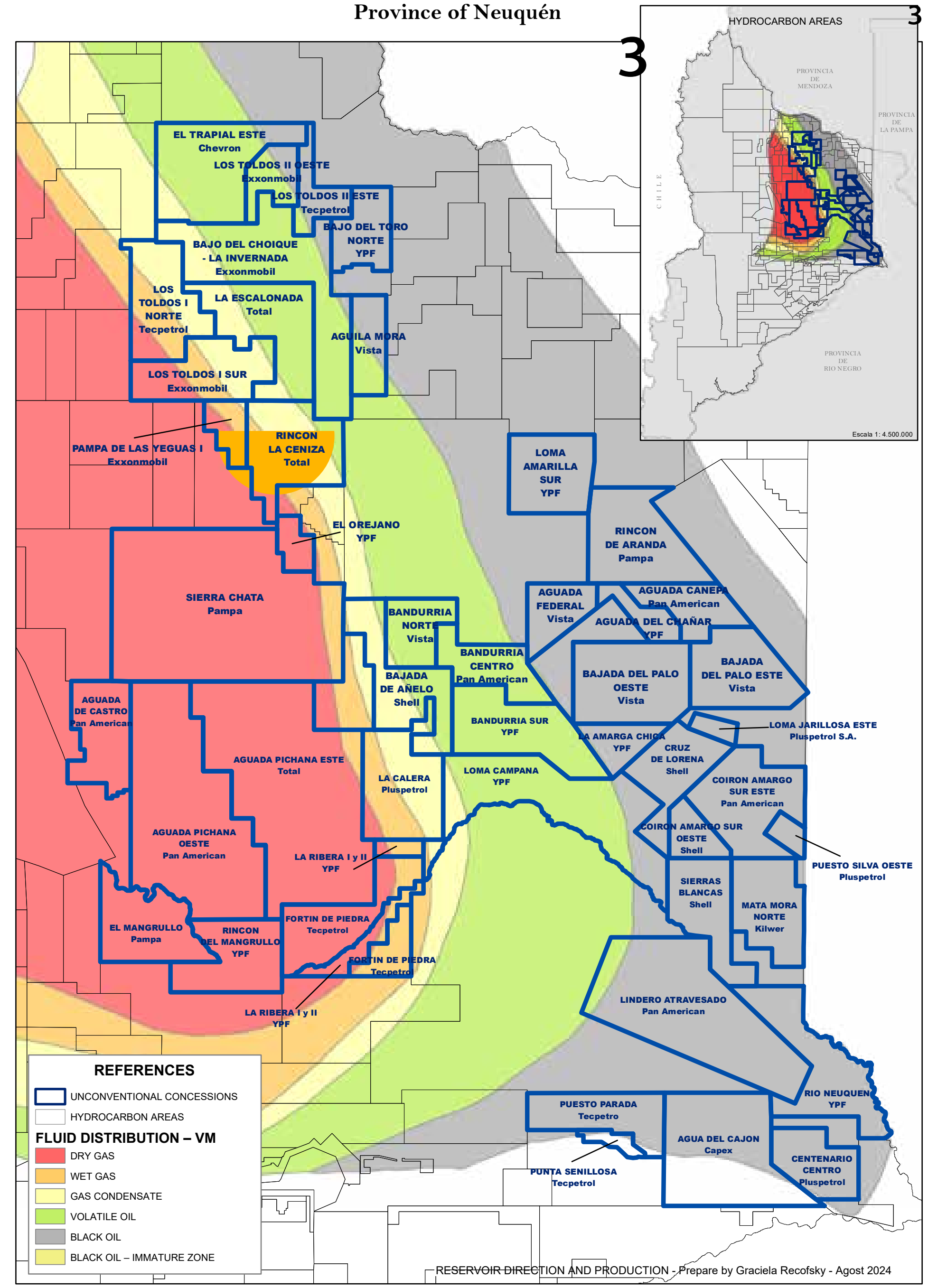
This measure also applies to the payment of profits, dividends, or interest to non-residents to the extent that they arise from capital contributions or other direct investments, or from loans or other financial debts abroad and have been brought in and settled in the foreign exchange market by the VPU following their registration under the RIGI; the above quantitative limit does not apply in this case

Stability

Under the RIGI, registered VPUs have regulatory stability in tax, customs and exchange matters for their projects. This benefit prevents the incentives granted from being affected by their repeal or by the creation of regulations that are more burdensome or restrictive than those contemplated in the RIGI.

Stability will be maintained for 30 years from the date of registration.

NON-CONVENTIONAL EXPLOITATION CONCESSIONS
Province of Neuquén



Vaca Muerta: main areas

	Area		Total investment (MMUSD)	Surface (km^2)
	El Orejano	YPF S.A.	639	45
2	Loma Campana	YPF S.A.	16,506	395
	La Amarga Chica	YPF S.A.	9,022	189
4	Bajada de Añelo	Shell Argentina S.A.	4,703	204
	Lindero Atravesado	Pan American Energy LLC	11,200	509
6	Bandurria Norte	Wintershall Energía S.A.	3,177	107
	Bandurria Centro	Pan American Energy LLC	6,800	130
8	Bandurria Sur	YPF S.A.	14,900	229
	Cruz de Lorena	Shell Argentina S.A.	4,575	159
10	Sierras Blancas	Shell Argentina S.A.	4,404	166
	Bajo del Choique - La Invernada	ExxonMobil Exp. Arg. S.R.L.	13,900	400
12	Aguada Federal	Wintershall Energía S.A.	2,946	97
	La Escalonada	Total Austral S.A. Suc. Arg.	6,446	239
14	Rincón La Ceniza	Total Austral S.A. Suc. Arg.	6,446	221
	Río Neuquén	YPF S.A.	2,565	2,565
16	Fortín de Piedra	Tecpetrol S.A.	6,000	233
	Punta Senillosa	Tecpetrol S.A.	61	249
18	La Ribera I y II	YPF S.A.	1,046	24
	Pampa de las Yeguas I	ExxonMobil Exp. Arg. S.R.L.	1,390	83
20	Agua del Cajón	Capex S.A.	1,530	59
	Centanario Centro	Pluspetrol S.A.	510	355
22	Aguada Pichana Este	Total Austral S.A. Suc. Arg	7,237	130
	Aguada Pichana Oeste	Pan American Energy LLC	5,479	761
24	Aguada de Castro	Pan American Energy LLC	1,992	605

	Area		Total investment (MMUSD)	Surface (km^2)
	Rincón del Mangrullo	YPF S.A.	4,306	163
26	Los Toldos I Sur	ExxonMobil Exp. Arg. S.R.L.	7,271	195
	El Mangrullo	Pampa Energía S.A.	2,494	194
28	Sierra Chata	Pampa Energía S.A.	5,657	866
	Coirón Amargo S. Este	Pan American Energy LLC	1,200	228
30	La Calera	Pluspetrol S.A.	2,381	230
	Coirón Amargo S. Oeste	O&G Develop. LTD S.A.	1,163	67
32	Aguada del Chañar	YPF S.A.	412	57
	Bajada del Palo Este	Vista Oil & Gas Argentina S.A.	4,127	198
34	Bajada del Palo Oeste	Vista Oil & Gas Argentina S.A.	5,145	254
	Los Toldos I Norte	Tecpetrol S.A.	5,420	202
36	Los Toldos II Este	Tecpetrol S.A.	1,766	78
	Águila Mora	Vista Oil & Gas Argentina S.A.	3,132	95
38	Loma Amarilla Sur	YPF S.A.	2,697	176
	Los Toldos II Oeste	ExxonMobil Exp. Arg. S.R.L.	851	78
40	Aguada Canepa	Pan American Energy LLC	2,100	112
	Mata Mora Norte	Kilwer S.A.	2,411	176
42	Bajo del Toro Norte	YPF S.A.	3,424	114
	El Trapial Este	Chevron Argentina S.R.L.	6,923	281
44	Puesto Silva Oeste	Pluspetrol S.A.	207	26
	Loma Jarillosa Este	Pluspetrol S.A.	245	25
46	Puesto Parada	Tecpetrol S.A.	2,412	159
	Rincón de Aranda	Pampa Energía S.A.	2,460	239
	TOTAL		**201,676**	**9,982**

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