



Oil & gas industry: Relevant issues for 2018

Energy

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Amid international price consolidation

Introduction

In an industry where external volatility is a major determinant of performance, at the beginning of 2018 the prices of the main energy commodities, specially oil and gas, continue on the path to recovery, a process that has started in late 2016. Although this recovery takes place after an overwhelming fall of the price level estimated at above 60%, accumulated until 2016 for both oil and gas, with respect to the maximum levels reached in 2012 and 2008, respectively, over the last two years, both commodities have shown a recovery, reaching a growth higher than 20% in 2017. As a result, the price of these commodities went from USD/bbl 43 (average price of the WTI, Dubai and Brent oil basket) and USD/MMBTU 3.5 (average price of the gas produced in the US and the EU) in 2016 to USD/bbl 53 and USD/MMBTU 4.3, respectively, in 2017. In addition, during the first month of 2018, the average price of crude oil was around USD/bbl 66 (Brent price was over USD/bbl 68), which reinforces the trend followed by prices. Based on the foregoing, it may be expected that prices will remain at around USD/bbl 70 by the end of the year (2018), as it has been forecasted by some experts. Such change in trend and the forecast made by analysts may be explained by two main factors, which are interconnected and contribute substantially to the recent rebalance between supply and demand in the oil and gas industry and to a future potential increase in demand.

The first factor is associated with the crude oil production cut that came into effect in 2016 upon the execution of an agreement by the member countries of the Organization of the Petroleum Exporting Countries (OPEC) -to which other non-OPEC countries, such as Russia and Mexico, have adhered. This organization is seeking to extend such cut agreement throughout 2018¹. Indeed, since January 2017, these countries and their partners reduced their output by around 1.8 million barrels/day with the objective of pushing up the hydrocarbon price and recovering lost ground in terms of investments. Furthermore, countries such as Libya and Nigeria, which so far had not cut their production, have adhered to the agreement. This has led to the creation of an unprecedented partnership, accounting for approximately 50% of the global crude oil supply. Likewise, as regards upwards pressures on the price of crude oil, the effects of military actions in the Middle-East (basically in Syria) cannot be overlooked. Unfortunately, these actions have not ceased and might prove to be functional to OPEC oil cuts. However, while the OPEC/Non-OPEC partnership seeks to control the price of crude oil and maintain it above USD/bbl 60, the high rate of hydrocarbon production in the US, as a second factor, might be a hindrance to this objective, depending on the degree of self-supply reached by this economy in 2018 and the related impact on international markets. In fact, the potential impact of shale production in this country cannot be disregarded, as over the last years, the US has had a strong influence on the drop of gas prices. Furthermore, since 2015, shale resources have represented a share of over 50% in the country's crude oil supply (4.9 million of barrels/day) and 60% in the gas supply (18 trillion cubic feet)², and, according to the US Energy Information Agency (EIA), they will reach 53% and 70%, respectively by 2020.

As indicated in our previous report, "Oil & Gas Industry: Four relevant issues for 2017 (KPMG, 2016)", the change in the price of hydrocarbons over the last decade was marked, in its upward trend period, by the super-cycle of increases in the prices of the main agricultural and energy

¹ "La OPEP extiende a diciembre de 2018 el recorte de la producción de petróleo" ["OPEP extends the oil production cut to December 2018"], El Cronista, December 1, 2017; <https://www.cronista.com/internacionales/La-OPEP-extiende-a-diciembre-de-2018-el-recorte-de-la-produccion-de-petroleo-20171201-0011.html>

² This includes both shale and tight gas.

commodities (the main determinant of which was the growth of emerging economies, mainly the so-called BRICS - Brazil, Russia, India, China and South Africa - and their pressure on the international demand for supplies and factors of production). This process, which spanned from 2003 to 2014, was followed by a period of decline, or a bearish phase, as a result of the slowdown in the growth of emerging countries (mainly China) and the resulting surplus in the supply of commodities (mainly energy commodities, such as oil and other minerals). The oil production cut agreed by OPEC/Non-OPEC oil producers attempted to remedy this situation, in a scenario in which unconventional hydrocarbon production could offset this effect. In this new scenario, where the decisions made by the main hydrocarbon producers and exporters will forge the path to be followed by prices from now on, Argentina, whose growth usually depends on the foreign prices of raw materials (since they represent around 6% of GDP and 25% of exports), has adopted a set of measures aimed at offsetting the volatility of prices and their internal effects (subsidized local prices; adjustments to gas and electricity rates for industrial and household consumption; agreements to streamline activity, reduce costs and improve productivity, etc.). At the same time, it has encouraged investment in exploration and extraction of hydrocarbons to solve supply issues (which caused a substantial deficit in the trade balance of the energy sector and a significant outflow of foreign currency) so that the country may regain its status as a net hydrocarbon exporter.

As indicated in the aforementioned report (KPMG, 2016)³, Argentina stop being a net energy exporter to become a net energy importer in a period of only ten years. Such change was the result of a significant decrease in the production of oil and gas (which started towards the end of the 90s and which became apparent in 2004 when the government was forced to create the so called National Energy Plan), and of the great imbalance generated by the policies applied to supply (unprofitable prices and uncertainty that discouraged investments) and to demand (subsidized rates that fostered excessive consumption). As a result of this process, Argentina's trade balance was impaired due to the significant increase in imports of gas and electricity, a situation that the country is still trying to remedy by means of the aforementioned set of measures aimed at balancing the domestic oil and gas market by boosting investment, production and stable prices. Despite these macroeconomic adjustments, recovering and improving the competitiveness of productive sectors, primarily the energy sector, remains a great challenge for the future, which calls for improvements in the legal, regulatory and tax frameworks.

In this scenario, it is essential to have a detailed description of the most relevant issues the Oil & Gas industry will have to deal with in 2018 to understand its immediate future. According to KPMG's prior reports "Oil and gas - balance of a decade, perspectives and challenges faced by the industry in Argentina (2005-2015)" (KPMG, 2015) and "Four relevant issues in the oil and gas industry for 2017" (KPMG, 2016), the growth and stagnation experienced by emerging countries, and the related impact on commodity prices were the two main issues the industry had to face over the last years, along with insufficient local production and investment. This document, which attempts to highlight the issues on the 2018 agenda, raises again the question of how investment, (conventional and unconventional) hydrocarbon production and price variables of this sector will behave, always bearing in mind the latest measures taken locally to change the direction of the industry, mainly in relation to unconventional production in the Neuquén basin (Vaca Muerta) and its importance and strategic influence in terms of finding a solution to issues of self-supply and the reliance on off-shore activities.

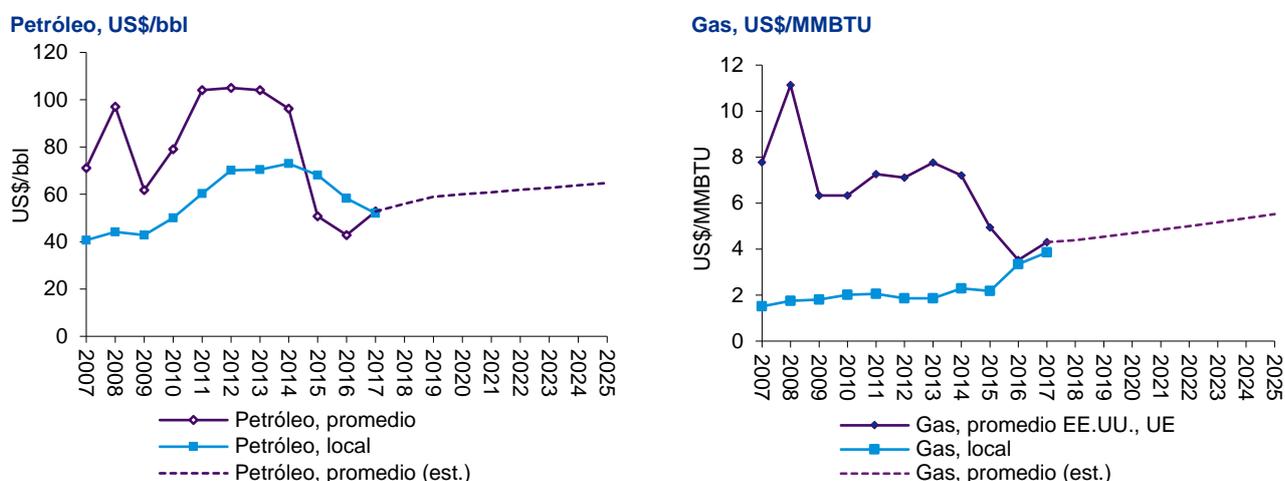
I. Recent changes in prices

Changes in oil and gas prices over the last decade reflect the different events that have led to such prices to date, i.e., acceleration, and drop and recovery periods determined by the aforementioned factors: the period of growth of emerging economies and the pressure exerted on international

³ "Oil & Gas Industry: Four relevant issues for 2017", KPMG, 2016.

demand for raw material, the slowdown and surplus in global production, and, finally, the current effect of the artificial measures taken by the main oil producers (OPEC and partners) to restrict the global output and encourage price increases. Over the last two years (see Figure No. 1), the oil price (WTI, Brent and Dubai average) marked a stable path and rose from an annual average of USD/bbl 43 in 2016 and USD/bbl 53 in 2017 to USD/bbl 66 in January 2018 (Brent, in turn, reached approximately USD/bbl 70), after the international price of the barrel of crude had exceeded USD/bbl 60 in December 2017. Before this, in October 2017, the World Bank⁴ had forecasted that the barrel of crude would not exceed USD 56 (on average) in 2018 and that it would reach an average of USD 60 in 2020. Although the recent changes may cause uncertainty as to whether these forecasts will actually be met, they continue to provide a good basis to predict the behavior of the oil price in the future, and, therefore, they are included in our analysis. Natural gas shows a similar behavior, since in the same period, the price of this hydrocarbon, understood as the average price of the natural gas produced in the US and the European Union (EU) per million BTU (MMBTU), went from USD 3.5 in 2016 to USD 4.3 in 2017. The World Bank sustains that the price of natural gas will remain at around USD/MMBTU 4.4 in 2018, and will range from USD/MMBTU 4.5 to 4.7 for 2019/2020. However, in the case of oil, the price of the barrel during 2018 is not expected to exceed or deviate significantly from the forecasts, since the OPEC production cut could be offset against the increase in crude oil production in the US, a country that, according to the International Energy Agency (IEA), has recently reached a new historical production record (February 2018), surpassing the levels achieved in 1970 and becoming the second world producer.

Figure No. 1
Changes in the average oil and gas prices and projection for 2025
(In USD)



Source: prepared by KPMG based on data published by the World Bank (World Bank Commodities Price Forecast, Oct. 2017) and the Argentine Department of Energy and Mining (MINEM), 2018.

Changes in local prices are based on two important premises. On the one hand, and regardless of the artificial measures implemented to sustain them, the behavior of external prices is decisive to determine the future trend of oil and gas prices internally. On the other hand, as part of its constant efforts to resume hydrocarbon production at levels that allow it to stop depending on gas and electric power imports in recent years, balancing its energy trade accounts and gradually returning to self-supply, the country has designed policies to boost investment, even more so after the

⁴ "World Bank Commodities Price Forecast", October 2017.

discovery of numerous unconventional hydrocarbon reserves⁵, mainly in Vaca Muerta formation, in the province of Neuquén.

The Government continues to redouble efforts to improve the performance of the hydrocarbons industry, mainly at the upstream phase, where the highest level of investment is required. As informed in KPMG's 2016 report, the recent trend in international prices put on hold the sector's most relevant exploration and exploitation projects in Argentine soil, mainly those associated with unconventional resources in the Neuquén basin, where the disbursement of the large investments necessary for their development was delayed due to the drop in oil and gas prices. Consequently, it was financially impossible to carry out such projects. For this reason, since 2015, one of the remedial measures taken by the Argentine government has been to shore up the local price scheme, basically by subsidizing the price charged by producers⁶ in order to protect the local market against external market fluctuations and offset the detrimental (damaging) effects for the industry, retain investment and reverse the negative trend in production. Since then, and as it can be seen in Figure No. 1, local average prices have showed a differential behavior with respect to international prices, mainly in 2015 and 2016, and tended to converge in 2017. During this short period, the clearest or most obvious case has been that of the crude oil price⁷, which during that period was between USD 15 and USD 17 above the international price, and finally, in 2017, when restrictions on the local price of fuels were lifted, converged at around USD/bbl 53.

Although this measure produced some desirable results that reignited the hydrocarbon sector activity mainly in terms of the exploration and extraction of unconventional resources, the objective is to start eliminating the asymmetries that triggered the implementation of these policies in order to gradually return to a scheme based on (international) market prices, thus encouraging greater transparency and investor's confidence. Accordingly, the so called *Plan Gas*, which was designed and set in motion in 2013 with the aim of reducing natural gas imports and the energy trade account deficit (and whereby the Government guaranteed a price of USD 7.5 per MMBTU for the incremental production of conventional, shale, tight, or off-shore gas with respect to agreed levels for the 2012-2017 period), ended by late 2017. Since then, the only program in effect was the *Program for Promoting the Production of Unconventional Gas* (mainly affecting the exploitation at Vaca Muerta in relation to both "pilot" projects and projects "under development", effective until 2021). Furthermore, Resolution No. 447/2017 of the Argentine Ministry of Energy and Mining (MINEM), provided for the extension of its benefits to the production of unconventional gas in the Austral Basin. As in the case of the *Plan Gas*, this program seeks to encourage investment in unconventional gas exploration/exploitation projects in the Neuquén (and Austral) basin, ensuring that the Government will pay a price higher than the international price, but with annual reductions of USD/MMBTU 0.5 until the end of the plan (2021); that is, USD/MMBTU 7.5 in 2018, USD/MMBTU 7 in 2019, USD/MMBTU 6.5 in 2020, and, finally, USD/MMBTU 6 in 2021 to converge at the market price as from 2022.

The World Bank estimates that both gas and oil prices will continue to show an upward trend in the future. In particular, the World Bank forecasts that the barrel of crude oil will reach USD 60 in 2020 (apparently, this price will be reached earlier than expected, since it is increasing at a rapid pace in

⁵ According to the "World Shale Gas and Shale Oil Resources assessment: Energy Information Administration-Advanced Resources International" issued by the US Energy Information Agency (EIA) in 2013, Argentina is amongst the first four countries with the highest potential for the development of unconventional resources, following Russia, the US, and China.

⁶ The program of subsidized hydrocarbon prices has been mainly supported by a gas plan ("*Plan Gas*") and a program of subsidized prices for the production of unconventional gas (*2018-2021 Program for Promoting the Production of Unconventional Gas*, Resolution No. 46/2017 of the Argentine Ministry of Energy and Mining).

⁷ Argentina has mainly two types of crude oil: Medanita and Escalante. For example, in 2016, during the effective term of the policy on subsidies on the price of the oil barrel, the **support** price of these two types of oil was USD/bbl 67.5 (Meditano) and USD/bbl 54.9 (Escalante). Clearly, as a result of the end of this policy on subsidies, the local price of the crude oil barrel is gradually converging with the international price.

2018), whereas MMBTU will be around USD 4.7. Disregarding any potential deviations from these projections, we can affirm that in the case of natural gas, the difference between the price forecast made by the World Bank and that arising from local programs, such as the Program for Promoting the Production of Unconventional Gas, reflects a clear competitive advantage that should benefit the local development of this hydrocarbon in the medium-term, at least until 2021, without considering any other potential measures that may be adopted from now on to promote investment and local production in the energy sector.

Finally, reference should be made to the impact of the changes in the prices of hydrocarbon byproducts, such as fuel and gasoline, in a scenario in which the Government has put an end to the subsidies to oil production and lifted the restrictions on local prices so that they converge with the market price. The price of these byproducts depends on the price of crude oil and the dollar exchange rate. In an economy that has maintained a double-digit inflation over the last years, and in which the price of fuel has formed the basis for setting the prices of many other goods, the recent slight devaluations of the exchange rate, which between January and February 2018 was close to ARS 20/USD, have an impact on refining and production costs, generating upward pressures on the price of fuels, above the changes that may result from fluctuations in the cost of crude oil. Therefore, it is important that the Oil & Gas industry as a whole (i.e. both the upstream and downstream companies) try to reach cost efficiency and enter into agreements with the Government (e.g., the reduction or elimination of tax on fuel transfer, or ITC) in order to reduce the transfer of these increases to the next link in the chain, minimizing the impact on the end consumer purchase power and mitigating its effect on the determination of the consumer price index (CPI), which is the benchmark indicator for measuring local inflation.

II. Hydrocarbon production

Domestic hydrocarbon production, mainly oil, has been showing a downward trend since the end of the 1990s, after the industry reached a historic record of around 50 million cubic meters in 1998 (a daily production average of approximately 850,000 barrels)⁸. The sector output began to respond to the unfavorable conditions of the economic environment, a situation that was closely associated with the growth model chosen during the years 2003 to 2015, and whose main characteristic was the implementation of policies aimed at promoting demand over supply disproportionately, thus generating a gradual but consistent decline in investment in almost all productive sectors. Since then, the reduction in hydrocarbon production combined with an increasing energy demand resulted in a supply crisis that had to be mitigated by a substantial increase in gas and electric power imports, which as of 2011, led to an important deficit in the energy account close to USD 7,000 million in 2013. At present, prospects are improving progressively due to the different measures aimed at encouraging investment and production in all sectors, which have started to show gradual results. Accordingly, while the energy deficit has begun to reduce slowly (in the last two years, for instance, the average deficit in the trade balance of the fuel and energy account remained at around USD 3,000 million), the production of hydrocarbons and their byproducts has begun to show some signs of reactivation, supported by the country's natural and technical resources.

Particularly, the important unconventional oil and gas reservoirs in the province of Neuquén, mainly in the Vaca Muerta formation, are one of the main references in the Oil & Gas industry at the global level, and higher investment is required for their development. In addition, Argentina stands out for having a well-developed infrastructure, which facilitates downstream activities (refining and production of byproducts) as well as the provision of other services associated with hydrocarbon extraction. As regards weaknesses, there are still high drilling costs in the upstream phase (mainly in the exploitation of unconventional resources, where costs tend to be higher than those incurred in

⁸ The Argentine Oil and Gas Institute (IAPG) reports a record production of 49.2 million cubic meters in 1998, a figure that was converted to daily barrels by applying a factor of 6.2898 bbl/m³ prorated for 365 days.

the exploitation of conventional resources). However, these costs have started to go down. In fact, even when specialists estimated that the cost of drilling an unconventional well in the Vaca Muerta region was around USD 15 million in 2016, integrated companies, such as YPF, managed to reduce that estimate by over 30%, i.e. to USD 10 million⁹. Moreover, YPF claims to have reduced such cost to USD 8 million in 2017¹⁰, achieving a break-even point below USD/bbl 40 and ensuring a profitable exploitation level comparable to the Eagle Ford formation in the US, which is commonly taken as reference and which recorded a drilling cost below USD 6 million per well in 2017. Although the average drilling cost in the Vaca Muerta region is still higher than that recorded in the US, there is a rapid process of convergence towards parity, promoted by the need of companies to be more efficient and profitable in a context of low prices, and by the sector-oriented plans aimed at improving productivity and reducing costs. In the medium term, this may lead Argentina to become one of the most attractive destinations for drilling and shale production outside North America.

Domestic drilling costs are mainly affected by labor, transportation and logistics, and tax aspects. Accordingly, the Government, the representatives of the Oil & Gas industry workers (Union of Oil and Gas Workers of Rio Negro, Neuquén, and La Pampa, and Union of Senior and Professional Personnel of the Private Oil & Gas Sector) and companies exploiting the Vaca Muerta region have signed an addendum to the Collective Bargaining Agreement that refers to the particular characteristics of the exploitation of unconventional resources and introduces some amendments to the labor conditions in force (mainly as it refers to the elimination of the payment of hours incurred in travelling to the workplace (*horas taxi*), work absenteeism measures, and the reduction of workers per well¹¹), authorizing labor contracts that, compared to those falling within the scope of the collective bargaining agreement applicable to the exploitation of conventional resources, are more flexible, allow for a reduction in industry production costs, and improve productivity. In fact, oil companies believe that the new agreement might lead to a significant reduction in labor costs, which would result in a larger investment flow into the region and attract new companies willing to exploit the formation. Indeed, in addition to the aforementioned companies operating in the Vaca Muerta region, there are some other companies that seek to increase their share, such as Wintershall, Shell, Pluspetrol, ExxonMobil, Statoil, and Pampa Energía. Moreover, the Government plans to install a new gas pipeline with the aim of exporting natural gas to Chile and to carry out a project under the public-private participation (PPP) model for the construction of a railway to Vaca Muerta (which would call for an investment of around USD 500 million). These projects are aimed at reducing production costs associated with transport and logistics.

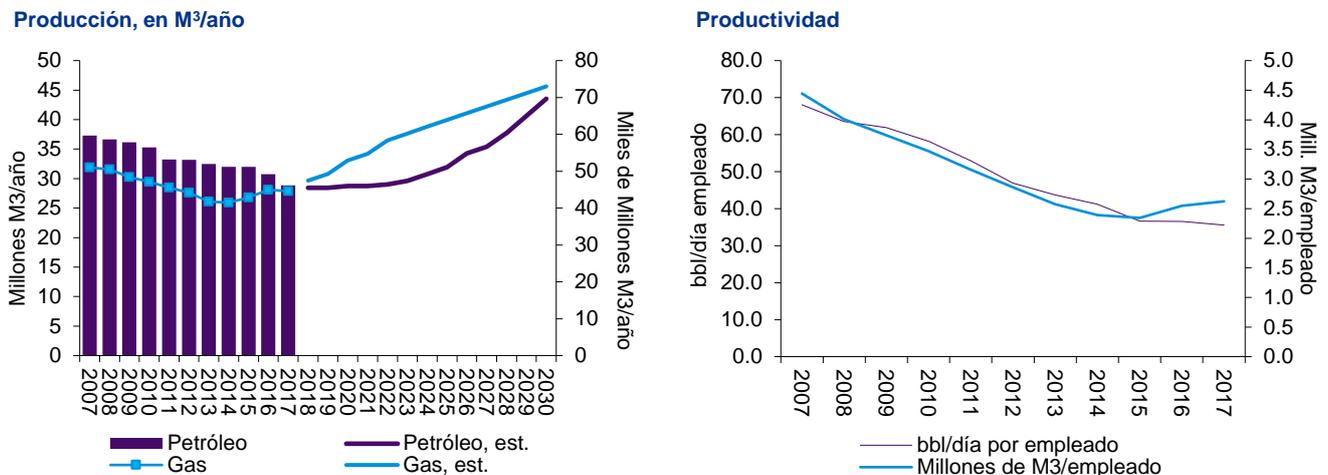
⁹ “YPF anunció una baja en costo de producción de Vaca Muerta a U\$S10 millones por pozo” [“YPF announced Vaca Muerta production cost went down to USD 10 million per well”], TELAM, September 13, 2016.

¹⁰ “YPF alcanzó un nivel de explotación rentable en Vaca Muerta” [“YPF reached a profitable exploitation level in Vaca Muerta”], TELAM, March 9 2017.

¹¹ It is estimated that Argentine wells use 70% more personnel than a comparable well in the US (“Las petroleras reducen costos para convivir con los bajos precios del crudo” [“Oil companies reduce costs cope with low prices in crude oil”], TELAM, October 9, 2016).

Figure No. 2
Changes in production and productivity in the Argentine Oil & Gas industry
Projection for 2030

(In thousands of cubic meters a year)



Note: i) The projection of production for the period 2018-2030 was based on the estimates published by the Argentine Department of Energy and Mining (MINEM) in its report “Energy scenarios 2030” (2017) about investment (oil) and trending (gas) scenarios; ii) to obtain an estimated measure of productivity for both gas and oil, the production of these resources was divided by total private and reported employment in the industry. Source: prepared by KPMG based on data collected from the U.S. Energy Information Administration (EIA), Argentine Department of Energy and Mining (MINEM), the Argentine Institute of Oil and Gas (IAPG) and the Argentine Labor Department (MTySS), 2018.

Coming back to production, Figure No. 2 shows the course of this variable and the productivity in the O&G industry over the last 10 years (2007-2017), as well as a projection of production up to 2030, based on the results published in the “Energy scenarios 2030” report issued by the MINEM (December, 2017). As noted, the oil production still shows a downward trend that started by the end of the 1990s and searches for a set of economic, institutional and political conditions to make it possible to reverse the trend and start growing. According to the figures published by IAPG, in 2017, the output of crude oil reached its bottom level in the last decade (29 million cubic meters a year). However, supported by the package of measures implemented to improve its performance, it is expected that the growing trend of the sector’s production be reinstated and that it may gain and maintain an annual 3% on average up to 2030 (which may account for 44 million cubic meters a year). On the other hand, the natural gas behavior has been different. Although it has shown a low performance in the last decade, its output started to reverse such trend in 2015, from an annual production of 41 billion cubic meter in 2014 to 43 billion cubic meters in 2015, achieving 45 billion cubic meters in 2017. This behavior dissimilar to that of crude oil derives from the result of government programs (mainly, the so called Plan Gas and the Program for promoting the production of unconventional gas) intended to boost investment in and production of natural gas within a context of supply crisis in connection with electricity and a substantial increase in the import of energy. By 2030, the trend of local natural gas production is also promising: it may account for 60 billion cubic meters in 2025 and exceed 70 billion cubic meters by 2030. Beyond the projections – which consider the changes and measures jointly adopted by the government and the sector–, the degree of success thereof, the new policies to be implemented in the future and the variations in the international price of crude oil barrel and gas MMBTU may move both estimates in either direction: upwards or downwards.

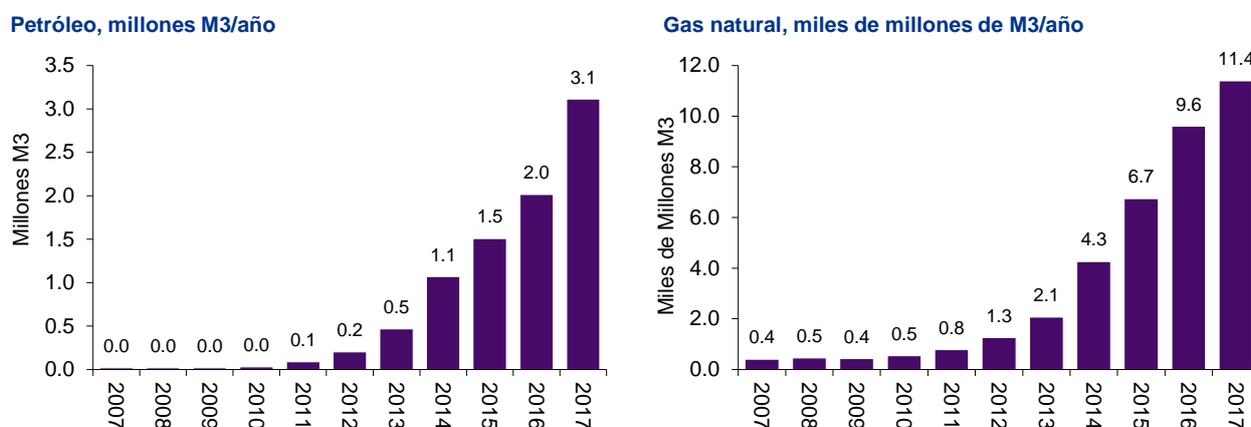
Regarding the productivity levels, a rate that measures the performance of the local industry in relation to the employment required (i.e. the quantity of product generated by a unit employed by day/year), Figure No. 2 shows that while crude oil has recently become steady around 35 barrels per employee, in the case of gas, in 2017, the increase would account for 2.6 million cubic meters per employee by year. The change in the trend of this performance rate, which may continue

growing from now on –if the potential results of the new Collective Bargaining Agreement, the decrease in logistics costs and the crude oil price stability are considered– forecasts a better return on investment projects (since productivity, stated at the price of the goods produced, works as a performance rate in the technical and financial assessments of investments), mainly in the Neuquina basin (Vaca Muerta formation), which may lead to new investments and support the production optimistic projections.

II.1. Unconventional resources

As mentioned, the discovery in Argentina of significant resources of unconventional hydrocarbons (mainly shale), whose estimated technically recoverable reserves, according to reliable resources (EIA), would amount to 27 million barrels in the case of shale oil and 22.7 billion cubic meters (or 802 cubic feet) in the case of shale gas, is a key milestone for the energy future of the country, as it is positioned among the economies with the highest potential for the production of this resource. It is estimated that most of total recoverable reserves of shale oil (16.2 billion barrels) and shale gas (308 billion cubic meters) existing in Argentina are in Vaca Muerta formation. Additionally, as indicated in other reports, the significant conventional oil and gas resources as well as the potential offshore exploration should not be disregarded. Actually, these resources are currently contributing to the total local production of hydrocarbons and are the main supply for generating electricity in the country.

Figure No. 3
Changes in the production of unconventional oil and gas 2007-2017 period
(In barrels and cubic meters a day)



Note: the levels of production shown in the figure consider the production of both shale and tight oil and gas.
Source: Prepared by KPMG based on data from MINEM, Universidad Austral and Hub Energía, 2018.

Over the last four years, the aggregate domestic production of unconventional hydrocarbons has jumped. Taking as a reference some of the years of the whole period with available data (see Figure No. 3), it may be noted that while the production of unconventional oil increased from 1 million cubic meters in 2014 to 3 million cubic meters in 2017, natural gas rose from 4.3 billion cubic meters (i.e., 10% of total annual production of natural gas) to 11 billion cubic meters (27%) in the same period. As it is well known, the Neuquina basin is the most important source of unconventional resources on the Argentine soil. YPF concentrates most of the production of this basin, mainly in Vaca Muerta formation (operated also by Chevron, Total Austral, PAE, Tecpetrol

and Wintershall, among others), and, at present, it is the company deriving the highest levels of production, about 45% of the total domestic output of unconventional resources.

Although the recent increase in domestic production of unconventional resources can be explained by the rise in international prices and the local programs to boost gas production, it would be premature to speculate as to the future outcome thereof, given that the company is still completing some pilot surveys in some areas and acquiring the necessary know-how to efficiently exploit the contents of the source rock within the upstream stage. In fact, currently, there are about 13 projects in the Neuquina basin, documented in Resolution No. 46 of MINEN (i.e., the program for promoting the production of unconventional gas, which provides a *support* price to the gas obtained from such source), which would mean investments in the amount of approximately USD 7 billion up to year 2021. In the case of oil, which has been governed by the law of supply and demand since the prior year (in line with the floating price of fuel) and whose average price at 2018 rose to USD/bbl 66, the analysts estimate that the crude oil barrel will not reach USD 80 until 2035. Consequently, companies are bound to operate at reduced costs and increased production efficiency by acquiring new technology and processes, in search of a profitable horizon, either in terms of production or prices. In Argentina, the government is seeking to promote and encourage agreements, while committed to make public investments to this end, to attract investments in local production in the short and mid-term. The MINEM expects that 2017 output be the platform from which local production will grow, estimating a change in trends and improved levels from 2018 to 2021. These projections rely not only on the conditions that will be locally generated but also on the experience and leverage of companies operating in our country, mainly in Vaca Muerta formation, which accelerates the local learning curve by seizing knowledge and experience gained by the American shale market.

Nevertheless, it is worth mentioning that the investments and costs involved in the extraction of unconventional resources are higher than those incurred in the production of conventional resources. Additionally, it should be understood that the decline in the production of unconventional resources is faster than in the case of conventional resources. In this regard, the development of policies designed to benefit the activity as well as the implementation of new agreements between the national and provincial governments and the O&G industry in order to improve the business environment and boost the investments to fight the price impact are still a priority. Although over the last years, a lot has been done (policies for subsidizing the price of conventional and unconventional hydrocarbons, addenda to collective bargaining agreements to reduce production costs and improve efficiency, and increased investment in infrastructure), the main risks to the development of the unconventional sector are the political uncertainties, macroeconomic instability and the behavior of prices. For these reasons, the government shall pursue an endeavor to control key variables such as inflation, interest rates, exchange rates, fiscal deficit, while it shall encourage new agreements to improve the legal and institutional frameworks (a major step, in this regard, was the new Hydrocarbons Law No. 27007, enacted in 2014); as all factors affect costs and the profitability expected by the oil companies, even considering that expenditures/investments required are quite significant, such as those involved in the exploration and exploitation of unconventional resources.

Moreover, unconventional resources entail a key component in reshaping the local energy matrix, aimed at overcoming the deficit in the trade balance of fuels and energy (which was reduced from its maximum amount in 2013 to the estimated amount of USD 3.3 billion in 2017), reducing gas and electricity imports and, finally, achieving, self-sufficiency. Although efforts have been made to increase the share of renewable resources in the energy matrix¹², which are sustainable, safer and

¹² Mainly, laws No. 25019/1998 (solar and wind energy promotion regime), No. 26190/2006 (supplementing the prior law by adding other renewable sources, such as geothermal, tidal, hydro, biomass and biogas energies) and No. 27191/2015 (National Regime to Foster the Use of Renewable Sources of Electric Power) intended to achieve 8% of electricity from renewable sources by 2018 and 20% by 2025. Additionally and to meet the objectives of this law, MINEM launched the public bidding program, RenovAR (the last bidding process was conducted in 2017).

less expensive –while favor foreign-currency savings–, reality shows that the energy matrix still depends heavily on fossil fuels. Consequently, besides the measures implemented for the benefit of the industry (supply), the government introduced other changes aimed at demand, mainly, in connection with the utilities rates in order to increase the performance of the generation, distribution and transportation of energy and gas for industrial and household consumption under a new scheme operating without transfers or subsidies that lead to distorted prices. However, the downward trend in international prices –though, recently, some recovery has been evidenced–, explained by the restrictions on production by OPEC producers and the increase in the production of unconventional gas and oil in the United States, as well as the international demand slowdown, increase the uncertainties about the development prospects of the sector, mainly in connection with investments in unconventional projects¹³ that require longer processes in the exploration and exploitation stages, including the source rock study (to define the best fracking method and maximize extraction) and performing pilot surveys to improve the know-how of the industry.

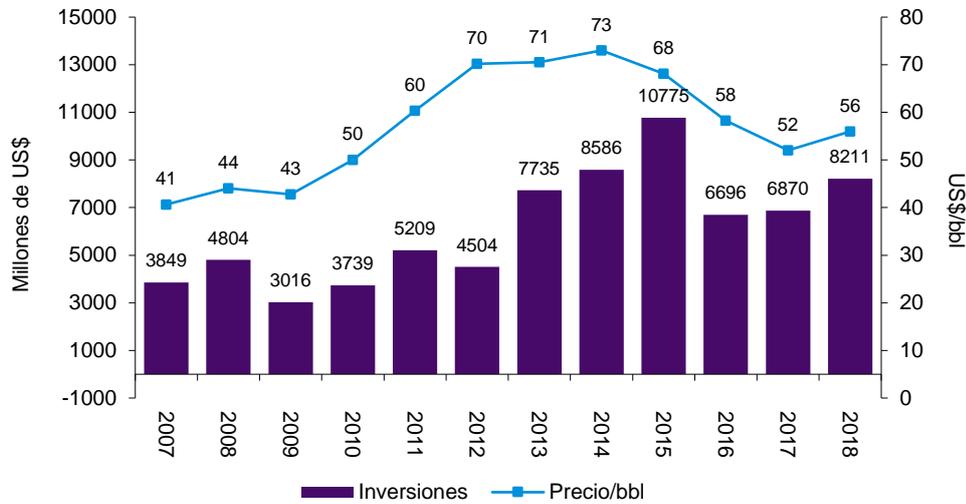
III. Investments in the O&G industry

In line with the development of the sector, the investment component shows a slight recovery in 2017, after the drop by 38% in nominal terms experienced in 2015 and 2016. As noted in Figure No. 4 depicting the changes in this variable and in the local price of oil over the last ten years, both variables show the same course during the period analyzed, which reflects the decisive effect of prices on the development of the sector. As sustained in the prior report (KPMG 2017), the political decision of placing the local price of oil and gas over international prices as from 2015 –through the implementation of programs for promoting hydrocarbon production (Plan Gas and the Program for Promoting the Production of Unconventional Gas, among others)– meant an effective protection intended to mitigate the fall in investments and the impact on the development of important extraction projects (mainly shale) as well as on the trade balance of energy (and the ensuing outflows of US dollars deriving from the import of energy). However, and despite some programs were discontinued during 2017 (particularly, Plan Gas that was discontinued in December 2017 and the new resolution of MINEM, whereby a floating domestic price scheme for fuel was adopted to reinstate a market based on international prices), investments projected by MINEM for 2018 expects a nominal increase of 20% with respect to the amount in 2017 that may exceed USD 8 billion (in line with the behavior of the expected crude oil barrel prices, estimated at USD 56 in 2018) and to resume the levels of 2014.

¹³ Nevertheless, this context has acted as an incentive for the overall nonrenewable energy companies, as they are operating within a low price scenario that forced them to reduce production costs and operating income.

Figure No. 4
Investments and local prices in the O&G industry 2007-2018

Inversiones



Note: the price of the crude oil for 2018 was taken from the projection made by the World Bank (*World Bank Commodities Forecast*, October 2017). The investment as of 2018 is that projected/forecasted by the MINEM.

Source: Prepared by KPMG based on Argentine Department of Energy and Mining (MINEM) and World Bank data.

Additionally, the government continues seeking new ways of promoting investment in the O&G industry and has a package of new measures to support conventional, unconventional (onshore) and offshore production. These measures include, among others, a new regime for the import of pre-owned equipment for the hydrocarbon industry (Decree No. 629/2017), which eases the import process involving pre-owned assets that the local industry cannot supply; the referred addendum to the collective bargaining agreement entered into between the government and the industry to reduce labor costs and improve efficiency and projects aimed at improving the infrastructure of the sector (such as the train to Vaca Muerta or the plan for a new pipeline to export natural gas to Chile). Also the bidding program for offshore areas, for which the sector has leading companies long engaged in this type of exploitation, or the extension of incentives to the production of unconventional gas in Vaca Muerta formation for projects that are in the development stage (resolution 419E of MINEM). This program benefits those companies that are currently conducting pilot surveys in several wells of the area based on substantial investments (from USD 100 million to USD 300 million).

However, as the results of all these changes may take time, the continuous low prices of raw materials may have a negative effect and reduce the foreign investors' appetite in the sector. Furthermore, and although YPF reduced the initial costs in the last two years (mainly, drilling costs), it is estimated that the unconventional activity still derives marginal income, which may also limit investments and CAPEX. Nevertheless, while the market starts a recovery and the shale producers improve their exploration strategies (acquiring know-how), Argentina improves its profile as one of the main targets for international investments in hydrocarbons.

Final Considerations

As noted over the prior years, the behavior of prices is still affecting the production of national and international hydrocarbons by directing total investments to the regions, which in an uncertain scenario, may offer the best potential environment for the oil business. The restrictions on crude oil supply imposed by the OPEC producers and partners as a result of the increased production in the United States take the hydrocarbons price to an unknown destination but, based on the most recent

data obtained and the projections of the World Bank, an upward trend is identified for 2018 and the following years.

In the local context, a more favorable environment has been shaped to foster investment in and production of hydrocarbons after years of neglect and a low performance, evidenced by the set of policies adopted to promote domestic consumption though not supply. As a result, an energy trade deficit is faced, which since 2011 has eroded the BCRA reserves in foreign currency and limits the use of this important resource for other purposes. Within a context of declining prices of the main energy commodities, since year 2015, the government has focused on adopting measures aimed at strengthening performance of the O&G industry through subsidy programs that implement a domestic *support price* for the local production of hydrocarbons. Thus, enabling the exploitation of the great potential of unconventional resources existing in the Argentine soil, mainly in Vaca Muerta formation (where, as estimated, most of total recoverable reserves of shale oil and gas of the country would be found). Additionally, over the last two years, the Government has striven for working out agreements with the main players of the sector (addendum to the collective bargaining agreement) to reduce labor costs and improve productivity. It has also removed the restriction on the import of capital assets and announced new investments in infrastructure to minimize logistics costs. Although Plan Gas and the programs for subsidizing the domestic price of the oil barrel were discontinued by the end of 2017, placing a floating price for fuels, there are still other programs in place, such as the program for promoting the production of unconventional gas for the province of Neuquén (to be effective up to 2021), which has been recently extended to projects in the development stage, and to other basins, such as Austral.

On the other hand, and strategically speaking, the development of renewable resources is still key to diversify the energy matrix. Despite the range of initiatives of the government involving the new law for promoting investment in renewable sources for generating electricity (Law No. 27191/2015, National Regime to Foster the Use of Renewable Sources of Electric Power) and the public bidding program, RenovAR, to award investment projects in this regard (whereby up to 2017, 147 projects were awarded in the total amount of 4467 MW at an average price of approximately USD 55 per MW/h), which are aimed at increasing these sources' share in the national energy matrix and reducing the import of fossil fuels, there is still a long way to go in this regard.

Furthermore, as mentioned in other reports, it is important to devise a strategy for diversifying the energy production in order to create incentives and the necessary conditions to foster and distribute local investments among the different resources and sources of generation. This relies on several factors. Firstly, because the exploitation of unconventional resources, considering their significance and current rate of exploitation, will only yield returns in the future. Secondly, because there are still important conventional hydrocarbons reserves to be exploited in our country (estimated by the EIA as of 2016 at about 2.4 billion oil barrels and over 0.3 billion of cubic meters of gas in conventional proved reservoirs). Finally, because the production of renewable energy is a factor that, in addition to contributing to the diversification of the energy supply, is considerably more sustainable over time than other alternatives.

Actually, the development of the global O&G industry in the short term will be mostly related to the accumulation and consumption of stock as well as to the market expectations about the consistency of these trends over time, which shall be essential to affect the most sensitive variables, such as investment, production and prices of the sector. Within the local scenario, we shall mention the good development prospects expected and announced for unconventional hydrocarbon resources and renewable resources, included in the national energy matrix.

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