



# Four important matters in the oil and gas industry for 2015

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# Introduction

As a consequence of the cycle of growth in the international price of commodities, which began in 2003 and started to show signs of coming to an end during the last global financial crisis (2008-2009), commodities and the countries producing and exporting them became a central topic. Energy commodities, together with soy and certain minerals, evidenced the highest price increases in most of the decade from 2003 to 2013. Oil offers a clear example of this, with an accumulated increase of 260%, in addition to natural gas (122%), carbon (162%), gold (288%) and copper (312%).

Most of the cycle is explained by the pressure exerted given the growth in the main emerging economies on the international demand for supplies. This growth has been a driver of the prices of most commodities exchanged in international markets, as revealed by the statistics on variations in the prices of oil, gas and coal, as well those related to imports made by these countries. In the case of China (maybe the most striking case), statistics indicate the existence of a high (positive) correlation, evidenced by the harmonic motion of variables throughout the period at issue (see Figure 1), which must be construed as the significant effect of this country and its imports on the price of commodities<sup>1</sup>.

However, the growth rates of the Asian giant have slowed down lately, from an annual average rate of 10% between 2000 and 2009 to a rate of 8% during the 5-year period 2010-2014. In fact, the International Monetary Fund (IMF) estimates that the projected growth for this country will not be higher than 7% annually, on the average, from now to 2020.

The slowdown in the economic growth of the Asian giant and the remaining emerging economies has produced an inverse effect on the prices of the main commodities compared to what propelled them since 2003, resulting in a gradual oversupply and producing an impact on the status quo and the future expectations of both businessmen and investors.

It is clear that in this new context, both as from 2003, when the cycle of growth in the international prices began, and presently, when prices have reduced, Argentina has played a central role.

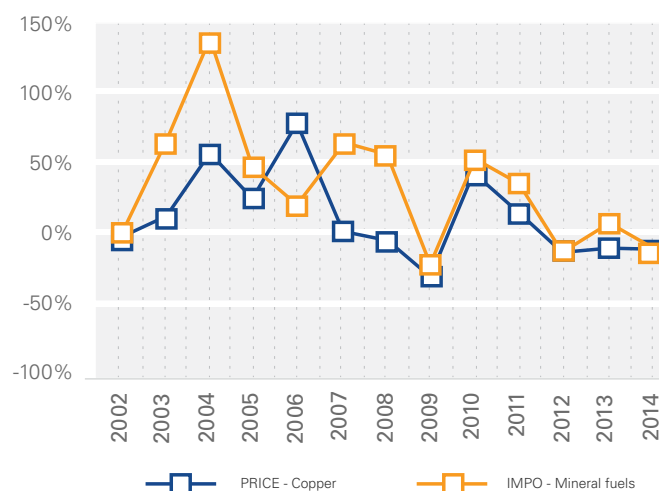
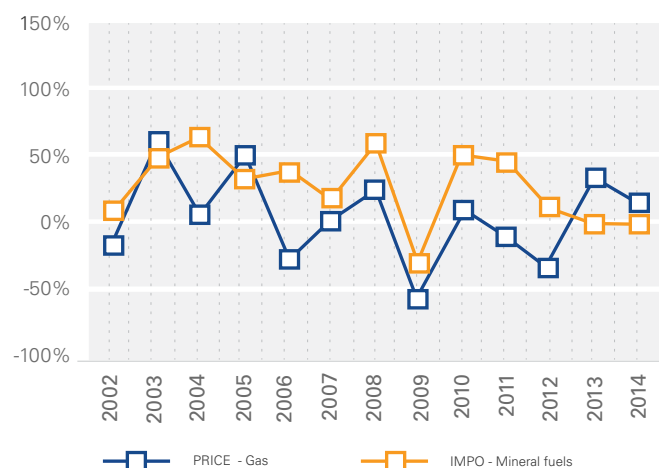
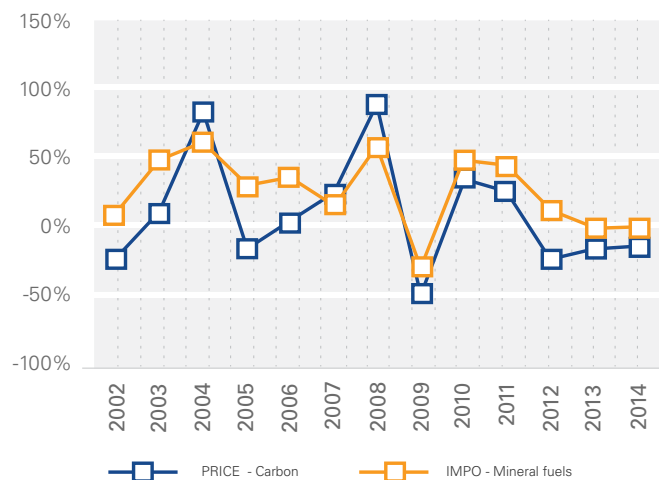
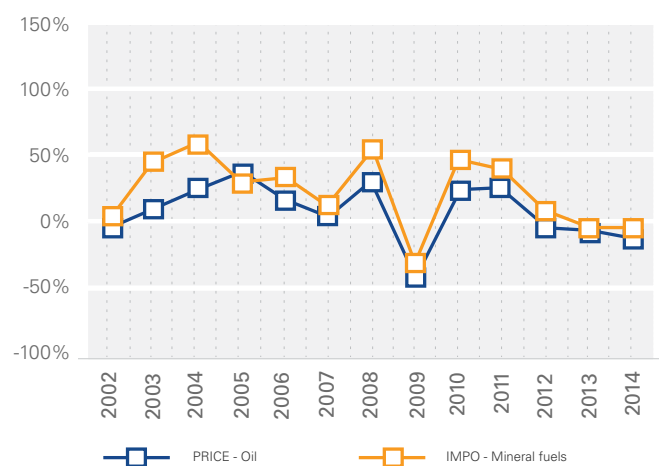
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<sup>1</sup> China is one of the main importers globally (in 2014 it imported 14% of the total amount of exports worldwide) and one of the most important purchasers of oil seeds (with a market share of around 46%), minerals (60%) and fuel (10%).



**FIGURE 1**  
PRICES OF ENERGY COMMODITIES/MINERALS AND  
DEMAND FOR IMPORTS IN CHINA: CORRELATION

(% variations)



Source: Prepared based on INTRACEN (COMTRADE) and World Bank data (2015).





As it is a producer and exporter of raw materials (around 6% of its GDP and around 25% of its exports are represented by primary production), and it has historically depended on external ups and downs, Argentina experienced an unprecedented growth in the decade 2003 to 2012, with a fall in 2009, due to the effects of the international crisis, and in the last two years (2013 and 2014). During the first five years, the increase in the price of commodities brought about a proportional rise in the terms of trade, which, together with a retarded exchange rate and stable domestic prices, generated a competitive advantage in international markets, which substantially improved the Argentine exports of commodities and the balance of trade, thus causing a constant increase in international reserves.

Nevertheless, other internal and external events taking place during the same period, but with a stronger impact in the last years, deteriorated the good economic conditions. The lack of investment, given the unused installed capacity during most of the 90's, which began to lack during the first years of the new century after the industry reactivation, jointly with an economic model of growth strongly supported by consumption, reduced the supply and generated a considerable increase in domestic prices. In addition, there was a strong devaluation in 2014 as a consequence of the pressure on the internal demand for foreign currency, the lack of local trust and the loss in the currency purchasing power; added to the deceleration in the growth of emerging countries, and a significant and constant fall in national exports, the emergence of an important energy deficit aggravated by the above described decrease in the price of commodities, which, reduced the inflow of foreign currency derived from agribusiness, but at the same time benefited the country by making the import of energy more affordable.

However, there is a major milestone related to the oil and gas industry that is worth remarking. Argentina stopped being a net exporter of energy in 2011. This event was explained by a significant fall in the production of oil and gas that started by the end of the 90's and was evidenced in 2004, when the Argentine Government was forced to develop the National Energy Plan, and by inconsistent policies applied to supply (non-profitable prices and uncertainty, which reduced investments) and demand (subsidized rates which promoted excessive consumption). After 2011, and due to these events, Argentina became an importer of gas and electric power, which has negatively affected its balance of trade. Therefore, a large portion of foreign currency from exports must be allocated to the purchase of energy from countries within the region (such as Bolivia, Uruguay and Paraguay) and outside the region (for instance, Qatar, Trinidad and Tobago).

In this scenario, from now on, any changes in the oil and gas (O&G) industry, at both the national and international level, as well as the issues faced by this industry in 2015, are key to understand the future of the industry and, to some extent, of the Argentine economy.

In general terms, it can be asserted that the stagnation in the growth evidenced by emerging countries, and the effect on the price of commodities, together with the instability between the supply and demand, is one, though not the only, of the main issues to be faced by this sector during the second half of the year. Other issues include the following: a) the impact of unconventional resources and their effects on the new context, b) the changes in internal productivity, and c) the importance of renewable resources.

## 1. Fall in international prices

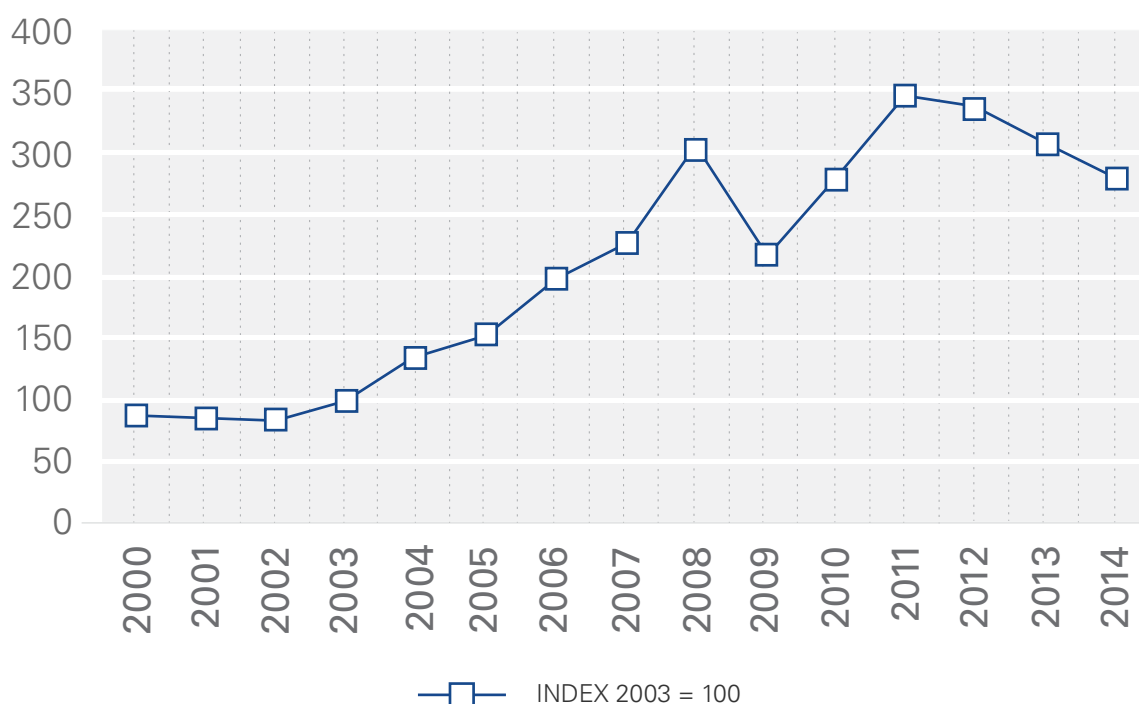
The recent deceleration and subsequent fall in the international price of the main commodities represent one of the milestones that have most affected the oil and gas industry in the last time. After a somehow stable period of growth between 2003 and 2011 (except for the fall experienced in 2009 due to the international financial crisis), the average price of oil<sup>2</sup> reached a plateau in 2012 (around US\$ 100 per barrel) and then went down in the first months of 2015 to around US\$ 50 and US\$ 60 per barrel.

Such was also the case of the price of gas, which, despite having recovered after 2009, decreased by the end of 2014, reaching an average price of US\$ 7.21<sup>3</sup> (per MMBTU)<sup>4</sup>. The remaining commodities showed a similar behavior: coal went from a maximum of US\$ 123 per metric ton in 2008 to US\$ 70 in 2014; soy went from a maximum of US\$ 591 per ton in 2012 to US\$ 491 in 2014; and, in 2011, copper reached a maximum of US\$ 8,800 per ton, then falling to US\$ 6,800 per ton by the end of 2011 (**see Figure 2**).

**FIGURE 2**

CHANGES IN THE PRICE OF THE MAIN COMMODITIES (Oil, gas, coal and soy).

(Average of Index 100 = 2003, US\$ per unit)



Source: Prepared based on World Bank data, 2015.

<sup>2</sup> Resulting from making an average of those observed for Brent, Dubai and WTI.

<sup>3</sup> This price is the average of the prices of natural gas in the United States and in Europe.

<sup>4</sup> The production and export of shale gas by USA has been a key factor for the decrease in the price of this supply

One of the factors that best explains the recent changes in international prices is, as mentioned before, the deceleration in the economic growth of emerging economies. The inconsistency between the growth projections for China and other countries and the actual situation is one of the main difficulties faced today by the producers of commodities. If we analyze the statistics provided by the International Monetary Fund, it can be noted that whereas in 2013 the entity estimated a growth of at least 7% for China by 2018, today it estimates that such figure will be just above 6%. Thus, the fall in the current and projected increase in the GDP of China, as well as most emerging countries, results in a proportional decrease in the international demand for imports, and an oversupply promoted by the investments made on the basis of prior-year growth projections, which nowadays affect the estimated profitability for most of the projects already in progress.

In Argentina, the drop in the price of hydrocarbons has raised hopes for important projects such as Vaca Muerta, aimed at exploring and exploiting unconventional resources (shale). The YPF-Chevron agreement to produce unconventional hydrocarbons (the most important agreement within the industry, which requires an investment of US\$ 15 billion) estimated an average price ranging from US\$ 80 to US\$ 100 per barrel. Taking into account these projections, which were applied to support investments and estimate the profitability of the project, and the downward trend of the oil and gas price during the last year, it is not surprising that the development of the project in Vaca Muerta, as well as those in other fields (such as Los Molles, San Jorge Gulf, or Chaco), may be delayed. However, Argentina's potential in connection with this resource continues to attract the attention of the main companies worldwide. This is evidenced by the announcement made on July 15, 2015 by the Governor of Neuquén, Jorge Sapag, about the commitment of YPF, PAE and the German company Wintershall to investing US\$ 30 billion in the development of South, Central and North Bandurria concessions.

For the purposes of maintaining the expectations of the O&G sector, during 2014, the Argentine Government has implemented price agreements with producers, a reduction of up to 20% in tax rates applicable to the transfer of fuels, a decrease in export withholdings and grants for oil production. In this way, the authorities expect to offset the losses that might be recorded by the industry as a consequence of the fall in international prices. These promotion policies are aimed at keeping oil investments and reversing the negative trend in the national production of hydrocarbons and the energy account deficit, at least in the medium term.

## 2. The solution is found in unconventional resources

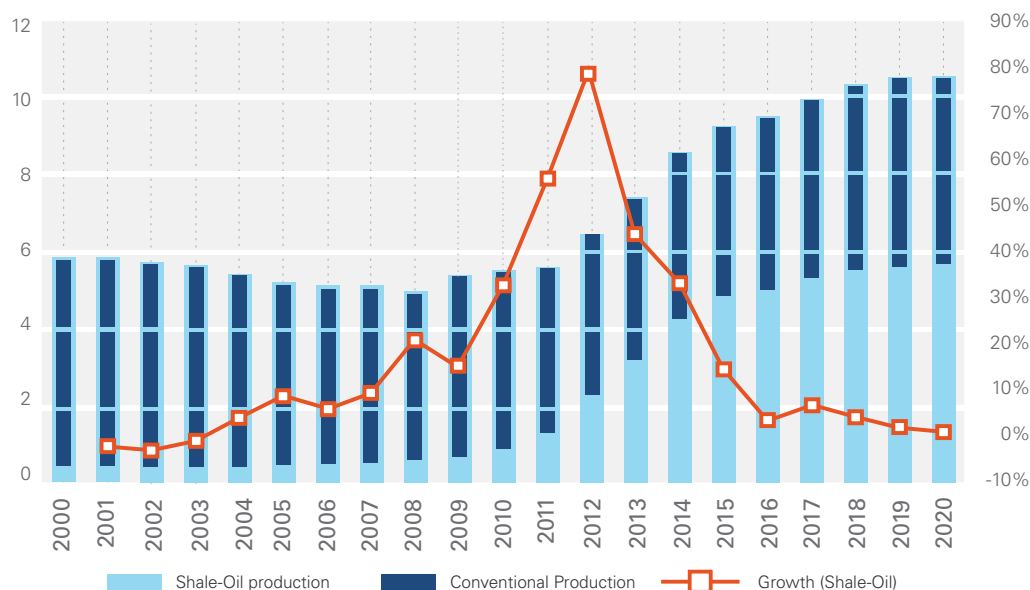
As a consequence of the discovery of unconventional hydrocarbons in their soils, the countries with these resources have begun to devise domestic policies intended to encourage their exploration and production. An example of success is represented by U.S.A., which has positioned as a leader in the industry. This country was the first to produce shale (the most common type of hydrocarbon extracted on the basis of unconventional methods) and to allocate physical and human resources to the enhancement of extraction techniques, without distorting the sector's profitability. This has allowed it to deter the decline in O&G production, gradually reduce imports and become the main global producer of shale, which explains, to a great extent, the decrease in prices.

As it can be noted in Figure 3, the production of shale oil has strongly risen in U.S.A. in the last decade, particularly between 2009 and 2012, when the production of unconventional oil grew at an average annual rate of 40%, from 590 thousand barrels a day to more than 2 million. During 2014, U.S.A. produced 4 million barrels a day of shale oil, on the average, and in 2015 such figure is expected to be over 4.7 million. Oil accounts for around 50% of total production, and according to statistics and projections provided by the U.S. Energy Information Administration (EIA), this trend is expected to continue by 2020, though at a decreasing rate.

Taking into account the possible energy crisis that the world will have to face in a near future, as well as past trends in the price of O&G, unconventional hydrocarbons are presented as a clear solution for those countries that have accounted for a considerable reduction in their proved conventional reserves (U.S.A., Colombia, Australia and Mexico represent a clear example), and a potentially profitable project for the other countries (basically those which have been unable to develop the hydrocarbon sector due to poor investments or difficulties in affording an energy matrix strongly based on fossil fuels).

**FIGURE 3**  
**U.S.A.: SHALE-OIL PRODUCTION**

(In millions of barrels a day)



**Note:** The production of oil for the period 2015-2020 is estimated by the EIA.

**Source:** Prepared based on EIA data, 2015.

The discovery in Argentina of important reservoirs of unconventional hydrocarbons (mainly shale), with technically recoverable reserves estimated at around 21,000 billion cubic meters of gas and approximately 27,000 million barrels of oil, is a major milestone for our country's future in terms of energy, which makes it one of the countries with the highest potential for the production of unconventional resources. As it can be seen in the reports prepared by the EIA between 2011 and 2013<sup>5</sup>, Argentina is the third potential producer of unconventional resources globally, after China and U.S.A. Furthermore, it is worth noting the vast reserves of conventional oil and gas, which entails a considerable challenge and a golden opportunity to achieve energy self-supply in the future, thus fostering national development.

However, the investments and costs to be faced for the extraction of unconventional resources are significantly higher than those required for the production of conventional resources and, therefore, it is of paramount importance to devise policies aimed at improving the business climate, encouraging investments and offsetting the negative effects of the recent fall in the present and expected levels of international prices.

The exploitation of unconventional resources seems a real and innovative solution to the problems posed by energy supply shortage in a country which, in two decades, has gone from the self-supply achieved in the 90's to the present dependence on the import of energy. This imbalance is commonly deemed as temporary because Argentina has the necessary resources, infrastructure and expertise in hydrocarbons to meet these challenges in a domestic market where the main global players, such as Chevron, Total, Petrobras, Shell, Pluspetrol, Madalena Energy, Pan American Energy and CNOOC (China National Offshore Oil Corporation), operate.

<sup>5</sup> EIA, World Shale Gas Resources: An initial assessment of 14 regions outside United States (April 2011) & EIA /ARI, World Shale Gas and Shale Oil Resources assessment: Energy Information Administration-Advanced Resources International, (June 2013).

In this economic, financial and energy context, Argentina urgently needs to enhance the sector development in order to balance trade and fiscal accounts and, especially, to reduce to a minimum the use of US dollars allocated to the import of energy. The potential of unconventional resources has acted as a strong incentive that has led the Argentine Government to draft a new hydrocarbons law<sup>6</sup>. Moreover, since the nationalization of YPF in 2012, other measures have been taken to encourage investment and production, such as the improvement in the wellhead price of gas. Additionally, a strategy –though ineffective– was designed to remove subsidies on gas and electric power for residential and business customers. These policies have been implemented within the framework of the imbalance generated by the energy deficit in the remaining economy, basically in the industry. Nevertheless, the recent fall in the price of energy commodities, partly explained by the increase in the production of unconventional oil and gas in U.S.A. (which is estimated to achieve an energy self-supply in the medium term), and by a lower dynamism of the demand (China has exerted less pressure on the demand in the last years), is undermining the sector's development prospects, particularly investments in unconventional projects. Due to these “difficulties,” the Argentine Government has recently taken certain measures, including the reduction in withholdings on the export of these resources to ensure the profitability of the sector and its investments, and thus protect projects relating to unconventional fields.

Despite the retarded development of the sector that these events associated with external circumstances might cause, it is to be noted that, irrespective of their negative effects, the drop in the international prices of energy goods may improve, to some extent, the Argentine balance of trade, positively impacting reserves and exchange rate pressures in a context of falling exports and high level of imports. Notwithstanding the foregoing, it is also crucial to further diversify the energy matrix, with a greater share and development of renewable energies, and to create a foreseeable business environment, while encouraging the development of biofuels and correcting market failures, and gradually reducing the structure of subsidies on consumption rates.

### 3. Increasing production

Despite the behavior of international prices and their impact on the forecasted profitability of ongoing projects, production and operating costs have not dropped at the same pace<sup>7</sup>, which represents a central problem for the sector from both the local and the international standpoint. In the case of Argentina, the production of hydrocarbons has been decreasing since the 90's, due to the mismatch caused by the application of inconsistent policies to supply (non profitable prices and uncertainty) and demand (subsidized rates that have led to uncontrolled consumption), which significantly discouraged investments and created a vicious circle, thus reversing the growth trend in the oil and gas activity, which started to record negative rates again, as in the first half of the 80's<sup>8</sup>.

Debido a la merma en la actividad, Argentina debió a comenzar a importar en 2011 lo que antes sabía generar (gas y energía eléctrica) y destinar gran parte de los ingresos provenientes de las exportaciones a la compra de esos bienes. Puertas adentro del sector, la productividad, representada en la Figura 4 en formato de índice, se desmoronó en sintonía con la inversión durante igual período de tiempo.

Due to the slowdown in activity levels, in 2011, Argentina had to start to import some goods that it formerly produced by itself (gas and electric power) and to spend a great deal of revenues derived from exports on the purchase of such goods. From the sector standpoint, productivity, which is represented in Figure 4 as an index, dramatically declined, in line with the fall in investments during the same period of time.

As it can be noted, the sector labor productivity, which measures the amount of goods produced per unit employed, started to become stable after 1998 and has fallen down since 2003. During subsequent years, the lack of incentives was even higher than external market signs that offered an opportunity. In this scenario, the growth of emerging economies and their pressure on international demand for factors created a cycle of increases in oil and gas prices, whereas Argentina continued to face limitations in the internal market and those imposed by a development model that is based on demand (consumption) and neglects

<sup>6</sup> In general terms, as a result of the amendment to the Hydrocarbons Law No. 17319 (or Law No. 27007 of 2014), concessions (particularly those exploiting unconventional fields) have been extended, the royalties to be paid by companies have been maintained and Decree 929/2013 (Investment promotion regime for hydrocarbon exploitation) has been converted to law. The main purpose of such regime is to promote investments in the oil sector by setting guidelines to release companies from paying export duties and authorize the remittance of foreign currency for projects involving investments higher than US\$ 250 million.

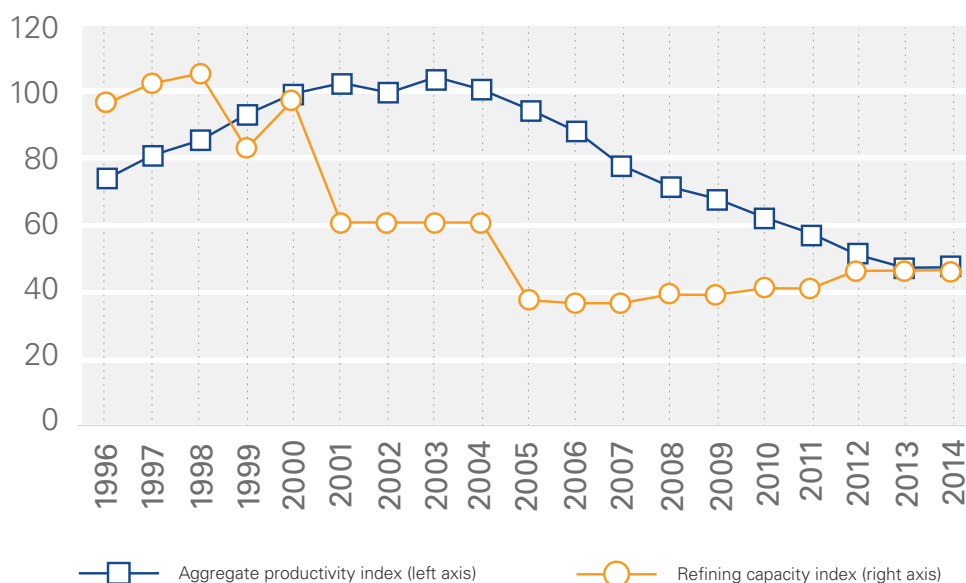
<sup>7</sup> En el caso del *shale*, por ejemplo, la caída en los costos se ha hecho algo más notoria (por caso, un informe de YPF destaca que ésta ha logrado reducir los costos de perforación en un 32% en solo un año de operación en Vaca Muerta).

<sup>8</sup> Entre 1998 y 2003 la actividad de extracción de petróleo cayó a una tasa del 1% anual promedio. En contraste, en el período que cubren los seis años anteriores (1992-1997) la actividad creció al 9% anual promedio.



**FIGURA 4**  
**CHANGES IN PRODUCTIVITY AND REFINING CAPACITY**

(Index 100 = 2000)



**Note:** The aggregate productivity index is the average between oil and gas productivity indexes, which are obtained by dividing the total barrels of oil and the cubic meters of gas produced per year by the number of registered employees in the crude oil and natural gas extraction area under the International Standard Industrial Classification of All Economic Activities – ISIC – (100 = 2000). Due to the lack of more accurate information, the refining capacity is used to assess the investment in the sector<sup>9</sup>

**Source:** Prepared on the basis of U.S. Energy Information Administration and Business Monitor International, Oil and Gas Report, 2Q 2015.

supply (investment). Furthermore, the drop in productivity levels and its trend hinted significant reductions in project returns, which contributed to the decrease in investments and the atomization of a sector that, even with large natural reserves that remain unexploited, was not under the financial conditions necessary for development.

In fact, investment, which in the figure above is estimated by the local refining installed capacity (also converted to the index 2000 = 100), progressively decreased throughout the whole period under analysis. During the last years, capacity has become stable at 630,000 barrels per day and the effective use, at 83%. According to the statistics collected and the projections made by the Business Monitor International (BMI) and the U.S. Energy Information Administration (EIA), no further considerable changes are expected for the future, in the light of such information, in investments devoted to increasing refining capacity; however, a gradual increase in use, estimated at 100% after 2020, is forecasted.

However, the discovery of unconventional oil and gas formations has revitalized a sector that is struggling to regain its position at the worldwide level, imitating the experience of the United States, and to achieve the much desired energy self-supply in the long run.

Upon the discontinuity of favorable conditions derived from external circumstances, and with the decline in the growth of emerging economies, as well as in the prices of energy goods, the future context will be more related to the present than to the past, that is, to falling prices and a more stable international demand, which is clearly detrimental to the development of sectors that are essentially dependent on these factors. However, as it has already been mentioned, upon the nationalization of YPF in 2012, Argentina has been implementing a series of policies aiming at fostering the investment and production of hydrocarbons in a less favorable context (see Table 1).

<sup>9</sup> According to a report issued by the Department of Economic Policies of the Argentine Ministry of Economy in 2001, around 86% of the oil extracted is used in refining (the remainder is exported as crude oil).



**TABLE 1**  
**FIVE INCENTIVE POLICIES FOR INVESTMENT AND PRODUCTION**

POLICY	OBJECTIVE
US\$ 7.5 PER MMBTU FOR GAS	Gas production
HYDROCARBONS LAW No. 27007	Production of unconventional resources
CONVERSION INTO LAW OF EXECUTIVE DECREE 929/2013	Promotion of investment
CREATION OF THE FIRST UNCONVENTIONAL AREA FOR 35 YEARS (NEUQUÉN)	Production of unconventional resources
PRICING AGREEMENTS (US\$ 63/77 PER BARREL) AND INCENTIVES FOR OIL (US\$ 2/3 FOR MAINTAINING/INCREASING PRODUCTION)	Promotion of investment and oil production

**Source:** Prepared on the basis of information provided by YPF (2015).

Although part of these initiatives have already been described in other sections of this report, it is to be noted that their very nature is to promote domestic production of hydrocarbons. The first initiative, in addition to being consistent with existing resources, is aimed at promoting gas production within the country's borders, thus reducing imports, setting aside the national policies encouraging depressed prices, which adversely affected the profitability of the sector. In addition, the objective of the amendment (Law No. 27007) to the old law of hydrocarbons, approved in 2014, is, among others, to facilitate and promote the production of unconventional O&G (see footnote No. 6), as well as to convert Executive Decree No. 929/2013 for the promotion of investment into law. In line with these initiatives, exploitation agreements have been entered into for the production of shale resources in Vaca Muerta and Los Molles formations, in Neuquén. Pricing agreements have also been concluded to promote the development of the sector under unfavorable conditions.

If these policies are successful and Argentina manages to channel production and the characteristic dynamism of the O&G industry during the coming years, improving the investment and productivity levels, benefits in the middle run will be significant, as this sector is crucial for the rest of the economic activities. Furthermore, the country will be able to settle its trade accounts and overcome the current energy deficit, while paving the way to self-supply, and to take advantage of the technology spillover and knowledge that this sector may generate in the middle and long run

## 4. Replacement of fossil fuels by renewable resources

It is widely known that, as long as fossil fuels do not start to be replaced by other fuels, they will constitute an insurmountable barrier to the worldwide economic development, due to their finite nature. Furthermore, the amounts of CO<sub>2</sub> (carbon dioxide) that our civilization has been emitting to the atmosphere when burning this type of fuels and their related adverse effects on environment are worrying.

According to EIA's statistics, during the last 35 years, emissions of carbon dioxide in the world have increased by 75% due to the burning of fossil fuels. Argentina's emissions have increased by 97% during the same period<sup>10</sup> (1980 - 2014). In line with these increases, which are part of a global trend impacting global warming, countries have become more dependent on polluting fossil fuels in their energy matrices, indefinitely postponing international agreements that are aimed at increasing the share of renewable resources in the mix of energy sources. Accordingly, the recent exploitation of unconventional hydrocarbons, and the discovery of abundant unconventional resources in many countries have considerably contributed to such deferral, widening the gap between prices and the opportunity cost when using one or other source (i.e. fossil and renewable fuels).

Notwithstanding the foregoing, there are many countries committed to reducing the use of fossil fuel and to moving towards renewable and cleaner energy. Although Argentina is among these countries, it has not been able to reduce the influence of oil in its energy matrix<sup>11</sup>.

Argentina has developed a legal framework to promote the use of renewable energies since 1998. Law No. 25019, which establishes a promotion regime for wind and sun energy, represents a clear example. Furthermore, in 2006, Law No. 26190 of renewable energies (which was intended to be supplementary to the aforementioned law) was enacted. In addition to widely-known renewable energies, such law included geothermal, tidal, hydro, biomass and biogas energies. One of its goals is that, by 2016, 8% of all the electric power locally used may derive from renewable sources. According to experts improving the production and increasing the share of renewable energies is critical due to the following five reasons 1) they are sustainable (a mix of these energies would allow for the generation of a portion of the necessary energy); 2) they are safe (the current deficit may be overcome at competitive prices and with no risk of collapse); 3) they are economical (foreign currency savings are generated); 4) they may promote local industry development; and 5) they do not pollute.

However, results have not been significant. According to a research conducted by KPMG in Argentina during 2014, only 2% of the electric power generated derives from renewable sources. Therefore, it is unlikely that the goal set by the law may be fulfilled by 2016. The causes of such a poor performance are, among others, the lack of financing and the weak regulatory framework, which, according to experts, needs to be updated. Such update would be materialized in the so called "Guinle" Law<sup>12</sup>.

<sup>10</sup> Industry, transport and electricity generation being the areas that contribute the most to the increase of such emissions.

<sup>11</sup> According to the Argentine Department of Energy, in 1970, the national energy matrix comprised 71% oil, 18% natural gas and 11% of other factors. In 2013, the natural gas share reached 53%; the oil share, 33%; and the other factors share, 14%. The last-mentioned ones include hydro energy (4%), nuclear energy (2%), bagasse (1%), heating oil (3%), coal (2%), firewood (1%) and others (1%).

<sup>12</sup> La Nación newspaper, "¿Por qué Argentina tiene que alcanzar el objetivo del 8% en renovables?" [Why is it necessary for Argentina to fulfill the 8% objective for renewable energies] (4/11/2014).

## 5. Final considerations

The increase in the prices of energy commodities during the last decade should have been an incentive for the domestic production of hydrocarbons, and it should have also changed the situation of a sector that, far from evidencing any changes, has performed poorly due to local policies that favored internal consumption and discouraged investment. The coexistence of positive signs from the external market and domestic limitations should have somewhat encouraged the move towards alternative energy sources and a greater development of renewable fuels, but that was not the case. On the contrary, during the last years, Argentina's energy needs became a matter of concern. Nowadays, hopes lie on the recent worldwide boom in the exploration and exploitation of unconventional resources, and Argentina is among the first five countries with the largest (unproven) reserves, according to EIA.

As it has already been mentioned, the Argentine Government has implemented a series of policies and concluded several agreements with foreign companies for the purposes of creating a more favorable environment for the development of the industry. In addition, the development of renewable fuels, which are essential to diversify the matrix and contribute to reverse climate change, has been postponed in order to generate greater amounts of fossil fuels that may meet local energy needs, thus eliminating the imports of these commodities, which, between 2013 and 2014, have represented around 15% of total imports. Accordingly, it is clear that, during 2015 and coming years, the oil and gas industry will be critical for local development as long as some additional problems that have recently arisen, especially at the worldwide level, can be overcome.

Throughout this report, the main issues faced by the oil and gas industry during the present and coming year were addressed. Even when the issues discussed herein are critical to determine the performance of the sector, they are not the only ones. There are other issues concerning this sector that should be included in the agenda: 1) need for qualified human resources, 2) obstacles to the financing of investment projects, 3) hedging agreements within a context of falling prices, 4) environmental impact, 5) legal security, 6) need for greater investment in infrastructure (not only in connection with the requirements to exploit unconventional resources, but also in relation to distribution and transport), and 7) a detailed analysis of the pricing process.

In parallel, it would be advisable that a diversification strategy be implemented for the extraction and production of hydrocarbons and for the overall production of energy. Firstly, because devoting all resources to the exploitation of unconventional resources –if successful– would only be profitable in the long run. Secondly, because, according to EIA, more than 2,500 million barrels of oil and around 370,000 million of cubic meters of gas in proven conventional reservoirs would remain unexploited in Argentina, and 2,200 million of barrels of oil and 1,217 billion cubic meters of gas remain undiscovered. Finally, because the production of renewable energy is a factor that, in addition to contributing to the diversification of energy supply, is considerably more sustainable over time than the other alternatives and this is certainly where the world's attention should be focused. This means that Argentina's challenge to overcome the energy deficit consists in being smart enough to develop strategies aiming at increasing the production of conventional and renewable resources in the short and middle run, while continuing to develop unconventional resources, which will yield maximum profits in the long run, with a focus on the potential of Vaca Muerta and other major shale formations in Argentina. ■





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