Argentina's Energy Transition:
The Macri Government's Vision

Mauricio Macri's election in late 2015 sent shockwaves across the hemisphere. Indeed, there was a period of euphoria as he announced his cabinet, economic team and desire to pursue unity and reset Argentina's regional and global standing. Throughout the campaign, he had made clear his intentions with regards to revitalizing the country's economic outlook, investment climate and particularly the energy sector. President Macri embraced the expectations for his administration when, during remarks to open this year's legislative sessions, he said that his government will change the country's history.

Since assuming power in December, the government has moved swiftly on a variety of fronts from navigating a path to a solution for the long-standing impasse between Argentina and international creditors and confronting onerous capital controls, the country's currency, export duties and jury-rigged inflation statistics.

The Macri government also brought a technical seriousness to the nation's energy bureaucracy, as well as a strong push to move beyond the "disorder" and "poor management" they inherited. There have been clear marching orders from the top as the administration works to "normalize" the many government institutions that had languished for years. In addition, little time was wasted to confront strongly entrenched market distortions and massively costly inefficiencies in the country's energy system.

President Macri's Early Moves on Energy

Quickly focusing on the nation's nearly bankrupt energy sector was immensely important for the Macri administration. During the first 100 days, optimism abounded but simultaneously the necessity to focus on the enormity of the needs for the nation's energy sector ushered in an increasingly workmanlike atmosphere.

Over the last few years, energy contributed around 5% of the nation's GDP, 6% of its export revenue and 17 percent of imports. Indeed, the interconnection between the nation's fiscal imbalance and the cost of energy subsidies and imports was clear and demanded immediate attention. Energy subsidies cost on the order of 12% of all government spending in 2014 while energy imports that same year totaled US$6 billion.

President Macri assumed power with a clear understanding that these statistics must be met head on if the country is to revitalize the energy sector and use it as a motor to jumpstart economic growth and be a significant driver of reform.

The Macri Government's First Look Energy Vision and Policy

At the 100 day mark, the Macri government has made a concerted effort to push the energy narrative past what was inherited toward how to manage the sector in their four year term. Indeed, the Ministry of Energy and Mining has been busy in an earnest effort to construct a detailed and strategic vision for the energy sector. The first draft, along with several first steps, is in place with the formal energy outlook for the government set to be finalized and published later this year in September.

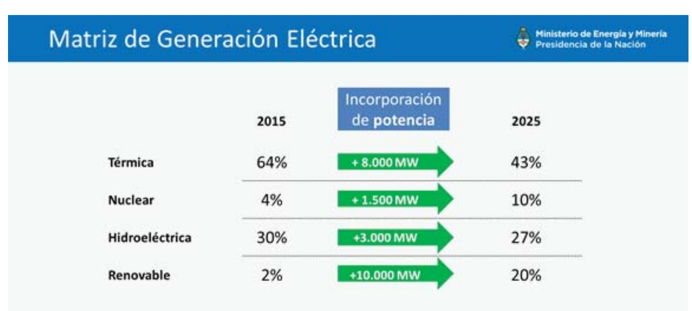
The initial draft of the Macri government's energy plan 2015-2019 has four key tenets and objectives:

• *Normalize regulatory institutions and the operation of energy markets;*
• *Improve access and efficient use of energy for the country's residents and its productive sectors;*
• *Supply the energy needs for a developing country;*
• *Diversify the country's energy matrix and boost usage of renewable energy sources.*

As part of the energy planning process, the government has developed preliminary plans for achieving the abovementioned goals for the sector by 2025. In terms of the primary energy matrix, the goal is to reduce oil from 32.6% to 23.7%, slightly reduce natural gas from 51.1% to 49.6% and increase renewable energy from 6.6% to 14.4% and nuclear from 2.5% to 5.6%. Hydroelectricity would also slightly decline from 5.4% to 4.8%.

Similarly, in the electric sector the government intends to boost the percentage of renewable power generation from 2% to 20%, nuclear generation from 4% to 10% and reduce thermal generation from 64% to 43% and hydroelectricity from 30% to 27%. (See Figure 1)

Figure 1: Changes in Argentina's Electric Generation Matrix 2015-2025



But as they craft a medium and long term strategy for the sector, the work has already begun on several fronts. Only days after taking office in December a state of emergency was declared for the nation's electric system to avoid what the energy minister called the possible collapse of the system. The presidential decree granted powers through the end of 2017 in an effort to stave off outages, deal with the challenges of the market distortions and begin medium and long term planning for the system.

As part of the emergency decree, the government also moved swiftly to complete a campaign promise to liberalize prices in the electric sector and deal with the long-standing problem of distortive subsidies. New prices for the national wholesale power market were introduced in January covering the three months between February and April. Further cuts to electric subsidies are likely later this year in an effort to move electric prices toward more market based rates. The goal in confronting these distortions and fiscal issues is to foster a more attractive investment climate and one that overturns years of confrontation between the government and private investors in the nation's energy sector.

Another early move that was applauded by markets and the investment community was the government's creation of a Ministry of Energy and Mining. The new ministry brought into government a wide range of experienced practitioners and energy sector veterans. The ministry replaced a Secretariat of Energy that had ceased to provide policy direction or vision.

As part of the new ministry, several new secretariats and undersecretariats were created including a renewable energy undersecrariat that will work to comply with the national goal of 8% renewables by 2017, a secretariat of energy scenarios to manage energy planning in the medium and long term (15-40 years) and an undersecretariat for energy savings and energy efficiency, which seeks to reduce consumption by 5% by 2020.

Vaca Muerta

For the last few years, Argentina's modest energy revival has largely been rooted in the US Energy Information Administration's analysis of the country's vast unconventional oil and gas potential. Argentina's shale formations contain the world's second largest shale gas resources and fourth largest shale oil. This translates to 802 trillion cubic feet (tcf) of technically recoverable shale gas and 27 billion barrels of technically recoverable shale oil. Much of this is contained in the Neuquén basin in west-central Argentina, and in particular the shale formation known as Vaca Muerta.

When it comes to the country's unconventional resource potential, there are two key factors that will determine the outlook for Vaca Muerta in the near to medium term: Oil and natural gas prices – international and domestic - and bringing to bear advances in innovation and technology.

As elsewhere in the world, it is critical for Argentina to distinguish between what the energy industry calls a resource and what is considered a reserve: Reserves are by definition economic or bankable while resources are a more optimistic and less tangible assessment and not entirely bankable. Solving this issue has become ever more critical as the new government seeks the appropriate balance between the fixed domestic prices for oil and natural gas and international prices and references. According to one estimate, given the current international price environment it is not economically feasible to increase oil production in Vaca Muerta but is so with regards to natural gas. At the same time, companies across the globe are struggling with the impact price is having on the bankability of resources on their books.

In addition, Argentina is attempting to adapt the technology and innovative techniques developed in other markets both above ground and below. For many years, the high cost of unconventional production in Argentina has cast doubts as to whether the country could fully realize its resource potential. Fully unlocking Vaca Muerta will hugely depend upon furthering efficiency by increasing productivity and lowering costs.

Indeed, as recently as 2011, the cost per well was around US$11 million. Enhancing local know how remains an important challenge in order to seize the opportunity that Vaca Muerta and the nation's unconventional resource potential holds. Moreover, reducing costs will also allow for a greater number of wells to be drilled and lead to progression up the local learning curve.

There are important deals that underscore the continued evolution of the sector and possible upside. Chevron was the first to sign a major deal with YPF worth a potential $15 billion. YPF has also signed deals with Petronas, Wintershall, and Sinopec, and has a tentative agreement in place with American Energy Partners. Of particular note is the Dow Chemical partnership with YPF for the El Orejano project. The project has seen investment on the order of $350 million over the last two years with projected investment in 2016 set to reach $500 million with 56 wells in production. Moreover, according to executives from Dow, the project has been able to reduce drilling costs, keep on budget and perform better than the best quartile of US shale gas plays.

Beyond Vaca Muerta

With much of the attention on Argentina's Vaca Muerta and shale plays, the country's other oil and gas opportunities have not received the attention many argue that they deserve. For several key operators in Argentina, tight gas is a major opportunity. Indeed, Argentina's second largest oil and gas producer, Pan American Energy, has highlighted their key findings and potential opportunities for tight gas extraction in Argentina. The company has natural gas projects in Salta, the northwest area of Argentina as well as in other areas of the country and neighboring countries such as Bolivia.

Further, Pan American has been deeply involved in exploring several areas in Argentina such as the Cerro Dragon area to increase the recuperation percentage of natural gas. The company underscores the importance of implementing tertiary recovery (Enhanced Oil Recovery or EOR) technologies such as Bright Water®. Currently, only 20% of oil is extracted from reservoirs with initial recovery, water injection and secondary recovery. With tertiary recovery applications there are possibilities to extract up to 3% more.

When it comes to Argentina's oil and gas opportunities beyond Vaca Muerta, there are five features to consider:

- *Focus on opportunities for tight gas in the area of the broader Neuquen Basin;*
- *Foster a collective effort between producers, associations, government and all stakeholders to be able to further exploit available resources;*
- *Focus on tertiary recovery and EOR in oil reservoirs;*
- *Strive to increase activity through project and drilling efficiency gains;*
- *Enhance relationships with unions in order to increase dialogue and improve understanding amongst all stakeholders for project development and execution.*

Regional Integration

Not that long ago, Argentina was a major energy exporter and pioneer in the development of natural gas and regional integration. But, in recent years, dealing with its neighbors on energy matters has presented a series of challenges. The new administration understands that Argentina and its neighbors must work together to overcome energy development barriers for electric interconnection and natural gas import-export regulations, particularly in order to be able to adapt to global energy prices.

While Argentina counts a vast amount of natural gas resources, the country has been unable to explore and produce to its potential for several reasons including onerous regulations and financial resources restriction. These factors have led to a deficit of exploration. Argentina is not alone, however, as other countries in the region such as Brazil are similarly experiencing a deficit in gas resources requiring increased imports in order to meet demand. The irony of this predicament is lamentable as both countries have enormous proven gas reserves. Argentina alone has reserves of 11.7 Trillion cubic feet (Tcf) as of January 2016. As evidenced by the arrival in Brazil of the first LNG cargo from the Cheniere Sabine Pass terminal in the US Gulf Coast, these trends indicate a need for LNG infrastructure development and natural gas transportation and transmission investment across the Southern Cone.

ENARGAS is Argentina's natural gas regulatory agency that focuses on development of domestic gas regulation and policies. At the same time, it has also underscored the government commitment to support and collaborate with key stakeholders to strengthen regional energy integration. Indeed, since the Macri government took office, ENARGAS has assumed a more proactive role in charge of regional cooperation which includes vital technical support to achieve energy security for Argentina.

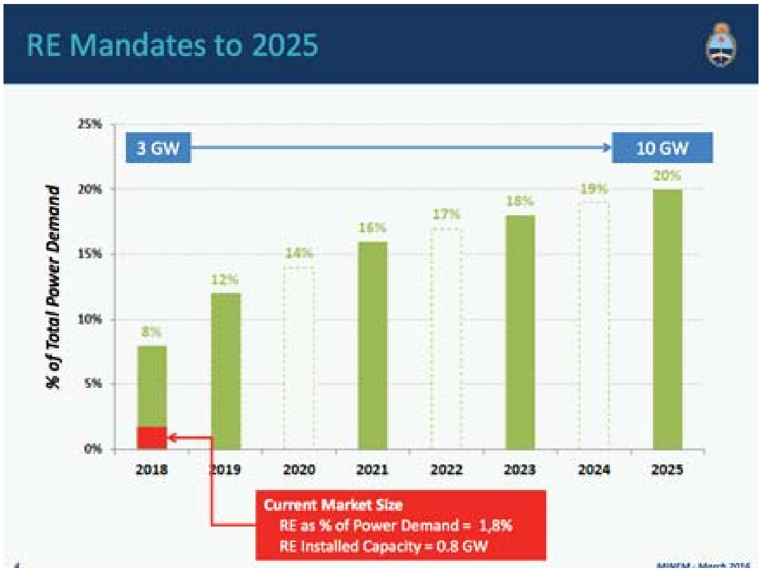
There are clear steps to be made to recover Argentina's leadership role. ENARSA and other government officials can continue to strive to create an atmosphere that honors import and export contracts that have languished or been outright discarded, and by optimizing flows of regional markets. But perhaps the most critical element for reinvigorating regional integration will be by enhancing domestic policies and opportunities for exploration and production and rational consumption of natural gas. It seems quite clear for Argentina that a stronger energy leadership position vis-à-vis regional projects and integration efforts should be seen as a win-win as well as offer the country enhanced energy security.

Renewable Energy

Before the election of President Macri, the energy sector was in dire straits, particularly with regards to the country's effort to develop renewable energy sources. Simply put, renewable energy sources were not imperative or remotely affordable for the country's energy matrix and legislation was unclear or without teeth. Consumers were not required to use renewables to meet electricity needs and natural resources were in many ways squandered. Therefore, as discussed earlier in this report, the Macri government has created an Undersecretariat of Renewable Energy with the explicit goal of reviving a rational and competitive regulatory framework to further develop the country's energy market with an emphasis on renewable energy. Law 27191 passed in late 2015 was the first concerted effort to advance Argentina's renewable energy potential.

Based upon the law, starting in 2018, electric consumption will derive at least 8% of their total energy demand from renewable energy sources. This strategy aims for the country to increase 3% on average annually to reach the 20% target of demand from renewable energy by 2025. (See Figure 2)

Figure 2: Renewable Energy Mandates to 2025



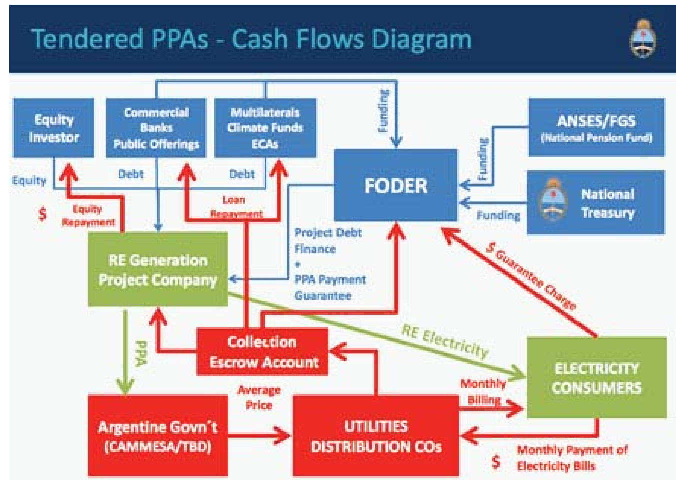
At the time of this report, the government has made a tremendous effort to advance policy and regulations to enable reaching the targets set by Law 27191. Plans are being finalized for tendering the first renewables contracts by the second semester of 2016. The government has indicated that the bid round and auction details will be published shortly with a public registration in order to promote transparency in the administrative contracts.

The new regulatory framework will allow the Ministry of Energy and Mining to have the authority to audit and control the new contractual scheme for projects. Additionally, Law 27191 offers investors clearer insights as to administration's long term plans for renewables. The plans include, but are not limited to, the opening of the Fund for Renewable Energy Development, or FODER, which will offer debt guarantees, financing options and fiscal incentives. FODER will be managed by Argentina's Investment and International Business bank, BICE, for it Spanish acronym. The trust will include objectives mainly focusing on import tariffs, accelerated depreciation, early reimbursement and credit lines for 5-10 years. FODER will be divided in two main accounts: 1) long term financing of projects and 2) payment guarantees. (See Figure 3)

The different types of renewable energy will not compete amongst themselves as the government will publish tariffs for each type of technology and will aim to promote a competitive market in order increase deployment and eventually lead to cost reduction. The government has indicated it will employ best practices and draw from successful cases from the region such as Uruguay and Peru.

Market participants and investors agree with the importance of regional and international lessons learned. In particular, other countries' experiences such as Spain and Germany, where government incentives and terms have caused issues and in some cases proved unsustainable in the long term. In addition, analysts and investors point to three overarching elements for boosting renewable energy deployment in Argentina: Infrastructure, fiscal incentives and funding. There is also a strong desire on the part of the government to achieve the largest percentage possible of local content in all projects.

Figure 3: Renewable Energy Auction and Tender Power Purchase Agreement Structure



When it comes to infrastructure, there must be a concerted focus on the availability of transmission, as well as clear sighted distribution tariffs. At the same time, fiscal incentives must be in place for both suppliers and project developers. Finally, the role of funding is particularly relevant for Argentina given the last 12 years. For the sector to attain the lofty goals the new government is setting, renewable projects must be able to utilize project financing, corporate financing and access capital markets. Industry response to the proposed FODER mechanism is positive, but several possible investors indicated that it was crucial to have possibilities to access financing besides FODER.

Finally, several industry and private sector organizations have emphasized the need to foster dialogue between government, industry and the community to define the essential needs of the energy matrix for the country. Specifically, the association of large energy consumers is concerned about the new regulations for energy supply as the transition seems to have been drastically changed from that of the last government, where renewable energy contracts were optional but now are an obligation.

Energy Transition

The changes in Argentina have led a wide range of international and local companies to begin to assess the opportunities for renewables. Many of the companies have developed renewable energy projects across the region and have been able to overcome energy transition challenges in other countries. This should prove beneficial for Argentina as it will lead to a smoother transition period.

Indeed, industry with experience in the region and other countries are ever more guided by the "3D" concept that focuses on decarbonization, decentralization and digitalization for a more efficient energy outlook. The interest and participation of firms guided by these principles will increasingly bring that to the policy planning debate in Argentina. For many companies, 3D plans and collaboration with key lending and funding organizations such as CAF are imperative for the growth of the Argentine market.

For many market players, wind and solar provide what they see as key energy sources of the future. Companies such as Engie are beginning to make drastic changes in their company planning by focusing decisions on commodity prices and eliminating coal projects. For firms such as Engie, they have concluded that natural gas is the energy source to support the transition from conventional to renewable energy sources, but with important caveats. Moreover, a key part of the broader concept of energy transition is the focus on innovative and renewable technologies.

Another key area for Argentina especially but also the larger energy transition narrative is energy efficiency. After years of mismanagement of the energy sector and a lack of rational usage across the country, the Macri government, as discussed above, has created an Undersecretariat for Energy Savings and Energy Efficiency, which seeks to reduce consumption by 5% by 2020. For many, this issue is fundamental for the country to right its energy sector.

Since the agreement reached in Paris last December, confronting climate change and vulnerabilities, as well as reducing CO_2 emissions demand sustainability practices that are in line with national commitments as part of the Paris accord and more rational national use of available water and other renewable resources.

The infrastructure and transportation industries are also main players for the energy transition in terms of efficiency. These large energy consumers may make important changes in their efficiency standards and eventually integrate renewable energies that could become crucial to achieve national efficiency and renewable targets.

Conclusion

Argentina, and its energy sector specifically, face immense challenges. At the same time, there is reason for the optimism that has surrounded the outlook for energy since the Macri administration was sworn in last December. As this report has outlined, the new government has embraced the seriousness of the task and responded in-kind with several early moves and key initiatives. Moreover, a medium and long term strategic planning process and the creation of a national energy vision are underway, with the intention of it being formally unveiled this September. That Argentina will have a national energy strategy set forth by the government is enormous progress.

Having passed 100 days in office, early efforts and optimism must continue to be translated into action and progress. Specifically, there are six areas to refine as the government's final energy vision is consummated:

- *Normalization of the nation's energy bureaucracy and reviving a clear and transparent legal framework that resets the role of dormant institutions;*
- *Fostering access to finance and international capital markets for energy projects;*
- *Boosting regional integration and recovering Argentina's leadership role by honoring import and export contracts that have been discarded and by optimizing flows of regional markets and Argentina's ability not only to produce and explore, but to consume natural gas;*
- *Long term planning for the nation's energy sector that goes beyond indicative and includes dialogue across the country with input and insights from all stakeholders;*
- *Absorb and learn not just from the last 12 years in Argentina as to the ills of mismanagement of the energy sector, but more importantly draw from lessons from countries across the region and world, particularly in terms of unconventional oil and gas development and successful deployment of increased renewable energy;*
- *Support diversifying the country's energy matrix and the energy transition that starts with rational energy consumption and increased use of natural gas but also contemplates a longer term horizon to reduced percentages of oil and gas in terms of the country's primary energy usage.*

Clearly, this is not a series of simple or perhaps completely attainable tasks, particularly in just four years. However, if the Macri administration is serious about changing the country's history, successful management of these elements will go a long way to insuring that was more than just a honeymoon boast.

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