

NATURAL GAS SOUTHERN CONE DYNAMICS AND DEVELOPMENTS

Alvaro Rios Roca

The Institute of the Americas is pleased to co-publish together with Gas Energy Latin America (GELA) a brief paper assessing the recent natural gas dynamics in the Southern Cone including developments due to the COVID-19 pandemic.

This report is up-to-date as of the middle of May and prior to the Institute's Virtual La Jolla Conference set for May 18-22. The paper offers a curtain-raiser and sets the stage for the conference session led by Alvaro Rios Roca on Wednesday, May 20.

Fracking activity in Argentina

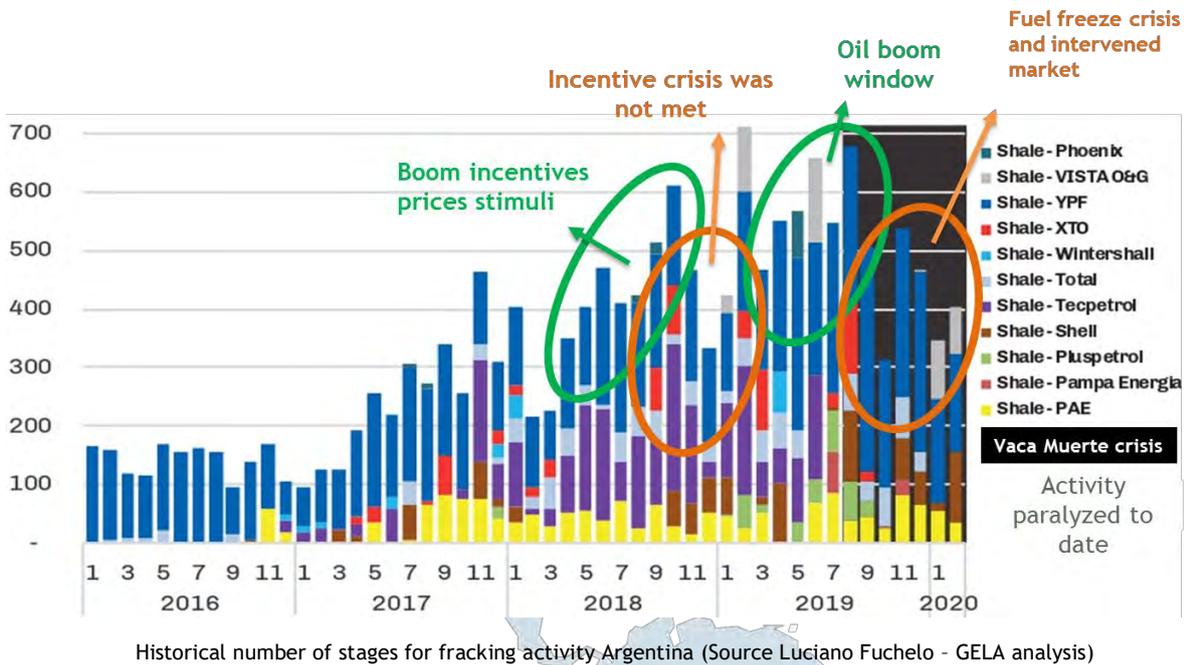
Vaca Muerta is one of the most prolific shale formations in the world from a geological and productivity standpoint. Many experienced Argentine, and a large number international oil and gas companies, have drilled pilot wells with excellent results in productivity and therefore costs in all three windows (oil, wet gas and dry gas).

Several have already developed factory drilling programs, firstly in the gas windows with the price incentives given during the Macri administration, and later in the oil window as local and international oil prices allow to realize the activity with certain profitability.

Unfortunately, the previous government did not adhere fully to given price incentives for natural gas. In the interim the country's political cycle kicked in and then primary elections (PASO) dealt a blow to the peso against the dollar. Natural gas tariffs to end users could not be restored and gas fracking activity fell precipitously towards the end of 2019.

Natural gas production capacity in Argentina is currently excess in the warmer months and has a deficit in the winter months due to residential peaking. Because of abundance of gas, prices in the internal market are quite low. Also, exports have restarted to Chile albeit with some restrictions; negotiation is under way with YPF in Bolivia as the fourth addenda comes to an end 2020.

The onslaught wrought by the COVID-19 pandemic destroyed demand, and oil prices went down as we all know. Of course fracking activity in the oil window also came to halt starting march 2020. Central government, industry, labor syndicates and local production governments, as we write, are trying to implement the "barril criollo" pricing for internal market setting price at 45 USD/barrel and imposing limitations on export taxes and compromising fracking activity. The graph below describes the above situation almost to date.



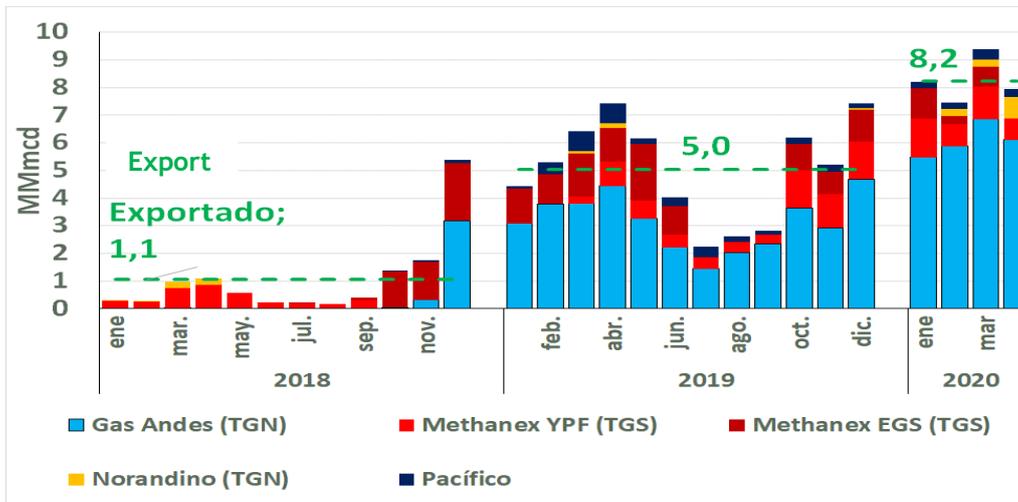
Most likely, with the “barril criollo” approved, some fracking activity in the oil window in Vaca Muerta will begin to restart. With regards to natural gas, the situation is a bit more complicated as there are payment issues in the commercialization chain and reduced exports and very low prices in the internal market. Without continued fracking, gas production will begin to decline as 2021 approaches. Thus additional imports will probably be needed from Bolivia and by way of liquefied natural gas (LNG), furthering the financial pain and shortage of dollars.

Argentina increased uncertainty - Chile and Bolivia

For almost two decades, natural gas has been at the center of what might be best termed a “love-hate” relationship between Chile and Argentina. During 2018 - 2019 it could be argued that the romance was alive and back on. But 2020 could be the end of the latest iteration of devotion.

Natural gas exports to Chile restarted 2018 and ramped up during 2019 and at the beginning of 2020 with main destination being power companies in Chile. This context can be seen in further detail in the graph below. All contracts of course are interruptible, but even in summer months interruptions took place that created uncertainty in Chilean users.

Regardless, Chilean companies were pleased as they could get these volumes from Argentina at lower prices than imported LNG. Landed prices in the Southern cone of LNG are between 2-3 USD/MMBTU as we write. An almost identical situation takes place with Uruguay where small volumes of gas are shipped when there is excess capacity in Argentina.



Natural gas exports from Chile Argentina - Chile by pipeline (Source ENARGAS - GELA)

Taking into account the gas production scenario in Vaca Muerta described above, starting in early December new export permits were discontinued by the new Fernandez administration. Some actual conditions that cause sudden cuts in supply and uncertainty in Argentine supply are:

1. Higher thermal demand in warmer months prioritizing the internal market;
2. Bolivia prioritizing Brazil supplies until march 2020;
3. Economic, political and exchange rates changes in Argentina.

But with investments in gas moving to the oil window and retracting from frack activity in the gas window and now almost no activity in fracking at all due to the health crisis, most experts agree that barring a miracle production will decline in 2021.

Exports to Chile will most likely decrease and negotiations with Bolivia, as noted, will be rather thorny. Bolivia with its declining production wants to prioritize and maximize export deliveries to other users in Brazil and wants to reduce exports to Argentina (receiving payments on time is seen as a big problem). Bolivia also wants to significantly reduce the winter peak demand established for 2019 and 2020 until the end of 2026.

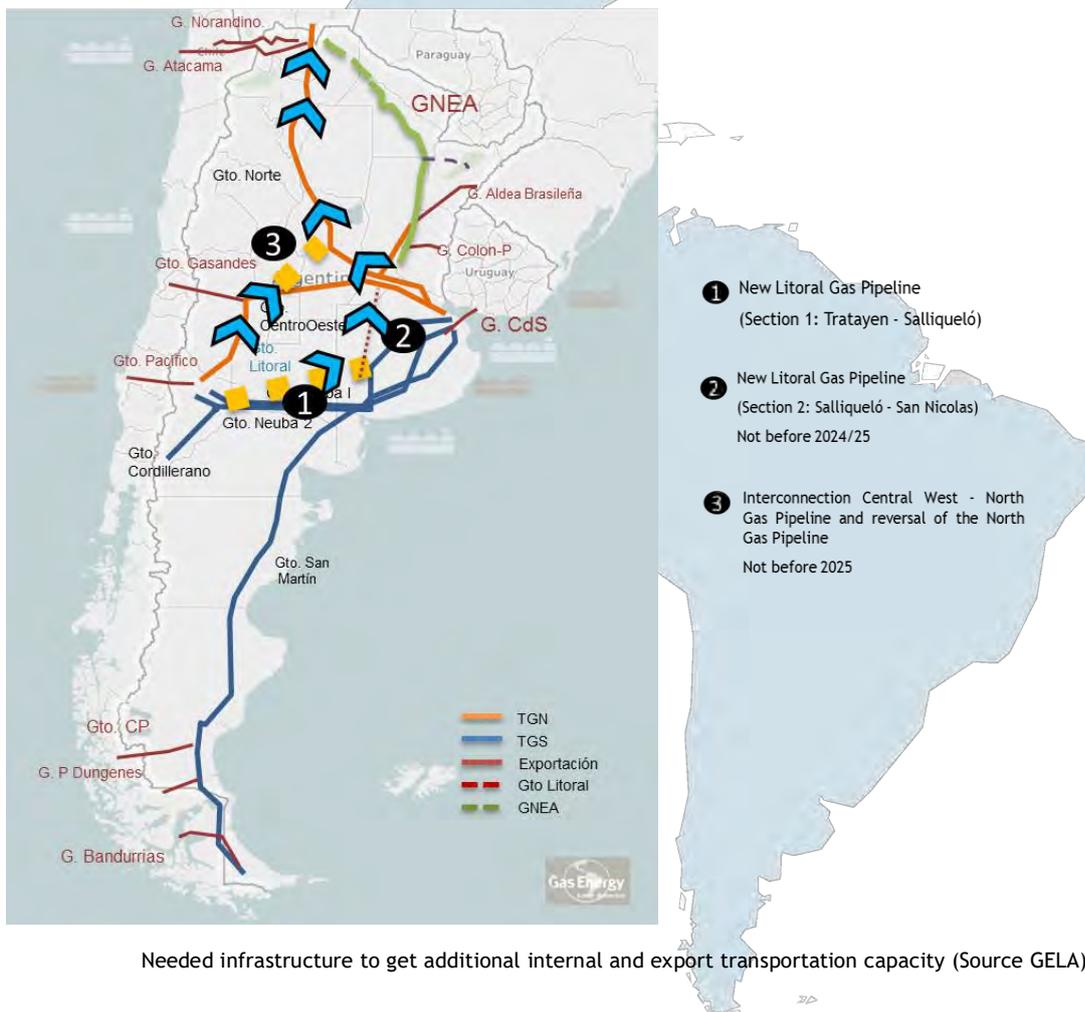
Odds are and our conclusion is that Argentina will reduce gas exports to Chile even more, and will definitely need more LNG imports starting 2021 when demand is somehow reestablished.

Argentina's possible exports to Brazil discussions

At Davos, President Fernandez asked the Brazilian Minister of Economy, along with an international development organization to analyze the financing and development of natural gas infrastructure to move large quantities of natural gas exports to Southern Brazil. An almost forgotten headline now given the COVID-19 crisis.

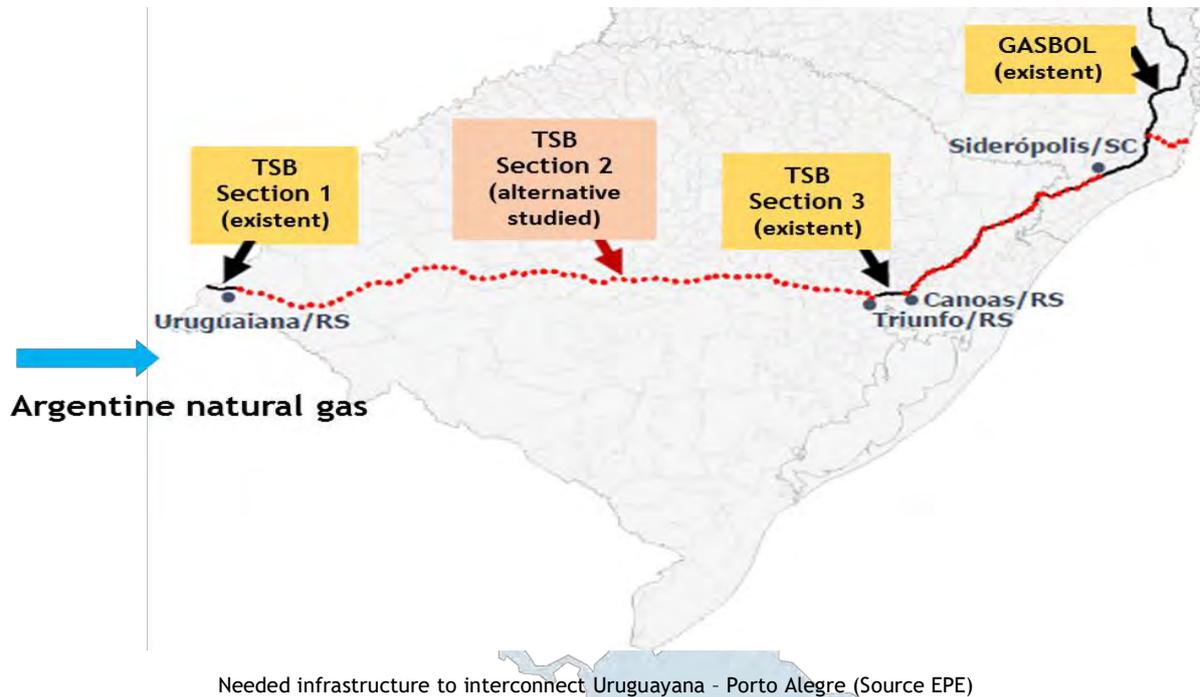
Our take is that it makes a lot of sense. More completion for natural gas in Brazil complements the ongoing restructuring of its gas market and further shifting the Petrobras monopoly. Just to remember, Brazil end users probably have paid and are paying for some of the most expensive gas in the world.

The map below represents our analysis of required infrastructure to boost additional transportation capacity within Argentina to deliver to its internal market, and then create additional export markets to Brazil and northern Chile and replace Bolivian imports. These gas pipeline projects have been studied and were seeking financing during 2007-2019 period with hope. Now they are just that, projects on a map on paper for now.



Needed infrastructure to get additional internal and export transportation capacity (Source GELA)

There is current infrastructure to move natural gas to Southern Brazil to Uruguayana that is not being utilized. In the figure below there is also a new gas pipeline under review to move molecules to Porto Alegre and close the loop with the Bolivian supply pipeline.



The logical question asked by everyone discussing financing is why Argentine companies do not pursue supply with firm contracts with clients in Chile and Uruguay. There is plenty of existing infrastructure. As we have discussed, with interruptions even in warmer months to these two countries why think of expanding new export capacity to Brazil.

Our view is that new infrastructure and gas contracts for the Brazilian market, with private buyers looking for lower prices and security of supply, will not happen soon. Maybe four to five years down the road, and only if, its gas producers prove, somehow that they will not stop fracking activity (as we have described above) due to government interventions in the market.

Argentina natural gas industry needs to prove itself as a credible supplier for what it is one of the most important issues in gas markets: Security of Supply.

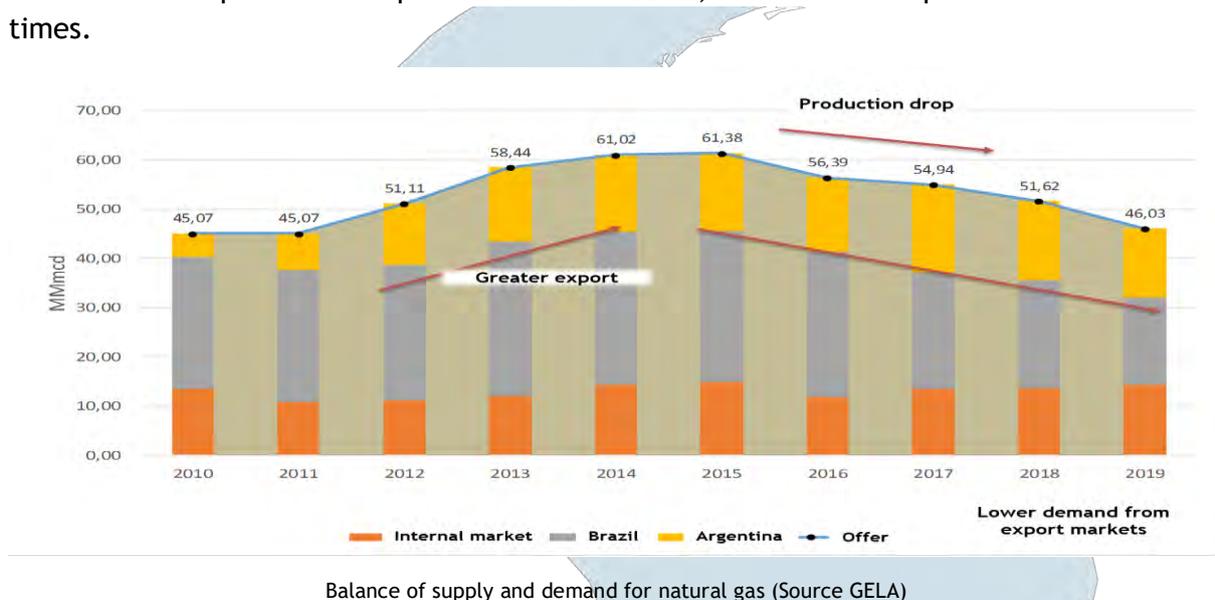
Uncertainties in Bolivia - Gas reform in Brazil and economy in Argentina

Bolivia, during Evo Morales' 14-year term, enjoyed spectacular natural gas exports close that garnered upwards to 47 billion dollars from 2005 to 2019, peaking at 6 billion dollars per year between 2012 and 2014. All of these gas exports to Brazil and Argentina, with an average government take close to 70 to 75% provide important stability to the Bolivian economy. Natural gas exports represented at its peak 52% of all country exports.

During the Evo Morales administration, there was lack of exploration and in many ways poor management of the oil and gas industry; reserves discovered 20 years before were those being monetized. By our calculations, almost 4 billion dollars' worth investments

were made in a number of projects that currently are not operating or produce losses for YPFB, the country’s NOC.

Natural gas reserves and capacity production are declining in Bolivia as shown in the figure below. We believe strongly that new actual exploration is not enough. Nevertheless, everyone in Bolivia is crossing their fingers (holding their breath?) that geology provides a pleasant surprise and maybe yields one or two prospects 2020-2022. Bolivian gas is the lowest cost to produce compared to Vaca Muerta, Pre Salt or imported LNG in normal times.



Brazil is undergoing a profound natural gas reform and trying to introduce new competitive gas in the market, provide open access for existing and new infrastructure and greatly reduce the role of Petrobras in essentially controlling the market.

Reform began in 2019 and 2020 figured to be the year for finalizing the new natural gas market and model, obtaining congressional approval, as well as potentially privatizing downstream assets of Petrobras. COVID-19 has slowed down this process but we expect that 2021 is the year that competing market activity will take place with Bolivian gas, Pre Salt gas and offshore gas and quite competitive and abundant LNG. We cannot emphasize enough that it is in this new environment that Bolivian natural gas reserves and production have to compete in the years to come in Brazil.

The groundbreaking YPFB contract with Petrobras concluded its original 20-year term at the end of 2019. A new contract with Petrobras was signed in March 2020, with 10 MMMCD less contracted volume and same pricing scheme, linked to fuel oils. Pre Salt and LNG are beginning to competing severely with Bolivian exports. LNG is pushing to take the power market in open and acutioned projects. As we show, drop in demand is part of the drop in production capacity during 2018 and 2019, as shown in the figure below.

With regards to the Bolivia-Argentina pipeline deal, the YPFB - IEASA gas sales contract runs through 2026. But, with Vaca Muerta development during 2018-2019, an addendum was signed with lesser volumes and modified prices during the winter months (linked to LNG supplies). The addenda terminates in 2020 and a tough negotiation is undergoing. One additional ingredient is that governments are not aligned ideologically. For Argentina, the backdrop is quite similar to Brazil, in that LNG and Vaca Muerta production are now competing with Bolivian exports that has dropped demand.

With lower volumes and lower pricing on natural gas exports to its only two markets with infrastructure, Bolivia has now to confront COVID-19. First came Petrobras with a volume reduction to only 10 MMMCD from its Take or Pay obligation of 14 MMMCD. Argentina is also demanding less gas than expected on the order of 14-15 MMMCD of the 16 MMMCD predicted by contract for the winter period.

Worse yet, is that natural gas pricing exports, in both cases are linked to fuel oils (except some volumes for winter in Argentina). Our assessment points to close to 3 USD/MMBTU prices at the border; therefore, the third and fourth quarters of 2020 will suffer severe exports cuts in dollar export terms for Bolivia.

It is clear that Bolivian gas is trapped in a competitive market in Brazil and with a very uncertain market in Argentina, quite controlled and regulated. Many actors in Bolivia even think that one day Argentina will stop paying for gas exports which Bolivia can't afford now.

We look forward to discussing these issues in greater depth on Wednesday, May 20 during our session at the Virtual La Jolla Conference.