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Geopolitics of Gas in South America

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1. Introduction

When speaking of energy in this first decade of the century, references are still mandatory oil or natural gas, as both accounts for about 60% of the global energy matrix. This energy demand global and regional scale has two outstanding features: on the one hand the growth of demand is increasing and, on the other hand supply is stagnant and in some cases declining. According to a 2007 report by the U.S. Energy Department is expected that the global primary energy demand increase, between 2004 and 2030 - by 57% which implies duplicate the energy consumption in the brief period of 26 years.

To meet this consumer expectations oil production should increase by 42%, natural gas 65% (reaching a figure of 163 trillion cubic feet or equivalent to 29,000 million barrels of oil) and coal by 74%. These increases in theory are almost impossible to materialize into reality because there is a continued contraction in supply, except for occasional new discoveries as in the case of Brazil, where extraction is difficult, and also requires large investments, and time for deployment.

The evolution and perspectives of Latin American regional gas market integration is usually analyzed from the point of view of Economics. This paper instead tries to explain its present state and perspectives by means of a geopolitical approach. The main conclusions (that result from a Master in Policies and Strategy thesis elaborated by the author, entitled "The strategic role of gas as a critical variable of the national and regional energy system"¹) enable to advance in the analysis of this regional problematic in which the introduction of global actors determined great scale changes. Beginning in 2004 as a binational crisis centered in Argentina and Chile, it became a regional and global one after the active participation of France and Russia.

The development of countries like Argentine and Brazil depend to a large degree on the provision of gas from Bolivia, a country with great amounts of reserves but scarce levels of infrastructure investments. Thus, though long term contracts have already been signed, the actual volume of supply remains uncertain.

Since the Argentina crisis of 2004, with regional effects that still continue, the security of regional energy supply, emerges as a key issue to be considered in the Continental Security

¹ Mg Ana Lía del Valle Guerrero, thesis of Masters in Policies and Strategies "the strategic roll of the gas like critical variable of the national and regional energy system", 2006, National University of the South, Bahía Blanca, Argentina.

Agenda. In spite of the existence of abundant reserves of gas in different countries of the region, like Venezuela, Bolivia and Peru, several facts have caused the gas regional crisis that this paper intends to explain from a geopolitical point of view. The particular situation of the resource gas will be analyzed, in the region with respect to its use and availability, emphasizing the effect of political decisions that causes the regional gas crisis.

The methodology of work based its arguments on non experimental investigation of correlational transactional type, by means of which, it is possible to analyze the problems of power supplying produced in the region - from 2004 to 2011- the period analyzed in the temporary scale.

The critical conditions of gas on regional scale derive from the decisions with respect to the use of a resource, conditioned by its territorial specificity - it is in a country and not in another one. Beside, the use of gas is more subjected to political decisions of the States that own the resource than to economic decisions, since some countries still base their decisions of supply of the resource on unresolved historical and geopolitical conflicts.

The main objective of this paper is to make a valuation and to have a deep knowledge of conflicts around energy-focuses on natural gas- from a South American geopolitical perspective; which emphasizes the interactions society/territory, in the regional scale. It is done from a - holistic and multi-factor - geopolitical perspective that tries to surpass the predominant economics vision.

Knowing that the gas reserves in the region are important and the internal consumption of South American countries is different. It is undeniable the necessity to work out a regional strategy with the objective of satisfying demands in order to avoid futures conflicts. For this it is required to make infrastructure investments and to get financial sources, which need a greater degree legal security that guarantees the participation of international organisms.

In South America, the geopolitics of gas presents a superposition of scenes that contrast projects with realities, and integration processes together with increasing conflicts that generate instability and fragmentation. Consequently, to promote a strategic alliance among States, approaching the issue from a global perspective, is a true priority for South America. This would have to be built with the participation of those actors who demand the resource and those who offer it within the region.

If the South American energetic integration were obtained, the region would be in the position to obtain financing its own future energy growth to future, and supplying a part of the needs to the rest of the world. The geopolitical analysis allows to understand the gas crisis in South America as product of a changing reality and to interpret the complexity and dynamics of existing social, political and economic processes. It also allows understanding the uncertainties and the possibility of new geopolitical situations in a regional space in which the reality is being constructed in daily routine.

This chapter consists of three parts, the first performing a global approach by region, from the economics point of view, in terms of natural gas resource -based on the last report of June 2011- from BP Statistical Review of World Energy 2011. The second part presents an explanation -from different approaches- of the changes in geopolitics. Finally, the third part -as a synthesis - focuses on the analysis and explanation of the Geopolitics of Gas in South America.

2. The natural gas resource situation in 2011

To get an updated picture of the global energy situation focusing on natural gas, Statistical BP Review of World Energy 2011 (June 2011), presents some numbers that show the state of resource from different points of view. First, from the point of view of consumption, there was an overall increase of 7.4% (the largest increase since 1984), U.S. presents a historical record of consumption growth of 5.6% in the period 2009 / 2010 and an increase in the same period in Russia (6.3%), China (21.8%) and India (21.5%). However, the greatest increases in consumption at a global level took place in South America led by Peru with 56%, followed by Chile with 51% and Brazil with 33.8% increase in consumption.

2.1 Global approach by region (economic point of view)

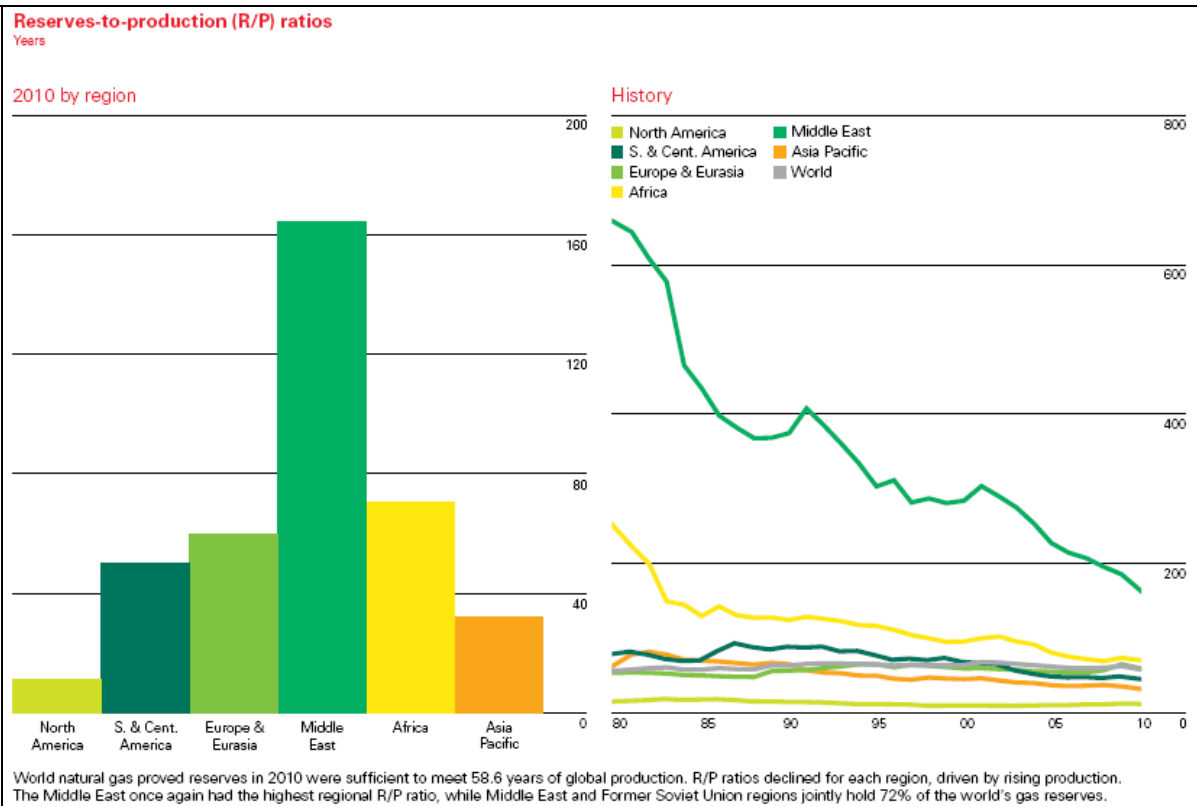
From the point of view of production, there was a similar growth in consumption of 7.3% globally. Some highlights are on growth 2009/2010: 30.7% increase in the production of Qatar and the largest at a global level growth is 108.4% in production in Peru. Furthermore, there is also respect to global production in 2010 that the United States (19.3%) moved from the first placed on the production on Russia (18.4%) and the significant decline in production in Canada (5%) for the fourth consecutive year.

In addition, increases of 10% in terms of trade, with a 22.6% increase in shipments of LNG, are highlighted in particular Qataris LNG shipments with a growth of 53.2% and the increase of Russian exports by pipeline. The graphs in Figure 1 shows that, from a historical point of view, taking into account the variations in the period 1980-2010 there is a declining trend in the Middle East, beyond being the largest producing region and possess the highest ratio reserves / production. The reserves of the other regions do not show large variations in its production, giving a total horizon reserve of 58.6 years.

It should be emphasized that the countries that occupy the top 3 worldwide in terms of proved reserves: Russia (23.9%) Iran (15.8%) and Qatar (13.5%) accounting for 53.2% of world reserves of natural gas and if we add the 15 first positions 84.5% of total reserves. In this context, the South American region represents only 4% of world reserves, with a ratio production / reserves of 45.9 years.

At regional level and analyzing especially the situation in the South American region as shown in table 1, we can see a stagnation in consumption in Argentina but you must remember that internal consumption in Argentina is from the 70's the highest of South and Central America and even the second highest in the world which represents 1.4% of world consumption, so it cannot grow more. It is also remarkable how growing consumption of natural gas in the period -2009/2010- in several countries in the region for example, in Peru (56.0%), Chile (51%) and Brazil (33.8%) .

The table 2 shows how are the proved reserves at regional level and notes that in the ratio reserves / production Peru appears whit reserves for 48.8 years followed by Brazil (28.9) and Bolivia (19.5). It should be noted that there is not data available for Venezuela who has the largest reserves in the region but not yet exploited. They are used for reinjected into oil production. Concerning Argentina has proved reserves to 8.6 years, although other studies consider a lower number of only 6 years.



Source: Statiscal BP Review of World Energy 2011 (June 2011)

Fig. 1. Reserves / production ratio by region, year 2010 and History 1980-2010

Consumption											Change	2010
Billion cubic metres	2000	2001	2002	2003	2004	2005	2006	2007	2008	2009	2010 over 2009	share of total
Argentina	33.2	31.1	30.3	34.6	37.9	40.4	41.8	43.9	44.4	43.2	43.3	0.4%
Brazil	9.4	11.9	14.1	15.8	18.8	19.7	20.8	21.1	24.6	19.8	26.5	33.8%
Chile	6.5	7.3	7.4	8.0	8.7	8.4	7.8	4.6	2.7	3.1	4.7	51.0%
Colombia	5.9	6.1	6.1	6.0	6.3	6.7	7.0	7.4	7.6	8.7	9.1	4.3%
Ecuador	0.3	0.3	0.2	0.3	0.3	0.4	0.7	0.5	0.5	0.5	0.5	-6.0%
Peru	0.3	0.4	0.4	0.5	0.9	1.5	1.8	2.7	3.4	3.5	5.4	56.0%
Trinidad & Tobago	10.6	11.6	12.7	14.4	13.4	15.1	20.2	20.3	21.9	20.9	22.0	5.5%
Venezuela	27.9	29.6	28.4	25.2	28.4	27.4	31.5	29.6	31.5	30.5	30.7	0.6%
Other S. & Cent. America	1.8	2.3	2.4	3.1	2.9	3.3	3.9	4.5	4.7	5.1	5.6	9.9%
Total S. & Cent. America	96.0	100.7	102.1	107.9	117.5	122.9	135.5	134.6	141.3	135.1	147.7	9.3%

Source: Statiscal BP Review of World Energy 2011 (June 2011)

Table 1. Natural gas consumption in the region of Central and South America

Proved reserves							
	At end 1990	At end 2000	At end 2009	At end 2010			
	Trillion cubic metres	Trillion cubic metres	Trillion cubic metres	Trillion cubic feet	Trillion cubic metres	Share of total	R/P ratio
Argentina	0.7	0.8	0.4	12.2	0.3	0.2%	8.6
Bolivia	0.1	0.7	0.7	9.9	0.3	0.2%	19.5
Brazil	0.1	0.2	0.4	14.7	0.4	0.2%	28.9
Colombia	0.1	0.1	0.1	4.4	0.1	0.1%	11.0
Peru	0.3	0.2	0.4	12.5	0.4	0.2%	48.8
Trinidad & Tobago	0.3	0.6	0.4	12.9	0.4	0.2%	8.6
Venezuela	3.4	4.2	5.1	192.7	5.5	2.9%	*
Other S. & Cent. America	0.2	0.1	0.1	2.3	0.1	*	22.4
Total S. & Cent. America	5.2	6.9	7.5	261.6	7.4	4.0%	45.9

Source: BP Review of World Energy Statiscal 2011 (June 2011)

Table 2. Proved reserves of natural gas in the region of Central and South America

Concerning to production, stands out the change in the relationship 2009/2010 to Peru with an increase of 108, 4% followed by Brazil with 23% and 16.8% in Bolivia, while Argentina shows the main decrease with a -3.0% despite continuing representing 1.3% of world production.

Production*												2010	Change 2010 over 2009	2010 share of total
Billion cubic metres	2000	2001	2002	2003	2004	2005	2006	2007	2008	2009				
Argentina	37.4	37.1	36.1	41.0	44.9	45.6	46.1	44.8	44.1	41.4	40.1	-3.0%	1.3%	
Bolivia	3.2	4.7	4.9	6.4	9.8	11.9	12.9	13.8	14.3	12.3	14.4	16.8%	0.4%	
Brazil	7.5	7.7	9.2	10.0	11.0	11.0	11.3	11.2	13.7	11.7	14.4	23.5%	0.5%	
Colombia	5.9	6.1	6.2	6.1	6.4	6.7	7.0	7.5	9.1	10.5	11.3	7.2%	0.4%	
Peru	0.3	0.4	0.4	0.5	0.9	1.5	1.8	2.7	3.4	3.5	7.2	108.4%	0.2%	
Trinidad & Tobago	14.5	15.5	18.0	26.3	27.3	31.0	36.4	39.0	39.3	40.6	42.4	4.4%	1.3%	
Venezuela	27.9	29.6	28.4	25.2	28.4	27.4	31.5	29.5	30.0	28.7	28.5	-0.7%	0.9%	
Other S. & Cent. America	3.4	3.5	3.4	3.1	3.1	3.4	4.1	3.9	3.7	3.2	2.9	-9.9%	0.1%	
Total S. & Cent. America	100.2	104.5	106.7	118.7	131.7	138.6	151.1	152.5	157.6	151.9	161.2	6.2%	5.0%	

Source: BP Review of World Energy Statiscal 2011 (June 2011)

Table 3. Natural gas production in the region of Central and South America

Finally, can be performed a comprehensive analysis based on data provided by the report of Statiscal BP Review of World Energy June 2011 to know the current situation by region, considering the following parameters for 2010: reserves tested, production, consumption and ratio reserves / production.

First, in figure 1 and then in table 4,we emphasized that the most favored region considering all parameters is the Middle East with a horizon of the world reserves of 40.5% , a consumption (11.5%) below the production (14.4%) and a ratio reserves / production over 100 years. In this region there are countries that occupy the top positions in terms of reserves, Iran (2 °), Qatar (3 °), Saudi Arabia (4 °), total nearly 63% of reserves in the region.

This distribution of reserves clearly shows two concurrent phenomena, concentration and fragmentation. By one hand there is a spatial concentration of proved reserves in a small

Region	Proved reserves in % 2010	Production in % 2010	Consumption in % 2010	Ratio reserves / production in years
North America	5,3	26	26,9	12,0
South and Central America	4,0	5,0	4,7	45,9
Europe and Eurasia	33,7	32,6	35,8	60,9
Middle East	40,5	14,4	11,5	+100
Africa	7,9	6,5	3,3	70,5
Asia Pacific	8,7	15,4	17,9	32,8

Source: Authors' calculations based on data from BP Statiscal Review of World Energy 2011

Table 4. Comparison by regions, 2010.

number of countries in the Middle East region, while on the other hand, this also implies a spatial fragmentation in the distribution of global resources, since the gas resource has territorial specificity, is in a territory and not in others, it gives power to its possessor.

In above table 4 in different colors can be seen the degree of difficulty faced by each region, in red the most engaged and in yellow the best positioned and green ones that may be future resource providers. This situation also represents global and regional asymmetries between the countries that own the resource and those which must import and therefore competition between producers and consumers. From the point of view of future conflict scenarios outlined in the first place, the North American region with proved reserves of 5.3% of the world (second lowest), with production and consumption within the highest in the world 26% and 26.9% respectively and the lowest ratio reserves / production in all regions of 12 years.

United States and Canada are in this region and occupy 1st and 3rd places respectively -in terms of worldwide production- (remember the mentioned at the beginning of this chapter about declining production in Canada during the last 4 years as an additional problem). Both scenarios show that in spite of being top producers are also important consumers United States in the first place and Canada in the 6th. This situation, combined with this region possess the lower reserves from all regions, makes envision a future of growing dependence on supplies from this region to other regions. Consequently, also generates vulnerability from the point of view of energy security. Particularly, United States would be most affected, considering its status as a global economic power where energy is indispensable to maintain growth.

Other region that can be observed -with future problems- corresponding to Asia Pacific it has 8.7% of global reserves and consumption (17.9%) above the production (15.4%) with a ratio reserves / production of 32.8 years, one of the lowest worldwide. A further problem that complicates this situation is the tendency to growth consumption in the region. This area has two of the most populous countries in the world, such as China and India, with economies in continuous growth.

From the point of view of reserves, in this region are countries that occupy positions 12th to 15th at the world. They are: Indonesia, Australia, China and Malaysia. China is in 7th place and Indonesia 9th from production and from consumption worldwide China is ranked 4th, Japan 5th and India 8th. Certainly and beyond any discussion mentioning Japan, China and India in the same region, means to mention the leading economic powers and the necessity of rising consumption will surely, as well as problems to ensure a fluid supply.

European region and Eurasia at regional level are in an apparent balance between production (32.6%) and consumption (35.8%), with a ratio reserves / production over 60 years. However, it is remarkable that the whole region depends on the supply of a single large supplier, Russia and to a lesser degree from Norway, which creates vulnerability and dependence of most of European countries on Russian gas.

Africa region shows consumption (3.3%) below its production (6.5%) and a high ratio reserves / production (70.5 years). Economic and political history of the region shows dependency on their colonizers and indiscriminate exploitation of their resources. Therefore, the possibility of placing on the market for its production is limited by previous situations of

States involved because these issues will determine future policy decisions in relation to the use of gas resources, which will go beyond just economic issues.

Finally, analyzing data from the region of Central and South America is one of the regions with lower consumption (4.7%) and production (5%) while the ratio reserves / production is in third place with 45.9 years. It may be noted further that, the main gas reserves in the region belonging to Venezuela remains untapped and that new oil discoveries in Brazil have not yet went into production. Moreover, Bolivia, the second country in reserves in the region, is not exploiting its full potential for lack of investment in infrastructure and Peru began to do as noted in the production growth of 108.4% over the period 2009/2010. All the foregoing indicates that production capacity is still not fully used in relation to its reserves and consumption.

To end, making a comparison among regions at a global level, it can be conclude that in spite of the region of Central and South America presents the lowest share of global reserves with 4% of total generation that has the greatest potential production because their main reserves have not yet been exploited and it presents a low consumption and a ratio reserves / production high. Therefore, this region is positioned as one of the future areas supplier of the resource gas.

Consistent with this point of view, which is not mostly accepted on these days, appeared in the journal Foreign Policy, an opinion of Amy Myers Jaffe², director of the Forum of Energy's Baker Institute, Rice University entitled "Goodbye, OPEC" where she argues that OPEC will lose much of its power in the late 2020 because ".. the Americas, not the Middle East, will then the global energy capital," says this change will be technological and political factors (growing regional instability in Africa as it generates drops in production). In the case of South America, include technological changes such as new horizontal drilling techniques for the Shale gas in Argentina with third global reserves, and plus advances for extraction in the pre-salt layer deep, in Brazil. Undoubtedly, this situation has not gone unnoticed by the big powers like China and the United States; they have already started negotiations with Brazil for the future use of their resources and have increased their presence in the region, as well as Iran, France, Spain and Russia among others.

It is argued that, since for any country is crucial to ensure plentiful supplies of energy, any action that could reduce the flow would threaten vital interests of national security, thus considered oil and gas as strategic natural resources at a moment of rising global energy demand against a stagnant offer. In the region, each state need to guarantee the supply of energy to its population, but this makes it necessary to reach agreements to solve both conflicts among countries and internal conflicts as in Argentina (the government has to decided either to supply energy to its population, or to export to Chile) and in Bolivia (government has to fulfill contracts either with Brazil or with Argentina). Therefore, to ensure providers is a priority for States to guarantee its Energy Security. To understand how the countries can obtain this security, geopolitics is an important factor but first it is necessary to know its evolution so that is explain in the next point.

² Published in el NuevoHerald.com "Oppenheimer: The new oil center in the world" Thursday September 29, 2011. Accessed on line <http://elnuevoherld.com/2011/09/28/v-print/1034152/oppenheimer-el-nuevo-ce...consultado30/09/2011>

3. Geopolitics and their different approaches

First part of work was focused on reserves, production, consumption and trade since an economic point of view. This second part shows the geopolitical point of view as another way to approach reality. In order to understand needs to be done a brief summary of the changes in the field of study of Geopolitics and the causes that motivated them, so you could understand the Geopolitical of Latin-American Gas.

3.1 Geopolitical

A definition that contains the basic features of Geopolitics is the following:

"Geopolitics is the science that studies the mutual relations, influences and actions between the State and Space, to provide knowledge or political solutions" (Marini, 1985,44). Additionally, "The geopolitical space is the geographical area within which act reciprocally geographic and political factors to be studied and resolved" (Marini, 1985, 45)

In summary, Geopolitics focused politically geographical space, through a harmonious relationship between Geography and Politics. Based on the article developed by Hutschenreuter (2008)³ about the evolution of the concept Geopolitics one can extract some central ideas. "... From the twenties, but particularly since the thirties, geopolitics, became an idea and practice of territorial expansion based on ultra-national, racial and military (Nazism) and was associated with a form of exercise of state and interstate power that dragged the nation to the status of war. Then, the scheme involved a granite bipolar geopolitical division of nations into spaces or spheres of influence ..." (Hutschenreuter, 2008:2)

3.2 Geoeconomics

However, in contrast to years following World War II, when the term (but not its exercise) was banned from the discussions, at the beginning of the new order international Geopolitics began a shy return from the seventies and eighties, with the rise of regional blocks returned from the hand of the geoeconomics. (Hutschenreuter, 2008:3). In the 90 highlights the Geoeconomics, focused more on trade and economic issues than political and territorial. Geoeconomics, establishes relationships between Geography and Economy, through the prominence of use of natural resources from a country by political action of States. Such if the great powers dispute for control of energy sources and those considered critical minerals like oil and gas. The variety, volume and quality of these natural resources are the primary basis for assessing the economic and political power of Nation⁴.

Later, geopolitics became a multi-thematic discipline more than a specialized type of geopolitics, a change that virtually meant the dissolution of the discipline. That is, the denaturation of a discipline that always characterized by its multidisciplinary nature,

³ Albert Hutschenreuter. *The gates of the twentieth century geopolitics*. This introductory article is part of an ongoing investigation. Working paper 04-In Program CAEI Geopolitical Argentine Center of International Studies.

Online www.caei.com.ar/es/programas/geopolitica/04.pdf

⁴ Briano, Justo "Geopolitics and American Geostrategy." Military Club Ed. Buenos Aires. 1972. p: 79.

though without ever losing its substance which was originally the incidence and consequence of the geographical factor in the political development of States. (Hutschenreuter, 2008:3)

But geopolitics is not only faced the phenomenon of distorted, but the same disregard, as the most conclusive sign of globalization is manifested in the weakening of the territorial factor in the world of states, for instance, in the disappearance of the national borders, the death of distance, the erosion of physical sovereignty of States, not including a geopolitical territory. Thus gave rise to a new form of state increasingly central and territorial, decentralized and virtual: the disappearance of geographical and territorial state would disappear one of the historical causes of the clashes, which had been the struggle for land or spaces. (Hutschenreuter, 2008:4). However, geopolitics was also affected by globalization characterized by the weakening of territorial factor, and the disappearance of national borders, who transformed it into geopolitics without territory.

3.3 Critical geopolitics

Critical Geopolitics arises then as a new geopolitics, which focuses on political power and ignores the geographical factor. The critical geopolitics is interested in all kinds of rivalries over territory and tries, from discourse analysis, see how enters practices of public and political actors in past and present scenarios. The nature "criticism" of this vision represents a reflection on the ways in which the geopolitical issues are represented and circumstances. Rather than traditional geopolitics research focused on geostrategy in terms of planning and results critical geopolitics is aimed to the examination of the ideas that precede them, their circumstances and their expression at the level of state discourse ... and provides a platform that aims to be valid for all levels of spatial analysis, not only international affairs but in its intrasocial globalization framework (Barton, 1997:17-18 Castro, 2006:191)⁵.

At the last stage, with the advent of globalization, the idea of deterritorialization and the development of critical geopolitics is remove one of the fundamental basis of geopolitics, territorial component. Within this context of change appears the Posgeopolitics, marked by the consequences of the implementation of neoliberal economic model that can penetrate into other spaces through a deregulation of markets that facilitates the opening of economies and get the same results but without the use of military power. It is also more a relationship between Economics and Politics, with the Territory.

3.4 New geopolitics of energy

In this context of change of discipline arises another change related to the focus on a particular conflict, but linking global geographical space with individual one who has a specific natural resource with political decisions of resource use, that is known as the New Geopolitics of Energy proposes to go beyond geoeconomics issue, Michael Klare (2003), argues that "... in this world after the cold war, wars for resources are not acts of God, or unrelated, on the contrary: they are part of a broader geopolitical and interconnected. Future wars will be for the possession and control of resources needed by modern industrial

⁵ Lyndon, A, Hiernaux, D (eds.) 2006-*Treaty of Human Geography*, Chap.8, Castro, P. Geography and Geopolitics, pp. 187-199. Ed. Antrophos, Mexico.

societies to function. Then emerges in this framework, a new geography of conflict, which has mapped a strategic area where political boundaries do not count but the concentrations of resources⁶. "

In a later book Klare (2008:18)⁷ argues that "... The global fear energy shortage is accompanied by a New Geopolitics of Energy. Within the international system of power that is being constituted can expect that the struggle for energy exceeds all other considerations, international leaders to go to extremes to secure energy supplies in their countries. the oil (and natural gas) will being primarily a business class that is bought and sold on the international market to become a preeminent strategic resource in the world, whose acquisition, production and distribution will absorb more and more time, effort and attention of governments and military leaders. "

Another component to emphasize in this New Geopolitics of Energy is the resurgence of the State's presence in front of business and private interests in the pursuit and domain of energy resources that would be one of the core dynamics of world affairs in the coming decades. In particular case of South America, appears as a resurgence of nationalism, as is shown by process of resources nationalization in Bolivia, Venezuela and Ecuador.

The proposal to analyze South American Geopolitics of Gas, through a holistic or integrative geopolitical point of view, arises to recover the contributions of these different tendencies in the discipline. Therefore, this paper recognizes the existence of classical geopolitics components, like presence of States and their political decisions in the area; Geoeconomics with its emphasis on presence of natural gas resource. Also analyzes discourses of Presidents, Ministers of Economy, Energy or Defense and political decisions of States as propose Critical Geopolitics. Finally, from the perspective of the New Geopolitics of Energy recovers the analysis of each component in the global level and put them at the particular context of the South American region.

From geopolitical and strategic point of view, acquire relevance relations between the States involved and the political decisions of use from resource natural gas. The location of the resource also acquires importance, in a certain territory and not in others - there lies the specificity of the territory - and to this, its value as a strategic resource has to be added the high degree of incidence in the economic development of a given country due to its direct use of energy in industrial, residential and commercial activities. Coinciding Isbell argues that "... today, the raw material for energy-particularly oil and potentially natural gas, have emerged as one of the important variables in the global geopolitical context. Although Latin America has relatively few energy resources, compared with Middle East or Russia, but in their own regional context, could achieve self-sufficiency and energy independence. This region represent a direct source of energy supply for the United States and play a very important role in the world energy geopolitical game"(Isbell, 2008:2)⁸.

From a geopolitical perspective and according to modern Strategy, a concept that handles international relationships focus on power relations among States, involving relations

⁶ Klare, M (2003) "*Resource Wars. The future scenario of global conflict*, " pgs: 261/262, Ed Trends. Spain.

⁷ Klare, M (2008) *Planet thirsty, dwindling resources. The New Geopolitics of Energy*. Urano. Barcelona España.

⁸ Isbell, P (2008) *Energy and Geopolitics in Latin America*, Working Paper No. 12/2008, Real Instituto Elcano. España.

between means and ends⁹. That generates dependency relationships where the power is perceived in terms of degree as States depend on the purpose of other actors. Possesses the resources or technology gives power to those who possess them and generates a dependence relationship of those consumers' countries.

3.5 New geopolitics of energy in South America

This context explains that, new geopolitics of energy in South America, have key players in global scale, such is the case of Iran, France, China, (which own the resource, technology and capital needed for investment in infrastructure) and they appear together with regional actors such as Venezuela, Bolivia and Brazil. There is also the apparent contradiction between go away from the United States to avoid dependency and the need to approach to others global players with whom they also create dependency relationships by transfer of technology to expand their bases of power (as in the case of relations France - Brazil, which aims to develop nuclear submarines to control their new discoveries in the pre-salt).

Also, from a geopolitical perspective, the achievement of energy for region self-sufficiency in the medium and long term, is becoming more evident if you observe the conflicts that arose between the countries of the region from 2004, for example, Argentina, Chile, Bolivia, Argentina, Bolivia, Brazil, among others and the solution was search for the supplies from outside the region by use of LNG tankers, ships and regasification. Situation led the region to have a dependency on supply from abroad, which creates a situation of energy vulnerability, in some cases, dependence on others or both simultaneously; such is the case of Argentina.

In this context, there are two geopolitical views on the relationship between Energy and Security. The first, related to State security and international competition to secure the possession of resources that are considered strategic because that empowered the State. The second is located above the national level and worries about security, development and welfare of society at regional and global levels through processes that promote energy integration. Beyond what is desirable, the reality is the prevalence of first point of view¹⁰.

In the case of South American in particular, process of nationalization of resources generated a territorialization of politics, produced as a result of decisions and political alliances between states- centered not on the market but political power that is exercised on a territory - leading to territorial dynamics of uncertainty and instability in energy at regional level, which threatens regional development and improved quality of life of the people involved in the process.

Usually, when you mention the strategic role of gas as a critical variable in the regional energy system, one thinks about the scarcity of the resource or infrastructure investments and passes unnoticed geopolitical component as determining the critical value of the resource, while decisions of resource use in South America is determined based on existing

⁹ Delamer, G. (2005) "*Strategy, for Policy, Company and Security* ". Naval Institute Publications. Buenos Aires. Argentina.

¹⁰ Adapted from Elsa Cardozo NEW SOCIETY 204 (2006) *Regional democratic governance and the role of (dis) integrated energy* pp.: 136 to 149.

Online <http://dialnet.unirioja.es/servlet/articulo?codigo=2380895>.

political issues rather than on economic grounds. Also, do not forget that the State's role is to act as a guarantor of energy security which would enable safety and welfare of the societies involved.

Into this new global energy order, proposed on basis of possession gas or oil are two main actors of the Cold War but with different roles. Main loser, Russia emerges as a leading energy supplier to Europe and Asia. While the United States, winner of this confrontation appears increasingly dependent on external suppliers of energy and therefore more dependent and vulnerable. In this new geopolitical scenario, add two actors with the fastest growing economies in the world, China and India becoming significant competitors in the search for energy reserves, to ensure global growth. In this context, the presence of China and Russia in the South American region is already notorious, especially in its relations with Venezuela, Bolivia and Brazil.

Also, in South American scenario has been produced the two major changes in the growth of global reserves. First, the great discoveries of hydrocarbons in Brazil, in the pre-salt area, that position not only as a country that achieved its energy self-sufficiency but also as an energy resource surplus country, added to its growing economic and political presence as an emerging country with one of the largest surface extensions and large population, adds a significant improvement in global positioning. Also, the final certification of oil reserves in Venezuela in 2010 (remembering that in many cases is associated with gas field) who listed this country first in the world reserves, above Saudi Arabia.

Principal countries providers of resources try to maximize the benefits and advantages it gives them this position within the new world energy order, which some call "resource nationalism" that could be defined as the management of energy flows according to the vital interests of the state, trying to convert the latent power and political advantage. Then the goals are still available to the respective governments and in some cases are used as instruments of foreign policy (Klare 2008: 34-35). These companies are increasingly involved in all stages of the circuits of production, transportation and marketing of products, either gas or oil.

A resurgence of behaviors "statist" regarding energy resources is a consequence of dependence the States from hydrocarbons in a context of shortage of production that generates threats to energy security and life quality of people in the most developed, while highlights conditions of vulnerability and dependence on the major consuming countries. All these economies-traditional and emerging grow up and compete for the same energy sources.

Further reality to be faced when speaking of the New Geopolitics of Energy is that it will remain dependent on increasingly scarce resources and higher demand since despite the efforts of scientists around the world trying to substitute these resources. Reality is that none energy consumer country can replace these resources on a large scale. Regard the report of the U.S. Department of Energy 2007 as these fuels will continue to meet global energy needs -even in 2030- around the 87% (DoE / EIA, IEO 2007, Table 2, p.85).

Another scenario arises; the countries that have the resources but are not in conditions of defend it against pressure from rich countries but poor in energy resources. This situation is clear in Africa. However, in South America face that possibility also Brazil move forward in

its nuclear program and develops a nuclear submarine -with French support- to protect his recent discoveries in the presal from external aggression. Related to this situation and the possibility of signing strategic alliances with States that have technology, weapons or knowledge arises in the region presence of global players such as Russia, France, Iran and China among others. Faced with this change in region United States reactive the 4th Fleet to protect its interests in the region with a power that, any Latin American country can withstand.

Competition for energy is intensified and considers that, owning energy is a factor that rivals with the military power; Russia is a clear example of this situation. The real possibility of transforming the natural gas from a strategic resource to a tactical one (which could be used as a tool of economic domination over other countries) was observed specifically on 1 January 2006, when Russian President Vladimir Putin put in check the European continent. In one of the coldest winters in its history, cut off gas supplies to Ukraine, the main distributor of resources from Russia, but far from its political ideology. Remembering the Cold War tactics, it became apparent that gas resource use represented an element of pressure and power - not military but economic - hence the idea of natural resource use as a strategic weapon.

A growing demand against a standing offer, both at global, regional or local level, certainly generate greater competition among energy-consuming nations, and those owners or producers of resources. Meanwhile, not all countries will be able to acquire these resources, high costs generated by the shortage, with the resulting consequences on the quality of life of the population.

Meanwhile, other countries with resource but which has less support have taken other measures such the proposal of Venezuela and Bolivia to create a "natural gas OPEC" or non-traditional alliances like the one held between China and Russia to reduce the weight of the United States. Experts suggest that every new barrel that is added to global reserves will be more difficult and expensive to extract than the last, will be deeper underground, farther from the coast in hazardous environments or in regions most susceptible the conflict, more hostile. It is probable that this same scenario is repeated in most existing fuels, including coal, natural gas and uranium.

If one analyzes from an energy perspective the reality of Latin America, focusing on gas resources, South American countries are a territorial space characterized by contradictory conditions on one side, have a variety of renewable energy resources and nonrenewable, that would mean the possibility of regional energy self-sufficiency, whereas on the other hand, reality shows that several countries in the region have a situation of dependence on external supply sources located at large distances and in other cases, energy vulnerability becomes more apparent as we move into the twentieth century, product demand growth against a standing offer for lack of investments in infrastructure and exploration tasks.

The most urgent energy problems it faces today the South American region is to supply natural gas fluid, predominant in the regional energetic matrix. That is aggravated by the absence of long-term public policies in this area, or the historical unpredictability that have occurred in some countries, such is the case of Argentina, who behaved like a country with large gas field and leading to overexploitation. Therefore, it becomes evident the need for

strategic decisions for the region considering to achieve energy security to ensure the development and welfare of future generations, compared to a situation of vulnerability and dependence on energy in the region.

4. Geopolitics of gas in South America

The changes in South American energy sector between 2004 and 2011 - focused on the use of gas - show situations that move from a bilateral conflict to a regional issue with the subsequent incorporation of global actors outside the region. These processes of change can be glimpsed through the application of geopolitical approach from different sides who allow us to perceive the complex power relations that exist between actors outside the region of global level - such as Russia, Iran and France - with key regional players - Brazil, Venezuela and Bolivia, through a series of non-traditional partnerships that arise as a result of changes in regional and global scenario where contrasting new integration processes globally with growing conflicts causing instability and fragmentation in regional and global level.

4.1 New geopolitics of energy -focused on gas natural - in South America

The geopolitical analysis allows us to understand the South American Gas Crisis as a result of a reality - changing and uncertain, and to interpret the complexity of the existing dynamic in the social, political and economic level. We also understand the power relations that are established for the emergence of new geopolitical situation in regional and global space, where reality is being constructed every day.

South America has abundant renewable energy resources and nonrenewable energy self-sufficiency that would enable the region and avoid dependence on uncertain supplies from abroad. However, the reality shows a situation in which, for historical and geopolitical conflicts existing inadequate policies and decisions, lack of long-term vision in the region have created situations of vulnerability and dependency and the possibility of disappear energy self-sufficiency in the region beyond the existence of reserves in quantity and variety of pipeline constructed and supply agreements signed between the countries

The sum of different factors detailed in this paper allows us to anticipate in the short term, a new crisis in the region in the period 2015-2020, if the necessary measures are not taken to reverse the current situation and creates a lack of energy security in the region. Geopolitical and Strategy, allows a differential analysis of energy security scenarios that goes beyond dominant economic view because they are political and not economic decisions which sometimes define the actions taken by States. In Latin America, particularly in South America, there are four main geopolitical trends concerning the use of natural gas:

1. An increased use of gas resources in relation to the rising price of oil and its minor effects on the environment and the massive installation of combined cycle power plants.
2. Increasing LNG trade growth both globally and regionally, making it possible to emerge from the constraints involving pipelines and that also allows the resource to get anywhere in the world.
3. Nascent proposal, supported by Venezuela and Bolivia, to form a gas group OPEC-style.

4. Potential trend, but ever closer, is the possibility that natural gas becomes a commodity like oil.

4.2 Analysis of the situation by country

Analyzing the case of South America, Chile has been one of the countries that quickly came to use of LNG from the supply conflicts with Argentina in 2004 and in 2010 led to the arise the possibility of exporting gas to Argentina through existing pipelines from the country and exporting country imported despite having no recourse but regasification plants installed in its territory.

In the region, geopolitical and strategic situation that arises is the need for each State to ensure the flow of energy supplies to its population. This requires the signing of agreements to overcome conflicts of interest that arise between players in the region, and internally within each state, for example, in Argentina provide its population or exported to Chile, Bolivia meet contracts with Brazil or Argentina as well as ensuring the domestic supply. Most South American countries are faced with the challenge of implementing policies and strategies that put them safe from possible energy crisis. Against this background, the various governments chose to perform different actions:

ARGENTINA: made a complex pattern of staggered withholding exports of oil and derivatives that led to overexploitation of resources and lack of investments. Added to this Argentina's energy matrix has 90% of depends on oil and gas. However, the two productions fall, almost continuously, since 1998. Probably, Argentina is one of the countries most affected by the energy crisis and move from being an exporter to being a net importer of energy, especially LNG. Currently, subsidies to the energy sector grew 63% in 2010, the National Administration expense subsidies spent amounted to \$ 48,032 million, which represents a 47% more than what was spent in 2009. The other bet is on the exploration and exploitation of thigt gas and shale gas reserves discovered in a "megafields" of unconventional gas in Neuquen basin, the argentine President announced in December 2010, that they would expand the gas reserves of 6 to 16 years. Their main problems to be in production are infrastructure investments, the highest price, use only for industries and pollution that it generates.

CHILE: has been one of the countries that quickly came to the use of LNG from the conflict with Argentina supply in 2004 and in 2010 led to the emergence of the possibility of exporting gas to Argentina through existing pipelines from the country and exporting country imported despite having no resource but regasification plants installed in its territory. Also, 53% of the energy matrix is represented by the hydroelectric system is affected by droughts that prevented from operating at full capacity. Response to the crisis has been the development of coal plants by 2015 it is expected that this technology represents almost 30% of the matrix of the SIC, the main electrical system of the country (three times the current share). Another strategy has been the installation of regasification plants that allow to bring resouce from anywhere in the world and is already thinking about export natural gas to Argentina. On November 13 in 2009, Chile¹¹ was signed the decree that

¹¹ Tecnoil journal report of January 27, 2011 as reported by the Argentina Association of Budget and Financial Administration (ASAP)

allows the sale of liquefied petroleum gas (LPG) to Argentina and from there to other countries such as Uruguay, Paraguay and Brazil, the sale could be from 2010 or 2011, when Argentina brings its legal framework. Argentina would thus be a supplier to the consumer.

PERU: tries to change his energetic matrix and stop using the petroleum products to exploit the Camisea natural gas, oil field discovered by Shell in 1983. Furthermore, the idea of an energy ring that communicates with Chile and from there to Argentina was dropped and resumed some contacts with Petrobras regarding the installation of refineries in the country. However, this year Peru exported 165 000 metric tons (MT) of natural gas (LNG) that will occur in the plant operating Melchorita Peru LNG consortium, it is projected that this year there will be about 52 shipments LNG around the world. Besides natural gas production has increased from 327 million cubic feet per day to around 700 million, confirming its strongest growth in global production of 108% between 2009/2010.

BRAZIL: it is one of the least affected by rising oil prices since they already achieved self-sufficiency in oil and also with the new discoveries of oil will be a surplus from the energetic point of view and have greater potential to prevent energy crises and regional ones once you get rid of the volatile gas shipments from Bolivia. It has an energy matrix with 46.6% of energy from renewable resources (the average is 13%). Added to that, the use of sugar cane is the second energy source after oil and this is another resource that leads us away from dependency. Natural gas consumption in 2010 increased 35.5% increase compared to 2009 with a daily average of 52.9 million cubic meters, said the association of gas distributors in the country. One factor for this growth was the heaviest use of thermoelectric plants using natural gas as fuel, since the increase in consumption in this sector was 171%. Among regular, the largest increase in industry which increased its consumption by 20.15% while household consumption grew 7.2% and 6.26% commercial¹².

BOLIVIA: it has the second largest reserve of gas in the region, and its largest supplier. Political instability and legal uncertainty prevented him from consolidating his position for the lack of investment in infrastructure to exploit that resource. Including conflict has domestic supply since the nationalization of hydrocarbons by itself does not generate wealth, foreign investments are needed if the country does not have the financial resources to become profitable and generate revenue from there that can be distributed among the population. Bolivian Fiscal Oilfields (YPFB Corporation) will spend more than \$ 43.2 million in exploration work and exploitation of hydrocarbons in the perspective of a 15% increase in oil production, natural gas and associated liquids in the department Cochabamba. The state oil company president, Carlos Villegas¹³, announced that from this amount 24 million dollars is earmarked for operating tasks in order to optimize local production and more than \$ 18.3 million in exploration for new reserves hydrocarbons.

VENEZUELA: it has the largest reserve of gas in the region but there is the feature that does not export gas to the region due to the lack of pipelines and regasification plants including

¹² On January 27, 2011 was signed this agreement and the Argentine Minister de Vido said that "the goal is to achieve greater exchange. Integration is very important, symmetry, which is going to go to work. It will at some point if a country is about something and the other will need to see how they complement. In this context, it might sell or buy gas, depends on the situation. For example, trade with Brazil we work very well "

¹³ According to the publication of the journal Tecnoil of February 8, 2011.

the paradox that imports gas from Colombia. PdVSA reduced 61% their investment goal for 2011 according to the provisions of the Oil Sowing Plan 2010-2015 which was designed in 2009, after changing the deadlines and goals of the original 2005 project. The tax burden from the Venezuelan oil industry on the remains, and is reflected in the forecasts of investment and social contribution. The current plan includes investments of 252 billion dollars, of which PDVSA will provide 197 billion dollars to move toward four strategic objectives: accelerating development of the Orinoco Oil Belt to add 2.8 million barrels a day production for the year 2030, the development of offshore gas to satisfy the domestic market and export to key markets, furthering the country's overall socialist development and territorial balance, and the absolute sovereignty over the oil and gas resources¹⁴.

In summary, concrete actions are only observed in some countries such as Chile and Brazil, with the difference that their interest is to secure its own energy supply, regardless of the recognition of the need for a strategy for achieving Supraregional Energy Security to allow the development of the region. Consequently, the two countries with the largest reserves of gas but no investment in infrastructure, increasing political instability and without legal certainty, such is the case of Bolivia and Venezuela to varying degrees, are creating vulnerability in the region such as Brazil and Argentina, dependent on gas from Bolivia, but with no assurance of continuous supply, despite the long-term contracts already signed. Argentina meanwhile, decreased exports to Chile and increased imports.

5. Conclusion

The survey of the energy potential of South American countries is a necessary step for a sustainable exploitation of resources to enable the use of all energy alternatives available to the region. Vulnerability is the counterpart of energy security to any country aspires and to avoid it is necessary joint actions conducive to regional integration.

The Americas region has enough variety and quantity of renewable and nonrenewable resources in the region without having to rely on sources outside the region. Victor Bronstein¹⁵, Director of the Center for Energy Studies, Politics and Society (CEEPyS) argues that "Latin America as a region and beyond the particular situation of each country energy self-sufficient. Then, the process of integration is important because the threshold of a new global energy crisis, the struggle will be for the price, but by the appeal "Ensuring a reliable supply of energy in America is the responsibility of governments. Therefore, governments should intervene to manage risks and avoid supply disruptions and as in reference to costs. The measures range from subsidies to producers or consumers of energy, to the signing of international conventions. Ensuring Energy Security is a State obligation, but recognition that this cannot be obtained in isolation and affirm the need to firm agreements.

In sum, the geopolitical landscape of energy in the South American region in 2011, focused on the gas resource, shows important changes:

ARGENTINA loses its position as a leading gas exporter in the region, as well as their ability to self-sufficiency due to declining reserves and lack of investment in exploration

¹⁴ According to a report in the journal *Tecnoil* of January 11, 2011.

¹⁵ Roca, M. (2010) "We are on the verge of a global energy crisis, Victor B." In DEF .Ed TAEDA, No. 64 p: 88.

and infrastructure tasks. His current dependence of LNG is evident when one considers that consumed 8 million cubic meters per day in 2009 with an estimated 270 to 320 million dollars. Can be reached the paradox of imported gas (LNG) from Chile, his old top consumer. Purchases of LNG began in 2008 with 8 ships as a transitional situation for the winter season, but in 2010 reached 21 ships and by 2011 anticipates the arrival of another 46 ships. On the last trip of the president to Qatar signed an agreement to import 20 million m³ per day to replace Venezuelan fuel oil, Infrastructure Minister Julio de Vido said the Qatar LNG is cheaper because it is transported in freight double-sized vessels and is better in environmental terms than Venezuelan fuel oil. Argentina has gone from being an exporter of energy to be a country dependent on imported energy resources (LNG, fuel oil, fuel) in 2010 was a net importer of oil after two decades of self-sufficiency and is vulnerable from point of view of the high costs to be paid to ensure the provision of these resources, oil purchases abroad increased from 76.8% of 1858 million in 2009 to 3,283,000,000 in 2010, according to a report published by the Sectorial Economic Research Center (ICE). Moreover, the alternative of unconventional gas exploration potential still have not been tested for their reserves, or made the necessary investments in exploration and production tasks.

BRAZIL is the biggest winner in the region, thanks to huge discoveries of oil and gas resources in the shelf made during 2007 / 8 and with a plan in place that will allow the rapid acquisition of the resource in 2015 would become a surplus country in energy resources (gas, oil, hydro, alternative energy). However, despite being oil self-sufficiency since 2007, in the short term shows vulnerable by their dependence on the uncertain supply of gas from Bolivia, in this regard, José Sergio Gabrielli, president of Petrobras, said wells in 6 years, new discoveries in the Brazilian continental shelf go into production, which would be achieved, in 2015 - get the gas self-sufficiency and achieving independence from unsafe gas supplies from Bolivia, thus exceeding its vulnerability.

CHILE, can also be a winner, because, before the gas supply crisis in 2004 adopted the necessary measures, like betting to LNG regasification plants and install that let in 2010, be able to feed itself and even export surplus the resource. His condition is a clear example of a country dependent but not vulnerable, given its regasification plant and sourcing safe and varied, but away from countries that do not generate vulnerability. In addition, he resumed investment in hydropower and coal and also took preventive measures energy rationing. VENEZUELA, BOLIVIA AND ECUADOR, are energy-exporting countries and nationalizing their reserves to increase its negotiating leverage with large multinationals in order to earn more income derived from oil and gas, but generating conflicts over legal certainty for investors, as a result, they do not make the necessary investments in infrastructure and this affects their growth potential.

BOLIVIA is another of the losers in the region, being a central actor for the regional energy supply started to have serious difficulties in complying with treaties agreed with Brazil and Argentina. The nationalization of the hydrocarbons generated that the companies concerned in their interests not to perform the necessary investments in infrastructure to ensure higher production that would allow her time to meet the agreed volumes of supply contracts. This is a special case of vulnerability and dependence because it depends on the one hand, of investments in infrastructure made by other third

countries and the sale of its gas to countries like Argentina and Brazil. Despite having signed long term supply contracts with these countries, cannot be enforced by the lack of investment in infrastructure, thus being in a vicious cycle that cannot leave despite having abundant reserves of gas resource.

VENEZUELA is also far from being the lead actor that was in 2008 with his proposal of the Southern Gas Pipeline, the fall in oil prices reduced its income. Also, climate issues as a severe drought seriously affected its hydroelectric resource dependent and uncovered its shortcomings and lack of investment in infrastructure to avoid a dependence on climate, the more even with large oil resources. However, the fact he mainly oil dependence creates extreme vulnerability of the country's GDP from the exportation resources. Oil Minister Rafael Ramirez said that Venezuela has a volume of country's oil reserves 297,000 million barrels, which would be the first country with the largest proved oil reserves, ahead of Arabia, with 266,000 million barrels, and countries like Iran or Kuwait, according to the Organization of Petroleum Exporting Countries (OPEC). However, it has problems of lack of investment in infrastructure as well Bolivia. Despite having the largest gas reserves in America these are not exploited and maybe it should think in the short and medium term export through LNG ships since the idea of South Pipeline had many obstacles to become possible. So far, only Venezuela provides fuel oil to Argentina and despite being the country's largest gas reserves in America, NO PROVIDE GAS TO THE REGION.

The entry of global players in the region, including Russia, France, China, Iran and Spain (with investments in Venezuela and Argentina through Repsol-YPF), due to the presence of abundant natural resources demonstrates the need for consumers to ensure the provision of them to not be vulnerable and also need for resource holders to ensure the ability to effectively protect, through deterrent military equipment. It seeks to obtain the transfer of technology that provides France and supported by Russia and China. This led to an increase in military spending in the region.

The application of geopolitical analysis allowed understand the South American gas crisis as a result of a changing reality and interpret the complexity and dynamics of social, political (resurgence of nationalism) and existing business and also understand the uncertainties and the possibility of emergence of new geopolitical situation in a regional space in which reality is being constructed daily. Knowledge of political, economic and geopolitical has shown, therefore, the important to draw scenarios about possible developments in energy markets and security of a regular supply companies.

Monitoring the energy situation in the country and the region began in earlier papers by the author allow to suggest that the conflict has expanded from a binational problem, focusing on conflicts of gas supply between Argentina and Chile, to a regional conflict who joined Bolivia, Venezuela and Brazil with the intention of the South American Gas Pipeline now discarded, which currently includes global players outside the South American region, as in case of Russia, France, Iran, and a look around the U.S. on the region. This allows to affirm the existence today of a situation of energy dependency and vulnerability in the region that must be reversed because it has sufficient resources to achieve its self-sufficiency energetic and also be exporting.

Concluding, while the reality is that only existing pipeline in operation - with the advantages that this implies - are in Bolivia, the reality is that contracts are not met and pipelines cannot be filled unless there are investments in infrastructure to ensure supply. There is the contradiction, the region is less vulnerable if choose to import gas from Qatar and other countries, beyond the distance and dependence that it generates, than if import the resources from countries with highest gas reserves in the region, Venezuela and Bolivia. As a result, promote a strategic alliance between States, since a global perspective is not only advisable, is a real priority for South America. This partnership should be built with the participation of State actors who claim the resource and those that offer it within the region. Achieving the South American energy integration, the region would be in the enviable position of energy self-sustaining future growth, and supply some of the needs of the rest of the world. At this point another challenge, not least the integration, is exporting hydrocarbons, but at the same time to develop, with the consequent improvement of quality of life of people from a specific resource territories, the energy.

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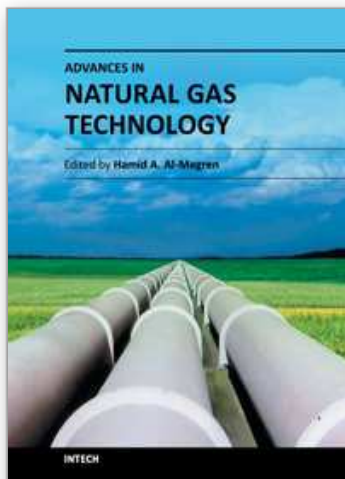
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Natural gas is a vital component of the world's supply of energy and an important source of many bulk chemicals and speciality chemicals. It is one of the cleanest, safest, and most useful of all energy sources, and helps to meet the world's rising demand for cleaner energy into the future. However, exploring, producing and bringing gas to the user or converting gas into desired chemicals is a systematical engineering project, and every step requires thorough understanding of gas and the surrounding environment. Any advances in the process link could make a step change in gas industry. There have been increasing efforts in gas industry in recent years. With state-of-the-art contributions by leading experts in the field, this book addressed the technology advances in natural gas industry.

How to reference

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