GAS MARKET INTEGRATION IN THE SOUTHERN CONE

A case study prepared for the International Gas Union's Gas Market Integration Task Force.

Gas Market Integration in the Southern Cone

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In several regions of the world, neighbouring countries have been feeling the pressure to take steps towards interconnecting their gas networks. However, not all countries follow the same steps towards, or achieve the same degree of, natural gas sector integration, as several factors condition the extent of interregional gas development. The evolution of proven reserves is just one factor affecting gas development. The presence of large economies of scale in transportation and distribution together with the relative inflexibility of investments and the lack of a world standard for gas pricing imply that the development of natural gas is mainly driven by demand – more precisely, by a demand that can justify financing the investments required all along the gas chain.[1] Therefore, overall economic and political conditions, regulatory frameworks and pricing policies are as important to integration as reserves. This case study examines the steps that the countries in the Southern Cone have taken towards the integration of their natural gas markets.[2]

The integration of natural gas markets offers advantages to both producing and importing countries. For producing countries, the main advantage of integration is the possibility to attract investment that would otherwise not be justified by a reduced local market. As soon as investors take into account the attractiveness of potential neighbouring markets, integration can help producer countries in using their natural resources to finance their development. For importer countries, market integration provides a source of energy to support their economic growth. Additional advantages of integration are related to higher reliability of supply and more stable rules. Moreover, integration tends to increase the utilisation of common energy resources, makes gas/electricity integration possible and increases the scale of energy markets. Altogether, these factors imply that gas market

1 In fact, 85% of gas consumed in the world is produced locally (OECD; 2003).

2 The Southern Cone is the region formed by Argentina, Bolivia, Brazil, Chile, Paraguay and Uruguay. Hereafter, Paraguay will be excluded in the analysis as this country is unlikely to take part in a regional gas market in the medium term because of its current lack of reserves and demand for natural gas.

Argentina is the major gas producer in the Southern Cone.

integration might be helpful in increasing the competitiveness of the countries involved.[3]

However, some observers consider that gas market integration has some disadvantages, which are mainly related to each country's freedom to develop its public policies. Examples may include a smaller margin for discretional regulatory policies or the restriction of domestic options for energy supply. This would especially be the case when economic and political environments differ considerably between neighbouring countries. Integration may also weaken the negotiating power of countries that have a strong position when dealing on a bilateral basis.

Natural gas markets in the Southern Cone

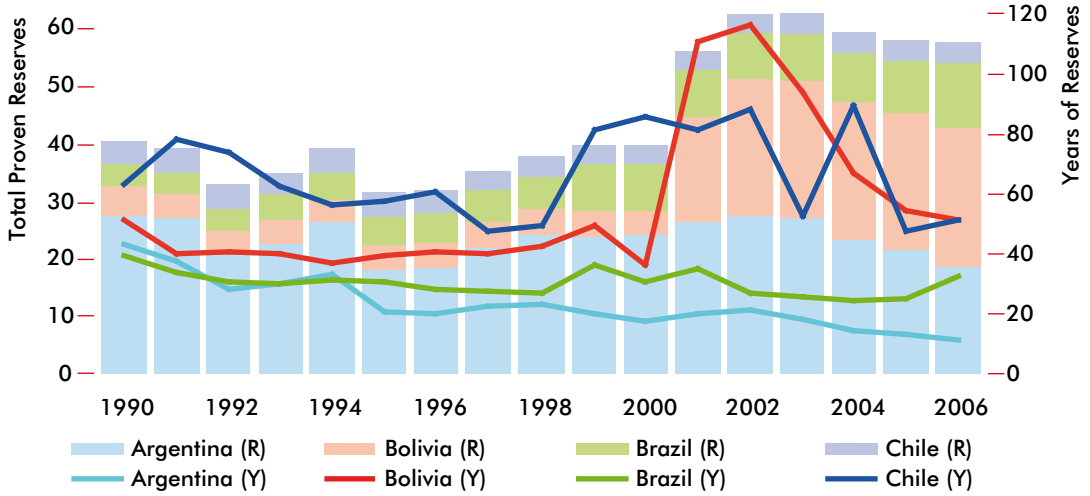
With the exception of Argentina, natural gas markets in the Southern Cone started to develop relatively recently based on important discoveries of this hydrocarbon in the late 1980s and early 1990s. Indeed, between 1990 and 2006, total reserves in the region increased more than 40%, mainly as a result of an expansion in exploration activities that responded to a more stable economic and political environment, privatisation and liberalisation of gas markets, as well as to a shift in demand more favourable to natural gas.[4,5] By 2006, proved natural gas reserves in the Southern Cone reached 57,841 billon cubic feet (bcf), or about 1% of the world's total. However, the dynamics of natural gas reserves differ considerably across countries. *Figure 1*

3 World Bank (2007).

4 The increase in gas consumption is not exclusive to Latin America. World natural gas consumption is projected to more than double over the next decades, rising from 23% to 28% of world total primary energy demand by 2030, and surpassing coal as the world's second energy source (Mares, D.; 2004).

5 Natural gas demand increased due to a combination of economic and environmental conditions. During most of the 1990s, natural gas was a less expensive source of energy than the oil products that it primarily competed against. Low gas prices (and the expectation that they would remain low), its clean-burning qualities and increasing environmental regulations contributed to large investment in facilities, particularly electric generation, that use natural gas (American Petroleum Institute, 2008).

PROVEN NATURAL GAS RESERVES IN THE SOUTHERN CONE, 1990-2006 (BCF)



Notes:

(1) Uruguay is not included because it lacks reserves.

(2) Years of reserves are defined as total proven reserves divided by total production.

(3) R= total proven reserves, Y= years of reserves.

Source: Energy Information Administration.

LEFT
Figure 1.

shows that proven reserves increased sharply in Bolivia and Brazil while they decreased in Argentina and Chile.

Figure 1 also presents each country's reserves in years, at prevailing production levels. It shows that by 2006 the region had natural gas for 147 years, a stock considerable smaller than the 255 years of proven reserves that the region had in 2002 when reserves in Argentina and Bolivia where at their highest. The data also shows that Argentine reserves decreased steadily from 1990 while Bolivia's started their downward movement in 2003, due to a combination of higher production and less exploration activities. Brazil's reserves, on the other

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Table 1.

PRODUCTION AND CONSUMPTION OF NATURAL GAS IN THE SOUTHERN CONE, 1990-2006 (BCF)

	Argentina				Bolivia				Brazil				Chile				Uruguay				Region
	P	*C*	*P-C*	*GDP*	*P*	*C*	*P-C*	*GDP*	*P*	*C*	*P-C*	*GDP*	*P*	*C*	*P-C*	*GDP*	*P*	*C*	*P-C*	*GDP*	*P = C*
1990	630	717	-87	1.00	107	30	77	1.00	97	97		1.00	66	66		1.00				1.00	900
1991	704	781	-77	1.13	104	26	78	1.07	119	119		1.03	52	52		1.10				1.07	979
1992	709	787	-78	1.26	110	32	78	1.09	130	130		1.03	55	54	1	1.24				1.17	1005
1993	760	833	-73	1.35	103	30	73	1.13	146	146		1.09	62	62		1.34				1.22	1071
1994	786	856	-70	1.44	105	35	70	1.17	152	152		1.16	69	69		1.42				1.33	1112
1995	883	953	-70	1.41	113	43	70	1.22	159	159		1.21	67	67		1.58				1.32	1223
1996	938	1010	-72	1.49	109	37	72	1.26	178	178		1.24	64	64		1.70				1.42	1290
1997	967	1008	-41	1.62	112	47	65	1.30	195	195		1.29	75	99	-24	1.82				1.50	1349
1998	1045	1077	-32	1.69	107	31	76	1.35	205	205		1.28	70	114	-44	1.88				1.57	1427
1999	1221	1143	78	1.63	87	32	55	1.34	218	231	-13	1.28	42	162	-120	1.87	1	-1		1.54	1568
2000	1321	1173	148	1.64	117	44	73	1.37	257	333	-76	1.35	40	184	-144	1.97	1	-1		1.54	1736
2001	1312	1103	209	1.59	165	29	136	1.40	234	396	-162	1.38	42	224	-182	2.06	1	-1		1.51	1753
2002	1275	1069	206	1.43	205	36	169	1.42	287	473	-186	1.42	39	227	-189	2.12	1	-1		1.36	1806
2003	1449	1221	228	1.57	255	79	176	1.46	311	499	-188	1.44	65	279	-214	2.23	2	-2		1.41	2081
2004	1585	1339	246	1.74	355	76	279	1.53	341	608	-267	1.54	38	293	-254	2.39	4	-4		1.61	2319
2005	1611	1428	183	1.94	436	75	362	1.60	345	657	-312	1.61	72	302	-230	2.57	3	-3		1.88	2465
2006	1628	1475	153	2.15	466	85	381	1.69	349	683	-334	1.70	67	263	-196	2.72	4	-4		2.07	2510
% Change 1990-2006	6.45	4.22		3.28	9.51	6.23	10.56	2.92	8.11	13.50		3.14	-1.17	13.60		5.84				3.27	6.78
% Change 1990-1995	6.5	5.14		7.39	0.68	7.80	-2.45	3.8	9.95	9.95		3.99	3.03	3.08		9.34				6.19	5.82
% Change 1996-2000	9.61	4.34		1.94	-1.10	-0.38	-1.38	2.01	8.83	15.28		1.63	-14.10	29.75		3.26				1.90	7.73
% Change 2001-2006	5.49	7.14		7.52	24.91	24.04	25.31	3.96	7.84	11.82		4.42	10.95	5.00		5.96	36.62			7.96	8.44

Notes:

(1) P = Production, C = Consumption, GDP = Gross Domestic Product based on purchasing-power-parity, per capita. Index 1990 = 1.

(2) Total consumption for the whole region equals total production, because during this period there were no imports or exports to countries outside the Southern Cone.

(3) Natural gas production and consumption in billion cubic feet.

(4) Equivalent annual change expressed as percentage.

Source: Energy Information Administration and International Monetary Fund.

hand, started an upward trend in 2005, mainly as a result of the development of the Santos Basin.

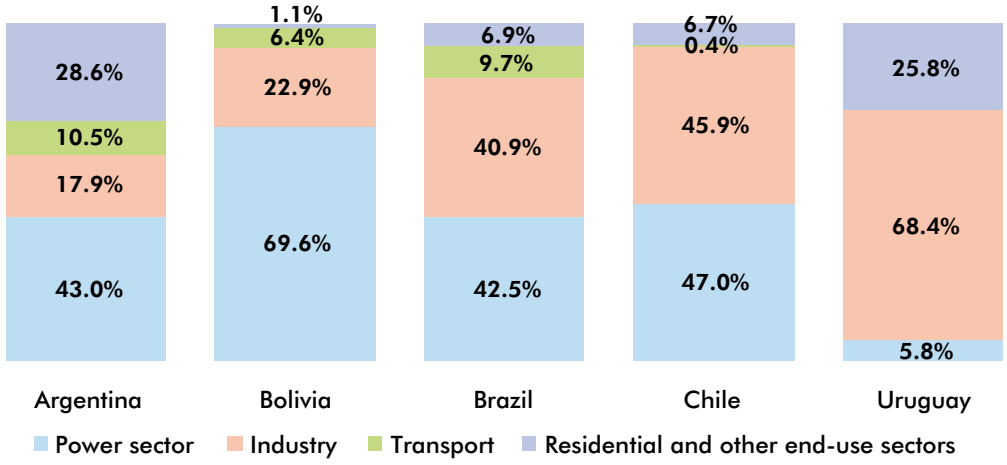
Widespread structural reforms and efforts towards macroeconomic stabilisation helped South American countries to recover sustained levels of economic growth. Hand-in-hand with rapid economic growth, there was also a rapid increase in regional energy demand, and natural gas was no exception. *Table 1* presents natural gas production and consumption series and compares them with the evolution of GDP. The series show that consumption and production are not equally distributed across countries. Natural gas production and demand is highly concentrated in Argentina, which in 2006 accounted for 65% of the region's gas production and almost 60% of total consumption. Bolivia's production was almost 20% of the region's total, while its consumption of natural gas was only 3.4%. In total, these two countries produce 85% of the natural gas in the region, and their gas exports to other countries represent more than 20% of the gas consumed in the Southern Cone. Put differently, the difference between production and consumption – the net trade balance – together with reserves data in *Figure 1* suggest that there exists a natural market for gas in which Bolivia and Argentina provide a surplus fuel source to Brazil, Chile and Uruguay.

The series in the table also show that between 1990 and 2006 natural gas demand in the region increased steadily, continuing its upward trend even in years of economic recession. Moreover, gas consumption increased much faster than GDP in all countries, though at a different pace: it increased about 30% per year more rapidly than GDP in Argentina, two times faster in Bolivia, Brazil and Chile and even more quickly in Uruguay.[6] The series also suggest that the increase in gas consumption is inversely correlated with its initial level; while Argentina was the largest gas consumer in 1990, its growth in demand was the smallest. The series also indicate that the increase in production was due to higher production levels in Argentina,

6 The increase of demand in Uruguay is due to the rapid expansion of gas grids in the residential sector.

LEFT
Figure 2.

SHARE OF NATURAL GAS CONSUMPTION IN THE SOUTHERN CONE, 2005



Notes:

(1) Power sector refers to energy uses in electricity plants, but it also includes distribution losses which are almost negligible in all the countries except Bolivia (11.9% and 6% of total gas consumption, respectively) and in Chile (11.9% and 6% of total gas consumption, respectively).

(2) Other end-use sectors include the residential, commercial and public sectors, as well as agriculture and forestry and other non-energy uses.

Source: International Energy Agency.

Bolivia and Brazil. However, the increase in production differs both across countries and periods; while gas production increased the fastest in Argentina and Brazil during the second half of the 1990s, it did so in Bolivia from 2000, transforming this country into the largest gas exporter in the region.

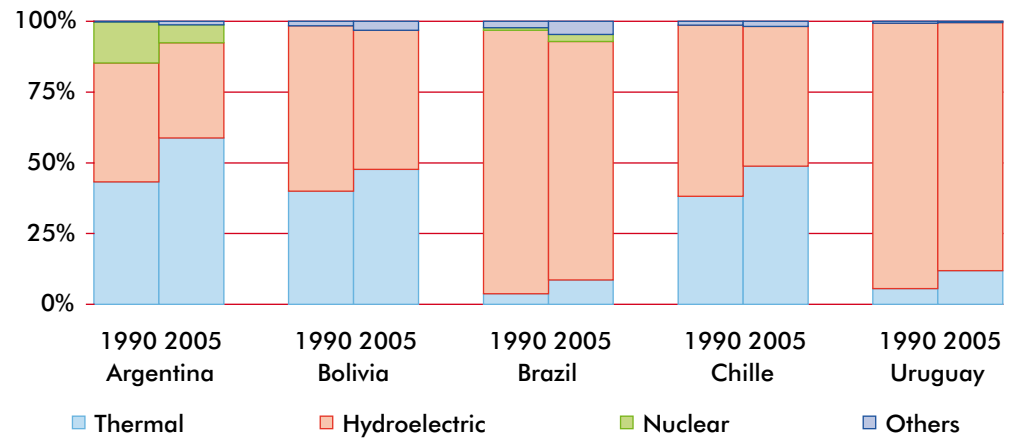
These trends in natural gas demand and supply respond to a combination of geographic, economic and regulatory conditions that affected the evolution and maturity of gas markets in each country. It is generally considered that maturity of gas markets is reached when gas penetration in the commercial and household sectors is high and can only be marginally improved.[7] *Figure 2* (previous page) shows that Argentina has the most mature gas sector in the region, with 28.6% of gas being consumed mainly by the residential and commercial sectors. This high level of penetration is due to the existence of an extensive pipeline network connecting main production regions to all major urban centres. Nonetheless, more than 40% of natural gas consumption comes from the power sector. Uruguay also seems to have developed quickly into a mature market. The picture is different in Bolivia, Brazil and Chile, where only a small fraction of total gas is consumed by end-use sectors, a fact that can be explained not only by a lack of network infrastructure but also by climatic conditions that translate into little or no need for space heating – like in most parts of Brazil, for example. On the contrary, in these countries gas consumption in the power and industry sectors results from differences in hydropower resources and the price of gas relative to other fuels.

Figure 3 complements *Figure 2* by presenting the sources of electric power generation in the Southern Cone. It shows that between 1990 and 2005, the share of thermal generation (and thus

7 This is because commercial and household sectors entail the highest costs in terms of infrastructure and supply flexibility. Note that maturity does not mean saturation, as it there exists considerable scope for growth even in mature markets (OECD; 2003).

RIGHT
Figure 3.

ELECTRICITY GENERATION IN THE SOUTHERN CONE BY GENERATION TECHNOLOGY, 1990 AND 2005



Notes:
(1) Percentages correspond to net electric power generation.
(2) Others include geothermal, solar, wind, and wood and waste electric power generation.
Source: International Energy Agency.

the use of natural gas in the power sector) increased in all countries. However, the implications of that increase in gas usage within each country's energy matrix differ across countries. In Argentina and Bolivia, more use of gas implies a less diversified energy matrix, while in the other countries thermal generation was encouraged as a way of reducing the dependence on hydroelectric power generation, and thus of increasing the diversification of the energy matrix.

Integration of gas markets in the Southern Cone

Gas trade in the Southern Cone has increased considerably in the last decade, but the region is still far away from regional integration. Indeed, regional trade and integration can be characterised as steps taken on a continuum towards full regional integration (El-Agraa, 1989). Following Pineau et. al (2004), it is possible to categorise the three key dimensions of integration of network energy markets into infrastructure interconnection, commercial integration and progression towards regional regulations. *Table 2* summarises the integration continuum, in which each dimension is further sub-divided into four stages. The table shows that the degree of physical infrastructure integration moves from isolated national systems to operation of a fully integrated regional system. Similarly, regulatory integration is at its maximum when a regional regulatory agency is established, and commercial integration occurs when efficient regional secondary and future markets are in place.

The evidence seems to suggest that the level of natural gas integration in the Southern Cone differs across dimensions. In the first place, infrastructure integration can be examined by means of the extent of cross-border transmission capabilities and the share they represent of total demand. *Table 3* displays key data for the cross-border pipelines in the Southern Cone. The table shows that the Yabog pipeline was the first cross-border gas project in South America; it links Bolivia to the northern regions of Argentina, which are not well supplied by the domestic gas transmission network. The table also shows that the longest and largest pipeline in the region is the Gasbol pipeline, which connects the production fields in Bolivia to the main consumption centres in Brazil. The capacity of this pipeline represents about 53% of total gas consumption in Brazil.

Over the last decade, however, another 11 cross-border pipelines connecting Argentine and Bolivian production fields with consumption regions in Argentina, Brazil, Chile and Uruguay were built. *Table 3* (over) shows that seven pipelines were built between 1996 and 1999 connecting Argentina to

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Table 2.

INTEGRATION CONTINUUM FOR REGIONAL MARKETS

Degree of Integration	Infrastructure Integration	Regulatory Integration	Commercial Integration
No regional integration	Isolated national systems	Independent national regulation	National markets with local ownership
↓	Cross-border pipelines	Compatible regulation	Cross-border trade and ownership
↓	Coordinated efforts in transport investment	Coordination of regulatory agencies	Unique regional price reference
Full regional integration	Fully integrated regional system operation	Regional regulatory agency	Regional secondary/future markets

Source: Adapted from Pineau et al. (2004).

RIGHT
Table 3.

CROSS-BORDER PIPELINES IN THE SOUTHERN CONE

Pipeline	Countries		Began Operations	Length	Capacity	Capacity Utilisation
	Exporter	*Importer*	*Year*	*Km*	*MMcf/day*	*%*
Yabog-Yacimientos	Bolivia	Argentina	1972	435	230	17
Gasbol	Bolivia	Brazil	1999	3219	1000	2
Paraná-Uruguayana	Argentina	Brazil	2000	451	100	20
Gasoducto del Litoral	Argentina	Uruguay	1998	19	4.9	2
Cruz del Sur	Argentina	Uruguay	2002	402	180	1
Tierra del Fuego	Argentina	Chile	1996	84	71	10
Gas Andes	Argentina	Chile	1997	467	310	2
Gas Atacama	Argentina	Chile	1999	933	300	2
NorAndino	Argentina	Chile	1999	781	250	3
Gasoducto del Pacifico	Argentina	Chile	1999	531	340	2
El Cóndor-Posesión	Argentina	Chile	1999	10	71	10
Patagónico	Argentina	Chile	1999	32	99	7

Sources: Energy Information Administration, "South American Gas. Daring to Tap the Bounty" (OECD, 2003) and website of Gasoducto Cruz del Sur.

Chile: three small pipelines (Tierra del Fuego, El Cóndor-Posesión and Patagónico) were built to meet the increased gas demand resulting from the expansion of a methanol plant in the extreme south of Chile, and the other four pipelines, which are bigger and longer, were built to supply Argentine gas to end-users and power plants.[8] The quick expansion of cross-border pipelines connecting Argentina and Chile is due to the fact that gas reserves in Chile – which are modest – are distant from consumption centres, so consumers can be supplied more economically from Argentina's basins. All in all, the total capacity of these pipelines doubled the current consumption levels in Chile.

8 Gasoducto del Pacifico and Gas Andes supply natural gas to residential and consumer users, while Norandino and Gas Atacama transport gas for industrial users and power plants.

The capacity of the pipelines that permit natural gas exports from Argentina to Brazil is smaller than those heading to Chile. The Paraná-Uruguayaná pipeline provides natural gas to a power plant in the south of Brazil, though this pipe is part of a more ambitious project that would allow Argentine gas to compete with the gas that Brazil imports from Bolivia. The Cruz del Sur and Gasoducto del Litoral pipelines, on the other hand, supply both end-users and power plants in Uruguay.

From a commercial perspective, gas systems in the Southern Cone are partially integrated. By 2006, more than 600 bcf of natural gas was traded between Argentina, Bolivia, Brazil, Chile and Uruguay. However, cross-border gas trade does not have a long history in the region. *Figure 4* shows that by the mid-1990s, international gas trade in the region consisted of a small quantity of

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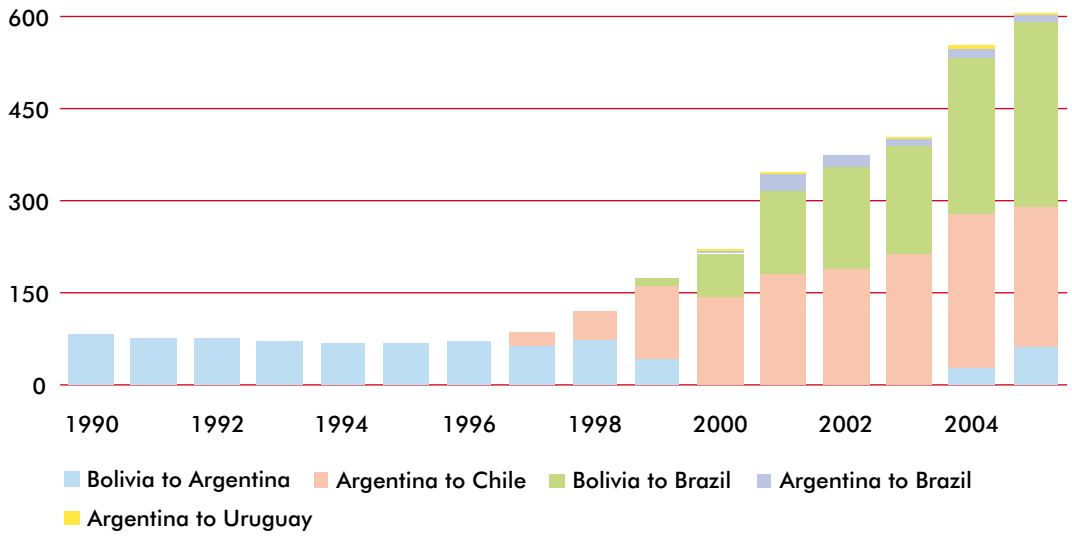
Figure 4.

CROSS-BORDER GAS TRADE IN THE SOUTHERN CONE, 1990-2005 (BCF)



Source: Energy Information Administration and Secretaría de Energía de la República Argentina (Argentine Energy Bureau).

exports from Bolivia to Argentina only.[9] The figure also shows that cross-border gas trade grew quickly from 1997, when Argentina began exporting to Chile. Most of the increase in the inter-regional gas trade was accounted for by Bolivia's exports to Brazil and Argentina's exports to Chile.[10] Exports accounted for more than 80% of total natural gas production in Bolivia and of 15% of total production in Argentina.

Commercial integration of energy markets usually results in the evolution of a unique regional price reference. Theory predicts that in an integrated market, prices of homogeneous products from different suppliers should move in the same direction, and price differentials should only be present if there are differences in transportation costs or quality. However, as shown by Ashe et al. (2002), the explanation behind price discrepancies may be somewhat more complicated in natural gas markets. Natural gas is overwhelmingly sold on complex long-term contracts that have a number of features that may influence the contract price, and hence lead to price variations across contracts. The authors show that when natural gas from different suppliers competes closely in the same market, prices move proportionally over time but there may be systematic differences in the price levels.

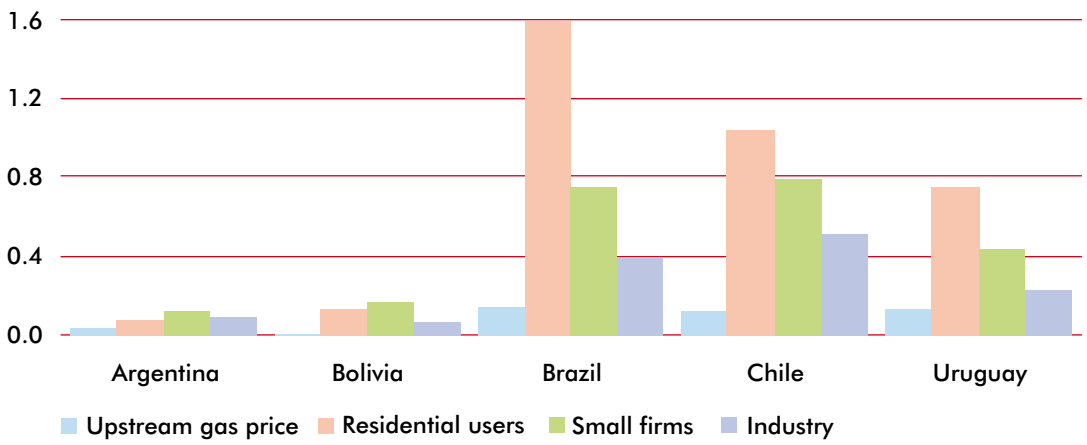
Figure 5 (over) illustrates the magnitude of the price distortion by comparing the level of residential and industrial prices of gas in the region, and shows that natural gas in producing countries is cheaper than in importing countries. Natural gas in Brazil's domestic market is 176 times more expensive than in the Bolivian market and five times more expensive than in the Argentine market, and residential users in Brazil pay as much as 23 times the price paid by those in

9 In fact, this was the case for more than 30 years, as gas exports from Bolivia to Argentina started in the 1960s, when the Argentine gas market was expanding rapidly.

10 Note also that Bolivian exports to Argentina never exceeded 100 bcf per year. Actually, they were zero between 2000 and 2003, when shortages in Argentina made it necessary to import Bolivian gas again.

RIGHT
Figure 5.

PRICE OF NATURAL GAS IN THE SOUTHERN CONE BY USER TYPE, 2007



Notes:

(1) Prices expressed in US dollars per cubic metre.

(2) Residential tariffs include value added tax.

(3) Small firms and industry tariffs do not include taxes.

(4) Price of natural gas for Uruguay and Chile was determined as the average price of gas imports from the corresponding Argentine basins; for Brazil, it was determined as the price of imports of Bolivian natural gas. Argentine and Bolivian prices of natural gas were computed as the average of the residential and industrial prices allowed by the national gas regulatory agency.

Sources: Metrogas (2007), ENARGAS (Argentine Natural Gas Regulatory Agency), Secretaría de Energía de la República Argentina, Superintendencia de Hidrocarburos de Bolivia (Bolivian Hydrocarbons Bureau) and Bolivian newspaper El Deber.

Argentina. Moreover, the figure shows that the relationship between the cost of gas for the various types of users is different in producing and importing countries: in Argentina and Bolivia, natural gas for residential users is cheaper than for firms, but in Brazil, Chile and Uruguay residential users pay the highest natural gas tariff.[11]

Indeed, probably the most restrictive dimension to integration consists of the regulatory asymmetries between markets, which to some extent might be related to the political and economic development differences among the countries in the region than to the specific characteristics of natural gas markets. In particular, the two largest producing countries in the region – Argentina and Bolivia – have both undergone intense macroeconomic and political crises that have had a strong impact on the energy industry. The severity of the impact led governments to restructure regulations – away from market forces – which ultimately brought about distortions in the prices of local energy baskets.

The artificially low prices of natural gas in Argentina resulting from the government's regulatory intervention led to both a rapid increase in demand and brought to a standstill exploration for new fields. As a result, consumers faced supply shortages when the economy recovered (unsatisfied demand in winter totalled about one-third of total demand) and natural gas exports were halted.[12] On the other hand, Bolivia's liberal energy regime was overturned by means of a highly nationalistic hydrocarbons law approved in 2005, which resulted in the nationalisation of gas firms. As a

11 It is reasonable to expect that residential users pay a higher tariff than industrial ones, as the former are more expensive to serve than the latter.

12 Among other things, the government froze prices of natural gas to consumers at a devaluated peso rate, limiting incentives for exploration and production. (World Bank, 2007)

result, both Argentina and Bolivia changed the private-sector orientation of their gas markets, which has had a strong impact on their neighbours, particularly Brazil and Chile.

The direct government intervention in gas markets has made both Argentina and Bolivia unreliable suppliers of natural gas in the region. Consequently, Brazil and Chile have changed their energy plans to focus on self-sufficiency and diversification of energy suppliers, based not only on higher exploration investments but also on the introduction of LNG and the conversion of thermoelectric plants from natural gas to diesel. Diversification of energy suppliers in Brazil and Chile changed a number of factors. The introduction of LNG, even though more expensive than neighbours' gas, provides importer countries with both flexibility and security of supply. This change also implies that Brazil and Chile are becoming more attractive to investors in natural gas sectors than Argentina and Bolivia, and thus that regional energy integration becomes less attractive and likely.

Conclusions

Natural gas markets in the Southern Cone present complementarities that can be better exploited under regional integration. The region has both large reserves and the correspondingly large potential domestic markets necessary to justify the major costs involved in developing those reserves and in building the network infrastructure. Complementarities derive from the fact that the combination of reserves and domestic market potential differs across countries; Argentina has both, Bolivia's reserves are the largest, but the country lacks domestic market potential, and Brazil and Chile do not have important exploited reserves, but they do have significant gas market potential.

The analysis indicates that the natural complementarities in the gas markets of Argentina, Bolivia, Brazil, Chile and Uruguay would be better exploited under an integrated system. Still, the evidence also seems to suggest that the region is far from a complete integration of its natural gas markets. Gas integration in the Southern Cone seems to differ across the integration continuum. The data indicates that a good percentage of the cross-border infrastructure required to make integration possible is already in place. Indeed, the rapid increase in natural gas trade in the Southern Cone was a consequence of the construction of new cross-border interconnections – that is to say, it was a response to higher infrastructure integration.

Nonetheless, one of the main limitations to the integration of natural gas markets in the region is the lack of an infrastructure network that allows gas from different suppliers to be considered as competitive to each other. As Argentine and Bolivian gas do not compete with each other in either of the importer countries, they cannot be aggregated into a single commodity with a single price. In Chile, for example, there are three independent gas network systems (north, central and south) and so there is no possibility for the natural gas feeding one of the systems to compete against gas feeding any of the other two systems. The situation is no different in Brazil, where in spite of the country's capability to import gas from Argentina and Bolivia, the domestic infrastructure is not developed enough.

Cross-border pipeline projects involve more than one sovereign state and, therefore, there is a need for the states to share the risks and rents. Some degree of coordination is required regarding energy taxation, technical standards and access regulation. Probably the main limitation to the integration of gas markets in the Southern Cone has been the high level of isolation of regulatory systems. Indeed, the economic and political evolution of the countries in the region has limited the integration process. Changes in the economic environment of exporter countries and shortages of supply have changed market

conditions; and importer countries have been faced with a trade off between security of supply and a higher cost of energy inputs. The analysis suggests that, in the future, Argentine natural gas will be largely destined for domestic use and that the country will have to continue importing natural gas, while Chile and Brazil will slowly move to different (more secure) suppliers of natural gas outside the region, reducing their dependency on Argentina and Bolivia.

Nevertheless, while there is no regional integration from a regulatory perspective, as the region operates on the basis of independent national regulation, from commercial and infrastructure perspectives, the integration process is a bit more advanced and is characterised by the existence of cross-border trade and ownership. It appears evident that further development of gas markets in the region is dependent on the harmonisation and improvement of regulatory standards. The challenge is to develop the institutional capabilities to achieve that goal.

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