

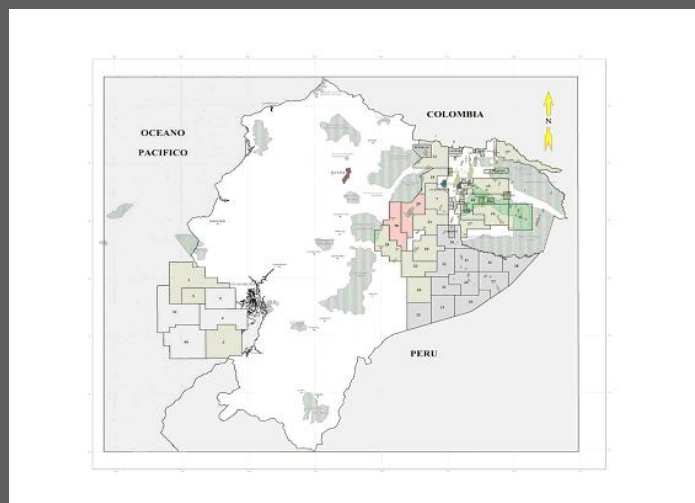
ECUADOR IN THE METHANE TO MARKETS INITIATIVE – GAS AND OIL SECTOR

Technology Transfer Workshop, Oil and Gas, Methane to Markets, and Technical Subcommittee Meeting

Villahermosa, Mexico, April 25 – 27 2006

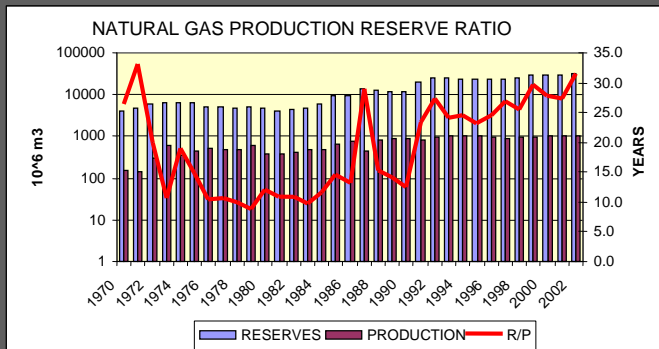


CHART 1. OIL BLOCK DISTRIBUTION MAP



- In Ecuador, the Oriental and Guayaquil sedimentary basins show evidence of hydrocarbon presence in commercial volumes. The oil contained in them holds important amounts of natural gas, especially in those operations where oil is medium-light type, (28 API degrees on average). Those oil fields have been exploited since 1972, mostly for oil production. On the surface, natural gas is separated from oil at production stations, and therefore, it becomes the national source of natural gas.

CHART 2. Natural Gas Reserve /Production Ratio Evolution



Source: SIEE, OLADE. June 2003. Based on Official Data From the Ministry of Energy and Mining.
Prepared by: UCE-STFS

- ⇒ Associated natural gas, a valuable non renewable energy resource, has always been burned in large amounts during its production as an oil sub-product.
- ⇒ The previous chart shows the evolution of natural gas reserves and production (logarithmic scale), associated with oil discovery and production. As you can see, the natural gas reserves-production (R/P) ratio, which represents the availability of this resource at each year's production rate in years, showed a fluctuating behavior during the 1970-2002 period.
- ⇒ **Table 1. Natural Gas Potential in Ecuador**

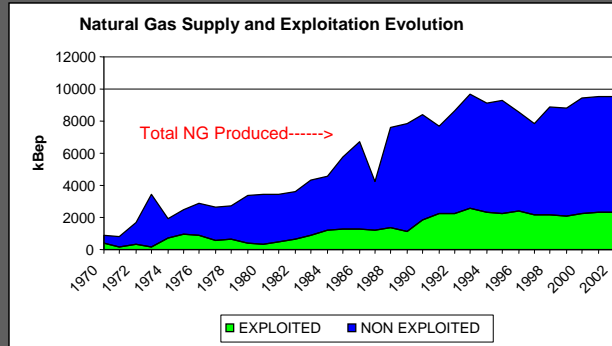
Due to the special treatment provided for in the Hydrocarbon Law and to the fact that investments, costs and expenses are mostly geared towards oil production, the reference to “gas reserves” used here will be framed within their dependence on proven oil reserves.

Table 1. Natural Gas Potential in Ecuador

<u>2002</u>	Natural Gas Reserves 10 ⁹ m ³		
	Continental	Off Coast	TOTAL
<u>PROVEN</u>	28.66	4.30	32.96
<u>PROBABLE</u>	0.20	2.80	3.00
<u>POSSIBLE</u>	-	7.00	7.00
<u>TOTALS</u>	28.86	14.10	42.96

Balance and Evolution of Natural Gas

Chart 3. Natural Gas Production and Exploitation



Source: SIEE, OLADE. June 2003. Based on Official Data from the Ministry of Energy and Mining.
Prepared by: UCE-STFS

The evolution of annual accumulation from natural gas production shown on the previous chart reveals an upward trend, in spite of some ups and downs; this situation is not true however, for the case of exploited natural gas. Since 1991, the existent gap between produced and exploited natural gas has been widening and it is likely to deepen even further if the focus on oil exploitation continues at its current level, especially now with the operation of the Heavy Crude Pipeline. This operation is creating an increase in oil production of around 500.000 barrels per day.

LPG production is closely linked to natural gas availability and to the Shushufindi Plant's operational capacity, as well as the Esmeraldas refinery capacity. Between 1970 and 2003, the gross LPG production increase rate in the country was 33.7 times higher compared to its level in 1970—this amounts to an interannual rate of 10.9%. However, in no year during that period was domestic production able to meet the country's demand for that product.

How to Increase LPG Supply

According to official information from the National Hydrocarbon Directorate (DNH) from the Ministry of Energy and Mining and Oil Statistics from the Empresa Estatal de Petróleo del Ecuador (PETROECUADOR), remaining oil reserves plus discovered reserves were 4.577 billion barrels (MMBLS) at the end of 2002. For an average 200 cubic feet per barrel gas-oil ratio, the amount of associated natural gas comes to 915 trillion cubic feet (MMMPC) which, if processed, could mean 20.15 million TM of LPG. Out of these reserves 74.32 % are located on PETROECUADOR fields and 25.78 % on fields operated by private oil companies.

- ⇒ Current and future natural gas production rates will depend on oil extraction rates and on heavy crude oil production rates, compared to medium-light oil. Starting the Heavy Crude Pipeline operations meant that by December 2003, crude oil production reached 494 thousand barrels per day, with the corresponding natural gas production increase to over 100 million cubic feet (27 319 TM) per day, out of which more than 50% (50 million cubic feet or an equivalent to 1.100 TM of GLP) is being burned on a daily basis. Since burning will continue, 401.500 TM of GLP could be wasted, which amounts to almost 72.24% of GLP imports during 2003, at a cost of approximately US\$ 206,683,125.

- Optimizing GLP Production at The Shushufindi Industrial Complex (CIS)

Gas capturing systems at the Aguarico, Atacapi, and Parahuacu Production Stations, which will allow the capture of approximately 3.5 MMPCD of natural gas, will in turn lead to a GLP production increase of about 50 metric tons per day at the Shushufindi Plant. Here, it is worthwhile to mention that gas capturing at Secoya Station has been in operation since June 2002.

- Improve the State-Owned Esmeraldas Refinery Load

If the crude quality is increased in 2 API gravity degrees, GLP production could be increased between 1.5% and 2%; which means an increase of between 1500 and 2000 tons per year.

LPG Additional Production

- ⇒ With these projects, we expect to capture approximately 3.5 MMPCD of rich gas, which would mean an increase in the Shushufindi Industrial Complex Gas Plant production of about 50 TM/day of liquefied petroleum gas (LPG).
- ⇒ Currently, the Gas Plant at Shushufindi gets LPG based on the availability of associated gas delivered by oil production, however, only about 200 TM/day are being produced out of the 500 TM/day of real capacity this plant has.
- ⇒ Studies carried out estimate that implementing these projects could produce about 55% of the LPG consumed in the country, which in turn, would bring large savings to the country.

GAS RESERVES OF INTERNATIONAL COMPANIES OPERATING IN ECUADOR

COMPANY	NATURAL GAS			
	PROVEN RESERVES (MMPCS)	ACCUMULATED PRODUCTION (MMPCS)	DATE	REMAINING RESERVES (MMPCS)
AEC Ecuador ltd	36.176,16	21.178,94	30 June 05	14.997,22
Agip Oil Ecuador	4.308,53	1.526,96	30 June 05	2.781,57
City Oriente	437,35	263,78	31 Dec 03	173,57
CNPC - Amazon	349,99	27,05	31 Dec 03	322,95

Ecuador TLC	1.328,77	30,81	31 Dec 03	1.297,96
ENCAN Ecuador	4.049,10	1.145,77	31 Dec 02	2.903,33
Occidental	94.491,70	41.848,57	30 June 05	52.643,13
Perenco	4.965,38	4.295,87	31 Dec 03	669,51
Petrobell	3.863,44	1.874,80	31 Dec 03	1.988,64
Petrobras	19.603,94	965,50	31 Dec 05	18.638,44
Petroecuador	1.117.918,75	672.595,08	31 Dec 03	445.323,67
Petrosud	4.821,70	4.141,73	31 Dec 03	679,97

Repsol - YPF	46.036,41	11.888,76	31 Dec 03	34.147,65
SIPEC	15.965,00	3.911,01	31 Dec 03	12.053,99
Tecpecuador	36.397,68 3.680,00	25.599,55 18,82	31 Dec 03 30 June 05	10.798,13 3.661,18
TOTALS	1.394.393,90	791.312,99		603.080,90

CO2 Emissions Reduction, Repsol YPF Project, Ecuador

- ⇒ The project involves converting the electric power generation turbine into a dual (gas-diesel) system with the goal of eliminating diesel consumption and running the turbine 100% on gas.
- ⇒ With this project we estimate an emissions reduction of 77 kton of CO2 per year: from 252 kton to 175 kton of CO2 per year.

CONCLUSIONS

By 2003 the total associated natural gas reserves were 42.96 Billion cubic feet.

From the total accumulated natural gas produced since the beginning of oil exploitation in the Ecuadoran Amazon Region (RAE), 188.3 million barrels of oil equivalent (Boe), around 144.7 million Boe have been burned--or 76.8% and the remaining 23.2% have been used to produce liquefied petroleum gas (LPG) and for power generation in some fields.

The gross LPG production increase in the country between 1970 and 2003 was 33.7 times, compared to its levels in 1970. This represents a 10.9% interannual growth rate. However, in no year during this period, was domestic production able to meet the country's demand for this product.

Except for very few years, the country has always had a deficit in LPG production. Petroecuador statistics show that from 1970 to 2003 LPG imports increased about 675 times—a growth rate of 21.8% for this period.

Out of all associated natural gas reserves in the country, 74.32% are located on Petroecuadro oil fields and 25.78% on private company-operated oil fields.

If we start from the premise that with relative certainty oil reserves will be eventually produced in the future, we can then assume that in a similar manner associated natural gas will be also available. This means that there is now an urgent need to define policies geared to capture and industrialize the largest amount of natural gas possible.

THANK YOU VERY MUCH!

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