



LPG MARKETS IN MEXICO:

*Analysis, Issues and
Cross-National Comparisons*

**Current Studies on Business/Public Policy
Issues in Energy**

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EXECUTIVE SUMMARY

LPG Markets in Mexico is an independent study of a critical component of Mexico's energy sector. It follows work performed at the University of Houston since 1991 on natural gas supply, consumption, cross-border trade and issues associated with natural gas market developments in Mexico and a major study on North American natural gas and electricity integration and policy coordination. LPG is an important fuel for domestic and small commercial use in Mexico. Indeed, it accounts for 40 percent of residential energy use while residential customers make up 90 percent of LPG consumption. Mexico imports around 31,000 barrels per day (b/d) of LPG, all of which is used in the northern states. Thus, the LPG market is of some interest to those engaged in commercial LPG sales to Mexico, or who provide goods and services associated with gas processing in Mexico given the importance of the domestic market. However, of greater interest is the development of natural gas markets in Mexico and the role that LPG may play in fuel competition. In order for natural gas demand to increase, it must compete successfully with and have a comparative advantage over LPG, especially with respect to residential consumption and the policy decisions associated with building residential natural gas distribution infrastructure. Thus, it is critical to have some reasonable understanding of LPG supply and demand patterns if we are to have any comprehension of the direction and pace of change in Mexico's natural gas sector and how Mexico fits into the bigger picture of North American natural gas balances.

Our approach to the task at hand is to first provide an overview of the LPG sector and its place in Mexico's overall energy picture. In doing so, we raise several issues about how LPG is priced. In short, LPG prices have historically been established by negotiation and not by market forces. As a consequence, price has not been an effective rationing mechanism for LPG consumption. A shift toward reliance on market-based pricing, which is underway, should begin to rationalize markets assuming that nontechnical losses are minimized. However, given the consumer behavior that has been in place for so long, it will be difficult to predict the shape of the LPG sector in the future or, for that matter, demand for natural gas relative to LPG.

We then tackle a series of questions. The first is, *at what price and cost structure will natural gas be competitive with LPG at the household burnertip in Mexico?* The level of information detail required for this analysis is difficult to obtain, so we rely on published data and industry standards with respect to natural gas distribution costs in the U.S. In spite of these constraints, we must question the prospect of increased natural gas use for residential cooking and heating in Mexico given household income levels, the current low household cost for LPG (by our estimate, an average monthly bill of \$6.50) and comparatively high unit costs of installing new natural gas distribution systems. We must conclude that residential demand for natural gas in Mexico will grow very slowly unless there is an unanticipated change in Mexico's economic performance and per capita income.

Apart from fuel competition, another issue related to the development of natural gas markets in Mexico is adequacy of domestic supply. Given the potential, at least, for displacement of LPG with natural gas and the extensive use of natural gas in Mexico's petrochemicals processes industries, the second question we ask is, *are there opportunities to displace natural gas with LPG or other inputs for petrochemicals production in order to increase natural gas supply?* We address this issue by building a "scenario" of petrochemical processes using 1993 data. We conclude that some natural gas could be freed up with energy conservation improvements, but that the nature of Mexico's petrochemicals industries is such that natural gas will remain an attractive fuel and feedstock, and that Mexico would have more to gain by exporting LPG that is displaced by natural gas in other end uses rather than use that LPG for petrochemicals feedstock.

Air quality is a large issue in Mexico's urban areas, and some attention has become focused on the role that LPG may play in air contamination. Thus, our third question is, *does LPG consumption contribute to diminished air quality in Mexico?* Our cursory analysis suggests that there is merit to recent research that suggests LPG is a significant factor in urban air contamination in Mexico. The principal issue appears to be inadequate infrastructure – poorly sealed rooftop tanks, for instance. The substitution of natural gas for LPG would solve these problems but, again, the price and cost structure of natural gas delivered to households is a consideration.

Finally, we ask the question, *how does Mexico's LPG sector compare with other important markets?* The issue of natural gas and LPG fuel competition is an important one also in Brazil, India and China, three countries that offer tantalizing prospects for rapid growth in energy consumption including a critical role for natural gas. We find many similarities with respect to the key issue of fuel competition and price structures between Mexico and Brazil. India and China are significantly different in that LPG is principally an imported fuel, and so, at least in China, conversion to natural gas might generate cost savings. Yet, these countries lag Mexico and Brazil in the development of natural gas policies and markets.

Because LPG infrastructure can be more quickly deployed, and because LPG will be an improvement over wood and coal, that fuel market will remain of considerable interest for foreign private investment in India and China.

The goal of this white paper is to make a contribution toward strategic and policy interests with respect to more competitive energy markets. On the strategic side, there is good reason for companies to continue to focus on LPG, both as a constraint to development of natural gas opportunities and as a viable commercial market. On the policy side, the long role of government in managing LPG markets in Mexico and our comparative countries of Brazil, India and China points to the difficulty and complexity associated with restructuring these energy sectors.

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