Translating LPG Market Research into Action: 7 Strategic Opportunities for Industry Involvement

Outcome of the participatory workshop

What do Guatemalan households say about LPG?
Lessons learned from LPG market studies
and opportunities for industry involvement

Guatemala, June 28th, 2016

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Summary

On June 28, 2016, key representatives of the Liquefied Petroleum Gas (LPG) industry and the Ministry of Energy and Mines (MEM) met in Guatemala City, to review the findings from two recent LPG market studies and their implications for LPG market growth. The workshop provided industry and government representatives an opportunity to explore strategies to grow the market for LPG for cooking in Guatemala.

During the meeting, participants discussed seven main topic areas: join efforts of Industry and government, improved service delivery, government oversight and regulation, poor cylinder quality, consumer's capacity to pay, cost perceptions and consumer education. They suggested a variety of strategic interventions to stimulate the LPG market as follows:

Topic	Strategies	
Join effort of Industry and Government	***Strategy 1.***	Create a committee including LPG companies and relevant government stakeholders to meet, debate, coordinate and define key actions for the sector, including the Law on LPG Markets (*Ley específica de la Comercialización de Gas Licuado de Petróleo*).
Improved service delivery	***Strategy 1.***	Develop a safe cylinder handling and LPG installation program and train gas retailers.
	Strategy 2.	Require a basic test for gas retailers and certify those who pass as LPG Installers. Establish a registry of certified installers and inspectors.
	Strategy 3.	Consider decentralizing gas retailer training and licensing and education on safe LPG uses. Apply lessons learnt from other countries, such as Nicaragua before implementation.
Government oversight and regulation	***Strategy 1.***	Identify where in the chain LPG losses are taking place, at the supplier and/or gas retailer levels.
	Strategy 2.	Continue conducting random inspections, issuing fines when appropriate, and strengthening enforcement and safety.
	Strategy 3.	Encourage retailers to weigh cylinders and use cylinder weight as a marketing tool.
Poor cylinder quality	***Strategy 1.***	Review existing regulations in order to simplify importation and sale of new cylinders.
	Strategy 2.	Better control the illegal importation of cylinders.
	Strategy 3.	Reduce the cost of replacing cylinders, lower import taxes on materials and products associated with cylinder manufacturing.
	Strategy 4.	Assess different mechanisms for sharing cylinder maintenance and replacement costs between Industry and Government. For example: create a special fund supported by a dedicated LPG sales tax, and/or international funds. Define Industry responsibility for cylinder repair and replacement to avoid undue hardship.

Topic	Strategies	
Consumers' capacity-to-pay	***Strategy 1.***	Develop special payment plans for LPG consumers. Payment plans could address up-front and ongoing fuel costs, defined in an agreement with suppliers/retailers and consumers, and adapted to their energy needs and capacity to pay.
	Strategy 2.	Explore ways to enable consumers to experience the benefits of LPG during a longer time period (e.g. provide a free second LPG cylinder).
	Strategy 3.	Study the technical feasibility, security requirements, benefits and constraints of partial refilling systems being operated in other countries.
Cost perceptions	***Strategy 1.***	Develop credible information showing that cooking with LPG is less costly than with firewood. Use this information to develop systematic messaging to users. To be credible, activities should be supported or conducted by a neutral third-party.
	Strategy 2.	Assess the feasibility and cost of using gauges or transparent cylinders to measure gas consumption.
Consumer education	***Strategy 1.***	Select the most appropriate media to reach priority audiences. For example, use mass media (radio, billboards, internet), interpersonal communication (community events, demonstrations), and written communication (leaflets).
	Strategy 2.	Focus on Cooking: Offer cooking classes and community demonstrations to increase women's confidence and knowledge about cooking with LPG. Teach women to use pressure cookers for these same reasons. Educate women how to cook in ways that economizes fuel. Focus on Safety: Teach consumers proper cylinder installation and good home safety practices. Inform consumers about common LPG risks and how to eliminate them.

Context

According to Guatemala's *2011 National Survey of Living Conditions (ENCOVI)*, about 70% of urban households use Liquefied Petroleum Gas (LPG) for cooking. Over half of these households, however, also continue to cook with firewood. The World Health Organization (WHO) estimates that 4.3 million persons die each year from illnesses linked to household air pollution, the result of burning solid fuels for cooking. An estimated 5,000 persons die prematurely each year in Guatemala from household air pollution. While substitution of LPG for wood is a step in the right direction, it is not sufficient in itself to protect health. Households will only enjoy the health benefits of clean-burning fuels such as LPG when it completely displaces polluting cooking fuels such as wood and charcoal.

A recent study commissioned by the Public Health Institute[1] identified **key motivators for cooking with LPG among urban and peri-urban consumers.** Foremost among them were ease of use, speed and convenience. The study also highlighted key barriers to sustained LPG market growth, including safety concerns about poor quality LPG cylinders; distrust of LPG suppliers and retailers; unfamiliarity with cooking with LPG or with a pressure cooker; difficulty comparing the cost of LPG with firewood. While women acknowledged LPG's health and environmental benefits, generally they did not find these qualities to be strong motivators for LPG use.

A study commissioned by the Global Alliance for Clean Cookstoves[2] identified similar motivators and barriers to LPG uptake among Guatemalans. The study estimated that over 210,000 households constitute an **easy-to-reach market for LPG.** These households typically have higher incomes or involve young, working women. They use LPG as well as firewood for cooking. Another 800,000 households constitute a complementary, relatively easy to reach market of families that currently cook with firewood. These households tend to have unstable incomes, and older or unemployed women. Women in such households have limited ability to make independent purchase decisions.

[1] Ampliando la demanda de GLP en Guatemala: Motivadores, obstáculos y oportunidades. Public Health Institute, 2015. http://cleancookstoves.org/resources/446.html (summary) http://cleancookstoves.org/resources/444.html (full report).
[2] Segmentación de Mercados para Estufas Mejoradas y Combustibles Limpios en Guatemala. Global Alliance for Clean Cookstoves, 2016. http://cleancookstoves.org/resources/455.html (summary) http://cleancookstoves.org/resources/454.html (full report).

Workshop objectives

The aim of the workshop was: 1) to present the results of consumer market studies to LPG stakeholders; and, 2) to give industry stakeholders a forum for advancing strategies for LPG market growth.

Specific objectives were to:

- Better understand **potential demand for LPG** based on market research with more than 450 households.
- Explore opportunities **to strengthen and increase demand for LPG** and **promote its exclusive use**.
- Understand the importance of LPG from a **public health** perspective.

Agenda and participants

Following plenary presentations on the health impacts of cooking smoke and LPG market research, participants focused on LPG uptake in three areas: 1) the quality of services provided to LPG consumers, 2) financial and economic constraints to LPG growth, and 3) infrastructure for LPG expansion. Discussion outcomes are summarized below[3].

Main outcomes

Main outcomes include 18 strategies along the key topics discussed during the workshop. For each of the topics presented below, "key barriers" represent the results of the market studies at the heart of the discussion with stakeholders, "discussion" paragraphs summarize information shared by stakeholders, and "strategies" represent possible actions to implement.

1. Join efforts of Industry and Government

Key barriers: The enduring lack of coordination between sector actors (MEM, suppliers, retailers, fabricators) has resulted in poor quality service and equipment provided to Guatemalan households.

Discussion: Given the magnitude of issues such as cylinder condition and related safety concerns, continued discussion and coordination among stakeholders is essential and beneficial. An early step could be to involve industry stakeholders in preparation of the Specific Law on LPG Markets (*Ley específica de la Comercialización de Gas Licuado de Petróleo*).

Strategy 1: Create a committee including private LPG companies and relevant government stakeholders to meet, debate, coordinate and define key actions for the sector, including the Law on LPG Markets (*Ley específica de la Comercialización de Gas Licuado de Petróleo*).

[3] A detailed agenda and list of participants are found in Annexes 1 and 2. Slides and questions discussed in groups are presented in Annexes 3 and 4.

2. Improved service delivery

Key barriers: Consumers reported receiving no information or instruction on safe installation or proper use of LPG. The quality of services provided by gas retailers (stove installation, cylinder handing) needs improvement.

Discussion: Gas retailers are sometimes poorly dressed, untrained and reflect badly on Industry. Not all gas retailers are licensed which may contribute to low standards. MEM is aware of this deficit. Reasons include the lack of information about licensing requirements and the complexity of the process. According to data from MEM, at the end of 2014, the Government counted about 10 licensed retailers for every 100,000 households. When delivering the license, MEM reported that they provide retailers with information on proper LPG use, cylinder maintenance and safety measures.[4]

The relationship between gas retailers and suppliers differs by company. Some retailers sell LPG from a single supplier, and sometimes are employed by that supplier. Other gas retailers operate independently, buying LPG wherever they get the best deal. These relationships are an important consideration for capacity building programs. Finally, a higher number of gas retailers in all regions would contribute to better consumer proximity.

Strategy 1: Develop a safe cylinder handling and LPG installation program and train[5] gas retailers.

Strategy 2: Require a basic test for gas retailers and certify those who pass as LPG Installers. Establish a registry of certified installers and inspectors.

Strategy 3: Consider decentralizing gas retailer training and licensing and education on safe LPG uses. Apply lessons learnt from other countries, such as Nicaragua,[6] before implementation.

3. Government oversight and regulation

Key barriers: Recent inspections conducted by the Ministry of Energy and Mines (MEM)[7] have found partially-filled cylinders in the marketplace, a practice widely experienced by consumers. Such experiences contribute to consumer distrust of both gas retailers and LPG suppliers. Consumers reported feeling exploited, frustrated and powerless to change the situation.

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[4] Gas retailers interviewed during the PHI study reported receiving brief instruction from their supplier only. One had received no education at all. Gas retailers also believed that they were only authorized to sell LPG only by the supplier they represent, and therefore did not need to obtain a license from MEM. One retailer explained that the licensing requirements were bureaucratic and time consuming - factors that could also contribute to the high number of unlicensed retailers.

[5] The role of INTECAP (*Instituto Técnico de Capacitación y Productividad*) would possibly deserve reflection, depending on the expertise of INTECAP in LPG installation and cylinder management.

[6] The National System for Disaster management and Prevention (SINAPRED, *Sistema Nacional para la Prevención Mitigación y Atención de Desastre*), the General Direction of Firemen (*Dirección General de Bomberos*) and gas suppliers collaborate in a national campaign on the safe use of gas cylinders)

[7] See for example:
http://www.mem.gob.gt/2016/06/sat-diaco-y-energia-y-minas-dan-inicio-a-operativos-conjuntos-a-nivel-nacional-para-la-vigilancia-y-verificacion-del-gas-propano/ ;
http://www.mem.gob.gt/2016/01/mem-pdh-y-diaco-inspeccionan-llenado-de-cilindros-de-gas-propano/

Consumers' experience getting less LPG than they pay for creates hostility toward Industry and ultimately limits market growth. On the other hand, satisfied consumers who talk positively about LPG with family members and friends often end up recruiting new customers.

Discussion: Incomplete supplier refills, illegal cylinder use by gas retailers before delivery, and leakage are all possible reasons for partially-filled cylinders. Some say that cylinders are full when shipped from the suppliers and that losses are taking place at gas retailers. Others report that gas retailers receive cylinders that are not full. Moreover, cylinder seals that purport to prevent access are not tamper-proof. They are easily removed and replaced, after LPG has been siphoned off, so have little credibility with consumers.

Some gas retailers have begun weighing cylinders at the point of sale, proving to consumers that they are supplying fully-filled tanks. Some companies are using cylinder weight as a marketing tool, demonstrating their honesty and customer service. As more distributors validate cylinder weight, consumers will come to expect and perhaps even demand it.

Participants acknowledged the need for both Industry self-regulation and Government monitoring and regulation. MEM has started conducting random inspections to verify scale accuracy and cylinder weight and issuing fines when appropriate. These spot checks have attracted media attention. Some in industry, however, object to Government involvement of consumer protection and human rights organizations (e.g. DIACO, *Dirección de Atención y Asistencia al Consumidor* and PDH, *Procurador de los Derechos Humanos*) in monitoring industry. More generally, MEM's weak enforcement of regulations is seen by Industry as deterrent to broader LPG use. Lack of human resources is an important factor in MEMs weak enforcement role.

Strategy 1: Identify where in the chain LPG losses are taking place, at the supplier and/or gas retailer level.

Strategy 2: Continue conducting random inspections, issuing fines when appropriate and strengthening enforcement and safety.

Strategy 3: Encourage retailers to weigh cylinders and use cylinder weight as a marketing tool.

3. Poor cylinder quality

Key barriers: Old, poor quality cylinders reinforce consumers' fear of LPG as well as confirm their negative impressions of the Industry. Consumers routinely complain about low-quality, damaged and leaky cylinders. Their only recourse is to refuse to accept the most damaged ones.

Discussion: Guatemala's cylinder distribution model is based on a centralized filling system, where consumers pay for the initial (empty) cylinder and the refill cost. They trade empty cylinders for full ones through neighborhood retailers. The customer "owns" the cylinder but cannot keep the same one when she receives a refill.

The lack of physical ownership means that the customer is not responsible for the cylinder's replacement at the end of its life. This also creates a lack of legal responsibility for maintenance[8] among suppliers. An estimated 3 million cylinders are on the market in Guatemala and a large proportion are believed to be worn out. Suppliers will need to invest in cylinder replacement as an ongoing operational cost. Since replacement is expensive, Industry is seeking to clarify maintenance and replacement responsibility and is interested in examples of Industry-government cost sharing. Mexico's experience in replacing old cylinders could be inspiring.

Strategy 1: Review existing regulations in order to simplify importation and sale of new cylinders.

Strategy 2: Better control the illegal importation of cylinders.

Strategy 3: To reduce the cost of replacing cylinders, reduce import taxes on materials and products associated with cylinder manufacturing.

Strategy 4: Assess different mechanisms for sharing cylinder maintenance and replacement costs between industry and Government. For example: create a special fund for this purpose supported by a dedicated tax on sales, and/or international funds. Define Industry responsibility for cylinder repair and replacement to avoid undue hardship.

4. Consumers' capacity-to-pay

Key barriers: Limited and unstable household income and women's preference for smaller, more manageable expenses, limit the use of LPG for cooking. Expensive up-front costs for the LPG cylinder-stove package is another important barrier to adoption.

Discussion: Higher family income and women's participation in the workforce contribute to LPG adoption and use, but are not requirements for LPG use. The difficulty of paying the high cost of a 25 lb. cylinder is a significant barrier for many households. Total monthly outlays for firewood suggests that families do in fact have the capacity to pay for LPG *if they could purchase LPG in small amounts*. LPG price fluctuations add to household uncertainty about LPG affordability. Small payments for firewood give households flexibility and economic security. In that sense, use of multiple-fuels gives households a sense of energy security, while dependence on a LPG alone may leave households vulnerable to price or income variations and unreliable services.

Participants suggested several options for overcoming consumers' limited capacity-to-pay:

- *Short-term credit* (e.g. one week), as offered by some gas retailers; credit from shops or banks to support up-front costs of stove and cylinder; payment plans, where supplier and consumer agree on equipment, payment amount and duration to cover up-front costs;
- *Partial cylinder refilling system*, as implemented in countries mentioned by Industry stakeholders as Honduras, Belize, and Kenya.[9] These systems raise several challenges, such as

[8] Matthews, William G. and Zeissig, Hilmar R. 2011. Residential Market for LPG: A Review of Experience of 20 Developing Countries. World Bank, Washington, DC.

[9] For example, in Kenya, the small "Pima" cylinder allows for partial refills of LPG. Kenya is also experimenting "pay-as-you-go" business models applied to LPG (http://www.paygoenergy.org)

technical feasibility and safety associated with LPG storage near residential areas. Partial refilling requires strict standards and Government monitoring to guarantee safety. In the market studies, LPG consumers mentioned that partial refilling could be a relevant option for their economic constraints. The need for consumers to transport the cylinder to and from a refilling plant is a possible limiting factor.

- *LPG subsidies* can be helpful if carefully designed and targeted to the poor (e.g. payment vouchers, integration in social programs, etc.[10]). They deserve careful feasibility and sustainability analysis before implementation. Stove giveaways are not very effective since stoves are often resold by households, as observed in Nicaragua or even Guatemala (Puerto Barrio). The technique of giving households a second LPG cylinder for free has sometimes succeeded in converting a family to LPG. Some suggest that once women are used to the comfort of LPG, they will continue using it and remain loyal to the company that provided it for free.

Strategy 1: Develop special payment plans for LPG consumers. Payment plans could address up-front and ongoing fuel costs, defined in an agreement between suppliers/retailers and consumers, and adapted to their LPG needs and capacity to pay.

Strategy 2: Explore ways to enable consumers to experience the benefits of LPG during a longer time period (e.g. provide a free second LPG cylinder).

Strategy 3: Study the technical feasibility, security requirements, benefits and constraints of implementing partial refilling systems being operated in other countries.

5. Cost perceptions

Key barriers: Women's primary concern about using LPG is their uncertainty about being able to afford a full cylinder when the current one runs out. The common perception that LPG is more expensive than wood is exacerbated by the association of LPG with higher-income households. Another important barrier is the difficulty women have comparing the cost of cooking with LPG and the cost of any other fuel. Women have no way to measure how much LPG they use to cook a meal, or even how much fuel remains in the cylinder. As women cannot measure LPG consumption, and want to avoid running out of gas, they continue to rely on more tangible fuels like firewood.

Discussion: When households exhaust a cylinder, they confront the fluctuating price of LPG and their own unstable income. In the Global Alliance study, most women reported that LPG would cost less or about the same as wood. Some perceived cooking with LPG to be expensive because it requires one, very large payment. Households on tight budgets, found big, occasional purchases of LPG much more difficult than multiple, smaller purchases of firewood. By purchasing in small quantities, households managed fluctuating incomes and fuel costs.

[10] As reminded in the PHI market study, universal price or blanket subsidy for LPG would generally be expensive and regressive, captured largely by middle- and high- income households. LPG vouchers or cash transfers to poor families are preferred by several countries, such as Brazil (implemented in the context of the social welfare program, *Bolsa Familia,* when the universal subsidy program was ended in 2002), El Salvador (subsidies limited to households with low or no electricity consumption), and the Dominican Republic.

Households lack easy cost comparisons between cooking with LPG and firewood. The absence of a gauge deprives cooks of a way to measure gas. Without a feedback mechanism, the lack of a gas meter also hinders women from learning efficient cooking practices. Demonstration activities and cooking classes on ways to economize gas would also be beneficial.

LPG marketers would do well to emphasize the cost-savings of cooking with LPG. Consumers might begin thinking and talking about actual LPG costs. Such claims would be more credible if validated by a third party. A university, for example, could compare the cost of cooking staple foods with firewood, LPG, and with LPG in a pressure cooker[11]. LPG promotions should also mention health benefits of LPG compared to wood.

Technical options to allow consumers to monitor gas consumption and contribute to resolving the problem of partially-filled cylinders include transparent cylinders and simple in-line pressure gauges. The additional costs for meters and potential leakage could be tested before promoting this approach more widely.

Strategy 1: Develop credible information proving that cooking with LPG is less costly than firewood. Use the information to develop systematic messaging to users. To be credible, activities should be supported or conducted by a neutral third-party.

Strategy 2: Assess the feasibility and cost of using gauges or transparent cylinders to measure gas consumption.

6. Consumer education

Key barriers: Women's lack of familiarity with cooking with LPG, why and how to use a pressure cooker and how to use LPG safely were key barriers to LPG use. In both studies, consumers acknowledged all these issues to be important. Industry also perceived these issues as challenges to scaling up LPG use.

Discussion: Social networks and community events are good ways to reach consumers. Community cooking competitions, like those sponsored by Pepsi, are another way to arouse interest. Cooking shows on television are especially relevant for those in Guatemala City and urban areas, but less so for rural households. YouTube videos (e.g. Tasty clips) showing how to use LPG can be a great medium for educating internet savvy women Education could also address ways to detect low cylinder volume (Zetagas has begun stamping cylinders with the installation date. The success of this approach has not yet been evaluated).

Strategy 1: Select the most appropriate media to reach priority audiences. For example, use mass media (radio, billboards, internet), interpersonal communication (community events, demonstrations), and written communication (leaflets).

[11] During the PHI market study, an experiment was conducted under real cooking conditions to compare the cost and time of cooking all meals with LPG exclusively versus cooking all meals with firewood exclusively for the same number of days. In one household of 3 adults and 1 child, a 25 lb. LPG cylinder used exclusively lasted 17 days, or 90 hours of cooking time. Cooking for 17 days with firewood exclusively required 35 more hours of cooking time than with LPG of cooking time than with LPG (40% more), and cost GTQ 38 more, 32% more than with LPG (price of 25 lbs. was GTQ 115).

Strategy 2: Focus on Cooking: Offer cooking classes and community demonstrations to increase women's confidence and knowledge about cooking with LPG. Teach women to use pressure cookers for these same reasons. Educate women how to cook in ways that economizes fuel. Focus on Safety: Teach consumers proper cylinder installation and good home safety practices. Inform consumers about common LPG risks and how to eliminate them.

7. Infrastructure Expansion

Key barriers: Increased LPG consumption is likely to require infrastructure expansion, especially import capacity.

Discussion: Virtually all of Guatemala's LPG is imported. As regards maritime imports, LPG comes into the country through two privately-held marine terminals at Santo Tomas de Castilla on the Atlantic (Tomza) and San Jose, Escuintla, on the Pacific side (Zeta Gas). Despite some capacity for expansion, dependence on just two terminals is seen by some industry stakeholders as a limiting factor for growth and competitiveness.

Strategy 1: No clear strategy was identified.

Conclusion

For the first time in many years, key representatives of the LPG industry, including large and small suppliers, and the Ministry of Energy and Mines worked together. The group proposed and discussed a series of strategic interventions to increase the LPG market for cooking.

Participants expressed interest in continuing to meet on a regular basis. The next step could include launching a public-private committee gathering representatives of LPG sector industry and government to coordinate the implementation of identified actions. PHI will survey industry about their priorities for action and discuss next steps with MEM.

Annexes (separated)

1. Agenda
2. List of participants
3. Presentations (slides)
4. Groups of discussions