

## Connecting Colombia's Poor to Natural Gas Services: Lessons Learned from a Completed Output-Based Aid Project

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**T**he Global Partnership on Output-Based Aid (GPOBA) has recently completed a project that made 35,000 new natural gas connections to poor households in Colombia's Caribbean coastal region. This partnership between GPOBA and Fundación Promigas (a charitable foundation established by Colombian gas distribution holding company, Promigas) has resulted in substantial benefits to Colombia's poor population. Because in-home natural gas connections provide a safer, more environmentally friendly, and less expensive substitute to previously used fuels, poor families are enjoying the long-term advantages from this program's one-time subsidies. This note explores the results of this program and draws lessons for future projects.

Since the 1990s, Colombia has made significant strides to allow access to natural gas connections for poor households.<sup>1</sup> Natural gas is the least polluting among the traditional fuels used for cooking or heating, is far cheaper, and is much safer than highly flammable alternatives. Yet many low-income families still rely on dangerous and less effective energy sources because they cannot afford the natural gas connection fee—despite the fact that the local distribution companies provided financing plans for up to six years.

### The GPOBA Project<sup>2</sup>

From June 2006 to November 2008, GPOBA entered into an arrangement with Fundación Promigas—the charitable foundation of Promigas, the owner of a number of Colombian gas transmission and distribution companies—to encourage very poor communities in the coastal areas of Colombia to use natural gas as



a fuel for cooking, heating, and other applications. At the center of GPOBA's program was the provision of a partial subsidy to reduce the burden of paying for a new gas connection. Connection fees often amount to more than twice a poor family's annual income. In contrast, monthly natural gas services are relatively affordable, especially when considering the money saved from not purchasing other fuels.

Currently the government of Colombia provides for a system of cross subsidy whereby poor residential customers receive a 40%–50% discounted tariff for the first 20m<sup>3</sup> consumed. Despite these consumption subsidies, collected from a surtax charged to high income strata and industrial users through monthly consumer bills, many households are still unable to afford the cost of connecting to the service. The GPOBA connection subsidy filled this gap. Eligibility for the GPOBA subsidies is based on a socioeconomic classification system developed by Colombia's National Planning Department (DNP). The subsidies were restricted to households in the lowest two strata of the Estratificación Socio-Económica (ESE) rating system. The ESE is a proxy means-testing targeting instrument that has been in operation in Colombia since 1965. This system classifies

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neighborhoods and rural areas according to six strata, from poor to rich, based on the external characteristics of houses and neighborhoods.

Under the program, Fundación Promigas was responsible for making new service connections to poor households. GPOBA's grant of US\$141 for each eligible household covered approximately 38 percent of new connection costs, which totaled US\$370. Regional distribution companies provided additional assistance through customer financing plans over six years for the remaining cost per connection (US\$229). The main project measurable output consisted of installing natural gas connections for about 35,000 households, providing such households with basic gas stoves and ongoing service. The program's output-based approach made funding contingent on three primary criteria:

- Proof that each newly connected household falls within one of Colombia's lowest two economic strata.
- Certification and inspection of new connections by an independent verification agent (IVA).
- Proof that newly connected households have obtained (and paid for) service for at least three months.

The verification of outputs was done in a two-stage process. The distribution companies reported the number of connections made to the National Regulator, and relayed this number to Fundación Promigas. Results were verified by the IVA, a private firm which was also the financial auditor of Promigas and its subsidiary distribution companies. They ensured that connections of the distribution companies were actually completed and undertook spot checks by selecting a random number of beneficiaries in the different communities.

## Results Achieved

Overall, the GPOBA program was successfully completed, as 98 percent of the total expected connections were made. Of the 35,000 initial connections projected, 34,138 connections were verified which included three months of satisfactory service delivery as evidenced by three months of paid electricity bills.

Promigas was responsible for coordinating the allocation of grant funds among the gas distribution companies. It was also accountable for consolidating and processing payment requests to GPOBA, based

on Stratification Certificates, Technical Certificates, and Installation of Connection Certificates held by the beneficiary households. The IVA carried out technical and financial audits to assess progress and performance of the project, including spot checks on connections made.

## Impacts of the Project

An independent study<sup>3</sup> undertaken by the Health Economics Group of the University of Cartagena and the Universidad del Norte found that before natural gas connections and stoves were installed, 40 percent of households suffered from respiratory problems. After installation, the frequency of households reporting a household member hospitalized due to respiratory illness fell by 75 percent. The reduction in exposure to indoor air pollution resulted in an estimated 4,000 disability-adjusted life years (DALYs). Using this metric, the project is estimated to represent a US\$20 per DALY investment (compared to at least US\$154 per DALY for pneumococcal vaccines). This suggests that the project can achieve health outcomes more cost-effectively than many health care interventions.<sup>4</sup> In addition, the amount of firewood used in the project's target area was reduced, preserving up to 34 hectares of forest or mangrove swamp land. Overall, the economic rate of return of the project over ten years is estimated to be 62 percent, discounting the consumption subsidy provided by the Colombian government for Strata 1 and 2. This result takes into account cost savings for medical treatments and expenditures, as well as economic savings due to households switching to natural gas.

## Implementation and Lessons Learned

*Need for an active project manager.* The Fundación Promigas, which administered the project and acted as the interface between GPOBA and the distribution companies, has been critical to the success of the project. Its role included helping the distribution companies select the beneficiary communities, ensuring adequate targeting, and securing agreement on the implementation and roll-out program for connections. Throughout the project, Fundación Promigas carried out regular visits and clarified any issues with the distribution companies related to beneficiary households and payment mechanisms. This experience demonstrates the need for an active project manager that is fully cognisant of the project and can directly liaise with the implementers.

*Verification of results.* The fact that the IVA had previous knowledge of the distribution companies and areas of activity made it easier for it to understand the project objectives and verify outputs. Furthermore, because the IVA was already the auditor of the distribution companies, there were some cost savings.

*Need for a system to protect against exchange rate variations.* The Grant Agreement specified the unit subsidy amount to be payable in Colombian pesos. During the period of project implementation (June 2006 to November 2008), the value of the dollar depreciated against the Colombian peso. Thus the actual subsidy payable to the distribution companies was reduced significantly and the difference was effectively paid by the distribution companies. This experience shows the need for structuring a mechanism whereby foreign exposure risk is not placed on the project implementers. In some instances, the financial strength of a project implemented may not be sufficient to absorb such increase in cost and may put the project at risk.<sup>5</sup>

*Improved targeting.* The project relied on the existing socioeconomic stratification system which is not necessarily up to date and has no mechanism for reclassifying a household once services have been provided<sup>6</sup>. Furthermore, the classification for Strata 1 and Strata 2 did not ensure that the poorest of the poor received the subsidy; the project could have focused exclusively on beneficiaries within Strata 1. This experience suggests that if the subsidy mechanism is to rely on an existing stratification scheme, the project should consider whether it is the most appropriate method for targeting, whether it can be modified with a more pro-poor mechanism, or if other systems of targeting should be developed. For example, it may be possible to use health data related to the incidence of respiratory disease to better target beneficiaries.

*Other incentives for connection.* For those beneficiaries that were using liquefied petroleum gas (LPG) for cooking, the distribution companies introduced a further incentive whereby a beneficiary household was given a \$20 voucher toward the cost of connection. This proved to be a successful measure that encouraged beneficiaries to make the most of the subsidy being offered and to change from LPG to natural gas.

*Validation of households.* Because the beneficiary households were sometimes in areas that had not

been subject to city planning, the distribution companies had to undertake a survey of the households, inform the municipal authorities of new households, and ensure that the corresponding road names and household numbers were registered in the urban registry. This proved to be an additional and unanticipated benefit of the project. It may be possible for future projects to design structures that provide an additional incentive to project implementers to undertake urban planning activities such as cadastral and household registry.

*Exclusion within targeted areas based on technical considerations.* In some instances, the division of areas that were to be connected (and thus would be eligible for the subsidy) was done based on technical reasons. Thus some parts of the community did not receive the service, as there were not enough funds to cover the whole area and it was technically easier to focus on a given section of the target area. It may be necessary to establish set rules so that private implementers do not exclude beneficiaries for technical reasons.

*Publicizing the subsidy program.* To ensure involvement of the beneficiaries and publicity as to the availability of subsidized connections, the beneficiary and implementing agencies organized a local media campaign and outreach activities, including the participation of mayors and other community representatives.

In conclusion, the experiences of this project show that targeted subsidy structures work well and can potentially be scaled up to the rest of Colombia.

## References

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- <sup>1</sup> See Mandri-Perrott and Patella (2007). A government initiative during the early 1990s focused on increasing the number of household gas service connections. This program successfully bolstered consumption by 50 percent over the course of a decade and was especially effective in the Bogota region.
- <sup>2</sup> The project built on a pilot project funded by the Dutch Directorate General for International Cooperation (DGIS). This US\$1.54 million project aimed at connecting 10,000 households between July 1, 2005 and June 30, 2007. It focused exclusively on unconnected areas.
- <sup>3</sup> Alvis, Orozco, and Alvis (2007).
- <sup>4</sup> This calculation of economic benefits is not intended to be definitive; rather it provides a methodology to quantify the potential benefits derived from the project.
- <sup>5</sup> One solution is to utilize an escrow agent, which would receive the funds from a subsidy funding agency, hold them in escrow in local currency, and make payments on behalf of the subsidy funding agency. No other changes to roles and responsibilities of the project implementers would be needed. The implementing agencies would bear the costs associated with running and administering the escrow. The total grant amount could be transferred to the escrow agent when the project began or grant amounts could be transferred in part against a prespecified schedule of outputs. The interest generated by holding the funds in escrow could be used to make new connections or simply returned to GPOBA.
- <sup>6</sup> The only reclassification that occurs happens as a result of a direct request by a given household to lower its classification.

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