

Output-Based Aid in Bolivia Balanced Tender Design for Sustainable Energy Access in Difficult Markets

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Bolivia is implementing an innovative public-private approach to increase rural electricity access to extremely remote areas via Solar Home Systems (SHS). Novel Medium-term Service Contracts (MSCs) balance the Government's wish for sustainable service and maximum control with providers' aim for minimal risk exposure. In 2005, 14 MSCs were successfully bid out to private service providers to minimize the subsidies paid against an ambitious set of provider obligations. The tender resulted in a 25-percent gain in number of new users. Although private participation in Bolivian infrastructure declined sharply in 2006, the SHS service model enjoys continued support by government and private providers alike.

Bolivia, South America's poorest country, is a land of stark contrasts. Beyond the illuminated homes of urban dwellers, 90 percent of which are electrified, many rural residents remain in the dark. Nationwide electricity coverage has reached 65 percent, but rural access is below one-third, the second lowest in Latin America and the Caribbean, after Nicaragua.

As a product of its highly scattered, low-income population—GNI per capita was only US\$1,010 in 2005—Bolivia has by far the lowest density of economic activity in South America. As a result, the costs of extending infrastructure services, particularly in difficult-to-reach rural areas, are extremely high.

Most of Bolivia's non-electrified households live in highly dispersed, rural settings; more than one-third are too remote from the national grid to permit an economically justifiable grid extension. They include some of the country's poorest people. Thus, their electrification calls for innovative off-grid technologies and supply schemes that match demand in a flexible, cost-effective manner. For many of these households, single-user Solar Home Systems (SHS) offer the most promising solution.

In response to this challenge, the World Bank, in 2003, approved the 10-year, US\$60 million Decentralized Infrastructure for Rural Transformation (IDTR) program, aimed at increasing rural access to electricity



and information and communications technologies (ICT) via decentralized public-private partnerships that benefit from performance-based subsidies, or output-based aid (OBA).

The first US\$20-million phase of this three-phase program, started in 2004, has a goal of at least 15,000 SHS—reaching more than 50,000 rural people in 14 target areas. To increase impact and sustainability of the new energy access, complementary services are extended to these same target areas, including (i) cell phone, radio, and television signal; (ii) business development services for productive energy uses in rural

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enterprises; and (iii) ICT equipment and training for rural schools and health posts.

Tender success: Marking a milestone

In 2005, 14 service contracts—varying in size from 350 to 2,200 future SHS users—were successfully bid out in a one-stage, multi-lot simultaneous tender. To minimize subsidies that the Government must pay private providers, each area was awarded to the qualified bidder promising to service the largest number of users at a given total subsidy per area, with well-defined and ambitious performance indicators. Price caps were set to prevent monopoly pricing, while minimum user requirements per area were fixed to prevent excessive unit subsidies.

In other countries, SHS concession tenders have often failed for lack of interested bidders or because of major re-negotiations before implementation. Thus, 2006 marked a milestone for Bolivia’s IDTR program: The SHS tender was successfully awarded to two bidders out of 11 pre-qualified consortia, and subsidy contracts for all 14 service areas were signed. An intensive road show in 2005 was key to attracting enough bidders. Of the more than 200 firms contacted, half

maintained general interest over time, leading to 14 consortia requesting prequalification.

After an initial delay, implementation started in July 2006, and more than 1,000 SHS were installed by December. Both providers maintained their original targets despite changes in Bolivia’s investment climate and shortages of SHS equipment supply in the region.

The successful tender award achieved significant efficiency gains. The winning bids exceeded the Government’s user-per-area target by 25 percent on average (table 1), and unit subsidies were lower than for comparable previous projects in Bolivia. The total subsidy amount of about US\$10 million corresponds to an efficiency gain worth about US\$ 2.5 million, compared to about US\$500,000 in overall costs of tender preparation and process. These efficiency gains are passed on directly via the Government (which pays the lower resulting unit subsidies) to the rural users (as 25 percent more users will receive subsidized SHS).

Gains per area varied between 1 percent and 35 percent, confirming the OBA assumption that bidders know the local markets better than government. One of the two winning bidders was a consortium led by an international photovoltaic (PV) module manufacturer with strategic interests in the region. This cost advantage resulted in the consortium winning 10 project areas. More bidders would have been preferable for benchmarking

Time will tell whether the two winners have overestimated local users’ willingness to pay. If so, they would have to reduce end-user prices, causing profits to shrink.

Balanced tender design

All elements of the IDTR program’s balanced tender design seek to ensure the long-term sustainability of service provided to Bolivia’s highly dispersed rural population, while avoiding an excessive assignment of risks to providers.

1. Medium-term service contract

The Medium-term Service Contract (MSC) is a new model for PV market development that balances providers’ wish to minimize risk exposure with the government’s desire to maximize control. In all service areas, exclusive access to project subsidies ends four years after installation, at which time users and suppliers may “graduate” to open competition. This approach stands between the traditional concession (of longer duration) and the dominant SHS dealer or credit-line model (competition in the market without exclusive areas). The new MSC model fits Bolivia’s

Table 1. SHS bidding: Summary results

| Area | Minimum SHS | No. bids | Winning bid | Efficiency gain (%) |
|------|---------------|----------|---------------|---------------------|
| 1 | 1,401 | 3 | 1,822 | 30 |
| 2 | 1,228 | 2 | 1,536 | 25 |
| 3 | 1,590 | 3 | 2,147 | 35 |
| 4 | 399 | 2 | 421 | 6 |
| 5 | 1,112 | 2 | 1,501 | 35 |
| 6 | 1,440 | 3 | 1,872 | 30 |
| 7 | 921 | 2 | 1,198 | 30 |
| 8 | 1,323 | 2 | 1,786 | 35 |
| 9 | 712 | 2 | 962 | 35 |
| 10 | 2,281 | 1 | 2,311 | 1 |
| 11 | 353 | 3 | 477 | 35 |
| 12 | 351 | 3 | 474 | 35 |
| 13 | 597 | 1 | 696 | 17 |
| 14 | 537 | 1 | 588 | 9 |
| | 14,245 | | 17,791 | 25 |

market conditions, where increasingly difficult rural markets in extremely remote areas must be reached on the way to universal access.

2. Transparent and reliable process

In high-cost, low-return off-grid markets like Bolivia, attracting enough private companies is often problematic. But having enough interested bidders is key to an efficient bidding process and reducing risk of pre-bidding collusion. IDTR's public-private partnership approach succeeded, in large part, because of its strong focus on transaction marketing and a well-balanced business proposal for the private sector.

According to a poll among participants, pre-qualified consortia explicitly valued the balanced design of the tender and the project's track record of transparency and reliability during tender preparation.

3. Well-informed freedom of choice

Given the early stage of Latin America's SHS service market, and to address the resulting information gaps, IDTR took special care to balance provider creativity with input control: On the one hand, providers were allowed to define their preferred business model, and were left enough room to decide how best to reach the required outputs. On the other hand, several clearly-defined inputs (minimum experience, equipment specifications, and overall system performance) were required for qualification to reflect past lessons on SHS sustainability. The consultation process with potential bidders helped to strike the right balance between output and input requirements.

The new SHS users choose from a broad yet manageable menu of options for system size and financing options. Providers' performance in informing users about their options and rights is checked continuously as part of the providers' service obligations.

4. Allowing for local-international alliances

Selecting service-area sizes small enough for micro, small, and medium enterprises (MSMEs) to participate and yet large enough to interest international bidders has helped to increase the pool of potential bidders. Both winning consortia included an alliance between domestic and international players. The IDTR webpage (www.idtr.gov.bo) contained a list of interested local and international players to facilitate such alliances.

As the new tender significantly increases the local SHS market, roughly doubling the installed capacity, it

is expected that current local production of equipment will expand significantly, with a view toward exporting to neighboring country markets. Following the Government's request, an ex-post subsidy bonus of up to 5 percent was defined for locally-produced parts.

5. Balanced disbursement schedule

IDTR sought to pay as much subsidy as possible late in the game (to maximize the incentive for improved performance) without overly increasing providers' risk exposure and financing costs (and thus subsidy needs).

Local MSMEs, whose access to financing is more difficult, are especially sensitive to this issue. By comparing bidder requests with the predicted cash flow of hypothetical providers using various business models, a balanced subsidy disbursement schedule was developed (box 1).

6. Contracting out technical assistance to providers where possible

In light of the high transaction costs of Bolivia's remote rural areas, IDTR delegated a set of additional local project tasks typically performed by consultants to the service providers. This decentralization of local market development and data collection for monitoring and evaluation is expected to reduce costs (as less visits to the remote areas are needed) and increase accountability (by assigning obligations to the party with the appropriate incentives).

Contracts create incentives for service providers to establish cooperation with microfinance institutions (MFIs) by requiring providers to offer users various payment options, including credit. One of the winning consortia includes a MFI, while the other subcontracts to a local MFI.

Box 1. Subsidy disbursement schedule

| | |
|------------|---|
| 15% | Against promotion, acceptance of prototypes, and training of technicians. |
| 68% | Against installations on a quarterly basis. |
| 12% | Against annual visits over 4 years and local market development. |
| 5% | At the end of contract, upon compliance with all obligations. |

Note: Providers can request an additional advance of up to 15 percent against a full bank guarantee (on top of usual performance guarantees).

7. Regulation by subsidy entity

Because SHS services are not regulated in Bolivia, a technical monitoring entity was set up inside the Government's project implementing unit to monitor the broad set of providers' service obligations against which subsidies are disbursed. Using a combination of random external audits and ongoing Government audits, product quality, technical service quality, and commercial service quality are monitored. If the predefined targets are not met, subsidy payments are withheld or fines imposed as defined in the subsidy contracts.

8. Poverty targeting of subsidies

A combination of measures has been used to achieve poverty targeting of subsidies. Users can select SHS sizes, allowing for differing service levels and thus widening the range of systems sold in Bolivia toward the low-cost end below 50 watts peak (Wp). The absolute unit subsidy is constant for all systems above 40 Wp for a progressive subsidy scheme. The rural target areas cover some of Bolivia's poorest residents. By subsidizing new access (as opposed to service), target users are on average poorer than is the case for social tariffs. PV schools and health posts in each target area will serve as anchor clients and will benefit the poorest households, for whom individual subsidized systems may be beyond reach.

Summary

The overall success of the MSC approach to bidding out SHS services can only be judged at a later stage, as installations have only just begun. The successful tender award and the efficiency gains achieved show that this new model merits closer analysis.

Bolivian public perception of private participation in infrastructure (PPI) has deteriorated in recent years, resulting in a series of severe conflicts revolving around the water and energy sectors. Against this backdrop of instability, the SHS tender has been welcomed by both the private sector and a series of changing governments.

The current administration has taken the underlying public-private approach as a cornerstone of its new universal access policy for the electricity sector; based on the project, it is planning to scale up with new funding from GPOBA. The ability of this output-based, public-private approach to receive continued support throughout several administrations is testament to a balanced and realistic subsidy.

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