Case Study: COELBA Community Agent Program for Slum Electrification and Energy Efficiency in Salvador, Bahia, Brazil

AVSI Foundation

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**Snapshot**
The Agente COELBA project is an electrification and energy efficiency initiative for low income areas carried out by a local NGO, CDM, in the city of Salvador, Bahia State, coordinated and financed by the electrical distribution company COELBA. Agente COELBA has been in operation for 11 years, beginning in 1999 with a pilot initiative in two communities and presently (2010) operating in 67 communities of Salvador, and in other cities of Bahia State. The project responded to a context of informal urban settlements with high levels of illegal access to electricity, widespread inefficiencies in energy use, and significant challenges to regularization of the client-company relationship.

Through close collaboration with a local NGO intermediary, CDM, COELBA invested in the development of a methodology that empowers Community Agents to establish or restore the client-company relationship, oversee subsidized installation of improved electrical connections, transmit educational information about energy efficiency, and enable the clients and company alike to realize important gains.

**Title** – Projeto Agente COELBA (Agente COELBA Project)

**Location** – Latin America/ Brazil/ State of Bahia, City of Salvador

**Energy Type** – Electricity

**Service Provider** – COELBA (Grupo NeoEnergia)

**Objectives** –

1) Reduce commercial losses from non-paying legally connected customers;

2) Reduce number of illegal connections and adjust energy consumption (bills) of low income consumers to their ability to pay;

3) Invest in customer relations through the mediation of agents embedded in communities;

4) Use a combined approach of information and energy efficiency improvements delivered by community agents together with increased utilization of Government subsidies (Social Tariff); and

5) Rely on an intermediary NGO to reach customers and establish a balanced relationship of mutual trust between customers and the company.

**Stakeholders** - Funder – COELBA; Beneficiaries – Residents/Customers; Implementer – AVSI and CDM

**Duration** – Pilot Project, 1 year (1999); Project (2000 – present)

**Status** – On-going in 67 Communities of Salvador
1. Background to the Case Study

The city of Salvador, the state capital of Bahia State and one of the oldest as well as the third largest city in Brazil, is home to approximately 2.7 million inhabitants in 651,008 households spread over an area of 707 km². About 35% of Salvador’s entire population is at or below the poverty level, defined as US$960/year or $80/month for a family of four.¹ It is estimated that in Salvador there are 357 slums, or favelas, with around 800,000 people living in conditions of extreme poverty.² According to a demographic study of Salvador in 2000, approximately 32.4% of the urban area of Salvador has been occupied informally since the 1940s, which represents almost one third of the population of the city.

Rapid urbanization through extensive informal settlements in Salvador has brought with it related urban problems such as high rates of unemployment, violence, high population density, poor living conditions, and limited access to regular, quality services including electricity.³

The policies of the Brazilian national and state governments towards slum regularization have historically been highly political and sensitive. Since the 1990s, policies have begun to favor slum recognition and incorporation into the formal cities and networks of public services. Governmental policies have continued in this direction throughout the life of the Project, with significant advances and investment by the government at multiple levels.⁴

Upon privatization of the electrical sector in 1995, it became apparent to the utility companies that illegal and irregular access to electricity was rampant, resulting in widespread system losses and significant public safety concerns. At the same time, households were accustomed to high levels of energy consumption due to use of low efficiency light bulbs, faulty electrical installations, refrigerators in poor condition, and inefficient home construction with no ventilation or natural lighting.⁵ As a result, energy consumption was consistently above the customers’ ability to pay; among formal COELBA customers, default rates were around 50-60%.⁶ The impact was negative for residents, consumers and the energy utility alike.

The configuration and location of dwellings in the urban slums and the lack of formal property registration meant that basic tools for communication between the service providers and customers—identifiable addresses, roads, telephone and postal service—were lacking. The environment fostered a conflictual relationship between utility companies and the community where non-paying consumers

¹ IBGE, 2000.
² CONDER, 2006.
³ The population of Salvador increased from 455,467 inhabitants in 1955 to 2.3 million in 1995.
⁴ For example, since 2007 the “Programa de Aceleração do Crescimento” guides significant investment into public infrastructure, electricity, water and waste services for around 23 million households in urban areas.
⁵ Neoenergia, “Neoenergia: Energia para o crescimento” (English version), Powerpoint presentation, June 9, 2010.
⁶ Data from Neoenergia.
preferred to remain invisible and the utility’s only recourse to non-compliance was service cuts and legal remedies.\(^7\)

### 2. Project Description

#### 2.1 Basic Features

The Agente COELBA project is electrification and energy efficiency initiative for low income areas carried out by a local NGO, CDM, in the city of Salvador, Bahia State, coordinated and financed by the electrical distribution company COELBA. Agente COELBA has been in operation for 11 years, beginning in 1999 with a pilot initiative in two communities and presently (2010) operating in 67 communities of Salvador, and in other cities of Bahia State. The program methodology has been replicated in the State of Pernambuco and internationally. Multiple complementary programs aimed at increasing energy efficiency and conservation have been developed within the framework of Agente COELBA; these initiatives have not only become formalized as stand-alone programs but have also expanded significantly and have gained international recognition. The initiative has had a significant impact on the policies and structure of Grupo Neoenergia which is fully committed to continuing the approach of community engagement to maintain the gains achieved.

COELBA invests $7.5 million per year (R$12.5 million) on average to sustain Agente COELBA and the related energy efficiency components and giving employment to 200 people.\(^8\)

#### 2.2 Objectives

The *Companhia de Electricidade do Estado da Bahia* (COELBA) designed and launched the project Agente COELBA to increase market reach and improve profits through minimizing inefficiencies. In so doing, COELBA “maintained a least-cost business approach that was nonetheless cognizant of difficult social and humanitarian conditions and promoted itself as a service company with an investment and responsibility in the well being of its customers.” \(^9\)

Agente COELBA had the objectives of:

- Invest in customer relations through the mediation of agents embedded in communities;
- Reduce commercial losses from non-paying legally connected customers;
- Reduce number of illegal connections and adjust energy consumption (bills) of low income consumers to their ability to pay;

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\(^7\) A thorough exploration of the phenomenon of energy theft in Brazilian urban slums, as well as an analysis of approaches to regularization can be found in: Mimmi,L.M., Ecer,S.,” An econometric study of illegal electricity connections in the urban favelas of Belo Horizonte”, Energy Policy (2010), doi:10.1016/j.enpol.2010.04.037

\(^8\) Interview with Ana Christina Romano Mascarenhas, Neoenergia, October 2010.

\(^9\) Smyser/USAID, p.4.
• Use a combined approach of information and energy efficiency improvements delivered by community agents together with increased utilization of Government subsidies (Social Tariff); and
• Rely on an intermediary NGO to reach customers and establish a balanced relationship of mutual trust between customers and the company.

3. Key Actors

COELBA (subsidiary of Grupo Neoenergia)

COELBA is a private, investor-owned distribution utility in the Northeastern state of Bahia, Brazil, and part of Grupo Neoenergia, the third biggest private electrically company in Brazil, in existence since 1996.10

In 2010, COELBA has 4.6 million clients in 415 out of 417 municipalities of the state with a population of 14 million; an estimated 50-60% of clients fall into the low-income brackets according to federal standards.

COELBA’s motivations can be summarized in the following:

 ➔ Regulatory and legal objectives (achieve 100% coverage; minimum reinvestment in energy efficiency and R&D);

 ➔ Business objectives (high technical and commercial system losses; high levels of non-paying customers; general inefficiencies at all operating levels); and

 ➔ Customer service objectives (poor customer satisfaction levels).

From the mid 1990s, COELBA began to dedicate greater attention to expanding and improved service in low-income communities. In 2000, COELBA intensified its investments in slum electrification and regularization, with attention to energy efficiency. The context presented a particularly difficult challenge for COELBA. The company had to overcome the resistance of the population to regularization (fear of high bills and resulting debt, distrust and legal concerns regarding property rights, resistance to change behaviors) while also finding ways to optimize energy consumption per household and increase the number of paying households.

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10 COELBA is a unit within Grupo Neoenergia, an energy company that includes 23 subsidiaries and covers the entire chain of electricity production: generation, transmission, marketing and distribution. COELBA is a leader in the distribution of energy in the Northeastern region of Brazil, reaching 9 million households and a population of approximately 35 million clients in the States of Bahia, Pernambuco and Rio Grande do Norte.
Grupo Neoenergia faced this complex set of challenges on a larger scale and therefore had a high level of interest in the success and challenges of COELBA to expand coverage in other urban slums of the State of Bahia, with a perspective of expansion to other states with high levels of low-income customers.

AVSI Foundation (formerly Associazione Voluntari per il Servizio Internazionale)

AVSI, an international non-profit organization based in Italy and engaged in development projects worldwide, had been conducting activities in Salvador since 1993 within the area of Alagados and in other locations in Brazil in urban slum upgrading. AVSI pioneered a methodology of intervention based on the integration of physical upgrading with a strong social component, in partnership with the state development agency and international donors. The methodology implies a process of recognizing the positive aspects in each context and mobilizing the slum dwellers and their organizations to participate in the physical and social renewal of their neighborhoods. The Alagados initiative expanded significantly over the years within the State of Bahia and in other States with increased coverage, national and international support and recognition.11

Cooperação para o Desenvolvimento e Moradora Humana (CDM)

CDM is a local organization born in 1995 in Belo Horizonte, the capital of Minas Gerais state, and with a branch in Salvador, Bahia State since 1998. CDM has been a close partner with AVSI since its beginning and has grown significantly in terms of technical and organizational capacity through this partnership. CDM provides services to communities and government in the slum upgrading and community development sector. Since 1999, CDM has been the primary executor of the Agente COELBA project with technical support provided by AVSI.

Community Associations

Community associations in intervention areas are key partners in this project, guaranteeing implementation and monitoring of activities with a high level of community participation including selection of Community Agents to be hired by the project. Associations also benefit from the Social Fund created for reinvestment of financial gains within Agente COELBA.

4. Project Implementation

4.1 Phases

Preliminary Phase

To have a more comprehensive picture of the complex reality of operations in Brazil’s urban slums COELBA contracted the firm *Diagonal Urbana* in 1998 to conduct a study to identify the main characteristics of low-income clients and residents in Salvador and to gather alternative approaches for interventions.\(^\text{12}\) In 1999, having known of their experience in the region, COELBA requested AVSI and CDM to prepare a proposal for a pilot project that could respond to the following issues and challenges:

- Even after illegal customers have been regularized, it is hard to keep new customers from defaulting or suspending service. Challenge: to improve client-customer relationship.
- Control and reduction of energy consumption as a message to clients is in the interest of the clients and ultimately in the interest of the company. Challenge: to devise a strategy to adapt energy expenditure to household income and deal with debts and irregularities proactively.
- Client attitudes and perception of services change over time. Challenge: to establish channels of communication through representatives of the company who are also trusted by the community.
- Intervening with only technical support to improve electrical connections and anti-theft kits may not significantly increase payment of electrical bills or reduce illegal connections. Challenge: to implement a more intensive education campaign and direct contact with consumers for effective, lasting solutions.\(^\text{13}\)

**Pilot Phase**

In 1999, COELBA initiated a partnership with AVSI and CDM aimed at defining an intervention methodology to guide the implementation of slum electrification and energy efficiency initiative with the specific goal of balancing the business interests and the explicit limitations of the communities.\(^\text{14}\)

The pilot was executed by CDM and AVSI in two communities characterized by extreme poverty and with high levels of both non-payment for electrical supply and household electrical consumption: Barrio de Paz and Barrio Jardim da Mangabiera in Salvador. The initial target was 6,000 households. The main activities carried out within the scope of the pilot project were:

1) Creation of field offices in the two communities  
2) Mapping of the communities via aerial photography  
3) Socio-economic survey of residents and situation of electrical service and usage  
4) Identification of community associations and actors  
5) Implementation of GIS system

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\(^\text{12}\) [www.diagonalurbana.com.br](http://www.diagonalurbana.com.br); Other experiences of slum electrification were considered, including Light Rio and CERJ. AVSI/CDM, 2001.  
\(^\text{13}\) AVSI/CDM, 2001.  
\(^\text{14}\) The title of the pilot project was “PROJETO DE MANUTENÇÃO DA REGULARIDADE NO FORNECIMENTO DA ENERGIA ELÉTRICA À COMUNIDADES POPULARES – AGENTES COMUNITARIOS.”
6) Elaboration of a social and educational plan of action for energy efficiency
7) Creation of an inter-institutional advisory body to guide implementation
8) Selection of community agents
9) Training of community agents
10) Elaboration of an instrument to support community agents

Important information on household electrical consumption was gathered in the social surveys. It was discovered that old refrigerators account for 70% of residential electricity consumption; inefficient lighting accounts for 20.6%; and televisions account for 8.4%. This information directly impacted the strategies for energy efficiency.

All stakeholders gained a deeper understanding of the context and an appreciation of the value of the community agent approach to establish or restore the relationship between consumers and the electrical company and to achieve benefits for both. This positive result reinforced the commitment of COELBA to invest in this approach on a larger scale.

**Official Launch**

In 2000, COELBA launched the first phase of the initiative under the name *Projeto Agente COELBA* in 11 communities of Salvador, targeting 20,000 households with a team of 19 Agents. CDM won a contract with COELBA, through a competitive bidding process, to serve as lead implementer for a project period of 12 months. CDM’s role was to hire, train and supervise the COELBA agents, organize events and educational programs, participate in planning and further development of the project methodology, and, in general, support COELBA’s access, acceptance and credibility in these communities. The project has gradually expanded over time as CDM has continued to serve as prime implementer through consecutive contracts with COELBA.

**Scaling-up and Replication**

The project has scaled up the number of communities reached gradually and consistently. See the Timeline of the Project. COELBA’s commitment to scaling-up was due to the gains in revenue coming from new customers, reduced levels of customers in default, reduced system losses and the parallel community appreciation of the initiative. As a result, Agente COELBA became part of the business model of COELBA as it also became an integral part of the community landscape, ensuring sustainability and continuity.

In 2003, replication of the project began in 10 communities of Feira da Santana. In 2007, replication of the project began in 6 communities in Lauro de Freitas and Simoes Filho. In 2010, AVSI Nordeste\(^\text{18}\) was

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\(^{15}\) AVSI, “Relatório Coelba,” 2010.

\(^{16}\) According to the terms of COELBA’s procurement policies, only Brazilian entities could be contracted as primary executor. AVSI continued to support CDM through the existing relationship and on-going technical assistance.


\(^{18}\) AVSI Nordeste is a Brazilian NGO linked with AVSI Foundation.
awarded a contract to initiate a parallel program with Companhia de Distribuição de Energia Elétrica Pernambuco (CELPE), the sister distribution company of COELBA within Grupo Neoenergia; this project is called Agente CELPE.

Scaling-up was a relatively smooth undertaking, made possible due to a gradual process of consolidation between COELBA and CDM; as Agente COLEBA became well-known and accepted by the communities, the barriers to entry in new communities were significantly reduced. On the technical side, the methodology was already tested and refined which allowed for easier technical planning and implementation. CDM faced the challenge of managing significant and steady growth of operations and structure, specifically in terms of the number of agents, employees and stakeholders. As the program becomes established in particular areas, the main focus of the Community Agents, and therefore of CDM, is ensuring sustainability of results, which implies keeping clients regular and ensuring good reception of the project by the community.

In the State of Pernambuco, the distribution company CELPE, launched a parallel initiative executed by AVSI in 34 communities to streamline the methodology as part of the Grupo Neoenergia’s policy approach to energy efficiency in low-income communities. The previous collaboration of AVSI with the government of the State of Pernambuco in slum upgrading allowed for greater collaboration and integration of the project and the Government’s own initiatives and strategies.

Internationally, Neoenergia collaborated with USAID in a replication of the Agente COELBA model in Angola starting in 2006.19

4.2 Methodology for Implementation

The methodological approach developed for the project involved the following essential components: 1) identifying points of entry in each community by engaging civil society, 2) empowering residents as key implementers through Community Agent model, 3) increasing access, quality, and affordability of service provided, and 4) improving energy efficiency and conservation at the household level through direct interventions.

1. **Identify points of entry in each community. Tool: Engage Civil Society/ Local Associations.** Existing community associations are identified and invited to become important collaborators in the project. The associations were given tasks such as: publicizing the initiative, integrating the project with the community, facilitating meetings and educational events, promoting the hiring of community agents, participating in evaluation of project, and identifying community problems with electrical supply and services.20 AVSI understood this aspect of the methodology to be essential for gaining

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19 Interview with Marcelo Maia de Azevedo Corrêa, President of Grupo Neoenergia, 10/2010.

legitimacy and improving the utility’s image in the communities, ensuring a high level of participation and communication and overall for reducing resistance to change.

2. **Empower residents as key implementers. Tool: Community Agent model.** Through the community associations, residents are selected to be interviewed for positions as community agents. Candidates submit a CV for review and must pass tests in math and Portuguese language and have an interview. CDM contracts the community agents directly and provides training together with COELBA; technical training is provided by COELBA, and CDM provides training on the social and human concerns.

In general, one agent is assigned to each community, with each agent responsible for 2,000 customers on average (10 visits per day). Agents are properly equipped and uniformed, and their daily work entailed advertising the program, identifying customers and interviewing households for data entry into COELBA’s database and the registry of low-income residents. The data collection effort is essential to establish the basis for communication between the customer and the company and for customers to benefit from the governments Social Tariff mechanism. Regular visits from the Agents provide for an on-going educational process to help new consumers reduce their energy demand through energy conservation, in addition to technical oversight of installation, meter reading, and upgrading. COELBA Agents regularly update the socio-economic information about clients and monitor payment of bills, providing an extremely important service for COELBA.

The Agents are supported by a Central Operating Base managed by CDM which coordinates the geographical reach of the Agents and field level supervision and support and streamlines communication between clients and COELBA. The Central Operating Base has primary responsibility for maintaining the client database and facilitating the flow of information from clients via Community Agents to COELBA (service demands, household level data, negotiated payment plans), and the information from COELBA to the clients (technical service response, bills, incentives). See the attached Organizational Diagram for more information and a visual display.

3. **Increase Access, Affordability and Quality of Energy Services. Tools: Social Tariff, Installations.** COELBA increased the number of legal, regularized electrical connections by responding to the requests for services generated by Community Agents. COELBA heavily subsidized the installation of new connections and theft-resistant meters, and facilitated client’s registration in the government Social Tariff program. Agents coordinated and monitored the installation process and negotiated tariff collection strategies with households. In this way, low income clients were able to overcome the barrier to access through a combination of utility sponsored subsidy and government sponsored subsidy (Social Tariff), facilitated by a trusted Community Agent.

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22 The average cost for connecting a client under the regularization program was R$515, of which the customer paid R$60 in payments spread over monthly electrical bills. Smyser/USAID, p.8.
An essential part of the program methodology was to give Community Agents significant authority over the negotiation of special tariffs and debt repayment plans, resulting in practical payment systems of irregular and low wage customers which were an incentive for participation. COELBA took seriously the need to assist households to reduce energy consumption and corresponding bills to affordable levels. In this regard, COELBA conducted research and analysis to provide benchmarks for sustainable rates of consumption per household. The result was a model of the “Efficient Consumer” who would spend no more than 5% of the family’s income on electricity. In addition, the utility has invested in both educational outreach and targeted interventions to improve energy efficiency of its customers.

4. Improve Energy Efficiency and Conservation. Tool: Energy Efficiency Sub-Projects: In the early stage of implementation, the project focused primarily on education and registration of clients in the Social Tariff mechanism. It was evident that these initiatives alone would not provide for an adequate reduction in energy consumption to effectively improve consumers’ ability to pay, and therefore decrease rates of default and outstanding debt. COELBA initiated the idea of sub-projects which would address different areas of the project’s objectives. The first sub-projects dealt with improvement of electrical installments, distribution of fluorescent lamps, and exchange of old refrigerator units. Over time, the number, breadth and scope of these projects expanded into large-scale programs with extensive reach.

4.3 Innovative Approaches

Appliance Exchange

Among the first energy efficiency initiatives involved the replacement of old appliances, primarily lamps, light bulbs and refrigerators. Over time, the refrigerator exchange became formalized into the project Nova Geladeria through which the company sold new, high efficiency units at a fraction of retail costs. In 2006, a partnership was established with the Brazilian Banco Popular to make a subsidy of 60% possible. In 2008, a 100% subsidy was made possible to clients meeting the following criteria: having regular electrical connection, timely payment of electrical bill, and registered in Social Tariff program.

The old refrigerator units are collected and the scrap metal and CFC gas is sold to raise money for community projects channeled through the Social Action Fund started under the program, and described below. Recycling of CFC gas has also has positive benefits for the environment.

In 2009, the Nova Geladeria initiative was recognized as an exemplary project by the United Nations Environment Programme.23

The ValeLuz COELBA project, launched in 2008 as a socio-environmental initiative that developed parallel to Agente COELBA, is aimed at stimulating the recycling of light bulbs and old appliances. Customers exchange recyclable material for discount coupons that can be applied toward their energy bills. Exchange posts in the two participating communities are managed by community organizations which benefit from the sale of recycled parts and materials.24

To date, COELBA has distributed the following:
- Lamps and lightbulbs – 525,126
- Refrigerators – donated – 51,185
- Refrigerators – sold – 17,72625

Community Education

Educational outreach has always been an essential component of the Community Agent methodology. Agents were given the primary responsibility of communicating energy efficiency strategies to client households and monitoring use of appliances as well as structural conditions which increase consumption. Agents create a space for on-going education on energy use and compliance with the terms of COELBA’s electricity service provision which builds trust among clients and the company.

Grupo Neoenergia and COELBA have plans to launch a mobile classroom initiative to reach schools and communities in 53 municipalities across the State of Bahia.26

Reinvestment of Revenue and Savings

A Social Action Fund was created by the Community Agent project as a vehicle to channel funds generated by the sale of scrap metal and CFC gas to address social and economic problems in the communities. The Fund was an innovative mechanism that provided for immediate reinvestment of the gains of the project into the communities in terms of concrete benefits of jobs and business opportunities for local cooperatives and cultural groups, and at the same time consolidated Grupo Neoenergia’s commitment to social responsibility. Half of the income generated was dedicated to program costs to continue and expand the initiative, and the other half dedicated to grants for community organizations engaged in education, employment and culture. Among the direct beneficiaries of this fund are: CAMAPET Scrap Collectors Cooperative, Paciecia Viva Scrap Collectors Cooperative, Salvador Biscuit Cooperative, and Cultural Group Baguncaco.27

The programs Nuova Geladeria, ValeLuz and the Social Fund were expanded to 21 cities in Bahia and Pernambuco, generating employment and environmental benefits.28

27 Neoenergia, 2010.
4.4 Implementation Problems and Solutions

Problem/Solution 1: The context of the favelas of Salvador in the mid to late 1990s was one characterized by high levels of violence and distrust of the population towards external interventions. COELBA faced a serious challenge of gaining trust among residents in order to simply enter the communities to initiate a new initiative. The strategies available to providers such as COELBA to enforce timely payment of service fees were limited to interruptions of service and fines. Solution: A high level of community involvement, led by respected NGO and CBO intermediaries, to allow for communication and direct engagement of the utility company with residents. The stable presence of Community Agents who were also members of the same community renewed and strengthened the relationship between clients and the company.

Problem/Solution 2: Affordable payment plans were challenging to negotiate with clients in default and with outstanding debts. Solution: Agents were given increased negotiation flexibility and authority when working with clients unable to make payments or with outstanding debt. Agents were supported by a customer-relationship team based in the central office of Agente COELBA, coordinated by CDM and with authorization for customized payment plans given by COELBA.

Problem/Solution 3: Given the informal nature of the targeted settlements, the creation of a client database that would serve the purposes of the company and client registration in the Social Tariff program was a significant early and on-going challenge. Solution: COELBA gave early attention to improving the customer database and data entry processes, even if it required Agents to re-visit clients to confirm accuracy and completeness of data. Through the project, COELBA was able to guarantee to its low-income clients that registration in its database would permit registration in the Social Tariff program, and consequently bring benefits in terms of subsidized rates for electricity.

Problem/Solution 4: A related challenge in the early years of Agente COELBA was the difficulty of distributing bills to households and subsequently monitoring payment or non-payment. Solution: community leaders were engaged to receive bills from COELBA and coordinate distribution to customers in the community.

Problem/Solution 5: With successful and deep outreach to clients in target areas came the subsequent influx of service demands and complaints. The continued acceptance and ultimate success of the project depended not only on the Agents’ ability to increase demand, but on the utility’s capacity to respond. In the first year, COELBA achieved a response rate to incoming service requests between 60-80% depending on the service. To its credit, the company judged these levels to be too low. Solution: Early attention to customer service satisfaction and responsiveness, and the technical systems required to reach those objectives. This customer-satisfaction strategy supported a positive image of the project and increased community acceptance. 29

5. Results and Impacts

The long trajectory and consistent expansion of the Community Agent project reflects continued investment by COELBA in this strategy due to its high level of success.

Over 11 years, Agente COELBA has expanded from reaching 6,000 households in 2000 to 200,000 households in Salvador alone in 2010. Direct employment created has grown from 6 Community Agents in 2000 to 102 Community Agents in 2010, involving 200 technicians considering the coordination and supervision of the project and the Nova Geladeira team.

The indicators which can be used to assess the impact of the Agente COELBA project are:

- Indicators of compliance/ non-default
- Indicators of energy consumption
- Indicators of client visits and service delivery of Community Agents (productivity)

5.1 Intermediate Results

Intermediate indicators of achievement between 1998 and 2003 were collected and reported by USAID. These reflect important achievements by the project in the first four years of the project, contributing to the sustained commitment of the company to scaling up the effort.30

In addition, a study carried out between 2001 and 2002 by researchers from the University of Salvador analyzed energy consumption data from 10 low-income communities of Salvador targeted by Agente COELBA. The conclusion was that on average, household energy consumption was reduced by 21% during this time period. The study attributes the combination of educational campaigns and government incentives to the achievement of these results.31

COELBA’s analysis in 2004 also showed positive results. Rates of compliance—customer accounts in good standing—were significantly higher in service areas covered by Agente COELBA: 60.45% of compliance in Agente COELBA areas and 43% of compliance in the rest of low-income areas of Salvador.32

30 Smyser/USAID, 2004. Results reported include: increase of 46.6% in number of customers; reduction of technical and commercial losses from 18% in 1997 to 12% in 2001; reduction of household energy demand by 21%; improved delinquency rates; and customer satisfaction over 90%.
31 Romano Mascarenhas, A.C., Nunes, D., 2005.
32 COELBA, 2005.
5.2 Current Results

Indicator of Compliance/ Non-Default

Reduction of non-payment and outstanding debt has been a long-standing objective of COELBA, as well as a continual challenge. It is important to consider that in low-income communities the indicator of compliance/non-default ranges between 40-50%. Taking this into account, in 2004, COELBA set the goal of 75% compliance, or an increase of 35-45% of customer accounts in good standing. In 2007, this goal was essentially met as the average monthly rate of compliance was 74.98%. In 2008 and 2009, the overall levels of compliance have declined each year, reaching 70.45% in 2009. Yet, COELBA has still accomplished a significant increase in compliance through this project relative to other service areas.

Indicators of Energy Consumption

COELBA monitors average energy consumption in the service areas covered by Agente COELBA and the Nova Geladeira project. Recent data on average household energy consumption reveals that while consumption does continue to increase, it is doing so at a slower rate than in previous years.

In 2003, when the project was not integrated with Nova Geladeira, a comparative study was conducted covering data from 2001-2003, verifying the reduction in average household consumption in the areas targeted by Agente COELBA in those years. The data show greater regularity in electrical consumption and a significant reduction in average consumption. In 2003, consumption ranged from 81.11kW/month to 96.41kW/month compared to the range in 2001 of 112.67kW/month to 72.81kW/month. (See Graph 1).

Graph 1. – Average Energy Consumption in Targeted Communities – Comparison 2001 – 2003

34 Ibid.
35 Official data Grupo Neoenergia.
In July 2007, COELBA conducted another internal study comparing the project results from 2006 and 2007. For this comparative study, data was collected on a sample of 576 clients from areas targeted by Agente COELBA and Nova Geladeira. In this target area, 17,000 refrigerators and 90,000 efficient lamps were distributed. The average consumption of these customers between January and April 2007 show a strong reduction of 28%, from average monthly consumption of close to 100kW/month to about 70kW/month. It can be noted that for a family participating in the Social Tariff program, this reduction in consumption is equivalent to costs savings of approximately 1/3 of the average household electrical bill per month. (See Graph 2).

*Graph 2. – Average Consumption in kWh/month for Clients of Refrigerator Exchange in July 2007*

In 2008, Neoenergia realized a similar survey among a group of clients and confirmed a reduction of 33% of consumption compared to the previous year and 46% reduction compared to a projection of consumption without the project intervention.

See Graph 3. One study found important behavioral changes among families which had received a new refrigerator, including increased spending on food, health, education and clothing, resulting in improvements in the quality of family life.37

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36 Official data from Grupo Neoenergia.
Indicators of Client Visits and Service Delivery of Community Agents

Despite the difficult economic environment of the recent years, Agente COELBA continues to address this segment of the clientele which has defaulted on electrical bills to avoid service cuts. From January to September 2009, a total of 76,330 visits to low income clients were realized by Community Agents. These visits generated more than 82,000 requests for services including registration, debt negotiation, and energy supply. COELBA managed to fulfill 85% of service requests. Considering that of clients visited with accounts in default, the project managed to negotiate a payment play for 50.1%, thus guaranteeing a recovery of $2,486,706 through debt negotiation and delivery of information about efficient energy use in the household.39

Also in 2009, COELBA conducted an evaluation of the program in the community of Mapele, a target community for Agente COELBA. The resulting data from 97% of clients interviewed showed that 100% expressed willingness to participate in new programs implemented by COELBA. This result illustrates the high level of client satisfaction with the actual programs and significant improvement in consumer perception of COELBA.40

38 Official data from Grupo Neoenergia.
5.3 Impacts on Residents/ Customers

The measurement of results by COELBA and ANEEL, together with the interviews conducted in October 2010, reveals the range of accomplishments toward the set of goals and objectives held by the stakeholders. Feedback from customers and COELBA Agents show that the project results are verified beyond the numbers and can be evidenced from the following results:

- Reduction of energy consumption, consequently reducing the amount of monthly bills;
- Increased possibility for household investments in health, education, food and clothing;
- Receipt of benefits such as new electrical installations, lights and refrigerator and improved quality of family life;
- Increased safety and security with regard to re-wiring;
- Social Fund from the sale of scraps of the refrigerators and the collective benefits generated by the project in projects with an educational and employment and income generation, including work opportunities through cooperatives;
- Registration in Government program through Social Tariff mechanism, making households eligible for other social services;
- Empowerment of low income customers through regularization of bills and participation in program;
- Greater awareness among customers about the rational and efficient use of electricity; and
- Emergence of a relationship of trust and loyalty, through a permanent presence of the agent, creating a positive relationship with COELBA.

5.4 Impacts on COELBA

- Economic viability and social sustainability of investments in market expansion;
- Reduction in bad debt and expansion of low-income clients with strong future potential income, linked to strong economic growth of Brazil's working class;
- Improved customer loyalty;
- Improved corporate image in from of low income customers;
- Reduced system losses due to illegal connections;
- Positive environmental impact; and
• Advancement of company commitment to social corporate responsibility.

5.5 Impacts on Community
• Greater purchasing power of residents and increased consumption in local economy;
• Improved community well-being;
• Increased maintenance of street lighting and other urban infrastructure and services through channels put in place by COELBA Agents; and
• Support for social and cultural programs through Social Fund.

5.6 Unexpected Impacts
Areas of positive impact that were not expected include the following:
• Residents gained “recovery of citizenship” through the proof of residency which electric bills provided them and through active involvement in the project.
• High quality jobs were created, directly through Community Agents (who received training, high level of responsibility, authority and respect in community), expansion of local cadre of electricians, and through Social Action Fund.
• Socio-cultural benefits were realized through the participation of community associations and cultural groups. Moreover, associations were enhanced and strengthened as a result of their engagement.
• Complimentary benefits to well-being in targeted communities were realized through increase household spending on health, education, food and clothing, resulting in improvements in the quality of family life.

6. Enabling Environment

The commitment of Grupo Neoenergia to provide adequate and affordable electricity service to low income customers was reinforced by the policy and regulatory environment of the electricity sector in Brazil in the late 1990s. Within in a broader context of increasing attention to urban slums upgrading, the government of Brazil contributed to an enabling environment marked by obligatory investment by utilities in approved energy efficiency programs and significant subsidies targeting energy access for low-income consumers.

Privatization of the sector began in 1996, and the Agencia Nacional de Energia Electrica (ANEEL) was created in 1998 to establish and oversee regulated retail tariffs and promote adequate and competitive services. The concession agreements signed by companies with ANEEL included various obligations. One
of these obligations was to dedicate a minimum of .05% of net operating revenues to projects that would reduce energy inefficiency. The Programa de Eficiência Energética das Empresas de Distribuição (PEE) was created to review and approve projects submitted by utility companies and to monitor compliance. The Agente COELBA project was approved by ANEEL as an acceptable investment in energy efficiency for low-income customers, thereby allowing COELBA to meet the requirements for reinvestment rate of net profit in energy efficiency and research.

Another element which was important for the birth of Agente COELBA was the creation of the Social Tariff policy and mechanism in Brazil. Distribution companies were responsible for the identification of low income customers and the setting of tariffs according to a graduated fee schedule set by ANEEL. In 2002, Electricity Law 10.438 established the Social Tariff which mandated a graduated fee schedule based on consumption, set at the national level and not by individual companies, and accessible to clients meeting certain criteria. Using targeted public subsidies within the system of market provision of services, the Social Tariff further incentivized utility companies to find ways of bringing service to low-income residents, thus furthering the policy of regularization of urban favelas and improving quality of life for low-income residents.41 Today, the eligibility criterion is set by Law 12.212/2010 and is based on individual registration in federal social welfare programs.

The government’s role in the Agente COELBA project has been indirect throughout most of the project’s trajectory.42 The state government offered a tax rebate on purchases of refrigerators by COELBA/Neoenergia as part of the refrigerator exchange program.

See Timeline of Project for details about the context of the electricity sector in Brazil.

7. Key Lessons

7.1 Program Lessons

Lesson 1: The Community Agent methodology was an innovative response to the main challenges of slum electrification and previous attempts to address isolated issues. Selecting Community Agents from among residents and with the assistance of local NGO and community associations, and supported by local presence of technical team members was a winning strategy. Agents knew the communities and real circumstances of life of the clients and could communicate on a personal level. Attention was paid to educating Agents to a direct approach with clients, providing a basis for personalization of the customer-client relationship. Agents were well equipped, given sufficient authority to negotiate with clients, and supported by technical and organizational systems which allowed for responsiveness and

41 In the Programa de Baixa Renda, clients register with the government program according to household income and history of electrical consumption. This registration authorizes COELBA as the utility to offer a preferential tariff on electricity consumption, with the difference subsidized by the government.

high levels of customer satisfaction. The establishment of a Central Operating Base by COELBA to collect and direct orders for service was a critical aspect of the Agents’ ability to be technically responsive to communities while also organizing data centrally.

"... We Coelba Agents are more than company employees, sometimes even Social Worker ..."

Coelba Agent Joel, interviewed by AVSI

Lesson 2: The partnership with experienced NGO intermediaries with a reputation for being trustworthy, effective and sensitive to community participation was particularly important within a context of significant social and economic challenges and limitations. As reported by USAID, "COELBA tried to do the program in Feira da Santana without using the NGO intermediary, but found that community members were suspicious of the motives and interests of the utility, and lacked the necessary trust to effectively make headway with the program."\(^{43}\) COELBA did not simply outsource a social program to an NGO in hope of positive dividends for the company, but engaged directly in a collaboration that was made possible by a consistent flow of communication and commitment of both parties.

"... I’m receiving you today because I have full confidence in the work of Coelba ..."

Chairman of the Committee, United Pernambués, Luiza, interviewed by AVSI

Lesson 3: Linking regularization of electrical service provision and payment with energy efficiency meant that customers felt the benefits of the program clearly and directly: more reliable, affordable and safe energy, opportunities to improve living conditions, education initiatives, and access to registered proof of residence. The greatest impact was had when services were bundled, with the replacement of old refrigerators playing a large role in reducing household expenditure on electricity.

"... I didn’t know why my account was so high and then came the agent and told me it was my old refrigerator ..."

Neighbor community Pernambués, Telma, interviewed by AVSI

Lesson 4: Business success depends on more than the quality of service or product and its pricing according to market rules. Agente COELBA demonstrates that the quality of relationship with clients, employees and partners is essential for long-term growth and stability of a business. Relationships based on respect and trust are fundamental to achieving business objectives. The project approach of direct and meaningful community engagement and the particular characteristics of the Community Agent figure helped to build and maintain this basis of respect and trust.

Lesson 5: Encouraging a sense of shared responsibility and active participation among community members, leaders and NGOs, and business is the most effective way to address enduring and complex problems and to channel aid. The government role is essential for creating an enabling environment and shaping incentives. The results of Agente COELBA depended on the people within each of the stakeholder groups (utility, NGO intermediary, community associations and Agents, and resident clients)

who accepted the challenge of constructing something positive, rather than resorting to the status quo of power relations and conflict. This implied a commitment to deal with issues and challenges as they arose, not through the logic of power and reliance on law enforcement, but instead betting on the possibility that a mutually beneficial outcome could emerge through dialogue and constructive engagement.
8. Attached Figures and Visuals

8.1 Map of Targeted Communities, Salvador (Agente COELBA)

8.2 Map of Targeted Communities and Income Levels, Salvador

8.3 Timeline of Project

8.4 Photos from Project

8.5 Organizational Chart
9. References

Agência Nacional de Energia Elétrica (ANEEL)  http://www.aneel.gov.br
Companhia de Desenvolvimento Urbano do Estado da Bahia (CONDER),  www.conder.ba.gov.br
Instituto Brasileiro de Geografia e Estatística (IBGE)  www.ibge.gov.br/cidadesat


Attachment 8.1
Map of Targeted Communities, Salvador (Agente COELBA)
Attachment 8.2
Map of Targeted Communities and Income Levels, Salvador
Attachment 8.3

Timeline of Project
Timeline of Project – Agente COELBA


**CONTEXT**

- Major reform of electrical sector in Brazil—privatization.
- ANEEL created for supervision of sector
- ANEEL initiates obligations for utilities to invest in energy efficiency programs for low income customers.
- (2000) Law No. 9.991 – Social Tariff for low income consumers differentiated by income. Distribution utilities obliged to invest .05% of annual revenue in energy efficiency and R&D for low income customers.
- Law No. 12.212 – New Criteria Social Tariff

**PROJECT ACTIVITIES**

- Pilot: 2 communities, target 6,000 HH (6 agents)
- Agente COELBA: 11 communities, target 20,000 (19 agents)
  - Agente COELBA: 10 communities, target 27,000 (20 agents)
  - Agente COELBA: 18 communities, target 41,000 (41 agents)
  - Agente COELBA: 27 communities, target 50,000 (50 agents)
  - Scaling-up to Feira da Santana: 10 communities
    - Agente COELBA: 65 communities, target 200,000 (100 agents)
    - Feira da Santana: 10 communities (100 agents)
    - Lauro de Freitas/Simoes Filho: 6 communities (2 agents)
    - Agente COELBA: 67 communities, target 200,000 (102 agents)

- Neoenergia begins replication in Angola (USAID funding)
- AVSI implements Agente CELPE in Pernambuco
Attachment 8.4
Photos from Project
Agente Coelba in operation, visiting a family

Agente Coelba in the neighborhood

Agente Coelba checking customer data
Attachment 8.5

Organizational Chart
STRUCTURE of AGENTE COELBA and NOVA GELADEIRA

COELBA – ENERGY EFFICIENCY SECTOR

(01) General Coordinator

(01) System Analyst

PROJETO AGENTE COELBA

(01) Supervisor

(10) Technical-Commercial Attendants

(04) Data Clerks

(01) Office Assistant

PROJETO NOVA GELADEIRA

(01) Supervisor

(01) Administrative Assistant

(06) Office Assistants

(02) Assistants for Loading/Unloading

(04) Motorized Mobile Agents

(04) Field Supervisors

(02) Field Supervisors

(102) Agents

(38) Mobile Agents

Central Operating Base

Logistics

Community
Structure of Agente COELBA and Nova Geladeira (as of 2005)

**Project Team**
General Coordinator and System Analyst are directly responsible for the two projects.

**Projeto Agente Coelba**

**Central Operating Base:** 1 General Supervisor, 5 Data Clerks (Digitadores), 1 Office Assistant, 10 Technical-Commercial Attendants. Responsibilities include maintenance of data base, systematization of service demands generated in the field, data entry and system support for Community Agents.

**Field team:** 4 Field Supervisors, 102 Agents. Each supervisor is responsible for roughly 25 Agents.

**Projeto Nova Geladeira**

**Office team:** 1 General Supervisor, 1 Administrative Assistant, 6 Office Assistants. Responsibilities include organizing attention to service demands, data entry and control of documentation for processing refrigerator exchanges.

**Field team:** 2 Field Supervisors, 4 Motorized Mobile Agents, 2 Assistants for Loading/Unloading, 38 Mobile Agents.

The **Central Operating Base** of the Agente COELBA and Nova Geladeira Projects is responsible for providing the following services within the scope of project implementation:

1) Interact with COELBA on the organizational aspects and management of the Agente COELBA and Nova Geladeira projects;
2) Organize activities of the project teams;
3) Organize the logistical aspects of refrigerator exchange;
4) Organize and communicate the assignment of Community Agents to specific target areas and provide guidance for customer visits;
5) Provide information to the Community Agents to manage delinquent customer accounts and negotiate subsidies and payment plans;
6) Collect and systematize demands for services and client information collected by Community Agents, including updates on customer registration and registration in Social Tariff, and channel these to COELBA;
7) Ensure settlement of disputes and regularization of service demands by clients visited by the Community Agents, and ensure the completion of refrigerator exchanges.