



TANZANIA LOW COST CONNECTIONS ASSESSMENT: LEADING PRACTICES IN HOUSEHOLD CONNECTIONS



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INTRODUCTION

Purpose

This Leading Practices Report consists of two major pieces of research that was conducted by the Sector Reform and Utility Commercialization (SRUC) Low Cost Connections Assessment (LCCA) Team (the Team): the case studies desk research and the focus groups, which were conducted in several TANESCO regions in Tanzania. Both are important components of the LCCA scope of work and will be used to inform the development of the assessment recommendations and pilot program design and implementation approaches. The Leading Practices Report intends to support TANESCO in identifying successful strategies that have been employed in other countries to address similar barriers, such as the high upfront cost of wiring and connections. The report offers examples from Kenya, Lao PDR, Jamaica, Cote d'Ivoire and India that successfully increased household connections through innovative technical, financial, and outreach strategies. The findings from the focus groups will add to TANESCO's understanding of the barriers faced by potential customers and ways to address those barriers.

Background

The SRUC Task Order is a five-year program which started in April 2014, funded by the US Agency for International Development (USAID) and implemented by Deloitte Consulting LLP. SRUC aims to promote utility commercialization and equitable, effective reforms that will enhance the financial viability and long-term sustainability of developing countries' electricity systems and thereby enable their expansion and growth and establish the necessary preconditions for clean energy investments. As part of this effort, SRUC works with USAID missions around the world to support demonstration projects, educations, workshops, and in-country experience that improve developing country electricity sectors, and thereby promote access to energy to previously unconnected groups, improves energy conservation, and reduces greenhouse gas emissions.

Since 2012, the national utility Tanzania Electric Supply Company Limited (TANESCO) has added more than 800,000 customer connections to its network, and has more than 1.9 million customers. Despite the progress on connections, there are still large numbers of potential customers who remain unconnected - even in the urban and periurban areas of Dar es Salaam and other population centers. The Government of Tanzania's Ministry of Energy is tracking another, similar metric: electricity access (generally defined as being within one kilometer of the grid). MEM believes that electricity access has reached more than 30%, which implies that approximately 15 million people are physically located within the vicinity of the grid.

In conjunction with USAID/Tanzania, the SRUC Team (the "Team") conducted a Low Cost Connections Assessment (LCCA) to help close the gap between the population that is actually connected to grid power and the population that, while physically located within reach of the grid, has been unable to connect. Using data from a household survey conducted by MCC, the Team conducted an analysis to assess specific household wiring barriers that limit the number of new customers connecting to the electricity grid. The assessment examined the demand profile of existing/potential customers of TANESCO, and with that information, designed a decision matrix to evaluate what different types of technologies may be most appropriate for safely installing internal wiring for new urban/periurban customers at a lower cost to the consumer. The Team also conducted multiple focus group discussions to develop a deeper understanding of the financial and technical barriers in household wiring and the affordability of connection fees. To complement the in-country research, the Team developed leading practice case studies from five countries to illustrate for TANESCO successful approaches that utilities and donors have used to increase household electricity connections.

PART I: FOCUS GROUP RESEARCH

Over the course of two months, the SRUC team conducted 16 focus groups in Dar Es Salaam, Tanzania. The purpose of the Focus Groups was to:

1. Ground truth the team's hypotheses of barriers to connection and household wiring among unconnected households in the urban and peri-urban regions of Dar-es-Salaam, particularly relating to financial barriers
2. Gauge the current knowledge and appetite for new low-cost connection/wiring options, i.e., ready boards and expansion options, among participants
3. Assess the most effective communications methods for TANESCO to use to effectively and efficiently engage target groups and to provide input to the Communications Plan

Prior to conducting the focus groups, the Team designed a focus group guide and roughly 20 questions to address five main categories of issues:

- Connection barriers, electricity use, and ability to pay;
- House wiring and low-cost wiring options;
- Financing wiring and connections costs;
- TANESCO customer relations and communications; and
- Recommendations for TANESCO to increase its household connections.

The focus groups were conducted with the assistance of Tanzanian facilitators, note-takers and translation for the SRUC team observing the focus groups. The 16 focus groups (in addition to one pilot focus group to test the questions and reporting methodology) took place in four of TANESCO's regions: Temeke, Ilala, Coast, and Morogoro. Two districts were covered within each region, selected based on suggestions obtained from the regional customer relations representative in each region. The focus groups were held with representatives from the district, and sometimes regional, customer relations department. In total, 216 existing or potential customers participated in the focus groups. The SRUC team aimed to have representation from both connected and unconnected households participating in the focus groups and tracked the gender participation in each focus group discussion. The chart below indicates the schedule, location, and number of participants in each of the focus groups.

Table 1 Schedule of Focus Groups in Dar es Salaam

No	Date	Region	District	Ward	Community	Connected	Unconnected	Total
1	Dec 5 ¹	Temeke	Kigamboni	Kigamboni II	Kigogo	N/A	N/A	N/A
2	Dec 7	Temeke	Yombo	Buza	Yombo	0	17	17
3	Dec 7	Temeke	Yombo	Buza	Yombo	9	10	19
4	Dec 11	Temeke	Kigamboni	Vijibweni	Kisiwani	4	14	18
5	Dec 11	Temeke	Kigamboni	Vijibweni	Kisiwani	9	7	16
6	Jan 9	Ilala	Tabata	Bonyokwa	Msingwa	10	1	11

¹ Pilot focus group discussion, not used in analysis.

7	Jan 9	Ilala	Tabata	Bonyokwa	Msingwa	7	7	14
8	Jan 11	Ilala	Gongo la Mboto	Msongola	Mbondole	0	11	11
9	Jan 11	Ilala	Gongo la Mboto	Msongola	Mbondole	9	1	10
10	Jan 16	Coast	Kisarawe	Buyuni	Nyeburu	10	0	10
11	Jan 16	Coast	Kisarawe	Buyuni	Nyeburu	0	12	12
12	Jan 19	Coast	Bagamoyo	Yombo	Matimbwa	0	15	15
13	Jan 19	Coast	Bagamoyo	Yombo	Matimbwa	15	0	15
14	Jan 23	Morogoro	Kilombero	Mkula	Katurukila	0	12	12
15	Jan 23	Morogoro	Kilombero	Mkula	Katurukila	11	0	11
16	Jan 24	Morogoro	Morogoro Urban	Mkundi	Kilongo B	0	13	13
17	Jan 24	Morogoro	Morogoro Urban	Mkundi	Kilongo B	12	0	12
TOTAL						96	120	216

FOCUS GROUPS ANALYSIS

The Team derived four main, high-level conclusions from focus group data regarding wiring options, connection, and utility communications in the urban/peri-urban regions visited:

1. **Financial limitations most prominent barrier to connection.** As hypothesized, focus group participants, both unconnected and connected, indicated financial conditions and cost as the most significant barrier to connection.
2. **Varying levels of knowledge regarding conventional wiring costs and process.** The depth of knowledge regarding the conventional wiring process and specific costs varied among focus group participants and across regions.
3. **High interest in ready board as low-cost wiring option, yet low awareness.** Focus group discussions on the ready board as an alternative to conventional house wiring revealed limited awareness and a high demand among participants.
4. **Need for multifaceted approach to TANESCO communications.** While the significance of different types of communications vehicles varied by region, the team observed a strong demand among participants for more engagement and more detailed information from TANESCO.

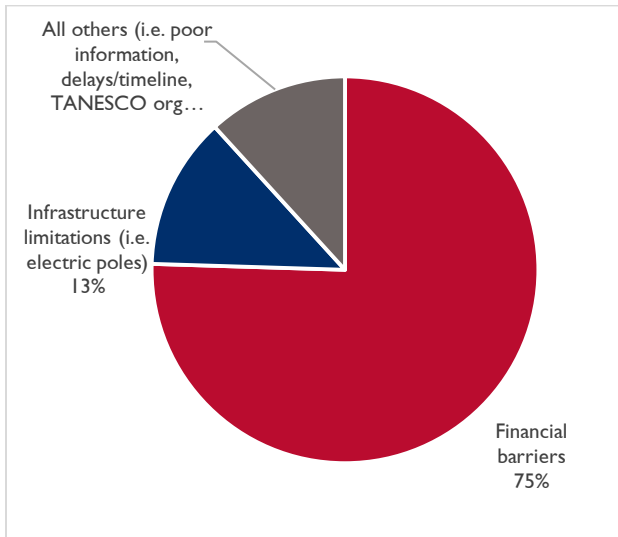
These conclusions were grounded on the following data analyses and visualizations.

Finding I

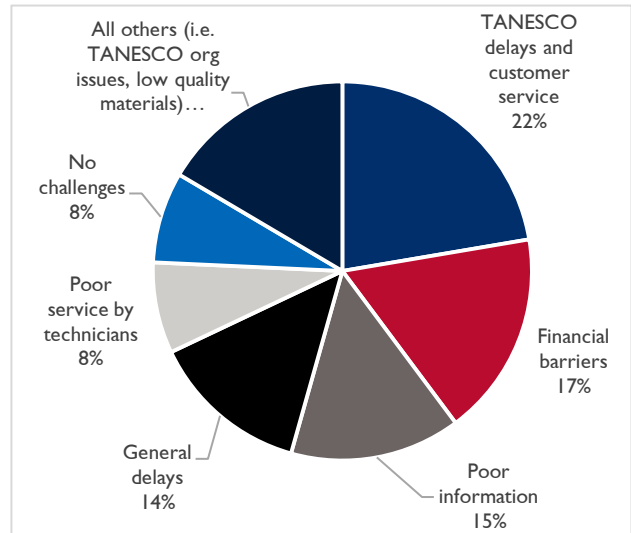
1. Financial limitations most prominent barrier to connection

As hypothesized, focus group participants, both unconnected and connected, indicated financial conditions and cost as the most significant barrier to connection.

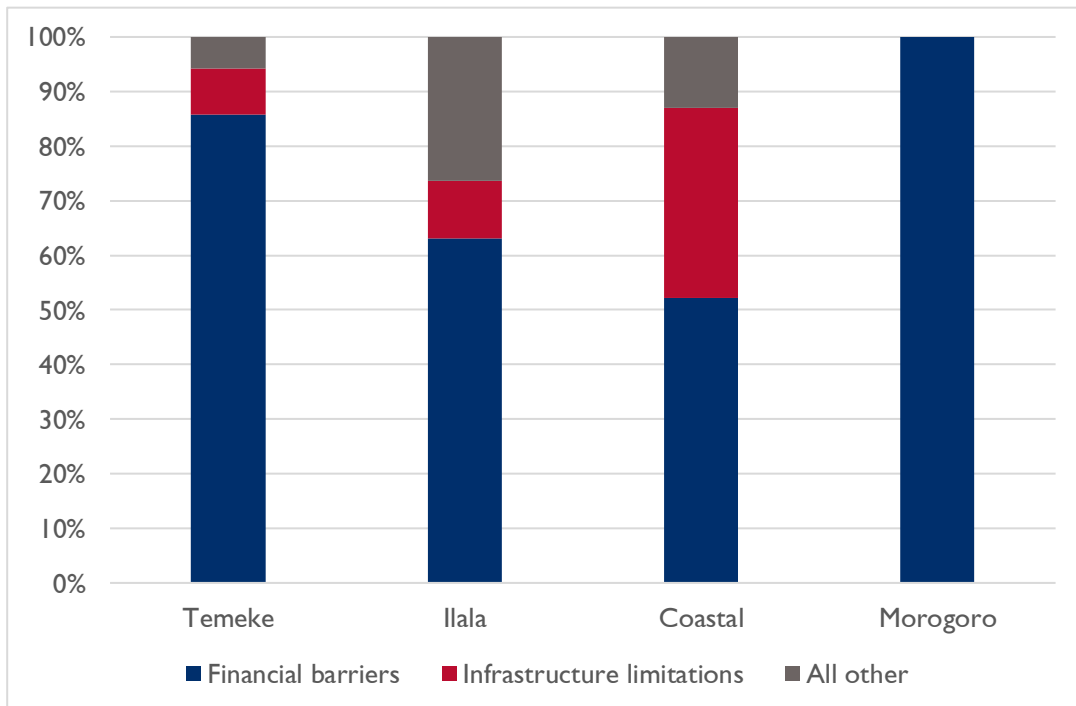
If you are located within 30 meters of the nearest pole, why are you not connected? What are the barriers you face to getting connected to electricity?



If you are already connected, what were the challenges you faced during the connection process?



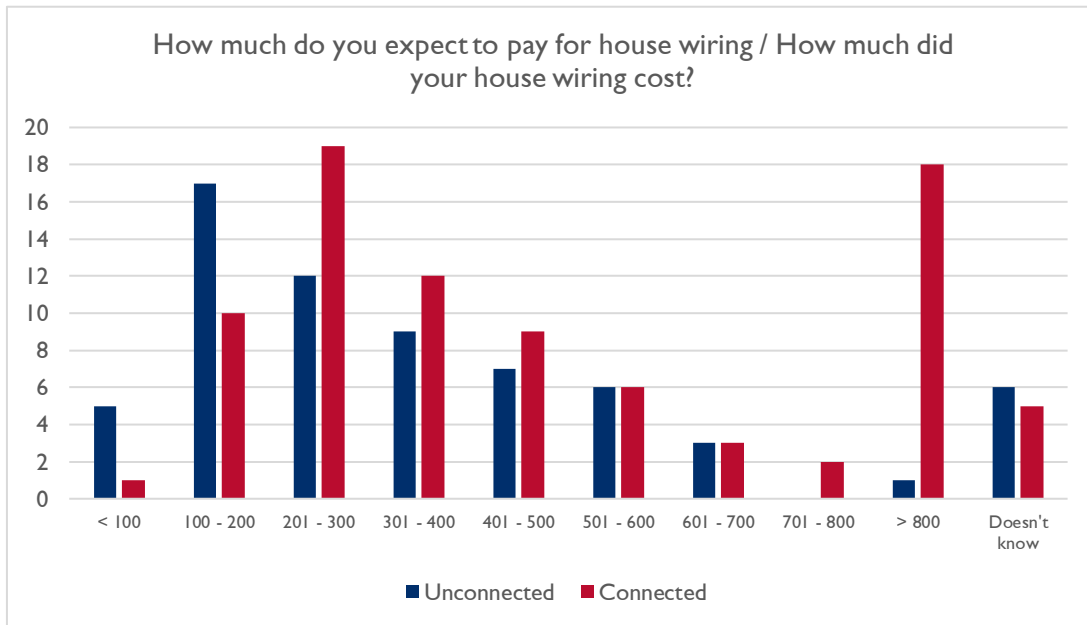
Financial limitations as the primary barrier to connection among unconnected customers was seen consistently across regions.



Finding 2

2. Varying levels of knowledge regarding conventional wiring costs and process

The depth of knowledge regarding the conventional wiring process and specific costs varied among focus group participants and across regions.

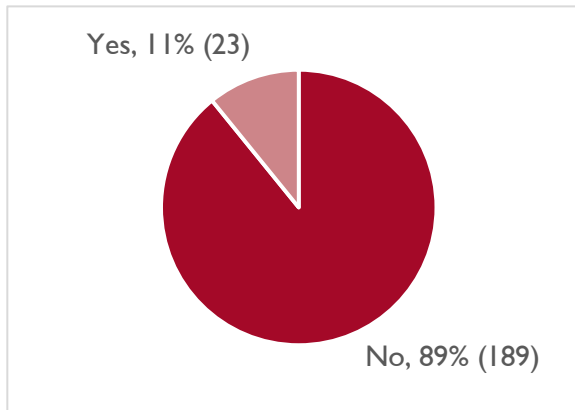


- Unconnected participants tended to have lower cost expectations for wiring compared to the levels paid by connected customers.
- A high number of connected customers quoted total expense levels in excess of ██████ Tsh while only one unconnected customer quoted expectations in this expense range.

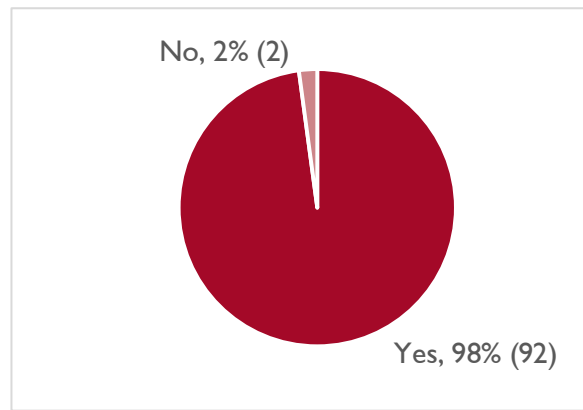
Finding 3

3. High interest in ready board as low-cost wiring option, yet low awareness

Focus group discussions on the ready board as an alternative to conventional house wiring revealed limited awareness and a high demand among participants.



Have you ever heard of a ready board?



Are you interested in the ready board? Does it seem like a good, low cost alternative to conventional wiring?

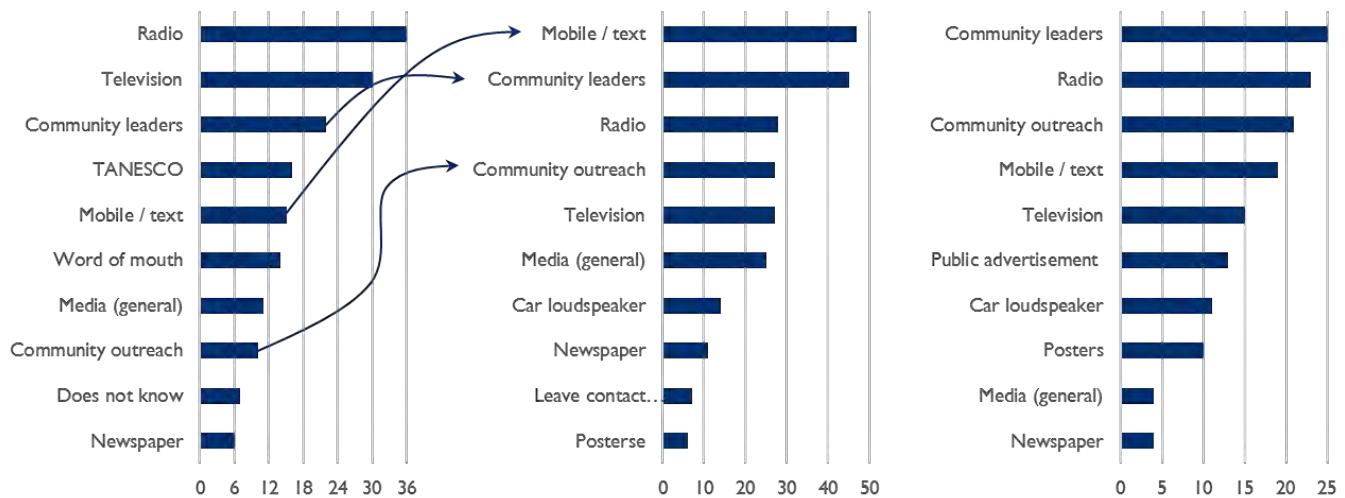
Finding 4

4. Need for multifaceted approach to TANESCO communications

Where do you get information about TANESCO / electricity?

How do you think TANESCO should disseminate information?

How do you receive information about other types of services?



While the significance of different types of communications vehicles varied by region, the team observed a strong demand among participants for more engagement and more detailed information from TANESCO. These graphics and findings convey the high-level observations of the focus groups; however, more detail on the methodology and findings is available in the accompanying final deliverable.

PART II: CASE STUDY RESEARCH

The purpose of the case studies is to provide TANESCO with leading practices that have proven successful in other countries, with a specific focus on technical, financial, marketing/communications and community engagement strategies. All of these aspects need to be considered by TANESCO in the design and implementation of a low-cost connections pilot program. Case studies were selected based on their applicability to TANESCO and the available information on the successful impacts of each program. The SRUC team used their own knowledge of successful examples, sought suggestions from USAID, and consulted with other experts in the field in order to select the case studies.

Case studies cover five different countries with varying contexts and challenges. In brief, they describe the following stories:

1. **Kenya:** Case study details the journey of the utility, Kenya Power (KP), under the support of the World Bank and the Global Partnership of Output-based Aid (GPOBA), to bring safe and affordable electricity to informal settlement residents of Nairobi. KP salvaged and converted an initial, failed attempt to achieve project goals into a national attention-garnering success story that exceeded connection goals and won public support. Critical success factors to turning this project around included South-South knowledge exchange with other utilities to redefine business strategy, rigorous community engagement, collaboration with a program that already had a long-standing community presence, and a willingness to reevaluate hypotheses and redesign project structure once proven ineffective.
2. **Cote d'Ivoire:** Cote D'Ivoire provides a still unfolding case study that shows the incredible growth of the power sector in the country following a postwar, political crisis, and a state of virtual financial insolvency among power sector stakeholders. The World Bank's Urgent Electricity Rehabilitation Project (PURE), followed by a government and utility-led Electricity for All (PEPT) Project, has facilitated large strides of progress in power availability, reliability, and financial viability. The PURE program pioneered an innovative financing mechanism, in the form of a revolving fund for subsidized connection fees and house wiring, which proved highly effective. It also focused efforts on intense rehabilitation of the distribution and transmission network. The PEPT project, which took lessons from the PURE project, has leveraged creative financing and marketing techniques that are increasing connections for rural and urban households by more than 200,000, and still growing.
3. **Lao PDR:** Lao's Power to the Poor (P2P) program leveraged diversified business models to increase access to unserved populations and enable them to afford the cost of connections and house wiring; from 1995 to 2017, the program helped increase the electricity access rate from 90% to 16%. Lao PDR offered an interest-free credit-repayment scheme targeted primarily at low-income households in villages where the electricity network was built out but households were not yet connected. P2P started with a pilot program (2008 to 2009) targeting 20 villages (approximately 3,000 households) which successfully increased the overall connection rate in those villages from 78% to 95%. The scale-up of P2P resulted in the connection of more than 47,000 households. The cornerstone of P2P was the establishment of an innovative financing mechanism that allowed low-income households to pay a small up-front fee and spread the remainder of the cost of house wiring and connection at a fixed monthly payment over three years. This case study demonstrates a successful combination of innovative financing and community outreach to increase connections.
4. **India:** Case study covers the transformation of Tata Power Delhi Distributed Limited (TPDDL) over the course of 12 years, overcoming theft, fraud, system losses, and other obstacles, to

become one of the most successful utilities in India. From 2002 to 2015, system losses decreased from 53% to 9.9%. Tata also grew its customer base from 700K to 1.4M. Over that period, it worked closely with its regulator, Delhi Electricity Regulatory Commission (DERC), to create regulatory incentives that facilitated the company's ability to connect low-income customers and invest in reducing its non-technical losses. However, impressive figures are not the most noteworthy or distinct indicator of TPDDL success. Tata's trademark is the notable emphasis it places on socially inclusive community engagement through generous, industry-leading CSR social service programs that: 1) build the capacity of low-income, informal settlement residents to become reliable, paying customers, and 2) empower women, in particular, and community members to become active participants in business decisions and activities that facilitate the utility's success. TPDDL credited community engagement for increasing revenues and as the cornerstone of their impressive loss reduction.

5. **Jamaica:** Jamaica's privatized electric utility, Jamaica Public Service Co. Ltd. (JPS) struggles with illegal, informal connections with system losses at 27%, with non-technical losses of 18% primarily due to power theft. JPS is undertaking a number of different efforts to bring down the level of non-technical losses and reduce electricity theft. This case study on the Community Renewal Program (CRP) focuses on a pilot funded by USAID supporting of JPS' efforts to reduce illegal connections with the use of ready boards as a solution for house wiring in substandard housing. The case study reviews JPS' target selection methodology, their community engagement, outreach and marketing strategies and the use of ready boards as a technical solution.



Each case study includes the following areas of assessment:



- **Introduction:** Describes the overall context in which each of the programs was designed.
- **Eligibility Criteria and Target Group Selection:** Explains how each utility identified the target group for their program and selected the eligibility criteria for households to be included.
- **Program Implementation:** Addresses the implementation experience of each program, with emphasis on where challenges occurred and the steps that were taken to overcome these challenges. This section also includes a description of the technical measures that were implemented such as ready boards and house wiring, where applicable.
- **Financing:** Details how funding was made available for implementing each program and describes the financing flow between donor (if applicable), utility, contractors (if applicable) and payments that were made by the households.
- **Gender:** Describes any gender considerations that were included in the design or implementation of the program.
- **Impact:** Covers quantifiable results or impacts of each program as self-reported or reported to donors who financed the programs.
- **Application to TANESCO:** Analyzes what lessons can be learned from each case study, taking into account the specific nature of the challenges being faced by TANESCO.



The case studies are presented in detail in the Annexes.

Major Findings of the Case Study Research for TANESCO

The five case studies provided several critical takeaways related to effective project design, monitoring, and execution that are summarized in the following table:

Theme	Key Findings
<p data-bbox="256 716 375 747"><i>Financing</i></p> 	<ul data-bbox="505 415 1421 1146" style="list-style-type: none"> • Most financing schemes of successful case studies involve lowering or eliminating upfront connection costs and/or offering graduated repayment options. Since focus group analysis indicated that 75% of participants in the research group identified financial barriers as the leading reason for remaining unconnected, TANESCO should consider schemes for modifying the standard payment structure. • Case studies also affirm that payment terms and processing options must be simple, convenient, and easy to understand. The majority of participants in the focus groups (89%) did not know what a ready board was. This indicates that the simplicity, convenience, and affordability of paying for electricity service through a ready board is key information. • In both Cote d'Ivoire and Laos PDR, designing programs that reduce the up-front cost for the internal wiring / connection fee and allow customers to spread payments over time increased the percentage of connected customers significantly. • Working with local community partners to normalize reliable and punctual payment is essential for building a culture of accountability. TANESCO should evaluate existing and prospective community partnerships and relationships to strategize about how to maximize brand credibility and respect. This will help to facilitate a culture in which TANESCO electricity service is regarded as highly valuable and worth prioritizing with punctual payments.
<p data-bbox="256 1304 375 1367"><i>Project Structure</i></p> 	<ul data-bbox="505 1167 1421 1581" style="list-style-type: none"> • Several case studies attested the importance of utility company managers/leaders monitoring and adapting the project according to challenges and developments that emerge. Regardless of implementation structure TANESCO chooses, it must iteratively evaluate its method and management according to evolving circumstances. • A central component of this is establishing two to three key performance indicators for a connections pilot/program so that the team can quantitatively track progress and recognize when and how it is not meeting its goals. • Utility project management teams should also try to maintain a nimble and adaptable style that can recalibrate after encountering inevitable failures and obstacles.

Theme	Key Findings
<p data-bbox="212 558 428 659"><i>Community Engagement and Outreach</i></p> 	<ul data-bbox="500 289 1419 1031" style="list-style-type: none"> • Community outreach and engagement is the foundation of a successful project. There is a broad spectrum of types and sizes of programmatic investments utility can make. For example, TPDDL invested at least ██████ in extensive corporate social responsibility (CSR) benefits to improve its customers' lives, including social services (drug rehabilitation, literacy centers, medical vans, vocational training, etc.). • On the other hand, KP partnered with another World Bank-funded program, the Kenya Informal Settlement Improvement Program (KISIP), in order to more effectively reach community members. KP also identified local leaders, or village elders, with whom to partner and coordinate to disseminate their communications. There are varying levels of cost and level of effort associated with the successful approaches found in the case studies and TANESCO's eventually should tailor its approach to its financial situation and customer context. • Gaining entrance into a community and building trust often first requires initiating and cultivating relationships with local civic, religious, and thought leaders. TANESCO should carefully consider what relationships can be established or cultivated to engage the targeted audience. • CSR benefits are powerful when they are linked to good payment history and respond directly to a demonstrated customer need. TANESCO may want to consider CSR programs if contextually and financially feasible.
<p data-bbox="240 1209 401 1272"><i>Gender and Inclusion</i></p> 	<ul data-bbox="500 1083 1419 1482" style="list-style-type: none"> • It is important to incorporate feedback and solicit participation, when possible, from local women (in culturally sensitive and appropriate ways) to ensure projects or programs adequately address their needs. • TPDDL used local women as Brand Ambassadors for the company to not only financially empower women with limited employment opportunities near their homes, but also to emphasize a familiar, face-to-face form of customer service and billing enforcement. TANESCO should carefully consider the best ways to incorporate women into their business strategy and operations. • Employing women in billing and collections proved a successful strategy that can increase revenues and improve the company's standing in the community.

Theme	Key Findings
Stakeholder Engagement 	<ul style="list-style-type: none"> It is essential to engage the pertinent regulatory authority and government ministries handling electricity and public works /infrastructure in both the design and execution phase. Where possible, form partnerships and relationships with donors, private sector actors, federal and local governmental entities, Non-governmental Organizations (NGOs) active in the community, and other programs/projects with a similar focus to leverage community knowledge and relationships. TTPDL worked closely with its regulator, DERC, to offer its low-income customers a lifeline tariff and tailored regulatory incentives to help the company focus on loss reduction. On the other hand, in Cote d'Ivoire not ensuring a coordinated government and donor community before beginning the PEPT has created an environment of uncertainty for the utility concessionaire and potentially jeopardizes its successful connections pilots. TANESCO should consider various engagement strategies for the regulatory authority, the national and local government, the public, and others.
Knowledge Exchange 	<ul style="list-style-type: none"> Facilitate knowledge sharing and transfer by engaging other peer companies/organizations tackling similar challenges. TANESCO should document and share insights, lessons learned, and challenges to share with other peer organizations post-pilot implementation. TANESCO should also carefully consider the lessons of these case studies to distill and apply findings that relate to their low cost connection challenges.

Each case study in the Annexes has a more detailed section that calls out specific recommendations on elements of each utility's experience that are potentially applicable to the challenges that TANESCO faces. The relevance is discussed in depth in each case study, highlighting the lessons that have been learned and the differences with TANESCO's situation. The chart below highlights the aspects of each case study that the Team deemed most relevant to TANESCO.

Case Study	Financing	Project Structure	Community Engagement	Gender and Inclusion	Stakeholder Engagement	Knowledge Exchange
Kenya Power	High	High	High	Low	High	High
Cote d'Ivoire	High	High	Medium	Low	Low	Low
Lao PDR	High	Medium	Medium	Medium	Medium	Low

Case Study	Financing	Project Structure	Community Engagement	Gender and Inclusion	Stakeholder Engagement	Knowledge Exchange
Tata Power	Medium	Medium	High	High	Medium	Medium
Jamaica JPS	Low	Medium	High	Medium	High	Medium

TANESCO has its own unique set of circumstances surrounding technical, financial, and customer engagement parameters, and any eventual program needs to be tailored to address those issues. Nevertheless, the experiences of other utilities that have faced similar problems will provide important lessons learned on approaches, testing, and pivoting that TANESCO can apply to the design of the low-cost connections pilot program and as it develops its implementation strategy.

ANNEX I: KENYA: SLUM ELECTRIFICATION PROJECT

Introduction

From 2010 to 2017, KP executed the highly successful Slum Electrification Project (SEP), funded by the World Bank's International Development Association (IDA) and the GPOBA. KP was struggling with high commercial losses in the parts of its service territory where informal urban settlements (so-called "slums") had been established with high-population densities and irregular housing structures. KP worked with the World Bank and the GPOBA to design and implement a loss reduction and regularization program – the SEP. In the first phase, KP experienced a number of significant challenges and an initial failure to reach its overall target of 66,000 legal connections. KP encountered a hostile customer base in the selected areas that was unwilling to give up illegal access to power and formally connect to utility service. After implementing the electrification project for one year, which followed two years of planning and preparation, KP had reached less than 4.5% of its connection target. At that point, KP had no choice but to revamp its strategy. While WB and GPOBA had reservations about continuing the project, they agreed to support another attempt with a reformed approach; the WB also facilitated extensive South-South knowledge exchange between KP and other utilities that had undergone successful slum electrification efforts to help KP revise its strategy and business plan.

After studying the socioeconomic conditions of target areas and learning from the experiences of other utilities through knowledge-exchange workshops and visits, KP implemented several major reforms to SEP. First, KP revised the selection criteria to focus on a more receptive target area with a more accessible customer base. Secondly, KP increased the affordability and convenience of its payment terms and delivery to enable and incentivize low-income customers to buy its services. Next, KP developed extensive customer engagement initiatives that not only gained KP credibility and familiarity in the community, but also enabled more effective communication and outreach to its target audience. These community engagement methods included employing local youth in the connection process, partnering with village elders to tailor outreach and discourage theft, tailoring marketing material in local languages, establishing local customer service points and branded kiosks, and working with initiatives already active in the community to synchronize efforts and build off existing knowledge and relationships within the target communities.

KP's revised strategy was so successful that they exceeded the revised target of 40,000 new connections, prompting the WB and GPOBA to extend the SEP. From 2012 to March 2015, 70,890 connections were added, of which 40,323 were funded by GPOBA.² Even after the GPOBA financing and verification ended, KP continued to add connections in informal urban settlements, adding more than 300K by 2015, 400K by 2016, and ending with a cumulative 845,463 new connections in 2016. Additionally, illegal connection to power infrastructure and vandalism concurrently decreased during the second iteration of the SEP project. These results attest the importance of pilot approaches to managing complex situations, which often require adaptive adjustments in order to succeed. The experience in Kenya also shows the power of leveraging leading practices, obtained through knowledge exchange, for tailoring a sustainable business model to the unique needs of local low-income communities. The success of KP would not have been possible without extensive partnership, collaboration, and local participation in the design and execution process.

² Pg. 28 of Dubey, Smith. Mwangi, Harun. Mathur, Subodh. Smyser, Connie. "Successful Electrification of Informal Settlements (Slums) in Nairobi, Kenya." 2017.

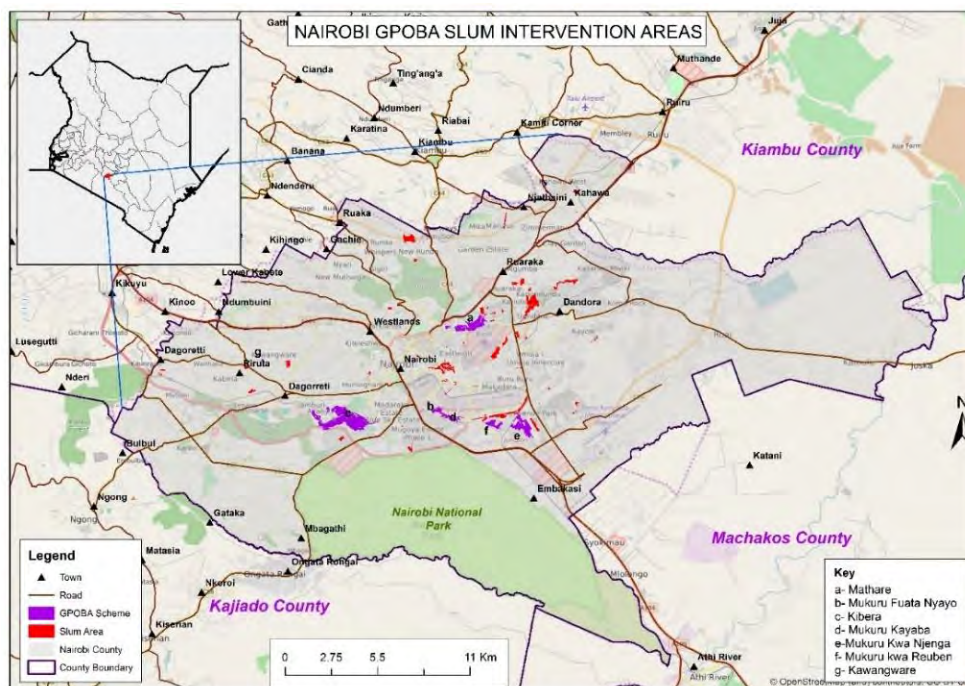
This case study will describe how KP, with the support of the World Bank and GPOBA, initially designed and implemented the SEP initiative, and how it was restructured to produce an increase in connections that continued to grow rapidly, even after the WB/GPOBA support ended. The considerations used to select project beneficiaries, establish an effective financing scheme, and execute effective outreach and marketing will also be covered in depth. There are several important insights that can be gleaned by KP's journey in increasing connections and expanding access in Nairobi's informal settlement communities.

Eligibility Criteria and Target Group Selection

Informal Settlement Selection

In advance of the project start, the World Bank, the GPOBA, and KP initially commissioned a study of the largest and densest slum in Nairobi—Kibera—to concentrate its electrification efforts. Early thinking led KP to believe that launching SEP in a major slum would lower the cost of the project due to the density of the structures that would need electrification. The following map shows a few of the original target areas, highlighted in purple.

Figure 1 Nairobi GPOBA Slum Intervention Area



After two years of assessment and planning, the electrification project implementation formally commenced in 2012. SEP began by establishing the power networks in the main slums of Nairobi, which included not only Kibera but several other major informal settlement communities. The construction efforts included distribution lines, substations, and service lines, as well as acquiring meters, line materials, and transformers. The geography of the slum posed significant issues since the settlement structures were unplanned in difficult-to-reach areas, such as river banks, without any internal paths or roads for navigating between structures. Utility workers also had to negotiate with cartel members and structure owners to build any infrastructure, which was a time-consuming and expensive process. To KP's and the WB/GPOBA's disappointment, as of October 2013, KP had only completed 2,264 connections of the

planned 66,000 connections. KP reflected on its implementation method and realized that the selection of the major slums, which they termed as “hard slums,” was a critical mistake for the following reasons:

- These areas had the highest number of illegal connections indicating they were the most severe cases of where entrenched cartels providing illegal electricity services were competing with KP;
- These areas were home to a particularly difficult customer profile—i.e., 1) hard slum residents were reluctant to pay for power, since the majority was already receiving it illegally, and 2) hard slum residents were resentful and distrustful of KP, viewing it as a force that could take electricity away and had previously failed to deliver on its commitments (perceptions gained by the KP personnel who tried to establish legal connections in the first phase);
- These areas had homes made of very poor-quality building materials with haphazard settlement structures, and no internal street networks, which complicated the electrification process; and
- These areas contained highly politicized residents who scrutinized any attempts to upgrade slums in light of the 2012-2013 election season.

Upon reflection, KP recognized that a great number of the challenges faced in the first attempt to expand electrification to slum residents were attributable to its selection criteria and target areas chosen. During this phase, KP also did not have a comprehensive community engagement strategy. Not only was KP working in a challenging geographic area, but it also had no mechanisms for meaningfully involving local residents in the process and convincing them to establish a legal electricity connection. KP assessed that SEP would have considerably higher odds of success with strategically modified selection criteria and an integrated robust community engagement campaign.

Revised Selection Criteria

From late 2013 to 2014, KP undertook investigations of other successful urban electrification programs and held discussions with community leaders, NGOs and other stakeholders to recalibrate its strategy. One key aspect that facilitated the shift was awareness of and cooperation with another ongoing WB program, the Kenya Informal Settlement Improvement Program (KISIP). KP was able to leverage the KISIP’s knowledge and relationships in various communities to select a new target population, involving a shift from “hard slums” to “soft slums” characterized by the following attributes:

- Few or no illegal connections created by cartels
- Passageways, or internal roads, for pole transportation and construction
- Structure owners and not tenants as majority residents
- Residents who, for the most part, did not already have electricity

These factors made a huge difference for several reasons. Few or no illegal connections meant that residents were eager for electricity because they recognized that having access would be an improvement in the quality of life. For KP, it also meant that there was less competition, a lower likelihood of violence, and ongoing theft from criminal actors. The lower population density in the soft slums also posed fewer physical challenges to complete wiring and installation of the distribution network because there were better internal roads for the transportation and placement of equipment. KP engaged structure owners as customers, who then served as the intermediary with additional potential customers, which was far simpler than having to deal with individual resident-owners and cartel members.

Program Implementation

As previously discussed, a crucial transformation took place once the project failed to meet its original goals in the first three years. KP started the reform process by trying to properly diagnose barriers and

shift strategy. Once KP experienced a demonstrable uptick in connections, there was sufficient progress for WB to extend the project longer with a slightly lowered target for number of connections. The lower target also meant that each connection would receive a higher subsidy, since it was the same amount of funding for fewer connections, as will be explained in more detail below.

A Knowledge Exchange Working Session and follow-up initiatives in 2014 also enabled KP to redesign its business plan. KP benefitted from insights from South-South exchanges to India and Brazil and a critical, Advanced Learning Program training for KP staff on community engagement. By 2015, connections exceeded the WB target by tenfold, with nearly 400,000 completed against the 40,000 revised target. Cumulative slum connections reached 800,000 in 2016, long after the end of the GPOBA and WB support, demonstrating the resounding success of KP’s efforts to sustainably reform business strategy.

Financing

Donor Activity

The World Bank provided a loan facility and GPOBA provided a grant to assist in subsidizing the slum dwellers’ connection cost. Under the overarching Kenya Electricity Expansion Program, the World Bank agreed to provide a credit of █████ and GPOBA agreed to provide a grant of █████ for SEP to cofinance system upgrades and connections for 66,000 residential structures in slums in Nairobi.

With the support of the MOE and the regulator, the SEP was designed such that KP agreed to prefinance the cost of connection and to meet any shortfalls not covered by the reimbursements and the customer contribution. Reimbursement to KP for part of the connection fee would be based on the number of meters/customers connected. Both funds were disbursed based on outputs, or in this case, connections that were verified by an IVA or Independent Verification Agent.

As the table below indicates, for each connection GPOBA contributed █████ in grant funds, and IDA contributed █████ USD as a credit to KP per connection, out of the █████ USD total cost of connection per resident. According to KP, the standard charge for residential connection is █████, but the estimated cost of connection across informal settlement communities was thought to be lower than average at around █████ USD because of the density. Thus, originally the funding from WB IDA and GPOBA was expected to cover the full cost of connection.

Table 2 Initial Connection Cost Sharing Agreement³

Source	Costs– Sharing (USD)	Amount (USD)	% of total costs
Customer	15	1,000,000	4%
GPOBA (Grant)	75	5,000,000	19 %
IDA (Credit)	150	10,000,000	38 %
KP (Internal funds)	155	10,300,000	39 %
Total	395	26,300,000	100%

In actuality, hard slums ended up costing close to █████ USD per connection due to the various aforementioned difficulties. Therefore, when WB and GPOBA lowered the target number of connections from 66,000 to 40,000 in the second project iteration, with the same level of funding, it effectively increased the per connection subsidy, lowered the requisite customer contribution, and made the project

³ Figures taken from Pg. 14 of Dubey, Smith. Mwangi, Harun. Mathur, Subodh. Smyser, Connie. “Successful Electrification of Informal Settlements (Slums) in Nairobi, Kenya.” 2017.

more financially feasible. The World Bank also provided technical assistance from its Energy Sector Management Assistance Program to the SEP project to assist in its design.

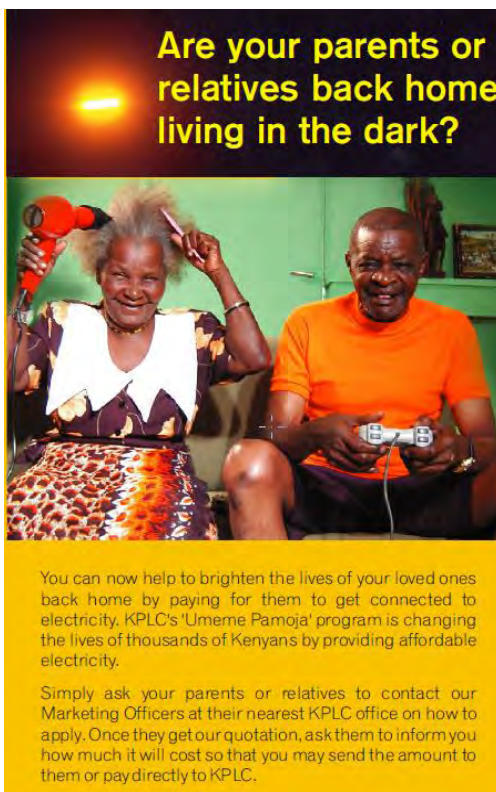
Outreach and Marketing Campaigns

KP employed a rigorous and multifaceted marketing campaign as a key to its success. KP worked closely with various stakeholder groups to devise and implement its revised program structure. These groups included:

- **Public Sector/Government:** KP worked with the Ministries of Housing and Public Works to coordinate the logistics of its infrastructure projects, and with local governmental entities to implement the high-mast lighting initiative, which was well received by the government and the public. Later, SEP became designated as a National Project due to the media attention it garnered and its positive impacts. Members of government, including Governors, Members of Country Assembly and Members of Parliament formally launched SEP initiatives in their respective jurisdictions, which involved the entire community.
- **Civic- or Community-Based Organizations and Leaders:** KP employees worked with village chiefs or a local administrative office to get permission for work in the informal settlements, which also helped to increase their level of protection. KP found ways to involve youth groups, churches/mosques, community health workers, and others in the program to spread awareness and more deeply cement its place in the community.

KP also employed a dedicated team of professional communications specialists/marketing professionals to improve their outreach/marketing material.

Figure 2: Example 1 of Marketing/Outreach Material

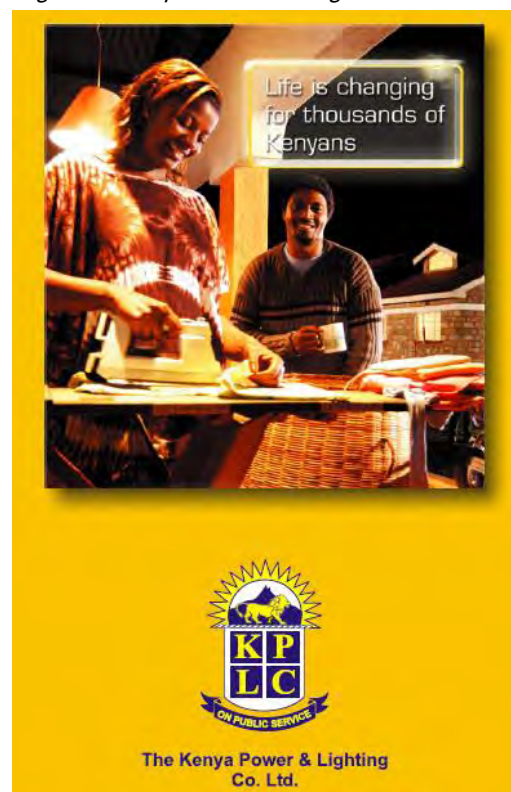


Are your parents or relatives back home living in the dark?

You can now help to brighten the lives of your loved ones back home by paying for them to get connected to electricity. KPLC's 'Umeme Pamoja' program is changing the lives of thousands of Kenyans by providing affordable electricity.

Simply ask your parents or relatives to contact our Marketing Officers at their nearest KPLC office on how to apply. Once they get our quotation, ask them to inform you how much it will cost so that you may send the amount to them or pay directly to KPLC.

Figure 3: Example 2 of Marketing/Outreach Material



Life is changing for thousands of Kenyans

KPLC
ON PUBLIC SERVICE

The Kenya Power & Lighting Co. Ltd.

Impact

Overall, SEP succeeded in both bringing new customers safe and reliable power and converting former consumers of illegal power into legal, paying customers. These achievements also have implications on public safety, since Kenya was facing severe issues stemming from fires and other hazards caused by poorly established illegal connections. The following table provides a snapshot of achievements in the KP SEP.

Metrics	
Total Number of KP Residential Customers	3,305,934
Total Number Starting Informal Settlement Customers	Approx. 1,000,000 (60% of which were illegally; 40% had issues with payment)
Total Number Ending Informal Settlement	869,000 throughout urban, informal settlements of Kenya
Revenue Increase	██████████ from connection fee and annual ██████████ from the program ⁴
% Informal Settlement Customers Paying KP for Electricity	Before: Pervasive issues with non-payment After: All wired to pay (due to prepayment meters)

Application to Tanzania

Leading Practices for Implementation in Tanzania

As TANESCO works to increase connections and achieve electricity access goals, the experiences of other utilities can inform its development of an effective approach that avoids common pitfalls and leverages tried-and-true strategies for success. While every environment is unique and requires tailored solutions, the case of KP indicates that there are certain leading practices that should ideally be incorporated into project design and execution. More specifically, the following key factors contributed to the success of SEP's implementation:⁵

1. **Collaboration with other programs with an existing community presence and familiarity.** KP worked with the KISIP, which identified more suitable settlements to target for electrification efforts. Knowledge sharing and synchronization of efforts clearly enhanced the ability of KP to achieve its objectives in the context of SEP. TANESCO should examine the landscape of power sector players in Dar Es Salaam and other population centers, and look at other donor-funded programs/projects or organizations working toward a similar or overlapping goal with whom partnerships could be formed. While the KISIP program did not have the exact same objectives, or scope, as the SEP initiatives, it did serve the same, general target population (i.e., informal settlement residents), and thus, it was still able to help SEP refine its strategy.
2. **Revision of selection criteria once proven unfeasible.** It was critical for KP to change direction and shift its target once it became clear that the project was failing to perform as expected. While the rationale was sensible for the initial selection of Kibera and other major slums, the actual results and experience in the “hard” slums disproved the original hypothesis and needed to be honestly

⁴ Based on ██████████ per connection and 30 kWh at US ██████████ per kWh

⁵ See “Bringing Electricity to Kenya’s Slums: Hard Lessons Lead to Great Gains.” <http://www.worldbank.org/en/news/feature/2015/08/17/bringing-electricity-to-kenyas-slums-hard-lessons-lead-to-great-gains>

appraised and altered. TANESCO must similarly maintain a nimble and reflective approach that can responsively adapt to emerging obstacles and developments to ensure success.

3. **Leveraging the relationships of community leaders.** KP worked with slum elders, who were paid a fee for each contracted and connected customer. Slum elders were also helpful in enforcement against electricity theft. Before leveraging community-based approaches to stopping theft, the community met KP with intense hostility and violence during attempts to deter theft or physically undo hooking onto the distribution infrastructure. KP strategically incorporated locally led forms of antitheft initiatives to legitimize these norms with respected and familiar faces. TANESCO can find community partners and gain a deep understanding of the social dynamics of the neighborhoods that it is targeting.
4. **Tailored solutions for low-income residents of slum communities.** KP went back to the drawing board and did extensive research before relaunching. KP consulted social scientists and specialists to better understand and improve interactions with residents. KP hired marketing professionals to improve outreach material and methods. KP increased its visibility by leveraging branded tents and kiosks to advertise its benefits and the basics of its project. KP also employed the following tactics:
 - a. KP provided the CSR benefit of high-mast lighting in slum communities, which increased the safety, security, and social prestige of these areas; this helped to win favor with residents, local politicians, and business owners who saw more economic activity.
 - b. KP employed local youth in the connection process, which gave them a personal stake in the effort and helped gain buy-in from local families.
 - c. KP provided marketing material in the language of the residents to convey key messages about the superior quality and affordability of KP electricity service to those without power and those with illegal power.
 - d. KP established customer service stations in the communities to increase access and ease of service.

Successful community engagement in low-income areas often involves intensive CSR investment. Minimally, TANESCO must facilitate community engagement through locally accessible and comprehensible communications that can speak to the needs of existing or prospective customers.

5. **Apply a technical approach to establishing and monitoring connections that is appropriate to the environment.** KP used ready boards to increase the ease of the connection process; with this type of technology, slum houses were not required to have wiring or a wiring certificate. KP Power also leveraged the following tactics:
 - a. Installed the transformers high above high tension lines to prevent vandalism, used a single pole for 60 to 70 cables to maximize its use in densely populated areas, and leveraged split meters to raise actual meters out of the reach of those attempting to tamper while preserving the ability of customers to digitally view usage. Additionally, KP used concrete poles, which are more difficult to climb to tap power.

KP has as its primary objective to expand electricity connections to unserved areas or areas with high levels of illegal connections. Through South-South knowledge exchanges and an adaptive learning approach to program implementation, KP gained additional insights about overarching strategy that TANESCO can also employ:

Prioritization of Affordability and Convenience.

- Make payment for electricity and the resolution of complaints/grievances easy and convenient by placing customer service representatives and vendors in the community
- Link remaining in good standing with TANESCO to provision of other CSR benefits as incentives for customers to pay their bills

Community Engagement.

- Identify and implement CSR activities that respond to community needs and improve resident's socioeconomic standing
- Involve local community members in the decision-making process and be responsive to their unique challenges and demands
- Seek out community champions that can play context-specific support roles within its efforts

Stakeholder Engagement and Partnerships.

- Engage federal and municipal governmental entities for coordination and support
- Work with NGOs, other donor-funded programs, or local organizations with deep knowledge of potential target areas and/or overlapping objectives related to increasing electricity access

Learning from Successful Slum Intervention Program.

- Analyze leading practices from around the world before designing a new program. KP was able to successfully revise its business plan after the South-South knowledge exchange program provided successful practices from other countries in slum electrification. The Knowledge Exchange Working Session included presenters from EKSOM in S. Africa, EPM in Colombia, LIGHT in Brazil, and various others companies in similar circumstances
- Approach design elements with the same level of flexibility, if not more, to shift or change select components if proven ineffective

Key Considerations of Differences between Kenya and Tanzania

While KP was initially struggling to convert people who already had power from other sources (cartels or through illegal connections) into paying KP customers, TANESCO's primary objective is to connect those areas where the electricity infrastructure is already available but there are unconnected customers.

There are key geographic differences between the areas that KP targeted and those TANESCO would like to connect. KP focused on areas that are defined as slums with poor quality building structures made with various materials and a lack of internal road networks. While TANESCO will also face some of these infrastructure challenges, most of the unconnected customers in TANESCO's target group are not connected because they cannot afford the high connection and wiring costs.

TANESCO has the most to learn from KP's marketing and outreach campaign. Tailored marketing and communications will need to be developed for customers to clearly understand the simplicity of ready boards and the corresponding benefits, convenience, and affordability of electricity services. TANESCO should emphasize use of local partners, who can serve as communications champions, partner with other organizations that are known in the community, and emphasize tactics that create a physically local presence with face-to-face or word-of-mouth marketing.

ANNEX 2: COTE D'IVOIRE: URGENT ELECTRIFICATION REHABILITATION PROJECT (PURE) AND ELECTRICITY FOR ALL (PEPT) PILOT

Introduction

From 2000 to 2008, Cote d'Ivoire struggled to maintain investment levels in its power sector in the aftermath of a destructive civil war (2002 to 2003) that compromised its economic prosperity and spurred a broad regression of social well-being and increasing poverty rates.⁶ While Cote d'Ivoire historically exported electricity, as of 2008, it had negligible surplus generation capacity and its main electricity distributor, Compagnie Ivoirienne d'Electricité (CIE)⁷, was experiencing rising commercial and technical losses. As a result, electricity consumers received a diminished quality of service characterized by long outage periods from an overloaded network. Various settlements of displaced people on the outskirts of Abidjan established illegal lines to facilitate connections that overloaded the transmission and distribution network and exacerbated electricity quality issues. According to analysis by the World Bank, by the late 2000s, the electricity sector was virtually financially insolvent and incapable of covering operating costs and making necessary infrastructure investments.⁸

The World Bank launched the Urgent Electricity Rehabilitation Project (PURE) in 2009, aiming to improve the quality of electricity service in Cote d'Ivoire, expand electricity access, and help return the electricity sector to a state of financial solvency. The World Bank's IDA provided around ██████ USD in grant funding to accomplish the following:

- Provide technical assistance to the major actors in the nation's electricity sector (i.e., the Ministry of Petroleum and Energy; CI-Energies, which is essentially a national utility and energy sector asset holding company (formerly SOGEPE, the holding company, and SOPIE, the entity responsible for technical supervision of the electricity network); ANARE, the regulator; and the private, transmission and distribution utility concessionaire, CIE.
- Make replacements and upgrades to the distribution network.
- Subsidize the cost of connections for low-income households through a revolving fund
- Provide compact fluorescent (CFL) bulbs to the customers in high density areas.

The grant funding and technical assistance provided by the World Bank enabled robust capacity-building, community engagement, and subsidy for the connection cost of low-income segments of the population, which all helped to enable the success of PURE.

Between 2011 and 2014, CIE, the private distribution utility of Cote d'Ivoire, successfully reduced the frequency of power outages, improved system loss rates, and connected more than 45,000 new customers through PURE. While the project implementation experienced some delays and obstacles related to political factors, PURE effectively met or exceeded the majority of its targeted outcomes in increased power availability, reliability, efficiency, and financial viability.

Following the success of PURE, the government of Cote d'Ivoire launched an ambitious program, called Programme Électricité Pour Tous (PEPT), or Electricity for All, aiming to connect 200,000 households per

⁶ See Pg. I of "Implementation Completion and Results Report" for Urgent Electricity Rehabilitation Project (2015), at <http://documents.worldbank.org/curated/en/147491468197062574/pdf/ICR3428-P112573-Box393255B-OUO-9.pdf>

⁷ CIE is the private concessionaire tasked by the government with managing electricity transmission and distribution since 1990

⁸ Ibid.

year for five consecutive years.⁹ While there have been some delays caused by coordination issues, in 2014, CIE implemented an interim self-financed PEPT “pilot” program. This program used innovative financing mechanisms to subsidize household connection costs and facilitated at least 228,000 new household connections over the course of three years.¹⁰

This case study will explain aspects of the design, implementation process, financing, and outreach and marketing of both the PURE and PEPT projects. The final section of this case study will discuss the lessons learned from the experience of CIE and other energy sector stakeholders to derive potential recommendations and industry-leading practices relevant to TANESCO.

Eligibility Criteria and Target Group Selection

PURE Program

The intended beneficiaries of the Urgent Electricity Rehabilitation Project (PURE) were the regulatory and commercial energy sector stakeholders who received technical assistance and targeted capacity-building activities, as well as those directly receiving benefits from distribution network enhancement, including the following:

- New households benefitting from subsidized connections
- Existing electricity customers in the greater Abidjan area, as well as customers in other target cities (i.e., Yamoussoukro, Soubré, Meagui, Gagnoa, and Gueyo), benefitting from improved service
- Households who received CFLs as a benefit

As the eligibility criteria demonstrate, the project intended to not only enable the addition of new, first-time customers, but also aimed to enhance the quality of service of existing customers and equip customers with energy efficient lighting to help reduce demand. The distribution of CFLs was concentrated in neighborhoods that experienced the most overloaded networks, given the CFL bulbs consume approximately a fourth of the electricity as the incandescent bulbs they were replacing.

PEPT Pilot Program

The successor program to PURE, the PEPT pilot, similarly focused on metropolitan regions, primarily Abidjan, but specifically sought out those who had existing illegal connections to convert them to legal paying customers. Both these programs were concentrated in urban areas where the majority of the Ivorian population lives and where electricity consumption is highest. While the government of Cote d’Ivoire is targeting increased rural and peri-urban connection rates, most of the new connections under the interim PEPT pilot have been in Abidjan with some new connections in small villages.

Program Implementation (PURE)

PURE Program

The PURE project was originally planned to last three years but was extended twice to have a five-year duration. This case study focuses on 2011 to 2014, because the first two years were characterized by stagnation due to a political crisis in the country and other difficulties in the sector. There were three distinct components of the Urgent Electricity Rehabilitation Project:

⁹ See “Côte d’Ivoire : Electricité Pour Tous à partir de samedi,” at <http://www.cie.ci/pept/actualite>

¹⁰ See Pg. 38 of “Cote D’Ivoire—Financing Alternatives Programme Electricité Pour Tous (PEPT).” USAID SRUC. 2017

1.) Distribution Network Rehabilitation and Expansion

PURE targeted rehabilitation and upgrades of the medium voltage/low voltage (MV/LV) distribution networks in the greater Abidjan area, including distribution substations and feeders, MV/LV equipment and transformers, and the installation of compensation devices in substations to conform to operating voltage standards and reduce losses. CIE had already identified specific projects that would have the maximum impact on increasing security of supply and loss reduction. Investments under this first component also aimed to help facilitate the addition of the targeted 40,000¹¹ new customers and subsidize low-income consumers.

2.) Preparation of Future Network Investment

The second project component financed consulting expertise to prepare feasibility studies and bidding documents for revamping and upgrading the high voltage network and increasing electricity exchanges with nations in the West African Power Pool. The project was also later restructured to include creation of a power sector master study to address the lack of sufficient energy sector planning.

3.) Institutional Support and Project Oversight

The third project component provided technical assistance and capacity-building training to the government and other stakeholders for supervision and implementation of the PURE; execution of legal, institutional, and financial studies for policy reforms; and program design for energy efficiency improvements (e.g., demand-side management and distribution of CFLs). The technical assistance included tariff restructuring and studies to optimize gas pricing. A revolving fund of ██████ USD was also established under this component to subsidize low-income household connections. Standard Chartered Bank managed the revolving fund and received initial funds from a combination of GoCI and IDA grant money.¹²

Financing (PURE)

Donor Contributions for PURE

The World Bank invested ██████ USD of the total ██████, about ██████ came from local sources of borrowing, USD devoted to the three core program components:

Program Component	Funding Amount
1. Distribution Network Rehabilitation	████████████████████
2. Preparation of Future Transmission Network Investment	████████████████████
3. Institutional Support and Project Oversight	████████████████████

CIE was guaranteed one-third of the electricity sales revenue to cover its costs of network operations and maintenance (O&M).¹³ Potential shortfalls in electricity payments from customers were designed to affect payments to Independent Power Producers (IPPs) and gas and fuel suppliers, but not the CIE in

¹¹ The original target was set at 60,000 new connections in 2009; however, the target was eventually revised and finalized at 40,000.

¹² Pg. 35 of “Cote D’Ivoire—Financing Alternatives Programme Electricité Pour Tous (PEPT).” USAID SRUC. 2017

¹³ See Pg. 18 of “Implementation Completion and Results Report” for Urgent Electricity Rehabilitation Project (2015), at <http://documents.worldbank.org/curated/en/147491468197062574/pdf/ICR3428-PI12573-Box393255B-OUO-9.pdf>

order to reduce risk of project equipment being improperly maintained due to insufficient financial resources. For context, in that era, Cote D'Ivoire had an intricate setup for how electricity revenue was allocated to cover sector-related expenses. The revenue was used for various items, including but not limited to: 1) payments to CIE, to cover O&M; 2) repayment of taxes; 3) purchase of fuel for power generation and IPP payments; 5) operating costs of regulatory authorities; and 6) state debt repayment. Hence, PURE was designed to ensure that O&M of the distribution and transmission network was financially prioritized because of its crucial role in improving the reliability and availability of power.

Government Contributions for PURE's Connections Component

The government of Cote d'Ivoire contributed ██████ USD to the project's revolving fund to subsidize electricity connections established under the third project component. CIE also contributed approximately ██████ USD toward the revolving fund for connections, which began with at least ██████ USD. While accounts of the revolving fund vary slightly by source, the final report by World Bank indicated the final composition, as of December 2014, as follows:

Contributor	Type of Financing	Amount (CFA, millions)	Amount (USD, millions)
IDA	Grant	600	1.2
GoCI	Subsidy	500	1.0
CI-Energies	Prefinancing	100	0.2
CIE	Debt	1,259	2.5
Revolving Fund	Customer Repayments	296	0.6
TOTAL		2,755	5.5

Cost of Connection for PURE

Under the subsidy facilitated by the revolving fund, the total unit cost of connection was approximately ██████ USD. Accounts of the upfront cost for first-time connection to the grid vary between ██████ USD and nothing. Households paid the remainder (█████ USD), or full amount, through bimonthly installments of ██████ USD¹⁴ in addition to the cost for electricity consumption. These payments from customers helped to replenish the revolving fund, which then reallocated the money for new connections.

Program Implementation (PEPT Pilot)

PEPT Pilot Program

The PEPT pilot program was more focused on increasing the number of connections than the previous PURE program, which encompassed broader reforms. However, it is important to first understand the context of the PURE program since much of the system rehabilitation and upgrade work helped enable the expansion of electricity service under the successive PEPT pilot. The PEPT pilot program specifically responds to one of the key barriers to electricity access—upfront costs of connection. The upfront connection fee charged by CIE is typically ██████ USD, which equates to 17% of the annual GDP per capita in 2016, or approximately two months of income.¹⁵ To overcome this financial barrier, the PEPT project

¹⁴ See “Tacking the last mile of electricity access in Cote D'Ivoire” at <http://blogs.worldbank.org/energy/tackling-last-mile-electricity-access-cote-d-ivoire>

¹⁵ See Pg. 36 of “Cote D'Ivoire—Financing Alternatives Programme Electricité Pour Tous (PEPT).” USAID SRUC. 2017

offers low-income residents in target areas loans and a simple electricity setup kit (explained in further detail in the subsequent section).

Financing (PEPT Pilot)

CIE Financing of the PEPT Pilot Program

The PEPT pilot program simplified the electricity connection process and reduced upfront costs to the target household by executing the following key steps:

1. Identifies villages and communities that already have access to the electricity grid.
2. Offers households in the target area a loan covering connection costs in addition to a kit typically including: one 13W Compact Fluorescent lightbulb (CFL), one light socket, one wall plug, and a 5A breaker with the necessary wiring (e.g., for a one room setup; this kit could be tailored based on the number of rooms and ability to pay).
3. Permits the households to repay the loan, with an 8% annual interest rate, proportionally to their consumption of electricity (with an annual catch-up)¹⁶ more than 5 years in urban areas and 10 years in rural communities.¹⁷

Because the CIE financed this program internally, it had to commit significant resources without donor or government support. The degree to which the Government of Cote d'Ivoire will reimburse this upfront funding by CIE is unclear at this point. Nevertheless, this financing arrangement has successfully incentivized a significant number of connections and its financial viability will be evaluated with time.

Outreach and Marketing Campaigns

The PURE project employed several means of outreach and marketing. In the design phase, the project solicited feedback from stakeholders, which was incorporated into the project structure; in the execution phase, the project employed local community members in the process. For example, an initial sector analysis with extensive consultation of stakeholders in the energy sector helped PURE prioritize the most critical issues to facilitate achievement of project goals.¹⁸ Consultations with stakeholders revealed that the sector's health was stunted by dependence on the huge state subsidy for purchasing gas/heavy fuel oil for generation and that the underperformance of the distribution network due to a lack of maintenance and high losses. Hence, consultation of key stakeholders preceding the official start of the project enabled its acuity in targeting a reduction in the subsidy and increased investment in the distribution network.

¹⁶ Under this program, CIE also charges the customer at the end of the year, with a "catch up sum," if he/she has not yet consumed enough electricity to pay back the full connection cost for that year.

¹⁷ Ibid.

¹⁸ See Pg. 8 of "Implementation Completion and Results Report" for Urgent Electricity Rehabilitation Project (2015), at <http://documents.worldbank.org/curated/en/147491468197062574/pdf/ICR3428-P112573-Box393255B-OUO-9.pdf>

The Government of Cote d'Ivoire also led a public awareness campaign explaining the importance of efficient lighting to accompany the distribution of 1.5 million CFLs to target households in high-load areas. The teams responsible for CFL distribution helped residences with installation and collected the inefficient incandescent lamps. The government provided trucks and required on-the-spot installation of the CFLs to accompany their distribution. The CFL initiative also incorporated direct community participation by employing 2,046 young people contracted for monthly pay of █████ USD to work on CFL distribution. CIE validated the efficacy of these energy efficiency campaigns and indicated that voltage fluctuations and overloading had decreased in places where CFLs were installed.

Figure 2 A CIE Utility Worker



Gender

The PURE project design incorporated key performance indicators to evaluate the impact of the program on gender equality and social development. A total of 125,733 female customers gained electricity access under the project, exceeding the project target of 100,000. Furthermore, the project also aimed to be socially inclusive by ensuring that some of the new electricity connections directly served low-income households to help improve their standard of living. These connections, totaling 42,392 by the project end, were facilitated by the revolving fund and targeted communities with vulnerable households.¹⁹

Impact

PURE Program Impact

Overall, the number of project beneficiaries in Abidjan (256,598) exceeded the target of expected project beneficiaries (i.e., 200,000). As the table below indicates, the program met or exceeded a majority of its key performance indicators. Customers who benefitted from a more efficient, reliable, and readily accessible electricity supply included not only residential customers, but also industrial customers, such as factories processing cement, pipes, steel, and concrete, and agricultural customers. Through more reliable

¹⁹ These households also primarily depended on illegal connections and were identified as poor, or underserved.

and stable electricity supply, PURE increased economic productivity in these sectors and facilitated strong economic growth. The table below highlights a few of the key performance indicators measured over the course of the project.

Figure 3 Key Metrics for PURE Project Evaluation²⁰

Dimension of Electricity Supply being Improved	Indicator	Before (2011)	Target* (2014)	After (2014)	Target Achieved (Y/N), % of Target
Availability and Reliability	Reduction of outages	2,243	1,912	1,792	Y, 20% Reduction
	Average outage duration	4 h 30 min	3 h 50 min	16h 12 min	N
Availability	Community electricity connections	0	25	21	N, 84% of Target
	Direct project beneficiaries	N/A	200,000	256,598	Y, 128% of Target
	Female direct project beneficiaries	N/A	100,000	125,773	Y, 126% of Target
	Number of new households connected (Abidjan)	0	40,000	45,821	Y, 114% of Target
Efficiency	Reduction of energy losses (Abidjan)	31.39	29.89	20.98	Y, 33% Reduction
Financial Viability²¹	Amount of state subsidy to power sector	194M USD	0	95M USD	N, 51% Reduction

As the table demonstrates, the project achieved or exceeded most of its target outcomes. In its project review, the World Bank noted that the financial viability target of reducing the state subsidy to zero was likely unrealistic in retrospect.

Furthermore, the baseline for the average outage duration was contested, since the final project review noted that it was inaccurately calculated at the outset and that CIE estimations placed it higher at project start (e.g. approximately 36 hours). However, the table shows the baseline that was officially reported by World Bank along with the final outcome for consistency purposes, relative to the rest of the metrics.

PEPT Pilot Program Impact

The PEPT pilot program achieved a noteworthy 228,000 new household connections from 2014 to early 2017, which is particularly impressive when compared to the 45,000 connections achieved under the PURE program. However, CIE has noted that electricity consumption by the new households that were connected has not kept pace with their forecast prior to implementation. At the current rate of

²⁰ See Pg. 21 of “Implementation Completion and Results Report” for Urgent Electricity Rehabilitation Project (2015)

²¹ This calculation assumes an exchange rate of 1 USD = 534,76 C CFA

consumption, CIE will not be reimbursed by urban customers for at least eight years compared to the five that were originally predicted. Likewise, rural customers will likely not reimburse connection fees for at least 17 years, as compared to the 10 years that was predicted. Hence, while the project succeeded in facilitating connections, it is unclear whether or not the financing scheme is sustainable over the long term.

Application to Tanzania

Leading Practices for Implementation in Tanzania

Like TANESCO, CIE had to explore financial options to accommodate low-income customers and expand its customer base. As noted in the initial barrier analysis for TANESCO, the upfront cost of wiring and connection fees are a key barrier to electrification. Under PURE, CIE had to subsidize the cost of connection and offer a graduated repayment schedule to make repayment feasible for its low-income customers. Similarly, under PEPT, CIE offered modified financing terms to low-income customers by advancing them a loan for the cost of connection and internal wiring and installation. TANESCO will have to explore various means of accomplishing this goal. TANESCO must also carefully consider the ability of low-income customers to pay based on an electricity consumption scheme, as with the PEPT pilot, which had to adjust to a longer time horizon.

Secondly, CIE used energy efficient appliances, under both PURE and PEPT, such as CFLs, to help reduce demand, spread awareness, and employ young people in the communities in which they work. TANESCO may want to explore ways in which it can reduce losses in simple and relatively low cost ways. Community engagement strategies that also involve community members as direct stakeholders, in the form of temporary or permanent employees, in some aspect of the project implementation, have proven successful in multiple examples, including that of the PURE program.

Additionally, the experiences of CIE emphasize the importance of getting government input and political consensus before project execution. In PURE, the government was an active stakeholder and a direct financial contributor. Though there were many political factors adversely affecting the project execution schedule, the government was a key enabler of success. In the context of the PEPT pilot, there are significant differences of opinion and interpretation of obligations between CIE, CI-Energies²², the regulator, and the government. It is unclear whether or not CIE will be reimbursed some or all of the funds it committed to the interim PEPT project since formalized agreements, pricing schemes, and terms were not established in advance. While other donors may be interested in supporting CIE, and helping to scale up the pilot, the lack of government support created coordination issues. TANESCO should heed this example by driving robust stakeholder engagement efforts with the government, regulator, donors, and other relevant energy sector actors. The importance of continuous engagement and true buy-in from these actors cannot be overstated.

Key Considerations of Differences between Cote d'Ivoire and Tanzania

The landscape of the Ivoirian energy sector and that of Tanzania differ drastically. Cote D'Ivoire has authorized a private concessionaire, CIE, to manage distribution and transmission. While the CIE has held this role since 1990, it still has to perform competitively to ensure it is reengaged when contract negotiations come every 15 years. Cote d'Ivoire has also broken up the other elements of the electricity value chain to include multiple private and public actors.

²² CI-Energies is the national utility company, which serves as an energy sector asset holding company and technical supervisor of power operations (Absorbed functions of SOGEPE and SOPIE)

TANESCO on the other hand is not a private utility but a state-owned and operated entity that handles every phase of the electricity value chain. It is responsible for the generation, transmission, distribution, and sale of electricity. This means that TANESCO and CIE face different sets of constraints and their respective leadership face differing decision-making processes and consequences. They ultimately answer to different groups of stakeholders, and thus, while they both have the same essential operational objectives, their environments are notably dissimilar.

The socio-political context of Cote d'Ivoire during the PURE program was also very different than that of current-state Tanzania. Cote d'Ivoire was fragile and post-conflict, and though the government was largely cooperative, there was not enough institutional capacity or political will to complete some of the larger-scale policy reforms under PURE, such as increasing tariffs to eliminate the need for a state subsidy. The government also dissolved two major institutions in the energy sector without any knowledge transfer and succession planning, causing various difficulties for the start-up of the newly created institution, CI-Energies. Tanzania is not dealing with complications in this realm, stemming from civil war and socio-political upheaval.

Under the PURE program, CIE and other energy sector stakeholders benefitted from a significant ■■■ million USD investment by the IDA. Under the PEPT pilot program, CIE essentially self-funded an entire program. Neither of these extremes reflect the financial resources of TANESCO for its efforts, and thus, TANESCO will have to carefully consider the financial resources that can be made available to increase the number of low-cost connections and potentially contribute to a financing option, i.e., revolving fund.

ANNEX 3: LAO PDR: POWER TO THE POOR

Introduction

Between 1995 and 2017, national access to electricity in the Lao People's Democratic Republic (PDR) increased from 16% to over 90%. Factors contributing to this success have been the use of multiple business models tailored to the special needs of different household populations, including off-grid electrification models for remote villages and specific efforts to connect the rural poor. The Power to the Poor (P2P) Program was an interest-free credit-repayment scheme that encourages universal penetration of household connections in villages that are connected to the grid. The P2P program was implemented by the Lao PDR Electricité du Laos (EDL) – Lao PDR's state-owned electric utility – and the Ministry of Energy and Mines (MEM) with support during its pilot phase from the World Bank and other donors. The program included an integrated lens for gender equality and sought to increase the electrification of households within connected villages from roughly 70% to more than 90% by overcoming financial access barriers for the poorest households in these communities.²³

A socioeconomic survey conducted in 2007 found that 30% of households in electrified villages were consistently remaining unconnected.²⁴ Given the proximity of many of these unconnected households to the electricity network (nearest electricity pole located a few meters or less from the household) and the relatively high average cost of connection (USD 100 - compared to the annual income of USD 500 for some of the surveyed households), the assessment determined the primary barrier to access to be financial and not technical or cultural. EDL implemented a financial support scheme pilot in 2008 for electricity connection to subsidize the up-front connection cost for poor households in select, electrified villages.

The 2007 socioeconomic survey also found that poor households were disproportionately female-headed. While female-headed households represented only 8% of all households surveyed, they accounted for 43% of households categorized as poor. Influenced by this finding, the P2P program designers specifically targeted female-headed households in program design, making a special effort to integrate gender considerations into the scheme.

The pilot program, which ran from the fall of 2008 to the spring of 2009, targeted 20 villages (approximately 3,000 households) in the southernmost province of Champasak. Under the pilot, the overall connection rate increased from 78% to 95%. Among female-headed households, the connection rate increased from 63% to 90%. The program was then scaled up under the World Bank's Rural Electrification Program Phase II, and was expanded to target an additional 8,000 households in provinces nationwide over three years. According to an evaluation of the World Bank program from 2010 – 2015, P2P resulted in the connection of more than 47,000 households during this period.²⁵

Eligibility Criteria and Target Group Selection

Village Selection

The primary objective of P2P was to increase the number of connections in villages where the electricity grid was built out yet households were not connecting due to financial constraints. Under the pilot program, villages that were included in the pilot were all located in Chanpasak (see map) and were prioritized according to:

²³ Lao PDR Power to the People: Twenty Years of National Electrification, The World Bank, January 2012

²⁴ Power to the Poor in Lao Brings Electricity to (Almost) All, The World Bank, May 2012

²⁵ Independent Evaluation Group Implementation Completion Report LA – Rural Electrification Phase II, The World Bank, 2015

- Proximity to existing major roads (i.e., closer villages = higher priority)
- The number of unelectrified households in the village (i.e., more households = higher priority)
- The degree of commercial / social activity in the village (i.e., greater degree of activity = higher priority)

Villages were also screened according to a weighted cost per connection criteria. This methodology assigned more connections for larger, economically important markets to account for the relative revenue potential for EDL. The actual connection cost, based on household data, ranged from USD 250 in Bolikhamaxay, Khammouane, and Xekong, to 346 in Attapeu. The 20 villages in the pilot province of Champasak had a total weighted cost per connection of 266.²⁶



Household Selection

Eligibility criteria were developed for households in the selected villages to target the intervention to economically distressed households, of which more than 40% were female-headed. In the pilot phase, households had to be: (a) located within villages that had been electrified for at least two years, (b) determined to be safe to electrify, and (c) be female- or single-parent headed, **or** meet one of the following poverty criteria:

1. Household has a rice shortage at least six months per year.
2. Household does not have any assets.
3. Household has access to less than 1 hectare of land for rice cultivation.
4. Household cannot finance education or medical costs.

As P2P was scaled up into a nationwide rollout, all villages that had been electrified for a minimum of one year were eligible to participate. The household eligibility criteria were also expanded to include households that had disabled family members.

²⁶ Lao Rural Electrification Program Planning, Worldwatch Institute, 2016

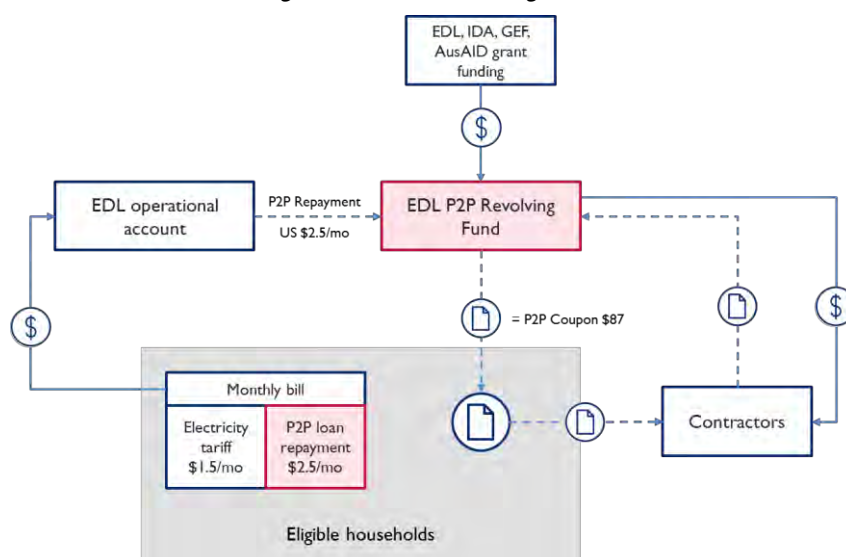
Program Implementation

The P2P program was implemented using a revolving fund to finance the electricity connections and house wiring. The program was structured as follows:²⁷

1. Villages are determined eligible according to selection criteria.
2. Unconnected households within villages are determined eligible.
3. Eligible households are provided with a coupon worth up to USD 87 for up-front wiring and connection costs.
4. Households use the coupon to engage a contractor to complete house wiring and connection. During the pilot phase, households were only allowed to use Electricity Construction and Installation (ECI), an EDL-selected contractor.
5. The contractor provides the household with a quotation for the connection. If the cost exceeds USD 87, the household bears the additional cost and must pay the contractor directly (typically around USD 20-30). If the cost is less, then the loan incurred by the household is lower.
6. The contractor completes the connection. Household and contractor sign the coupon after the connection is complete, with an exact amount specified for completing the work.
7. The contractor is reimbursed by EDL up to the USD 87 ceiling, from the revolving fund initially capitalized by donor agencies.
8. Households make monthly payments on the zero-interest loan to EDL over a maximum of 36 months, at a cost of USD 2.50 per month (assuming the household borrows the entire available construction cost loan amount of USD 87).
9. Households also pay a monthly electricity bill for kWh consumed, average amount USD 1.5 with the actual amount varying according to their metered usage.

Figure 1 below depicts the financial flows for the P2P Program.

Figure 1: Lao PDR P2P Program Financial Flows



Source: *The Gender Action Plan (GAP) in Lao PDR*, The World Bank, March 2009

²⁷ Lao Rural Electrification Program Planning, Worldwatch Institute, 2016

Following the positive results of the pilot program, EDL organized the nationwide roll-out of the P2P program in additional villages. The roll-out to each village typically took place according to the below four phases²⁸²⁹:

Mobilization (One month)

1. EDL developed awareness materials for distribution in selected village.
2. EDL's community outreach team was deployed to mobilize support and awareness of the program through village meetings.

Selection (One month)

1. EDL community advisor worked with the village authorities (including village chief, Lao Women's Union, Lao Front) to identify eligible households.
2. List of eligible households vetted by EDL and District Authority.
3. Meetings with selected households were conducted by EDL and district authorities to consult with eligible households regarding their ability to repay a loan (determined based on non-cooking energy expenditures in excess of USD3.2).
1. A second village meeting was held to seek consensus on the selected households.

Electrification (One month)

1. A household survey was conducted to establish a livelihood baseline.
2. Homes were inspected to confirm that they are safe to electrify.
3. EDL approved a credit line and made a billing and accounting system entry.
4. Households signed individual credit agreement and receive coupon.
5. Households contracted for wiring and connection, using contractors preapproved by EDL
6. The wiring contractor performed the work, collected household co-payment, submitted coupon to EDL, and received payment.
7. EDL inspected installation, reimbursed the contractor, and set the meter.

Billing (36 months)

EDL tracked all monthly payments by households both for electricity use and the connection loan. Costs in addition to the face value of the coupon were settled between the contractor and the household with no financial involvement by the electricity provider.

Financing

Donor Activity

In the pilot phase (2009-2010), the P2P revolving fund was seeded with contributions from the World Bank with support from the Global Environment Facility (GEF).³⁰ Following the successful results of the pilot, the World Bank's IDA and the Australian Agency for International Development (AusAID) each contributed USD 600,000 (fund total USD 1.2 million) to capitalize the revolving fund for the program's expansion (2010-2012). EDL was responsible for overall management of the P2P revolving fund. Sufficient seed funding under both the pilot and the nationwide roll-out were critical components of the program's

²⁸ Why Measuring Energy Access for Women Makes Smart Business, The World Bank, September 2017

²⁹ Do Government and Financiers Listen to Men and Women?, World Bank, November 2008

³⁰ Power to the Poor Brings Electricity to (Almost) All, The World Bank, May 2012

success. Donors also provided funding to train provincial EDL teams and MEM to implement the P2P scale-up in the nationwide expansion. No commercial banks were involved in the program.

P2P Household Coupons

The credit repayment scheme began with EDL distributing P2P coupons to eligible households who have agreed to the P2P repayment terms and signed a simple contract with EDL. Participating households contracted with connection contractors preapproved by EDL and already working in the target village. The contractors provided an estimate based on a standard menu of materials and labor (Table 1) and participating households signed over the credit coupon to the contractor upon completion of the connection and wiring work. The value of the coupons was capped at USD 87, and EDL paid contractors for their services upon presentation of a signed coupon and the signed cost estimate agreed to by the participating household. If the contractor cost exceeded the coupon face value (USD 87), households paid the difference at the time of coupon signature. If the contractor cost was less than the coupon face value, then the actual value of the coupon was adjusted to the real cost and EDL adjusted payment to contractors accordingly.

On the household side, the signed coupon served as a three-year, interest-free loan to that household. The monthly payments of USD 2.5 for the loan plus monthly electricity bills (ranging from USD 1-3) included tiered consumption costs, standard meter maintenance fees, and tax. Households received a monthly statement from the EDL district office and made their payments directly to EDL.

Costs of Connection

The total cost of connection and internal wiring ranged from USD 65-100.³¹ An example of a quote from ECI during the pilot phase (2008-2009) is provided below:

Table 1: Sample Connection Cost Quotation

No.	Item	Unit	Qty	Unit price (USD)	Total Price (USD)
1	PVC 1x10mm ² Al.	m	70	0.37	26.10
2	PVC 2x4mm ²	m	4	1.19	4.77
3	PVC 2x1mm ²	m	10	0.37	3.73
4	clip No. 1, 2, 3, 4	g	1	0.75	0.75
5	Nails No. 3/8	g	1	0.45	0.45
6	Nails No. 8	g	1	0.45	0.45
7	Plugs	pcs	1	0.30	0.30
8	Sockets for light bulbs	pcs	2	0.75	1.49
9	Fluorecence 20 w	set	2	3.43	6.86
10	Panel for switching	pcs	1	0.89	0.89
11	Fuse box	pcs	3	0.45	1.34
12	Fuse link 5 A(20 cm length)	roll	1	0.19	0.19
13	Breaker 2 p 10 A	pcs	1	2.24	2.24
14	Tape	pcs	1	0.75	0.75
15	Switch	pcs	2	0.45	0.89
16	Screw No. 6	g	1	0.30	0.30
17	Screw No. 10	g	1	0.45	0.45
18	Parallel groove clamp Al 16/70	pcs			0.00
19	Rack with 2 spool insulator	set			0.00
	Total Cost of Materials				51.94
	Labor cost				15.66

³¹ [Lao PDR Power to the People, Twenty Years of National Electrification, The World Bank, January 2012](#)

No.	Item	Unit	Qty	Unit price (USD)	Total Price (USD)
	Administration service				16.79
	Tax 10%				8.44
	Grand Total				92.82

Source: Quotation for Installation of In-house Wiring and Electricity Outlets, Internal World Bank Document

Contractors were responsible for providing the connection, including all household wiring, the meter, and the service drop. Standard household wiring included a 3/9 ampere meter which was the same basic connection that EDL provided to all households. Contractors supplied locally manufactured post-paid totalizing inductive meters. In terms of external household connection, the standard practice was to use 22 kV transmission and LV distribution.

Setting the Household Fees

Data from the 2007 socioeconomic survey was used to set the fee structure for the pilot program. A household energy use survey collected details on household use of energy sources such as candles, diesel lamps, and car batteries in order to estimate the total monthly expenditure for lighting and other uses. EDL then subsidized the cost of electricity supply up to 20% to ensure that total fees were less than the target household's current energy expenditures, typically USD 3-5 per month.³²

The World Bank determined the repayment amount on the connection cost loan by finding the middle ground between the amount that low-income households were willing to pay and the revenue that EDL needed to maintain a positive cash flow.

Outreach and Marketing Campaigns

The first step in outreach to the community was to send a 'runner' to the village to explain the P2P new connection program and distribute outreach materials that had been developed by EDL's marketing department.³³ EDL's community advisor worked with the village chief and the village committee to identify potential program participants based on eligibility criteria. A meeting was then convened by the village chief with eligible households. Information that highlighted the benefits of electricity was disseminated. Information sessions were scheduled at times that women would likely be available to attend so that the maximum number of female-headed households could be reached.

³² Lao PDR: Rural Electrification Program, The World Bank

³³ Results from the Power to the Poor Rural Electrification Pilot in Lao PDR, The World Bank

Figure 1: Sample Material Provided to Households Selected by the P2P Program



Source: Results from the Power to the Poor Rural Electrification Pilot in Lao PDR, The World Bank, April 2011

Gender

As noted above, the initial socioeconomic survey indicated that female-headed households comprised 8% of total households, but 43% of all poor households.³⁴ As a result, gender equality considerations became a focal point of the program and were thoughtfully integrated by both the World Bank and EDL.

In the nationwide expansion, households headed by females were considered automatically eligible for P2P financing, so long as their houses were considered safe to electrify. Program implementers used gender-conscious marketing materials and scheduled consultation times to increase the uptake of the program by female-headed households. Additionally, local women’s groups were specifically included in the initial household selection meeting with village leaders to provide gender-sensitive input.

³⁴ Power to the People: Twenty Years of National Electrification, The World Bank, January 2012



Photo Credit: Grayson Heffner

The program also incorporated gender indicators into the monitoring program for electrification reporting; each provincial branch office tracked these indicators as a part of their regular data collection.

Impact

The national P2P program resulted in access to electricity for an additional 47,255 households according to the World Bank. An evaluation study conducted in 2013, in the middle of the implementation period, found environmental and socioeconomic benefits for households, villages, and the country. Because of the transition away from candles and diesel lamps to electricity, the P2P program is estimated to have reduced carbon dioxide emissions by 300 kilotons per year. Not a single household defaulted on payments beyond the allowable three-month arrearage period³⁵, and P2P households spent less on energy than in a 2004 baseline study. Additionally, women reported a reduction in time spent on chores from more than 60 minutes per night to 23 minutes per night on average.

The primary focus of the P2P Program was to increase the number of electrified households in Lao PDR. However, the program also sought to improve the long-term viability of the national utility EDL, an objective that was not fully met due to obstacles independent from the P2P program. For example, EDL faced substantial budgetary constraints and organizational restructuring not foreseen by P2P that rendered objectives difficult to achieve or measure. However, P2P was able to support the establishment of key institutional development measures at EDL, including a Rural Electrification Master Plan.

Application to Tanzania

According to recent survey data and household interviews, the primary obstacle to electrification in Tanzania is the upfront cost of wiring and the connection cost. Nearly one out of four Tanzanians in urban areas live in households with incomes below the poverty threshold of ████████ TSh (USD 197) per year.

³⁵ Why Measuring Energy Access for Women Makes Smart Business, The World Bank, September 2017

³⁶ ³⁷ Given the median cost of standard house wiring in urban areas is approximately ██████ TSh (USD 225), it can reasonably be assumed that the cost of house wiring is a primary barrier to electrification in these areas. Similar to Lao PDR, Tanzania should focus on overcoming this obstacle and making electrification financially feasible for households.

Leading Practices for Implementation in Tanzania

The Lao PDR P2P Case Study provides an example of a successful local pilot that went on to have nationwide success and impact. Should the USAID SRUC assessment recommend a similar pilot structure for TANESCO, the team may consider integrating some of the many leading practices and lessons learned from the Lao's P2P program particularly relating to financing structure.

A key consideration in Tanzania will be the need for TANESCO to secure outside funding to implement a financing scheme aimed at increasing connections for low-income households. Adequate seed funding will reduce TANESCO's risk in expanding services to low-income customers and serve as an incentive for utility participation. The level of funding and resulting scale of the pilot will be a critical factor for ensuring successful replicability in other localities, regions, or nationwide.

The structure of Lao's implementation and financing schemes also hold valuable lessons for Tanzania. One foundation of P2P's success was that it involved a wide breadth of key stakeholders – the community, customer, contractor, and utility – in sharing the cost and the risks. As a result, the fund was not only structured to ensure that participants were prepared to play their role, but also to demonstrate that it was mutually beneficial to do so. Upfront customer contributions were minimized by the full-value, EDL-issued installation coupon, which was paid back on a no-interest, monthly basis at an amount similar to the customer's ongoing energy expenses. The utility collected monthly consumption payments from the newly connected households in the same way as established customers, resulting in an expansion of the customer base with no negative impact on cash flow. The needs of the contractor were met because the coupon that it received from the customer for household installation could be immediately redeemed with EDL. Also, the community was actively involved through village meetings, household gatherings, outreach programs, and marketing materials.

Beyond the implementation structure, the Lao PDR P2P program also demonstrates leading practices for the inclusion of target demographics such as low-income households and women. Similar approaches such as the development of carefully targeted selection criteria may result in more equitable outcomes if applied to Tanzania. The Lao PDR P2P Program reinforces that stakeholder input and satisfaction should be driving factors, especially where contract enforceability is low.

Key Considerations of Differences between Lao PDR and Tanzania

One variable that should be noted is the scope of electrification in Lao PDR versus Tanzania. Whereas in Lao PDR the P2P Program focused on households in rural areas, the SRUC Low-cost Connections Assessment work in Tanzania is primarily focused on new urban/peri-urban connections in areas like Dar-es-Salaam. This presents different challenges and opportunities, including but not limited to the availability of contractors, ease of access to the grid, and development of selection criteria.

³⁶ Country Development Strategy: Empowering Women and Youth, The World Bank

³⁷ Key Findings: 2011/2012 Household Budget Survey Tanzania Mainland, Ministry of Finance, November 2013

ANNEX 4: INDIA: TATA POWER DELHI DISTRIBUTION LOSS REDUCTION PROGRAM

Introduction

In 2002, TPDDL, formerly named “North Delhi Power Limited,” gained over half a million customers from the takeover of a previously state-owned electric utility. Following the takeover, the utility struggled to combat financial losses, corruption, pervasive nonpayment of power bills by residents in informal urban settlements, and extensive illegal electrical connections.³⁸

Over the course of a more than 12-year transformation, TPDDL revamped its operating model, upgraded its physical infrastructure, and improved its operational and management practices to better serve existing customers and incentivize residents of low-income, informal urban settlements to become paying customers. Notably, TPDDL also dramatically reduced energy losses and increased revenue with an approach that leveraged innovative community engagement practices and collaboration with the local regulator, DERC, to improve the affordability of legal connection to the electricity grid. TPDDL’s extensive community engagement practices included establishing social compacts with local leaders to foster community trust and credibility, as well as making significant human capital investments to build the capacity of low-income residents to become reliable customers. This core part of its business strategy transformed the reputation of TPDDL from a widely disliked entity to a community partner that treats residents as collaborative stakeholders while providing them with valued services.

As a result of these efforts, by August 2015, TPDDL had reduced its technical and commercial loss rate to 9.9 percent from 53 percent in July 2002. TPDDL also improved the reliability and affordability of its service, and subsequently expanded its customer base from an initial 700,000 in 2002 to 1.4 million in 2015. Overall revenues increased from US [REDACTED] million to US [REDACTED] million. The story of TPDDL’s impressive transformation demonstrates that although connecting customers in lower-income communities requires community engagement efforts far beyond what is typical of conventional utility operations, these efforts can result in a mutually symbiotic relationship with customers and a sustainable and profitable business model.

This case study will focus on the overall process that TPDDL used to design and implement its revamped business model and the corresponding community engagement strategy that enabled its success. The case study will also provide detailed information on the selection of project beneficiaries, the phases of implementation, the outreach and marketing tactics, and the incorporation of gender considerations that TPDDL used; this background information will help contextualize the positive impact of these changes on TPDDL’s financial performance and customer base. Lastly, this case study will leverage the key success factors and insights from the experience of TPDDL to analyze potential implications for TANESCO’s efforts in Tanzania.

Eligibility Criteria and Target Group Selection

Group Selection

TPDDL understood that one-third of its non-technical losses were attributable to non-paying inhabitants of informal urban settlements, and set out to address the residents’ need for electricity and their inability to pay. Low-income, informal urban settlement residents in India often either steal power directly by

³⁸ See “Winning Over Communities to Provide Electricity Access while Reducing Nontechnical Losses: TPDDL.” World Bank Group. 2016.

establishing illegal connections, or sign agreements with illegal intermediaries who provide high-cost, poor quality, and unsafe electricity connections.

TPDDL recognized that a new business model needed to be developed and adapted for this particular group of vulnerable customers who had limited means to pay for electricity. TPDDL established the Special Consumer Group (SCG), a unit devoted to understanding the electricity needs of residents in informal urban areas, stopping theft, and increasing billing and collection efficiency. The SCG collaborated with the TPDDL's Corporate Social Responsibility (CSR) unit that delivered specialized, socially targeted initiatives to segments of the population in need. CSR's activities and projects focused on health care, employment, employability, education, and entrepreneurship. Together, the SCG and the CSR unit aimed to not only improve these customers' socioeconomic conditions, but also to empower and motivate them to become legal, paying customers with an enhanced quality of life.

As each customer cluster was selected for SCG's regularization interventions, the SCG performed an initial needs assessment with well-respected community leaders, called *pradhans* in Hindi, and conducted GIS mapping and assessment of the cluster areas. SCG chose the most critical communities to focus on first, i.e., those with the lowest collection rates and billing effectiveness. The CSR unit used various engagement methods for understanding these critical groups, such as personal home visits to determine needs, behavior, perceptions, and community dynamics, and then designed initiatives based on the analysis. Recognizing deficiencies in their current model in serving low-income customers, TPDDL designed, through trial and error, a specialized business unit to rework their approach for engaging low-income customers and reducing non-technical loss in informal urban settlements.

Program Implementation

Program implementation took place over the course of more than 12 years, which allowed the multifaceted reform strategy to be sequenced and build upon successful approaches. Additionally, this long time horizon enabled TPDDL to invest in capital costs over time, instead of front-loading these significant costs all at once. For example, in 2002, TPDDL first targeted loss reduction in non-informal urban settlement customer segments with technological and other operational upgrades, before addressing informal urban settlements customers in 2009³⁹. The first phase of reforms, targeting non-informal urban settlements customer segments, resulted in an overall aggregate technical and commercial loss reduction from 53 percent to 15 percent as of 2009. TPDDL devoted a full seven years to improving core operations and customer service to reach a point where they could, financially and operationally, target issues with informal urban settlement customers with precision.

The implementation process of the reforms targeting informal settlement residents can be condensed into the following key steps:

1. TPDDL worked with *pradhans*, or local community leaders, to better understand community dynamics in informal settlements and to communicate to residents, in local languages, about the purpose and benefits of rehabilitation and improvement of their power system.
2. Next, TPDDL conducted a needs assessment and willingness/ability to pay study, leaning on the insights of an external consultancy that helped TPDDL tailor and prioritize potential CSR programs.

³⁹ Initial upgrades included increasing the voltage in the entire system from 110 to 220 to improve system efficiency, modernizing IT interfaces to improve customer service experience, introducing leading system-management practices (i.e., AMR, SCADA, SAP, GIS, and the outage management system), and improving performance management processes for the TPDDL workforce.

3. TPDDL then executed a GIS mapping and customer identification initiative, with the support of contractors, to enumerate approximately 200,000 structures with unique identifiers that would later be used as addresses. These SCG numbers eventually became a source of pride for residents who often lacked an official address or signifier of ownership.
4. From that point, TPDDL still had to figure out how to upgrade service in the informal settlement territory. TPDDL ended up laying around 8,000 km of new lines and cables, constructing 56 grid stations, and adding 180,000 new poles. Additionally, TPDDL established enterprise resource planning (ERP) applications that linked to the GIS system so that all installations could be identified and managed; TPDDL also implemented an automated software system that could read meters remotely and upgraded both its distribution management system (DMS) and an operations management system (OMS). For some of the upgrades, TPDDL leveraged the previous technological infrastructure and system upgrades that were done for non-informal settlement customer segments.
5. In order to reduce theft, which typically occurred through illegal hooking to unprotected distribution lines and transformers, TPDDL deployed personnel to physically remove connections periodically and offer rapid legal connection options. Eventually, TPDDL also leveraged social audits that involve public participation for monitoring and deterring theft.⁴⁰
6. TPDDL worked with the DERC to make connections more affordable by offering reduced connection fees and gradual payment over time, and to establish a “lifeline” rate for consumption under 200 kWh per month.
7. TPDDL developed processes for substandard structures and for residents without proper identity documents so that they could become registered electricity customers with any non-official form of identification. They also developed a contract with customers that absolved TPDDL from liability if the structure was later removed. Furthermore, Indian law does not allow utilities to connect structures with unsafe internal wiring systems, so TPDDL required the installation of proper internal wiring and a master circuit breaker before or at the same time as the establishment of a connection.
8. TPDDL provided individual meters to customers that were postpaid and tamper-resistant (i.e., encased in plastic and hung outside the structure at a level that could not be read by the customers).
9. TPDDL employed a locally driven customer service approach with extensively publicized social services (e.g. drug treatment camps, literacy centers, medical mobile vans, and student tutoring) contingent upon remaining in good financial standing with TPDDL. Abhas, or local women hired by TPDDL to function as brand ambassadors and customer service representatives, were deployed to remind residents about upcoming bills and inform them of the potential social services available for remaining in good standing.
10. CSR benefits and community engagement methods helped redefine norms of payment and solidify the TPDDL brand as a community-centric organization entrenched in the very fabric of residents’ lives. CSR benefits also helped motivate and enable informal settlement residents to be loyal customers by investing in their health, employability, and educational status.

TPDDL’s loss reduction program was adaptively managed throughout the duration of the program to respond to emerging issues and learn from unsuccessful interventions. For example, group metering was

⁴⁰ See Pg. 13 of Reducing Technical and Non-Technical losses in the Power Sector, Background Paper for the World Bank Group Energy Sector Strategy at http://siteresources.worldbank.org/EXTESC/Resources/Background_paper_Reducing_losses_in_the_power_sector.pdf

initiated in 2011 and stopped a year later due to rampant theft of electricity from supply cables and inaccurate customer billing. TPDDL followed the unsuccessful group-metering program with extensive community outreach that resulted in individual, informal installations mapped with GIS, as previously discussed. Naturally, trial and error is required for the design and implementation of any large-scale customer engagement transformation to be successful. TPDDL had established indicators to track progress, continuously monitor results, and recalibrate after failures to determine what would work for its specific operating environment.

TPDDL also had to overcome significant social barriers among its target customers who initially distrusted the utility and mostly relied on illegal electricity. Before the broad reforms of TPDDL, utility workers were routinely harassed, beaten, and assaulted, reflecting deeply hostile attitudes and distrust from its customer base.⁴¹ However, TPDDL's approach to not only address the technological needs of customers, but the social needs, recognizing the intersectionality and interdependence between them, successfully won the loyalty, trust, and respect of formerly resentful community members. Community engagement was not only additive in this context, but also foundational to implementing a sustainable business model in low-income communities.

Likewise, TANESCO may consider various ways to engage, motivate, and connect with its existing and prospective customer base. As evidenced in the Initial Findings and Barriers document, TANESCO is facing social barriers that include a lack of accurate information leading to misunderstandings about the cost, convenience, and safety of TANESCO-provided ready boards. In order to overcome this barrier, it will be important to communicate effectively with customers and solicit buy-in from community stakeholders. To do so, TANESCO must employ creative, context-specific community engagement techniques that convey the value of the TANESCO brand and the reliability, safety, and affordability of its services, including ready board installation. It must also find ways to foster trust and respect, leveraging local knowledge, to offset any potential resentment among customers. While TPDDL was able to employ very comprehensive CSR programming through a ██████ USD investment, TANESCO can start with simpler and more inexpensive means of engagement that increase its visibility and convey a positive presence in the community.⁴²

Community Engagement and Customer Initiatives

In order for TPDDL to accomplish its objectives of reducing theft and turning electricity consumers into paying customers, they prioritized the following strategies and approaches:

- **Make connections more affordable and convenient.** With the approval of the regulatory authority (DERC), TPDDL reduced new connection fees for customers from ██████ to US ██████. TPDDL required an upfront payment of US ██████, with the balance to be paid in 24 equal monthly increments of US ██████
- **Forgive historical debt that deters customers from returning.** One of the key barriers to connecting formerly registered customers in informal urban settlements was their inability to pay

⁴¹ See "In Delhi, Army of 800 Women Come Around To Say "Your Power Bill Is Due," <https://www.ndtv.com/delhi-news/in-delhi-army-of-800-women-come-around-to-say-your-power-bill-is-due-1758358>

⁴² See "Reducing Technical and Non-Technical losses in the Power Sector, Background Paper for the World Bank Group Energy Sector Strategy" at http://siteresources.worldbank.org/EXTESC/Resources/Background_paper_Reducing_losses_in_the_power_sector.pdf

their outstanding, past due debt. TPDDL worked with DERC to get approval to waive their outstanding balances.

- **Make the connection process simple and fast.** Modified financing mechanisms coupled with same-day meter installation resulted in a significant amount of revenue-generating, new connections very quickly. Hired representatives of TPDDL, from the local community, would go door-to-door helping customers fill out connection forms, submit documentation, and guide them through the process for same-day meter installation and connection.
- **Improve the affordability of consumption.** TPDDL also worked with DERC to temporarily revise the tariff structure. The agreed-upon cap on the lifeline tariff was 400kWh, modified from 200 kWh, for the year of 2015 alone.
- **Make the payment process local, personal, and tailored to the needs of customers.** Customers in informal urban settlements had difficulties going to regular TPDDL service centers to pay their bills or voice customer service grievances. In response, TPDDL created two main mechanisms to meet their needs and provide a high level of customer service.
 - TPDDL created a system of franchisees, or locally familiar individuals who could serve as the face of TPDDL and interface directly with customers, on billing and customer complaints. TPDDL chose *pradhans*, or local leaders, with strong reputations in the communities and paid them initially through fixed amounts, and then eventually on a performance-based system designed to increase bill collection efficiency.
 - TPDDL also recruited Brand Ambassadors, also called “Abhas,” from the Women Learning Center’s “Earn While Learn” program, sponsored under CSR activities. Brand ambassadors were responsible for delivering bills, reading meters, encouraging illegal consumers to get legal metered connections, processing accident insurance applications for new customers, and increasing overall customer satisfaction (i.e., handling complaint redress). Brand Ambassadors were assigned a territory of 300 customers each and paid Rs 1,050 (US\$) per month to liaise with customers with past-due bills in their assigned groups. Bonuses were disbursed when they successfully convinced customers to pay.

TPDDL created innovative and inclusive ways of first connecting new customers or reconnecting old customers, and then of structuring payment terms and payment delivery options to empower low-income residents to remain formal consumers of legal electricity. This model leveraged the support of local community members for payment support, enforcement, and delivery and modified the terms to make connections accessible to those with low and unsteady flows of income. Potential customers in Tanzania similarly face significant financial barriers. Taking into account the success of TPDDL, TANESCO may benefit from a strategy to adjust the terms, timeline, and delivery options of payment. For adjustments in tariffs, the relevant regulatory authority should be engaged; for understanding and, if necessary, streamlining legal documentation and wiring requirements, the appropriate municipal and federal governmental entities should be engaged. To accomplish this, TANESCO would likely need to concurrently engage government, local stakeholders, and community partners to devise a feasible and appropriately tailored solution.

Outreach and Marketing Campaigns

TPDDL used various communication channels and tailored marketing materials to engage the community and create brand consistency. Targeted marketing and messaging were delivered with the support of the following tactics/tools:

- Banners emphasizing key TPDDL policies and benefits in all major clusters;

- Leaflets sharing details of TPDDL policies and services delivered with the bill;
- Pay & Win events or monthly and annual lottery-style events that reward customers in good standing; and
- Various forms of in-community entertainment, developed in conjunction with local NGOs and themed to increase awareness of the benefits of electricity service and associated CSR initiatives.

Figure 4 Picture of "Abhas," or the Women Employed as Brand Ambassadors



Image credit: Bloomberg

The use of pradhans and Brand Ambassadors, as depicted in the picture, added a highly personalized, human element to stakeholder engagement and marketing campaigns. Abhas, or female Brand Ambassadors, hired from the community that TPDDL serviced, were extremely effective as marketing agents and customer service representatives. As of 2015, Brand Ambassadors had enabled TPDDL to deliver 90,000 bills, and increased the billing collection rate by 13% and the billing efficiency rate by 16% by 2015.⁴³

Finally, the extensive CSR benefits provided by TPDDL (i.e., vocational training centers, drug addiction/rehabilitation programs, student tutoring programs, water stations, and medical van) constituted powerful forms of community outreach and engagement that conveyed that TPDDL was invested and committed to the community.

Gender

TPDDL incorporated several initiatives aimed toward women, both as beneficiaries of its CSR initiatives and through direct involvement in its community operations. As previously discussed, the Brand Ambassadors were exclusively women hired directly from CSR programs. The company specifically chose educated women because of their familiarity and respect in the community.⁴⁴ As women are often not allowed to work outside of the community, the local programs provided women with a flexible option to work near their homes that was culturally permissible. Additionally, TPDDL led a Women's Literacy

⁴³See "Winning Over Communities to Provide Electricity Access while Reducing Nontechnical Losses: TPDDL." World Bank Group. 2016.

⁴⁴ See "In Delhi, Army of 800 Women Come Around To Say "Your Power Bill Is Due," <https://www.ndtv.com/delhi-news/in-delhi-army-of-800-women-come-around-to-say-your-power-bill-is-due-1758358>

Center program to enable women between the ages of 18 and 65 without formal education to access computer-based literacy programs that provided training in the alphabet, numerals, arithmetic, and reading and writing. The program began in 2010, and as of 2015, there were 290 operational centers with an annual participation of 17,000 women. This program also specifically recruited educated women from the community to serve as center instructors. Small fees were charged to make sure that the participants were incentivized to complete the program.

The literacy classes were purposefully held in the afternoon and evening hours to cater to women who are typically free from daily chores at those times, and included awareness sessions on health and safety. Nearly 167 Self-Help Groups (SHGs) have formed as a result of the program and have been linked with banks that help women get formal bank accounts in their name where they can deposit savings. TPDDL is also working with NGOs to help train and enable the SHGs to develop entrepreneurial ventures.

Impact

TPDDL leveraged innovative and context-specific technical and managerial practices to better engage and empower the communities so as to increase access to safe, reliable, and affordable power for the entirety of its customer base. As a result, the customer base of TPDDL has more than doubled to 1.4 million in a dozen years creating new revenue for the company and vastly improving its coverage of its service territory; surveys conducted by TPDDL have documented increased access to service and customer satisfaction. Regular electricity service has expanded in informal urban settlement areas through the use of graduated rates and maintenance improvements that have reduced costly waste.

Table 3 High-level Overview of Impact of TPDDL's Transformation

Metric	July 2002	March 2015	Change (%)
Total Customers	0.7 million	1.4 million	+200%
Informal Settlement Customers	93,000	175,000	+88%
AT&C Losses (%)	53.6% (At time of privatization)	9.98%	-79%
Bill Complaint Resolution Time (Days)	45	6	-87%
Total Revenues (USD in Millions)	133.4	990	+642%

As the table above indicates, TPDDL has made significant strides in technical, operational, and financial performance as a result of its robust reforms and transformation. Revenue has increased; AT&C losses have decreased; and the customer base, in both formal and informal settlements, has increased significantly.

Application to Tanzania

Leading Practices for Implementation in Tanzania

The India example provides several lessons learned that can be considered by TANESCO in its efforts to connect low-income unconnected households in Tanzania. The experience of TPDDL illustrates that outreach strategies need to be adapted to the unique characteristics and needs of specific customer segments. TPDDL established a new company unit to create a business model capable of addressing the needs of low-income residents in informal urban settlements. While an adaptation of this scale may not always be necessary, it is crucial to recognize that a one-size-fits-all approach will not work with communities living in poverty and facing unique challenges, threats, and demands. Furthermore, one key

success factor of the effort was leveraging trusted and locally familiar figures and community members to help design, drive, and disseminate communications. Enlisting the support of members of the target community, as TPDDL did with Abhas and pradhans, is essential to the success of a given outreach or awareness effort.

In the case of Tanzania, a financial barrier clearly exists for urban low-income households. While this sample is not definitively representative of all unconnected households within connected villages, taking TPDDL as an example for innovative financing mechanisms could lower upfront connection costs necessary for households that want to connect to grid-supplied electricity. Options such as connection fees that can be paid in installments, same-day meter installation, and personalized customer service may be considered by TANESCO. However, these kinds of significant adjustments require working effectively alongside the regulator and other pertinent governmental or oversight entities to ensure appropriate regulatory approvals and compliance requirements.

The TPDDL example illustrates the critical value of partnerships with the local civic and public sector, which will be crucial in Tanzania. More specifically, TPDDL worked with the regulator to adjust tariff structures, the government to overcome legal/procedural barriers to new connections, and NGOs to appropriately tailor communications and interventions to the landscape. The leadership of TPDDL has emphasized that the program would not have been successful without the support of these other actors.

In Tanzania, at least some of the barriers preventing people from using ready boards are related to fundamental misunderstandings of how ready boards work. TANESCO efforts to increase connections would benefit from a robust communications campaign that clearly articulates the benefits and costs of ready boards. TANESCO could partner with NGOs and community leaders who have in-depth understanding of cultural norms and attitudes to tailor their communications effectively.

Key Considerations of Differences between India and Tanzania

Tailoring communications and a stakeholder engagement strategy to a Tanzanian environment depends entirely on the cultural and social context. The cultural equivalents, if in existence, of Indian pradhans, or Abhas (i.e., Brand Ambassadors), will have to be researched, identified, and then similarly leveraged as communications champions for TANESCO. However, the case of TPDDL affirms the importance of locally recognizable figures being hired or, at least, socially connected to the utility. Utility workers faced intense hostility and violence before TPDDL undertook comprehensive reforms that enlisted the support of local women to rebrand the utility and affirm its commitment to the community.

TPDDL's efforts were driven by the imperative to reduce theft of electricity. The communities that are being targeted by TANESCO are not currently supplied with electricity so their objectives are somewhat different. Furthermore, the housing stock in these areas and the conditions are not necessarily in the same category as the "informal urban settlements" communities in India. However, both environments necessitate conscientious design and planning for unconventional housing types.

Furthermore, TANESCO is a public utility, while TPDDL is a quasi-private company. While TPDDL must answer to its shareholders, TANESCO faces a distinctively different set of challenges by virtue of its public status. TANESCO reforms and potential investments must be approved by the government, and indirectly, the public who hold political leadership accountable for its decisions. Thus, TANESCO has to navigate another level of careful and strategic branding, communications, and stakeholder engagement in order to drive any large-scale or truly transformative type of reforms.

ANNEX 5: JAMAICA: JPS COMMUNITY RENEWAL PROGRAM

Introduction

JPS – Jamaica’s privatized electric utility that is the sole provider of electricity on the island – struggles with illegal, informal connections. Due to these informal connections, system losses are currently 26.71%, made up of technical losses in the order of 8.6% (which is average for utilities of similar size⁴⁵), and non-technical losses in the order of 18.11% primarily due to power theft.⁴⁶ In this context, JPS is undertaking a number of different efforts to bring down the level of non-technical losses and reduce electricity theft. JPS had been historically unsuccessful in reducing non-technical losses, a portion of which stem from illegal connections in informal settlements, inner-city slums, and low-income areas.

JPS indirectly provides service to approximately 180,000 unauthorized residential consumers through these informal connections. It is estimated that if all these consumers use power at the same level as the average household, and pay for the amount they consumed, the increase in revenue to JPS from regularizing this entire group could be ██████████ per annum. (This is likely an underestimate, given consumers that do not pay for power tend to consume higher than average amounts due to a lack of price signal.)⁴⁷ While these are high-level estimates, they indicate the scale of the problem and the size of the opportunity for JPS.

Prior to the introduction of ready boards to the island, an estimated 5% to 10% of these 180,000 illegal connections originate in substandard dwellings that cannot legally be wired for electricity due to Jamaican housing standards. This reality meant many households engaged in illegal connections and dangerous wiring alternatives to utilize power in their homes. While no statistics are collected on fires, fatalities, or injuries caused by illegal, poor wiring, the USAID team observed 13 houses burnt to the ground, likely attributable to poor electric wiring.

Initially, JPS dealt with the electricity theft in these communities by cutting off the power supply. The regulatory authority, Office of Utility Regulation (OUR) issued several “cease and desist” orders that led to restoration of power, and the convening of task force to design a comprehensive theft reduction approach and steps within the communities to implement the program. In 2015, JPS launched the CRP in seven communities in the parishes of Kingston and St. Andrew, with the objective of converting households that are connected to illegal sources of electricity to JPS paying customers. A pilot phase is being conducted to gather information and experience that will be used to inform a full-scale roll-out of the program across Jamaica.

This case study on the Community Renewal Program focuses on a subinitiative pilot funded by USAID supporting of JPS’s efforts to reduce illegal connections with the use of ready boards as a solution for house wiring in substandard housing. The case study reviews JPS’s target selection methodology, their outreach and marketing strategies and the use of ready boards as a technical solution.

Eligibility Criteria and Target Group Selection

For the pilot phase of the Community Renewal Program, JPS selected seven communities in Kingston and St. Andrew based on those communities where electricity losses are in excess of 70%, the so-called

⁴⁵ JPS Tariff Application 2014-2019: Going for Growth. JPS Co, Ltd. April 7, 2014

⁴⁶ Jamaica Public Service Company Limited Annual Review 2017 & Extraordinary Rate Review - CPLTD

⁴⁷ USAID Scoping Trip Final Report. January 2015. Based on numbers reported in the JPS Tariff Application 2014-2019: Going for Growth. JPS Co, Ltd. April 7, 2014

'red zones.' The pilot program was targeting 2,000 households in the communities. The communities that were targeted for the pilot phase include McGregor Gardens, Denham Town, Payne Land, Majesty Gardens, Whitfield Town, Arnette Gardens and Bayfarm Villa

In targeting the red zones, JPS aimed to provide a holistic solution for at-risk communities experiencing social and economic challenges which contribute to electricity theft. Many of these communities' residents lack consistent income streams, which also acts to fuel the propensity to install an informal connection. Annually, JPS removes more than 170,000 informal connections to the power grid, primarily in these 'red zone' communities, only to see the connections reestablished shortly after they are removed. The company's current strategies to tackle red zone issues include social intervention programs and taking down illegal connections.

In 2015, working in conjunction with the Jamaica Social Investment Fund (JSIF), a not-for-profit fund primarily designed to channel resources to small-scale communitybased projects, JPS completed the upgrading of 600 households to the wiring standard required in the code for safe electric consumption as determined by the JS21 and the National Building Code. This was to enable the facilitation of legal connection to JPS' distribution lines across communities such as McGregor Gardens, Majesty Gardens, and Payne Land.

JPS experienced challenges in connecting customers, which resulted in delays in scheduled implementation in several communities, including:

- Developing viable, legal house wiring solutions for informal households;
- Building relationships with local residents and educating new customers on electricity use;
- Violence encountered in some communities;
- Damage to the guard boxes shortly after implementation;
- Bridging of the energy guards;
- Lack of communication between meters;
- Developing an appropriate implementation structure on the ground;
- Technical limitations of the metering infrastructure; and
- A general distrust and dislike of JPS because of the perception that electricity prices are high and should be lower. In addition, many people think that JPS is government-owned which compounds the perception of the high cost of electricity.

Based on the experience of the first year of implementation, JPS included some additional elements in the program to combat the above-mentioned challenges, such as:

- Increased and tailored community engagement techniques;
- Introduction of a new advanced metering infrastructure focusing on prepaid capabilities for this customer base;
- Improving the robustness of antitheft measures in metering and with the secondary distribution lines;
- Use of more versatile and technically resilient metering infrastructure; and
- A community renewal rate, introduced in JPS Annual Tariff Adjust Filing in 2016, allowed customers in targeted communities access to electricity at reduce rates.

Program Implementation

While the primary focus of this case study is on the installation of the ready boards in Majesty Gardens under the USAID-funded Jamaica Ready Board Demonstration Project, this was only a small component of the larger Community Renewal Program. JPS conducted the CRP in all seven of the selected districts, but the ready boards were introduced only in Majesty Gardens.

The Jamaica Ready Board Demonstration Project chose Majesty Gardens as a pilot area due to the following factors:

- Substandard housing environment that could not facilitate conventional house wiring under the policies and regulations around house wiring at the time;
- Significant losses in the community hovering between 75%-85%;
- Large, concentration of illegal consumers (~1100 residents, or 400 households targeted for intervention); and
- Local infrastructure permitted the removal illegal access to consumers, and – with small infrastructure redesign – allowed for elimination of access points to consume electricity.

Financing

The program was financed out of JPS funds⁴⁸ that were allocated for community renewal and loss reduction. The cost of the program was included in the rate application to be recovered through the tariffs charged to customers, and approved by the regulator. USAID, through SRUC, financed the procurement, assembly, and installation of ready boards in dwellings in Majesty Gardens that were not physically able to be wired due to their inaccessibility and poor structural condition. USAID conducted a detailed household consumption and willingness to pay survey and focus groups prior to installation of the ready boards and their connection to the grid network. USAID also provided funding for community engagement and demand side management leading practices as well as technical and engineering design support for the ready board specification. JSIF supported the socialization and community engagement (along with JPS) and supervised the ready board assembly and installation. A local engineering university, UTech, provided students to assemble and test the ready boards. Once ready boards were fully installed, JPS connected customers to the grid.

Outreach and Marketing Campaigns

The launch of the Community Renewal Program in each community begins with community outreach through community meetings. In the case of the Jamaica Ready Board Demonstration Project, these meetings took on additional communications around the rollout of the new technology as well as safety benefits of the ready boards. Included in the Demonstration project and the CRP in general are several social intervention programs offered to residents in the project areas either free of cost or at a minimal cost to residents.

JPS then conducted an extensive social intervention campaign in the targeted neighborhoods. The two primary reasons for offering these interventions are to 1) facilitate the conversion of consumers to customers and 2) to promote sustainable behavioral change by keeping persons engaged throughout the communities. Prior to commencing the social intervention campaign, JPS conducted extensive research in the communities funded by USAID and the World Bank. USAID funded a survey in the Majesty

⁴⁸ Incentives designed by the regulator OUR for influencing JPS to reduce non-technical losses shifted with the signing of a new electricity license in July 2016.

Gardens while the World Bank conducted a baseline survey in all of the pilot communities. The main objectives of the research were to:

- Identify NGOs and community leaders.
- Conduct baseline survey to designing social and technology approach.
- Help determine ability/ willingness to pay, appliance ownership (consumption levels), habits and behaviors, receptivity to regularization and technology.
- Help design the technical solution that was applied to that community (e.g. a ready board) – how many outlets needed, number of rooms in home, and housing construction.



In a baseline survey of 350 households in Majesty Gardens, USAID found that the main source of light was electricity (94.3%) provided through an illegal connection (94.9%). Candles (80.6%) were the next most common source of lighting.

Wellness Fairs

JPS hosts two to three wellness fairs per year to engage current and potential customers in high loss areas (red zones). The wellness fairs bring together a variety of services for Jamaican communities to one location alongside JPS and JSIF to foster the relationship between the red zone residents and JPS. Services offered at the wellness fairs included free medical and dental services, and on-site government services such as land registration and government document processing.

Youth Education

JPS conducts youth education and recreation classes within the targeted communities. These efforts include preparing at-risk students for their high school exams, training local residents as teachers in the community, and individualized teaching assistance. While the capacity-building efforts might not add to household income immediately, the training has the potential to secure employment in the future and was seen by the community as a positive investment by JPS which contributed to the company's image.

Service Centers, Community Facilitators, and Community Relations Officers

Community facilitators were hired from each of the project areas. The community facilitator's role is to act as a JPS customer service representative in the communities to monitor JPS service applications, respond to simple bill inquiries, and to act as community "champions" for JPS initiatives in their communities. The facilitators are also trained to conduct energy audits and energy management sessions to assist residents in controlling their consumption. The community facilitator may also run the local service center which is designed to accept connections applications within resident's communities as well as provide a direct source for customer service. The community facilitator worked closely with the Community Relations Officers who were representatives of JPS's Community Renewal Team employed to design, execute, and monitor the impact of community-related programming on its effect on connection and regularization efforts. The model allowed JPS to leverage experiences and lessons across different communities through the use of Community Relations Officers who managed multiple

communities across Jamaica, while remaining locally focused through the continued investment in Community Facilitators.

Additionally, vendors for prepaid credits were established and colocated within the community to allow for reduced time and expense in adding value to customer's prepaid meters.

House Wiring, Recertification, and Ready Board

In 2016, the CRP offered house wiring and recertification at minimal or no cost to customers. Under the Jamaica Ready Board Demonstration Project, ready boards were offered to the Majesty Gardens community, with installation conducted by JSIF through local electricians. JPS asked residents to make a small contribution as a show of commitment and to ensure that the customers understand and appreciate the value of the service.

In Majesty Gardens, there are some houses that cannot be traditionally wired and to overcome this obstacle, JPS partnered with USAID and UTech to implement a ready board solution implemented through JSIF. This project began in 2016 with installations of ready boards beginning in November and continuing in 2017 to meet the target of 400 new, safe, legal electricity connections. As of the end of 2017, approximately 360 out of the 400 targeted customers had their ready boards installed and were connected to electricity. An evaluation of the ready board program will take place in 2018.



Energy Conservation and Management

An energy conservation initiative was included in the CRP to promote energy conservation and efficiency. JPS hosted an energy products booth at the wellness fairs that included information about how customers could save energy and marketing of JPS e-stores for purchasing discounted energy efficiency and surge protection products. In 2016 and 2017, JPS conducted energy conservation sessions and energy conservation competitions in which communities competed against each other – some aspects were even broadcast on local television. Residents competed to earn points in energy efficiency related tasks such as matching kWh consumption to different appliances and identifying bad consumption practices. Feedback on the initiative was solicited through a survey, and residents felt overall that the sessions were useful and they saw reductions in their energy bill.

USAID also provided safety training to members of the community in order to help customers understand the dangers in illegal connections as well as become educated on the new ready board technology. Customers were instructed on how to avoid common bad practices that result in electrocution, in addition to explaining the elements of the ready boards and legal connections that further protected customers from the dangers of illegal connections.

Best Practice Symposium

JPS, in collaboration with Planning Institute of Jamaica, National Housing Trust, and Social Development Commission, hosts an annual symposium on leading practices in Jamaica for community renewal in the

areas of 1) community entry and mobilization, 2) youth development, and 3) social enterprise. More than 100 people attended the Symposium in 2017 and there was an overall positive review of the event according to a follow-up survey conducted by JPS. The top recommendations from the conference were to involve more community persons and to work with more agencies. JPS planned to continue the best practice symposium based on the favorable reception from the communities.

Community Relations Meeting/Community Engagement

JPS conducted ongoing dialogue with customers through community outreach meetings, i.e., town halls. The topics covered during the town hall meetings included presenting JPS progress in infrastructure construction in the communities, safety training to prevent harm from illegal connections, and discussions on social issues, such as mental health. This campaign is aimed at finding creative ways of influencing customer attitudes toward electricity theft and energy conservation.



Gender

As a result of USAID's detailed household consumption and willingness to pay survey in Majesty Gardens, there were significant differences in response between males and females. The findings indicated that women in the community did not feel safe in their neighborhoods after dark due to the lack of street-lighting. In order to adjust to this reality, trouble lights (extension cords with single lights attached to the end of the cord) were provided by USAID with each ready board to ensure residents would be able to extend light beyond the room the ready board was installed in so as to provide outside safety lighting to residents.

Application to Tanzania

According to recent survey data and focus groups conducted by the Low Cost Connection Activity, the primary obstacle to electrification in Tanzania is the upfront cost of wiring and the connection cost. The focus groups also indicated a level of frustration with TANESCO on their ability to provide timely connection service. While the main objective of JPS was not the same (i.e., reduction in the level of illegal connections targeted neighborhoods) the JPS CRP provides an example for TANESCO in the use of ready boards to reduce the house wiring cost and accessibility and in the outreach strategies used to build trust within the communities.

Leading Practices for Implementation in Tanzania

This case study provides an example of a successful pilot that combines extensive community engagement with new technical solutions. TANESCO could adopt some of the local engagement strategies to better communicate connection processes and options available to customers, as well as educate consumers on controlling their energy consumption. In Jamaica, community liaison officers were particularly effective at ensuring the customers continue to pay their electricity bills and to create a positive relationship between the utility and its customers. Partnering with local NGOs and municipal government organizations expanded the reach of JPS's community engagement programs and led to

greater acceptance and credibility of the utility efforts as it moved beyond traditional electricity customers.

The ready board technical solution is also relevant to TANESCO. In Jamaica, the housing in many areas was substandard which prevented conventional house wiring and connection. The solution was to build a ready board that could be adopted in this housing stock all while working with stakeholders who interpret building electrical code to accommodate the use of ready boards. The ready board research being conducted under this program will assist in addressing the technical issues relating to increased connections in Tanzania.

With regards to the sales and marketing of ready boards, JPS developed the programs contained in this review around producing excitement and a sense of ownership of the community's path to connection. Programming centered on engaging community members where they live, lowering the barriers to participation but also illustrating to community members the sense of importance JPS was placing on establishing relationships and goodwill with the members. Building this goodwill allowed JPS to make the issuance of and education on ready boards far more personal than merely a piece of hardware along, but elevated the technology to a symbol for the improvement of the community and movement toward higher living standards for those involved. The passion seen from community members during energy efficiency competitions and ribbon cutting ceremonies clearly demonstrated the unique relationships JPS was able to build over the course of the program. TANESCO, in close cooperation with villages could build similar connections with its customers to improve the impact of communications and roll-out of house wiring options.

Key Considerations of Differences between Jamaica and Tanzania

One variable that should be noted is the primary objective of JPS versus TANESCO; i.e., reducing high distribution losses through illegal connections vs. connecting customers who are close to the distribution infrastructure but not yet connected. Residents in the "red zone" communities were consuming electricity already at a high cost in both monetary terms and potential safety risks. With TANESCO's customers, the major barriers appear to be financial, both the high cost of wiring and cost of connection. It seems logical that the cost barrier will need to be addressed for TANESCO customers prior to seeing a significant increase in connections.

Another key difference is the corporate structure of JPS versus that to that of TANESCO as it relates to financial sustainability and potential funding mechanisms. JPS is a private company, with a majority ownership from At JPS, all of its community engagement programming and non-technical loss reduction investments must show a return on investment and/or be justified to its shareholders. TANESCO, as a government-funded entity, needs to show value to its citizens and may face the same budget pressures facing the GoT.