



## **Powering an improved utility customer experience**

A framework to measure customer experience investments  
in developing country electric utilities

Deloitte Consulting LLP's Energy Reform practice has a track record of excellence and impact with government and public services clients—we are a leading consulting partner for the U.S. Agency for International Development (USAID), the U.S. Department of State, and the U.S. Department of Defense. Working alongside these agencies, our practice advances efforts on energy and natural resources development and investment, energy sector policy, holistic governance, and operational and institutional reform. Our work accelerating energy sector development and reform in the U.S. and globally includes providing strategic and specialized support across four key entry points in the energy sector ecosystem: policy and strategy, regulatory reform, project development and finance, and human and institutional capacity building. Contact the authors for more information or read more about our supply chain and manufacturing operations services on [Deloitte.com](https://www.deloitte.com).

# Contents

Introduction	2
Evaluating CX programs: Current challenges and the need to shift to a customer-centric approach	4
How to choose CX programs	6
Measuring costs and benefits of CX investments	8
LTV/CAC framework in action: An illustrative approach	12
Benefits of CX programs on a utility's organization	16
Powering the customer experience	19
Endnotes	21

# Introduction

UTILITIES AROUND THE world are placing an increasing focus on the customer experience (CX).<sup>1</sup> Competitive markets, distributed generation, renewables, digitalization, and an increasing number of natural disasters are just a few of the reasons that many utilities in the United States, Europe, and Australia are beginning to invest in CX programs in earnest, despite existing traditional monopoly structures. This increased focus is leading to more CX-oriented investments and the need for a simple and concrete way for utility companies to measure their impact.

Electric utility companies in developing countries face similar pressures as those in developed

**Investments in the CX can help developing country utilities to reduce nonpayment, add new customers, and educate existing customers on their responsibilities and the role of the utility.**

countries to improve the customer experience, but often operate under very different technical circumstances, market conditions, and policy environments. And, like their developed country counterparts, these resource-constrained electric utilities—mostly established as state-owned regulated monopolies—have historically had little incentive to think about CX beyond their national mandate to connect.

But now, they're increasingly having to justify their large-scale investments in connecting new customers as well as in regularizing illegal

customers to establish long-term revenue streams. This is particularly important with international donors and governments providing capital and funds to support the addition of new customers.

To achieve this more effectively, utilities in developing countries should focus on the **customer experience** and invest in it across various stages of the customer journey. Such investments can help utilities reduce nonpayment, add and maintain customers in good standing, and educate new customers on their responsibilities to pay on time and maintain utility assets. Through these investments, utilities can strengthen their long-term revenue streams and reinvent themselves as customer-centric organizations.

This article presents a quantitative framework that electric utilities in developing countries can use to evaluate *if* and *how* to invest in CX initiatives. It does so by introducing developing country utility managers to a financial

metric, comparing the customer lifetime value (LTV) and customer acquisition cost (CAC) when evaluating different types of CX investments. While this metric is commonly used across other industries and in developed markets,<sup>2</sup> in this article, we apply it to the utility context and analyze its implications for investment decisions. We also discuss a series of potential CX investments that utilities can make to recruit, educate, and retain residential and small commercial customers. We then apply the LTV/CAC framework to show how it can help quantify, evaluate, and prioritize these investments.

Equipping utility managers with a decision framework and tools to evaluate CX considerations

can help them support their case in business decision-making across the organization. At a broader level, it can help utilities in developing countries evolve into more customer-centric organizations in a way that promotes financial solvency and foster happier, more satisfied customers on a stronger, more resilient grid.

**The LTV/CAC framework can be applied to the developing country utility context to quantify, evaluate, and prioritize CX investments.**



# Evaluating CX programs

## Challenges and the need to shift to a customer-centric approach

THE MONOPOLISTIC ADAGE “build it and they will come” is less applicable to utilities in developing countries with national service mandates, operational losses, and alternative power sources for customers, which have all reduced the reliability on long-term cashflows. Given this and other pressures on the balance sheets of these utilities, combined with the critical need for electrification in their service territories, the case for investing in CX appears all the more compelling.

However, identifying and optimizing these investments is not easy as these utilities face many challenges. They typically struggle with high levels of aggregate technical and commercial (AT&C) losses stemming from electricity theft, nonpayment, fraud, and more. With high levels of AT&C losses, a portion of their customer base is consuming the utility’s product (electricity) but not generating any revenue. When utilities fail to generate enough revenue, they are unable to reinvest in infrastructure and systems, worsening the quality of power and their ability to serve customers, a potentially self-fulfilling downward spiral. Adding to this financial strain, many utilities also face pressure from the government and multilateral donors to connect large numbers of unelectrified households to the grid in both rural and urban geographies.

The organizational structure of these utilities often makes planning and undertaking CX investments more complicated. Utility companies both in the United States as well as in developing countries are typically organized by function and CX projects are typically implemented across business units. There is no naturally occurring unit to sponsor these projects, making the business case harder to justify across units and responsible cost centers difficult to identify.

Utilities use a limited number of frameworks to quantitatively evaluate the financial benefits of CX investments—sometimes making it tough to justify and deploy such projects. In addition, while some utilities have dedicated account managers for large commercial and industrial clients, usually, there are no dedicated teams or protocols to manage CX initiatives for small commercial and residential customer classes. This can put an extra onus on utility managers trying to evaluate different types of investments in CX—also referred to as customer engagement projects or initiatives—to justify such costs to management.

At present, most developing country utilities use more traditional metrics—such as a discounted cashflow, capital asset pricing model, or a simple payback analysis—to evaluate investments.<sup>3</sup> Our goal is to help shift their thinking from connecting and servicing customers as purely a “capital investment” (with smooth, stable long-run cashflows requiring little or no planned customer reinvestment) to better reflect the reality of an “electricity service” provided over an extended period.

As we demonstrate in this article, CX initiatives can be evaluated by applying a ratio of the lifetime value—all revenues and direct costs—to the cost of acquiring the customer (i.e., LTV/CAC). It is adapted from a common metric used in subscription-based business models<sup>4</sup> (such as software as a service), where there is a similar

business imperative to retain customers and have them utilize services over extended periods. Making an upfront investment to connect with customers may not be enough to retain them over the long term. Competition has made other options available to both residential and commercial customers in the form of distributed generation, a problematic trend for the traditional utility business. In some instances, a lack of continued investment may lead regularized customers to revert back to theft.

*But here’s a caveat: We recognize that the LTV/CAC framework is a significant departure from traditional methods of utility investment evaluation and advise readers to apply the metric with the understanding that costs of capital and relative project risk are not immediately apparent in the framework.*

# How to choose CX programs

**C**X INVESTMENTS ARE investments in initiatives, processes, or programs that help shape customer behavior and improve the customer experience while driving an attractive return for utilities. There are many ways in which utility companies can shape CX projects—focusing on improving reliability, decentralizing customer operations, modernizing customer billing, and/or implementing energy-efficiency programs. CX programs can take the form of moving nonpaying consumers to paying customers (regularization) or as customer acquisition programs that develop mutually beneficial relationships starting at the time of connection. CX programs at utilities can be organized into one of the following categories:

**Option 0: Infrastructure upgrades** are physical upgrades to the distribution infrastructure that allow utility companies to deliver electricity more broadly, efficiently, reliably, and/or of a better quality to their customers. Infrastructure *must* be in place to deliver services and facilitate other CX investments—hence it is Option 0. This is the traditional approach most utilities take to improve the customer experience and represents the foundation CX programs can be built upon. Infrastructure upgrades include capital expenditure such as installation of line reinforcements, repairs to secondary and primary distribution lines, or subsidizing connection

infrastructure (e.g., distribution poles, service line drops). These infrastructure upgrades, while being financially challenging, are usually mandated investments to provide electricity to ratepayers and are supported by policy, regulation, and utility cost recovery. Without infrastructure investments, utilities do not have a platform on which to innovate the customer experience.

## ***Infrastructure must be in place to deliver services and facilitate other CX investments—hence it is Option 0.***

**Option 1: Social interventions** are programs implemented by utilities for a specific set of customers to help improve their ability to pay or to elevate their financial and social standing. Such interventions might take the form of planned investments in communities of existing customers or in targeted, new customer segments as the utility connects new customers or tries to convince others to return to regularized service. Examples of social interventions include setting up a dental clinic and signing up new customers in the process or holding a fair with a government agency to help customers apply for official identification. Such projects are designed to help build trust and establish the utility as a partner in the community.

**Option 2: Behavioral campaigns** are initiatives that help assess CX needs and orient customer interface design (e.g., payment systems) to encourage or nudge customers to behave in a certain way. Examples of behavioral campaigns might include educating customers on electricity usage or setting desired behaviors as the default. They may include direct marketing campaigns that seek to appeal to customer reason and consciously shift behavior, for example, educating customers on ways to conserve energy. These efforts can manifest in marketing collateral, monthly bills, and other campaigns directed at target customer groups. They typically leverage information about the customer and the social context to tailor the utility's services and messaging to customers.

**Option 3: New technologies or software systems** are information technology (IT) programs that allow utilities to better connect with customers' needs and preferences and provide visibility into how and why these customers use electricity (e.g. smart customer interface software). These software applications augment aspects of customer acquisition and maintenance programs (i.e., signing up customers, billing, or locating assets and areas with high losses) and improve the utility's insight into and ability to respond to customer needs.

# Measuring costs and benefits of CX investments

**R**EGARDLESS OF THE level of innovation in any CX program utility managers want to implement, success can depend on whether it can be justified by sound financial calculus. Unfortunately, managers often struggle to explain to their leadership the reasons for upfront costs and ongoing expenditures in these programs.

All utilities have the tools to measure the costs, benefits, and appropriateness of investments in their capital infrastructure, technologies, and other business priorities. As mentioned earlier, this is typically done through a capital budgeting process or a simple payback analysis.

As the LTV/CAC framework and the following example illustrate, to enhance

utility performance it is not only important to improve CX, but also to do it in a way that supports the drivers of the utility's key financial metrics. This framework is not intended to *supplant* existing methods or internal processes, but rather *translate the value* of CX investments into the language of the utility's core business economics. This approach is intended to offer a *new perspective* using a customer-focused financial metric to evaluate different types of CX investments for utility companies to consider.

## The LTV/CAC framework

To apply this framework, we first define a streamlined set of inputs that can help quantify the different costs and benefits associated with CX initiatives. Using these inputs, utility managers can calculate a metric for evaluating the value of a CX investment. This metric is a **ratio of the net lifetime value of customers retained (LTV)** to the **costs of acquiring those customers (CAC)**. Simply put, does the value of the customer over the life of their relationship with the utility justify the upfront cost of acquiring them?

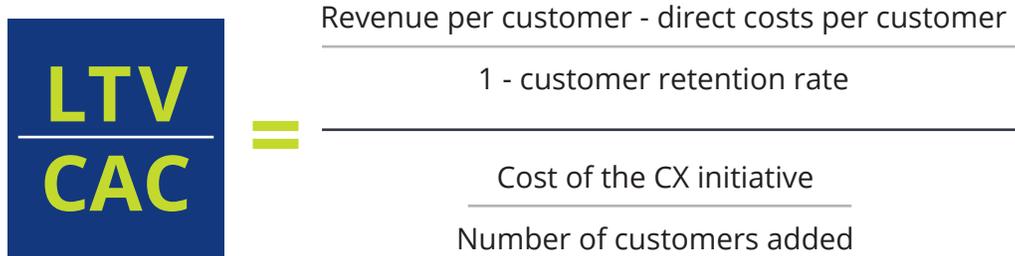
## Does the value of the customer over the life of their relationship with the utility justify the upfront cost of acquiring them?

The ratio includes straightforward inputs and can help managers estimate this metric for a targeted service area or customer segment. Figure 1 details each of these inputs and their role in shaping and influencing the LTV/CAC ratio. This metric allows for a standardized discussion within the utility and in developing countries at large, thus creating grounds for more nuanced conversations with international donors or other entities providing funding for utility companies.

FIGURE 1

## The LTV/CAC formula: Calculating the value of CX investments

**LTV:** lifetime value    **CAC:** customer acquisition cost



The diagram shows the LTV/CAC formula. On the left, a blue square contains 'LTV' over a horizontal line and 'CAC' below it. To the right of the square is an equals sign. Further right is a fraction: the numerator is 'Revenue per customer - direct costs per customer' over '1 - customer retention rate', and the denominator is 'Cost of the CX initiative' over 'Number of customers added'.

$$\frac{\text{LTV}}{\text{CAC}} = \frac{\frac{\text{Revenue per customer} - \text{direct costs per customer}}{1 - \text{customer retention rate}}}{\frac{\text{Cost of the CX initiative}}{\text{Number of customers added}}}$$

### LIFETIME VALUE OF A CUSTOMER: INPUT VARIABLES

Input	Description
<b>Revenue per customer</b>	Revenue per customer is a simple calculation of the tariff charged to a customer multiplied by the average annual electricity consumption of the customer segment targeted by the investment. The tariff used to calculate this figure is the basic residential rate or, if it's a low-income area, the lifeline rate. Any additional fees charged by the utility should also be captured under this input. The revenue figure used to calculate this input is an annual figure.
<b>Direct costs per customer</b>	The direct cost of a customer to the utility includes everything from processing costs to equipment provided to the customer. A set cost plug for processing and onboarding a newly connected (or regularized) customer can be used, or the cost can vary depending on local utility practices.
<b>Churn* or customer retention rate</b>	The expected annual retention rate of customers connected (or regularized) through the program being evaluated.

## CUSTOMER ACQUISITION COST: INPUT VARIABLES

Input	Description
<b>Cost of the CX initiative</b>	The program cost to the utility (i.e., the cost of the new billing software, organizing a customer registration fair, donating a soccer field, etc). This cost number should be focused on the direct costs of the specific investment. For ease of analysis, it should not include the staff or operational costs (which are captured in the direct costs per customer in the numerator).
<b>Number of customers added</b>	The anticipated number of net new (either newly connected or consumers converted to legal customers) added from the program.

\*Note: Churn rate plays a critical role in translating annual expected profit per customer to the expected value of an acquired customer over time. For example: An 80% retention rate means that there is an 80% chance that a customer will still be around after a year, a 64% chance after two years (.8 x .8), and so on. This geometric distribution of customers yields a mean tenure expectancy of  $1 / (1 - .8)$  or 5 years.

Source: Corporate Finance Institute, "CAC LTV Ratio," accessed January 4, 2021.

## Benefits and nuances of the LTV/CAC framework

One of the primary benefits of using the LTV/CAC framework to evaluate potential CX investments is that it can help utility teams think through the different components of a customer engagement program and identify which levers to focus on. This, of course, will generally depend on factors such as the goals of the investment, types of customers being targeted, financial health of the company, amount of capital available for the project, type of aid or assistance from international donors, and the political and/or cultural context. The idea, again, is not to supplant long-term financial planning models but to *add another metric* to financially contextualize these projects from the customer perspective.

It is also **important for the utility to define the specific customer type or segment before applying the framework**. This is because different customer types—say, those who have never received electricity service vs. those who are illegally connected to the grid—will have different LTV/CAC input numbers. For instance, regularizing illegal users of electricity not only increases revenue but also reduces cost for a

**The idea, again, is not to supplant long-term financial planning models but to add another metric to financially contextualize these projects from the customer perspective.**

utility—a double impact on its bottom line that is not present during the acquisition of a new customer who has never used electricity service.



Utilities should also keep in mind that different types of CX investments can address the unique needs of different customer segments. While identifying programs, CX teams should consider these nuances to ensure that various customer types are identified, contextualized, and designed for in each project.

The LTV/CAC framework also offers CX teams a standard metric to compare the potential merit of different types of programs before taking them to international donors. Often, discussions with donors are based on a portfolio of project options. The CX team can use the LTV/CAC metric to evaluate the potential lifetime value of a project as well as the potential customer acquisition costs,

thereby prioritizing and planning better for discussions with donors.

It's worth noting again the omission of typical inputs used in utility investment decisions models—costs of capital, discount rates, risk premia—that are front and center in any discounted cash flow calculation. These traditional inputs are not to be found explicitly in the formula. The LTV/CAC ratio is not designed to generate a specific project value, but rather offers a relative decision metric between a set of comparable project options. Under this framework, future cashflows can act as relative proxies among investments, with similar timelines allowing for comparability among project options.

# LTV/CAC framework in action

## An illustrative approach

**T**O ILLUSTRATE HOW the LTV/CAC metric can be used to evaluate potential CX investments, consider a hypothetical utility, Electric Co., which is the sole provider of electricity to residential and commercial customers in a developing country. Its service territory, the hypothetical Circuit County, has a population of approximately 100,000 potential customers, 50% of whom are formally connected through a prior extension of the grid.

Unfortunately, funds for connecting the remaining customers ran out as government mandates require only a 50% connection rate along with reasonable proximity of the lines to the remaining population. As a result, many people have remained unconnected, burning local biofuels for cooking and, at times, connecting illegally to weak points in the utility's network. The legal customers hold resentment for the illegal ones and are frustrated as they're paying their fair share, but the latter receive free power and degrade the power quality. Also, the legal customers, who are new to grid-connected electrical service, are trying to understand how to maximize service quality and minimize their cost.

After hearing the legal customers' stories at a local meeting, a county manager of Electric Co. is evaluating the costs and benefits of different types of investments for both connecting new customers and formalizing those who are illegally connected to the grid. Electric Co. is considering investments in each of these categories: a direct social intervention with both unconnected and connected households; a behavioral design and marketing campaign initiative; and procurement of a new

customer interface software technology. In evaluating these options, the company also must keep in mind its mandate from the government to add 10,000 new connections by the end of the year.

Electric Co. decides to compare the LTV/CAC metric for each of the above-mentioned CX investments. The inputs for the LTV/CAC metric, as detailed earlier (figure 1), include revenue and costs per customer, retention rate, total number of customers added as a result of the initiative, and cost of the initiative. The nature of the investments (capital expenditure vs. marketing) will drive different types of costs, so those have been delineated as well.

Figure 2 outlines the estimated impact of each input in relation to the others as well as the impact on the numerator versus the denominator of the LTV/CAC ratio. The intent of this figure is to illustrate how the different components of the LTV/CAC ratio can be measured—positively and negatively—for different types of CX investments, and how those inputs work together to produce an overall ratio.

As discussed earlier, an **infrastructure investment** is Option 0 as such an investment must be already in place to leverage other CX investments. So, we have excluded the option from the LTV/CAC matrix below. As we see in the Electric Co. example, CX investments can quickly deteriorate if the actual customer experience is not managed. Expansion of the distribution network comes at a high direct cost in the form of capital expenditure and typically doesn't include marketing costs. Despite this high investment cost,

FIGURE 2

### Illustrative LTV/CAC inputs for Electric Co. and their directional impact on potential CX investments

Main components	Input variables	Social interventions	Behavioral campaigns	New technology and software
 Increases to LTV increase LTV/CAC	Revenue	⊕ ⊕ ⊕	⊕ ⊕	⊕ ⊕ ⊕
	Retention	⊕	⊕ ⊕	⊕ ⊕ ⊕
	Number of new customers	⊕ ⊕	⊕	⊕
 Increases to CAC decrease LTV/CAC	Direct costs	⊕ ⊕ ⊕	⊕	⊕ ⊕
	Marketing cost	⊕	⊕ ⊕ ⊕	⊕

Source: Deloitte analysis.

a comparable increase in revenue is not a guaranteed result.

Customers need to understand the terms of service first and be able to pair that understanding with an ability to pay for the upfront connection, electricity service, and fees. Where customers can pay for connections and service, infrastructure upgrades have the potential to add a significant number of new connections (and corresponding revenue) but are less likely to help regularize illegal customers. Electric Co. faces a mandate to not only connect a certain number of customers by end of the year, but also needs to realize a return on capital deployed. According to the LTV/CAC framework, Electric Co. should now focus on *servicing the customer* and providing a competitive electricity service.

**Social interventions** (Option 1) are popular solutions deployed in many developing markets. A social intervention aims to drive higher revenue and gain new customers by providing a better ecosystem of social services paired with electricity service. For this CX intervention, Electric Co. is

considering partnering with a nonprofit organization to provide health care services to customers of good standing. This intervention will bring some direct costs in the form of health care support to Circuit County citizens and marketing costs associated with educating potential and existing customers on the program and how to use it. The intervention will return value to the utility in the form of increased customer retention resulting from the improved relationship between the customer and the utility as well as an increase in the ability for a customer to pay for service (e.g. healthy customers miss fewer days of work, are more likely to stay employed, and have more income to pay their utility bills).

**Behavioral campaigns** (Option 2) are similar to social interventions in that they usually don't require significant capital expenditure but differ in their target audience. Generally, behavioral campaigns are geared more toward existing customers in the hope of nudging them toward preferred behaviors. Electric Co. is considering an energy-efficiency education campaign paired with an electricity bill management education session

based on residential customer usage patterns in Circuit County. This behavioral campaign is expected to drive a modest increase in revenue (since customers will be better able to manage their monthly bill and, therefore, pay it more regularly) and generate moderate retention among existing customers. This initiative has little or no focus on connecting new customers. Costs associated with this intervention will largely be marketing related and directed at existing customers.

**New technology systems** (Option 3) come at a more modest cost as compared to a large infrastructure investment but have the potential to generate significant revenue and increased retention among existing customers. New software is one of the more appealing investments for Electric Co. as it may also require a certain level of investment in infrastructure upgrades to the grid, which Electric Co. is mandated to make in its service area in any case. This is because a user-friendly prepayment software can't function without a significant grid extension.

It's important to note here again that **customer segmentation** has a significant impact on these results. Defining the target customer type should be the first step to using the LTC/CAC framework. For our analysis, we have limited the segmentation to new and illegal customers, but a utility's customers could include a mix of new customers, previously illegally connected customers, customers segments with highly fragmented income distributions, or divergent consumption profiles, to name a few. A careful customer segment analysis can help tailor CX initiatives for different communities and optimize capital deployment.

With a view to exploring different CX investments and their relationships with one another, we used

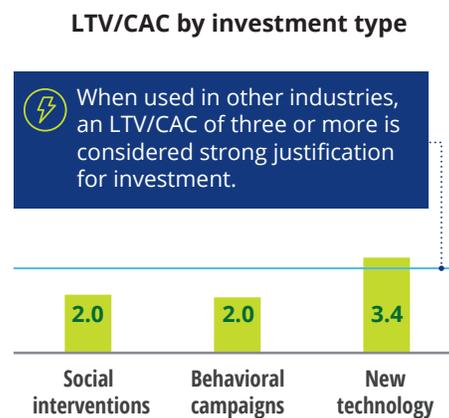
the LTV/CAC metric to understand and compare the basic inputs and expected outputs for Electric Co. (figure 3). For the illustrative example, we used approximate estimations based on Deloitte's

## A careful customer segment analysis can help tailor CX initiatives for different communities and optimize capital deployment.

experience working with developing countries and industry standards for a developing country utility, with Electric Co.'s profile. Based on these estimations, we arrived at metrics of roughly two to one for each social and behavioral interventions and three to one for technology solution investments.

After applying the LTV/CAC framework to Electric Co., it becomes clear that while Option 0 is necessary as a baseline, the case for infrastructure

FIGURE 3  
**LTV/CAC for different investment initiatives at Electric Co.**



Once the **shift in mindset** is achieved and several CX programs are implemented, evaluating and justifying such programs become much easier with the LTV/CAC ratio.

Source: Deloitte analysis.

investment on its own would appear quite weak in comparison because of the high upfront capital cost and limited impact on customer revenues over time. Under the LTV/CAC application, infrastructure investments drive a very large denominator (customer acquisition costs) with limited to no impact on the numerator (direct increase in customer revenues over time). Spending significantly more to connect customers to the grid than they return over time is a fast route to insolvency. This iterates the necessity of an ecosystem of programs to support new on-grid connections in developing countries. Connection costs need to be brought down, electricity rates should reflect the costs, and after an infrastructure investment, utility services should meet customer expectations in today's highly competitive environment.

Most importantly, Electric Co. can't undertake the other CX initiatives listed here without investing in Option 0. Analogous to the technology service industry that LTV/CAC was adapted from, Option 0 is the heavy cost the utility must bear to make the more attractive subsequent marginal investments in Options 1, 2, and 3—social interventions, behavioral campaigns, and new technology or software systems respectively.

For CX investments in Options 1, 2, and 3, Electric Co. could produce US\$2–3.5 in revenue for every dollar spent on connecting a customer. So, unlike in Option 0, Electric Co. doesn't need any other financial incentives to implement programs in

these areas. That said, this requires a fundamental mindset shift away from capital buildouts and toward executing novel customer-centric programs. While there's never been a more opportune time to engage with customers, such a mindset shift in a traditional utility structure will require time and resources from leadership to linemen.

In addition to the potential impact of each of these interventions independently, there are opportunities for compounded impact when they're used together. Behavioral campaigns, for example, are likely to have a greater impact when informed by data collected and monitored through new technology and software systems.

Electric Co. may struggle with these new dynamics at first but would eventually benefit from adopting new CX initiatives and effecting a mindset shift to a more customer-centric organization. The medium-to long-term financial results, as measured by the LTV/CAC metric, illustrate that the benefits of the upfront investment should justify the shift. Doing so can enable utility managers to better appreciate the business case of delivering a strong customer experience unique to the socio-economic conditions and local context of their service territory. Once the shift in mindset is established and several programs have been implemented, evaluating and justifying CX programming typically becomes easier and more common. Eventually, Electric Co. may look at new, more innovative CX programs.

# Benefits of CX programs on a utility's organization

IN ADDITION TO the financial calculus outlined above, there are several other quantitative and qualitative benefits that utilities can reap from customer-oriented investments. Generally, utilities operate in siloed departments, but developing a CX program requires the involvement of utility managers and employees across the enterprise. This can help improve internal communications and promote an understanding of other functions and roles among teams. This **cross-enterprise collaboration** can also help drive diversified experiences and learning for employees.

CX programs can help employees feel more aligned with the utility company's mission and help meet its key performance indicators.

Working in a company that receives positive feedback from its customers can **improve employee morale**. As employees may sometimes be part of the problem in a utility (for instance, employees who aid illegal connections), putting in place

programs that help them feel better invested in the company mission and see how it improves the lives of its customers may have the ancillary effect of **mitigating some of the AT&C losses**.

For most citizens in developing countries, utility companies are often at best an afterthought and, at worst, disliked and distrusted entities.<sup>5</sup> This sentiment can result in vandalism of utility assets (further exacerbating financial strain) or normalization of a culture of nonpayment (across income levels, which is particularly problematic in

the case of customers with high consumption levels). Publicly and meaningfully carrying out CX initiatives that result in connecting customers to high-quality and reliable electricity services can help ameliorate the utility's public image. Working closely with community leaders and civil service organizations to address citizens' pain points can also help **improve the company's reputation in the community** it serves. In line with improvements to the utility's reputation, is the utility's understanding of the customer. Where the utility has better, clearer, and more credible insight into public opinion, this information can serve as a sound source for informing and justifying future investments or rate decisions.

**Meaningful CX initiatives that connect customers to high-quality and reliable electricity services can help ameliorate the utility's public image.**

Finally—especially in the case of capital investments—CX programs can help **create a more reliable, long-term stream of cashflows** from net new and newly regularized customers. As evident from our analysis, some CX program investments have higher costs or are more resource intensive to implement. But others, such as creating operational processes to better understand different customer types and address their concerns, require less capital upfront, yet can result in tangible long-term revenue gains.

### CASE STUDY: MOZAMBIQUE'S EDM REINVENTS ITS CUSTOMER EXPERIENCE

In Mozambique, the state-owned electric utility Electricidade de Moçambique (EDM) recently used human-centered design (HCD) to reimagine its customer experience as it established a new electrification management unit (EMU) and sought to expand its customer base by increasing its connections rate five-fold (from 300/day to 1,500/day in 2021) in order to achieve a national goal of electrifying all households by 2030.<sup>6</sup>

EDM realized there was a lack of clarity among unconnected citizens about the relationship between the utility and the customer and the latter's role in paying for service. Political leaders often announce mandates for electricity connection and communicate to citizens that they will receive electricity. It is only once the utility arrives in their communities that people learn of the cost of connection and service. This longstanding disconnect poses a significant financial burden to the utility.<sup>7</sup>

In Mozambique, all residential service is delivered via prepaid meters. The utility incurs large capital costs in installing these meters and relies heavily on customers to use them to recoup the investment. Even when customer usage and payment is reliable it can take years for the utility to recoup the cost of the meter.<sup>8</sup>

Utility managers at EDM recognized these issues but did not know where to start in terms of improving and managing the customer relationship. They also needed to discuss the initiative internally and propose the investment to their leadership and board. This case presents an ideal opportunity for comparing metrics around the potential **LTV** of new customers and the **CAC in each segment** to help the EMU prioritize and roll out new initiatives as it undertakes a totally new approach to customer engagement across its organization.

Customer centricity is critical for EDM as it seeks to clarify the utility-customer relationship. So is building trust among citizens and strengthening revenue streams on which EDM's financial viability is dependent. Since Mozambique citizens view the electric utility as quasi-governmental, the service relationship gets blurred, putting even greater emphasis on building trust and understanding with the customer. The quasi-governmental relationship also impacts customer behavior, in some cases degrading customers' sense of obligation to pay, weakening the financial viability of the utility.



The HCD approach taken by EDM followed a process of discovery, define, develop, and deliver. In the discovery phase, the team listened to EDM customers through 191 interviews, collecting data to draw clearly the lines of each problem faced by customers. The team then used this data to build nine personas that helped connect the problem to the person, shed light on decision-making, and inform individual experiences. The personas paint a holistic picture of the customer archetype—their goals and motivations, worries and frustrations, where they get information, and their basic demographics—informing *why* and *how* a persona reacts across moments in the customer journey. The gathered data can help design future **behavioral campaigns** or tailor potential **social interventions** in the target communities.<sup>9</sup>

The EMU used the personas to craft customer journey maps that outline the crucial moments, emotions, and outcomes experienced by the customer. The journey maps followed the customer experience from preparing to connect through each stage of connection, to the connection itself, and finally the postconnection customer experience.<sup>10</sup>

The HCD approach helped the team identify several opportunities for improving the customer experience, organized both by stages in the customer journey as well as by EDM's verticals: communications, billing process, managing expectations, technology, and employee experience. The project had a more critical impact in that it helped the EMU immerse itself in the perspective of its customers as it set forth on its journey to build a more sustainable, customer-centric company responsive to its end users.

As an important next step, EDM should appoint dedicated utility managers (each serving different communities and customer types) in its local offices to work across functions and provide a customer lens. These local managers can serve to inform electricity investments, connections, and service delivery. Providing these managers with a quantitative framework (i.e., LTV/CAC) to evaluate CX initiatives could help streamline the discussion among the managers as well as help them prioritize projects for their local office.

These local managers can also play an important role in growing the number of connections by improving the customer service on the ground. Most utilities send agents to install meters for new connections; these agents often turn up without much notice or go late to customer households. If the customer is not at home, the connection is not installed, and the costs of the trip goes unrecovered. The utility often doesn't send an agent to the household again, degrading its trust with the potential customer and even discouraging them from applying for a new connection or service in the future.

Effectively deploying and integrating local customer service managers at local offices and providing them with the tools they need could be key to EDM's success in shifting to a more customer-centric organization. LTV/CAC is one way for EDM to ensure its reorientation to the customer is sustained as investments in CX arise for evaluation and decision.

# Powering the customer experience

**U**TILITY COMPANIES IN developing countries are facing new pressures, growing competition, and continued challenges related to an eroding customer base. There is a pressing need to justify to international donors and governments large-scale investments in increasing connections, and to regularize illegal customers to establish long-term revenue streams.

Utilities can do this by reimagining the customer experience and investing in its various aspects. While deciding on and prioritizing different areas of investment—from infrastructure and social interventions to behavioral campaigns and new technologies—they should keep an eye on the target customer type and segment.

**The LTV/CAC framework** can help them parse this space systematically and consistently. It can help utility managers compare the potential value of CX investments across customer types so they can take informed discussions along with the buy-in of their leadership. It can also help companies to create **lifetime customers who are dedicated to the utility in the same way the utility is dedicated to them**. This approach can help utilities in developing countries become more financially sustainable, customer-centric organizations with an increasing base of satisfied customers on the grid.



## Endnotes

1. Corrie Carrigan et al., "Powering up the customer experience in utilities: Understanding what matters most to customers helps identify areas for improvement," Bain & Company, June 21, 2019.
2. Corporate Finance Institute, "CAC LTV ratio," accessed December 11, 2020.
3. National Association of Regulatory Utility Commissioners, "Cost of capital and capital markets primer for utility regulators," April 2020.
4. Vikas Taneja and Mark Roberge, "The one ratio every subscription business needs to know: Using LTV/CAC to guide investments and operations," Boston Consulting Group, February 9, 2017.
5. As an example, see the following: Sanjay Dutta, "Why 28% of power consumers are unhappy, poll throws light," *Times of India*, November 9, 2020.
6. Power Africa, "Mozambique energy sector overview," USAID, September 28, 2020.
7. Power Africa, "Improving electricity utility customer management in Mozambique through human centered design," September 16, 2020.
8. World Bank, International Development Association, *Project appraisal document on a proposed grant to the Republic of Mozambique for power efficiency and reliability improvement project*, Report No. PAD1935, September 7, 2017, p. 3.
9. Power Africa, "Improving electricity utility customer management in Mozambique through human centered design."
10. Ibid.

## About the authors

### **Sophia Peters | [sopeters@deloitte.com](mailto:sopeters@deloitte.com)**

Sophia Peters is a senior manager with Deloitte Consulting LLP, leading contracts focused on international clients in emerging markets related to utility operations and commercialization, electricity markets, and power project development. She has a specific interest in understanding how consumers make decisions and how that decision-making process can be improved.

### **Ryan Daly | [rydaly@deloitte.com](mailto:rydaly@deloitte.com)**

Ryan Daly is a manager with Deloitte Consulting LLP and has conducted projects in over a dozen different countries across a variety of public and private clients, supporting technology strategy, infrastructure finance, and renewable generation projects. His focus is on improving the resiliency of power sectors, through enhanced electric utility performance and fostering growth in innovative technologies.

### **Kathy Julik-Heine | [kjulikheine@deloitte.com](mailto:kjulikheine@deloitte.com)**

Kathy Julik-Heine is a manager with Deloitte Consulting LLP. Her areas of expertise include renewable energy finance and development, energy and climate policy, international economic development, and gender economics. She has experience driving technical studies, assessments, and analyses, conducting field research, managing projects internationally, and collaborating across nonprofit, government, and corporate sectors.

## Contact us

*Our insights can help you take advantage of change. If you're looking for fresh ideas to address your challenges, we should talk.*

### **Sophia Peters**

Senior manager | Deloitte Consulting  
+1 571 814 6400 | sopeters@deloitte.com

### **Ryan Daly**

Manager | Deloitte Consulting  
+1 571 882 8134 | rydaly@deloitte.com

### **Kathy Julik-Heine**

Manager | Deloitte Consulting  
+1 571 882 6821 | kjulikheine@deloitte.com

## Practice leadership

### **Marlene Motyka**

US and Global Renewable Energy leader  
Principal | Deloitte Risk and Financial Advisory  
+1 973 602 5691 | mmotyka@deloitte.com

Marlene Motyka specializes in renewable energy, power and utilities, and valuation for Deloitte's Risk and Financial Advisory practice.

### **Bruce Chew**

Managing director | Deloitte Consulting  
+1 617 437 3526 | brchew@deloitte.com

Bruce Chew specializes in enterprise and customer strategy and the building of organizational capabilities for Deloitte Consulting LLP.

### **Richard Longstaff**

Managing director | Deloitte Consulting  
+1 724 719 1357 | rlongstaff@deloitte.com

Richard Longstaff leads Deloitte's Federal Energy team, he also specializes in international energy, extractives, and utility development in the public and private sectors.

## The Deloitte Research Center for Energy & Industrials

### **Carolyn Amon**

Manager | The Deloitte Research Center for Energy & Industrials | Deloitte Services LP  
+1 571 814 6979 | caamon@deloitte.com

Carolyn Amon researches and develops thought leadership in the renewables, power and utilities, and oil and gas sectors.

## Acknowledgments

The authors would like to thank **Nick Cooper**, **Alexandra Eterno**, **Greyson Heffner**, and **Richard Longstaff** from Deloitte Consulting for their technical contributions to the perspectives developed in this article; **Carolyn Amon** from the Deloitte Research Center for Energy and Industrials for her instrumental guidance and editorial support; and **Bruce Chew** from the Deloitte Center for Government Insights and **Marlene Motyka**, Deloitte US Global and Renewable Energy leader, for their valuable insights. The authors would also like to thank our international development clients and the many managers and leaders at power utilities around the world whose efforts and collaboration provided insight for this article.



# Deloitte.

## Insights

Sign up for Deloitte Insights updates at [www.deloitte.com/insights](http://www.deloitte.com/insights).



Follow @DeloitteInsight

### **Deloitte Insights contributors**

**Editorial:** Prakriti Singhanian, Rupesh Bhat, and Nairita Gangopadhyay

**Creative:** Adamy Manshiva and Kara Vuocolo

**Promotion:** Maria Martin Cirujano

**Cover artwork:** Nagaraju Mangala

### **About Deloitte Insights**

Deloitte Insights publishes original articles, reports and periodicals that provide insights for businesses, the public sector and NGOs. Our goal is to draw upon research and experience from throughout our professional services organization, and that of coauthors in academia and business, to advance the conversation on a broad spectrum of topics of interest to executives and government leaders.

Deloitte Insights is an imprint of Deloitte Development LLC.

### **About this publication**

This publication contains general information only, and none of Deloitte Touche Tohmatsu Limited, its member firms, or its and their affiliates are, by means of this publication, rendering accounting, business, financial, investment, legal, tax, or other professional advice or services. This publication is not a substitute for such professional advice or services, nor should it be used as a basis for any decision or action that may affect your finances or your business. Before making any decision or taking any action that may affect your finances or your business, you should consult a qualified professional adviser.

None of Deloitte Touche Tohmatsu Limited, its member firms, or its and their respective affiliates shall be responsible for any loss whatsoever sustained by any person who relies on this publication.

### **About Deloitte**

Deloitte refers to one or more of Deloitte Touche Tohmatsu Limited, a UK private company limited by guarantee ("DTTL"), its network of member firms, and their related entities. DTTL and each of its member firms are legally separate and independent entities. DTTL (also referred to as "Deloitte Global") does not provide services to clients. In the United States, Deloitte refers to one or more of the US member firms of DTTL, their related entities that operate using the "Deloitte" name in the United States and their respective affiliates. Certain services may not be available to attest clients under the rules and regulations of public accounting. Please see [www.deloitte.com/about](http://www.deloitte.com/about) to learn more about our global network of member firms.