

Smart Power for Advancing Reliability and Connectivity (SPARC) Technical Assistance Program

ENHANCING CUSTOMER CENTRICITY IN THE ELECTRICITY DISTRIBUTION SECTOR



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Foreword

The United States and India's collaboration in the field of energy has always been among the strongest pillars of our bilateral partnership. The United States, through the U.S. Agency for International Development (USAID), works closely with the Ministry of Power, Government of India, and together, we have implemented some very successful programs such as the Distribution Reform, Upgrade and Management (DRUM) program in 2004 and the more recent Partnership to Advance Clean Energy-Deployment Technical Assistance (PACE-D TA) program, which ended in 2018. These programs are just two examples of our strong history of working together and how well our engineers and analysts collaborate to help progress India on its journey to a low-carbon, high-powered growth.

USAID's "Smart Power for Advancing Reliability and Connectivity (SPARC)" program, launched in 2018 in collaboration with the Ministry of Power, is yet another joint initiative that aims to advance India's power sector reforms by supporting the transformation of operational and financial performance of Indian power distribution companies (DISCOMs).

One of key focus under this bilateral program is supporting the Ministry of Power and related agencies on driving fundamental changes, including introducing market-friendly policies and regulations; building institutional and human capacities; and sharing knowledge and best practices for improving and modernizing the Indian distribution companies in India.

As a part of this program, we have developed this report "Enhancing Customer Centricity in the Electricity Distribution Sector" in partnership with the National Smart Grid Mission under the Ministry of Power. This report identifies strategies and implementation enablers for customer experience transformation in India's electricity distribution sector, and provides a comprehensive analysis of the existing processes, customers' expectations across each of the customer utility touchpoints and also suggests appropriate nudge techniques to enhance the uptake of suggested digital interventions.

Thank you to all stakeholders who contributed to this report. I am confident that this report will help DISCOMs in better engaging their customers.

USAID is proud of its partnership with the Ministry of Power and looks forward to continuing its path-breaking collaborative work to build a more secure, smart, intelligent and customer-centric electricity network in India.

Karen Klimowski

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Foreword

Transforming demographics, shift in economic power, and advancements in technology are reshaping the expectations of customers across sectors and organisations and corporations especially in transaction oriented business are redesigning how they operate to move towards more customer-centric business operations. The power sector, hitherto a monomplistic and supplier dominated domain, is inching towards transactive energy scenerio thanks to Technology, ever competitive Solar and projected Storage options. Thus Power Sector is fundamnetally going to change and coupled with increased expectations of customers, the power distribution companies (DISCOMs) need to reinvent and achieve customer service excellence.

The Government of India (GOI), in the last few years, has been leading the transformative effort and made significant strides in increasing access to electricity. It has taken various reform measures including initiatives for enhancing customer convenience for availing new electricity connection, distribution of LED lamps under the UJALA program, launch of Pan-India complaint number 1912 integrated mobile application (Urja Mitra) and promotion of digital payments, among other initiatives.

A key requirement for DISCOMs and associated stakeholders today is to initiate systematic and structured interventions that not only deliver better value to the customer but also enhance the overall experience of dealing with public DISCOMs.

I am pleased to note that the USAID Smart Power for Advancing Reliability and Connectivity (SPARC) Program, in partnership with the National Smart Grid Mission (NSGM), Ministry of Power has compiled report “Enhancing Customer Centricity in the Electricity Distribution Sector”. The report provides an indepth analysis of customer-utility touchpoints and leading practices followed by DISCOMs in India and globally and sets the context for proposed interventions for enhancing customer-centricity in the electricity distribution sector. The report also draws upon learnings from leading practices followed by service providers in other sectors including banking, telecommunication, online retail, aviation, entertainment, and travel industry.

I take this opportunity to commend the entire USAID SPARC team for developing a comprehensive report providing guidance to DISCOMs and other stakeholders on how to enhance customer centricity and look forward to USAID partenering with DISCOMs in field to apply and test ways in which the proposed interventions can be achieved vis-s-vis exisitng system, processes and resources within DISCOMs.

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LIST OF ACRONYMS

AC	Air Conditioner
AePS	Aadhaar enabled Payment System
AJAY	Atal Jyoti Yojana
AMI	Advanced Metering Infrastructure
AMR	Automatic Meter Reading
APTEL	Appellate Tribunal for Electricity
ARRA	American Recovery and Reinvestment Act
BESCOM	Bengaluru Electricity Supply Company Limited
BESS	Battery Energy Storage System
BG	British Gas
BGE	Baltimore Gas and Electric
BHIM	Bharat Interface for Money
BRPL	BSES Rajdhani Power Limited
BSES	Bombay Suburban Electric Supply
BU	Billion Unit
BYPL	BSES Yamuna Power Limited
CAPEX	Capital Expenditure
CEA	Central Electricity Authority
CEEW	Council on Energy, Environment and Water
CERC	Central Electricity Regulatory Commission
CESC	Calcutta Electric Supply Corporation
CGRF	Consumer Grievances Redressal Forum
CII	Confederation of Indian Industry
CIS	Customer Information System
COVID - 19	Corona Virus Disease 2019
CSR	Corporate Social Responsibility
CTI	Computer Telephony Integration
DBT	Direct Benefit Transfer
DER	Distributed Energy Resources
DERC	Delhi Electricity Regulatory Commission
DEWA	Dubai Electricity & Water Authority
DHBVN	Dakshin Haryana Bijli Vitran Nigam

DISCOM	Electricity Distribution Company
DR	Demand Response
DT	Distribution Transformer
DTE	Detroit Edison
DTH	Direct-to-Home
DVD	Digital Video Disc
EE	Energy Efficiency
EESL	Energy Efficiency Services Limited
EHT	Extra High Tension
EM&V	Evaluation, Measurement & Verification
EMI	Equated Monthly Instalment
EV	Electric Vehicle
FAQ	Frequently Asked Question
FEDCO	Feedback Energy Distribution Company Ltd.
FIs	Financial Institutions
FOR	Forum of Regulators
FP&L	Florida Power & Light
FSA	Financial Service Authority
GB	Great Britain
GOI	Government of India
GST	Goods & Service Tax
GW	Gigawatt
HAREDA	Haryana Renewable Energy Development Agency
HDFC	Housing Development Finance Corporation
HER	Home Energy Report
HERC	Haryana Electricity Regulatory Commission
HT	High Tension
I&M	Indiana Michigan Power
IBM	International Business Machines
ICICI	Industrial Credit and Investment Corporation of India
IEA	International Energy Agency
IEGC	Indian Electricity Grid Code Regulations
IMPS	Immediate Payment Service
INR	Indian National Rupees
IOS	iPhone Operating System
IPPB	India Post Payments Bank
IVRS	Interactive Voice Response System
JVVNL	Jaipur Vidyut Vitran Nigam Limited
KERC	Karnataka Electricity Regulatory Commission

kW	Kilowatt
KYC	Know Your Customer
LED	Light Emitting Diode
LT	Low Tension
MP	Madhya Pradesh
MAIFI	Momentary Average Interruption Frequency Index
MANIREDA	Manipur Renewable Energy Development Agency
MERC	Maharashtra Electricity Regulatory Commission
MNRE	Ministry of New and Renewable Energy
MOP	Ministry of Power
MP&W	Muscatine Power & Water
MPUVNL	Madhya Pradesh Urja Vikas Nigam Limited
MRI	Meter Reading Instrument
MSEDCL	Maharashtra State Electricity Distribution Company Limited
MSPDCL	Manipur State Power Distribution Company Limited
MW	Megawatt
NEFT	National Electronic Funds Transfer
NGO	Non-Governmental Organization
NOC	No Objection Certificate
NV Energy	Nevada Energy
O&M	Operation & Maintenance
OFGEM	The Office of Gas and Electricity Markets
OG&E	Oklahoma Gas & Electric
OMS	Outage Management System
PCS	Public Charging Stations
PG&E	Pacific Gas & Electric
PM KUSUM	Pradhan Mantri Kisan Urja Suraksha evem Utthan Mahabhiyan
PNB	Punjab National Bank
POS	Point of Sale
PPA	Power Purchase Agreement
PV	Photovoltaic
PVVNL	Paschimanchal Vidyut Vitran Nigam Limited
QR	Quick Response
Rinfra	Reliance Infrastructure Limited
RTGS	Real Time Gross Settlement
SAIDI	System Average Interruption Duration Index
SAIFI	System Average Interruption Frequency Index
SBI	State Bank of India
SCE	Southern California Edison

SEFALI	Society's Empowerment for Assuring Livelihood
SERC	State Electricity Regulatory Commission
SIM	Subscriber Identity Module
SKY	Suryashakti Kisan Yojana
SMC	Surat Municipal Corporation
SMS	Short Message Service
SOP	Standards of Performance
SPARC	Smart Power for Advancing Reliability and Connectivity
SRISTI	Sustainable Rooftop Implementation for Solar Transfiguration of India
SRT	Solar Roof Top
SSE	Scottish and Southern Energy
T&D	Transmission & Distribution
TEPCO	Tokyo Electric Power Company
ToD	Time-of-Day
TPDDL	Tata Power Delhi Distribution Limited
UAE	United Arab Emirates
UHBVN	Uttar Haryana Bijli Vitran Nigam
UP	Uttar Pradesh
UPERC	Uttar Pradesh Electricity Regulatory Commission
UPI	Unified Payment Interface
US DoE	United States Department of Energy
USAID	United States Agency for International Development
USD	United States Dollar
UT	Union Territory
V2G	Vehicle-to-Grid

EXECUTIVE SUMMARY



Background

Customer centricity is increasingly becoming an intrinsic part of business strategy. Customers today are better informed and have higher expectations from their service providers. This is mainly driven by changing demographics, an economic shift, and technological advancements that are reshaping the market dynamics. Customers have become more demanding due to the seamless experience provided by various service providers such as an omnichannel interface, 24/7 customer care services, personalized services, etc. Several sectors that were previously served by monopolies have transitioned to competitive markets (e.g. telephone services, airlines, banks, broadband and cable television services, etc.). Customers of these sectors have the freedom to make choices. This trend is putting pressure on other sectors such as electricity to enhance customer experience as well. Electric utilities need to respond to the changing market trends and move towards more customer-centric business operations.

International brands such as Amazon, Google, Toyota, Netflix, etc., known for their exceptional customer services, can provide great lessons to electric utilities as they strive to make customer interactions personal, seamless and frictionless. For example, Amazon helps its customers to make purchase decisions by allowing them to post and read reviews on their website. Google provides personalized feeds and updates (news, search results, videos, etc.) to its users. Toyota's "customer first and quality first" principles are designed to "pull" customer's feedback through various personalized "touch-points" to drive innovation and ensure quality. Netflix¹ logs and analyzes every customer interaction to predict viewing preferences and deliver personalized recommendations. Similarly, electric utilities need to revisit the business processes and provide enhanced value-added as well as customer-centric services such as data analytics, energy management solution, home automation, flexible payment options, multimedia interaction platforms (including chatbots, interaction through social media, mobile applications, etc.), among others.

The COVID-19 pandemic has brought to the fore the need for enhanced customer centricity for electric utilities across the globe. Proactive initiatives of utilities to ensure business continuity have led to adoption of new and innovative ways to engage and help customers in these difficult times. Many utilities are offering free services, providing customized financing solutions for payment of bills, and are setting up dedicated facilities to address customer concerns. Harnessing cutting-edge technology and digital platforms can unleash a completely different customer experience for electricity customers and redefine the supplier-customer relationship.

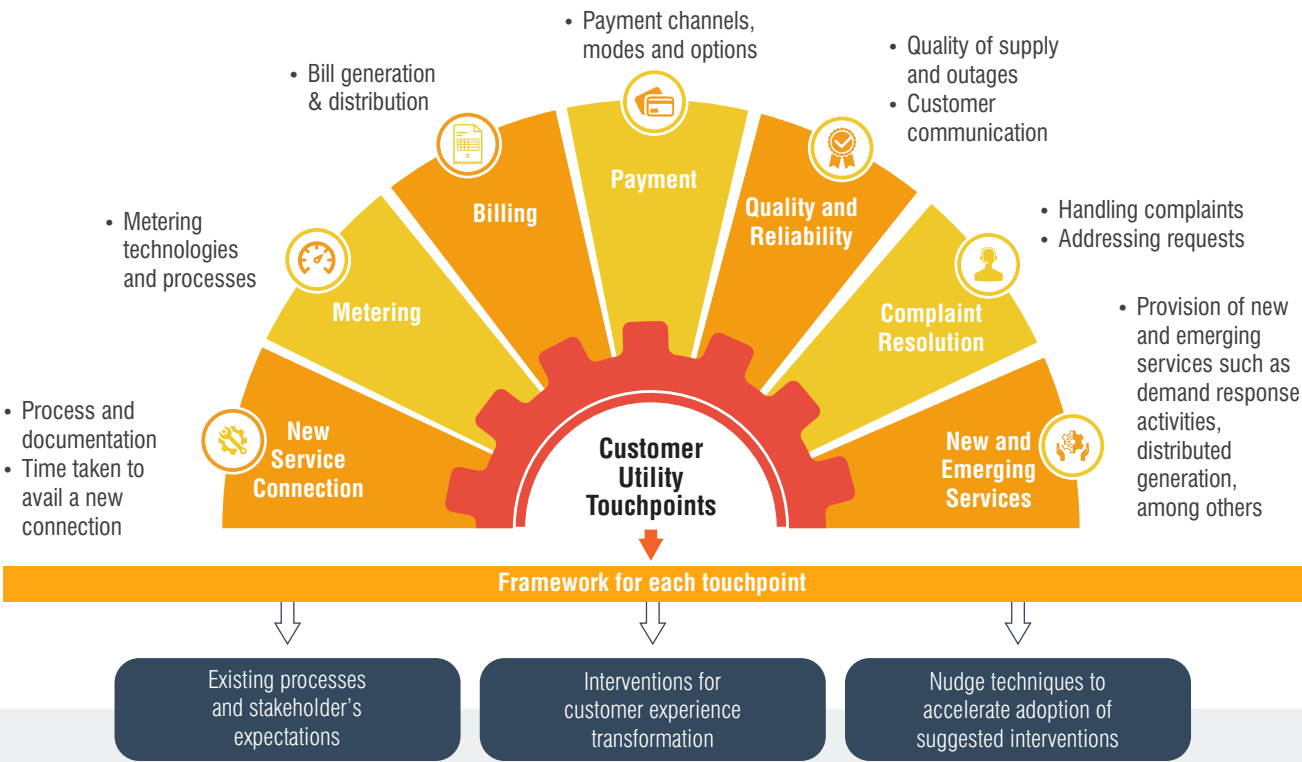
In this context, the U.S.-India bilateral program, Smart Power for Advancing Reliability and Connectivity (SPARC)², conducted a study on "Enhancing Customer Centricity in the Electricity Distribution Sector". The study was carried out to identify relevant strategies and implementation enablers for enhancing customer experience. This report provides an in-depth analysis of existing consumer-utility touchpoints and suggests interventions for enhancing customer-centricity in the electricity distribution sector.

¹<https://www.forbes.com/sites/anthonymsmith/2017/12/12/how-to-create-a-customer-obsessed-company-like-netflix/#222622d76d22>, last accessed on 11th January 2020

²The United States Agency for International Development launched the SPARC Program in partnership with the Ministry of Power, Government of India in 2018. SPARC is a three-year (September 2018-September 2021) initiative that focuses on the transformation of operational and financial performance of electricity distribution utilities. The implementing partner of the SPARC program is KPMG Advisory Services Pvt. Ltd.

Approach

Figure 1: Framework for Study on Customer Centricity



Summary of key findings

As a part of this study, the USAID SPARC Program team identified a set of interventions for customer experience transformation across all major utility-customer touchpoints—from availing new service connection to metering, billing, payment, quality, grievance redressal and emerging services. These interventions were identified based on detailed analysis of existing processes, customers' expectation and discussions carried out with the various utilities. A brief overview of proposed interventions is shown in Table 1.

Table 1: Overview of proposed interventions for customer experience transformation

Stakeholder's Expectations	Evidence	Leading Practices	Suggested Interventions
1. New Service Connection			
<ul style="list-style-type: none"> • Responsive parameters in the application form • Fast track procedure • Best-in-class services 	<ul style="list-style-type: none"> • Application form requires inputs on 50-70 parameters, and it takes 30-45 minutes to complete. • In some cases, customer needs to provide technical information like estimated load and nearest pole number which is difficult to identify. • In FY2018-19, average time taken for availing an electricity connection in India was 53 days—the same in Singapore and United Arab Emirates (UAE) was 23 and seven days respectively.³ • Utility officials visit customer's premises for site inspection. 	<ul style="list-style-type: none"> • In the U.S. and UK, application forms require inputs on 20-30 parameters, and it takes 15-20 minutes to complete. • Under the "Tatkal" scheme, citizens can obtain passports in one to three days. • A new telecom connection can be activated in one to two hours. • Kotak Mahindra Bank provides instant/door-step account opening services. • Specialized training on customer management is provided by Orlando Airport authority to its staff. 	<ul style="list-style-type: none"> ✓ Simplify the application form—seek minimum information from customers and provide default values, wherever possible. ✓ Provide door-step assistance to apply for a new connection. ✓ Reduce the number of steps for issuing a new connection – revisit Standards of Performance (SOP) regulations. ✓ Train the utility staff on customer management and behavior.
2. Metering			
<ul style="list-style-type: none"> • Consumption monitoring • Customer choice • Building trust • No disconnection – in case of unresolved complaints 	<ul style="list-style-type: none"> • Most of the existing meters do not capture hourly consumption data. • Customers do not have any choice of pre-paid or post-paid connection. • Physical meter reading is prone to human errors. • Utilities with smart meters—Bihar and Uttar Pradesh (U.P)—were able to achieve 95% billing efficiency during the lockdown period. • In most cases, regardless of the dispute resolution status, customers have to pay the entire bill, or the amount based on average consumption of past three-six months to avoid disconnection. 	<ul style="list-style-type: none"> • Customers can monitor hourly data usage for mobile phones. • In telecom sector, users have the option of pre-paid or post-paid connections. • Tata Power Delhi Distribution Limited (TPDDL) introduced a self-meter reading services extended by Delhi Electricity Regulatory Commission (DERC) during the lockdown period. • U.S. laws restrict the financial service providers to close customer account (in case of pending disputes). 	<ul style="list-style-type: none"> ✓ Initiate large-scale deployment of Advanced Metering Infrastructure (AMI) to enable remote meter reading and consumption monitoring. ✓ Provide self-meter reading option to customers (for customers who do not have smart meters). ✓ Provide customers with an option to avail pre-paid or post-paid connections (once AMI programs are planned). ✓ Develop a mechanism to avoid disconnection in case of pending meter accuracy related complaints. The disputed amount should be payable only after resolution of complaints.
3. Billing			
<ul style="list-style-type: none"> • Flexible billing cycle • Timeliness and accuracy 	<ul style="list-style-type: none"> • Billing cycle for customers is decided by respective state regulators. 	<ul style="list-style-type: none"> • In the banking sector, customers can select payment due date for their credit cards. 	<ul style="list-style-type: none"> ✓ Provide customers with an option to select/change their billing period.

³ FY 2018-19 estimates: World Bank ease of getting electricity index - <https://www.doingbusiness.org/en/data/exploretopics/getting-electricity>, last accessed on 9th March 2020

Stakeholder's Expectations	Evidence	Leading Practices	Suggested Interventions
	<ul style="list-style-type: none"> Various studies have shown that many customers do not receive electricity bills regularly. As per a study conducted in rural areas, about 22% of rural customers reported that they do not receive regular bills⁴. A study conducted by the Council on Energy, Environment and Water Environment (CEEWE) revealed that about 23% of rural customers mentioned that their billing frequency was more than three months. A World Bank study revealed that issues related to bill inaccuracy contributed to the 2nd highest number of grievances. The Forum of Regulators (FOR) has issued a model bill format but many Electricity Distribution Companies (DISCOMs) are yet to adopt. 	<ul style="list-style-type: none"> Regular billing has become a norm in many other sectors i.e. telecom, banking, Direct to Home (DTH) services, etc. Long Island Power Authority (a U.S.-based electric utility) provides financial incentives to its customers to enroll for digital bills. SSE (a UK-based electric utility) provides information on a range of topics (like energy saving tips, benchmark consumption levels, etc.) in electricity bills. 	<ul style="list-style-type: none"> ✓ Nudge customers to opt for digital bills: (i) make it as default option; (ii) send periodic reminders; and (iii) share information on how many customers have opted for digital bills. ✓ Re-design bill formats and include information on energy saving tips, benchmark consumption, Quick Response (QR) code for payment, etc. ✓ Implement a Know-Your-Customer (KYC) campaign to provide seamless customer services and enable Direct Benefit Transfer (DBT).
4. Payment			
<ul style="list-style-type: none"> Enhanced collection efficiency Financing options for bill payment Convenience of payment 	<ul style="list-style-type: none"> At all India level, bill collection efficiency was 97% in FY-19. It was further impacted during the COVID-19 led lockdown period (April 2020) – reaching to 20%-40%. Few DISCOMs (TPDDL, BSES Yamuna Power Limited (BYPL), etc.) provide financing option for payment of electricity bills. In some rural areas, customers have to travel long distances for payment of bills. DISCOMs in some states levy processing charges for digital payment. These may be as high as 0.8% of transaction value. 	<ul style="list-style-type: none"> TPDDL in collaboration with HDFC Bank offers a utility credit card exclusively for bill payment. Bajaj Finance Ltd. has launched #BijliOnEMI initiative wherein customers buying air-conditioners (ACs) on Equated Monthly Installment (EMI) can avail an instant credit in their 'wallet' which can be used to pay electricity bills on EMI. Utilities in the UK and U.S. provide incentives to customers for enrolling for direct debit (autopay) programs. Many banks in India provide door-step payment/collection services through Aadhaar Enabled Payment System (AePS). They have delivered ~INR 412 crore (USD 54.5. million) in rural areas during the lockdown period (April 2020). 	<ul style="list-style-type: none"> ✓ Collaborate with banks and Financial Institutions (FIs) to provide financing options for payment of bills. ✓ Enable multiple payment avenues including digital payment channels (such as e-wallets, payment banks, net banking, etc.), 24/7 collection centers, door-step collection, etc. for consumer categories. ✓ Nudge customers to opt for digital payment: highlight the benefits, provide financial incentives and enable social comparison by sharing information on how many customers pay bills through digital modes of payment. ✓ Establish targeted assistance programs to help underprivileged: collaborate with large corporates (leveraging Corporate Social Responsibility (CSR) funds) and Non-

⁴ <https://www.psrindia.com/Upload/Resource/Brochures/Document/Enhancing%20Effectiveness%20of%20Rural%20Electrification%20Programmes20190113132751732.pdf>, last accessed on 21st February 2020

Stakeholder's Expectations	Evidence	Leading Practices	Suggested Interventions
		<ul style="list-style-type: none"> Many utilities in the UK (British Gas, npower, etc.) have set up charitable trusts offering grants to customers who are unable to pay. 	Governmental Organizations (NGOs).
5. Quality and Reliability			
<ul style="list-style-type: none"> Reliable power supply Timely and relevant information about outages 	<ul style="list-style-type: none"> The average monthly duration of outages in urban areas was 0-43 hours during Feb 19 to March 20 (in different states).⁵ Lack of one-to-one communication related to outages often leads to inconvenience and loss of productivity. SOP regulations across states includes quality and reliability parameters, however these are not adequately measured and monitored. 	<ul style="list-style-type: none"> DTE Energy, (electric utility in the U.S.), provides weather advisory and real time updates during outages to its customers. PG&E (electric utility in the U.S.) equips its field crew with emergency equipment such as water bottles, flashlights, etc. to help customers with no power. The Indian Airline industry offers compensation (USD 160-300) in case of flight delays/cancellation. 	<ul style="list-style-type: none"> ✓ Avoid planned outages during working and non-working days for industrial/commercial and domestic customers respectively. ✓ Adopt a proactive approach and one-to-one communication strategy to inform customers about outages. ✓ Inform customers about the compensation they are eligible for, due to delay in restoration of supply. ✓ Reassess SOP regulations and parameters coupling them with clear description of method of measurement (basis the physical infrastructure at the utility) and strict compliance.
6. Complaint Resolution			
<ul style="list-style-type: none"> Convenient process to register complaints Prompt resolution 	<ul style="list-style-type: none"> Many DISCOMs do not have an official account on social media (i.e. WhatsApp, twitter, Facebook, etc.). Complaint resolution process involves multiple steps: call center executives are not empowered enough. 	<ul style="list-style-type: none"> TPDDL and BSES accept complaints through WhatsApp. E-commerce players such as Amazon have set new benchmarks for complaint resolution by introducing “no question asked return” policy. Customer service team of Bonobos (a leading garment company in the U.S.)—known as ‘Ninja’—is empowered to take any decision (including returns, compensation, etc.) to ensure customer satisfaction. 	<ul style="list-style-type: none"> ✓ Start with a basic centralized customer care call center equipped with modern facilities such as Interactive Voice Response (IVRS), Computer Telephony Integration (CTI), and automatic call distributor implemented for optimum routing of consumer calls. ✓ Provide multiple options for complaint registration—through website, chat-bot, social media, mobile application, etc. ✓ Reduce the number of steps involved in complaint resolution process. ✓ Send regular updates to customers about the complaint. ✓ Nudge customers (through regular messages) to register complaints through digital channels like mobile application or website.

⁵ <https://npp.gov.in/dashBoard/rd-map-dash-board>, last accessed on 31st May 2020

Stakeholder's Expectations	Evidence	Leading Practices	Suggested Interventions
7. Demand Response (DR)			
<ul style="list-style-type: none"> • Increase tariff choices • Revenue neutrality • Convenience of participation 	<ul style="list-style-type: none"> • Offering multiple tariff plans has helped energy suppliers (such as British Gas and SSE) in the UK to retain customers. • Electric utilities in the U.S. provided USD 1.1 billion⁶ as incentives for implementing DR programs in 2018. This led to peak demand reduction of 12-13 gigawatt (GW) and annual energy saving of 1.4 billion units (BU).⁷ • During a pilot project implemented by BYPL, customers were able to save INR 100 - 400 (USD 1.3 - 5.3) per DR event. • Most of the pilot DR projects implemented in India have been revenue-neutral by design. 	<ul style="list-style-type: none"> • FP&L (electric utility in the U.S.), provides financial incentives to residential customers to participate in auto DR programs. • Financial incentives of INR 1.00 - 2.25 (USD 0.01 - 0.02) per unit of energy saving were provided to customers during the pilot DR programs implemented in India. • BYPL created a WhatsApp group to inform customers about DR events. 	<ul style="list-style-type: none"> ✓ Provide pricing options to customers. ✓ Nudge customers to alter their consumption behavior to enhance system efficiency.
8. Distributed Energy Resources (DER)			
<ul style="list-style-type: none"> • Financing - capital expenditure • Convenient enrollment processes • Enhanced awareness 	<ul style="list-style-type: none"> • All DER projects are capital intensive. The cost of setting-up a 5-kW solar Photovoltaic (PV) rooftop plant varies from INR 1.2-1.6 lakhs (USD 1,590 - 2,120) in India. • Lead time for obtaining approval for net-metering varies from one to three months in some states such as Madhya Pradesh (M.P.), Odisha, Maharashtra, etc.⁸ • Many studies have identified low awareness as a key barrier for large-scale deployment of solar rooftop projects. 	<ul style="list-style-type: none"> • Few DISCOMs (like BYPL and TPDDL) and banks (State Bank of India (SBI), Punjab National Bank (PNB), etc.) are providing financing solutions to customers for installation of solar rooftop projects. • E.ON, (a German electric utility) has provided an online tool wherein customers can locate their house, access specific information like capital cost, generation potential, suppliers, etc. 	<ul style="list-style-type: none"> ✓ Enhance awareness and nudge customers to install DER projects: spread information related to environment and cost benefits. ✓ Collaborate with banks and FIs to provide financing options for setting-up DER projects. ✓ Simplify the processes of application and approvals for net-metering. ✓ Provide one stop solution for all the services related to DER including assessment, procurement, approvals, installation, etc.
9. Other New and Emerging Services			
<ul style="list-style-type: none"> • Enhanced non-tariff income to leverage existing network and share part benefits with customers 	<ul style="list-style-type: none"> • Many State Electricity Regulatory Commissions (SERCs) have provided incentives to DISCOMs to explore innovative ways of increasing their non-tariff revenues. For instance, DERC allows DISCOMs to keep 40% of the revenue earned from other businesses if regulated assets are used. 	<ul style="list-style-type: none"> • Several utilities (Dodo, Amaysim, Origin, Commander and Sumo Power) in Australia offer electricity and gas services along with internet and phone plans. • Sacramento Municipal Utility District (an electric utility in the U.S.), has created an e-commerce marketplace of energy-efficient products. 	<ul style="list-style-type: none"> ✓ Explore cross-sector partnerships to leverage expertise and network of existing market players. DISCOMs can provide additional services to customers such as establishing marketplace for selling energy efficient appliances, setting-up Electric Vehicle (EV) charging infrastructure, providing home automation systems, etc.

⁶ https://www.eia.gov/electricity/annual/html/epa_10_09.html, last accessed on 5th June 2020

⁷ https://www.eia.gov/electricity/annual/html/epa_10_08.html, last accessed on 5th May 2020

⁸ Study on Decentral energy and DISCOMs - Can They Co-exist? Conducted by CII and BCG

Stakeholder's Expectations	Evidence	Leading Practices	Suggested Interventions
		<ul style="list-style-type: none"> Some utilities in India like TPDDL, BRPL, Tata Power, BYPL, etc. are providing energy efficient appliances like ACs, fans, etc. to customers at negotiated prices. 	

CHAPTER 1



BACKGROUND OF THE STUDY

Customer centricity is increasingly becoming an intrinsic part of business strategy. Customers today are better informed and have higher expectations from their service providers. This is mainly driven by changing demographics, an economic shift, and technological advancements that are reshaping the market dynamics. Customers have become more demanding due to the seamless experience provided by various service providers such as an omnichannel interface, 24/7 customer care services, personalized services, etc. Several sectors that were previously served by monopolies have transitioned to competitive markets (e.g. telephone services, airlines, banks, broadband and cable television services, etc.). Customers of these sectors have the freedom to make choices. This trend is putting pressure on other sectors such as electricity to enhance customer experience as well. Electric utilities need to respond to the changing market trends and move towards more customer-centric business operations.

Lessons from International Brands

International brands such as Amazon, Google, Toyota, Netflix, etc., known for their exceptional customer services, can provide great lessons to electric utilities as they strive to make customer interactions personal, seamless and frictionless. For example, Amazon helps its customers to make purchase decisions by allowing them to post and read reviews on their website. Google provides personalized feeds and updates (news, search results, videos, etc.) to its users. Toyota's "customer first and quality first" principles are designed to "pull" customer's feedback through various personalized "touch-points" to drive innovation and ensure quality. Netflix⁹ logs and analyzes every customer interaction to predict viewing preferences and deliver personalized recommendations. IBM introduced a hybrid method for product development that engaged customers to use the software or service from start to finish during the development phase and demonstrated the state of the proposed solution.¹⁰

Similarly, electric utilities need to revisit the business processes and provide more value-added as well as customer-centric services such as data analytics, energy management solution, home automation, flexible payment options, multimedia interaction platforms (including chatbots, interaction through social media, mobile applications, etc.), among others.

India's energy policy landscape has evolved from the model of electricity being served by monopolies to a newer version in which large customers (with 1 MW and above sanctioned load) can purchase electricity from open markets (under the open access regulations). Various state governments have notified net metering policy which allows customers to generate power locally (through solar rooftop) and even sell the excess power to the DISCOMs. In addition, DISCOMs are now adapting new strategies to provide seamless customer experience. The Government of India (GOI) is considering introducing retail competition in the power sector which will lead to innovative mechanisms for consumer engagement. This includes the provision of 24/7 customer care centers (Maharashtra, Delhi), installation of smart meters (U.P., Haryana, and Bihar), promotion of digital payments (nearly all the states), among others. While these interventions can help in improving customer service, there is a huge scope to significantly enhance overall customer satisfaction through implementation of structured interventions across key utility-customer touchpoints and accelerate their uptake through appropriate nudges.

The India Economic Survey 2019 specifies the adoption of the right tools such as nudges, mandates, etc. for influencing customer behavior. Such influences or nudges can not only deliver better value to the customer but also enhance their overall experience of dealing with utilities. Application of such nudge techniques is common in various sectors across the world. Many countries (including the U.S., UK, Australia, Japan, etc.) have set up dedicated units to use behavioral insights for effective decision making.

⁹ <https://www.forbes.com/sites/anthonymsmith/2017/12/12/how-to-create-a-customer-obsessed-company-like-netflix/#222622d76d22>, last accessed on 11th February 2020

¹⁰ <https://hbr.org/2015/06/how-ibm-intuit-and-rich-products-became-more-customer-centric>, last accessed on 5th December 2019

The COVID-19 pandemic has brought to the fore the need for enhanced customer centricity for electric utilities across the globe. Proactive initiatives of utilities to ensure business continuity have led to adoption of new and innovative ways to engage and help customers in these difficult times. Many utilities are offering free services, providing customized financing solutions for payment of bills, and are setting up dedicated facilities to address customer concerns. Harnessing cutting-edge technology and digital platforms can unleash a completely different customer experience for electricity customers and redefine the supplier-customer relationship.

In this context, the U.S.-India bilateral SPARC Program undertook a study to identify the strategies and implementation enablers for customer experience transformation in India's electricity distribution sector. The key objectives of this study were to:

- Identify key customer-utility touchpoints and analyze existing processes followed by the DISCOMs,
- Identify interventions required for enhanced customer experience across each touchpoint, and
- Suggest appropriate nudge techniques for accelerated adoption of identified interventions.

The key findings of the study along with suggested interventions have been captured in this report.

Implementation of identified interventions will lead to higher participation from customers in utility-led initiatives and significant improvement in satisfaction levels of customers. This will facilitate in forging a trusting utility-customer relationship and streamline implementation of future programs in the power sector.

CHAPTER 2

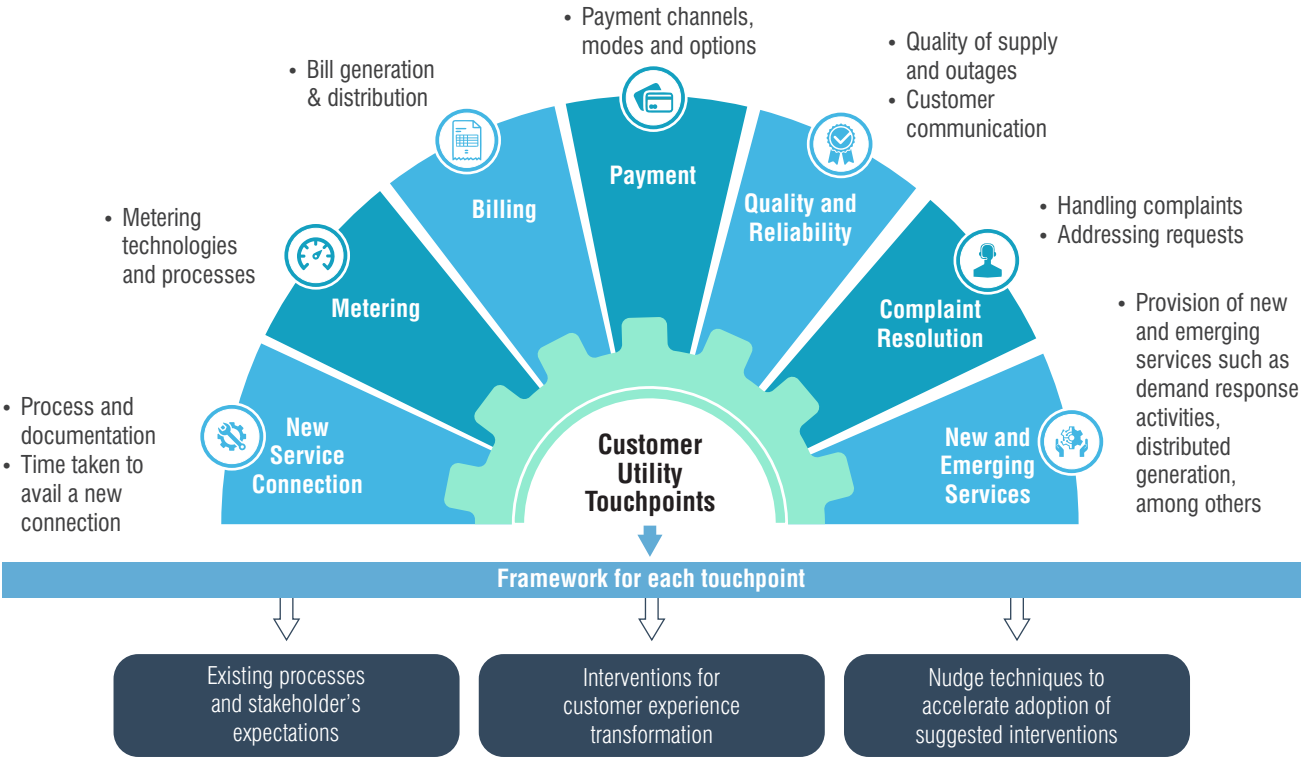


CUSTOMER EXPERIENCE

FRAMEWORK

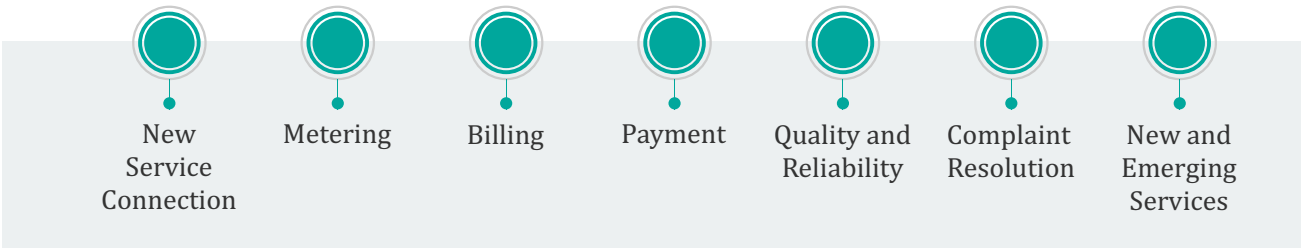
The framework used for understanding the customer-utility touchpoints and identifying interventions for transformation of customer experience is provided in Figure 2. The key elements of the framework include analysis of each of the key utility-customer touchpoints with respect to the existing utility processes, understanding the expectations of stakeholders, identifying interventions to enhance customer experience, and suggesting nudge techniques to accelerate adoption of proposed digital interventions.

Figure 2: Customer experience framework



1. Understanding existing processes across touchpoints and stakeholders’ expectations

A touchpoint can be defined as a medium through which a potential or existing customer comes into contact with the utility. For instance, a customer accesses the utility website for a new service connection or calls the utility call center to register a complaint or receives monthly electricity bill through e-mail. These touchpoints can be broadly classified into seven categories:



The first component of the framework includes assessment of existing processes involved in the touchpoints to understand a typical customer’s journey. The second component includes identifying stakeholder expectations to ascertain the desired quality and level services required to enhance customer satisfaction. To aid these assessment/identification processes, the USAID SPARC Program team held discussions with utility officials and select customers in the states of Delhi, Telangana, and U.P.

2. Interventions for customer experience transformation

The team did a comprehensive mapping of stakeholders' expectations and existing utility processes (across each utility-customer touch point) to identify gaps and interventions required for customer experience transformation. Analogies from different sectors (such as telecom, banking, aviation, etc.) at the national as well as global scale were also included to further strengthen the identified interventions.

3. **Nudge techniques to accelerate the adoption of suggested interventions**

Nudge techniques can be defined as actions for influencing the behavior of an individual or a group of individuals in a predictable way without forbidding any options or significantly changing their economic incentives. For example, DISCOM can increase the adoption of digital payment by making digital electricity bills as a default option (i.e. customers need to opt for receiving physical bills). This study also identified the appropriate nudge techniques that can help enhance the uptake of suggested digital interventions.



CHAPTER 3



NEW SERVICE

CONNECTION

Abstract

Availing a connection is the first step for customers to join the electricity supply value chain. The process generally includes submission of an application form, inspection from utilities (to assess feasibility), payment (as per prevailing regulatory norms), external and internal wiring related work and installation of meters. This section provides a brief snapshot of existing processes, stakeholders' expectations and key interventions required to enhance customer experience. This includes suggestions related to simplifying the application form, training DISCOM officials on customer relationship aspects and better planning to reduce time taken for issuing new service connections. Additionally, nudge techniques (such as the use of social norms, default options, etc.) which can be adopted for simplification of the process have also been identified.

Customers take the first step into the electricity supply value chain by availing a connection. The process generally includes submission of an application form, inspection from utilities (to assess feasibility), payment (as per prevailing regulatory norms), external and internal wiring related work and installation of meters. Similar processes are being followed in case the customer intends to change the sanctioned load. The complexity of the procedure, time and cost required is directly related to the ease of living and ease of doing business.

Various sectors (such as telecom, banking, insurance, aviation among others) have revised the process of enrolling customers by adopting digitization and enhanced use of technology. For instance, leading telecom service providers such as Airtel and Vodafone provide free home delivery of SIM cards. The SIM is delivered at a time slot convenient to the customers and the complete onboarding process takes place within one-two hours. Similarly, the Kotak Mahindra Bank offers a fast, convenient and secure way to open a bank account online. Customers can create an instant account online eliminating multiple steps. The process is completely paperless—removing significant paperwork and enabling “anytime and anywhere” account opening. Aegon N.V.¹¹, a leading life insurance firm, provides online calculators, uses social media log-in and links existing databases to pre-fill the application form to enhance ease and convenience for its customers.

World Bank's “Ease of Doing Business” Index

The World Bank's Ease of Doing Business index compares economies across a range of parameters in ten major “Doing Business”-related topics i.e. getting electricity, paying tax, enforcing contracts, registering property, etc. Key parameters considered for “Getting Electricity” are average cost of availing an electricity connection, number of days, and steps required to get an electricity connection. Due to continuous efforts by electric utilities in India, India's ranking on “Ease of Getting Electricity” parameter of the World Bank's “Ease of Doing Business” index has increased to 22nd in 2019, up from 137th in 2014. Some of the key observations from “Getting Electricity” rankings are:

- Average time taken for availing an electricity connection (for businesses) in India (average of Delhi and Mumbai) was 53 days—much lower than some of the developed economies like Australia (73 days); Japan (81 days); Norway (66 days) and Canada (137 days) among others.
- Average cost of availing a new electricity connection (expressed as percentage of per capita income) in India was 28%—significantly lesser than developed economies like Canada (116%); Spain (93%); New Zealand (67%) and Bahrain (57%).

Electric utilities have undertaken multiple initiatives to streamline the process and reduce the cost and time for availing electricity connections. This includes digitizing the process of submission of applications, waiving off the inspection requirements for few high voltage customers, etc. However, there is significant scope for further improvement to meet customer expectations. The following sections highlight key suggestions to enhance customer satisfaction.

While digitization may increase efficiency, it is important to review existing rules to understand whether they are increasing customer's convenience or not. In many instances, the existing rules may need to be

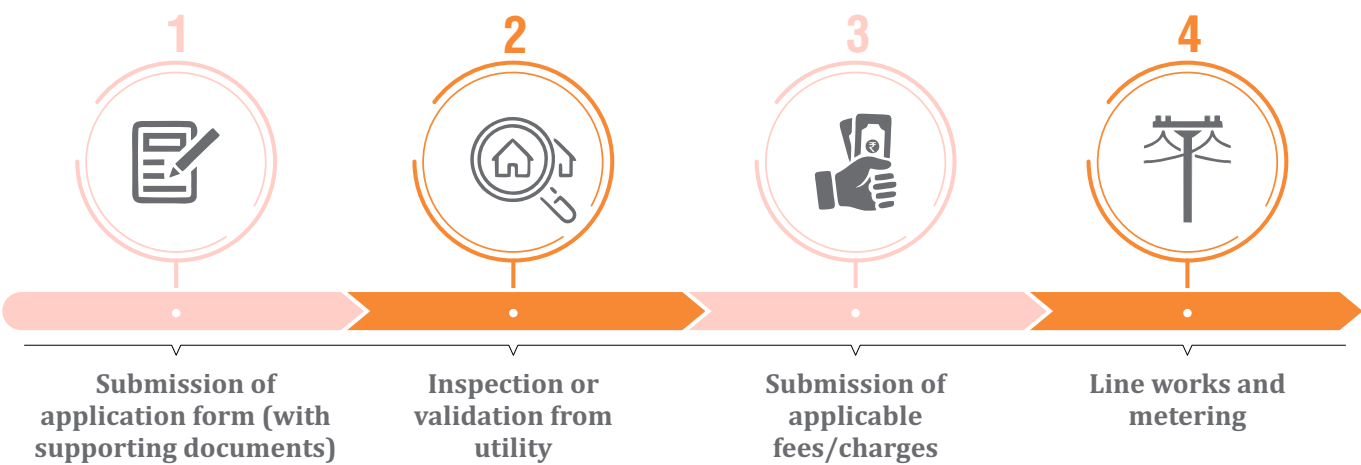
¹¹<https://www.aegonlife.com/calculators>, last accessed on 3rd January 2020

changed. For example, until 2012, passengers were required to show printed copies of airline tickets to enter the airports. Later, the Bureau of Civil Aviation Security issued an order to accept digital copies of tickets as a valid document, making it convenient for the customer¹². Similarly, in electricity sector, the rules related to information required for issuing new connections may also need to be re-examined to eliminate inefficiencies (if any).

3.1 Existing processes

Accessibility of infrastructure services is one of the most important parameters, which directly impacts economic growth, productivity and customer satisfaction. Key factors which determine the ease of getting electricity connection are (i) ease of process, (ii) number and type of documents required, (iii) connection fees, (iv) number of days taken by utilities to process the request, and (v) number of approvals required to be taken by customers (as applicable), among others. Figure 3 shows the standard processes followed by most electric utilities in India.

Figure 3: Processes involved in new service connection



The key steps involved in availing a new service connection include:

- 1. Submission of application form along with supporting documents**
Customers can submit their application for a new service connection either online at the consumer portal or through offline mode at the DISCOM's office by submitting the prescribed form(s). In addition, customers need to submit several supporting documents (such as house number and ownership documents, tax bill, No-Objection Certificate (NOC) in case of a joint holder, NOC from the owner if rented, etc.), and the applicable registration fees.

Waiver on submission of proof of residence in Madhya Pradesh

As per the details provided in the electricity supply code issued by Madhya Pradesh Electricity Regulatory Commission (MPERC), customers can avail a waiver on submission of proof of ownership documents in the state during issuance of a new connection in lieu of additional security deposit (paying for cost of average consumption for 90 days instead of 45 days).¹³

- 2. Inspection or validation from utility:** Once the application has been successfully submitted, the utility officials conduct a technical survey of the site where a new connection is sought by the customer. After this, the utility provides a cost estimate to the customer which includes service line/line charges and security deposit.

¹²<https://www.huffingtonpost.in/rahul-tongia/overruled-why-maximum-gov-b-9234308.html>, last accessed on 4th January 2020

¹³Source: Madhya Pradesh Electricity Supply Code, 2013, http://www.smartbijlee.mpez.co.in/design/310813-Supply_Code_2013_english.pdf, last accessed on 31st March 2020

3. **Submission of applicable fees/charges:** At this stage, the consumer needs to make the payment of applicable fees/charges either online at the consumer portal (in case of online application) or offline at the utility office through cash/cheque (in case of an offline application).
4. **Line works and metering:** On receipt of the payment from the customer, the utility commences the line works and installs the meter and any other external wiring as per the requirement. During the online application process, the consumer has the option to check the status of the application at the consumer portal. In the case of an offline application, all enquiries have to be made directly at the utility's customer care center.

Figure 4 highlights the procedures, time, and costs that customers in Delhi, India have to undergo for getting electricity, including submission of application form, external site inspection by the utility, and meter installation. When compared to the best in class, Dubai, UAE, which tops the World Bank ranking for ease of getting electricity, it can be seen that a customer in Dubai can avail electricity connection in just over seven days¹⁴, however it will take nearly 27 days¹⁵ for a customer in Delhi to get a new connection (Figure 4). Further, the cost of availing electricity connection in India is also high as compared to Dubai. For instance, typical cost of availing a new electricity connection for a warehouse in Delhi is ~INR. 64,500 (USD 850)¹⁶ whereas the same can be availed without any charges in Dubai.

Figure 4: Comparison of processes involved in issuance of new connection

TATA Power Delhi Distribution Limited (TPDDL), India (Rank 22)	Days	Cost
Submit application to Tata Power Delhi Distribution Ltd. and await site inspection	3 Calendar days	Rs. 64,521
External site inspection from Tata Power and await demand note	3 Calendar days	
Connection, meter installation and electricity flow	21 Calendar days	
Time taken 27 days		Total Cost Rs. 64,521
Dubai Electricity and Water Authority (DEWA), UAE (Rank1)	Days	Cost
Submit application to Dubai Electricity and Water Authority (DEWA)	2 Calendar days	AED 0
Inspection, external connection works and meter installation	5 Calendar days	AED 0
Time taken 7 days		Total Cost AED 0

3.2 Stakeholder expectations

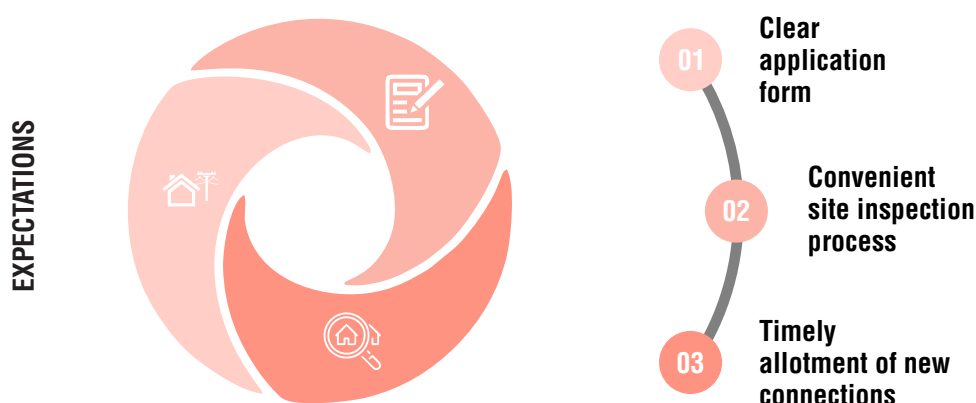
The study analyzed existing processes for releasing new connections across few electric utilities and identified major customer expectations as shown in Figure 5. Information was collected from the utility website, stakeholder consultations and various online platforms. These expectations need to be addressed to ensure customer satisfaction.

¹⁴https://www.doingbusiness.org/en/data/exploreeconomies/united-arab-emirates#DB_ge, last accessed on 10th January 2020

¹⁵https://www.doingbusiness.org/en/data/exploreeconomies/india#DB_ge, last accessed on 10th January 2020

¹⁶These costs include obtaining RoW permit, laying of Service cable, installation of meters and wiring within the meter board. The electricity connection is a permanent, three-phase, four-wire Y connection with a subscribed capacity of 140-kilovolt- ampere (kVA) having a length of 150 meters. The cost assumes works that involve the crossing of a 10-meter wide road (by excavation, overhead lines) on public land

Figure 5: Customer expectations in provisioning of new service connection



a. Clear application form

Analysis of application forms (for availing new service connections) revealed that too much information is sought from customers—some of which can be avoided. For example, it is difficult for a new customer to provide details related to nearest pole/DT/feeder number, rating of end-use appliances, estimated load, etc. In many cases, customers need assistance in filling the application forms. Hence, utilities should consider simplifying the existing application form required for availing a new connection.

70 parameters for a new service connection form in Indian utilities

An analysis of application forms required to be submitted for a new service connection was carried out for six states. It was observed that customers need to provide information related to 50-70 parameters (varies from state to state), some of which can be avoided. For e.g. in a few cases, information related to the nearest customer ID¹⁷, occupation, nearest pole and DT number, load requirement (kW) or information on the number of appliances to be used, etc. is included in the form. Many customers (who do not understand the technical terms) are not able to provide this information without seeking help from utilities.

Similar analysis for international utilities (i.e. Duke Energy and British Gas) reveals that only basic information, related to 20-30 parameters, is required from customers.

Innovation and disruption in customer onboarding experience

Door-step Assistance by Telecom Companies

In telecom sector, service providers such as Airtel and Vodafone provide door-step assistance to their customers for availing new service connections.

Interventions by Public Sector

Seven Delhi government departments have rolled out the Door-step Service Delivery (DSD) to home-deliver 40 key services. Under the scheme, the resident needs to contact a 24x7 helpline, where the call center provides information about the mandatory documents and the charges to be paid. After an appointment is booked, a facilitator carrying a biometric device and a camera visits the resident's premise to initiate the process.

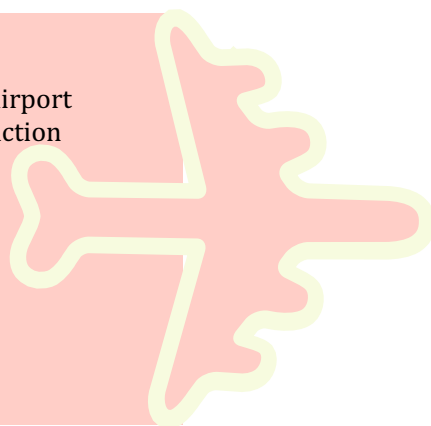
¹⁷ <https://www.tsecln.in/webdynpro/resources/nerapdrp.gov.in/home~tseclnwconn/TseclNwConn#>, last accessed on 15th March 2020

b. Convenient site inspection process

One of the key process requirements for releasing a new connection is site inspection to assess feasibility. It is generally carried out by the utility officials competent to assess technical feasibility for releasing new service connection. However, these officials receive limited or no training on customer relationship management and customer satisfaction. It is critical to impart adequate training to utility officials before they are asked to carry out site visits and interact with customers. This will facilitate a seamless site inspection process. Site inspection in countries such as Germany and Spain are carried out by certified professionals¹⁸. Also, in times when COVID outbreak has necessitated the need for social distancing, the staff needs to be well trained on health and safety measures as well. In addition, other methods of assessing the load requirement such as benchmarking with similar customers in the neighborhood, virtual site inspection, etc. may also be considered.

Customer experience at an airport

Orlando Airport in the U.S. is known for its hospitality and customer services. The airport was ranked highest in its class in the J.D. Power 2018 North America Airport Satisfaction Study¹⁹. The study measures overall traveler satisfaction by examining six factors: terminal facilities; airport accessibility; security check; baggage claim; check-in/baggage check; food, beverage and retail. The Orlando airport authorities regularly organize training programs for all their employees on key aspects of customer satisfaction and relationship management. It was observed that simple gestures like looking people directly in the eye and smiling, picking up trash and focusing on customer safety have resulted in high level of satisfaction among travelers.²⁰



c. Timely issuance of new connections

Customers expect that new service connections should be issued at the earliest once the application is submitted. Time taken to issue a new connection is also an important parameter in the World Bank's "Ease of Doing Business" index. It was observed during stakeholder interactions that delays in issuing a new connection are largely due to: (a) lack of adequate infrastructure/distribution network capacity (i.e. distribution transformers, external wiring and poles or sub-station capacity), and (b) lack of adequate human resources to conduct site inspection or carry out the meter installation related works. The utilities and regulatory commissions should try to minimize the time taken (and the number of visits) to issue a new service connection by addressing these issues. Further, the guidelines on maximum allowable time for issuing a new service connection also varies from state to state (refer Table 2) depending on availability of distribution infrastructure, type of customer and type of connection. Respective SERCs should also revisit the regulations and reduce the maximum allowable time for issuing a new service connection.

Table 2: State-wise time taken for issuing new connection

S.No.	State	Time-taken for communicating estimated cost of issuing a new connection	Time-taken for issuing new connection after receiving the application fees ²¹	
			If grid extension/ augmentation is not required	If grid extension/ augmentation is required
1	U.P.	On the Spot	7 Days	45-300 Days
2	Haryana	7-25 Days	13 Days	57-142 Days
3	Punjab	7-30 Days	7-15 Days	30-90 Days
4	Kerala	7-40 Days	37 Days	45-90 Days

¹⁸In such economies, only certified professionals are required to undertake internal wiring works and are held responsible for the same.

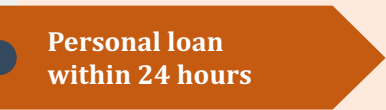
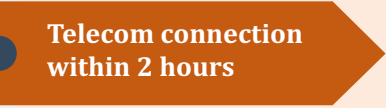
¹⁹<https://www.orlandoairports.net/press/2018/09/19/ranked-1-again/>, last accessed on 28th May 2020

²⁰How customer experience takes flight at the Orlando airport, February 2017, McKinsey & Company

²¹Standard of Performance and Supply Code Regulation of respective SERCs

The transition to instant services across sectors

In many other sectors (banking, telecom, etc.) customers can avail services within few minutes. Some relevant examples are as follows:

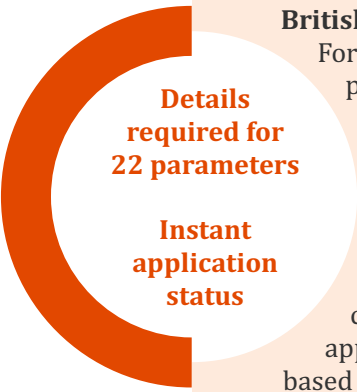
 Personal loan within 24 hours	HDFC Bank, Bajaj Finserv, and ICICI Bank (leading financial institutions in India) offer the fastest personal loans - with disbursal in under 24 hours. They also offer instantaneous credit cards with immediate application status to the customer.
 Digital Bank Account within 2 minutes	Kotak Mahindra Bank offers an instant savings bank account that can be set up by downloading the Mobile Banking App or by visiting the website. The customers need to upload general identification proofs and can start using the account immediately.
 Telecom connection within 2 hours	Along with door-step assistance to its customers, telecom providers such as Airtel and Vodafone provide a prepaid new connection with an activation time of around 1-2 hours.

3.3 Key interventions to enhance customer satisfaction

Based on the review of the current processes and stakeholder consultations, a set of interventions have been identified to enhance customer experience. These include:

- 1. Simplification of application form**
The application form required for availing a new connection needs to be simplified. The information which can be presumed or deciphered by utilities (i.e. nearest pole/DT number, load requirement, etc.) may need to be removed. For instance, load requirements (in kW) can be estimated based on customer category, location and number of family members or rooms. Utilities may re-design the application form and conduct pilot testing, to seek feedback from customers before re-launching it. This process might be repeated once in a year or two.

International Case Study: Online application process for a new service connection



Details required for 22 parameters

Instant application status

British Gas²² (UK-based utility)

For applying a new service connection with British Gas (BG), the customer needs to provide details for only 22 parameters. Default values are automatically populated in several parameters which is suitable for most applicants, making the application process simple and convenient from a customer’s perspective. For example, for residential connections, customers provide information related to (i) geographical area, (ii) number of people living in the house and (iii) number of rooms, expected connected load automatically populated by the software. Once the application is submitted, an estimated quote is generated instantly based on inputs provided by the customer such as locality, number of occupants and house size. Also, there is no ‘status’ applicable for application—the request for connection is instantly confirmed or denied based on the information provided by the customer.

²²British Gas: <https://www.britishgas.co.uk/GetAQuote/#/new/quote-details>, last accessed on 23rd December 2019

**Details
required for
29 parameters**

**Pre-filing
of the
form**

Duke Energy²³ (U.S.-based utility)

In the case of Duke Energy, a customer is required to provide details for 29 parameters for applying for a new service connection. As a result, the online application process becomes convenient, simple and quick for the customer. The parameters in the form are populated with default values which aid the customer in easily completing the application form.

2. Training of utility officials

The ability to deliver high-quality services and achieve the desired level of customer satisfaction requires continuous training of the workforce on critical aspects of customer relationship management, customer behavior, inclusion and communication. It is thus imperative to ensure that utility officials responsible for conducting inspections may undergo rigorous training on these aspects on a regular basis. Further, in view of the social distancing norms being followed across the country, training may also be provided on aspects of maintaining hygiene and social distance during the site visits. Utilities may develop/revise the standard operating procedures incorporating new norms for health and safety.



Training of Income Tax officials - implementation of GST

The Central Board of Indirect Taxes and Customs, Ministry of Finance, GOI organized training programs for nearly 2 million officials for effective implementation of tax reforms – Goods and Services Tax (GST). The topics covered during the training program also included subjects related to customer centricity, grievance redressal, marketing etc. apart from others like GST Law, Rules, and Systems & Procedures.²⁴

3. Reduce the time to issue a new service connection

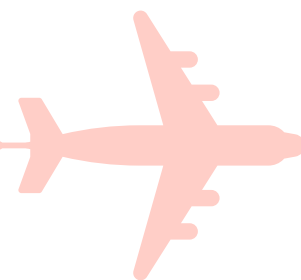
In some cases, the customer needs to wait for several days before he/she gets the power supply connection from the utility. One of the key reasons for this delay is limited visibility of the network and inadequate network planning. As a result, availing a new connection gets delayed even if the utility has surplus power, leading to potential revenue loss. Therefore, the utility might enhance its planning capabilities and increase network visibility so that timely decisions can be taken for network augmentation and optimization. For building such capabilities, utilities need to deploy end-to-end AMI technologies that facilitate real-time monitoring and control across the power distribution network.

²³Duke Energy: <https://www.duke-energy.com/home/start-stop-move#startStop>, last accessed on 23rd December 2019

²⁴http://economictimes.indiatimes.com/articleshow/57466359.cms?from=mdr&utm_source=contentofinterest&utm_medium=text&utm_campaign=cppst, last accessed on 12th December 2019

'No missed trips': Expediting the passport issuance process

Under the "Tatkal" scheme, citizens of India can obtain a passport within one to three days of submission of required documents (by paying an additional fees). The police verification of documents is carried out post issuance of the passport. The print queue is also separate thus ensuring faster print of Tatkal passports.



3.4 Nudge techniques

Recent advancements in behavioral sciences have spurred interest in the power distribution sector. Also, the India Economic Survey 2019 specifies the adoption of the right tools such as nudges, mandates, etc. for influencing customer behavior. Such influences or nudges can not only deliver better value to the customer but also enhance the overall experience of dealing with utilities. The appropriate nudge techniques for simplifying the application form to enhance customer experience include:

- **Increase convenience to fill application form**

The utility could consider the following nudges to improve the ease and convenience of accessing application form for a new connection.

- **Default options for general information**

Availability of default choice is the most effective method for inducing compliance (Keller et al, 2011).²⁵ Customers may be provided with default options for general information such as connected load, contract demand, and supply type, among others. This information can be based on customer profile (e.g. domestic, commercial, industry, etc.) and geographical location. Once the customer has provided this information, default options for general applicant details may be provided for the customer to choose from. As mentioned above, British Gas (an electric utility in the UK) provides default values for several parameters, making the application process simple and convenient from a customer's perspective. For example, the expected connected load is populated automatically for residential customers, based on information provided by the customers related to geographical area, number of people and number of rooms in the household.

- **Door-step assistance**

Simplification of the enrollment process has a positive effect on enrollment increasing the number of applicants (Chimento et al., 2003).²⁶ The additional step of filling details in the application form could deter customers from applying for a new connection. To further simplify the application process, utilities may offer help in the form of door-step assistance for filling and submission of application forms. This assistance could be offered to customers at their homes and time convenience and provide them an option to avoid queues at the utility center.

- **Introduce periodic reminders**

Reminders²⁷ sent to people have a boosting effect on success in achieving behavior change goals (Pirolli, et al, 2017).²⁸ To expedite customer action during the application process, utilities may send periodic reminders to the customers regarding document submission, payment of fees, meter installation date, etc.²⁹. These reminders should be consistent with the regulatory requirements e.g. 'Utility is mandated to install meter within seven days of application submission. Do you plan to pay the application charges?' Such reminders will help customers to fulfill any shortcomings in the application at the earliest and plan ahead for any process that may require their involvement.

²⁵Keller et al. (2011), Enhanced active choice: A new method to motivate behavior change, Journal of Consumer Psychology

²⁶Simplifying Medi-Cal Enrollment: Opportunities and Challenges in Tight Fiscal Times, Lisa Chimento, Moira Forbes, Joel Menges and Anna Theisen

²⁷Specific plans regarding how and when to enact behavior

²⁸Implementation Intention and Reminder Effects on Behavior Change in a Mobile Health System: A Predictive Cognitive Model, <https://www.ncbi.nlm.nih.gov/pmc/articles/PMC5730820/>, last accessed on 1st December 2019

²⁹The availability heuristic is a mental shortcut that relies on immediate examples that come to a given person's mind when evaluating a specific topic, concept, method or decision.

CHAPTER 4



METERING

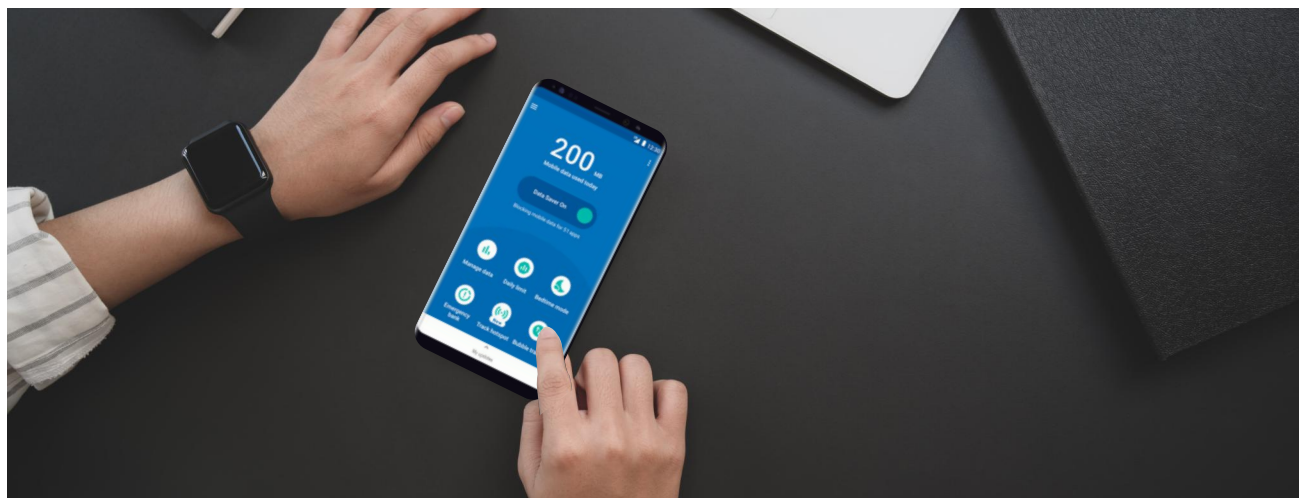
Abstract

Customer metering is the lifeline of the electricity supply business. It directly impacts the revenue stream and operations of the utilities. This section provides a brief snapshot of the key metering technologies used in India, key issues faced and expectations of stakeholders and suggests interventions required to enhance customer satisfaction. This includes suggestions for establishing a mechanism to avoid disconnection in case of complaints regarding meter accuracy; provision of options for availing pre-paid and post-paid connections to customers and enabling remote meter reading. In addition, nudge techniques (such as simple process to switch to pre-paid meters, regular reminders and promotion of current customer adoption data of pre-paid meters) which can be adopted to enhance uptake of pre-paid services have also been identified.

Customer metering, the lifeline of the electricity supply business, directly impacts the revenue stream and operations of utilities. It provides useful information to estimate electricity consumption; measure network losses and instantaneous/maximum demand, monitor supply quality; design demand-side management programs, distribution network planning, etc. Modern metering devices (i.e. smart meters) also provide flexibility to communicate with the customers, enable time of day or time of use pricing, remote connect/disconnect and even remote control over end-use appliances. (Refer Figure 4).

Monitoring of consumption has improved in the last few years across sectors. For instance, telecom customers receive updates on the amount of data consumed on a daily basis and during the month. The customers also have the option to choose an upper limit on the daily data consumption exceeding which they would receive an alert to restrict usage. Figure 6 provides screenshots for data usage for a day and the monthly trend.

Figure 6: Monitoring of mobile data consumption in telecom sector



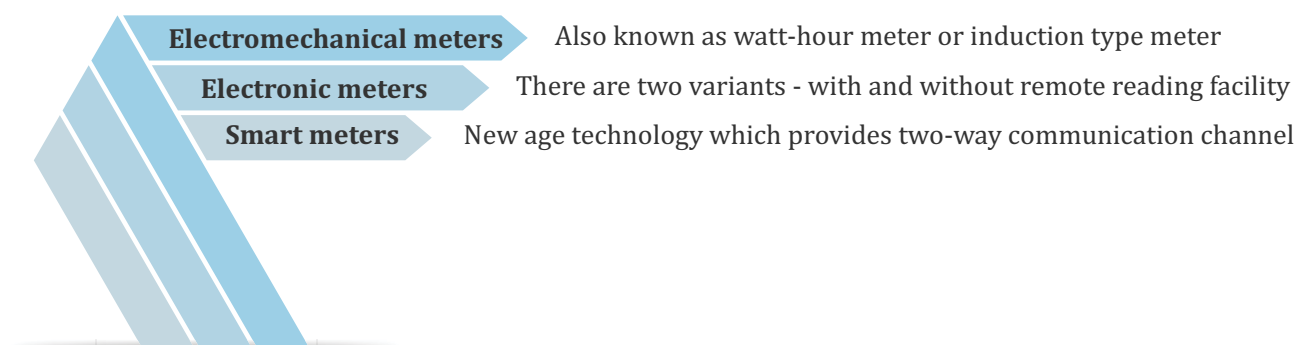
Various initiatives are being taken up by the electricity utilities in India to enhance customer experience with respect to metering. The GOI has set a target of converting all meters to smart pre-paid meters by 2022³⁰. With smart pre-paid meters, customers will get the flexibility to use and pay for electricity as per their requirements, instead of paying the full electricity bill at one go.

4.1 Existing processes

Electric utilities use different types of meters for different customer categories (industrial, residential, commercial, agriculture, etc.). At the basic level, all meters provide an output related to the amount of electricity passing through it. The more sophisticated meters provide additional information related to demand tracking, power quality parameters, defects, theft alert, and use various communication channels for data transfer. Broadly these meters can be classified into three categories: (i) Electromechanical; (ii) Electronic, and (iii) Smart meters (Refer Figure 7).

³⁰<https://pib.gov.in/Pressreleaseshare.aspx?PRID=1557203>, last accessed on 21st April 2020

Figure 7: Types of meters



4.2 Stakeholder expectations

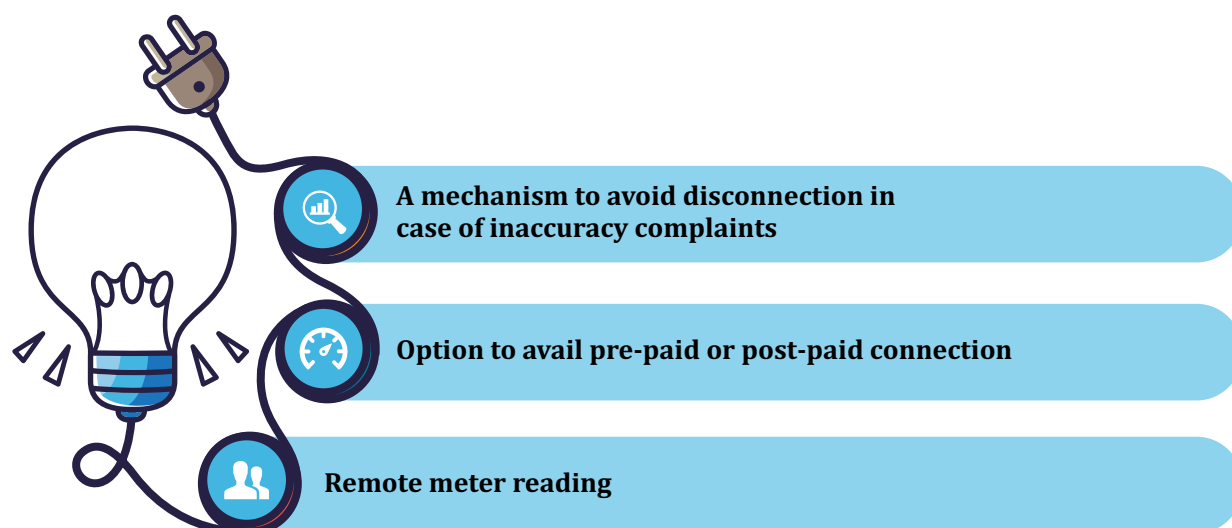
Meter installation is generally a customer's first experience with the utility. Subsequently, the customers interact with utilities when utility officials visit for meter reading or when customers have any complaint regarding the functioning of the meter. It is important for utilities to ensure a seamless process across these stages to ensure customer satisfaction. The key expectations of customers and utilities from metering perspective include:

- a. **Accuracy**
Customers expect accuracy in meter reading. However, they sometimes face issues of inaccurate meter readings due to faulty meters, inability of utility officials to record meter reading (due to unavailability of consumers), meter burn out, and other technical faults. In such an instance, electricity consumption is estimated based on average historic consumption, which sometimes leads to inaccurate electricity bills.
- b. **Meter reading**
The meter-related operational cost for distribution utilities includes meter reading and data punching. Cost of meter reading, especially in sparsely populated rural areas and remote areas, is significantly higher than that of urban areas. Remote reading or customer-enabled meter reading may be institutionalized to reduce the operational cost of utilities. Further, the outbreak of COVID-19 has shown that remote meter reading infrastructure is critical to build a resilient electricity supply network.
- c. **Periodicity**
In most utilities (where smart meters have not been installed), information regarding daily or hourly electricity consumption is not available. Meters should provide information on a real-time basis so that both the customer and the utility can understand the consumption pattern and take appropriate measures to reduce electricity consumption.
- d. **Disconnection**
As per the existing process (in many utilities) even if a customer registers a complaint regarding meter accuracy, they have to pay the entire bill amount or the amount based on average consumption of past 3-6 months (whichever is lower) to avoid disconnection. Additional charges or adjustments, if any, are adjusted during subsequent billing cycles.

4.3 Key interventions to enhance customer satisfaction

Based on the review of the current processes and stakeholder consultations, a set of interventions have been identified to enhance customer experience.

Figure 8: Interventions for enhancing customer satisfaction



1. **A mechanism to avoid disconnection in case of complaints linked to inaccurate bills:**
In India, customers have to pay the entire electricity bill amount, or the amount based on average consumption of past three to six months (whichever is lower) to avoid disconnection even if they have disputed the accuracy of the bill. In some cases, the current electricity consumption of the customer may not be commensurate with the historical consumption due to various factors such as varying industrial demand, seasonal variations (especially for agriculture customers), etc. In other sectors, for example in banking, credit card charges are reversed until the complaint is resolved. Hence, utilities should devise a mechanism wherein they do not disconnect their customers until the complaint regarding meter accuracy is resolved.



Favorable laws to protect consumer rights

Customers in the U.S. can question the validity of a transaction applied to their credit card, in case they experience erroneous charge. These transactions can happen for reasons including unauthorized or fraudulent charges, failure by the merchant to deliver merchandise, double swiping and billing errors. In such cases, customers can report the transaction to the credit card company's creditor department along with copies of receipts or other evidence and request them to carry out inquiries with regard to the billing statement. The dispute should be sent out to the department within 60 days after the erroneous bill is received by the customer. Generally, the company reverts minor disputed charges (up to USD 25 or less) immediately. As per the Fair Credit Billing Act, the company cannot collect the amount that is in dispute or the interest on that charge, although the customer will need to pay the part of the bill that is not under investigation. During the investigation, the company is not allowed to close the account or report the customer to the credit bureaus for failing to pay the disputed charge³¹. The creditor must resolve the dispute within two billing cycles and not more than 90 days after receiving the complaint.

2. **Remote meter reading**
One of the major issues faced by the utilities is the inability to record meter reading due to various reasons such as unavailability of customers at the time of reading, location of meters (mounted at a

³¹<https://www.cesisolutions.org/2015/07/credit-card-dispute-what-happens-after-you-dispute-a-charge/>, last accessed on 05th February 2020

certain height or inaccessible basement), inability to read display due to dirt or cracks, etc. Deployment of AMI infrastructure to enable remote meter reading may help in dealing with such issues. Utilities might consider deployment of AMI infrastructure for all customers. Meanwhile, they may also provide the self-meter reading option to its customers. These readings can be verified physically or by conducting random visits or periodic audits. With the outbreak of the recent pandemic, remote meter reading has assumed significant importance. Due to lack of remote meter reading capabilities, utilities have resorted to average/estimated billing based on past consumption and this has significantly impacted their revenues. The Energy Efficiency Services Limited (EESL) has installed about 1.2 million smart meters across 4 states (Bihar, Delhi, Haryana and U.P.). This has enabled DISCOMs to generate around 95% of billing efficiency by using smart meters amid this lockdown.



Self-billing service

TPDDL has introduced a self-meter reading service which allows customers to submit meter readings along with photographs on a dedicated WhatsApp number. The readings shared by the consumers are marked as Consumer Brought Reading and the bill is treated as provisional. However, only two provisional bills can be generated using this service—the subsequent third bill must be as per readings captured from the site. In order to promote self-meter reading during the ongoing pandemic of COVID-19, the DERC has announced an additional rebate of INR 20 (USD 0.26) per bill given the meter-reading is submitted by the customer.

Increasing investments on utility modernization projects may also help in economic recovery and job creation. During the financial crisis of 2008, the U.S. Government introduced American Recovery and Reinvestment Act (ARRA) to boost economic growth and create jobs. As a part of this initiative about USD 4.5 billion of public funds were provided for utility and grid modernization projects. Subsequently, a study conducted in 2013 by the U.S. Department of Energy (DOE) showed that smart grid projects funded through the ARRA created nearly USD 7 billion total economic output, 47,000 jobs, and over USD 1 billion in government tax revenue³².

3. Option to avail pre-paid or post-paid connection

Once the utility starts installation of smart meters, it can provide customers with an option to opt for pre-paid services similar to that in the telecom sector. The telecom sector provides a choice to customers to avail pre-paid or post-paid connection during sign-up and the option to switch the existing pre-paid to post-paid connection and vice versa. Several utilities in India (Bihar, U.P., Assam, etc.) have provided such options to some customers. The GOI has also set a target to convert all meters to smart pre-paid meters by 2022³³.

Pre-paid meter installation program in Manipur

In 2011, the Manipur State Power Distribution Company Limited (MSPDCL) implemented a pilot pre-paid metering program covering nearly 18,000 customers. The objective of this program was to reduce the cost of meter reading and billing (especially in hilly areas) and enhance end-use energy efficiency. Owing to the positive response from its customers, MSPDCL implemented a state-wide pre-paid metering program, which helped the utility in reducing its aggregate technical and commercial losses from 77% in 2010-11 to 50% in 2016-17 and reducing its peak demand from 180 MW (in 2010-11) to 100 MW (in 2016-17).

Pre-paid meter installation in the U.S.

In the U.S., about 200 electric utilities are either offering, piloting or planning to introduce pre-paid service connections. This includes public and investor-owned utilities, cooperatives and municipal utilities. As per the research conducted by “quid research”, AMI meters used for pre-paid electricity services may increase from 0.6 million (in 2017) to 2.6 million in 2021.

³²<https://cleantechnica.com/2013/05/03/doe-smart-grid-funds-created-6-8-billion-economic-boost-47000-jobs/>, last accessed on 10th March 2020

³³<https://pib.gov.in/Pressreleaseshare.aspx?PRID=1557203>, last accessed on 21st December 2019

4.4 Nudge techniques

Among the suggested interventions above, increasing uptake of pre-paid smart metering may require behavioral change and customer sensitization. Appropriate nudge techniques which can be adopted by the utilities include:

- **Simplify the process to switch to pre-paid metering:** The easier the purchase-decision journey for customers, the more likely they are to repurchase the brand (Freeman, 2012)³⁴. Simplification of process to shift from status-quo to a new service can help in increasing its adoption. Utilities may provide options to customers by switching from post-paid to pre-paid services by sending a simple SMS or by a single click on their website or by simply submitting a request at the call center.
- **Leverage herd instinct:** The herd instinct bias refers to our tendency to replicate others' actions, even if this implies overriding own beliefs. Professionals are heavily influenced by the behavior of their peers (Gould and Lawes, 2016). Utilities may leverage this bias to increase adoption of pre-paid services by providing information related to number of customers who opted for pre-paid services to its customers (e.g., "over 3,000 customers have installed pre-paid meters in your neighborhood in the past 12 months"). This may help in dealing with the status-quo bias due to which customers may prefer to maintain post-paid services.
- **Educating the customer for knowledge dissemination:** Educating customers about service features and applications can help increase adoption (Page and Luding, 2003). Utilities must initiate smart meter informational programs where customers learn about the importance of smart meters and conserving energy through specially designed resources. This campaign could be initiated across different customer categories with relevant messaging for school children, industrial customers, and rural households.
- **Positive installation experience:** A report released by Smart Energy GB revealed that customers with a positive installation experience are more likely to use their smart meters and continue to modify their energy usage and behavior in the future³⁵. Hence, to enhance installation experience, utilities may send a teaser package containing informational brochures, energy saving ideas and a selection of offers or free gifts a few days before the scheduled installation. The idea leverages enhanced commitment during the point of installation for triggering the formation of new habits.

³⁴<https://hbr.org/2012/05/to-keep-your-customers-keep-it-simple>, last accessed on 20th January 2020

³⁵Smart Energy GB Consumer Engagement Plan and budget 2017

CHAPTER 5



BILLING

Abstract

After meter reading, billing is a critical function in the electricity supply business, impacting customer satisfaction and utilities' revenue stream. The process usually includes bill generation and distribution. This section provides a brief snapshot of billing technologies used in India, key issues faced and expectations of utilities and customers and interventions to enhance customer satisfaction. This includes suggestions related to capturing customer identification details; providing clarity on the constituents of the bill; increased focus on distribution of digital bill and providing flexibility to customers to select their billing period. Additionally, nudge techniques like paperless bills as a default choice and leveraging herd bias which can be used to enhance the adoption of digital bills have also been elaborated.

An electricity bill is an important communication tool between utilities and customers. The bill provides basic information on consumption and payment and ensures accurate financial transactions between utilities and customers. From the utilities' perspective, accurate bill generation and prompt distribution is essential to ensure effective revenue realization. It is, therefore, critical to maintain the quality and accuracy of bills.

The contents of an electricity bill vary amongst states depending on the state regulations. For instance, the Karnataka Electricity Regulatory Commission (KERC) has provided guidelines on constituents of the electricity bill which are highlighted in Figure 9. Utilities such as TPDDL (Delhi)³⁶ and MSEDCL (Maharashtra) are also using the bill as a medium to enhance ease of payment for the customers by printing a QR code on the bill (snapshot in Annexure) which enables customers to make payment through the mobile application.

Figure 9: An example of bill constituents

Bill constituents specified by Karnataka Electricity Regulatory Commission

- Details of the consumer
- Consumption details (present and history)
- Period covered, type of service and tariff applicable
- Summary of payment methods
- Various charges such as fixed, demand charges etc.
- Last date for payment without penalty
- Essential links for internal grievance redressal
- Wheeling charges and surcharges if applicable
- Outstanding arrears or credits
- Contact details of the CGRF and Ombudsman
- Dates of current and previous readings

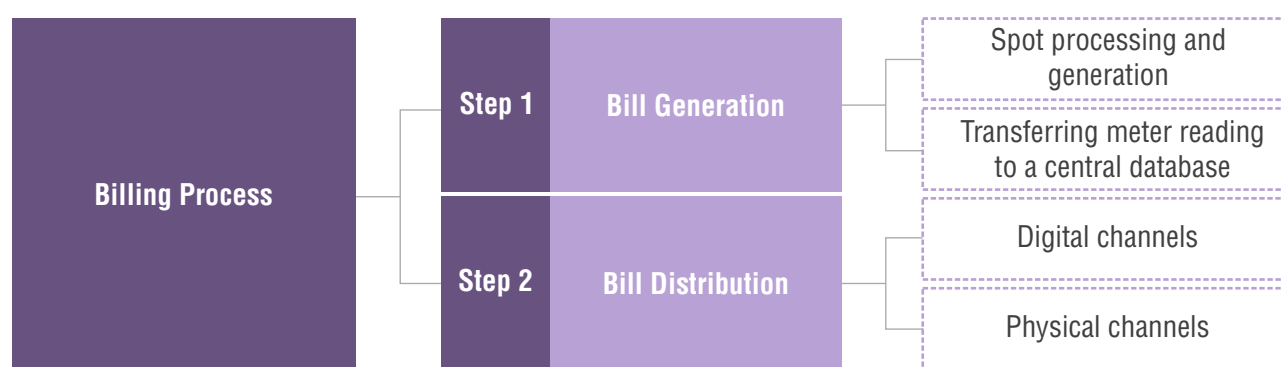
5.1 Existing processes

The electricity bills in India are processed depending on the billing cycle defined in the state regulations. The billing cycle usually varies for different customer categories (typically monthly or bi-monthly for residential customers and quarterly for agriculture).

The billing process typically consists of two broad steps: (i) bill generation and (ii) bill distribution. Based on the meter reading, the utility generates and distributes bills using various types of billing techniques varying as per customer category (industrial, residential, commercial, agriculture, etc.). The billing process in India is highlighted in Figure 10.

³⁶<https://economictimes.indiatimes.com/industry/energy/power/tata-first-power-utility-to-use-qr-code-for-bill-payment/articleshow/60093712.cms?from=mdr>, last accessed on 05th November 2019

Figure 10: Billing process in India



Bill generation

Indian electric utilities use two types of bill generation technologies:

- **Spot processing and generation:** This technology has streamlined bill generation and distribution into a single step. Meter data is captured using hand-held devices either manually or through an optical or wireless interface³⁷. The in-built billing software processes and generates the bill on the spot with the image of meter reading at the customer premises. Customers can also be intimated about the bill amount through e-mail/SMS/App notification immediately after the meter reading. For instance, MSERCL sent bills through an SMS to more than two crore customers in FY 2019-20 instantly after their meter was read.³⁸
- **Transferring meter reading to a central database:** In this case, the meter reading is captured through various techniques such as physical visits by meter reader, remote meter reading, using Meter Reading Instrument (MRI), etc. The data is then transferred to a central database for billing, troubleshooting, and analysis purpose. In the case of data collected by meter readers, the bill generation begins with data punching to a billing software followed by bill printing and distribution. With the installation of AMR meters in states such as Haryana and Delhi, automated bills are being generated by directly downloading the meter reading, thereby minimizing human intervention.

Bill distribution

Indian electric utilities typically distribute bills to customers using the following channels:

- **Digital channels:** Utilities provide several digital channels to avail electricity bills. This includes e-mail, mobile app, website, SMS notification and more recently, WhatsApp.³⁹
- **Physical channels:** This includes distribution of hard copies of the bill. Few states such as U.P. have created billing distribution centers to provide bills to the customers.⁴⁰

5.2 Stakeholder expectations

Generating an accurate bill based on energy consumption data is the first step towards realizing the billed revenue. Several utilities are not able to bill the net input energy leading to low billing efficiencies. The billing efficiency at the national level for the year 2018-19 was 84.3%⁴¹. Few utilities⁴² have reported billing efficiency as low as ~65% for the year. These inefficiencies in billing energy consumption can be partly attributed to factors such as delayed/erroneous readings, delayed delivery of bills, fault in billing software, etc. It can be observed from Figure 11, that increase in billing efficiency from 84.3% to 87% (in FY 2019-20), may have resulted in ~INR 17,200 crore (USD 2.3 billion) of additional revenue realized for DISCOMs. This is ~64% of the total book losses of the distribution utilities for the year (INR 26,956 crore⁴³) (USD 3.6 billion) (Refer Figure 11).

³⁷Madhav, Mrinal Mehta, Shivika (Case of Reforms in the Indian Power Distribution Sector: A Move Towards Eradicating Energy Poverty)

³⁸Tariff Order issued by MSERC, Maharashtra for FY2017-18

³⁹<https://economictimes.indiatimes.com/industry/energy/power/now-get-duplicate-bses-bill-on-whatsapp/articleshow/67660614.cms>, last accessed on 20th April 2020

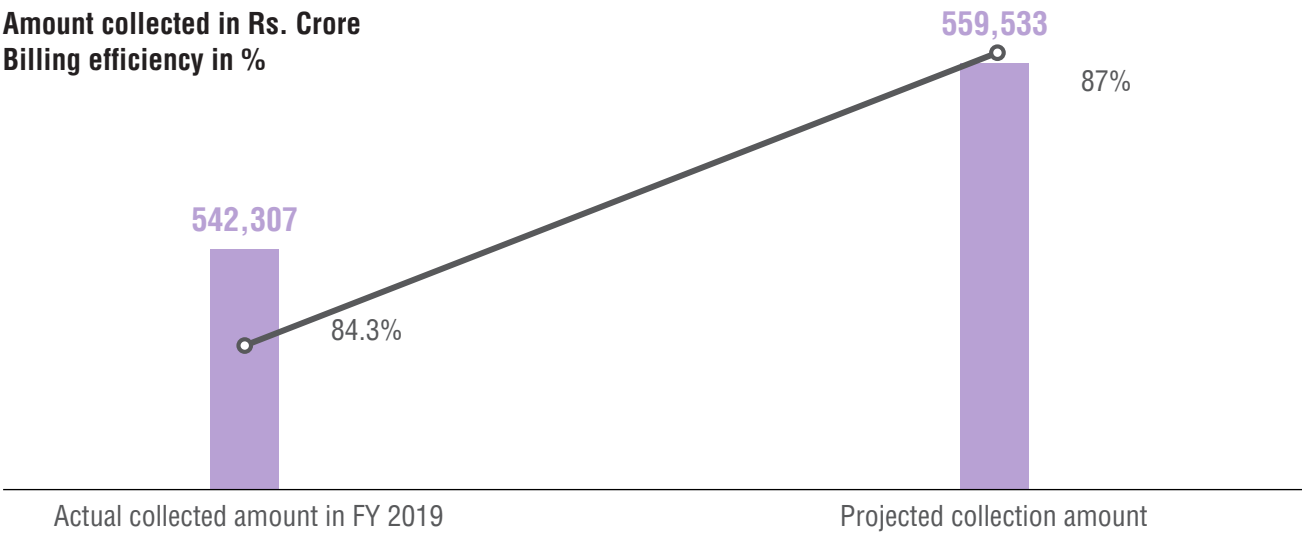
⁴⁰Tariff Order issued by UPERC, Uttar Pradesh for FY2018-19

⁴¹Source: <https://www.uday.gov.in/>, UDAY portal, last accessed on 22nd March 2020

⁴²Example: MEPDCL, Meghalaya

⁴³Source: <https://www.uday.gov.in/>, UDAY portal, last accessed on 7th March 2020

Figure 11: Impact of billing efficiency on the amount collected

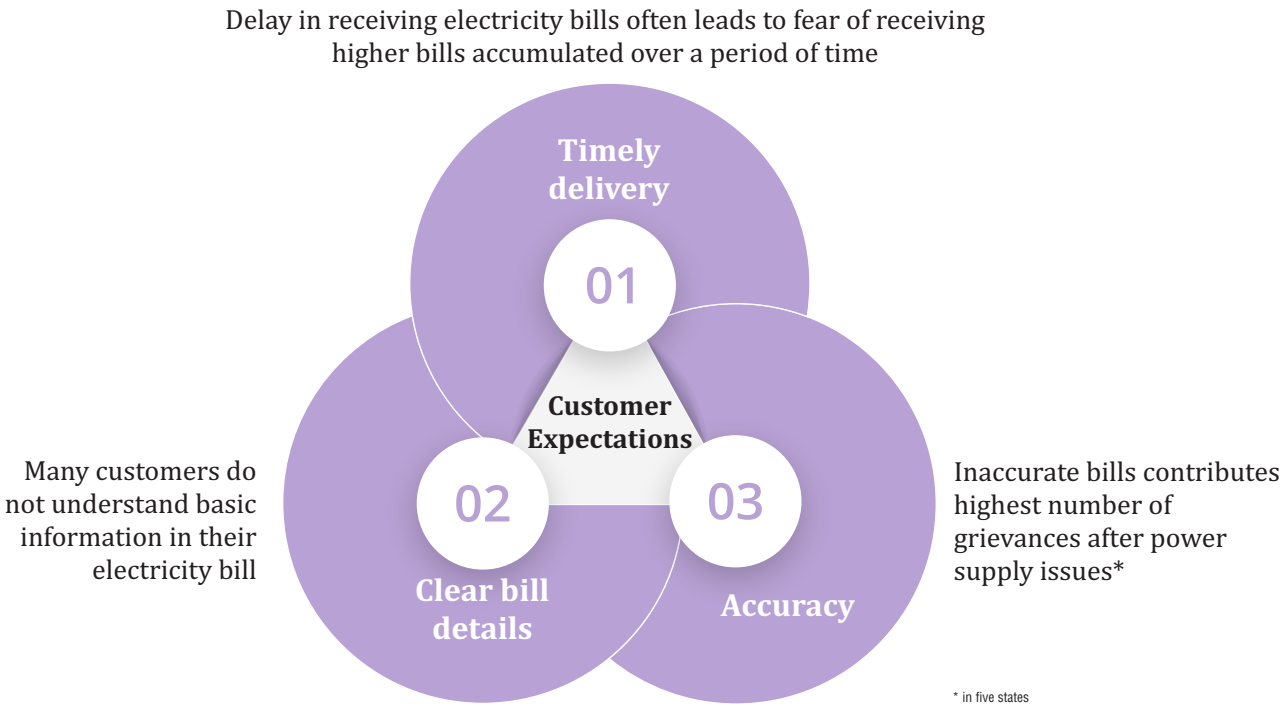


Incorrect billing contributes to highest number of grievances after power outages

A report by World Bank in 2015 studied the different kind of problems faced by customers with their electricity service. The range of issues identified include power supply interruptions, incorrect meter reading and billing, faulty meters, load and connection issues, among others. Customers were studied across five states including Delhi, Haryana, Karnataka, Maharashtra, and Rajasthan. The report revealed that issues related to incorrect bill contributed to the highest number of grievances after power supply issues across the identified five states.⁴⁴

Key expectations of customers from a billing perspective are elaborated in Figure 12.

Figure 12: Customer expectations from a billing perspective



⁴⁴Khanna Ashish, Singh Daljit, Swain K Ashwini, Narain Mudit (2016), Transforming Electricity Governance in India, Has India's Power Sector Regulation Enabled Consumers' Power?

a. Timely delivery

Consumers expect timely delivery of their electricity bills. According to a study on “Empowering People – Enhancing Effectiveness of Rural Electrification Programmes”, 22% of rural customers (sample size of ~2,200) reported that they did not receive regular electricity bills. A study conducted by CEEW on ‘Electricity Consumers and Compliance’ also revealed that about 23% of rural customers mentioned that their billing frequency was more than 3 months. This often leads to a fear of receiving higher electricity bills accumulated over a period of time, thereby restricting some consumers to use electricity only for lighting.

b. Accuracy

Billing inaccuracy is one of the major issues raised by customers across states. For instance, as per the details provided in Forum of Regulators (FOR) report, billing inaccuracy complaints constituted 89% and 69% of the total grievances received by the Consumer Grievance Redressal Forum (CGRF) during 2015 in Chhattisgarh and Madhya Pradesh respectively⁴⁵. The key reasons for inaccuracy may be attributed to faulty meters, manual errors in meter reading and billing, fault in billing software, etc. There is no doubt that billing accuracy is a primary requirement in electricity supply business and is a prerequisite to ensure customer satisfaction.

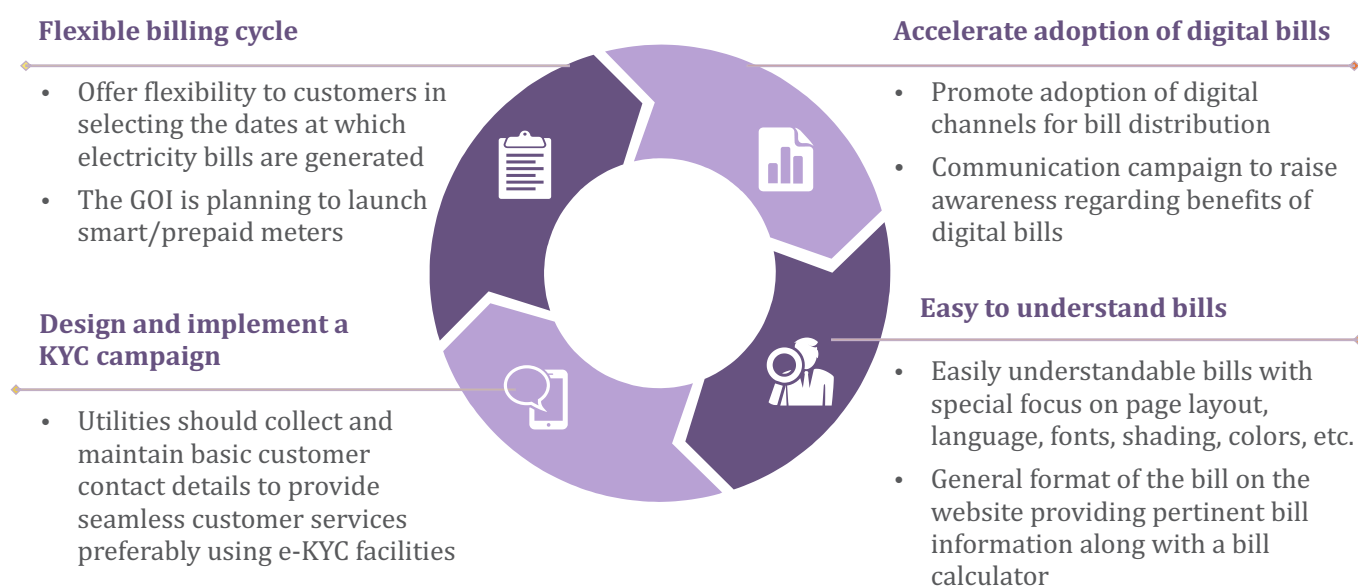
c. Clarity about the bill constituents

Electricity bills are often packed with a lot of information or technical terms. However, most customers do not understand basic information such as break up of charges, applied tariffs, consumption, etc. in their electricity bill⁴⁶. The FOR has also issued a model format for electricity bills to make sure that the information provided in the bills is easy to understand by customers⁴⁷. However, many utilities have not adopted this format. It is imperative to ensure that both the content and layout of electricity bills meet customer expectations.

5.3 Key interventions to enhance customer satisfaction

Based on the review of the current processes and stakeholder consultations, a set of interventions (Figure 13) have been identified to enhance customer experience.

Figure 13: Suggested interventions



⁴⁵Source: Report by Forum of Regulators, “Review of functioning of CGRF & Ombudsman”, August 2016

⁴⁶(May 2017), Energy Billing: Landscape Report and Summary of good practice, BEUC Input to The Consumer-Friendly Energy Bill Initiative, last accessed on 2nd January 2020

⁴⁷<http://www.forumofregulators.gov.in/Data/study/SEB.pdf>, last accessed on 28th April 2020

1. **Flexible billing cycle**

All electric utilities in India generate periodic electricity bills depending on the billing cycle which is generally allocated by the utilities. Customers do not have the flexibility to select a billing cycle or date when bills are generated. This contrasts with other sectors (for example banking/financial services) where customers have an option to select the dates on which the bills will be generated. Similarly, electric utilities may also provide this flexibility to its customers. With smart pre-paid meters, customers will get flexibility to use and pay for electricity as per their requirements, instead of paying the full electricity bill at one go.

Flexible billing cycle in the banking sector

Many leading FIs such as American Express, HDFC Bank and Citibank, among others, provide a one-time option to its customers to change the payment due date or statement closing date. This provides flexibility to the customers to opt for the most suitable date at which they can clear their dues (e.g. few days after receiving salary).

2. **Accelerate adoption of digital bills**

One of the major cost elements for electric utilities is the printing and distribution of electricity bills. For instance, printing and distribution costs contributed nearly 27% to the overall bill generation and distribution costs⁴⁸ for Jaipur DISCOM (Rajasthan, India)⁴⁹. The printing and distribution costs can be reduced by switching to digital modes such as e-mails, mobile messages, mobile applications, etc. A switch to digital channels will also ensure that customers receive their bill on time. Utilities may consider providing such options to their customers along with suitable incentives. A robust communication campaign can be designed and implemented to raise awareness about related benefits such as environment benefits, reduced cost of electricity distribution, etc.

Digital bills in the U.S.

Pacific Gas and Electric (PG&E), Southern California Edison (SCE), Long Island Power Authority in the U.S.; and Energy Australia and Horizon Power in Australia are some examples of utilities that provide a digital version of the electricity bills to their customers. In some cases, utilities also incentivize customers to opt for digital bills, e.g. Long Island Power Authority provides a USD 15 gift card on enrolling for paperless billing.

3. **Easy to understand bills**

Utilities should realize that providing more information does not necessarily make a bill “easier” to understand. Many techniques are available to make a bill more understandable, including working with page layout, language, fonts, shading, colors, etc. Many customers are unable to understand the key constituents of electricity bills. A study by the European Commission (2010:16) found that only less than half of European households knew how much electricity they consume. It may therefore be advantageous for utilities to engage with customers and representative organizations/forums to develop bills which are best suited in the local context. The electricity bills can also be used as a tool for educating customers about energy efficiency and demand side management techniques. Utilities may also include a QR code on the bill to enable customers to make payment through the mobile application.

⁴⁸Other costs include implementation and operation of billing system and meter reading

⁴⁹http://energy.rajasthan.gov.in/content/dam/raj/energy/jaipurdiscom/pdf/orders/ITCirculars/TN_42_DIL.pdf, last accessed on 12th December 2019

Redesigning electricity bill

SSE, a U.K-based energy company, published a simplified bill to reduce customer confusion over energy bills. SSE proposed a simpler bill sample covering a range of topics including energy savings tips, clear depiction of payable amounts, benchmarking against previous duration and contact details for further correspondence among others⁵⁰.



4. Know Your Customer

In order to provide seamless customer services, it is imperative to collect and maintain basic details about the customers like name, address, e-mail address, phone numbers, BPL cardholder number (if any), etc. This information is also a prerequisite for implementing alternate mechanisms for disbursement of subsidies like DBT scheme, wherein customers pay electricity bills as per the tariff determined by the regulators, and subsidies are transferred directly into their bank accounts. Such a mechanism could help in resolving the issues related to poor targeting of subsidies (even wealthy customers are eligible for subsidies), inefficient consumption (inadequate incentives for customers to enhance consumption efficiency) and increased subsidy burden for the government. Many utilities in India (Delhi, Jharkhand, Haryana, etc.) have initiated or are planning to initiate the process of collecting such details for each customer. The DISCOMs should initiate the process of capturing such details for all customers. The data collection may be done through digital modes of communication as adopted in an e-KYC facility.

e-KYC facility in the banking sector

- In the banking sector, complying with KYC regulations increased the turnaround time for carrying out major activities. For instance, opening a bank account used to take 7-10 days. To address the issue, application forms for financial products started to be digitally filled using data from each person's e-KYC. This significantly cut down the paper usage and reduced both cost and time. Each form was digitally signed through biometric authentication. Since all records are provided instantaneously in electronic form, the time taken for document verification and data entry was reduced to zero.
- Axis Bank was the first bank in India to offer an e-KYC facility in 2013. This reduced the turnaround time for opening a bank account to just one day. Today, this facility has become a norm as many traditional banks and licensed payment banks in India offer bank accounts that can be opened and used instantly with e-KYC.

⁵⁰ <https://sse.com/newsandviews/allarticles/2016/02/new-sse-bill-design-aims-to-end-energy-bill-confusion/>, last accessed on 20th February 2020

5.4 Nudge techniques

Among the suggested interventions, adoption of digital bills requires customer sensitization and behavior change. Appropriate nudge techniques which can be adopted by the utilities to increase uptake of digital bills include:

- **Minimize friction costs by making digital bills as default option:** Automatic enrollment for a choice increases customer participation along with sustaining a substantial retention rate. (Madrian et al, 2001)⁵¹. Several countries in Europe have changed their laws to make organ donation the default option, increasing participation from 15% to 90%. Instead of requiring customers to choose their preferred mode of bill distribution, utilities may provide digital electricity bills as default option to new customers. This may increase the uptake of digital bills by reducing friction costs for customers.
- **Sharing information related to number of customers opting for digital bills:** Several international brands such as Google Apps for Work⁵² and Netflix⁵³ highlight the most popular pricing plan to incentivize the customer to select the same. In a similar manner, utilities may also spread the message related to number of customers who have opted for digital bills to increase adoption (e.g. 90% of people have shifted to digital bills in your locality).
- **Minimize fear of shifting to digital bills:** Customers tend to prefer known risks over unknown risks (Fox & Tversky, 1995).⁵⁴ Customers may be fearful of shifting to digital only bills due to consequences such as fear of missing the date, unclear charges, and data inaccuracy. Ensuring that the digital bills are viewed as trustworthy and accurate source of information may help to increase adoption. This could be done by combining digital bills with other services like regular reminders of payment of electricity bills, flexibility to verify consumption charges through DISCOM's website or mobile application or through call centers, etc.

⁵¹Madrian & Shea (2001), The Power of Suggestion: Inertia in 401(k) Participation and Savings Behavior, The Quarterly Journal of Economics

⁵²https://gsuite.google.co.in/intl/en_in/pricing.html, last accessed on 10th March 2020

⁵³<https://www.netflix.com/signup/planform>, last accessed on 15th March 2020

⁵⁴This tendency to prefer known risks over unknown risks is referred to as uncertainty aversion.

CHAPTER 6



PAYMENT

Abstract

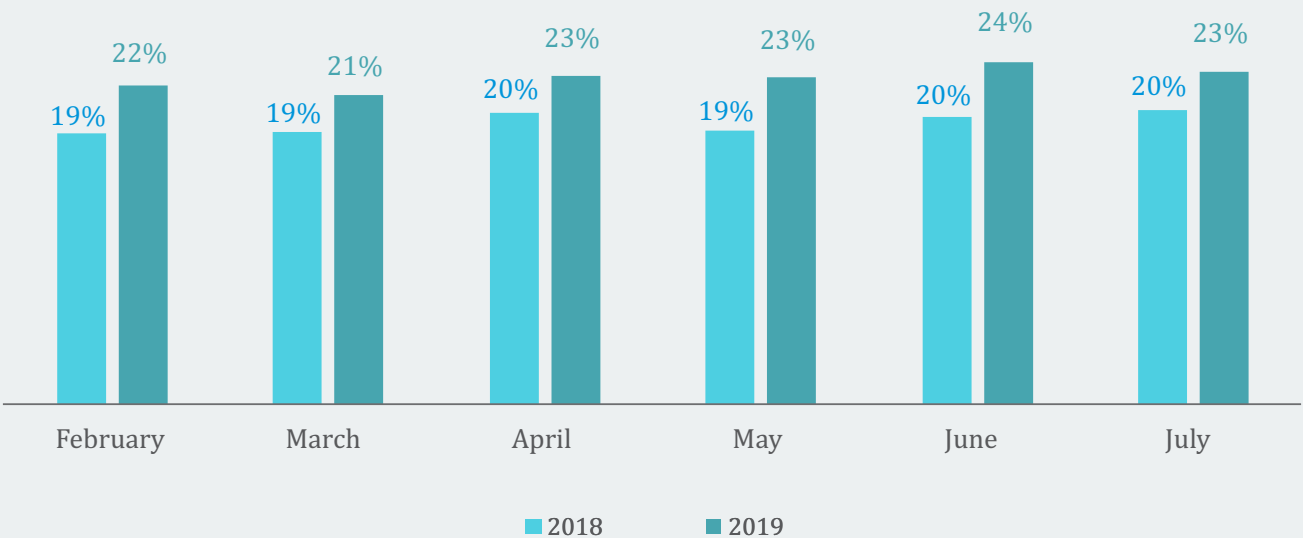
Payment of electricity bills is a crucial interaction between the customer and the utility. Technological developments and progressive regulatory policies have accelerated innovation across payment methods impacting the customer's experiences with the utility. While this has enhanced the ease of payment for the customer, there are few concerns in the process such as limited options for financing, customer's preference towards cash-based payment, lack of 24x7 payment collection centers, etc. This section provides a brief snapshot of payment processes in India, stakeholders' expectations and interventions required to enhance customer experience. This includes interventions like (i) introducing multiple financing options for customers; (ii) multiple avenues for bill payment and (iii) energy assistance programs to support the vulnerable groups.

The collection of the electricity bill directly impacts the financial health of any utility. For the customer, bill payment is an indispensable interaction with the utility. Therefore, utilities may provide flexible and user-friendly bill payment facilities to ensure prompt payments and enhance overall customer satisfaction.

Companies in other sectors such as banking, e-commerce, etc. are constantly innovating to provide best payment services to their customers. Some banks are providing interest-free emergency loans to their customers for a period of nearly 90 days up to the cash limit available in their credit card⁵⁵. These days, all major e-commerce companies provide the facility to pay by cash or card at the time of delivery. Further, online grocery delivery companies are also accepting meal coupons as a payment mode at the time of delivery.

Bill payments in India have witnessed accelerated innovation over the years due to technological developments and progressive regulatory policies. For instance, the GOI has set digital payments target to the tune of INR 4,000 crores (~USD 560 million) in FY 2019-20. In the power sector, the promotion of digital payments has been adopted as one of the key resolutions across all states. Digital payments are witnessing steady growth and acceptance amongst customers. This is evident from month-on-month growth in 2019 against 2018 as demonstrated in Figure 14. However, despite this growth, the total number of consumers making e-payments is not substantial. Further, limited uptake of digital payment options has also substantially affected the utility's collection during the lockdown imposed by the government to contain spread of COVID-19. In some states, the reduction in revenue collection was as high as 80% in April, 2020⁵⁶.

Figure 14: Percentage of customers making e-payments out of the total consumers in urban IT enabled towns covered under IPDS/R-APDRP



⁵⁵ <https://www.bajajfinserv.in/rbl-bank-platinum-plus-fyf-supercard>, last accessed on 21st January 2020
⁵⁶ <https://economictimes.indiatimes.com/industry/energy/power/blackout-threat-looms-as-discom-collections-peter-out/articleshow/75523491.cms?from=mdr>, last accessed on 05th January 2020

6.1 Existing processes

Utilities across India use a range of payment channels and modes for bill payments to enhance customer satisfaction. For instance, customers can pay through online channels such as website, mobile app, etc. and offline bill payment channels such as local office, payment service center, collection camps, etc. Similarly, they can opt for different payment modes. The key channels and modes for payments include:

Payment channels

Apart from the traditional channels, DISCOMs are providing novel and multiple payment channels to reach all potential customers and offer flexibility. For instance, ATM machines, Point of Sale, third-party service providers, etc. (Figure 15 and Figure 16). Few utilities such as MSEDCL and TPDDL are promoting digital payments through various measures such as cash incentives, waiving convenience fee, consumer-friendly online payments and raising awareness through various media.

Figure 15: Online payment channels

Online Channels

- Internet (through DISCOM website/mobile app)
 - Scanning a QR code on the bill using mobile app (such as MSEDCL, Maharashtra)
- Point of Sale (POS) and mobile POS (mPOS) (such as Gujarat)
- Third party service providers (i.e. Paytm, PhonePe, etc.) (such as BSES, Delhi, Odisha DISCOM etc.)
- Mobile banking and Mobile wallets (such as TPDDL, Delhi)
- ATM machines (such as TPDDL, Delhi)
- Payments bank/Bharat Bill payments scheme (such as Andhra Pradesh, Uttarakhand)



Figure 16: Offline payment channels

Offline Channels

- Local office of the DISCOM or authorized payment centers
- A 24-hour bill payment service in some urban areas (Arunachal Pradesh, Jharkhand, etc.)
- Collection camps to improve collection from rural areas (Bihar, Jharkhand, etc.)
- On-spot collection from unpaid customers (such as Karnataka)
- Post office (such as Tamil Nadu)
- Third party agencies (such as Uttar Pradesh)
- Drop boxes at various locations (such as TPDDL, Delhi)



Payment modes

Electric utilities offer various payment modes for payment of electricity bills. These include payment through cash, cheque, demand draft, credit card, debit card, net banking, account transfer, e-wallet, Unified Payment Interface (UPI), Immediate Payment Service (IMPS), National Electronic Funds Transfer (NEFT)/Real Time Gross Settlement (RTGS) and Aadhaar-based payments.

6.2 Stakeholder expectations

The majority of customers in India pay their electricity bill post-consumption. However, a large number of utilities are not able to recover the amount billed leading to low collection efficiencies. The collection efficiency at the national level⁵⁷ for the year 2018-19 was 97%⁵⁸. Few utilities⁵⁹ have reported collection efficiency as low as ~82% for the same year. Some of these utilities continue to incur financial losses.

The growing internet and smartphone penetration and entry of third-party players such as UPI, RuPay, Bharat Interface for Money (BHIM), Paytm and PhonePe has provided the necessary thrust to digital payments. While this has increased the ease of payment to the customer, there are few concerns in the process such as limited options for financing, customer's disposition towards cash-based payments, etc. The key expectations of the customers include:

a. Accessibility of offline payment facilities

One of the key areas of concern among customers is the accessibility of offline payment facilities⁶⁰ which is often limited to working days. In some remote areas (e.g. hilly terrain, remote villages) customers need to travel long distances for payment of electricity bills. Further, most of these payment collection centers were closed due to the lockdown imposed by the government to contain transmission of COVID-19.

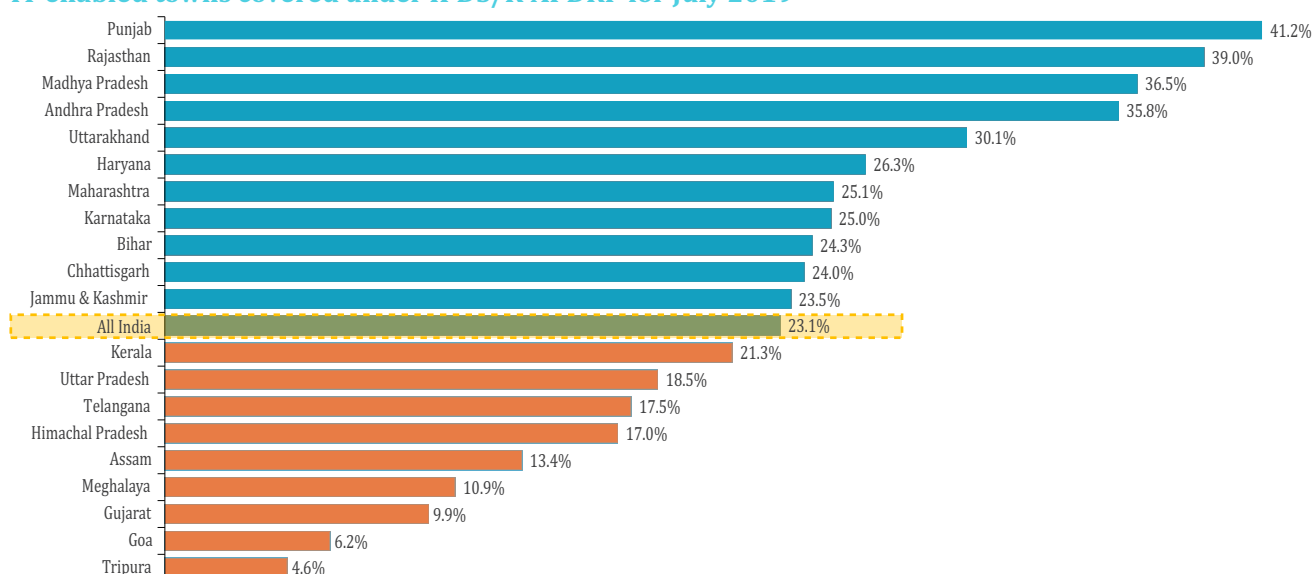
b. Digital payment service charges

Another key area of concern is processing charges for digital payment. For example, in Tamil Nadu these charges may range from INR 5-10/transaction (USD 0.06-USD 0.12), in Kerala it ranges from 0.78-0.84% of the transaction value⁶¹. Also, certain payment gateways and issuer banks levy processing fees for payments above a certain amount such as INR 5,000⁶² (~USD 66). These charges often restrict users to opt for digital modes of payment. At the all-India level, e-payment constitutes nearly 23% of total bill payments (July 2019). Consequently, there exists significant potential for increasing digital payments. State-wise progress for July 2019⁶³ is highlighted in Figure 18.

Figure 17: Bill payment illustration



Figure 18: Percentage of customers making e-payments out of the total consumers in urban IT enabled towns covered under IPDS/R-APDRP for July 2019⁶⁴



⁵⁷UDAY states and UTs

⁵⁸UDAY portal

⁵⁹Jammu and Kashmir

⁶⁰These facilities include payment centers, utility offices, third party agencies, etc.

⁶¹[https://digitalindia.gov.in/writereaddata/files/4.Digital Payments.pdf](https://digitalindia.gov.in/writereaddata/files/4.Digital%20Payments.pdf), last accessed on 3rd March 2020

⁶²<https://www.tatapower-ddl.com/billpay/paybillonline.aspx>, last accessed on 15th March 2020

⁶³<https://urjaindia.co.in/>, last accessed on 10th April 2020

⁶⁴Source: <https://urjaindia.co.in/>, last accessed on 9th November, 2019

c. **Financing options**

Customers often receive high bills in select months as compared to other months due to seasonality in consumption. In electricity sector, there are very limited financing mechanisms (most of which are offered by third party service providers).

6.3.Key interventions to enhance customer satisfaction

Based on the review of the current processes and stakeholder consultations, a set of interventions have been identified to enhance customer experience. These include:

1. Multiple financing options for bill payment

As per the prevailing norms, customers must pay their full electricity bill before the due date to avoid disconnection. They do not have any options for part payment or financing of electricity bills. Whereas in other sectors, such as banking (credit cards), customers have an option to pay a minimum amount due (which is 10-20% of the total bill) to avoid disconnection of services. The remaining amount is generally financed by the service providers and is added to the next billing cycle. Similarly, electricity utilities may also provide financing options to customers, in collaboration with financing institutions or banks. Customers may be required to pay the minimum due to avoid disconnection and the remaining amount can be financed at appropriate interest rates.

Credit Card exclusively for bill payment

TPDDL in collaboration with the HDFC Bank offers a utility card exclusively for bill payments. This facility is available to consumers in certain categories, wherein the card is issued without any joining or annual fee and an interest-free credit period up to 40 days is provided for bill payment⁶⁵.

Financing options on Air Conditioners

Bajaj Finance Ltd. recently introduced a unique proposition—#BijliOnEMI— wherein customers buying ACs on EMI can avail an Insta Credit loan in their 'wallet' which can be used to pay electricity bills on EMI. This facility is available only for those who have purchased their ACs on EMI from Bajaj Finance.⁶⁶

2. Multiple avenues of payment

Utilities across the globe provide multiple payment options to increase the ease and convenience for the consumer. This includes omnichannel presence across the digital modes of payment (through the mobile application, websites, net banking, third-party service providers, etc.), 24x7 payment facilities, payment through ATM machines, direct debit facilities, door-step payment collection (on customer's request), among others. While some of the utilities in India provide multiple avenues for bill payment, there is still considerable scope for improvement, for e.g., 24x7 facilities for bill payment, direct debit facility, payment through ATM machines, etc. Further, few electric utilities do not support digital payment through third-party service providers. For instance, payment through Paytm is possible only in 34 states/UTs. It is imperative to ensure that multiple avenues and choices are provided to the customers for bill payment. This should include digital payment channels such as e-wallets and payment banks, website, net banking, mobile applications, AePS, etc.). Utilities can also leverage the experience from banking sector where door-step financial services are being provided through postmen.

Door-step financial services provided by postman in rural India

The lockdown has unleashed a revolution in the banking sector. During the COVID-19 lockdown, between 24th March to 23rd April 2020, post offices across the country delivered INR 412 crore (USD 54.5. million), mostly in rural and unbanked areas through a network of 1.36 post offices. This was made possible through AePS of the India Post Payments Bank (IPPB). This system enabled customers to withdraw money at their door-step even if they had an account with any other bank. It requires authentication of transaction through biometrics if the bank account is Aadhar linked.

⁶⁵https://www.tatapower-ddl.com/Editor_UploadedDocuments/Content/Terms%20and%20Conditions%20-%20HDFC%20Credit%20Card%20offer%20for%20HRB%20&%20KCG%20consumers.pdf, last accessed on 3rd March 2020

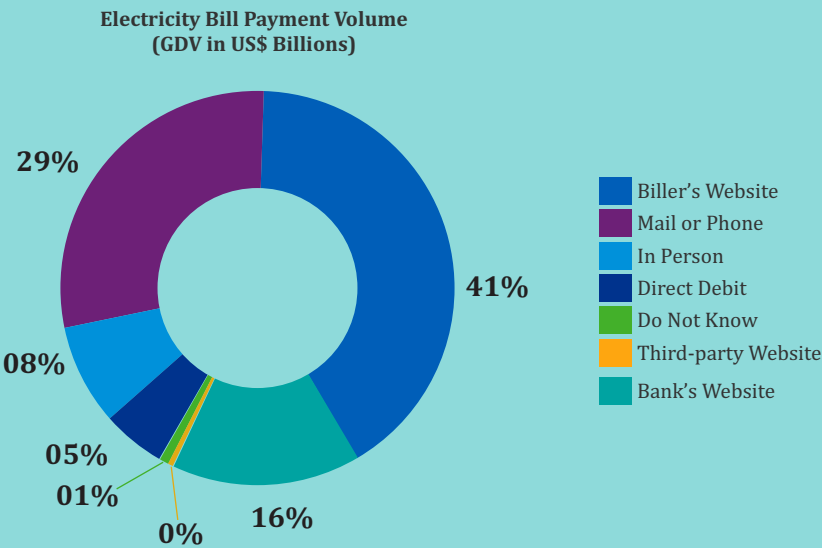
⁶⁶<https://timesofindia.indiatimes.com/india/postmen-turn-into-bankers-for-doorstep-financial-services/articleshow/75360334.cms>, last accessed on 11th March 2020

Direct Debit Facility

Utilities across the globe—Duke Energy, Oklahoma Gas & Electric (OG&E), and Baltimore Gas and Electric (BGE) in the U.S.; British Gas, OVO Energy, and Spark Energy in the UK; and Horizon Power and Energex in Australia—provide direct debit options to customers for payment of electricity bills. In some cases, utilities also incentivize customers, e.g. Pulse Power (an electric utility in the U.S.) provides a USD 1 credit on every bill when customers sign up for Autopay from their bank account.

Payment channels preferences of U.S. citizens

A study conducted by the Aite Group in 2017⁶⁷ showed that a large number of bills in the U.S. were paid through digital modes of payment (91%) in 2016. This included payment through biller’s website, bank’s website, third-party portals, e-mails or phone banking, etc.



3. Energy assistance programs

In certain circumstances (i.e. pandemic, flood, earthquake, and other natural calamities), affected customers may not be able to pay electricity bills. In such a scenario, utilities may establish targeted assistance programs in collaboration with NGOs or corporate organizations (under their CSR initiatives) wherein financial assistance can be provided to affected customers.

Grants and Benefits to pay energy bills

Utilities in the UK have set up charitable trusts (such British Gas Energy Trust, npower Energy Fund, Scottish Power Hardship Fund, etc.) which offer grants to customers who are unable to pay their bills. Apart from trusts, certain targeted schemes by the government and energy suppliers such as winter fuel payments, cold weather payments, warm home discount scheme, etc. are offered to help low-income customers and pensioners pay during extreme weather conditions.

6.4 Nudge techniques

Among the suggested interventions above, multiple financing options and assistance programs for bill payment focus more towards realignment of institutional mechanisms. However, encouraging timely bill payment and promoting digital avenues of payment requires sensitization of consumers for effective implementation. Utilities may adopt the following nudge techniques to increase the share of digital payments:

⁶⁷<https://aitegroup.com/report/how-americans-pay-their-bills-sizing-bill-pay-channels-and-methods>, last accessed on 10th June 2020

- **Disclosing outcomes**

Reciprocity appeal⁶⁸ is highly effective among customers and also increases acceptance (Schumann et al, 2014).⁶⁹ In the UK, to increase tax compliance, people were sent variations of text messages on how their taxes make a difference to public services. People who owed most tax were most responsive to the messages asking them to pay. Compliance increased without increase in tax surveillance costs (UK Cabinet Office, Behavioral Insights Team, 2012). Similarly, to boost payment morale, utilities can inform customers that in return of timely bill payment they can avail improved quality of supply and service (reciprocity appeal). To accelerate adoption of digital payments, utilities may encourage customers by sending text messages on how digital payments will help in reducing transaction cost of the utilities, thereby reducing the overall cost of service.

- **Reminders during suitable period**

Customer choices are influenced by the way these choices are framed through different wordings, settings, and situations, which is referred to as the framing effect. Leveraging this bias, utilities can send payment reminders to customers to pay for their electricity bills during suitable periods. For instance, a favorable time to get people to pay for electricity bill is at the time when their salary credits. At such times, people are less likely to consider bill payment as a loss compared with other times of the month.

- **Collaborate with trustworthy members of the society to increase collection**

Moral principles govern a person's actions and reflect different beliefs in terms of human behavior. These morals are shaped by social and cultural norms and religious practices⁷⁰. Leveraging this fact, utilities could collaborate with trusted and prominent members of society to spread awareness about importance of timely payments, recover pending electricity bills, and promote digital avenues of payment.

Religious leaders help DISCOM recover INR 8 crore (USD 1 million) dues

Paschimanchal Vidyut Vitran Nigam Limited (PVVNL), a DISCOM in U.P., India sought help from religious leaders to recover dues from defaulters, especially those in rural areas. Different religious entities were requested to 'inspire' defaulters to clear their pending dues. After the appeal by the religious leaders, ~18,000 customers registered under the DISCOM's easy installment scheme helping the DISCOM recover its pending dues of nearly INR 8 crore (USD 1 million).

- **Financial incentives for digital payments**

Even a small financial incentive has a considerable effect on customer behavior (Thorton, 2008)⁷¹. Utilities may also provide financial incentives for customers to promote digital modes of payment or to encourage customers to pay well before the last date of payment. These incentives can be recovered from cost reduction owing on-time payments, reduced man-power cost and efficiency improvements.

Smart Rewards

The Life Insurance Corporation of India offers a rebate of 2% on select insurance schemes to accelerate online payments.

- **Enabling social comparison**

People tend to pay attention to others' conducts and search for social proof. Periodic reminders with customized messages like "90% of customers in your area pay electricity bills through online modes of payment" may encourage customers to opt for digital modes of payment. Utilities may consider sending such customized messages to a targeted group of customers.

⁶⁸A strategy for social exchange e.g. a website highlights its free service provision to elicit users' need to reciprocate by providing personal data for targeting purposes that help the provider finance its free offer.

⁶⁹Schumann et al. (2014), Targeted Online Advertising: Using Reciprocity Appeals to Increase Acceptance Among Users of Free Web Services

⁷⁰Policy for Homo Sapiens, Not Homo Economicus; Leveraging the Behavioural Economics of "Nudge", Chapter-2, Economic Survey of India, 2018-19, Volume 1

⁷¹Thorton (2008), The Demand for, and Impact of, Learning HIV Status, The American Economic Review

CHAPTER 7

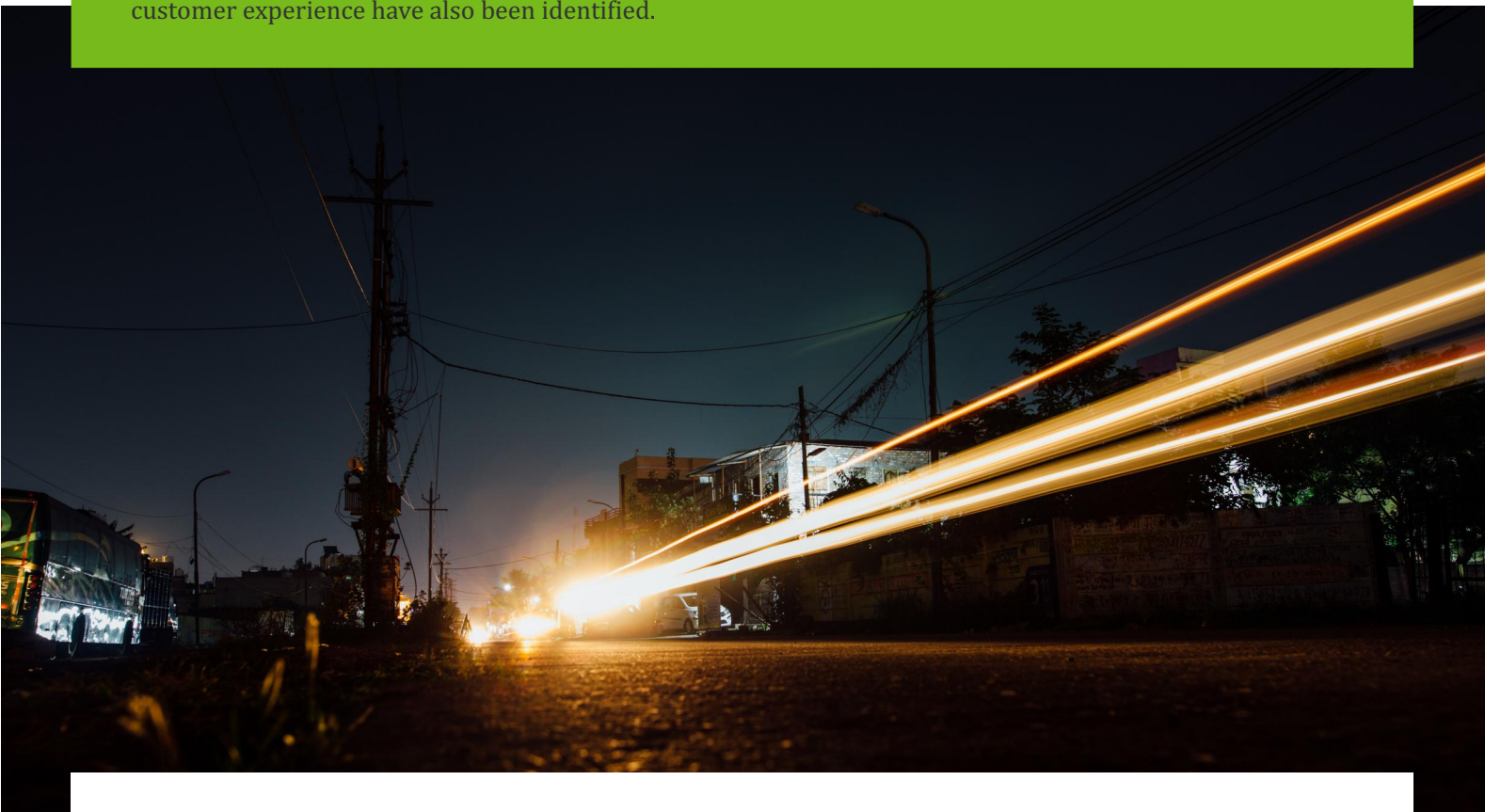


QUALITY AND

RELIABILITY

Abstract

Quality of supply and services significantly impact the customer's perception and satisfaction. With increasing digitization and customer-focused business practices in other sectors, customer expectations from electric utilities have also increased. This section provides a snapshot of existing standards related to quality and reliability of supply and service, stakeholder's expectation and interventions required to enhance customer experience. This includes interventions to minimize impact of planned outages, proactive approach to inform customers about planned/un-planned outages and communicating compensation information. Further, nudge techniques (like sharing information related to comparison and compensation, frequent power restoration messages, prompts to the customer on the waitlist, etc.) which can be adopted to enhance customer experience have also been identified.



Quality of supply and services significantly impact the customer's perception and satisfaction. While quality and reliability of supply relates to the continuity of supply, voltage and frequency variations, harmonics distortion and power factor variations; quality of service relates to overall customer experience. With increasing digitization and customer-focused business practices in other sectors, customer expectations from electric utilities have also increased. For instance, e-commerce companies in India are leading the way in adoption of customer-centric practices to drive online sales while ensuring high quality of customer service. A company dealing in sale/rent of used customer goods online, offers a “No Questions Asked On-the-Spot Return” policy at the time of delivery across all of its products⁷². In case the delivered product does not match the customer's expectation, the company will take the product back at no extra charge and refund the full amount in the stipulated time. Similarly, a major company in food and beverages sector has created a viable market for home delivery of food through its “30 minutes or Free” guarantee⁷³. This promise of timely food delivery has been such a success that many other companies have adopted the same policy to build their customer base.

Customers are now increasingly becoming sensitive to the quality of supply and services. Even a small interruption in supply or voltage fluctuation is not acceptable and 24x7 supply is becoming a norm in most of the states.

⁷²<https://www.gozefo.com/>, last accessed on 12th November 2019

⁷³<https://www.dominos.co.in/hot-pizza-30-minutes-delivery-guarantee-at-dominos-get-pizza-hot>, last accessed on 2nd December 2019

A pioneer in faceless banking – First Direct bank, UK

First Direct bank was launched as the UK's first telephone bank in 1989 and over the past 30 years, it has transformed itself to one of the leading banks of UK by launching a whole gamut of customer services. It is the first faceless bank of UK, with no physical branches and remains open 24 hours a day. The bank offers services through online channels (website, messages, etc.) and phone calls.

Further, the current account service offered by First Direct bank has leading features which includes a welcome credit of £100 (USD 125) for new accounts and parting gift of £100 (USD 125), should a customer decide to close their account. The customer churn rate of the bank is one of the lowest in the industry. This is due to a host of features offered by the bank including (i) seamless switching process from another bank to First Direct bank where the transition steps of closing the old account are handled by First Direct bank itself; (ii) customer convenience to manage the account remotely; (iii) 24x7 call center services; and (iv) additional services for e.g. with minimal charges of ~£15 (~USD 20) per month, customers can avail benefits of worldwide travel insurance, motor breakdown assistance, mobile phone insurance, and many other leisure discounts and offers.

Revolutionizing the way people buy a car – Tesla

Founded in 2003, Tesla produced its first electric sports car in 2008. In 2012, it launched its electric luxury sedan—the Model S. This became the world's best-selling plug-in electric car in 2015 and 2016. Tesla's global sales hit 150,000 units in late 2016.

The differentiating factor for Tesla is its innovative sales process—an online experience rather than the traditional dealership model. This model finds its roots in the research study conducted on trends in car buying patterns of consumers in the U.S. The study found that nearly 25% of the customers who visited car dealers were not happy with the experience and almost 33% would consider buying a car online. For purchasing a Tesla, the customer simply needs to visit the company website to make an order and customize the car. When the car is ready, it is delivered to the customer's address and any kind of software updates are sent wirelessly. This wireless connection of the car with the centralized office helps Tesla to identify several technical problems before they lead to much bigger problems and tarnish the brand image. Tesla has also set up a few showrooms. However, the aim of these showrooms is to educate customers rather than drive sales. The showrooms offer a host of features for a great customer experience such as coffee bars, internet stations with Wi-Fi access, free international calls, and an open service bay technician can be seen working on Tesla cars.

7.1 Existing processes

At present, few parameters related to power quality and reliability are specified under the regulations notified by the Central Electricity Authority (CEA) and SERCs—Grid Code and Supply/Grid Code and SOP regulations respectively. These regulations prescribe limits for various quality and reliability related parameters i.e., time duration within which utilities need to inform customers about scheduled outages, amount of compensation to be paid by utilities for un-scheduled outages, limits for voltage variations, limits for indices like System Average Interruption Duration Index (SAIDI) and System Average Interruption Frequency Index (SAIFI) among others.

The regulations specified by SERCs for power quality and reliability are not congruous across different states. There are several variations in similar power quality parameters specified by different SERCs. Also, the penalties prescribed in case of non-compliance are low and there is general lack of information (in the public domain) pertaining to the amount of compensation actually paid by the utilities to customers on account of such deficient services. Table 3 lists the comparative assessment of specific limits (of selected quality and reliability parameters) prescribed by SERCs of six states.

Table 3: Limits⁷⁴ of key parameters related to quality and reliability of supply

Parameters	Limit prescribed in the regulations					
	Gujarat	Haryana	Jharkhand	M.P.	Andhra Pradesh	U.P.
LT Voltage Variation	± 6%	+10% / -15%	± 6%	± 6%	± 6%	± 6%
HT Voltage Variation	+6% / -9%	NA	+6% / -9%	+6% / -9%	+6% / -9%	+6% / -9%
EHT Voltage Variation	+10% / -12.5%	NA	+10% / -12.5%	+10% / -10%; +5% / -10% (for 400kV line)	+10% / -12.5%	+10% / -12.5%
Reliability Indices	SAIFI, SAIDI and MAIFI	SAIFI and SAIDI	SAIFI, SAIDI and MAIFI	SAIFI, SAIDI and MAIFI	SAIFI, SAIDI and MAIFI	SAIFI, SAIDI and MAIFI
Information about scheduled outage	Notify by a minimum of 48 hours in advance	Notify by a minimum of 24 hours in advance	Notify by a minimum of 24 hours in advance	Provide advance notice	Provide advance notice	Notify by a minimum of 24 hours in advance
Compensation for power outage	INR 25 (USD 0.33) for LT and INR 50 (USD 0.7) for HT consumers for each six hours (or part thereof) of delay in restoration of supply subject to a maximum of INR 500 (USD 6.6) (INR 1000 (USD 13.2) for HT) for LT connection	INR 100 (USD 1.3) per day or part thereof in case of delay to each affected consumer	INR 25 (USD 0.33) to each affected consumer for each case of default	INR 100 (USD 1.3) for each day (or part thereof) of delay	INR 50 to INR100 (USD 0.7 - USD 1.3) for each case of default	INR 50 to INR 150 (USD 0.7 - USD 2) per day

In absence of suitable metering infrastructure, electric utilities are currently not able to capture the quality and reliability of supply related information at the customer's end.

⁷⁴Report on Power Quality of Electricity Supply to the Consumers, FOR; SoP documents released by the regulatory commissions of the state of Haryana, Jharkhand and U.P.

Table 4: Time limits⁷⁵ of key parameters related to quality of service

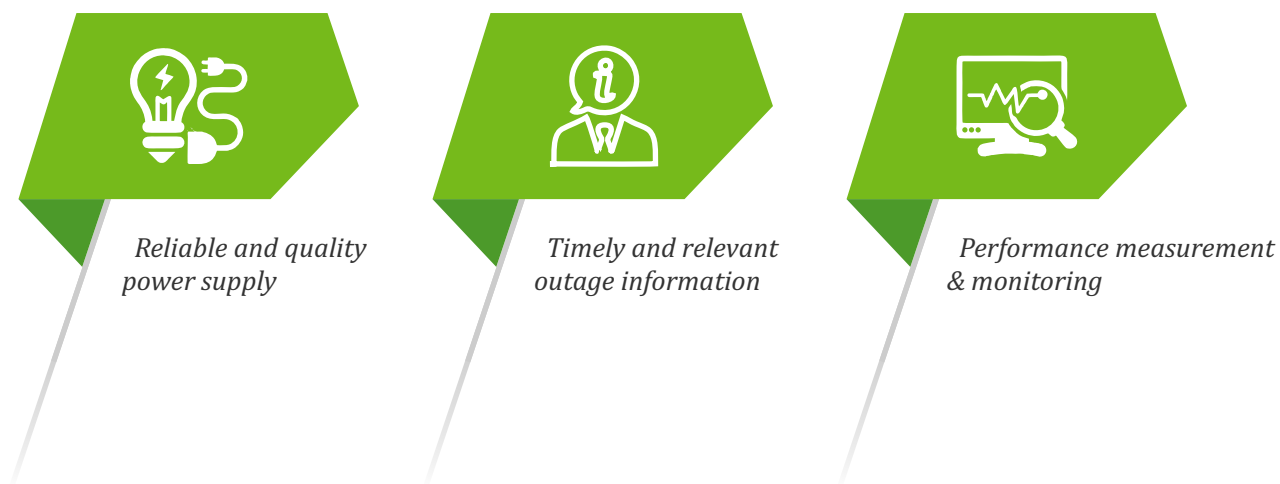
Nature of Service	Category	Time limit for Restoration of Supply					
		Gujarat	Haryana	Jharkhand	M.P.	Andhra Pradesh	U.P.
Normal Fuse Off	Urban	Within 4 hours of receiving the complaint	Within 4 hours	Within 8 hours of receiving the complaint	Within 4 hours (5 hours on non- working days)	Within 4 working hours	Within 4 hours of receiving the complaint
	Rural	Within 24 hours of receiving the complaint	Within 8 hours	Within 12 hours of receiving the complaint	Within 24 hours	Within 12 working hours	Within 6 hours of receiving the complaint
Line Breakdowns	Urban	Within 8 hours of receiving the complaint	Within 8 hours (12 hours if pole gets broken)	Within 12 hours of occurrence of breakdown	Within 12 hours	Within 6 hours (12 hours in case of underground cable)	Within 3 hours of occurrence of breakdown (12 hours in case of underground cable)
	Rural	Within 24 hours of receiving the complaint	Within 16 hours (24 hours if pole gets broken)	Within 24 hours of occurrence of breakdown	Within 3 days	Within 24 hours (48 hours in case of underground cable)	Within 24 hours of occurrence of breakdown (48 hours in case of underground cable)
Distribution Transformer Failure	Urban	Within 1 day of receiving the complaint	Within 24 hours	Within 36 hours of receiving the complaint	Within 24 hours	Within 24 hours	Within 8 hours of receiving the complaint
	Rural	Within 3 days of receiving the complaint	Within 48 hours	Within 48 hours of receiving the complaint	Within 72 hours	Within 48 hours	Within 48 hours of receiving the complaint
Period of Scheduled outages	Urban	Not to exceed 10 hours on any day	Not to exceed 8 hours on any day	Not to exceed 12 hours in a day	Not to exceed 12 hours	Not to exceed 12 hours	Not to exceed more than 12 hours
	Rural						Not to exceed 24 hours in a month

⁷⁵ SOP Regulations notified by the SERCs of the state of Gujarat, Haryana, Jharkhand, M.P., Andhra Pradesh and U.P.

7.2 Stakeholder expectations

Utilities and customers are both affected by the quality and reliability issues of power supply. While utilities suffer from additional expenses due to frequent maintenance, repair of damaged equipment, loss of revenue, etc., customers suffer from increased repair cost of consumer electronics, unscheduled power cuts etc. leading to a high degree of inconvenience. Some of the key expectations of utilities and customers are highlighted in Figure 19.

Figure 19: Key expectations of utilities and customers



a. Reliable and constant power supply

Unreliable power supply often leads to economic losses for customers and impacts the quality of life. For industrial customers, the economic losses are due to plant shutdown, lost work in process, additional labor cost, etc. For residential customers it influences the daily routine and results in increased adoption of alternate energy supply sources (i.e. batteries, diesel generators, etc.). Further, in many instances, though customers are eligible to receive compensation for unreliable power supply (as per the provisions of regulations notified by various SERCs), it is not provided by the utilities or customers are not aware about the same.

Compensation and penalties in the Indian Aviation industry

The Directorate General of Civil Aviation of India has revised compensation/penalty guidelines for air carriers during instances of flight delays and cancellations, oversold flights, and denied boarding cases to the end-customer.

- In a case where an airline carrier cancels flights without informing passengers, they must pay a compensation of up to INR 10,000 (~ USD 160) or disburse the amount to the tune of a one-way ticket⁷⁶, whichever is less, in addition to a refund of the ticket price.
- If a passenger is denied boarding against his or her will, the airline carrier must arrange an alternate flight for the passenger within one hour of the scheduled departure, failing which it may have to refund the ticket and pay compensation of up to 400% of the fare to a maximum of INR 20,000 (~USD 300).

b. Timely and relevant outage information

Timely communication in the form of notices through e-mails, SMS, social media, etc. is important to ensure that customers are least impacted. These communications may include information such as the cause of the outage, estimated time of supply restoration, the progress of work, etc.

⁷⁶Including basic fare plus fuel charge

Role of communication during outages

Ameren, an Illinois-based power utility (U.S.), adopted a communication strategy⁷⁷ to improve its customer outage experience. In 2016, following a series of severe winter storms and widespread outages, the utility received significant negative customer feedback regarding inconsistent outage notifications and changing estimated restoration times. Post implementation, almost 94% of Ameren's customers stated that they found the communication strategy “valuable” and 68% reported that receiving the notification increased their satisfaction with the utility.

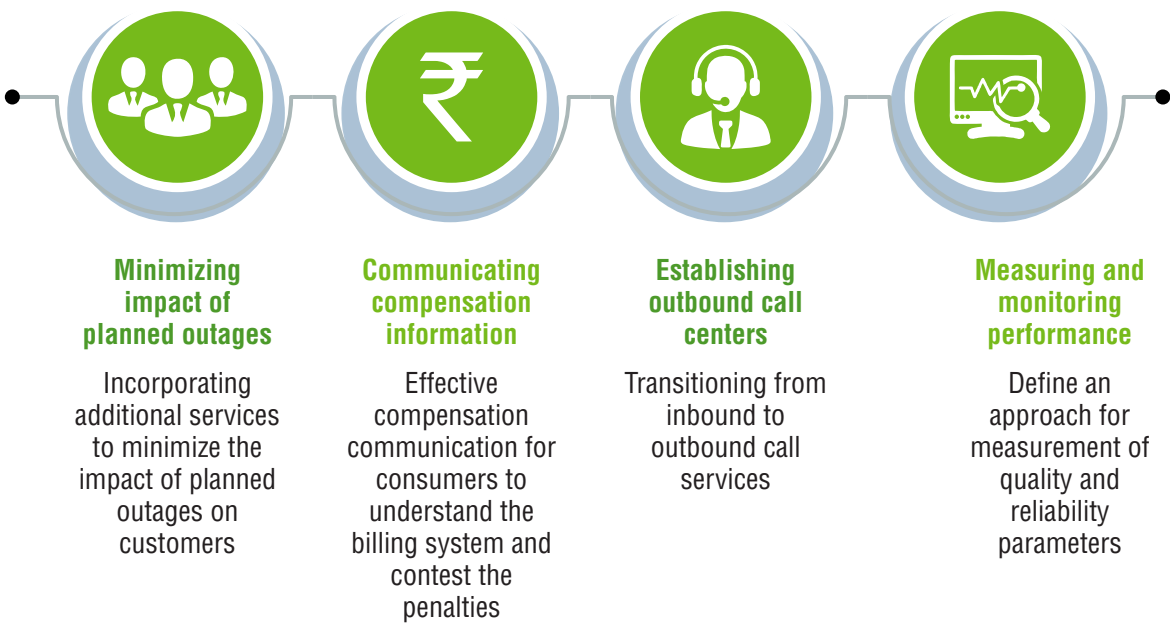
c. Performance measurement and monitoring

As mentioned in the previous sections of this report, the SOP regulations across states specifies limits for quality and reliability related parameters. It is imperative to ensure that these are adequately measured and monitored, especially at the customer end.

7.3 Key interventions to enhance customer satisfaction

Based on the review of the current processes and stakeholder consultations, a set of interventions (Figure 20) have been identified to enhance customer experience. These include:

Figure 20: Key recommendations



1. Minimize the impact of planned outages

As per existing regulations, utilities need to inform customers about planned outages in advance (the time duration varies from state to state). Additionally, utilities might endeavor to minimize the impact of planned outages on customers by: (i) avoiding outages during weekends and holidays and planning it during off-peak time/season; (ii) scheduling maintenance activities in industrial areas during weekly shutdown; (iii) informing customers through personalized messages (through SMS, WhatsApp, phone calls, etc.) about planned outages; (iv) planning operational maintenance activities in consultation with the customers; (v) maintaining a dedicated page for customers to access real-time information about outages and estimated restoration time along with contact information for customer service staff; and (vi) conducting a survey regarding the utility responsiveness to the outage.

⁷⁷<https://www.esource.com/system/files/consultingcasestudy-amerenoutages-web.pdf>, last accessed on 23rd March 2020

Rethinking power outages from customer's perspective

Pacific Gas and Electric Company, a U.S.-based utility, is rethinking the way it handles power outages. As an experiment, the utility is issuing field crews with equipment such as wilderness blankets, water bottles, flashlights, charging stations, and even a Wi-Fi hotspot to help customers with no power. The idea was inspired by primary research and a look outside the industry to see how exemplary companies go to great lengths to recover from disappointing customer experiences.

2. Proactive approach

Utilities may transition from inbound to outbound services i.e. instead of customers approaching the utilities, utilities may reach out to customers in the events of planned/unplanned outages. In this regard, utilities in several Indian states (such as Tamil Nadu, Andhra Pradesh, Karnataka, Delhi, etc.) have established inbound call centers⁷⁸ where customer complaints are registered and forwarded to the field personnel for timely action and rectification. The services at these call centers may be extended to reach out to the customers proactively. In the case of unplanned outages (including during floods, earthquake, landslides, and other natural calamities), utilities may properly manage communications sent to customers to minimize the impact. For empathizing with the customers, the communications might include statements such as “We regret the inconvenience caused...”, “We apologize....”, etc. In addition, utilities may inform customers about the compensation that will be paid to them due to the power outage. This compensation will be applicable in case the power supply restoration time exceeds the prescribed duration.

Proactive outage communication

DTE Energy, located in Michigan, U.S., began handling power outages in a proactive way. During forecasts of severe weather, including high winds, the company sent e-mails to customers to provide a weather advisory and provide tips for preparing for possible outages. It also provided a real time update during outages.

IT-enabled Outage Management System

Till 2017, MSEDCL had a manual Outage Management System (OMS) on which data was updated manually on a post facto basis. Customers did not receive advance outage notifications and only 10% of the outages were reported leading to faulty computation of indices. The DISCOM shifted to automated feeding of planned outages in advance via the Employee Mobile APP. The outage information is now available on website and SMS notifications. The Employee Mitra App's share of outage data capture grew from 44% in FY 2017 to 96% in FY 2019-20. To improve O&M costs, the DISCOM is planning to apply advance analytics on past data.



⁷⁸<https://powermin.nic.in/en/content/electricity-call-center>, last accessed on 8th March 2020

3. **Communicate compensation information**

Currently in India, the regulator provides compensation to the customers in case of unscheduled outages due to range of activities including normal fuse off, overhead line/cable breakdowns, underground cable breakdown, DT failures, among others. Even though outage handling forms a major component of customer satisfaction, utilities provide compensation details in a limited fashion. Compensation to be paid to the customer in lieu of unplanned outages must be transparently communicated. They can be communicated to consumers through e-mail/SMS/App notification, through printed media, brochures in the utility's office, or through electricity bills amongst others. This information is important for consumers to be able to better understand the utility billing system as well as to be able to contest the penalties.

Compensation trends across the globe

Many economies have established a robust independent regulatory framework with the right oversight and incentives to improve the reliability of supply. Regulators in some economies adopt a strategy to reduce outages by setting a limit on the frequency and duration of outages and then requiring utilities to pay a fine or a compensation to customers if they exceed that limit.

- In Spain, utilities are obliged to compensate their clients if unplanned outages last over three minutes. Alternatively, regulators may impose a fine on utilities.
- In Georgia, the regulator imposes a penalty on the utility if the frequency and duration of outages are worse in the current year than in the previous one, and/or if the utility fails to warn customers on upcoming planned outages less than two days in advance.
- UK customers get £70 (~USD 90) in compensation if the power outage duration was 24 hours followed by £70 (~USD 90) for each following 12 hours, up to a maximum of £700 (USD 880) - which would be a maximum of 10 days. The regulator provides an extra £75 (~USD 95) compensation if the power goes off more than four times in one year, for more than three hours.
- Vector group (New Zealand's largest electricity and gas distributor) endeavors to pay USD 200 in case of network failure and the power doesn't restore within the timeframes outlined in the service standards. To make a claim, customers need to call on the national helpline within six months of the eligible power outage.

4. **Measure and monitor performance**

SOP regulations across states prescribe limits for various quality and reliability related parameters. It is imperative to measure and report the utility's performance on these parameters on a periodic basis to ensure compliance. The SERCs may revisit these regulations and define an approach for measurement (on the basis of physical infrastructure at the utility), reporting formats and reporting periods to ensure compliance.

7.4 Nudge techniques

Among the suggested interventions above, minimizing the impact of planned outages requires sensitization of consumers for effective implementation. Utilities may adopt the following nudge techniques to build customer confidence while communicating about outages:

- **Performance comparison and compensation information**

Disclosure plays an important role in ensuring that consumers are aware of product performance and their opportunities to act at certain points in the product lifecycle (FSA, 2006). Utilities may provide outage information in advance through SMS/e-mail/ web notifications. Customer communications could be supplemented with information such as (i) comparison of power cut duration in the past week to the average duration of power cuts in the past month; (ii) total compensation provided to the customer as bill credits during last month in lieu of delay in power supply restoration; (iii) accuracy (last month average) of power supply restoration time estimations, etc. By providing such information, utilities can create a positive outlook of its services and pacify annoyed customers to some extent.

- **Frequent power restoration messages**

'Hot' and 'cold' states refer to contrasting conditions that underpin decision making. In a 'hot state' an individual will decide based on an emotional, visceral, impulse-driven reaction (Loewenstein, 2005). The 'cold state' is an exact opposite of 'hot state', wherein people tend to relax and do not appreciate their own feeling during 'hot state'. The majority of customers facing power outage are likely to be in a 'hot state'. Therefore, certain triggers, for example power restoration messages can help to overcome this state. In addition to performance and compensation information, utility can increase the frequency of messages related to information about power restoration. This strategy will aid in instilling the belief among customers that the utility is undertaking all possible steps to ensure minimum inconvenience to its customers.

- **Automate follow-up with customers**

The Office of Gas and Electricity Markets (Ofgem), a government regulator for the electricity in Great Britain, conducts an annual customer survey to track quality and reliability of the existing suppliers. Currently, utilities in India do not follow-up with the customer regarding power quality. To provide sustained support to customers during outages, utilities could send automated messages by SMS/e-mail/App after resolution of the complaint for their feedback on the service and the probable development areas. These messages could be automated and would only require utility officials to actively follow-up with the customers if they report any subsequent incidence of outages.

- **Prompts to customers on the waitlist**

'Goal gradient hypothesis' mentions that motivation of people increases as they approach their desired goal (Hull, 1932), while 'endowed progress effect' refers to the greater persistence on a task when people perceive progress towards it (Nunes & Drèze, 2006). Customers in India approach the utilities to register power outages. The waiting time to register power outages complaints can be long due to lack of capacity. This might increase customer exasperation and customers may drop-out while waiting to submit complaints. Goal gradient hypothesis and endowed progress effect could be used to motivate customers to stay on waitlist, by conveying how close they are to their goal and how much progress they have already made by joining and progressing in the queue (e.g., "Congratulations on moving in the queue. Your complaint will be attended within x minutes:").

CHAPTER 8



COMPLAINT

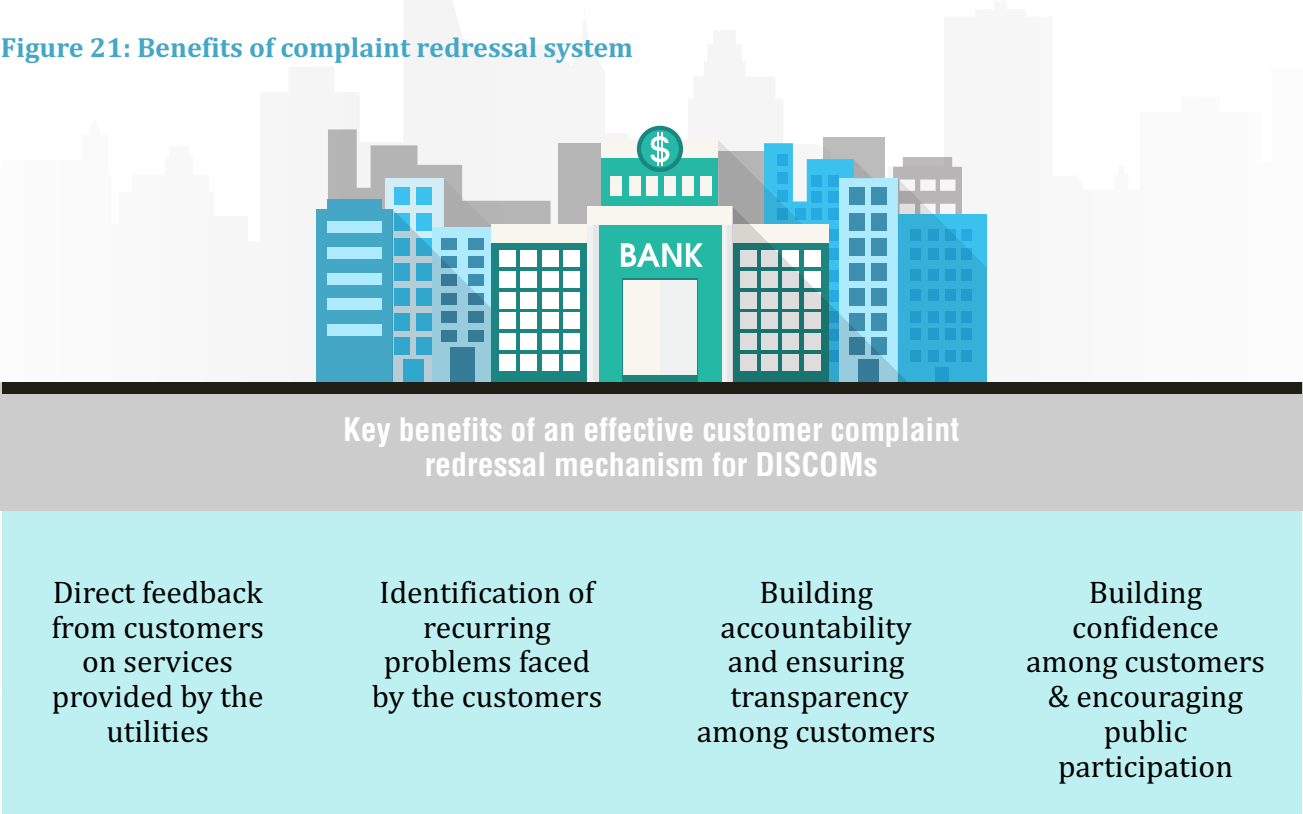
RESOLUTION

Abstract

Customer complaint redressal system is an important function of electric utilities which helps in improving performance and building trust. The basic purpose of complaint redressal system is to provide a platform wherein customers can register complaints, voice their opinion and provide feedback. This section provides a brief snapshot of complaint redressal mechanisms, key issues faced and expectations of utilities and customers and interventions to ensure better complaint redressal and enhance customer satisfaction. This includes multiple avenues for complaint registration and simplification of internal grievance redressal process. Nudge techniques (like sending periodic messages highlighting number of customers using digital medium for grievance redressal and managing customer communication during complaint registration) which can be used to enhance uptake of redressal services have also been elaborated.

Customer complaint redressal system is an important function of electric utilities which helps in improving performance and building trust. The basic purpose of complaint redressal system is to provide a platform wherein customers can register complaints, voice their opinion and provide feedback. It also serves as a means to measure the efficiency and efficacy of the services provided by the utilities. An effective complaint redressal system provides for two-way communication (customer to utility and utility to customer) which can be used by utilities for improving service quality. Figure 21 provides an overview of key benefits of an effective customer complaint redressal mechanism for electric utilities.

Figure 21: Benefits of complaint redressal system



Additionally, with increased focus on customer services and personalized experience provided by many organizations in other sectors, customer expectations from electric utilities have also increased. One such example is services provided by the 'Bonobos' – a leading online men clothing provider in the U.S.

Customer service team offers legal services to aggrieved customers

Bonobos is known for its liberal customer service strategy. The company has a dedicated customer service team (also called 'Ninjas') who is provided with a free hand to take care of the customer. This means that if the customer care representative thinks that the customer needs to be compensated, they can take the decision immediately. They can even offer legal services to customers if the aggrieved customer desires to take a legal course of action.

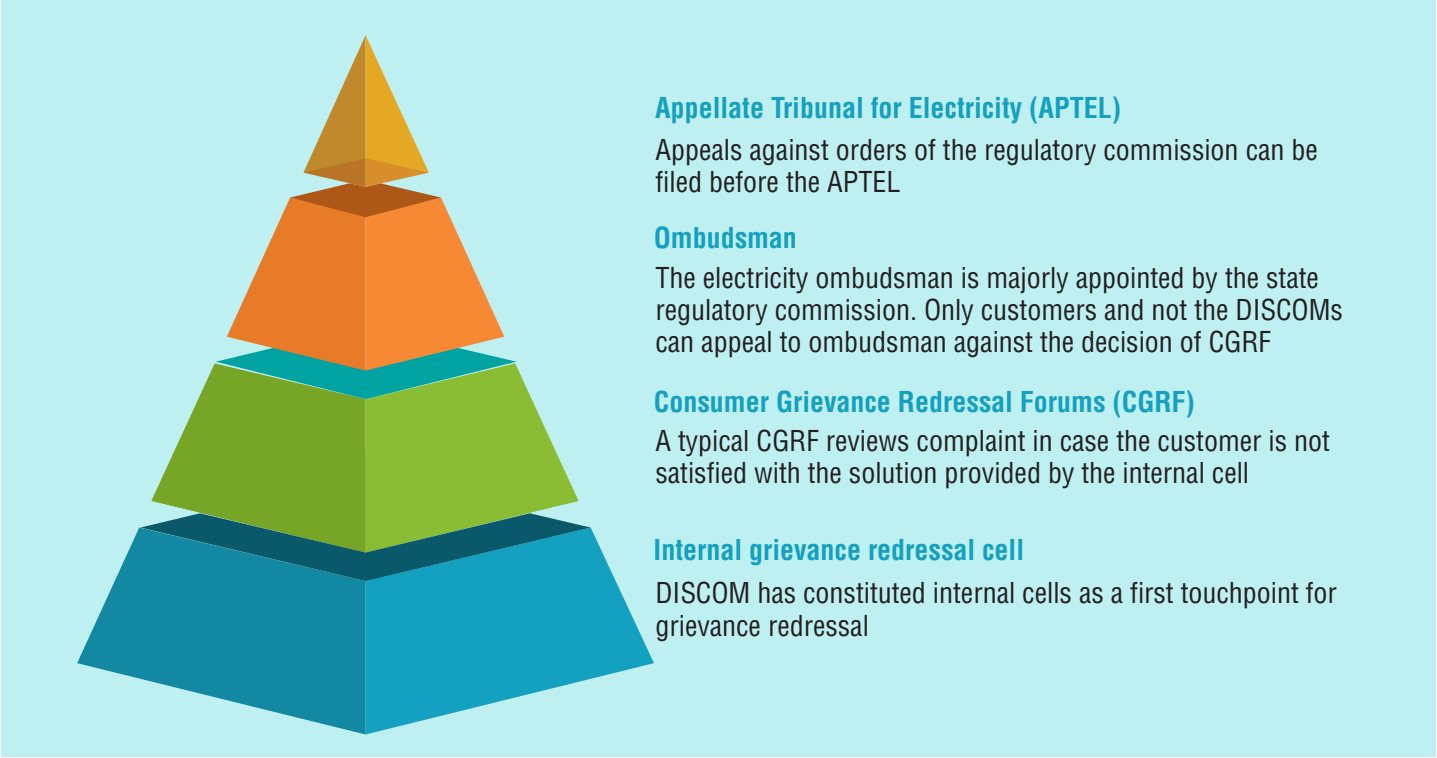
With Bonobos' desire to provide great customer service, they closed a USD 16.4 million strategic minority investment round in 2012 followed by a USD 30 million round in 2013. In June 2017, Walmart purchased the brand for USD 310 million in cash.

8.1 Existing processes

The Electricity Act, 2003 recognized the need for a grievance redressal system to ensure service quality. It specified establishment of a three-tier customer grievance redressal mechanism: (i) electric utilities are mandated to set-up CGRFs at the local level; (ii) if unaddressed at this level, customers can reach out to ombudsman at SERCs, and (iii) if customers are not satisfied with the decision, they may also reach out to the Appellate Tribunal for Electricity (APTEL) at the national level. In addition, most electric utilities in India have set-up their internal complaint redressal mechanism which can be used by customers before reaching out to the CGRFs. (Figure 22)

Figure 22: Tiered grievances redressal system

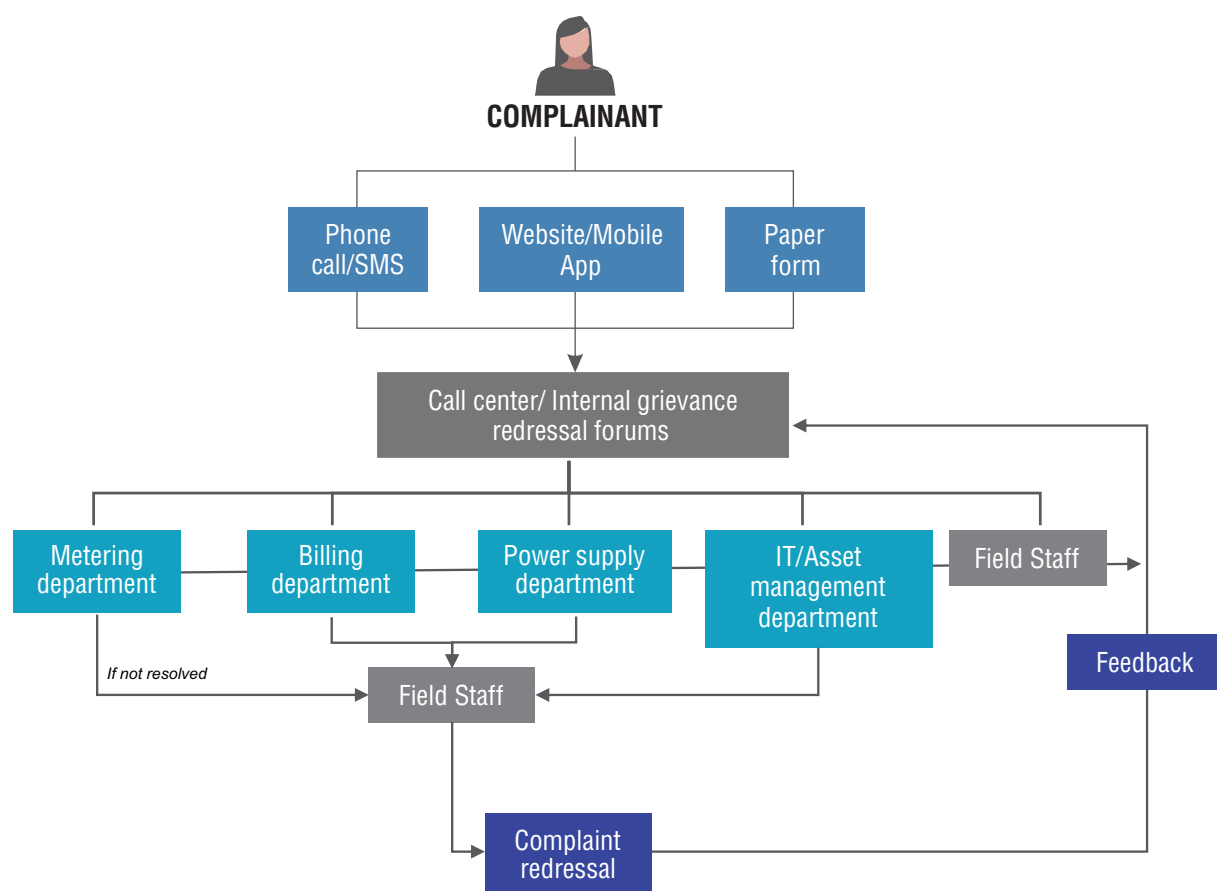
Customer grievance redressal mechanism tiers



The USAID SPARC Program team reviewed the complaint redressal system of select utilities to understand their existing processes. The broad approach of most utilities is highlighted in Figure 23.

- Customers can register complaints or provide feedback through various modes such as phone call, through utility website/mobile app or by submitting a written complaint.
- Utility's customer care center officials transfer the complaint to the concerned department (metering, billing, asset management, safety, etc.) for resolution. The concerned department transfers the complaint to the field staff, if needed.
- Depending on the type and severity of complaint, field staff is allocated to address the customer complaints.
- Once the complaint is resolved, the details are updated in the utility's system for complaint mangement. The customers are also notified of the complaint status.

Figure 23: Workflow of customer complaint redressal



Various initiatives have been taken up by the central government, SERCs, state governments and utilities to strengthen the grievance redressal system. Some of the initiatives include:

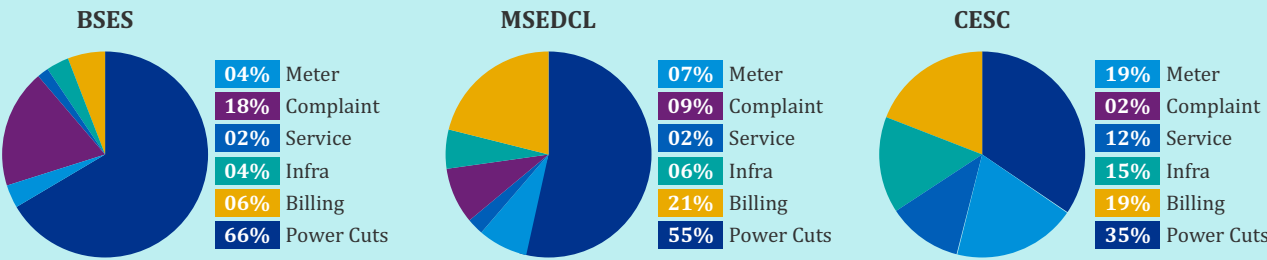
- **Dedicated number for electricity call centers:** The Ministry of Power, GOI has allotted a single telephone number '1912' to the Electricity Call Centers for handling power supply related complaints. The number is operational in many states including Andhra Pradesh, Karnataka, M.P., Rajasthan, U.P., and Tamil Nadu. Few states have also made it a toll-free number such as U.P., M.P. and Tamil Nadu⁷⁹.
- **Customer interaction meetings:** For timely disposal of consumer complaints, Bengaluru Electricity Supply Company Limited (BESCOM) organizes monthly customer interaction meetings in all of its sub-divisions.
- **Involvement of local communities:** Feedback Energy Distribution Company Ltd. (FEDCO), Odisha is taking assistance from Women Self-Help Groups in grievance redressal activities under its incentive-led SEFALI (Society's Empowerment for Assuring Livelihood) program⁸⁰.
- **Consumer satisfaction survey:** DERC, Delhi conducted a survey across the distribution areas served by the three private distribution companies to get a first-hand assessment of consumer satisfaction levels against the services provided by the DISCOMs.

⁷⁹<http://pibarchive.nic.in/ndagov/Comprehensive-Materials/compr22.pdf>, last accessed on 07th December 2019

⁸⁰<https://orissadiary.com/fedco-aims-widen-women-shg-network-puri-sefali-programme/>, last accessed on 12th November 2019

Complaints registered by customers on Twitter

An analysis of customer complaints registered through Twitter was carried out on sample basis by the project team to understand the user perspective of five different electric utilities—BSES (Delhi), MSEDCL (Maharashtra), DHBVN (Haryana), BESCO (Karnataka), and CESC Limited (West Bengal).



The issues were divided into several different groups. The tweets to the electric companies during a period of ten days were extracted and analyzed according to these groups. The analysis for three major utilities revealed that BSES had a majority of issues related to power cuts while MSEDCL was suffering from billing issues along with power cuts. CESC was suffering from power cuts, infrastructure and billing issues.

Further analysis was also conducted to ascertain the causes behind the major issues. These causes included certain transformer issues, heavy rainfall, and erratic bill delivery schedules, among others.

8.2 Stakeholder expectations

The customer grievance redressal mechanism in the power sector was established to increase accountability and transparency in the performance of utilities. Despite proper regulations in place, these mechanisms have not reached their potential in terms of effectiveness. The key expectations of customers are:

- a. **Convenience process**
Many DISCOMs in India register complaints received through phone calls, SMSes or physical application. While some DISCOMs (like TPDDL, BSES, Torrent Power, DISCOMs in U.P. etc.) have also started accepting complaints through other communication channels (like WhatsApp messages, mobile application, etc.), it is imperative to provide flexibility to customers to register grievances through their own preferred mode of communication.
- b. **Transparency**
Customers expect complete transparency in complaint resolution process with an option to track the status of the complaint through a convenient medium such as an online portal. However, most utilities lack the online facility for tracking complaint status. Thus, setting up of complaint tracking systems by utilities will increase transparency in the complaint resolution process.
- c. **Effective and efficient process**
The existing internal grievance redressal mechanism of DISCOMs comprises of multiple steps, making the resolution of a grievance a monotonous experience for the customers. An effective and efficient complaint handling mechanism internally will reduce manpower cost for the utility and enhance the overall customer experience at these stages.

Setting new benchmarks of customer service in e-commerce

Amazon is constantly innovating customer service with new customer solutions, including no-questions-asked return policy, zero mailing charges for returned items, multi-lingual customer support system, call-back scheduling system, etc. These solutions enable customers to do online shopping without worrying about a traditionally complicated process of filing complaints for wrong/defective items.

8.3 Key suggested interventions to enhance customer satisfaction

Based on the review of the current processes and stakeholder consultations, a set of interventions have been identified to enhance customer experience. These include:

1. Multiple communication channels for complaint registration

Utilities can enhance customer satisfaction by facilitating multiple channels for registration of their grievances. To start with, utilities may consider implementing a centralized customer care call center equipped with modern facilities such as IVRS, CTI, and automatic call distributor implemented for optimum routing of consumer calls. Eventually, multiple options for complaint registration – e.g. through website, chatbot, social media, mobile application, etc. may also be provided to the customers. With increasing popularity and usage of social media platforms such as Facebook, Twitter, LinkedIn and WhatsApp, utilities may also incorporate social media as part of their broader customer engagement programs.

Further, additional information may also be provided to the customer during complaint registration such as expected time of complaint resolution, applicable compensation (if any), etc. In addition, continuous update may also be provided to customers using online (website, app) and offline channels until the complaint is resolved. Post resolution, the utility may endeavor to receive feedback from customers. This information can be analyzed periodically to identify areas of improvement. Such initiatives will help DISCOMs to enhance transparency in complaint resolution process.

Dedicated WhatsApp channel to provide customer service

Endesa, a leading electricity provider in Spain, launched a customer service channel via WhatsApp in May 2016, becoming the first energy company to offer this service. This channel was launched in addition to the traditional channels such as hotline number, customer website, mobile app and social media. Customers could check their bills and receive advice and information about products through Endesa's WhatsApp service. In just two months of the rollout, the WhatsApp channel established 1,000 conversations, of which 50% were related to billing and contract issues.

2. Simplification of internal grievance redressal process

The internal complaint application process in the majority of DISCOMs has multiple steps and can lead to withdrawal of application in the middle of process by customers⁸¹. To address this concern, utilities may consider having a single step internal complaint handling process. Several DISCOMs in Karnataka and Haryana are already in the course of improving their grievance redressal process and consumer experience. A simplified system will be economical for utility and highly satisfactory for customers defining clear steps with conclusive timelines.

⁸¹Study on “Transforming Electricity Governance in India, Has India’s Power Sector Regulation Enabled Consumers’ Power?” conducted by the World Bank (2015)

8.4 Nudge techniques

Among the suggested interventions, multiple channels for complaint registration and simplification of grievance redressal process rely on digitalization of underlying processes to gain efficiency. Utilities may adopt the following nudge techniques for promoting digital avenues of complaint registration and managing customer communication:

- **Periodic messages highlighting number of customers using digital medium for grievance redressal**
As discussed in the previous sections, the herd instinct bias refers to our tendency to replicate others' actions, even if this implies overriding own beliefs. In order to increase adoption of digital medium (i.e. website, mobile application, etc.) for grievance redressal, utilities may send periodic messages to customers highlighting number of customers using digital medium. This will help leverage the herd bias and encourage people to follow their own beliefs.
- **Social norm feedback**
While responding to grievances, utilities could further leverage the fact that people are heavily influenced by social norms—following the way individuals perceive people around them to behave. In this regard, utility can attempt to reinforce particular behavior and provide a soothing experience to customers. When a customer reaches out to the utility, he/she may be informed that similar complaints are being received from many other customers and the utility is already making efforts to solve the issue at the earliest.
- **Manage customer communication during complaint registration**
Representativeness bias refers to the notion of interpreting the likelihood of an event based on its similarity to other events, rather than relying on more objective criteria (Tversky & Kahneman, 1974). In case the customer registers a complaint using a helpline, they are likely to face representativeness bias. Customers may overestimate the likelihood of a long waiting time until their call is answered, or even presume that their call will not be handled professionally. To overcome the bias, utilities could insert a message while customers are waiting for their call to be answered - the message could include expected waiting time and what to expect once their call is answered.

CHAPTER 9



NEW AND EMERGING
SERVICES

Abstract

Advances in technology and utility modernization are setting the stage for electric utilities to expand their services beyond electricity supply and grid management. Electric utilities can leverage their competencies and resources (i.e. field staff; distribution assets; customer information, etc.) for providing new products and services more efficiently than any other player. An assessment of additional services provided by electric utilities shows that the range of new services related to demand side management, energy efficiency, decentralized energy solutions, etc. are being provided to generate additional revenues. The time is ripe for electric utilities to expand their services and identify the best revenue generating opportunities in a transforming future market landscape.

Advances in technology and utility modernization are setting the stage for electric utilities to expand their services beyond electricity supply and grid management. Leading products/service providers in other sectors have also shifted their businesses owing to changing customer expectations or technology. For instance, IBM abandoned its core hardware business and ventured into software. Similarly, Netflix transitioned from renting DVDs to streaming content online.

Electric utilities can leverage their competencies and resources (i.e. field staff; distribution assets; customer information, etc.) for providing new products and services more efficiently than any other player. Utilities across the globe are exploring new lines of business, focusing on energy management, energy efficiency, infrastructure services, consulting and other offerings. These services may be offered either by the utilities themselves or in partnership with third party service providers. Emerging services pertaining to dynamic tariff and distributed energy systems are gaining momentum across the country. In this backdrop, the report classifies emerging services into the following categories:

1. Demand response
2. Decentralized energy systems
3. Other emerging activities such as energy audits, energy portfolio advisory, among others

Customer experience framework elaborated in the earlier section was used for conducting analysis of these consumer-utility touchpoints and suggesting interventions to enhance adoption.

9.1 Demand Response (DR)

In a DR program, consumers can support the utility in grid operation by curtailing or shifting their electricity usage during peak periods in response to time-based rates or other forms of financial incentives. Methods of engaging customers in DR efforts include offering time-based rates such as Time-of-Day (ToD) pricing, critical peak pricing, real time pricing, incentives for reducing/increasing demand, etc. It also includes direct load control programs which provide the ability for power companies to gain operational control of certain consumer side appliances during periods of peak demand in lieu of financial incentives.

These programs present mutually beneficial options for utility and consumer. The utility benefits by postponement of grid investments, higher grid reliability, power purchase cost reduction during peak hours etc. Meanwhile, the consumer benefits by supply continuity, improved quality of power supply, savings on electricity bill, etc.

Several sectors such as telecom, E-commerce, aviation, etc. have adopted strategies for customer demand management and provide incentives to customers for shifting their consumption. In the telecom sector, until recently, key network operators used to provide subsidized tariff plans for certain hours of the day. The tariff was lower during nighttime hours due to low network congestion. Amazon offers an option of incentivized delayed delivery to its consumers wherein a financial incentive is provided if the customer avails the delayed option other than standard or fast delivery. Similarly, many airlines offer affordable rates for economy class travel on several routes when the tickets are booked nearly six months in advance.

9.1.1 Existing process

DR programs can be categorized into two types viz. manual and automated. Under manual DR, the system operator (or electricity utility) sends a signal directly to the customer or DR aggregator(s) through SMS/e-mail/telephonic call, etc., for initiating the DR event to curtail load. On the other hand, automated DR consists of fully automated signaling from the utility to enable control of consumer's appliances.

The importance of DR program as a key measure for grid balancing has been recognized by the regulators in India. Key regulations include:

- CERC in its IEGC 2010 regulation has defined DR in Indian context for the first time in Electricity Regulations, and
- MERC in its April 2010 regulation under Section 4(c) has recognized DR as an integral part of the DSM implementation framework. Also, utilities have been highly receptive of DR as a strategic measure for peak demand management.

Key DR Initiatives in India

- **Tata Power, Mumbai implemented a manual DR program**⁸² for commercial and industrial consumers with a connected load above 500 kW. A load curtailment of ~15 MW was achieved through 21 events of two hours each. An incentive of INR 2.25 (USD 0.03) per kWh was also offered to the customers.
- **JVVNL, Jaipur implemented a manual DR pilot program**⁸³ which saw participation from 25 consumers belonging to manufacturing/processing industries. A total of four events were conducted of one hour each and a curtailment of ~87 MW was achieved out of a targeted load of 110 MW.
- **RInfra, Mumbai partnered with Innovari to implement a DR/Automated Demand Side Management (ADSM)**⁸⁴ pilot in Mumbai. For seven participants, a load curtailment of 1 MW was targeted through ~250 events of 30 to 240 min duration. Basis the success of the pilot, an expansion contract of 100 MW was approved by RInfra.
- **BYPL, Delhi implemented a manual revenue neutral DR pilot project** which saw participation from 19 consumers from industrial and commercial category. From eight DR events, a curtailment of 17 MW was achieved. Incentives were provided at the rate of INR 1.0 (USD 0.01) per kWh⁸⁵

In addition, several state DISCOMs (Delhi, Tamil Nadu, etc.) have conducted various studies to estimate the potential of DR. SERCs of 17 states have commissioned⁸⁶ ToD tariff structure for large industrial and commercial consumers. Also, Haryana Electricity Regulatory Commission (HERC) approved⁸⁷ and defined a protocol for implementation of “Brown out” scheme by UHBVN, Haryana. Several utilities, that have implemented the 11 smart grid pilots in India, have successfully tested⁸⁸ DR and built institutional capacity to scale-up such programs.

9.1.2 Stakeholders' expectations

Some of the key expectations of consumer and utility from DR programs include:

a. Ease of participation

A streamlined process for customer participation is critical to the success of a DR program. Customers expect that all the required actions can be completed through easily accessible platforms, with least amount of efforts for participating in DR events.

⁸²<https://beeindia.gov.in/sites/default/files/ctools/Shekhar%20Khadilkar%20Tata%20Power%20DR.pdf>, last accessed on 13th March 2020

⁸³https://regridintegrationindia.org/wpcontent/uploads/sites/3/2017/09/9B_1_GIZ17_050_presentation_Gurpreet_Chugh.pdf, last accessed on 3rd May 2020

⁸⁴<https://www.tdworld.com/distributed-energy-resources/demand-side-management/article/20965238/innovari-signs-mou-with-rinfra-to-expand-automated-demand-side-management>, last accessed on 3rd March 2020

⁸⁵<https://www.bsesdelhi.com/web/bypl/demand-response>, last accessed on 14th June 2020

⁸⁶Assignment on Implementation & Impact Analysis of Time of Day (TOD) tariff in India, PwC, FOR

⁸⁷HERC order for case no. 58 of 2014, <https://www.herc.gov.in/writereaddata/orders/o20151216b.pdf>, last accessed on 11th March 2020

⁸⁸Impact Assessment of Smart Grid Pilot Projects Deployed in India, NSGM (Status as of March 2019)

Florida Power & Light (FP&L), Florida – Full-Scale Direct Load Control Program

FP&L maintains large direct load control programs for all customers. It provides incentives for residential customers to allow the utility to temporarily shut off or modify the operations of electric water heaters, air conditioners, space heaters, and pool pumps during system emergencies. Commercial customers can enroll air conditioners in a similar program. According to estimates, the DR program has supplanted nearly 2,000 MW of generation capacity.

b. Proactive and timely communication

Any reluctance or hesitation among customers with respect to DR program participation, is generally amplified by lack of communication or delayed information. Therefore, it is imperative to ensure proactive and timely communication from utility related to forthcoming DR events, performance of concluded DR events, incentives or billing credits, etc.

Pacific Gas and Electric (PG&E), California - EV Direct Load Control Program

The “ChargeForward” pilot program established by BMW and PG&E explored EV charging DR. The program resulted in nearly 200 DR events taking place over the 18-month period, 94% of which reached the load reduction target of 100 kW. Customers were notified by BMW of the charging delay, and the customer could decide to participate or opt-out. On account of effective communications, 92% of participants recorded their satisfaction with the program.

c. Revenue neutrality

The DR programs need to be designed in a manner to ensure revenue neutrality for electric utilities and customers. While utilities may gain from reduction in peak power purchase cost, avoided capital investments, etc. customers should also have the opportunity to reduce overall electricity bills by participating in DR programs.

9.1.3 Key interventions to enhance customer satisfaction

A set of interventions have been identified for enhancing the customer experience. These are based on the review of the current processes and stakeholder consultations. These interventions include:

1. Ensure revenue neutrality

It is imperative to ensure that DR programs are designed to ensure revenue neutrality from both utilities and customers perspective. In this regard, extensive load research studies may be conducted at regular intervals to understand energy consumption patterns, load curtailment/shifting potential, time of peak and off-peak demand, etc. Based on this, the policymakers can take informed decisions about level of incentives required to elicit consumer participation, potential event timings and durations for minimal drop-out rates, etc.

2. Robust monitoring framework

The customer incentives are directly linked with their performance in the DR program. Therefore, it becomes pertinent to ensure transparency in DR programs to gain the consumer's trust. A key measure for improving transparency is adoption of a robust Evaluation, Measurement and Verification (EM&V) strategy, and deployment of monitoring systems and their integration with other utility systems such as billing, metering, Customer Information System (CIS), etc. Going forward, utilities may also focus on automating DR processes using smart grid. An automated DR would automatically detect the need to shed load, send signals to participants, and control all devices, thereby ensuring complete transparency.

3. DR consumer portal to enhance convenience

Utilities may develop a multi-platform (mobile – android, IOS, and web-based) DR portal for customers which is easily accessible. Details pertaining to past as well as forthcoming DR events may be available on this portal. Moreover, the portal may facilitate a convenient way of participating in the DR events for consumers

4. **Customers communication strategy**

An extensive communication strategy may be adopted to minimize drop-out rates among consumers. The strategy may focus on informing consumers about the impending DR events while avoiding too many or frequent notifications which may lead to customer fatigue. Upon conclusion of the DR event, a summary of the event should be sent to the consumers which will be instrumental in securing their participation in subsequent events.

5. **Dynamic tariffs**

Utilities may also consider implementation of dynamic tariff structures for load management. This means different tariffs are applicable during different hours of the day and this structure may vary on a daily or weekly basis. The customers may be provided with an option to opt out of the new tariff structure – highlighting benefits for shifting to the dynamic tariff structures.

9.1.4 Nudge techniques

For increasing the uptake of DR programs among consumers, utilities may need to undertake some behavioral change and sensitization measures or nudge techniques in addition to the above discussion interventions. Some of the suggested nudge techniques include:

- **Regular reminders**

As highlighted in the earlier section, reminders sent to people have a boosting effect on success in achieving behavior change goals (Pirolli, et al, 2017).⁸⁹ An enhanced communication strategy may be adopted by the utility where customers are updated at regular intervals about the forthcoming DR events. In addition, all communication channels must be synchronized to avoid repeated notifications.

- **Social norms to increase customer acceptance**

The information about the existing DR participants in the immediate neighborhood and their respective savings may be communicated to a potential participant of DR program. This information will help in better motivating the consumer as examples from immediate neighborhood would be more relatable.

- **Pre-filled application forms for DR event's enrollment**

Utilities may integrate the database of DR portal with their CIS database so that the application forms of consumers interested in DR program can be filled automatically i.e. without any intervention from consumers. This integration will enable one-click enrollment process, making it convenient for consumers.

- **DR event live-tracking**

Utility may provide DR event's real-time data on its consumer portal so that consumers can track and compare their performance with respect to the overall event and other participants. This step will further improve the transparency of DR program.

9.2 Distributed Energy Resources (DER)

Distributed Energy Systems (DER) refer to systems that generate, store and distribute energy in a localized manner for multiple applications. Distributed systems such as solar rooftop provide a range of benefits to utilities and customers. These systems help electric utilities in lowering installation time against conventional methods and reducing T&D losses. They also enable cost savings due to reduced installation of long-distance transmission lines. Additionally, the system provides a clean source of energy, improves reliability of power supply and lowers the overall electricity bill with low dependence on expensive grid power for customers. Some of the applications along with description and initiatives taken up by utilities nationally and globally are highlighted in Table 5.

⁸⁹ Implementation Intention and Reminder Effects on Behavior Change in a Mobile Health System: A Predictive Cognitive Model, <https://www.ncbi.nlm.nih.gov/pmc/articles/PMC5730820/>, last accessed on 1st March 2020

Table 5: Assessment of decentralized energy solutions

Key products and services	Description	Initiatives taken up by utilities nationally and globally
Solar Rooftops	Installation of solar rooftop provides a clean source of energy and improves reliability of power supply for rooftop owners. The range of benefits for utilities include low installation time, reduced T&D losses and avoided need of installing long-distance transmission lines.	<ul style="list-style-type: none"> BSES, Delhi has recently installed a grid-connected solar rooftop plant⁹⁰ in one of the residential colonies Kerala State Electricity Board Ltd. plans to implement solar rooftop projects during FY 2019-20⁹¹
Energy Storage	Energy storage enables storage of electricity and its delivery on-demand. It also provides the flexibility and agility to better integrate intermittent solar and wind energy resources into grid and ensure high-quality power for consumers.	<ul style="list-style-type: none"> A grid-scale Battery Energy Storage System (BESS⁹²) has been established at TPDDL's substation
Microgrids	Microgrids are modern, localized small-scale versions of the centralized electricity system. They achieve specific local goals, such as reliability, carbon emission reduction, diversification of energy sources, and cost reduction. They offer an ideal way to integrate renewable resources on the community level and allow for consumer participation in the electricity enterprise.	<ul style="list-style-type: none"> Duke Energy has pioneered in deployment of microgrids⁹³

Companies in other sectors such as automotive and hospitality have evolved from their conventional role – enabling customers to participate in the business processes. One of the car rental services in India has launched a peer to peer sharing program. This program allows the customer to register their car on the platform, get bookings from peers and earn benefits when they are not using the vehicle. In the hospitality sector, Airbnb allows 150 million customers across the globe to rent their properties to travelers looking for low-cost or non-traditional accommodations, thereby diversifying the potential revenue streams for property owners.

9.2.1 Existing processes

The GOI has set a target of 175 GW of renewable energy capacity by 2022—of this 100 GW is to come from solar including 40 GW of solar rooftop.⁹⁴ Various initiatives are being taken up by the central government, state government, and electricity utilities in India to increase adoption of DER. Some of these the initiatives taken-up at the central level are provided in Table 6.

Table 6: Initiatives by central government to promote DER

S.No.	Initiatives by central government	Description
1.	PM KUSUM scheme	Central government has launched the PM KUSUM Scheme for farmers for installation of solar pumps and grid connected solar and other renewable power plants in the country. The scheme aims to add solar and other renewable capacity of 25,750 MW by 2022.
2.	SRISTI scheme	SRISTI or Sustainable Rooftop Implementation for Solar Transfiguration of India provides an incentive for installation of solar panels on rooftops by the central government along with bridging the knowledge gap. The cabinet committee has recently approved phase-II of the grid connected solar rooftop program.

⁹⁰<https://www.saurenergy.com/solar-energy-news/dwarka-housing-society-gets-first-grid-connected-rooftop-solar-plant>, last accessed on 10th March 2020

⁹¹<https://mercomindia.com/kerala-soura-program-200mw-solar/>, last accessed on 10th March 2020

⁹²<https://www.tatapower.com/media/PressReleaseDetails/1617/tata-power-collaborates-with-aes-and-mitsubishi-corporation-to-power-up-south-asias-largest-grid-scale-energy-storage-system-in-india>, last accessed on 10th March 2020

⁹³<https://www.greenbiz.com/article/utilities-accelerating-microgrid-investments-innovative-and-strategic-ways>, last accessed on 10th March 2020

⁹⁴<https://mnre.gov.in/img/documents/uploads/cf28af553bf04afe87a972e4aba0987a.pdf>, last accessed on 10th March 2020

S.No.	Initiatives by central government	Description
3.	Atal Jyoti Yojana (AJAY)	Central government has launched the Atal Jyoti Yojana (AJAY) for installation of high mast solar LED streetlights across five states ⁹⁵ . By March 2018, 1.45 lakh solar streetlights were installed in 96 parliamentary constituencies. Recently, phase-II of the scheme was approved with a target of installing 3 lakhs solar streetlamps.
4.	Million Solar Urja Lamp (SoUL) Program	The Ministry of New & Renewable Energy - Government of India, has sanctioned the 70-lakh solar study lamp scheme, that aims to provide high quality, affordable clean light in the form of solar study lamps to local communities in the five states of Assam, Bihar, Jharkhand, Odisha and U.P.

About 30 states and UTs in India have implemented the net metering policy to support grid-connected solar PV projects. Apart from drafting net metering policies, various initiatives have been taken up by the state government and electric utilities in India for promotion of distributed system capabilities. Some of the schemes are mentioned in Table 7.

Table 7: Initiatives by state government to promote DER

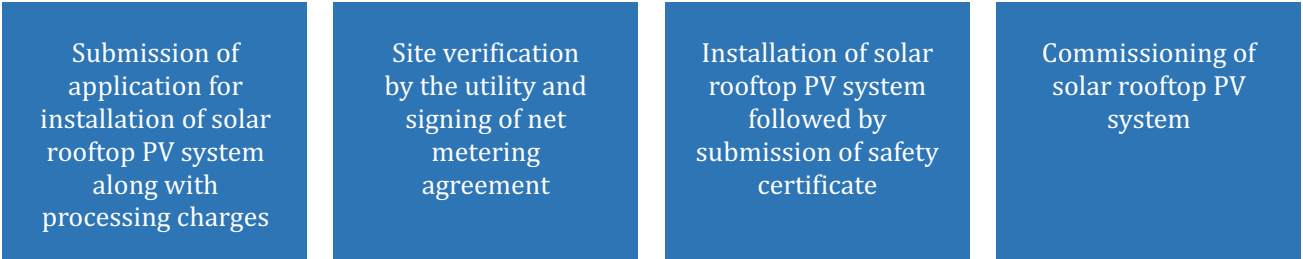
S.No.	Initiatives by state government	Description
1.	SOURA scheme	KSEB Kerala initiated a subsidy program for domestic consumers. In this subsidy initiative, KSEB introduced three special models based on the average consumption of the consumer. The scheme aims to give financial support to the weaker section by making them green energy partner of the state.
2.	Suryashakti Kisan Yojana (SKY)	The Gujarat government has launched a solar power scheme for farmers enabling them to generate electricity for their captive consumption as well as sell the surplus power to the grid and earn revenue.
3.	Utility Driven Solar Roof Top (SRT) Pilot Program	Several states such as Andhra Pradesh, Telangana, etc. have come up with innovative demand aggregation models wherein utility acts as an aggregator. The DISCOM aggregates the demand for solar rooftop in their licensee area and facilitates access to debt and collection of repayments from consumer. The DISCOM also allocates the project to a developer through a competitive bidding process.
4.	BRPL Solar City Initiative	BRPL aims to bring the benefit of Solar rooftop power to Delhi. In its first phase, the flagship initiative BRPL Solar City is targeting Group Housing Societies in Dwarka sub-city to bring the benefit of rooftop to customers ⁹⁶ .
5.	Initiatives by MPUVNL	<p>Madhya Pradesh Urja Vikas Nigam Limited (MPUVNL), has undertaken several initiatives to promote deployment of solar rooftop:</p> <ul style="list-style-type: none"> • Identified 567 project site locations across the state reducing the risk of aggregating the demand • Creating an innovative database of site-specific information along with the World Bank • Pre-cleared PPAs with the beneficiaries • Providing central and state subsidies together as high as 48% of the CAPEX for the institutional sector • Compensation for pre-mature termination <p>The result of these measures was seen in the auctions with the solar rooftop PV tariff reaching a low of INR 1.58 (USD 0.02) per kWh in 2018.</p>

⁹⁵States of U.P., Jharkhand, Bihar, Odisha, and Assam

⁹⁶<http://solarbse.com/#>, last accessed on 10th March 2020

Similar processes are being followed by most electric utilities in India for installation of solar rooftop PV. Broad steps involved in installation of solar rooftop PV under net metering arrangement are highlighted in Figure 24⁹⁷:

Figure 24: Key steps for installation of solar rooftop



- 1. Submission of application for installation of solar rooftop PV system along with processing charges**
Customers can submit their application for installation of solar rooftop PV system through offline mode at the utility’s office by submitting the prescribed form(s) along with processing fees.
- 2. Site verification by the utility and signing of net metering agreement**
Once the application has been successfully submitted, the utility officials conduct a site verification to assess the technical feasibility of the site. System feasibility check is also conducted for plants above a certain capacity. After this, the utility provides an approval for installation of solar rooftop PV system.
- 3. Installation of solar rooftop PV system followed by submission of safety certificate**
At this stage, the customer installs the solar rooftop PV system from companies/firms empaneled with MNRE. Post installation of solar rooftop, a safety certificate needs to be submitted. In certain cases, certificate by empaneled agency suffices whereas in some cases certificate issued by Chartered Engineer or Electrical Inspector is required. This is usually followed by submission of “work completion report” by the customer.
- 4. Commissioning of solar rooftop PV system**
Customers can procure the meter for solar rooftop from empaneled agencies, in case of unavailability with the DISCOMs given, it complies with specifications issued by the DISCOM. Post meter installation, the utility connects the solar rooftop PV system with the grid. After submission of work completion report and safety certificate by the customer, the utility commences commissioning of system.

9.2.2 Stakeholder expectations

The key expectations of customers and utilities from DERs include the following:

- a. Financing options**
Solar rooftop installations require significant upfront investments with long payback periods. This is a key bottleneck leading to slow deployment. Several utilities (like BSES, Torrent Power, TPDDL) and banks⁹⁸ (SBI, PNB, Bank of India, among others) in India have provided financing options for solar rooftop PV projects. However, similar schemes have not been provided by many utilities to their customers. Given the high initial capex involvement, availability of financing options by utilities can be a critical factor for large-scale adoption of solar rooftop.
- b. Awareness**
Several renewable energy departments such Manipur Renewable Energy Development Agency (MANIREDA), Haryana Renewable Energy Development Agency, (HAREDA) etc. have undertaken

⁹⁷States of U.P., Jharkhand, Bihar, Odisha, and Assam
⁹⁸<https://solarrooftop.gov.in/notification/Notification-01092017-145851.pdf>, last accessed on 10th March 2020

initiatives to increase customer awareness on the installation process of solar rooftop. However, there is little awareness among customers about the existing processes. Hence, enhanced focus may be given to customer education and communication of information through popular mediums regarding the registration and implementation process for solar rooftop. Customers should also be educated about the benefits of implementing DER projects.

c. Convenient process

Customers expect minimal delay and complete transparency in installation process of solar rooftop. A study conducted by CII and BCG in August 2019, shows that lead time for approval and meter-installation (for net metering) process in few states was as high as 3 months⁹⁹. Most utilities lack the online capability for tracking the application process. Thus, providing an option to track the status of the application through an online portal would increase transparency. Also, utilities may strive for defining clear steps for the approval and installation process with conclusive timelines.

9.2.3 Key interventions to enhance customer satisfaction

1. Financing options for distributed generation

As per the prevailing scenario, installation of solar rooftop projects involve significant upfront investments for setting up the distribution network. There is limited scope of financing in these projects for the end customers. In sectors involving high capital investment such as automobiles and real estate, customers have varied financing options available. Customers have an option to pay a minimum amount (which is 10-20% of the total investment) to avail the services. Electric utilities may collaborate with financing institutions or banks to provide this option for solar rooftop projects.

2. Simplification of application process

The application form required for installation of solar rooftop in the majority of DISCOMs involves multiple steps. While several utilities have addressed this challenge, there is significant scope for further improvement to enhance customer satisfaction. To address this concern, utilities may consider having a single window clearance for application forms. Utilities may re-design the project lifecycle approvals and implementation process and conduct pilot testing, to seek feedback from customers before re-launching it. A simplified system will help to increase adoption and enhance customer satisfaction.

International Case Study: Online application process for a solar installation

For installation of solar panel with E.ON, a German electric utility, the customer needs to provide details for only six parameters. The website allows you to locate your house on map and requests for ownership details. After a successful application, the utility reaches out to the customer for installation making the application process simple and convenient.

3. One-stop solution

The easier the purchase-decision journey for customers, the more likely they are to repurchase the brand (Freeman, 2012)¹⁰⁰. Utilities may provide one stop solution to customers providing all the services related to DER. These services include vendor selection and empanelment, establishing dedicated helplines, conducting site assessment, installation of net meters, O&M activities of rooftop systems, preparation of standard documents (contract, leasing agreement), among others. It is critical to increase the ease and convenience for the customer to ensure higher installation of systems.

⁹⁹Decentral energy and DISCOMs can they co-exist? CII and BCG report, August 2019

¹⁰⁰<https://hbr.org/2012/05/to-keep-your-customers-keep-it-simple>, last accessed on 20th January 2020

EWE utility providing DER services

EWE utility in Germany has been able to provide customers with environmentally friendly energy sources, more flexible offers and more efficient services. EWE companies have developed a suitable, attractive range of products including:

- EWE EQ00 smart storage enables homeowners to meet 70% of their energy needs with their own photovoltaics installation while remote controlling the energy system via Web portal or App.
- With the combination of the energy, telecommunications and information technology business areas, EWE customers are able to receive electricity and gas as well as telephone and internet services from one source.
- Other examples include the "Sparpaket Heizung" a solution for intelligent automation and remote control of home heating, and the "Energiemanager App" for tracking and benchmarking energy consumption.

4. **Effective communication strategy to raise awareness:** At present, there is limited awareness about key benefits of distributed generation. To increase customer engagement and increase adoption of distributed generation, utilities can undertake the following steps:
 - Establish interactive apps or website to demonstrate the potential benefits of decentralized power generation.
 - Use the bill as a medium to advertise decentralized power generation and raise awareness about the registration process for the customers by printing contact information on the bill.
 - Develop a FAQ page on the website to increase awareness about the benefits and other applications.
 - Connect and communicate with customers using their preferred mode of communication (such as text, e-mail, SMS, social media).
 - Set up consumer helpline center and consumer grievance cell specific to DER.
 - Organize consumer awareness drives and camps.

Solar Revolution program in Surat

When the Surat Municipal Corporation (SMC) launched its solar rooftop program, it focused on creating consumer awareness using the #SuratSolar hashtag through various mediums of communication, such as website, mobile apps, pamphlets, newspapers and magazines, social media, FM radio, public hoardings, special video messages by prominent social figures as brand ambassadors. SMC has been able to install 4,500 solar rooftop panels on houses in the city with an installed capacity of 15 MW PV solar power within an year of launching the program.

9.2.4 Nudge techniques

For increasing the uptake of DER programs among consumers, utilities may need to undertake some behavioral change and sensitization measures or nudge techniques in addition to the above discussion interventions. Some of the suggested nudge techniques include:

- **Simplification of registration process**
As highlighted in the earlier sections, simplifying the enrollment process has a positive effect on enrollment increasing the number of applicants (Chimento et al., 2003).¹⁰¹ Utilities may simplify the registration process, design structured schemes, and convey these schemes using simple layman language to improve connect with the customers.

¹⁰¹Simplifying Medi-Cal Enrollment: Opportunities and Challenges in Tight Fiscal Times, Lisa Chimento, Moira Forbes, Joel Menges and Anna Theisen

- **Leverage herd instinct**

The herd instinct bias refers to our tendency to replicate others' actions, even if this implies overriding own beliefs. Professionals are heavily influenced by the behavior of their peers (Gould and Lawes, 2016). Utilities may leverage this bias to increase adoption of DER systems by providing information related to number of customers opting for it till date. Messages such as “over 300 customers have installed solar rooftop in your neighborhood in the past 12 months” could be communicated.

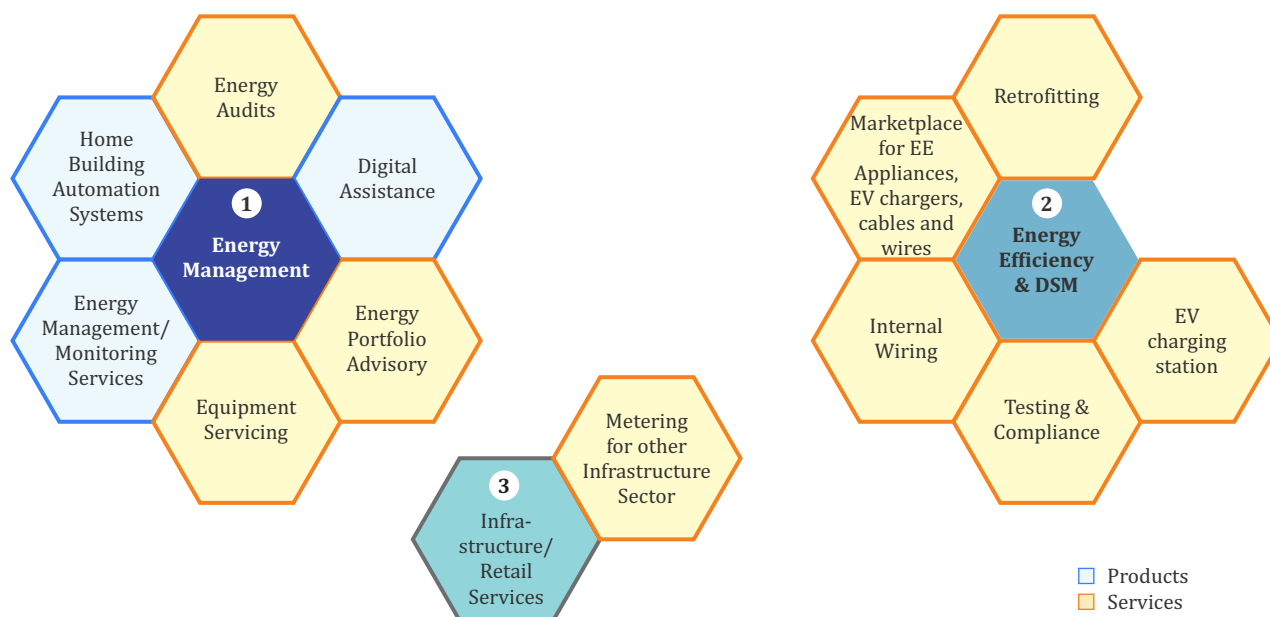
- **Door-step assistance**

Utilities may provide door-step assistance for filling and submission of application forms for installation of distributed systems. This assistance could provide customers to avoid queues at the utility center and increase adoption.

9.3 Other Emerging Services

Other emerging services include conducting energy audits, providing energy portfolio advisory, equipment servicing, energy management/monitoring systems, home/building automation systems, creating Marketplace for EE and Smart Appliances (lighting, cooling, TVs, etc.). An analysis of these services offered by electric utilities across the globe was carried out. Figure 25 provides a comprehensive view of other emerging services being offered by the electric utilities.

Figure 25: Comprehensive view of other emerging services



9.3.1 Existing processes

Various SERCs in India have provided incentives to utilities to explore innovative ways of increasing their non-tariff-revenues. For instance, DERC allows utilities to keep 40% of the revenue earned from other businesses if regulated assets are used¹⁰². Similar instances are also present in the case of international utilities where regulators are promoting a positive environment for revenue growth of utilities. South Carolina's solar leasing law removes the cap on solar leasing thereby allowing utilities to make earnings on solar services¹⁰³.

In California, the regulations allow the utility to offer non-tariff (unregulated) products and services that utilize existing utility assets provided that there is no negative impact on cost, quality and reliability of the regulated products. The regulatory structure determines splitting of generated revenue between ratepayers and shareholders¹⁰⁴. An assessment of new and emerging services provided by utilities in India and across the globe is provided in Table 3.

¹⁰²<https://economictimes.indiatimes.com/industry/energy/power/derc-for-allowing-discoms-to-keep-greater-non-tariff-revenue/articleshow/53736705.cms?from=mdr>, last accessed on 17th January 2020

¹⁰³http://www.energy.sc.gov/files/view/SC%20Energy%20Freedom%20Act_summary%2009.012.2019.pdf, last accessed on 7th February 2020

¹⁰⁴<https://www.power-grid.com/2016/05/24/uncharted-waters-new-revenue-streams-for-utilities/#gref>, last accessed on 17th March 2020

9.3.2 Stakeholders expectations

Customers today expect a higher level of services from their suppliers owing to the seamless experience and additional services provided by various online service providers. For example, Timesaverz, an online marketplace for home services, provides a range of services including cleaning, beauty services, laundry management, pest control and appliance/equipment repairs. Similarly, Google, one of the largest technology companies in the world, provides various services such as advertisement, mobile phone operating systems, search engines, cloud computing, software and hardware. Another example is Amazon, an online marketplace for products, which also provides subscription-based entertainment services and Artificial Intelligence-enabled home appliances.

Similarly, electric utilities can also facilitate products and services beyond basic electricity services that help in meeting customer's expectations and desires. An indicative list of customer's expectations includes:

- a. Clean energy**
Today's customer recognizes the importance of clean energy for building a sustainable and cleaner future. A study conducted by Mercom Communication on "Survey of India Consumer Perceptions on Renewable Energy" found that 82% of customers were likely to pay more for solar energy¹⁰⁵. This provides significant opportunities to electric utilities to offer decentralized energy solutions to customers.
- b. Savings in electricity bills**
Customers will undoubtedly like to reduce their electricity bills without compromising on ease of living or comfort. In this regard, SERCs in India encourage utilities to provide energy efficient appliances at discounted rates and/or implement peak load management programs.
- c. Consumption tracking**
Lack of required infrastructure and in some cases, inadequate awareness, restrict willing customers to track their electricity consumption. Few electric utilities in India (Delhi, U.P., Maharashtra, etc.) have launched mobile apps through which customers can track hourly electricity consumption, however, the availability is limited by the presence of AMI infrastructure.
- d. Convenience and advanced technology**
Many customers are interested in easy-to-use new age technologies which can help them manage their electricity consumption. Smart home devices, security systems, mobile applications and analytics tool—all represent new ways for customers to use and manage their electricity consumption.
- e. Data privacy**
With the advent of new age technologies such as smart meters, home energy systems, smart appliances, etc., there has been a growing concern among customers with respect to the privacy of their personal information and energy usage data. Customers expect that their data is protected through implementation of adequate cyber security measures and only used for intended purposes.

9.3.3 Suggested interventions to enhance customer satisfaction

With increasing awareness, adoption of new technology and modernization of electricity grid, customer expectations will also increase. The time is ripe for electric utilities to expand their services and identify the best revenue generating opportunities in a transforming market landscape. These new opportunities may range from services to provide decentralized energy generation solutions to energy management services, data analytics and information services to communication services, among others. Table 8 provides an assessment of new and emerging services provided by utilities in India and internationally.

¹⁰⁵https://2rjrmf33rccw3lrxgi3x82yy-wpengine.netdna-ssl.com/wp-content/uploads/2018/01/Survey_MercomIndiaSurveyRenewables.pdf, last accessed on 2nd January 2020

Table 8: Assessment of new and emerging services provided by utilities

Business segment	Key products and services	Description	Initiatives taken up by utilities nationally and globally
Energy Management	<ul style="list-style-type: none"> Energy Audits 	Energy audits present a solution for monitoring energy networks by supplying data regarding its performance. This solution enables real time energy audit of the household and guides customers to identify the exact points of high usages. Also, the solution will assist utilities to detect the exact points of losses and enable them to take corrective action.	<ul style="list-style-type: none"> Independent organizations in UK such as National Energy Foundation conduct home energy audits and surveys.¹⁰⁶
	<ul style="list-style-type: none"> Digital Assistant 	In-home voice assistants such as Amazon's Alexa, Apple's HomePod, etc. can be used by electric utilities to reduce call center costs and add a new, innovative, self-service channel for the customers.	<ul style="list-style-type: none"> I&M, a U.S. utility, provides voice-activated energy information and notifications via the Google Assistant and Google Home devices.¹⁰⁷
	<ul style="list-style-type: none"> Energy Portfolio Advisory 	Energy Portfolio Advisory uses a mix of data analytics and behavioral science which helps customers to better understand their energy usage and take steps for adopting more energy efficient equipment.	<ul style="list-style-type: none"> Utilities across the globe (Endesa, Spain; Tenaga National Berhad, Malaysia, etc. Oklahoma Gas & Electric, OG&E, U.S.) provide personalized home energy reports. BRPL, Delhi is, also, testing a territory-wide Home Energy Report (HER) program.¹⁰⁸
	<ul style="list-style-type: none"> Equipment Servicing 	An equipment service plan by the utility would provide a choice of repairing or replacing certain residential home electrical components. As a result, consumers will be protected from unexpected repair cost while ensuring convenience to the end customer.	<ul style="list-style-type: none"> Utilities such as Scottish Power, UK provide appliance care plans for a range of kitchen appliances.
	<ul style="list-style-type: none"> Energy Management/ Monitoring Systems 	A home energy management system is a technology platform which allows the user to monitor energy generation and control the use of energy within a household.	<ul style="list-style-type: none"> UK energy company Centrica intends to bring smart home energy management options to the U.S. market.¹⁰⁹
	<ul style="list-style-type: none"> Home/ Building Automation Systems 	A home automation system helps in linking of all the devices and appliances within a household to a centralized system. This linkage enables setting-up of operational schedules for devices which minimizes electricity consumption. Hence, these systems help in reducing monthly bill for customers and optimizing energy usage for DISCOMs.	<ul style="list-style-type: none"> TPDDL has recently introduced a home automation system using IoT.¹¹⁰ TEPCO, Japan offer an all-in-one solution of smart home services using IoT and 4G technology.

¹⁰⁶<http://www.nef.org.uk/service/existing-buildings/energy-management/energy-surveys-audits>, last accessed on 3rd January 2020

¹⁰⁷<https://www.tdworl.com/smart-utility/home-voice-assistants-utility-customers>, last accessed on 13th March 2020

¹⁰⁸<https://www.oracle.com/a/ocom/docs/industries/utilities/behavioural-energy-efficiency-wp.pdf>, last accessed on 13th March 2020

¹⁰⁹<https://www.greentechmedia.com/articles/read/centrica-smart-home-energy-management-investments>, last accessed on 13th March 2020

¹¹⁰<https://www.tatapower-ddl.com/smartniwas>, last accessed on 13th March 2020

Business segment	Key products and services	Description	Initiatives taken up by utilities nationally and globally
Infrastructure/ Retail Services	<ul style="list-style-type: none"> Metering for other infra sectors like water, natural gas distribution, etc. 	Electricity distribution companies may extend their billing services to other city services like – Water utilities, Gas utilities, etc. Thus, helping in the efficient utilization of technological resources and streamlining customer experience.	<ul style="list-style-type: none"> MP&W, a U.S. utility, provides electric and water services along with internet, TV & phone services to Muscatine¹¹¹. Several utilities in Australia (Dodo, Amaysim, Origin, Commander and Sumo Power) also offer electricity and gas services along with internet and phone plans.¹¹²
EE and DSM	<ul style="list-style-type: none"> Marketplace for EE and Smart Appliances (lighting, cooling, TVs etc.), EV Chargers, etc. 	A utility marketplace is an e-commerce platform that connects utilities with consumers by offering household products such as energy-saving appliances. The goal of a utility marketplace is to empower customers to make informed purchasing decisions, manage energy costs and provide a more satisfying customer experience. ¹¹³	<ul style="list-style-type: none"> The Sacramento Municipal Utility District, U.S., created an e-commerce marketplace with energy-efficient products.¹¹⁴ Some utilities in India (TPDDL, BRPL, Tata Power, BYPL, etc.) are providing EE appliances like ACs, fans, tube lights etc. to customers at negotiated prices.
	<ul style="list-style-type: none"> Retrofitting, Construction and Renovation 	Utilities can provide retrofitting services for inefficient appliances. Retrofitting would help to reduce per capita greenhouse gas emissions and enable energy efficiency benefitting customers and utilities.	<ul style="list-style-type: none"> Holland has retrofitted all city buildings cutting 7 metric tons of carbon dioxide emissions per capita in seven years.¹¹⁵
	<ul style="list-style-type: none"> EV charging station 	The installation of public charging stations would help in increasing the adoption of EVs. With the increasing penetration of EVs, the local emission of pollutants is expected to reduce which would lead to cleaner air and ultimately several health benefits to the end-customer.	<ul style="list-style-type: none"> Energy Efficiency Services Limited (EESL), an energy services company in collaboration with Municipal Corporation inaugurated an EV charging station at a car park¹¹⁶.

Utilities may explore cross-sector partnerships to leverage expertise, strengths and network of existing market players before venturing into additional services. Moreover, the development strategy of such services may include identification of suitable business models and services based on customer's feedback, market analysis, policy and regulatory landscape and their existing strengths. There are several pioneering examples of utilities providing innovative offerings to their customers. For instance, Commonwealth Edison in Chicago has developed an electricity products marketplace in partnership with Simple Energy (a technology company). This marketplace provides access to information and energy-efficient products, rebates and discounts to its customers. Similarly, automakers and utilities in the U.S. are partnering to develop new business models, such as the development of energy storage facilities that rely on used EV battery modules, or ancillary services provided by Vehicle-to-Grid (V2G) technology.

¹¹¹<https://www.mpw.org/about-us/>, last accessed on 13th March 2020

¹¹²<https://www.canstarblue.com.au/electricity/telco-energy-companies/>, last accessed on 13th March 2020

¹¹³<https://uplight.com/wp-content/uploads/2019/10/U.WhitePaper.PowerOfUtilityBrandedMarketplaces.pdf>, last accessed on 12th March 2020

¹¹⁴<https://smartenergycc.org/what-do-utility-customers-want-beyond-electricity-delivery/>, last accessed on 11th March 2020

¹¹⁵<https://www.hollandsentinel.com/news/20191103/whats-next-for-hollands-community-energy-plan>, last accessed on 22nd December 2019

¹¹⁶<https://www.financialexpress.com/auto/car-news/eesl-south-delhi-first-ev-charging-station-sdmc-car-parking-electric-cars-in-india/1794288/>, last accessed on 12th December 2019

Public Charging Infrastructure for Electric Vehicles¹¹⁷

Background

The global EV market is at the herald of a new beginning. Decreasing cost of lithium ion batteries and policy push by several countries increased the global EV sales to 2 million mark in 2018 from less than 50,000 in 2010. By November 2019, the total global EV stock reached 7 million from a mere 15,000 at the start of the decade. Based on existing and newly-announced policies across the globe, the International Energy Agency (IEA) estimates there will be ~130 million EVs on the road by 2030.

The GOI is proactively working towards large-scale deployment of cleaner mobility solutions in the country, including deployment of EVs. Several state governments have also set targets for EV adoption within the next 5-10 years. EESL is anchoring the EV ecosystem development in India. As a part of its National e-mobility Program, EESL has deployed more than 1,500 EVs and 470 chargers across India (as on November 2020). The chargers installed by EESL were mostly within office complexes and societies for captive use. This left out a range of general public and commercial EVs that require regular charging. To address this gap, EESL is pioneering an initiative for large-scale deployment of Public Charging Stations (PCS) in India. A wide network of PCS will not only ease range anxiety of existing EV owners but also encourage others to adopt EVs.

Role of SPARC program:

In 2018, EESL partnered with the USAID's SPARC Program to develop and implement a scalable business model for PCS. As a part of this initiative, the Program provided technical assistance to EESL in structuring a first-of-its-kind large-scale roll-out of PCS in New Delhi. The Program also supported EESL to create an enabling EV ecosystem by establishing partnerships with electricity distribution utilities, municipal corporations, and private sector players including fleet operators, metro rail corporations, etc. The overall support provided under SPARC program can be broadly classified in four phases:

- a) **Business model design and cost economics of PCS:** Under this phase, the USAID SPARC Program helped EESL to develop the business model design and cost economics of PCS along with the pricing strategy.
- b) **Location assessment and installation of PCS:** A detailed location assessment methodology was developed to prioritize locations for installation of chargers. Basis this, field survey was also undertaken in New Delhi, Gurugram, Jaipur, and Chennai.
- c) **User interface and EV analytics:** The USAID SPARC Program developed a charger monitoring dashboard, ChargeD, to monitor key performance indicators of PCS.
- d) **Scaling up and enabling development of EV ecosystem:** Standard methodology, tools, and documents were created in this phase. The Program built the capacity of EESL officials for rapid scale-up installation of chargers. It also assisted EESL in forming partnerships with other EV ecosystem players for sustainable development of PCS ecosystem.

Impact:

The standard methodology, documents and capacity building undertaken as a part of the Program has helped in smoothing the initial challenges and identify best practices. These have also significantly simplified the process of designing and deploying PCS in a time and cost-effective manner. By November 2020, EESL has installed 85+ PCS in New Delhi out of the total of about 140 PCS in India and plans to deploy more than 1,500 PCS in FY 2021.

9.3.4 Nudge techniques

Increasing customer base for additional services and products require customer sensitization. Utilities may adopt the following nudge techniques to increase the customer base:

¹¹⁷<https://www.eeslindia.org/content/dam/doitassets/eesl/pdf/programmes/eVehicles/EVCI.pdf>, last accessed on 20th March 2020

- **Actionable advertisements**

Advertising content persuades customers by appealing “peripherally” to intuition rather than reason and significantly affects demand (Bertrand et al, 2010)¹¹⁸. Advertisements of utility's new services can be designed by using simple eye-catching messages and placed strategically in the electricity bills. Since electricity bills are distributed periodically to customers, it would be an effective way of reaching out to several customers. Frequent nudging through information sharing will motivate customers to enrol for these services.

Disruption in Indian automotive sector

MG Motor India's recent campaign promotes EV adoption with #ChangeWhatYouCan campaign. Its title encapsulates its core proposition: making personal choices that contribute to a large-scale transformation. The campaign calls upon customers to champion the protection of the environment through EV adoption and lays the foundation for a positive societal change.

- **Focus on savings**

Disclosure of critical information plays an important role in building customer trust (Morey et al, 2015).¹¹⁹ Utilities can inform customers about the financial and environmental savings of using the utility's new emerging services. Through such disclosures, customers can make an informed decision about choosing a product or service which is cost-effective and environmental-friendly as well.

- **Highlight data on customers using emerging services**

Social proof is the one of most powerful nudge techniques as customers are more likely to be influenced by other people's behaviour and choices. Thus, utilities can combine the information on emerging services with regular communications sent to customers. The information on emerging services may include number of customers using emerging services/products; amount of benefits accrued to various customers, etc.

- **Streamlined enrolment process with proper guidance**

Cognitive load refers to the used amount of working memory resources. People have limited cognitive capacity to perform deliberative tasks. Hence, customers may find it difficult to actively engage in each of the new emerging services having different procedural rules. This heavy cognitive load may lead to low take-up of emerging services. Simplification of the process to enrol for new services or purchasing products could reduce cognitive load and may also help in increasing customer base. Utilities may design simple messages with appropriate link through which customers can enrol for new services in a single click or by sending a mobile SMS.

¹¹⁸Bertrand et al. (2010), What's Advertising Content Worth? Evidence from a Consumer Credit Marketing Field Experiment, The Quarterly Journal of Economics

¹¹⁹<https://hbr.org/2015/05/customer-data-designing-for-transparency-and-trust>, last accessed on 10th January 2020

CHAPTER 10



SUMMARY OF

INTERVENTIONS

This section summarizes the leading practices and suggested interventions and also captures essential success factors customer experience transformation.

10.1 Leading practices and suggested interventions

DISCOMs need to move towards customer-centric business operations to keep up with the increasing expectations of customers. They can follow the best practices of other sectors (telecom, banking, retail, airlines, etc.) that provide omnichannel interface including 24/7 customer care services, no questions asked return policy, customer analytics for provision of personalized services, etc. to offer enhanced customer experience.

The USAID SPARC Program has identified a set of interventions for customer experience transformation across all major utility-customer touchpoints—from availing new service connection to metering, billing, payment, quality, grievance redressal and emerging services. These are summarized in Table 9.

Table 9: Summary of suggested interventions

Stakeholder's Expectations	Leading Practices	Suggested Interventions
1. New Service Connection		
<ul style="list-style-type: none"> • Responsive parameters in the application form • Fast track procedure • Best-in-class services 	<ul style="list-style-type: none"> • In the U.S. and UK, application forms require inputs on 20-30 parameters, and it takes 15-20 minutes to complete. • Under the “Tatkal” scheme, citizens can obtain passports in one to three days. • A new telecom connection can be activated in one to two hours. • Kotak Mahindra Bank provides instant/door-step account opening services. • Specialized training on customer management is provided by Orlando Airport authority to its staff. 	<ul style="list-style-type: none"> ✓ Simplify the application form—seek minimum information from customers and provide default values, wherever possible. ✓ Provide door-step assistance to apply for a new connection. ✓ Reduce the number of steps for issuing a new connection – revisit SOP regulations. ✓ Train the utility staff on customer management and behavior.
2. Metering		
<ul style="list-style-type: none"> • Consumption monitoring • Customer choice • Building trust • No disconnection – in case of unresolved complaints 	<ul style="list-style-type: none"> • Customers can monitor hourly data usage for mobile phones. • In telecom sector, users have the option of pre-paid or post-paid connections. • TPDDL introduced a self-meter reading services extended by DERC during the lockdown period. • U.S. laws restricts the financial service providers to close customer account (in case of pending disputes). 	<ul style="list-style-type: none"> ✓ Initiate large-scale deployment of AMI to enable remote meter reading and consumption monitoring. ✓ Provide self-meter reading option to customers (for customers who do not have smart meters). ✓ Provide customers with an option to avail pre-paid or post-paid connections (once AMI programs are planned). ✓ Develop a mechanism to avoid disconnection in case of pending meter accuracy related complaints. The disputed amount should be payable only after resolution of complaints.

Stakeholder's Expectations	Leading Practices	Suggested Interventions
3. Billing		
<ul style="list-style-type: none"> • Flexible billing cycle • Timeliness and accuracy 	<ul style="list-style-type: none"> • In banking sector, customers can select payment due date for their credit cards. • Regular billing has become a norm in many other sectors i.e. telecom, banking, DTH services, etc. • Long Island Power Authority (a U.S.-based electric utility) provides financial incentives to its customers to enroll for digital bills. • SSE (a UK-based electric utility) provides information on a range of topics (like energy saving tips, benchmark consumption levels, etc.) in electricity bills. 	<ul style="list-style-type: none"> ✓ Provide customers with an option to select/change their billing period. ✓ Nudge customers to opt for digital bills: (i) make it as default option; (ii) send periodic reminders; and (iii) share information on how many customers have opted for digital bills. ✓ Re-design bill formats: include information on energy saving tips, benchmark consumption, QR code for payment, etc. ✓ Implement a Know-Your-Customer campaign to provide seamless customer services and enable DBT.
4. Payment		
<ul style="list-style-type: none"> • Enhanced collection efficiency • Financing options for bill payment • Convenience of payment 	<ul style="list-style-type: none"> • TPDDL in collaboration with the HDFC Bank offers a utility credit card exclusively for bill payment. • Bajaj Finance Ltd. launched #BijliOnEMI, initiative, wherein customers buying ACs on EMI can avail an instant credit in their 'wallet' which can be used to pay electricity bills on EMI. • Utilities in the UK and U.S. provide incentives to customers for enrolling for direct debit (autopay) programs. • Many banks in India are providing door-step payment/collection services through AePS. They have delivered ~INR 412 crore (USD 54.5. million) in rural areas during the lockdown period (April 2020). • Many utilities in the UK (British Gas, npower, etc.) have set up charitable trusts offering grants to customers who are unable to pay. 	<ul style="list-style-type: none"> ✓ Collaborate with banks and FIs to provide financing options for payment of bills. ✓ Enable multiple payment avenues including digital payment channels (like e-wallets, payment banks, net banking, etc.), 24/7 collection centers, doorstep collection, etc. for consumer categories. ✓ Nudge customers to opt for digital payment: highlight the benefits, provide financial incentives and enable social comparison by sharing information on how many customers pay bills through digital modes of payment. ✓ Establish targeted assistance programs to help underprivileged: collaborate with large corporates (leveraging CSR funds) and NGOs.
5. Quality and reliability		
<ul style="list-style-type: none"> • Reliable power supply • Timely and relevant information about outages 	<ul style="list-style-type: none"> • DTE Energy, (electric utility in the U.S.), provides weather advisory and real time updates during outages to its customers. • PG&E (electric utility in the U.S.) equips its field crew with emergency equipment such as water bottles, flashlights, etc. to help customers with no power. • Airline industry (in India) offers compensation (USD 160-300) in case of flight delays/cancellation. 	<ul style="list-style-type: none"> ✓ Avoid planned outages during working and non-working days for industrial/commercial and domestic customers respectively. ✓ Adopt a proactive approach and one-to-one communication strategy to inform customers about outages. ✓ Inform customers about the compensation they are eligible for, due to delay in restoration of supply. ✓ SOP regulations and parameters need reassessment. These need to be coupled with clear description of method of measurement (basis the physical infrastructure at the utility) and strict compliance.

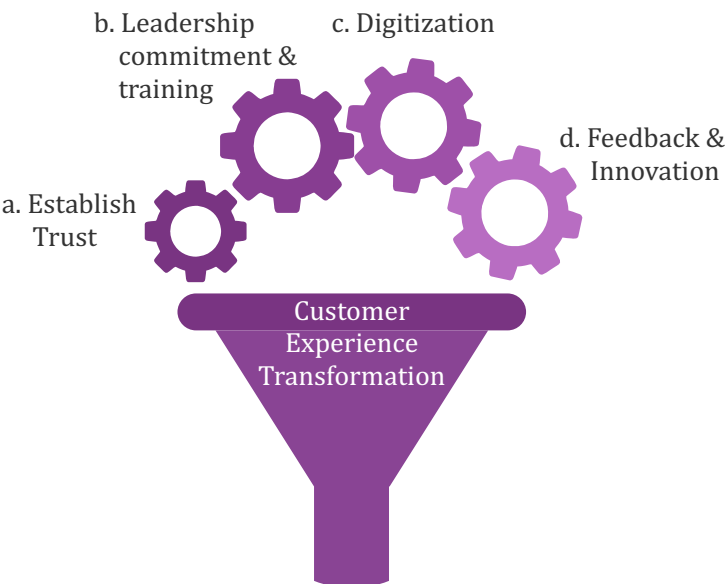
Stakeholder's Expectations	Leading Practices	Suggested Interventions
6. Complaint resolution		
<ul style="list-style-type: none"> • Convenient process to register complaints • Prompt resolution 	<ul style="list-style-type: none"> • TPDDL and BSES, Delhi accept complaints through WhatsApp. • E-commerce players like 'Amazon' have set new benchmarks for complaint resolution by introducing “no question asked return” policy. • Customer service team of Bonobos (a leading garment company in the U.S.)—known as 'Ninja'—is empowered to take any decision (including returns, compensation, etc.) to ensure customer satisfaction. 	<ul style="list-style-type: none"> ✓ Start with a basic centralized customer care call center equipped with modern facilities such as IVRS, CTI, and automatic call distributor implemented for optimum routing of consumer calls. ✓ Eventually, provide multiple options for complaint registration - through website, chatbot, social media, mobile application, etc. ✓ Reduce the number of steps involved in complaint resolution process. ✓ Send regular updates to customers about the complaint. ✓ Nudge customers (through regular messages) to register complaints through digital channels like mobile application or website.
7. Demand Response		
<ul style="list-style-type: none"> • Increased tariff choices • Revenue neutrality • Convenience of participation 	<ul style="list-style-type: none"> • FP&L (electric utility in the U.S.), provides financial incentives to residential customers to participate in auto DR programs. • Financial incentives of INR 1.00 - 2.25 (USD 0.01 - USD 0.02) per unit of energy saving were provided to customers during the pilot DR programs implemented in India. • BYPL created a WhatsApp group to inform customers about DR events. 	<ul style="list-style-type: none"> ✓ Provide pricing options to customers. ✓ Nudge customers to alter their consumption behavior to enhance system efficiency.
8. Distributed Energy Resources (DER)		
<ul style="list-style-type: none"> • Financing - capital expenditure • Convenient enrollment processes • Enhanced awareness 	<ul style="list-style-type: none"> • Few DISCOMs (like BYPL and TPDDL) and banks (SBI, PNB, etc.) are providing financing solutions to customers for installation of solar rooftop projects. • E.ON, (a German electric utility) has provided an online tool wherein customers can locate their house, access specific information like capital cost, generation potential, suppliers, etc. 	<ul style="list-style-type: none"> ✓ Enhance awareness and nudge customers to install DER projects: spread information related to environment and cost benefits. ✓ Collaborate with banks and FIs to provide financing options for setting-up DER projects. ✓ Simplify the processes of application and approvals for net-metering. ✓ Provide one stop solution for all the services related to DER – assessment, procurement, approvals, installation, etc.
9. Other new and emerging services		
<ul style="list-style-type: none"> • Enhanced non-tariff income to leverage existing network and share part benefits with customers 	<ul style="list-style-type: none"> • Several utilities (Dodo, Amaysim, Origin, Commander and Sumo Power) in Australia offer electricity and gas services along with internet and phone plans. 	<ul style="list-style-type: none"> ✓ Explore cross-sector partnerships to leverage expertise and network of existing market players. DISCOMS can provide additional services to customers like establishing marketplace for selling EE appliances, setting-up EV charging infrastructure, providing home automation systems, etc.

	<ul style="list-style-type: none"> • Sacramento Municipal Utility District (an electric utility in the U.S.), has created an e-commerce marketplace of energy-efficient products. • Some utilities in India like TPDDL, BRPL, Tata Power, BYPL, etc. are providing EE appliances like ACs, fans, etc. to customers at negotiated prices. 	
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10.2 Embedding customer centricity in delivery of electricity services

Based on the review of existing process and leading practices highlighted in the previous sections of this report, four critical success factors to enhance customer experience include (Figure 26):

Figure 26: Key success factors to enhance customer experience



- a. Establishing the trust with customers**
Establishing trust between the electric utility, its actors (customer facing employees) and customers is essential to enhance customer experience. Some of the key factors which often lead to dissatisfaction among customers are irregular billing, frequent outages, delays in issuing new connections, lack of choices and delays in resolving customer complaints, among others. DISCOMs should ensure that their customers retain trust in the business processes. The foundational step to building this trust equation is maintaining transparency and simplicity across all key touchpoints—new service connection, metering, billing, payment, complaint resolution, etc. Customers should be informed about the principles, policies and procedures involved in providing the services.
- b. Leadership commitment and training**
A distinctive customer experience depends on a collective sense of conviction and purpose. This should be made clear to all the staff members through a shared vision and aspiration to be developed by utility's leadership. The vision should then be translated into a set of simple principles or standards to guide staff's behavior. All the utility officials (management, administrative, technical and non-technical) should be trained on key principles of customer satisfaction, customer relationship management and behavior analysis.

c. Leverage digital technologies

Technological advancements and digitization have completely revolutionized the service sector. Customers are accustomed to personalized experience and dealing with digital natives. Electric utilities should focus on digitizing the key processes behind the most important customer touchpoints and nudge customers to opt for digital options (like for submission of application form, payment of electricity bills, compliant registration, etc.). In these efforts, utilities would also gain by reducing cost associated with traditional practices.

d. Seek feedback and innovate

The key to ensure customer satisfaction is to continuously seek feedback, improve and innovate. An important aspect of this process is to develop a system which can collect, analyze and act on the customer's feedback in an efficient and effective manner. The system should be able to apply advanced analytics and predict future customer behaviors to foster innovation.

“ The customer experience transformation is a journey which means enhancing the complete end-to-end experience across all key touchpoints. This requires adoption of a customer centric approach across all the key business processes and changing the mindsets of employees to consistently deliver value to the customers. It is expected that implementation of suggested interventions and nudge techniques presented in this report can help utilities to meet the growing customer's expectation and enhance satisfaction. ”



ANNEXURE

Electricity bill for an MSEDCL consumer

Figure 27: Front page of the electricity bill



CIN: U40109MH2005SGC153645
BILL NO.(GGN):000000273694695

महाराष्ट्र स्टेट इलेक्ट्रिसिटी डिस्ट्रीब्यूशन कंपनी लि.

बीज पुरवठा देयक

संकेतस्थळ www.mahadiscom.in

File No : 3-88/300-M
CB 1.0.1

GSTIN: 27AAECM2933K1ZB

BILL OF SUPPLY FOR THE MONTH OF - डिसेंबर-२०१८

HSN CODE: 27160000

ग्राहक क्रमांक

Consumer Name 1

Consumer Address

देयक दिनांक : 21-12-2018

देयक रक्कम रु : 280.00

देय दिनांक : 10-01-2019

या तारखे नंतर भरल्यास : 290.00

मोबाइल/ईमेल :
बिलिंग युनिट : 4599/AUNDH SUB-DN./SHIVAJI NAGAR
दर संकेत ** : 92/LT I Res 3-Phase
पी.सी./चक्र+मार्ग-क्रम/डि.टी.सी. : P2/22/3801/0020/4599380
चालु रिडिंग : 17-12-2018
मिटर क्रमांक : 07601902003

पुरवठा दिनांक : 09-05-2006
मंजूर भार : 7.00 KW
पोल नंबर :
मागील रिडिंग दिनांक : 16-11-2018

Scan this QR Code with BHIM App for UPI Payment



QR कोडद्वारे भरणा केल्यास, भरणा दिनांकानुसार लागू असलेली तत्पर देयक भरणा सुट किंवा विलंब आकार पुढील देयकात समाविष्ट करण्यात येईल.

चालु रिडिंग
24819

मागील रिडिंग
24693

गुणक अवयव
1.00

युनिट
126

समा. युनिट
0

एकूण बीज
वापर
126

Meter Status: Normal



17-Dec-18 16:13:26

मोड्यूल-2018	148
ऑक्टोबर-2018	163
सप्टेंबर-2018	126
ऑगस्ट-2018	147
जुलै-2018	174
जून-2018	176
मे-2018	161
एप्रिल-2018	177
मार्च-2018	169
फेब्रुवारी-2018	110
जानेवारी-2018	130

बीज वापर

डिसेंबर - 2017 286

डिसेंबर - 2018 126

मध्यवर्ती तक्रार निवारण केंद्र 24 X 7
1800-233-3435, 1800-102-3435, 1912

ग्राहकांच्या तक्रारीचे निवारण करण्यासंबंधीचे नियम व कार्यपद्धती महावितरणच्या संकेत स्थळ www.mahadiscom.in > Important Links > Consumer Grievance Redressal Forum यावर उपलब्ध आहे .

मुख्य अभियंता (वाणिज्य)

ग्राहक महावितरणच्या अधिकृत संकेत स्थळाद्वारे (www.mahadiscom.in) व मोबाईल ॲपद्वारे बीज देयकाचा निःशुल्क ऑनलाईन भरणा करू शकतात. नेटबँकिंग, UPI, डेबिट कार्ड, डिजिटल वॉलेट, कॅशकार्ड याद्वारे बीज देयकाचा भरणा केल्यास ग्राहकांना कोणतेही शुल्क आकारले जाणार नाही.

स्थळप्रत बिलिंग युनिट : 4599	ग्राहक क्रमांक	पी.सी. : P2	दर : 92	या तारखे पर्यंत भरल्यास	31-12-2018	Rs. 270.00
अंतिम तारीख	10-01-2019			या तारखे नंतर भरल्यास	10-01-2019	Rs. 290.00

बँकेची स्थळप्रत:

बिलिंग युनिट : 4599

ग्राहक क्रमांक

45992

100120190000002800010003112180010

डिजिटली क्र. : 4599380

पी.सी. P2 दर: 92

अंतिम तारीख	10-01-2019	Rs. 280.00
या तारखे पर्यंत भरल्यास	31-12-2018	Rs. 270.00
या तारखे नंतर भरल्यास	10-01-2019	Rs. 290.00



Figure 28: Back page of the electricity bill

10

सूचना व अटी : वीज शुल्क शासन अधिसूचना क्र. ईएलडी / प्र.क्र.-21 / उर्जा-1 दि. 13/04/2015 अन्वये आकारण्यात येईल. वीज विक्रीकर शासन अधिसूचना दि. 21/04/2015 अन्वये आकारण्यात येईल. *वैलेजर आधारित थरासाठी किंवा इतर स्पर्धीकारणसाठी कृपया विद्युत नियामक आयोगाचे आदेश बघावे. **मोटर वसतिगृहात वेईपर्यंत उदाधिक द्याने आकारणी करण्यात येईल.

- 1) देयकातील चुकविलेली कोणतीही तक्रार कोटनीच्या स्थानिक कार्यालयात लेखी स्वरूपात करावी लागेल. देयकात काही चुक असली तरी दिलेले शुल्क भरावे लागू नये म्हणून देयक सातपुरत्या स्वरूपात अथवा परत तपासणी करून दुरुस्ती करण्याची ठरकत नोंवतून पूर्ण रक्कम भरावी. मात्र अपवादाला अग्रे वाजवीपेक्षा जास्त रकमेचे देयक असेल तर तक्रारीचे निवारण होईपर्यंत ग्राहकास त्याने त्यापुढी वापरलेल्या युनिट इतके विल दिले जाईल व त्यासाठी मेळ पूर्ण तपास करून नंतर धावण्यात येईल.
- 2) देश तारखेच्या नंतर मागील देयकाची रक्कम भरली असेल व ती बाकी म्हणून सध्याच्या धावू देयकात असेल तर सध्याचे देयक भरताना मागील देयक व त्याची पावती रोजपलाल दाखवावी.
- 3) सर्व प्रकारचा प्रत्यक्ष करतरेवेडी ग्राहक क्रमांकाच्या (पी.सी.बि.यु. सहित) निर्देश करावा.
- 4) ग्राहकाला दिलेले देयक हरपले अथवा चालकत नसेल तर प्रत्येक देयकासाठी रु. 1/- भरण्यानंतर पुन्हा प्रत देण्यात येईल. परंतु त्यासाठी देयक भरण्याची मुदत का अखेरची तारीख वाढविण्यात येणार नाही.
- 5) विद्युत पुरवठ्याच्या अटी, संकीर्ण आकार व परतची आणि महाराष्ट्र शासनाच्या अधिनियमाद्वारे तयार केलेले नियम व आदेशातील तरतुदीमुसार हे देयक पाठविण्यात येत आहे.

चेक लिहीण्यासाठी सूचना :

- 1) चेक अकाउंट पेटी असावा. * चेक 'MSEDCL' च्या नावे असावा, चेक स्थानिक बँकेचा असावा. * चेक सोबत पावती स्थळप्रत जोडावी, टप्पेवत करू नये. * चेक पुढील तारखेचा नसावा, चेक / डीडी ने देयकाचा भरणा केल्यास, महावितरणच्या खात्यात रक्कम जमा होण्याची दिनांक, भरणा दिनांक म्हणून गृहित धरली जाईल.
- 2) देयक चेक कलेव्हान पेटीत लाकताना चेकच्या मागे वाहक क्रमांक (पी.सी.बि.यु. सहित) लिहावा व स्थळप्रतीच्या मागे चेकचा तापहील लिहावा.
- 3) प्रक्राम्य संलेख अधिनियम (Negotiable Instrument Act) 1881 कलम 138 प्रमाणे चेक न वळणे हा दंडनीय अपराध असून कायदेशीर कारवाईस पात्र आहे.

हे वीज देयक मालमतेच्या अथवा जागेच्या मालकीपत्राचा पुरावा मानण्यात येऊ नये. कायम स्वरूपाचे विद्युत पुरवठा खंडीत केलेल्या ग्राहकाला चातू विद्युत देयक आले असल्यास ग्राहकाने संबंधित उपविभागीय कार्यालयाशी संपर्क साधावा. अनधिकृतरीत्या वीज देयकात कोणताही बदल वा दुरुस्ती करू नये, असे देयक स्विकारले जाणार नाही. चुकमूल देणं घेणं, वरील नमूद केलेल्या अटीस आधीन राहून.

9

** विद्युत नियामक आयोगाने दिनांक		01-09-2018	पासून निर्धारित केलेले वीज दर खाली नमूद			
केल्याप्रमाणे एक महिन्याच्या वीज वापरासाठी आहेत.						
घरमूली श्री फेज	युनिट	0-100	101-300	301-500	501-1000	>1000
स्थिर आकार	वीज आकार (रु.)	3.00	6.73	9.75	10.50	11.50
रु. 300 प्रति जोडणी/महिना/10 कि.वॅट पेक्षा जास्त भारावर रु.9.4८ प्रति कि.वॅट	ई.स.आ.(रु.)	0.170	0.280	0.360	0.400	0.420

Tariff Revision Difference Rs.७४.२९

Bill Period: १.०३/

* डिजिटल माध्यमाने भरणा केल्यास, डिजिटल भरणा- सुट २.३८ रु. पुढील देयकात समाविष्ट करण्यात येईल.

क्रेडिट रु.	मागील	१४	२४	३४	४४	५४	६४	७४	८४	९४	१०४	११४	१२४	१३४	१४४	१५४	१६४	१७४	१८४	१९४	२०४	२१४	२२४	२३४	२४४	२५४	२६४	२७४	२८४	२९४	३०४	३१४	३२४	३३४	३४४	३५४	३६४	३७४	३८४	३९४	४०४	४१४	४२४	४३४	४४४	४५४	४६४	४७४	४८४	४९४	५०४	५१४	५२४	५३४	५४४	५५४	५६४	५७४	५८४	५९४	६०४	६१४	६२४	६३४	६४४	६५४	६६४	६७४	६८४	६९४	७०४	७१४	७२४	७३४	७४४	७५४	७६४	७७४	७८४	७९४	८०४	८१४	८२४	८३४	८४४	८५४	८६४	८७४	८८४	८९४	९०४	९१४	९२४	९३४	९४४	९५४	९६४	९७४	९८४	९९४	१००४	१०१४	१०२४	१०३४	१०४४	१०५४	१०६४	१०७४	१०८४	१०९४	११०४	१११४	११२४	११३४	११४४	११५४	११६४	११७४	११८४	११९४	१२०४	१२१४	१२२४	१२३४	१२४४	१२५४	१२६४	१२७४	१२८४	१२९४	१३०४	१३१४	१३२४	१३३४	१३४४	१३५४	१३६४	१३७४	१३८४	१३९४	१४०४	१४१४	१४२४	१४३४	१४४४	१४५४	१४६४	१४७४	१४८४	१४९४	१५०४	१५१४	१५२४	१५३४	१५४४	१५५४	१५६४	१५७४	१५८४	१५९४	१६०४	१६१४	१६२४	१६३४	१६४४	१६५४	१६६४
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1: Details of the consumer	6: Various charges
2: Meter reading	7: Payment history
3: Consumption history	8: Recording the amount paid
4: Bill overview and other features	9: Rate of charges
5: Essential links for grievance redressal	10: Terms and conditions and cheque payment information

About the USAID SPARC Program

The Smart Power for Advancing Reliability and Connectivity (SPARC) is a key initiative under USAID's Asia EDGE program. It is a three-year bilateral program with the Ministry of Power, Government of India. The objective of the program is to modernize electricity distribution utilities to improve their operational and financial performance. The implementing partner of the USAID SPARC Program is KPMG Advisory Services Pvt. Ltd.

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