

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.
- **JVNL, 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.

⁸⁹Implementation 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-are-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://solarbses.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 as 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 "Energimanager 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.

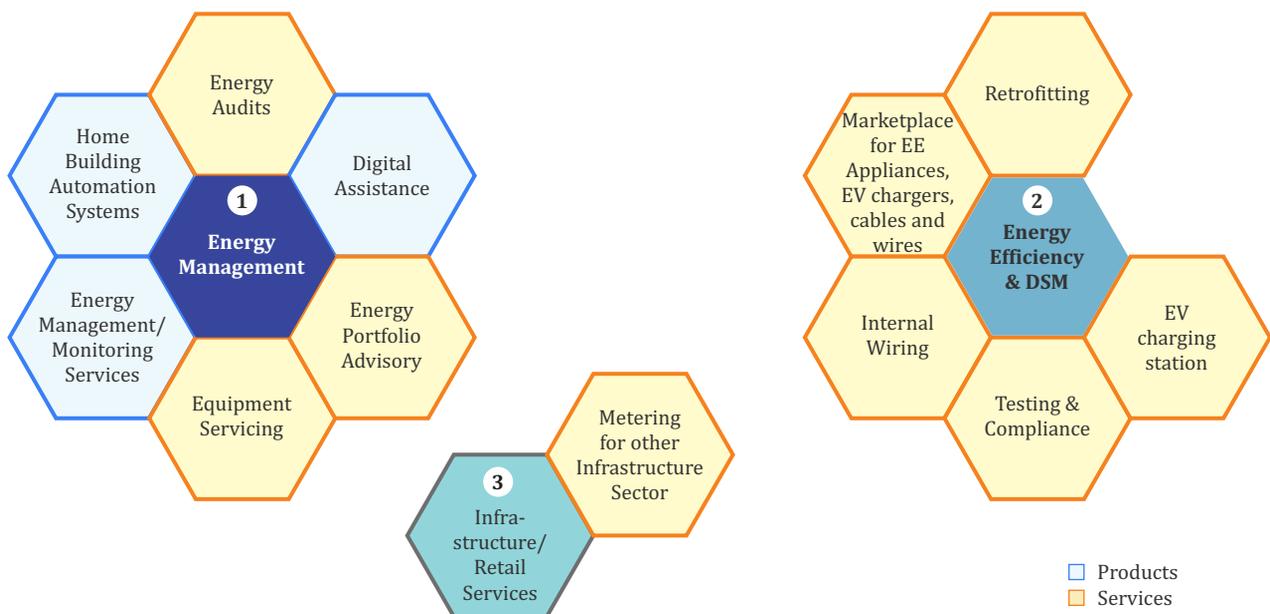
¹⁰¹Simplifying Medi-Cal Enrollment: Opportunities and Challenges in Tight Fiscal Times, Lisa Chimento, Moira Forbes, Joel Menges and Anna Theisen

- **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

¹¹³https://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.

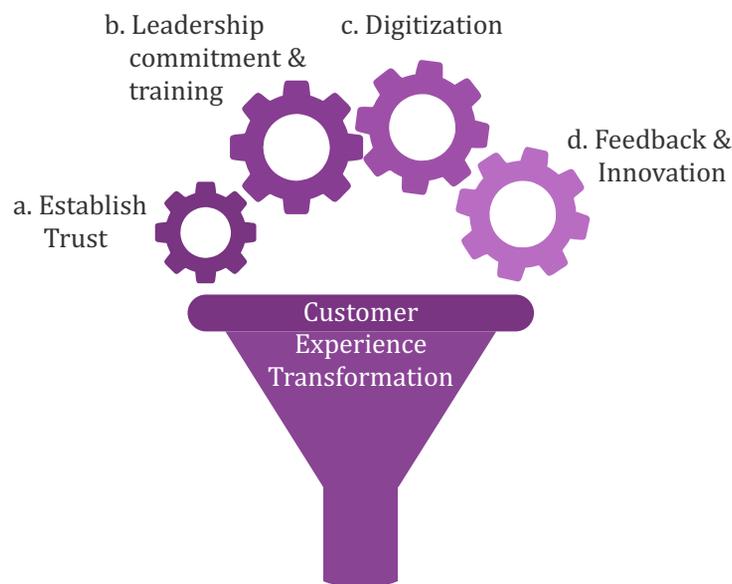
Stakeholder's Expectations	Leading Practices	Suggested Interventions
6. Complaint resolution		
<ul style="list-style-type: none"> • Convenient process to register complaints • Prompt resolution 	<ul style="list-style-type: none"> • TPDDL and BSES, Delhi accept complaints through WhatsApp. • E-commerce 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



महा वितरण
CIN: U40109MH2005SGC153645
BILL NO. (GGN): 000000273694695

महाराष्ट्र स्टेट इलेक्ट्रिसिटी डिस्ट्रीब्यूशन कंपनी लि.
बीज पुरवठा देयक
www.mahadiscom.in
GSTIN: 27AAECM2933K1ZB

File No : 3-88/300-M
CB 1.0.1
- डिसेंबर-२०१८
HSN CODE: 27160000

ग्राहक क्रमांक : 1

Consumer Name

Consumer Address

देयक दिनांक : 21-12-2018

देयक रक्कम रु : 280.00

देय दिनांक : 10-01-2019

या तारखे नंतर भरल्यास : 290.00

मोबाइल/इमेल :
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
चालू 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.

चालू रिडिंग
24819

मागील रिडिंग
24693

गुणक अवयव
1.00

युनिट
126

समा. युनिट
0

एकूण बीज वापर
126

Meter Status: Normal



2

नोव्हेंबर-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	

3

बीज वापर	
डिसेंबर - 2017	286
डिसेंबर - 2018	126

5

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 .

महाराष्ट्र
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
45992

ग्राहक क्रमांक
10012019000002800010003112180010

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



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.

For further information, please contact

Apurva Chaturvedi
Senior Clean Energy Specialist
USAID/India
Email: achaturvedi@usaid.gov

Vikas Gaba
Partner
KPMG Advisory Services Private Limited
Email: vikasgaba@kpmg.com

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