NEW REVENUE OPPORTUNITIES FOR DISCOMs"

REJI KUMAR PILLAI

PRESIDENT, INDIA SMART GRID FORUM

CHAIRMAN, GLOBAL SMART ENERGY FEDERATION

ISGF

India Smart Grid Forum

DISTRIBUTION UTILITY MEET

DUM 2020

A. New Revenue Opportunities Enabled by Digitalization of the Power Sector

PHYSICAL ASSETS DEPRECIATE.....

1. Power Plants
2. Transmission and Distribution Network Equipment
3. Offices, Buildings, etc
4. Computer and Communication Hardware

.....DIGITAL ASSETS APPRECIATE

1. Customer Data
2. Billing and Collection System
3. AMI Data and Energy Consumption Profile
4. GIS Map indexing Electrical Network and Customers – cover all buildings and roads
5. Automation Systems - SCADA/DMS, DA and SA, DR, DERMS…
6. Outage Management System and Mobile Workforce Management System
7. Call Centers and Call Data Archives

B. New Services and Revenue Opportunities from Unlocking Existing Infrastructure and Services

1. Selling of Rooftop PV (RTPV) Systems and promoting "Prosumers"
2. Selling of Energy Efficient (star-rated) and "***Smart***" Appliances
3. Promotion of Electric Cooking and sale of Cooking Appliances
4. Selling Electric Vehicle Chargers
5. Selling Batteries for Energy Storage and Other Applications
6. Sharing of Communication Bandwidth
7. Smart Home: Grid Interactive Buildings and Appliances
8. Maintenance Services to Large Buildings and Complexes
9. Unlocking the Value of Substation Land: Commercialization of Surplus Land by Conversion of existing Substations to Gas Insulated Substations (GIS)
10. Unlocking the Value of Lamp Poles and Transmission Towers:
    - Installation of EV Charging Points
    - Installation of 4G/5G/WiFi Antennas/Navigation Systems for Drones
    - Installation of Security Cameras/Pollution Monitoring Sensors
    - Advertisements
11. Cooling as a Service – District Cooling Systems

Need to un-regulate all these

A. New Revenue Opportunities Enabled by Digitalization of the Power Sector

A1. Customer Data

- Digital data can be shared easily: removes spatial and inter-domain barriers
- Cross-pollination over several sectors

The market opportunities

- Share with Service Providers in other Domains: Water and City Gas Distribution, Municipal Agencies, Renewable Energy Development Agencies
- Large aggregation allows for better and more integration of renewables into the grid on the supply side and more effective Demand Response tools on the demand side
- **Big data analytics** can use power system data for various cross sectoral themes - environment, lifestyles, wealth, health, etc
- Analytics **both real-time and non real-time from remote - equipment, systems, O&M**
- The use of **AI** and **m2m** communications to determine optimal energy use, lifestyle comfort, energy efficiency

A. New Revenue Opportunities Enabled by Digitalization of the Power Sector

A2. Billing and Collection System

- State of the art Billing and Collection Systems deployed in utilities cover all customers (residents in the service area) and are capable of extending to other smart city domains

The market opportunities

- Extension of the billing and collection system to water and city gas distribution, house tax collection, other municipal/city taxes
- Can even be extended to other service providers such as cable TV, internet, telephone, etc in semi-urban and rural areas
- Considerable savings in **cost of doing business** to other domain owners
- Additional **revenue stream** for electric utilities

A. New Revenue Opportunities Enabled by Digitalization of the Power Sector

A3. AMI Data and Energy Consumption Profile

- AMI data is an invaluable resource on energy consumption profile of millions of customers
- Could help better estimation of demand leading to savings in power purchase cost

The market opportunities

- Sharing of AMI data with a variety of Industry players for development of innovative applications and services
- Authentic load research for many stakeholders in the sector
- New revenue stream for distribution utilities

A. New Revenue Opportunities Enabled by Digitalization of the Power Sector

A4. GIS Maps

- All electrical assets (medium voltage and low voltage lines, substations) and consumers are mapped on a digital map and the Utilities update this system on regular basis to capture changes/addition to the electrical network as well as new consumers/buildings
- This digital map can be effectively used by other infrastructure services providers for planning as well as operation and maintenance of their systems
- Very useful for planning the laying of water supply and sewerage lines, telecom cables, gas pipe lines etc; also useful for planning of road networks

The market opportunities

- Share the maps with other stakeholders in a city for a modest fee

A. New Revenue Opportunities Enabled by Digitalization of the Power Sector

A5. Automation Systems - SCADA/DMS, DA and SA, DR, DERMS

- Field infrastructure and dedicated communication bandwidth of automation systems can be shared with other infrastructure domains
- Latest trend is building own communication networks by utilities

The market opportunities

- **Common SCADA** with water and gas distribution utilities
- Sharing the **communication infrastructure** for security cameras, traffic cameras and other smart city applications
- Communication network can be leased to telecom operators

A. New Revenue Opportunities Enabled by Digitalization of the Power Sector

A6. Outage Management System (OMS) and Mobile Workforce Management System (MWFM)

- OMS and MWFM are very powerful platforms that can be shared with other infrastructure and services providers

The market opportunities

- Revenue from sharing the OMS and MWFM with water and gas distribution agencies, white goods services agencies, other city service providers

A. New Revenue Opportunities Enabled by Digitalization of the Power Sector

A7. Call Centers and Call Data Archives

- Customer Care Centers, Call Centers, Chatbots and Voice Bots of electric utilities are very valuable assets in a city/country
- They have 4 digit common numbers (1912) all across the country
- The incoming calls (on single number) can be diverted to the respective teams responsible for each domain and their crew
- The IT and communication infrastructure and cost can be optimized to a great extent

The market opportunities

- Revenue from sharing the Customer Care Centers, Call Centers, Chatbots and Voice Bots with other stakeholders
- **Analytics of data** from the customer calls and interactions with Chatbots and Voice Bots can be useful tools for different stakeholders to optimize their business operations
- Call Centers of electric utilities can be made **City Command and Control Centers** at marginal cost

B. New Services and Revenue Opportunities from Unlocking Existing Infrastructure and Services

B1. Selling of Rooftop PV (RTPV) Systems

- RTPV has become economically attractive to most category of customers
- Customers are not familiar with RTPV systems and models available in the market; neither aware of the formalities to avail net-metering/gross metering benefits
- Utilities could TEST and CERTIFY good quality RTPV Systems and undertake complete EPC of the RTPV to Customers; and also well maintain it through annual maintenance contracts
- 2019 study by BRPL-CEEW estimated a net benefit of Rs 0.22/kWh of RTPV power generated in Dwaraka/Delhi
- Time has come to unleash a RTPV revolution in the country and Utilities can benefit from this huge opportunity – being part of this revolution is better than being a “Kodak of Tomorrow”

B. New Services and Revenue Opportunities from Unlocking Existing Infrastructure and Services

B2. Selling of Energy Efficient (star-rated) and ***Smart*** Appliances

- Many utilities are already promoting replacement of old Air-Conditioners and Refrigerators with new star-rated appliances
- Should promote "***smart***" appliances which can be connected to the WiFi network and remotely controlled
- The range should cover geysers, washing machines and cooktops
- This can be clubbed with energy efficiency programs and incentives
- Promote innovative and sustainable business models that will be WIN-WIN for both the Utility and the Customers

B. New Services and Revenue Opportunities from Unlocking Existing Infrastructure and Services

B3. Promotion of Electric Cooking

- Electricity is the cleanest fuel at the user end and an increasing share of electricity is being generated from clean resources
- Millions of women and children in rural areas in developing countries use firewood/biomass and cow dung for cooking leading to pollution and serious health issues
- Electric cooking leads to economic efficiency in myriad ways:
  - Houses are already connected to the grid - no additional infrastructure is required to electrify the kitchens
  - Huge amount of energy (and money) being wasted in transporting gas cylinders to households – 1500 million LPG cylinders handled in 2019-20
  - Billions of dollars spent every year in subsidy for cooking gas and kerosene
  - Healthcare expenses to treat respiratory diseases in millions can be avoided
  - Emissions from cooking is a significant contributor to CO_2; Electric Cooking will help achieve NDC targets faster
- ***Electric pressure cooker, oven, hot plate, kettle, induction cooktop and air fryer*** – the combination of these appliances can cook almost every item in all cuisines
- Electric Cooking can also help the grid in load balancing – there is surplus electricity on the grid during many timeslots in a day and can offer cheap electricity to millions of cooking appliances that will improve the load on the grid. With Time of Use (ToU)Tariff and Smart Plugs, most cooking load can be shifted to non-peak hours at lower tariffs
- Electricity connection capacity to all households should be enhanced to 3-5kW so that cooking and cooling laod can be met efficiently
- **Electric Cooking is an Idea whose time has come!**

B. New Services and Revenue Opportunities from Unlocking Existing Infrastructure and Services

B4. Selling Electric Vehicle Chargers

- Most EV owners like to buy EV Chargers for home charging
- Utilities could partner with EV manufacturers and set-up home charging facilities (mostly AC Slow Chargers)
- AC Chargers with Vehicle-to-Grid (V2G) functionality would help load balancing on the grid
- Large number of EVs connected to the grid could be aggregated as virtual power plants (VPP) and support the grid in many ways
- New revenue opportunity for utilities

B. New Services and Revenue Opportunities from Unlocking Existing Infrastructure and Services

B5. Selling Batteries for Energy Storage and Other Applications

- Energy Storage System (ESS), particularly Lithium-ion Batteries (LiB) is fast becoming popular for several applications at customer end:
  - DG Set Replacement
  - Solar and Wind Power Applications
  - EV Charging
  - Data Centers
  - Stand-by Power for all new Infrastructure – lifts, emergency lights, computers and WiFi routers
- Utilities can offer LiBs to Customers and lease it back for grid support (large batteries):
  - Ancillary Services
  - Network Upgrade Deferrals
  - Smoothening of Power from Solar PV
  - Other Emergency Situations
- Smaller batteries at customer premises can be aggregated through battery aggregation systems and run as virtual power plants

B. New Services and Revenue Opportunities from Unlocking Existing Infrastructure and Services

B6. Communication Bandwidth

- The latest trend is to build own telecom network by utilities
  - Electric cables with in-built fiber optic cables are now available at marginally higher cost – no additional right of way required; laying cost also saved; only fiber termination cost is extra
  - PLC/RF Mesh is used for last mile connectivity
- Own communication network for smart metering and network automation
- The spare fibers can be leased to third parties and telecom service providers
- Could offer internet and cable TV services in **underserved communities**

B. New Services and Revenue Opportunities from Unlocking Existing Infrastructure and Services

B7. Smart Homes - Grid Interactive Buildings and Appliances

- Buildings are becoming smart – it can be made grid interactive
- Large buildings and campuses with Rooftop/in-premise Solar PV, Electric Vehicles (EV) and Battery Energy Storage Systems can be made Grid-Connected Smart Microgrids that could
  - Island from the grid during peak hours
  - Buy electricity from the grid when prices are low and store it in the BESS and EVs and sell back to the grid during peak hours
  - Provide Ancillary Services
- Smart Homes/Buildings with Smart Appliances could provide Demand Response (or load relief) to the grid when required
- Utilities can evaluate appropriate equipment, smart appliances and systems to facilitate this transformation to smart homes/grid interactive buildings for mutual benefit

B. New Services and Revenue Opportunities from Unlocking Existing Infrastructure and Services

B8. Unlocking the Value of Substation Land: Commercialization of surplus Land by conversion of existing Substations to Gas Insulated Substations (GIS)

- Large substations built 30-40 years ago outside the cities are now prime commercial properties
- Old substations require urgent modernization and capacity enhancement
- Conversion of these substation to Gas Insulated Substations (GIS) could release up to 70% of the land that could be commercialized
- Only a small portion of the price of the land commercialized is required for the conversion to GIS and to enhance the capacity

B. New Services and Revenue Opportunities from Unlocking Existing Infrastructure and Services

B9. Unlocking the Value of Lamp Poles and Towers:

- Millions of lamp poles that utilities own is an under valued asset which can be deployed for:
    - Installation of EV Charging Points
    - Installation of 4G/5G/WiFi Antennas
    - Installation of Navigation Systems for Drones – Passenger Drones and Delivery Drones
    - Installation of Pollution Monitoring Sensors
    - Installation of Security Cameras
    - Advertisements
- Lamps can be converted to solar powered lamps with integrated sensors and cameras for the above - lot of innovation going on in this domain

B. New Services and Revenue Opportunities from Unlocking Existing Infrastructure and Services

B10. Maintenance Services

- All large buildings outsource electrical maintenance services to third parties
- Utilities have skilled employees and better access to supply chain for undertaking such services efficiently
- Customers will have more trust with Utilities taking over the responsibility to maintain their buildings and campuses – particularly in case of Schools, Colleges, Hospitals, IT Parks etc

B. New Services and Revenue Opportunities from Unlocking Existing Infrastructure and Services

B11. Cooling as a Service – District Cooling Systems

- Summer temperature in North India is constantly on the rise - during the past 3 decades maximum temperature in Delhi has gone up from 42°C to 48°C; at this rate by 2030, temperature in most parts of North India will be above 50° C – will be impossible for people to live, work and commute
- Nationally only 5% people have room air-conditioners; Urban India has 10% (Delhi – 30%)
- Room air conditioners spew out heat and create heat islands – making it further difficult to for those without access to cooling!
- Incremental improvement in efficiency of room air conditioners and other appliances will be overtaken by the sheer increase in the number of new units added every year
- Water, Electricity and Gas are provided as a service to buildings – same way Cooling can be provided as a service
- Chilled water produced at a central chiller can be supplied to buildings through insulated pipes where air handling units will cool the air passing over chilled water pipes for air conditioning the buildings/rooms – **District Cooling Systems (DCS)** – successfully implemented in several cities around the world including GIFT City in Gujarat
- DCS is highly energy efficient and economical; reduces the electrical load of individual buildings
- Electric Utilities should seriously consider Cooling Service with DCS as a new business opportunity

Contact US

India Smart Grid Forum

CBIP Building, Malcha Marg, Chanakyapuri, Delhi-110021

www.indiasmartgrid.org

www.globalsmartenergy.org

www.dumindia.in

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The Data Exchange Eco-System - Number of Players is Growing Fast