Customer Disruption for Distribution Companies

Customers are changing how the modern distribution grid works

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Different Perspectives

Customer

– Choice
– Transparency
– Customer service
– Bill impact

Operations

– Safe and reliable service
– Operational efficiency
– Asset performance
– Infrastructure improvement and planning practices

Safe, Reliable, Clean, Affordable Service
Retail Disruption and Customer Experience - Changing Customers in Changing World

BEFORE

All the same
Consumers
Demand
Limited Value Add

AFTER

All different
Prosumers
Flexible
New Services

Consumers
Prosumers
Forces in Play for Utilities

- Affordable Micro Generation & Storage
- Energy Efficiency and Control

More Customer Choices

- Revenue Erosion
- Price Volatility

Business Model Challenge

- Smart Metering
- Connected Home, Devices, Communities

Harnessing Big Data

Source: Oracle Study 2013 – “Utilities and Big Data: Accelerating the Drive to Value”
The “Edge of the Grid” is more complex.

Most Distributed Energy Resources are outside utilities’ direct control. Intermittent distributed generation and variations in consumption patterns create information which is vital to efficient control of the network. This happens outside the reach of traditional utility SCADA systems & DMS.
Why is Prosumer Management important?

• Support the growth of customer-driven energy trends, e.g. the integration of rooftop solar, EV & energy management systems

• Increase customer engagement by simplifying the decision making, adoption and ongoing technical and financial management of their energy resources.

• Increase customer choice to participate in demand response, load shifting, and the sales of excess and stored DER generation into other markets.
DER lifecycle management solutions

- CONNECTION & ENERGIZE
- OPERATIONS & CONTROL
- SERVICE & MAINTENANCE
- RISK ANALYSIS & PLANNING
- OUTAGE MANAGEMENT
- CUSTOMER INTERACTION
Customer Centric Edge of Grid
Leverage our expertise in Customer Care

- Targeted edge technology sales
- Segment CC&B/MDM Data
- Run campaigns with Program Management
- Push offers via Self-Service

- Integrated Service and Maintenance of edge devices
- Integrated appointment Mgt
- Real-time work tracking
- Customer updates via CCB/CSS

- Advanced commercial offers
- Support complex time of use tariffs
- Real-time pricing and billing
- Forecast generation and demand profiles and settle

- Enroll, Execute and reconcile Demand Response events
- Segment customer & usage data
- Enroll best customers in program
- Execute campaigns with DERMS/IOT or 3rd Party
- Analyze event & settle finances
What Can Utilities Do to Turn This into an Opportunity?

- Embrace Customer Control of the Grid
- Connect Customers with Value centered Services
- Drive Smart Cities Initiatives
Embrace Customers Control of the Grid

By proactively integrating these resources into the network model, Utilities can:

• Reduce capital and maintenance expense by harnessing data from DER to predict asset risk
• Tap distributed generation resources to improve capacity to produce power demand
• Reduce customer minutes of interruption through more accurate load profiling for cold load pickup
• Deliver flexibility for peak demand by shifting output among generation and storage resources
• Model future requirements for utility resources needed to support DER growth

SOLAR GROWTH

Achieved @ 2012

Almost two decades faster than expected

Estimated @ 2030
Connect Customers with Value-Centered Services

By connecting customers with value-centered services, Utilities can:

• Expand revenue potential by providing life style based energy sources and services to customers.

• Harness the value of real-time data to increase sales of excess and stored DER generation into other Markets

• Gain revenue from new value-added opportunities, such as offering segmentation, energy trading and community-owned DER services

• Remain viable by evolving to a forward-looking business model
Drive Smart City Initiatives

By showing leadership in smart city initiatives, Utilities can:

- Provide smarter planning for cities by integrating DER as part of the energy ecosystem
- Enable cities to reduce the cost of improving and maintaining investments by extending the life of distributed, community-owned assets
- Deliver empirical cost/benefit evidence for cities that are comparing DER-based conservation, efficiency, and emission reduction projects
- Empower communities and individuals within cities to leverage DER to address environmental, social, and economic concerns
Water Management

• Meter testing and replacement program
• Leak detection and repair program
• Distribution system audit program
• Incentives, subsidies, and rebates for adoption of conservation measures

Benefits of Demand Reduction

• Energy savings in water heating and pumping
• Foregone costs of water treatment, distribution system capacity, wastewater collection and treatment
• Savings in capital expenditures because of deferred, downsized, or eliminated water supply projects.
Organizations and Technology Solutions Working Together Can Drive a Better Result

CUSTOMER EXPERIENCE
- Digital Engagement
- Marketing Cloud

DEMAND SIDE MANAGEMENT
- Energy Efficiency
- Behavioral Demand Response

CUSTOMER OPERATIONS
- Sales Cloud
- Service Cloud
- Customer Service Interface
- Customer Care & Billing
- Meter Data Management

FIELD OPERATIONS
- Work and Asset Management
- Mobile Workforce Management

NETWORK OPERATIONS
- Network Management System

ANALYTICS
Integrated Cloud
Applications & Platform Services
APPENDIX
Leap of faith

- Specification choices
- Trusted/Rogue providers
- Panels outlast solar firms
- Distributor discussion
  - Support information management processes for operations and planning
  - DER Asset Registry and lifecycle management
- Certifications
- FiT Registration
Now what?

PV output vs. household load

• Turn those lights out!
• Domestic optimization
• Sweat that asset
• Financial monitoring
• Forecasting
• What’s Next?

System impact of investment

Supply from utility
Consumed PV
Export PV to utility

Net Load

System Low Days

1500 MW in 2.5 Hours

Hour Ending Pacific Standard Time (PST)
A long term relationship

- Noisy Inverters
- Efficiency degradation
  - Panels
  - Inverters
  - Storage cells
- Failing cells/panels
- Early identification
- Weather damage
- System expansion
The Problem or the Solution

- Network model to customer DER
- Leverage engaged consumers
- Demand response enrollment
- Financial incentives

- Be a good neighbor
- Make it simple / automation
- Controllable smart inverters?
  - IoT, voltage support, transactive energy

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The moment of truth

• Grid-edge control to minimize the impacts of outages
• Islanding (microgrids)
  – Local generation
  – Storage
  – Demand management
• Transactive energy markets
  – Real-time, differentiated communication to consumers and community energy “players”
• Contribution recognition
Closing the loop

- Day to day interaction
  - On-site appointment booking
  - Outage notification
  - Demand response event enrolment
  - Pricing signals
- Rewarding grid support
- Proactive energy insights
  - Usage profile
  - Dodgy devices
- Next best investment business case
  - Water heating & battery Storage
  - EV charging service
  - Generation extension