Utility Marketplace with a Texas Twist

NAAUD 2015

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Tim Hein
Director Strategic Sourcing and Procurement
ABOUT ONCOR

- Largest T&D system in Texas – 6th largest in Nation
- Service territory is about one-third of Texas (54k sq. miles)
- 10 million customers served
- 3.3 million metering points
- 112,312,279 MWh delivered
- 36.4% of ERCOT peak 68,305MW
- 401 cities served
- 104,440 distribution conductor miles
- 1,159,640 distribution transformers
- 16,180 transmission circuit miles
- 1,001 stations - 1,763 power transformers
- 3,432 employees – 3,300 FTE’s
- More than $10 billion in capital expenditures over the past decade, including:
  - 1,000 miles of CREZ lines – 7,000 total miles
  - 3.3 million advanced meters
  - Smart grid & SVC technology investment
**OUR ROLE IN THE MARKET**

- Competitive ERCOT wholesale and retail electric energy market since 2002 for investor-owned players
- Regulated delivery utilities – do not generate, own, or sell electricity

*Reliable delivery through the application of technology*
Oncor’s CREZ build exceeds 1,000 line miles and supports delivery of wind power by the end of 2013

Largest and fastest acting Static Var Compensator in the world

“Self Healing” network restores service without human intervention

3.3 million smart meters integrated by the end of 2012

SmartGrid Outage Management System Operational 2012
IS TEXAS AFRAID OF GOING GREEN?

https://www.youtube.com/watch?v=rDoRgNBZ_w4&feature=player_embedded

https://www.youtube.com/watch?feature=player_detailpage&v=rDoRgNBZ_w4&t=122
ONCOR & CREZ

CREZ – Competitive Renewable Energy Zones

• The PUC assigned $4.93 billion of CREZ transmission projects to be constructed by seven utilities (final costs were $7 billion). The project will eventually transmit 18,456 megawatts (MW) of wind power from West Texas and the Panhandle to highly populated metropolitan areas of the state, currently Texas has over 14,000 MW of installed wind capacity, the most in the nation.

• Oncor’s CREZ accomplishments
  • Over 1,839 circuit miles of Transmission circuits constructed
  • 65 CREZ projects completed and in service
    • Oncor was awarded more projects than any other utility
  • Worked with nearly 1,500 landowners to construct transmission lines across 40 counties and 1,000 right of way miles of greenfield construction.
  • Approximately $1.9B spent
FUN FACTS: ONCOR & CREZ

Over 1,000 linear miles of right of way required
- Distance from Dallas to Salt Lake City

Over 1,800 circuit miles of transmission lines
- Equivalent of a single circuit transmission line from Dallas to Seattle.

112,200,000 lbs of steel
- Enough to build 17,000 Chevy Suburbans

61,200 cubic yards of concrete
- Enough to build slab foundations for over 1,400 2,000 sq ft houses

13,000 miles of wire weighing 147 million pounds
- Enough to stretch ½ way around the world or to Cairo and back.

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AMS & OMS INVESTMENT

Provide utility operation functions such as remote disconnect, on demand meter reads, and operation interfaces

Advanced Meter

Provide 15 minute usage data to ERCOT and the Market - 2 terabytes of data storage per month
316,220,000 reads / day

Provide real-time usage data between the meter and premise

In-home Display Thermostats
Lighting Controls Smart Appliances

Provide the REPs direct interaction with customer’s Home Area Network (HAN) devices
20,700 registered devices
AMS & OMS OPERATIONAL BENEFITS

Our 3.3 million advanced meters have enabled us to automate our meter reading system, integrate our meter data system with the outage management system and work meter-related service orders remotely.

**IDENTIFY + ADDRESS POWER OUTAGES**
Outage events impacting 150,000 customers analyzed, dispatched, and repaired without customer interactions in 2014.

**CHECK METER VOLTAGE REMOTELY**
Personnel verified power to the meter at 31,292 locations in 2014 without rolling a truck.

**ADVANCED METER**

**REMOTE CAPABILITIES TO COMPLETE WORK**
Over 14.8 million orders worked remotely since March 2009.

**RESOLVE PROBLEM BEFORE OUTAGE**
Repaired connection issue at 2,553 locations before an outage occurred in 2014 by analyzing meter last gasp data.

**INCREASED SAFETY 92%**

**REDUCED ENVIRONMENTAL IMPACT**
74 million fewer miles driven, 6.2 million gallons of fuel saved and 60,400 tons of CO2 not released.
TECHNOLOGY INVESTMENT – THINGS CHANGE!
So, what do these sweeping changes have in common?

Rate of unanticipated change

Dramatic change in value proposition

Technology advancements as the enabling element
Last year, Wal-Mart announced a partnership with SolarCity to equip California stores with solar panels and has long said it wants to power its stores using 100% renewable energy technologies.
Google Map Snapshot of Ikea in Frisco, Texas
Crane expects many American residences to go “off the grid” within two years as reliance increases on natural gas and solar panels.

He said it is easier and cheaper for many more residents to have devices that convert the natural gas into electricity, to add solar panels to homes and to "tell the electric company to get lost." The trend will start in the Northeast and spread nationwide, he said.
STRATEGIC VISION

Transform the value of the grid through innovative, technology-driven and customer-focused energy solutions
About 90% of Texas load
24 million consumers
Competitive-choice customers: 75% of load
More than 43,000 circuit miles of high-voltage transmission
550 generating units
More than 74,000 megawatts (MW) capacity for peak demand
Record peak demand: 68,305 MW (Aug. 3, 2011)
Energy used in 2014: 340 billion kilowatt-hours – A 2.5 percent increase compared to 2013
More than 1,100 active entities that generate, move, buy, sell or use wholesale electricity
ERCOT 2014 Energy Use & Generation Capacity

**Energy Use 2014**
340,033,353 MWh

**2014 Generation Capacity**
effective December 2014
ERCOT Growth of Wind

The data presented here is based upon the latest registration data provided to ERCOT by the resource owners and can change without notice. Any capacity changes will be reflected in current and subsequent year totals. Scheduling delays are also reflected in the planned projects as information is received.

This chart reflects planned units in the calendar year of installation, rather than installation by peak of year shown.
TEXAS’ CHALLENGE: POWERING OUR FUTURE GROWTH

26M PEOPLE
2014

50M PEOPLE
2050

$ $ $ INCREASED INVESTMENTS

$ $ $ $ ECONOMIC GROWTH

OF THE FASTEST GROWING AREAS IN THE U.S

TEXAS LEADS:

COMpetition 1999

ENERGY INFRASTRUCTURE 2005

ADVANCED METERS 2005

ENERGY STORAGE - NEXT STEP

ENERGY STORAGE WILL BRING

- RELIABILITY
- AFFORDABILITY
- FLEXIBILITY
- EFFICIENCY
- INDEPENDENCE
- SECURITY

FORBES FASTEST GROWING CITIES (FEB. 2014); FORBES FASTEST GROWING SMALL CITIES (JUNE 2014)
ENERGY STORAGE: CRITICAL COMPONENT

Grid integrated energy storage is the only technology that allows utilities to accomplish all of the following:

- Improve reliability by providing backup power during short-term outages
- Defer transmission and distribution investment through extending grid element life and optimization of system
- More efficiently and flexibly use existing power resources
- Improve voltage regulation
- Address renewable integration and grid stability
BRATTLE REPORT: SUMMARY

• Consultants from The Brattle Group examined the relative economics of a range of distributed electricity storage (from 1,000 MW to 8,000 MW).

• The system-wide (and societal) analysis shows that ~5,000 MW (15,000 MWh) of distributed electricity storage is most cost-effective across ERCOT at $350/kWh storage cost.

• System-wide benefits include:
  • Avoided distribution outages
  • Deferred distribution investment
  • Deferred transmission investment
  • Avoided new generation capacity investments
  • Production cost savings

Positive payback is dependent on both regulated investment deferral and merchant/market value of the energy:

• Merchant suppliers acting alone would under-invest and under-utilize storage for valuable T&D applications for which there is no market price

• TDUs deploying storage only for targeted T&D applications would forgo wholesale market value
Oncor evaluates all relevant technologies to improve reliability on an ongoing basis.

This constant evaluation led to the deployment of smart meters, digital wireless communications and grid automation systems.

For decades, Oncor and the electric industry have known that electric storage has great potential to improve the operation of the grid.

Cost and useful life of storage have been the barriers to adoption until now.

One chemistry, Lithium Ion, has made great strides recently on both fronts driven by the wide acceptance of cell phones, electric vehicles, laptop and iPad computing.

This research and volume production is bringing power storage for electric grids into the affordability range for select markets like Hawaii and California.
Our Goal
Oncor has a goal to implement technologies, facilities, and operating procedures that improve distribution reliability, safety, efficiency, and the customer experience.

Purpose
The Neighborhood Storage Reliability Initiative will evaluate the effectiveness of deploying small-scale battery storage for the purpose of bridging short duration outages and improving local power quality.

Project Details
Six 25 kW Lithium Ion batteries have been installed, tested and monitored.

Capacity
These batteries are capable of bridging outages up to a few hours duration.

Project Timeline
Installations occurred Q2, Q3 and Q4 2014.
Our Goals and Purpose

- Improve reliability of electric service
- Provide flexibility and resilience for a prolonged outage
- Test the integration of solar PV, storage, and microturbine on a utility distribution system
- Provide a training center
MICROGRID VIDEO

A video on Oncor's website

https://www.youtube.com/watch?feature=player_detailpage&v=dz9X2YTE_0Q

ONCOR FUTURE VIDEO

https://www.youtube.com/watch?feature=player_embedded&v=D7Z2qskItcM
WHAT IS ONCOR’S FUTURE?

Oncor auction passes another deadline Monday
*Dallas Business Journal; 4/12/15*

EFH files revised plan to reorganize by end of year
*Dallas Morning News; 4/14/15*

Texas power firm Energy Future lays out debt overhaul plan
*Reuters; 4/14/15*