ANALYTICS WILL POWER EXELON’S UTILITY OF THE FUTURE

Marketing models identify what messages, timing, channels, etc. will best drive community solar adoption.

Electrification propensity model can prioritize which companies are most likely to electrify.

Asset health models proactively notify grid operators about needed maintenance/equipment replacement.

Sensors on streetlights and other devices to monitor air quality, traffic, etc. are rolled into dashboards for Smart Cities managers.

Intelligent traffic signals use historical data and routing algorithms to minimize commuting times.

Models suggest where EV charging infrastructure is most needed and how many charging stations to install.

Vegetation management models prioritize and optimize jobs, routing, etc.

Propensity/churn models identify which rooftop solar customers most likely to use P2P marketplace.

NOTIFICATION
Estimated time remaining: 45 minutes

Vegetation management models prioritize and optimize jobs, routing, etc.
EU ANALYTICS VALUE STRATEGY FOCUSES ON 4 DOMAINS

**Smart Energy Services**
Online tools & notifications will drive **3.1 Terawatt hours** of customer savings Enough to power more than 300,000 homes for a year!

**Customer Operations**
Use Cases across...
1. Customer Strategy
2. Customer Operations
3. Revenue Cycle
4. Products & Services
...that will:
• Enhance cust. experience
• Automate low value interactions

**Grid**
23 Use Cases across...
1. Asset Management
2. Grid Operations
3. Extended Systems
...that will:
1. Improve Reliability
2. Improve Customer Sat.
3. Reduce O&M Expenses
4. Capture new Revenue

**Advanced Metering Infrastructure**
33 Use Cases across:
1. Meter Operations
2. Network Operations
3. Theft Detection
4. Inactive Meters

New Use Case Pipeline – Job One Focus on Safety

Data Analytics Platform (DAP)
Accelerating EU Analytics Maturity & Culture
GRID ANALYTICS SUMMARY & OBJECTIVES

**DATA**
- Asset data
- Inspection data
- Outage information
- Historical & forecasted weather
- Crew information & location
- Time series data
- Asset alerts & alarms
- Meter reading & event data
- Vegetation trim cycles
- Financial data

**ANALYTICS**
- Storm Readiness
- Historical Outage
- Vegetation Management
- Asset Health
- PI Historian Mapping

**INSIGHTS**
- Optimal reliability program recommendations
- Asset maintenance effectiveness
- Asset life predictions
- High risk assets & circuits
- Storm damage prediction

- Storm damage prediction
- ETR calculations
- Asset failure signatures
- Network connectivity data quality
- DER load forecasts

**Reduce Operational Costs**  **Increase Revenue**

**Improve Reliability**  **Reduce System Risk**

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Exelon Utilities
NETWORK CONNECTIVITY USE CASE

Network Connectivity constructs a digital twin of the electric grid as a foundation to maximize the value of grid analytics across EU.

Digital Twin of the Utility Grid
- Foundation for all future Grid Analytics use cases
- Dynamic user interface with multiple map layers and filters
- User & automatic network corrections

Identify mismatched Meters to Transformers and Transformers to Feeders across all of Exelon Utilities

Reduce Falsely Reported Customer Interruptions to improve operation and reliability

Core T&D Data Sources Ingested

Analytics Self-Correct Data Quality Issues
STORM READINESS USE CASE

Storm Readiness Analytics uses machine learning for high resolution damage prediction models to drive improvements in reliability and customer satisfaction.

Machine Learning for Storm Response
- Damage Prediction
- Staffing Level Recommendations
- Pinpoint Crew Placement
- ETR Estimates

EU Annual Storm O&M is one of the largest expenditures across all of the Operating Companies.

Reduce Customer Interrupted Minutes Per Year by leveraging data analytics for storm response.

Leverages best in class weather forecasts.

Tool will support our dedicated Emergency Response Teams.

EP TEAM—"We can’t wait to start using this tool!"

"This will provide better resolution on the actual weather that caused the damage."
ASSET HEALTH USE CASE

Integrate real-time asset condition data from intelligent devices with static data sets (preventative maintenance, corrective maintenance, reliability history) to move from time/ failure based maintenance and replacement strategies to condition/ risk based maintenance and replacement strategies.

- **Risk Algorithm Design**
- **Reduce the impact to customers and the cost of reactive maintenance**

### Asset Health and Risk Analytics

- Real Time Asset Condition Data
- Robust Asset Health & Risk Scores
- Failure Mode Tracking
- Dynamic Asset Strategies

### Geo-spatial Asset Analysis

### Financial Analysis and Cost Benefit Tools
VEGETATION MANAGEMENT USE CASE

Vegetation Management Analytics will offer a data-driven approach to enable smart contracting and transform the way EU manages vegetation risks.

Managing vegetation is one of the highest priorities due to customer impact and O&M spend.

Vegetation related outages has significant customer impacts, accounting for more than 24% of All Outages.

Innovative Analytics for Smart Vegetation Management

- More efficient data-driven work planning
- Vegetation risk management & smart contracting
- Reduced vegetation related outages

Targeting high-cost LiDAR solution

Risk identification using low cost satellite imagery