Emerging AMI Technology and Benefits Enabled

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GLOBAL DRIVERS

Government Mandates
Capacity / Supply Constraints
Grid Reliability / Resiliency
Operational Improvement
DER Integration
Loss Reduction
Consumer Empowerment
Smart Cities
New Revenue

Global Drivers:
- Government Mandates
- Capacity / Supply Constraints
- Grid Reliability / Resiliency
- Operational Improvement
- DER Integration
- Loss Reduction
- Consumer Empowerment
- Smart Cities
- New Revenue
### PROVEN BENEFITS

<table>
<thead>
<tr>
<th>Company</th>
<th>Description</th>
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<tbody>
<tr>
<td>CenterPoint Energy</td>
<td>13 million customer service transactions automated (98.7 percent)</td>
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<tr>
<td>BC Hydro</td>
<td>Reduced electricity theft by 80 percent (875 GW to 175 GW)</td>
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<td>DTE Energy</td>
<td>7.3 percent improvement in CAIDI; 8.3 percent in SAIDI due to AMI event data</td>
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<td>Southern California Edison</td>
<td>AMI-enabled PTR program reduces peak load by nearly 30MW</td>
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<td>Avista</td>
<td>CVR project demonstrates 2-5 percent energy reduction achievable</td>
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<td>Glendale Water and Power</td>
<td>51 percent reduction in annual meter reading and customer operations costs</td>
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<td>National Grid</td>
<td>By combining rate choice, smart meters, in-home technology, customers save between 10 and 49 percent energy</td>
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<td>SDGE</td>
<td>250,000 vehicle trips avoided annually; nearly 2,000 metric tons of carbon reduced</td>
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<tr>
<td>Consumers Energy</td>
<td>22 point improvement in customer satisfaction; 75 percent increase in “net promoter” score in installed territories</td>
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TECHNOLOGY EVOLUTION

- **Manual meter reading**
  - Meter
  - 1-way communication
  - Meter centric

- **AMR**
  - Advanced meter
  - 2-way communication
  - Big data
  - Network centric

- **AMI**
  - AMI meter as sensor
  - Higher network throughput, lower latency
  - Bigger data
  - Back office centric

- **SMART GRID**
  - Distributed computing platform
  - Adaptive communications
  - P2P communications
  - M2M computing
  - Analysis and action at the edge
  - The right data
  - Application centric

- **ACTIVE GRID**
  - Distributed computing platform
  - Adaptive communications
  - P2P communications
  - M2M computing
  - Analysis and action at the edge
  - The right data
  - Application centric
THE BUSINESS CASE EVOLUTION

**Consumer Benefits**
- Billing Accuracy
- Privacy

**Utility Benefits**
- Manual Meter Reading
- AMR – Walk By, Drive By
- AMI
- Smart Grid

**Automation**
- Reduced Cost, Revenue Cycle Services, Advanced Billing, Improved Customer Service

**Optimization**

**Extension**
- AMI Plus: Distributed Platform for New Services, Prosumer Enablement, DER Integration, Safety Monitoring

**Transformation**
- Assured Connectivity, SCADA-like Awareness, Intelligence at the Edge
**DISTRIBUTED INTELLIGENCE SOLUTION MODELS**

**Traditional Back Office Analytic**
- Outage Analysis
- Forecasting and Load Research
- Distribution Planning
- Advanced Billing

**Distributed Analytic**
- High Impedance Detection
- Intelligent Voltage Monitoring
- Load Disaggregation

**Distributed Analytic With M2M**
- Distributed Generation and Real Time Markets
- Location Awareness
- Outage Detection and Location
- Theft Detection
- Electrical Faults and Safety

**Local Analysis and Action**
- Active Load and Voltage Control
- Active Demand Response
- DA Device Integration
- Electrical Faults and Safety
THANK YOU

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