A journey through AMI

Strategy, planning, implementation, and measurement

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E Source

POWERING WHAT'S **NEXT**

Agenda

- Introductions

- What is advanced metering infrastructure, a customer engagement portal, and meter data management?

- Who are the major vendors and what do they offer?

- How can AMI help my organization and our customers?

- What can we learn from other utilities?

- How to avoid possible pitfalls

Introductions

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Introductions

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POWERING WHAT'S NEXT

Who we are

A research, consulting, and data science firm focused exclusively on the intersection of utilities and their customers

Clients

We work with more than 600 utilities, cities, and their partners

Founded

Founded in 1986, we've been in the industry for nearly 35 years

E Source

We understand utilities and municipalities because we've made them our business for more than 30 years.

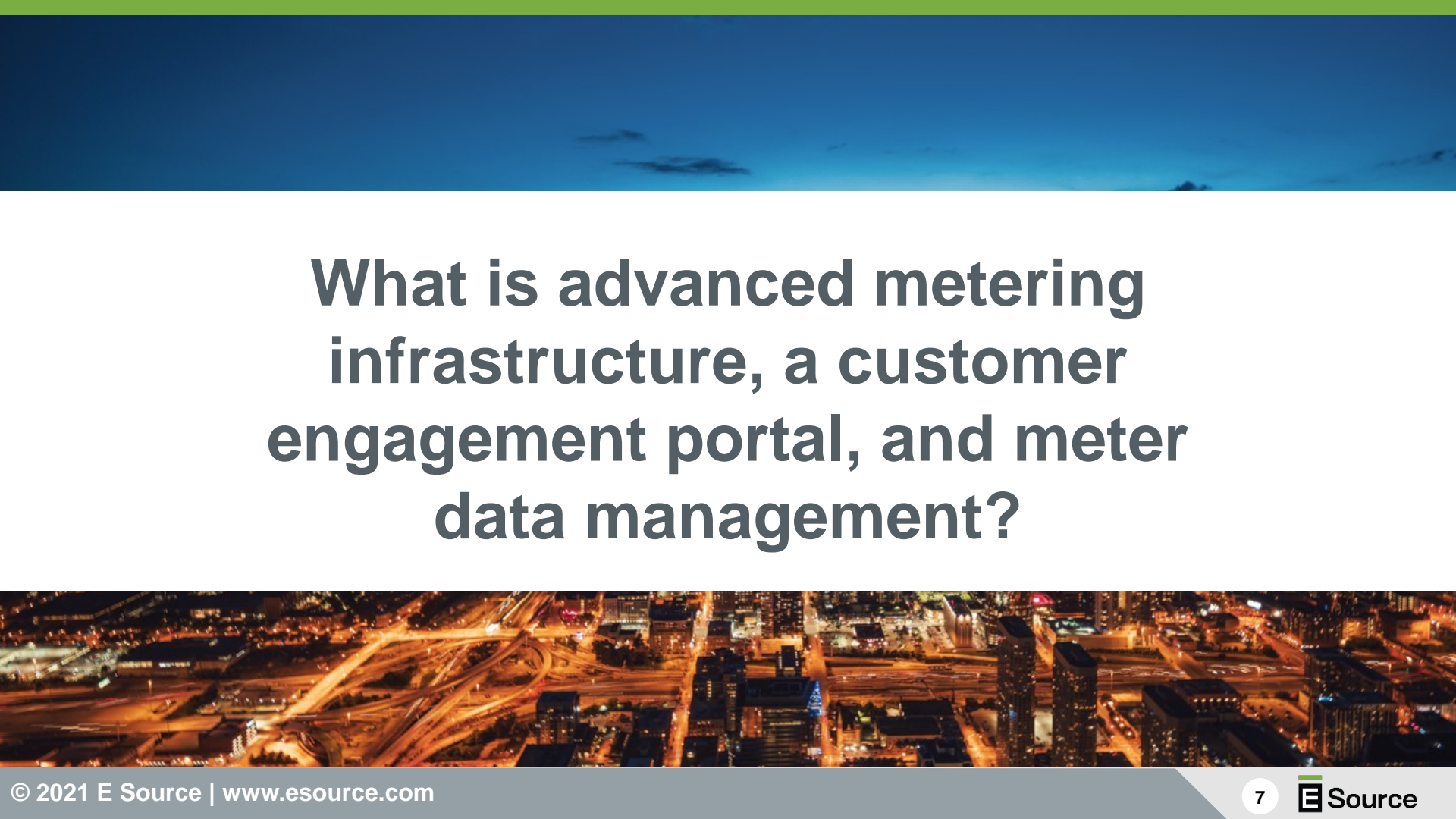## Utility research and advisory

Using market research data, expert analysis, and industry experience, we help utilities put their customers first, meet their business objectives, and solve their corporate challenges.

Data science

Applying predictive data science to help electric and gas utilities make data-driven decisions that improve their bottom line and increase customer satisfaction.

Strategic utility consulting

Advancing business and technology solutions that strategically enhance operations for utilities and their cities.

What is advanced metering infrastructure, a customer engagement portal, and meter data management?

Advanced metering infrastructure (AMI)

Hardware


Networks

Software & data management

AMI allows **two-way communication** between a customer's meter and the utility, and it provides **near real-time information** about usage.

AMI system components

Network
- Vendor-provided network
- Backhaul

Hardware
- Electric meters
- Endpoints

Software
- AMI head-end
- Meter data management system (MDMS)
- Data analytics

Software
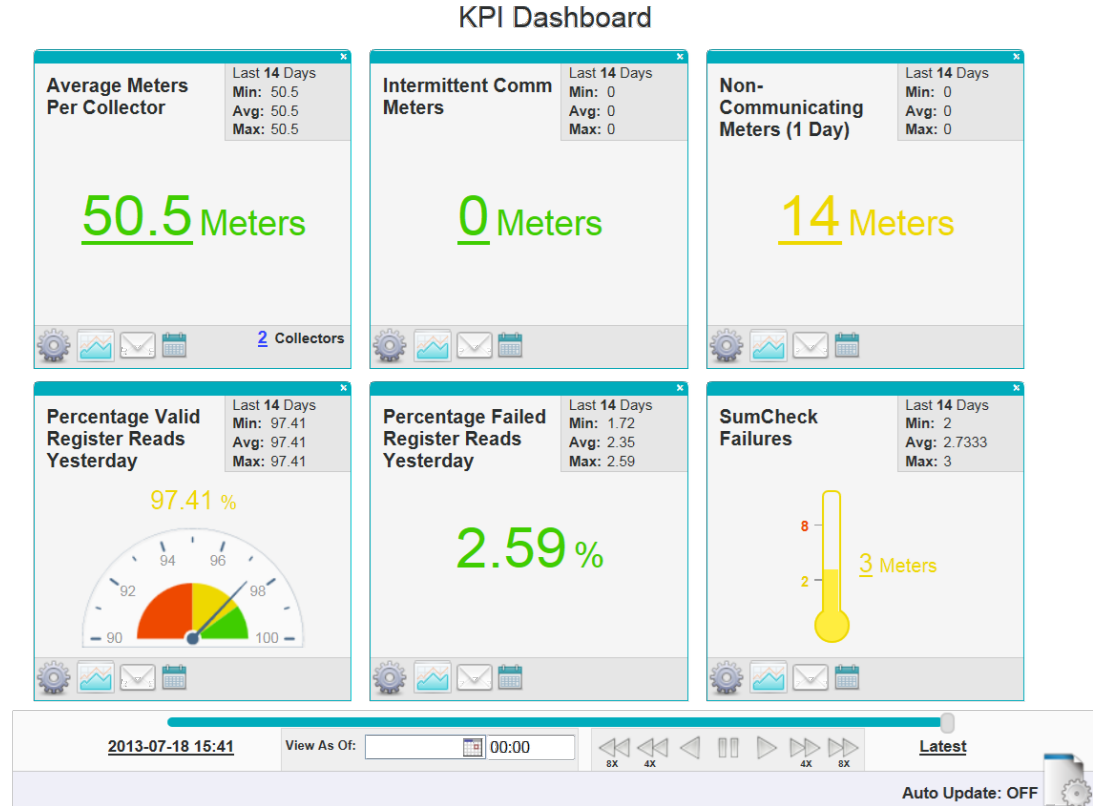- Customer engagement platform

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Meter data management system

- Long-term storage

- Basic analytics

- Source of customer portal data

- Integrations facilitate greater uses

- VEE functionality (validating, editing and estimating)

  - Helps automate manual pre-AMI processes
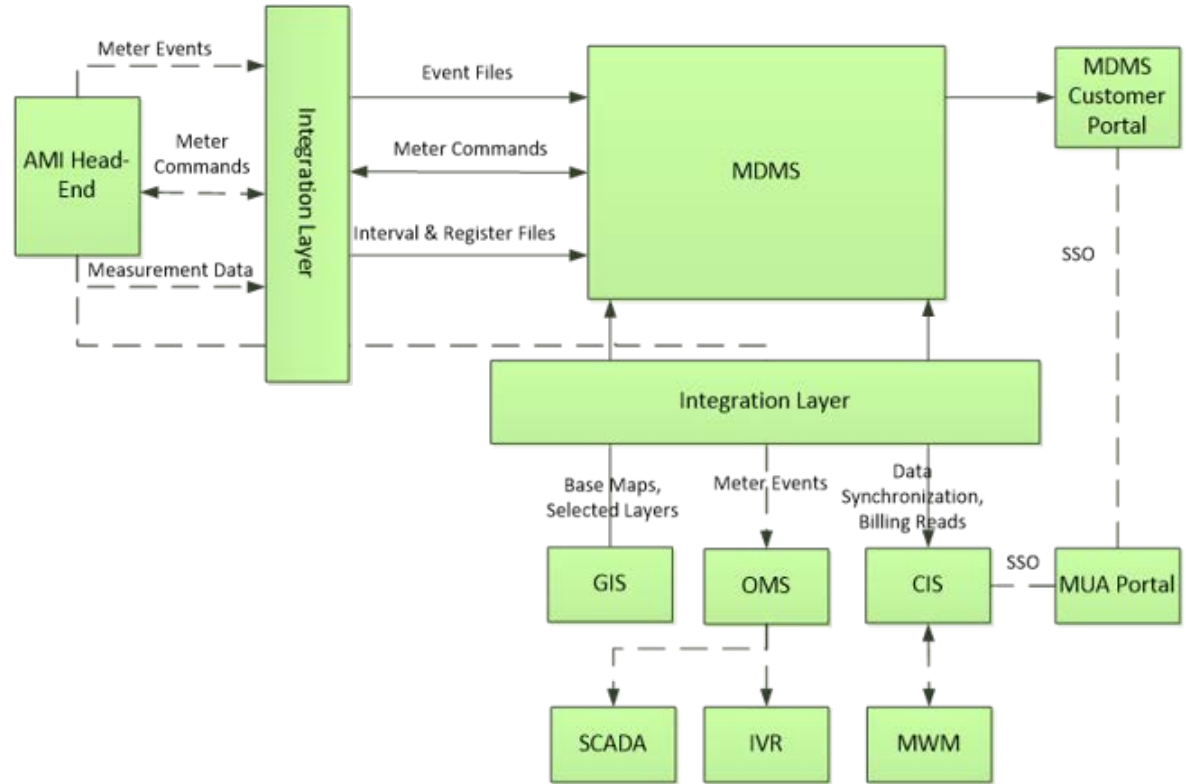
Key performance indicator (KPI) dashboards

- Dashboards are a common feature of an MDMS

- These dashboards can be role based

- KPIs can be found for business, operation, or through the system

KPI Dashboard

Average Meters Per Collector	Last 14 Days Min: 50.5 Avg: 50.5 Max: 50.5

50.5 Meters

2 Collectors

Intermittent Comm Meters	Last 14 Days Min: 0 Avg: 0 Max: 0

0 Meters

Non-Communicating Meters (1 Day)	Last 14 Days Min: 0 Avg: 0 Max: 0

14 Meters

Percentage Valid Register Reads Yesterday	Last 14 Days Min: 97.41 Avg: 97.41 Max: 97.41

97.41 %

92 94 96 98 90 100

Percentage Failed Register Reads Yesterday	Last 14 Days Min: 1.72 Avg: 2.35 Max: 2.59

2.59 %

SumCheck Failures	Last 14 Days Min: 2 Avg: 2.7333 Max: 3

8 2 **3** Meters

2013-07-18 15:41   View As Of: ____ 00:00   8X 4X ⏸ ▶ 4X 8X   **Latest**

Auto Update: OFF

Customer engagement platforms (CEPs)

Customer engagement tools provide transparency to customers and serve as a platform for **two-way** communication between utilities and customers

- Customer self-service tools to reduce calls
- Near real-time and historical consumption data
- Leak and high-bill notifications

- Consumption and conservation self-management
- Start, stop, and transfer service requests
- Email, SMS text, and web chat
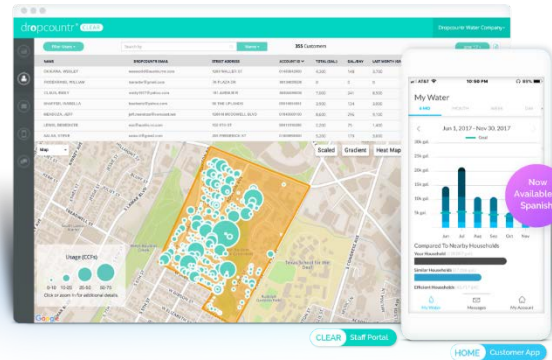
Customer engagement platforms

- Mobile devices are supported by most CEPs—either through dedicated apps or mobile-responsive web portals

- CEPs can be integrated with existing payment systems and interactive voice response (IVR) systems for a seamless customer experience
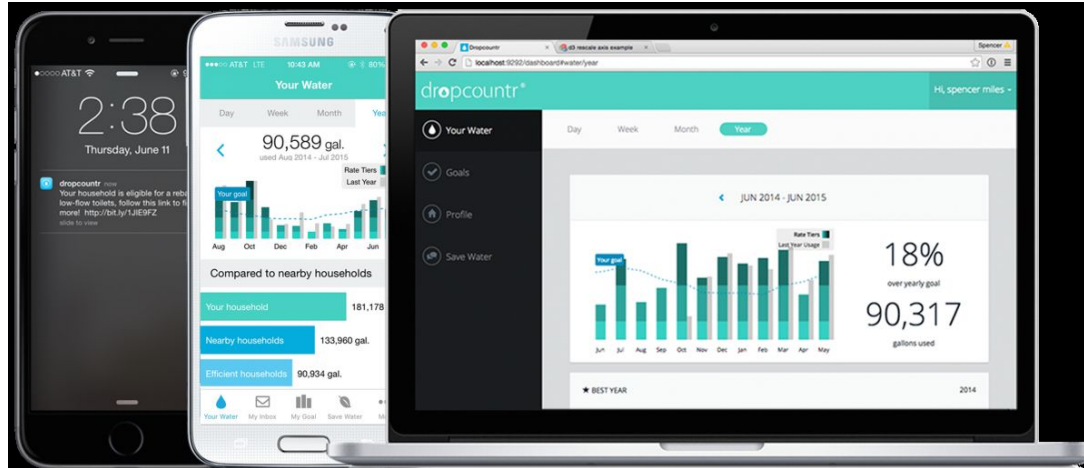
Trends in customer engagement platforms

- Meet customers where they are: mobile apps and web portals for one-stop shopping

  - See electricity and water usage (how much and when)
  - Set goals and notifications for conservation and billing
  - Get alerts for leaks, service disruptions, and projected high bills
  - Make payments easily from any device
  - Compare against peers
  - Sign up for rebates
  - Receive news from the utility

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Who are the major vendors and what do they offer?

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Complex vendor marketplace

Meter manufacturers

AMI solutions

Meter data management systems

Customer engagement platforms*

*Includes CEPs without customer portals

AMI providers for multiservice utilities

- Aclara

- Honeywell Elster

- Eaton Cooper Power

- Itron

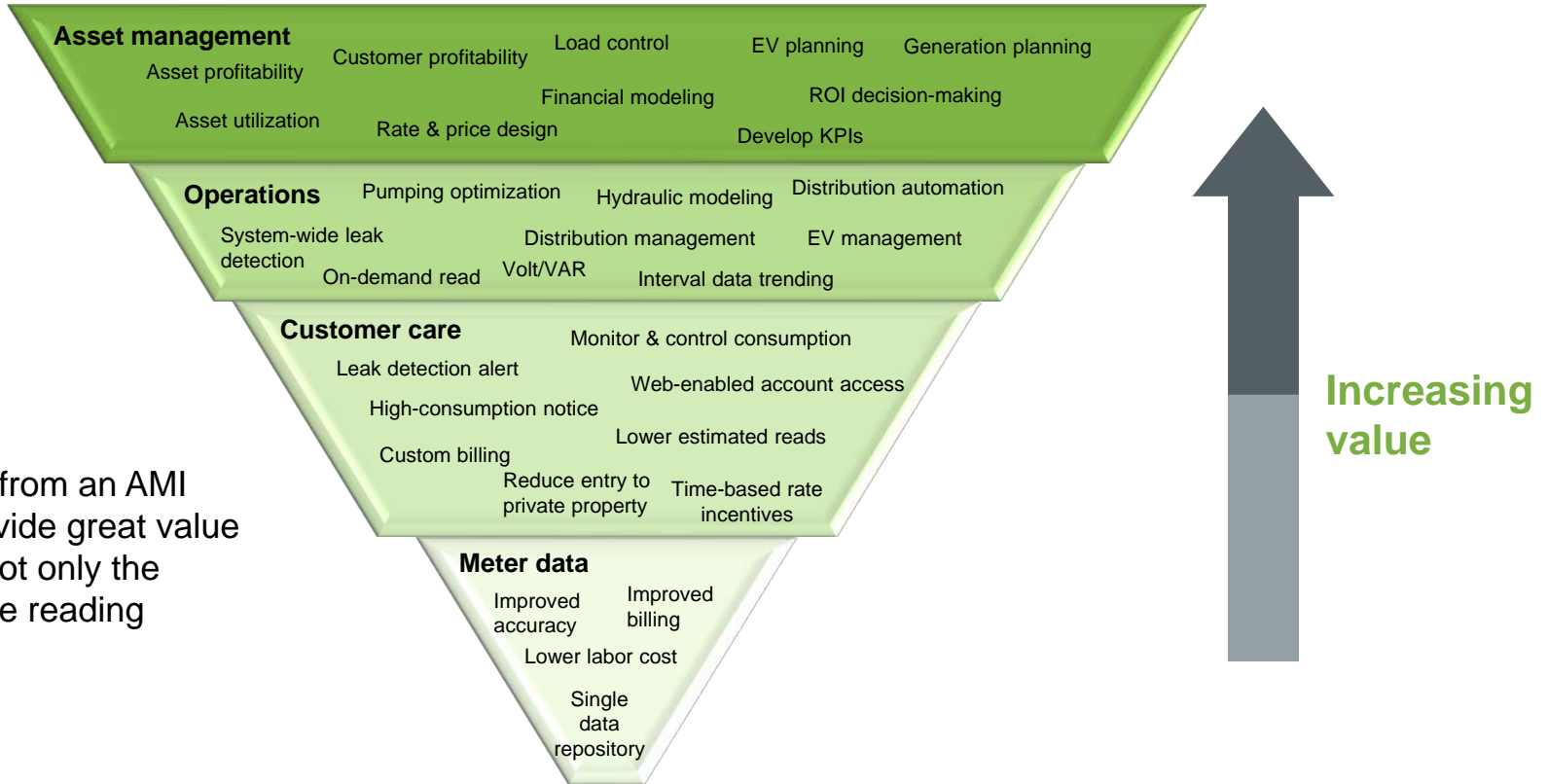- Landis+Gyr

- Xylem (Sensus)

- Tantalus

How can AMI help my organization and our customers?

AMI data value chain

Asset management

Asset profitability Customer profitability Load control EV planning Generation planning

Asset utilization Financial modeling ROI decision-making

Rate & price design Develop KPIs

Operations Pumping optimization Hydraulic modeling Distribution automation

System-wide leak detection Distribution management EV management

On-demand read Volt/VAR Interval data trending

Customer care Monitor & control consumption

Leak detection alert Web-enabled account access

High-consumption notice Lower estimated reads

Custom billing

Reduce entry to private property Time-based rate incentives

Meter data

Improved accuracy Improved billing

Lower labor cost

Single data repository

Increasing value

All data taken from an AMI meter can provide great value to a utility … not only the value of remote reading

Benefits of AMI

Customer

- ✓ Fewer estimated bills*
- ✓ Reduced disputes*
- ✓ Leak detection & notification
- ✓ Enhanced online tools & experience
- ✓ Consumption management
- ✓ Improved emergency response time & notification
- ✓ Reduced carbon emissions*
- ✓ Conservation

*Also a benefit of drive-by automated meter reading
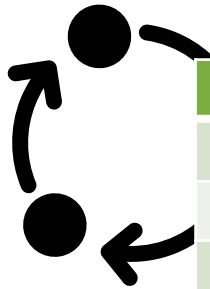
Utility

- ✓ Timely & accurate meter reading*
- ✓ Reduced truck rolls*
- ✓ Main break prevention
- ✓ System planning & optimization
- ✓ Enhanced outage detection
- ✓ Nonrevenue water detection
- ✓ Reduced bill adjustments
- ✓ Real-time analytics & modeling
- ✓ Theft detection
- ✓ Improved safety*
- ✓ Rate design
- ✓ Reduced carbon emissions*
- ✓ Conservation
- ✓ Platform for smart city (Internet of Things)

What can we learn from other utilities?

Introduction

- E Source has experience working with over 150 cities and utilities

- We, along with our clients, are invited to many events to share our experience and results

  - Attending conferences such as TVPPA/AWWA events with your peers can provide valuable opportunities to share knowledge

- Forums such as this webinar serve as opportunities to learn about other utilities' experiences

- E Source would be happy to make introductions for more information about their experiences

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Loudon Utilities

- E Source (formerly UtiliWorks) was engaged

- Vendor selection process

- Deployment
  - Performed their own water gas and electric installations
 - E Source provided the work order management system (WOMS) for the installation

Background on Loudon Utilities

- 21,493 total residential and commercial meters
- 11,762 combined residential and commercial electric meters (all new)
- 4,531 combined residential and commercial gas meters (replace or retrofit)
- 5,200 combined residential and commercial water meters (replace or retrofit)

LOUDON UTILITIES
Natural Gas ● Electricity ● Water ● Wastewater

Loudon Utilities

- Program branded UtiliWise, with a robust awareness and education campaign for utility employees and customers
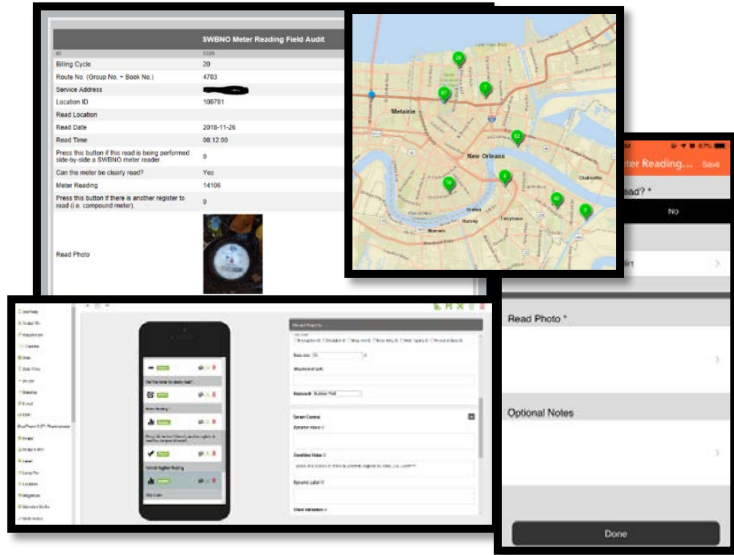
- Deployment
  - Performed their own water, gas, and electric installations
  - E Source provided the WOMS for the installation

Loudon Utilities

- **Lessons learned**
  - Do no harm
  - It's hard. Don't do it alone.
- **Realized benefits**
  - Automation
  - Data
  - Interdependence
- **Future plans**
  - Leveraging data
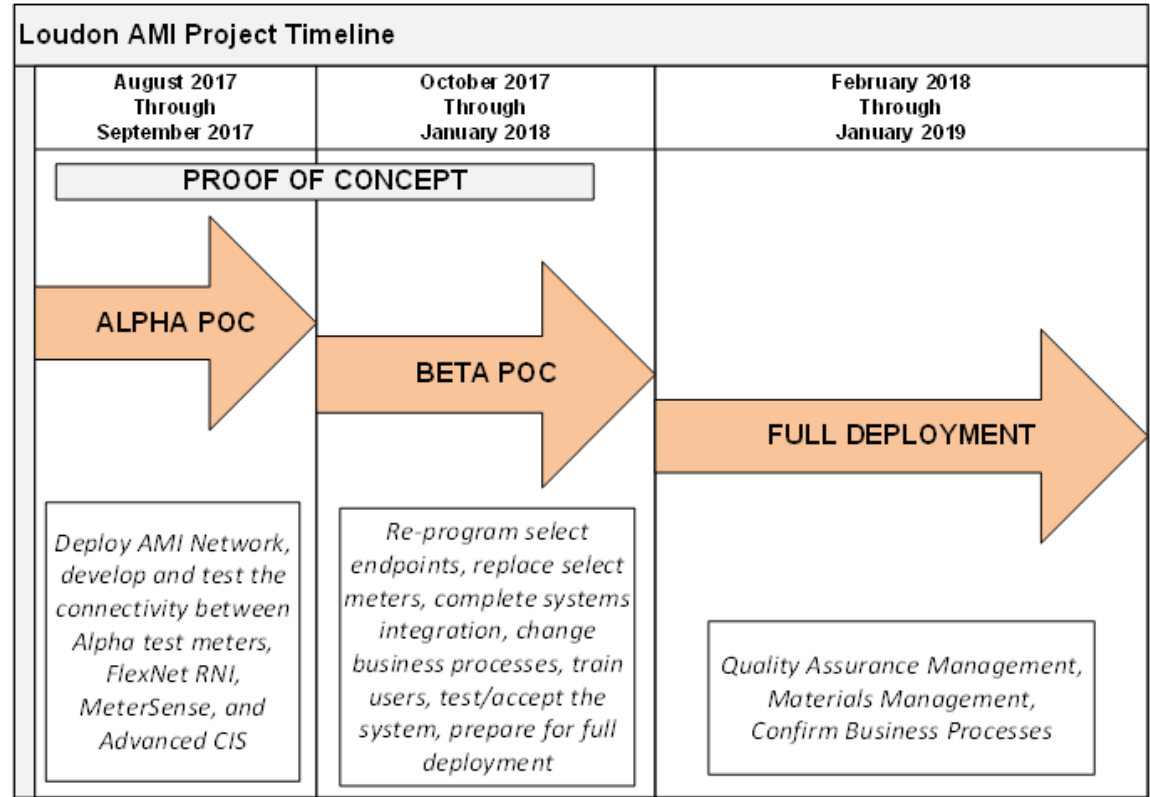
Loudon AMI Project Timeline

August 2017 Through September 2017	October 2017 Through January 2018	February 2018 Through January 2019

PROOF OF CONCEPT

ALPHA POC

BETA POC

FULL DEPLOYMENT

Deploy AMI Network, develop and test the connectivity between Alpha test meters, FlexNet RNI, MeterSense, and Advanced CIS

Re-program select endpoints, replace select meters, complete systems integration, change business processes, train users, test/accept the system, prepare for full deployment

Quality Assurance Management, Materials Management, Confirm Business Processes

How to avoid possible pitfalls

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Common challenges in AMI projects

- Commitment, participation, and engagement from the entire utility organization

- Considering all aspects of project cost

  - Meter assets at end of life

  - Project financing

  - Rate changes

  - Increased accuracy

- Accuracy of water meter asset characteristics

- Balancing the goals of the utility and the interests of the vendors

- Early engagement of the CIS vendor/systems integrator

- Perception that this is *only* a meter-replacement project; it's an enterprise technology-upgrade program

- Typical installation issues with mass deployments

  - Identification

  - Workflows, records, photos, and audit trails

- Adequate staffing assessment and adjustments

  - Project hiring

  - Long-term changes to roles and responsibilities

  - IT support: software as a service

  - Field support: network as a service

- Policy impacts

How to launch an AMI program
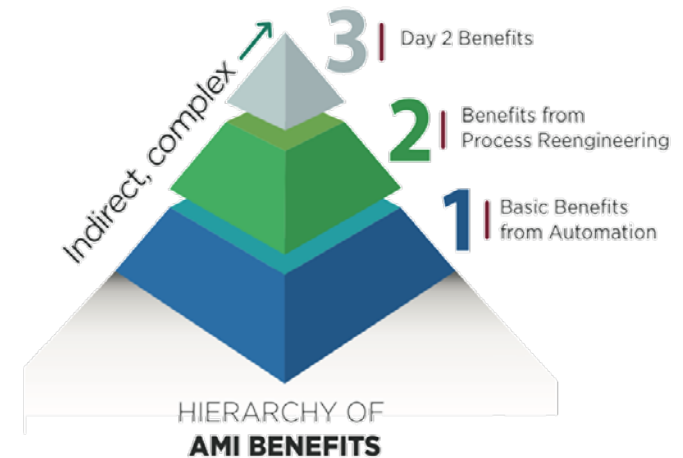
- Staffing plans

- Business case

- Procurement

- Budgeting

- Data management

E Source Advantage

Program management • Stakeholder engagement • Organizational change • Business strategy

Optimize
- Benefits realization
- System maintenance and monitoring
- Functionality enhancements
- Complementary technologies
- Continuous improvement
- Analytics

Implement
- Project management
- Field quality assurance
- Training oversight
- Acceptance testing
- Awareness and education
- Organizational transition

Design
- System architecture design
- Resource planning
- Deployment preparation
- Future-state business process
- Testing approach
- Communications plan

Procure
- Technical/functional requirements
- RFP development
- Proposal evaluation
- Reference checks/site visits
- Negotiations
- Contracting support

Assess
- Technology education
- Current-state gap analysis
- Goals and objectives
- Use-case prioritization
- Business case
- Road map development

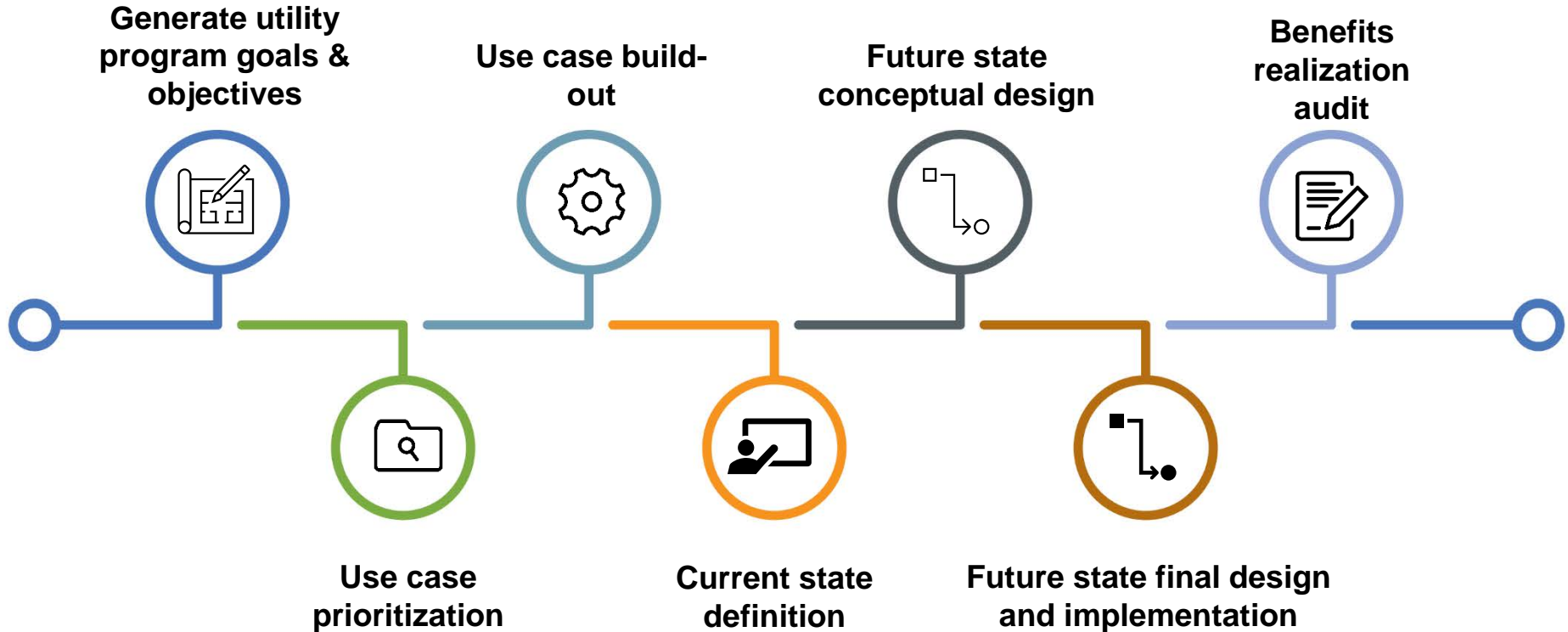E Source

Day 2 AMI benefits

- Most AMI implementations are based on a feasibility study that examines the economic benefits of AMI

- After the AMI system is installed, there is a desire to improve the operation and find ways to leverage the investment

- Most of these benefits focus on the advantages of automation and new technology features

- Utilities should move beyond the initial, more-direct benefits and incorporate those that build increasing value over time

- The utility's business and technology groups should collaborate to build a road map

Indirect, complex ↗

3 Day 2 Benefits

2 Benefits from Process Reengineering

1 Basic Benefits from Automation

HIERARCHY OF
AMI BENEFITS

Some areas to consider

- Analytics: use of data across the organization
- Outage management
- Distribution automation
- Conservation voltage reduction

- Demand response
- Street lighting control
- Pre-pay
- Time-of-use
- Sharing the AMI network

Use case approach

Generate utility program goals & objectives

Use case build-out

Future state conceptual design

Benefits realization audit

Use case prioritization

Current state definition

Future state final design and implementation

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Key steps to ensure success

- Establish project **goals and objectives**

- Institute robust **project governance** and program management

- Develop a project and post-project **staffing plan**

- Craft an employee and customer **education and communication** campaign

- Capture **requirements** across all departments

- Publish a comprehensive, well-informed **request for proposals**

- Define and include clear **acceptance criteria** in all vendor contracts

- Create a **partnership** with the solution vendors

- Prepare for the rollout starting with a **proof of concept**

- Reengineer your **business processes** to maximize your AMI investment

Everyone needs a seat at the table
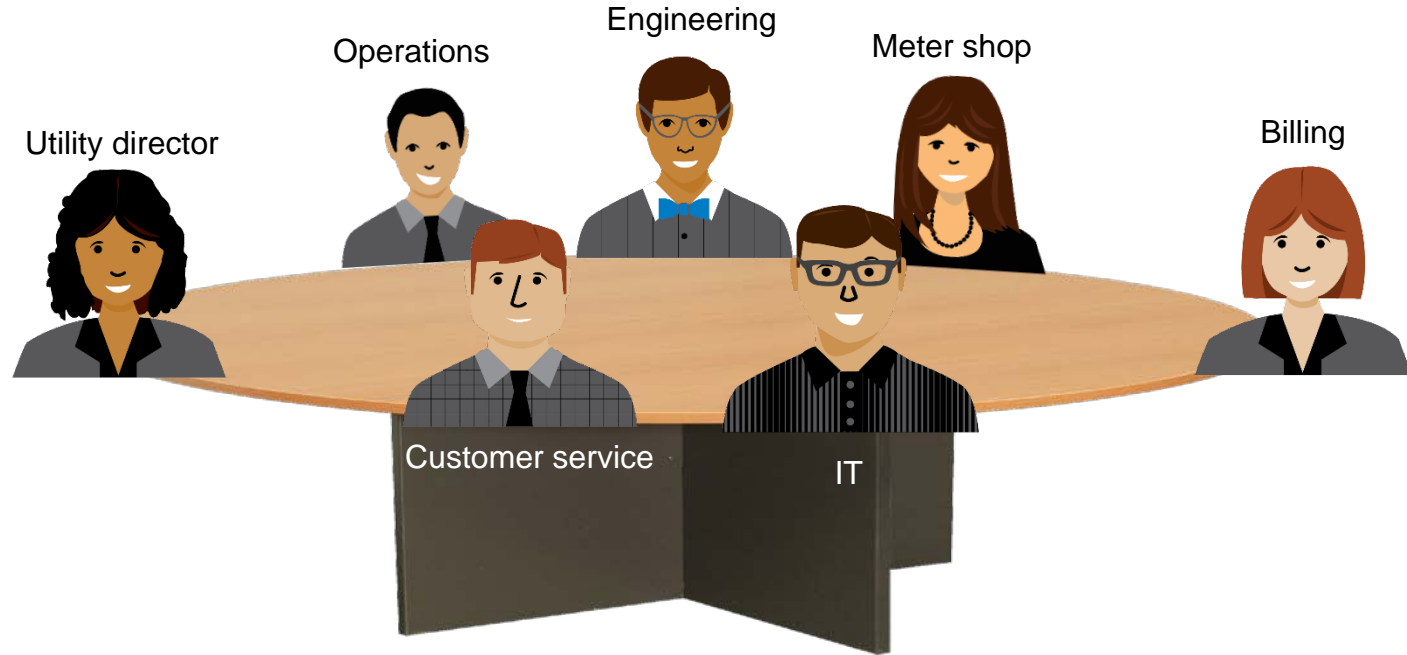
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