

JULY 2007

Advanced Metering Infrastructure: **What Public Power is Doing**

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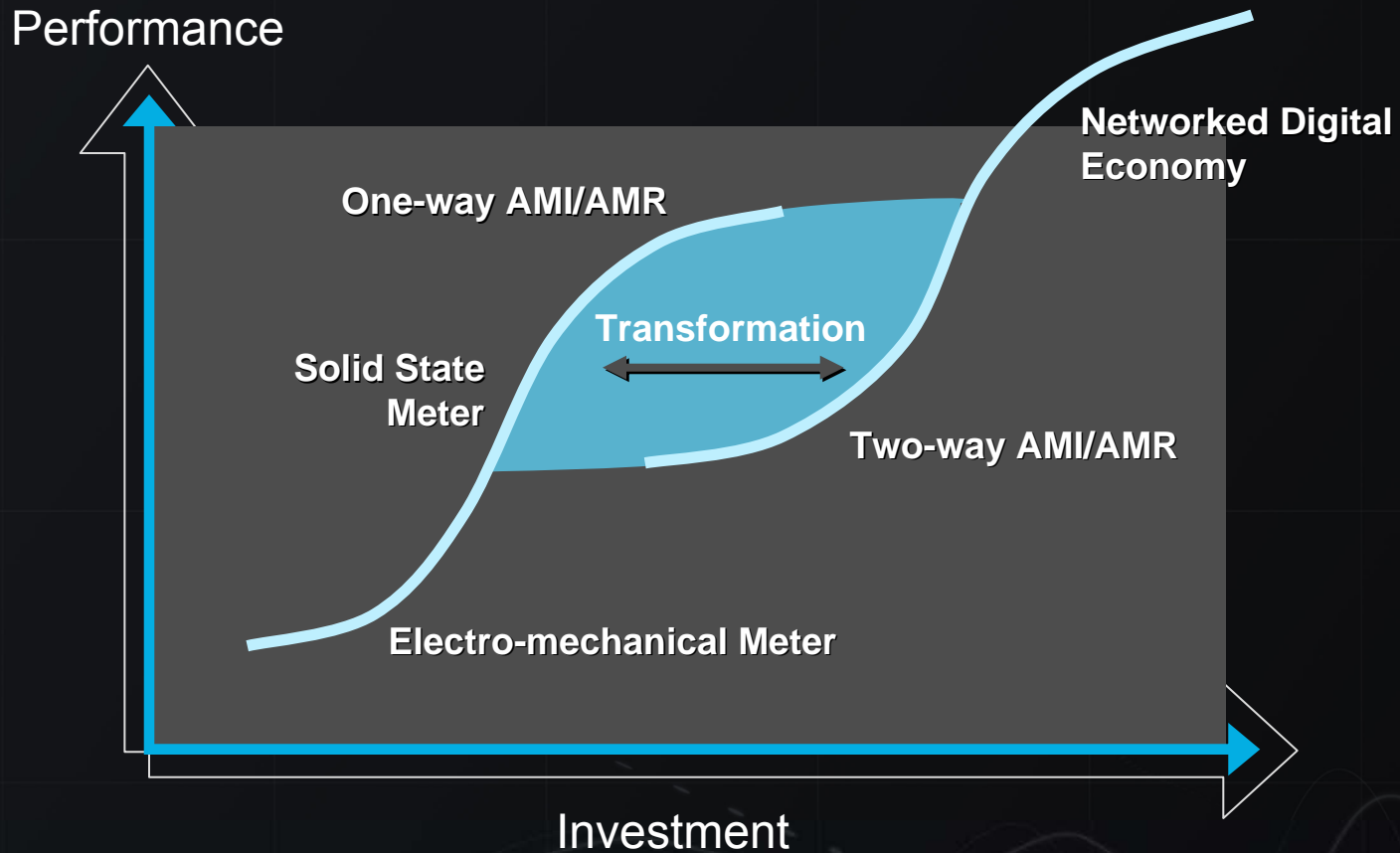
Mark Gabriel

Key Drivers of AMI and Related Systems

- Need to modernize critical (historically low) infrastructure investments
- Operating cost pressures
- Significant advances in technology
- Changing relationships with customers
- It's the law: 2005 Energy Policy Act*

*All PURPA utilities must consider advanced metering

Market Transition in AMI/AMR



Public Powers' Path in AMI



- Public power, large and small are deciding on AMI systems
- Decisions are driven by utility strategy, technology, operations, regulatory and financial considerations
- AMI benefits from technology improvements in systems operations, communications, and computing

Public Powers' movement in AMI



Three basic tracks

- Do nothing, wait and see (and hope)
- Move slowly toward AMI (the pilot plan)
- Aggressively pursue AMI implementation

Who is doing what?

- **Austin Energy**
 - 60% installed with a two-way system for electric
- **SMUD**
 - Moving ahead with a two-way system after initially deciding on drive-by
- **City of Tallahassee**
 - Moving ahead with a three service advanced system including thermostats
- **City of Shasta Lake**
 - Installing two-way system
- **Jacksonville Electric**
 - Looking to expand its current one-way mesh system
- **City of Danville**
 - Exploring ways to use its fiber ring for advanced metering
- **Seattle City Light**
 - Piloting two-way system
- **Dozens of other public power entities are exploring their options**

Evolution of AMI

- **Advanced Metering gains low or no attention**
- **Technology and system ability questioned by industry leaders**
- **Perception that AMI would reduce meter reader jobs**

10 YEARS +

- **Advanced Metering now at forefront of industry**
- **Technology widely recognized and exceeds expectation**
- **Law and markets now support action**

AMI Builds Core of Advanced System



● Sensor

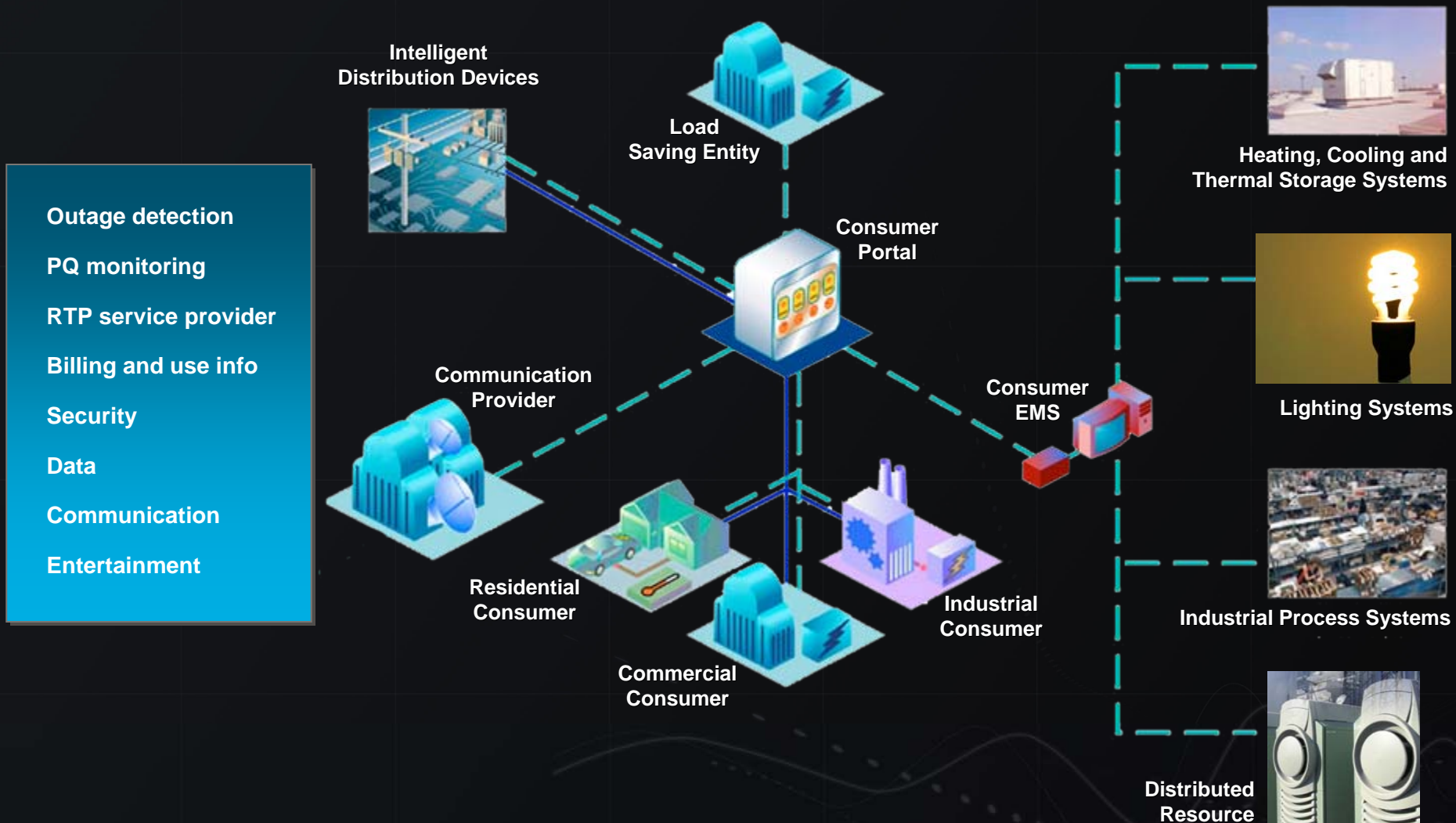
● Sensor/Communications

● Communications

■ Customer Portal

⚡ Generation

Advanced Metering Empowers Consumers



Strategic Themes of AMI/AMR Vary



Plain Vanilla

- One Way Drive-By Communication
- Stand Alone System
- Inexpensive but dead-end for the future



Main Street

- Advanced 2-Way, PLC & Wireless
- Separate but connected
- Can be ramped and expanded over time



Brave New World

- BPL, Advanced 2-Way
- Seamless Integration Across Systems
- Expensive but with most options

Strategic Themes of AMI/AMR Vary



Plain Vanilla

- City of Wichita



Main Street

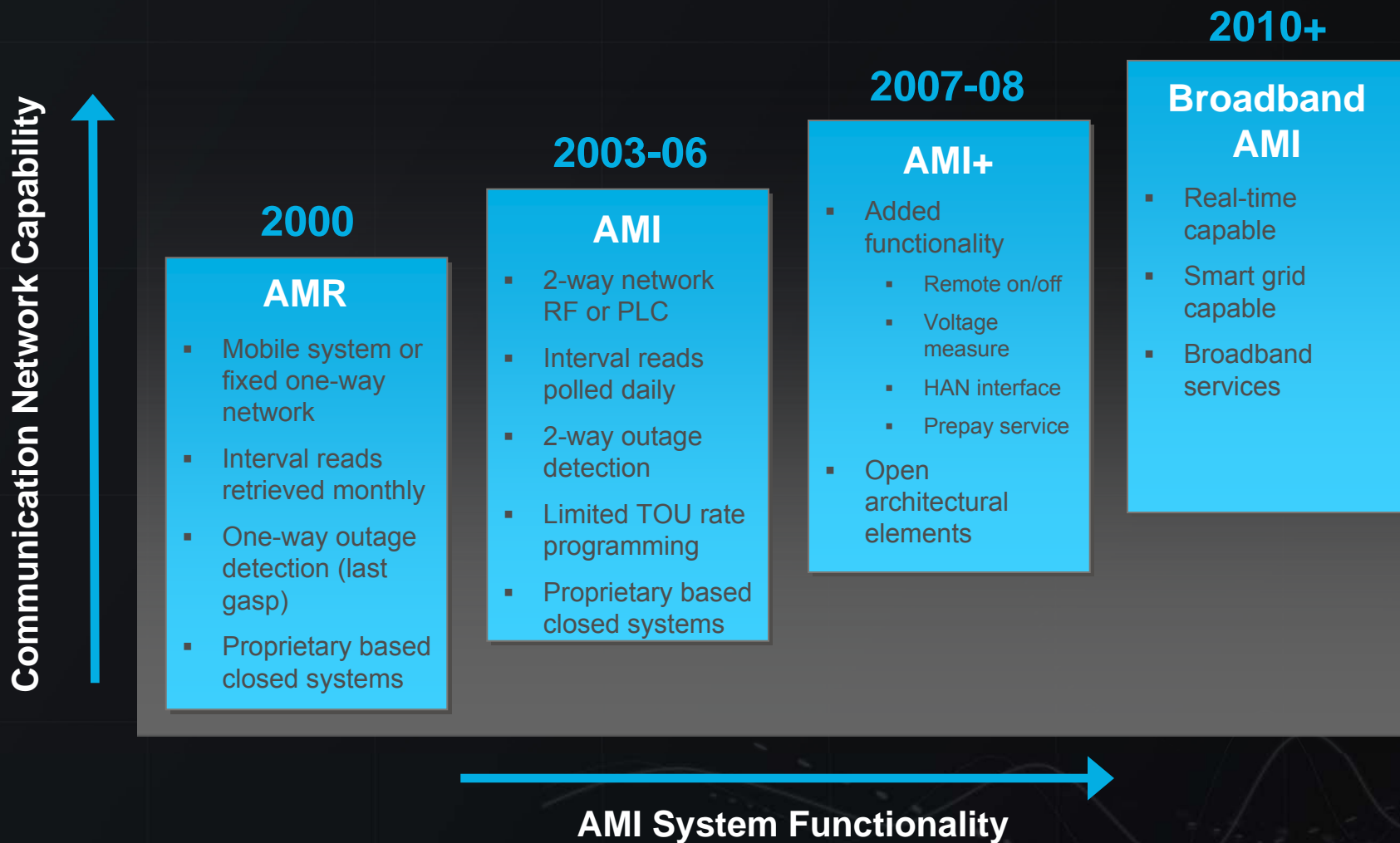
- Austin Energy
- City of Shasta Lake
- Jacksonville Electric



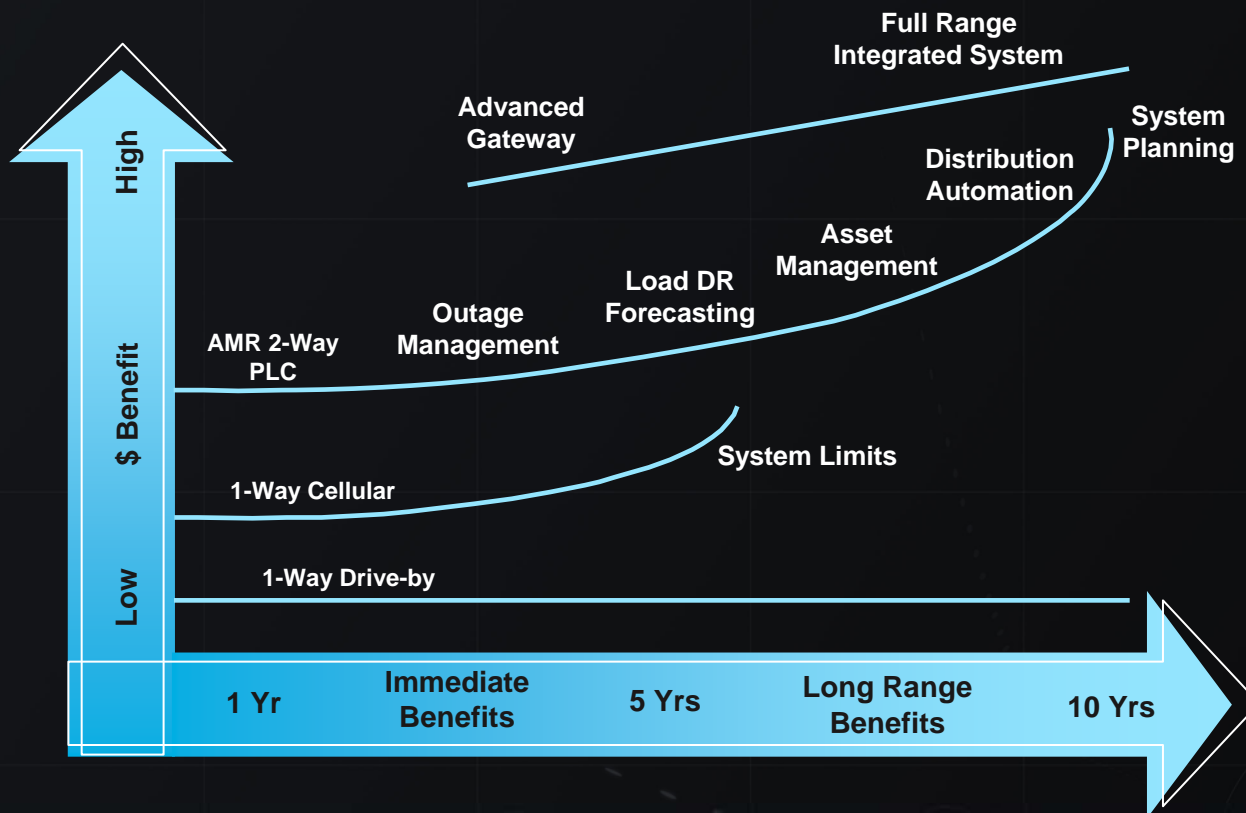
Brave New World

- Holyoke Municipal
- City of Danville

Migration of Strategies



Time and Investment Benefits



How Public Power is moving ahead

- The plunge (just do it)
- A pilot (the toe dip)
- The turn-key (hire an integrator)
- Business case (creating a strategic plan)

AMI/AMR Business Case Process



What is involved in making the decision?

Strengths

What areas of utility operations encourage AMI/AMR deployment?

Weaknesses

What areas of utility operations are obstacles for AMI/AMR deployment?

Opportunities

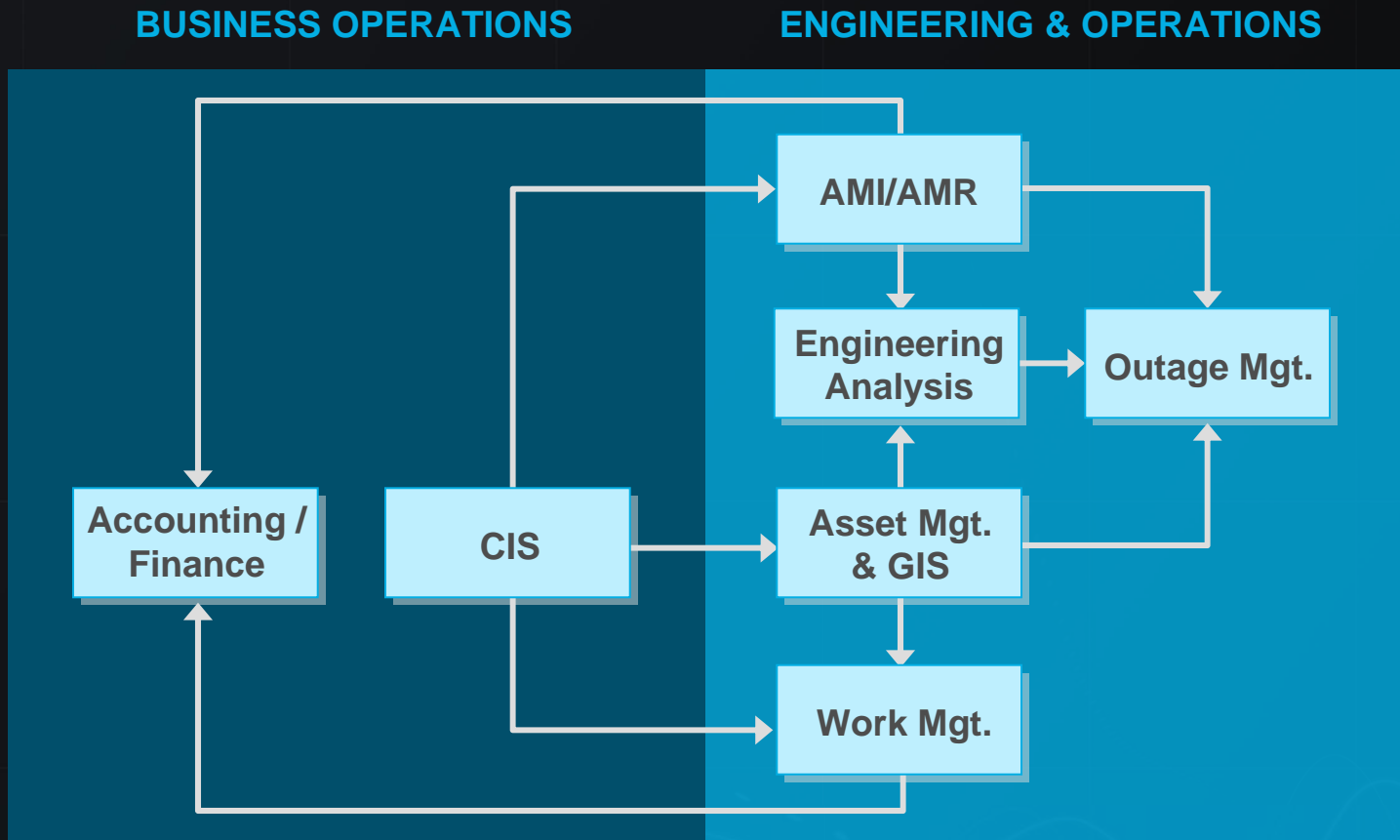
What areas of utility operations benefit with AMI/AMR deployment?

Threats

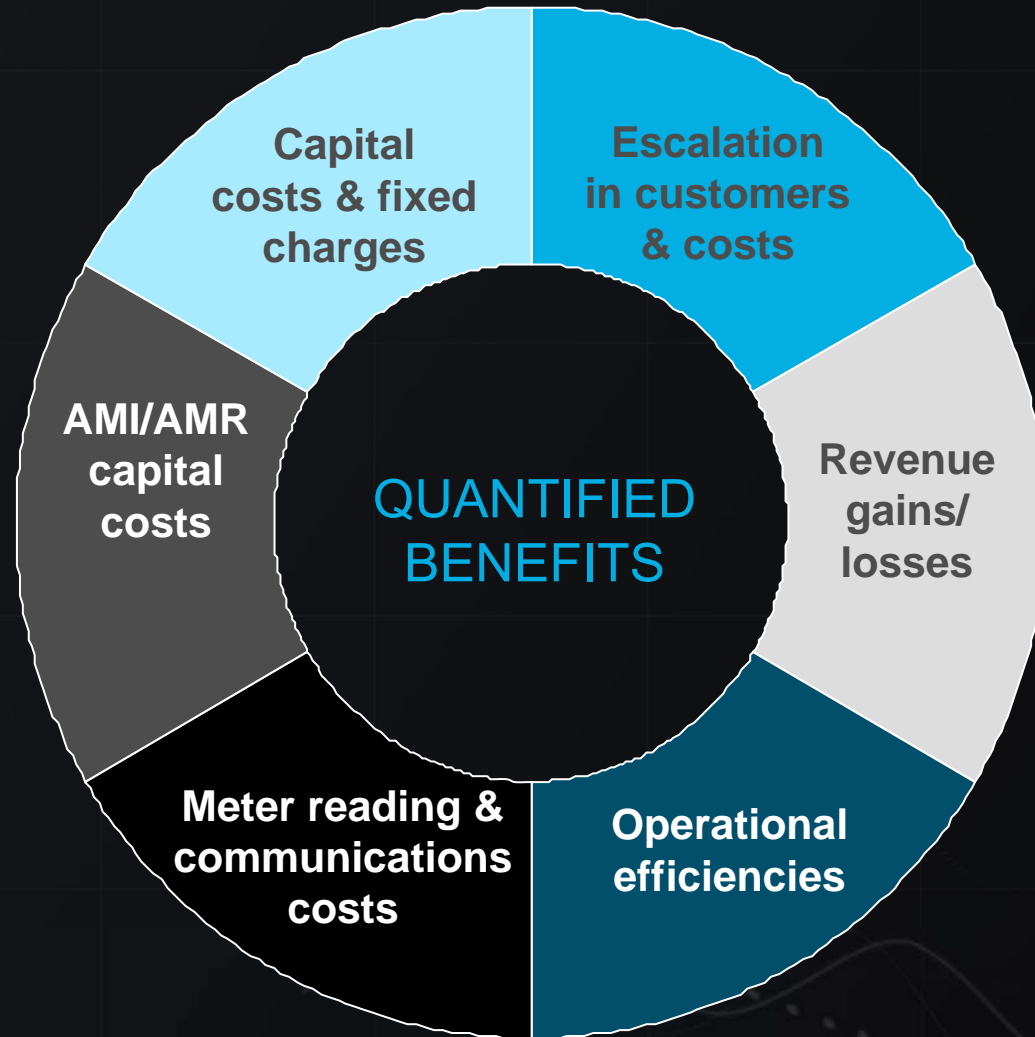
What areas of utility operations are threatened by AMI/AMR deployment?

- Meter read process
- Billing process
- Power theft history
- Accounts receivable
- Turn-on/Turn-off processes
- IT infrastructure
- Priority and special-care customers
- Electric system planning
- SCADA and DA systems
- CIS, GIS, OMS, EA, other apps
- Reliability and E&O standards
- Electric losses
- Outage restoration processes
- Organizational structure/staffing
- Strategic and departmental plans
- Rate classes and meter types
- Customer satisfaction and complaints

Understanding Linkages and RFP Development



Cost Benefit Evaluation



Current Best Practices-What we learned

- Consider the entire process—this is not just about metering
- Develop an AMI/AMR support plan
- Bring in cross functional resources—both internal and external.
- Align AMI/AMR activities with distribution, finance, risk management and customer service programs

Developing a Vision

- Can occur before, during, or after implementation
- Signs that a vision is not fully developed or executed
 - Lack of alignment with existing programs and AMI
 - An overwhelming amount of data
 - Competing system with the Utility
 - Back office and IT conflicts
- Key: Find opportunities beyond the obvious, not costs beyond the ordinary

Operational Best Practices - Strategic

Strategic - *Process orientation, Teaming, Communications*

- Link AMI as part of an integrated energy plan
- Anticipate needed functionality and budget for additional costs
- Shift financial responsibility to vendors and partners (When possible)
- Link multiple needs of the organization to a broad vision for support – but attach each pieces on its own merit

Operational Best Practices - Tactical

Tactical — *Data Mgmt, Inventory Control, Technology Flexibility*

- Recognize the huge process implications of AMI
- Maintain tight inventory and installation control
- Get pre-approval of expenditures when possible
- Be flexible and use a blended approach with technology

Recent AMI/AMR Activities



- **City of Lake Shasta, CA**
Evaluation and Recommendation of Electric and Water Metering Technology
- **City of Tallahassee**
AMI/AMR System Engineering Review
- **Sacramento Municipal Utility District**
Evaluation and Recommendation of Electric and Water Metering Technology
- **Seattle City Light**
Advanced Metering Program
- **Colorado Springs Utility**
Review of AMI Plan and System
- **Clark Energy Cooperative, KY**
AMI/AMR Evaluation, Planning, Deployment and Operations

*RW Beck and Plexus Research

QUESTIONS?

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