



Asset Management at Portland General Electric

From the turbine to the toaster: changing
the way PGE thinks about utility assets



Portland General Electric

PGE's Operating Area

Oregon's largest utility

Fully integrated (generation, transmission, substation, distribution, communication)

2800 Employees

820,000 accounts serving 1.6 million customers

Smart meter deployment (850,000 meters)



Well-maintained, High-quality System

Continuous system investments

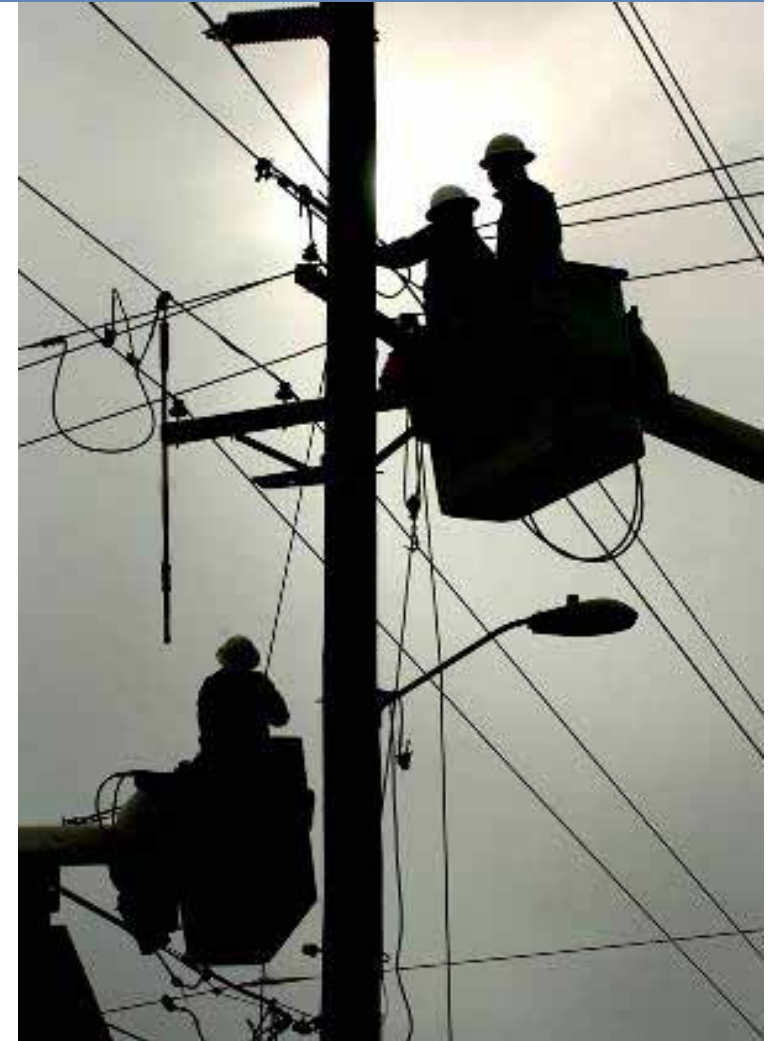
- \$775 million over 5 years

High customer satisfaction

- Reliability among highest in nation
- PGE ranked highest in the Western region in overall business customer satisfaction, according to J.D. Power and Associates, 2009

Green power leader

- #1 in nation for renewable power sales for fifth year in a row



The Problem



- **Siloed organization**
- **No enterprise view of anything**
- **No single source of truth**
- **High costs**
- **No metrics**
- **Over 300+ software applications**

2020 Vision

Achieve business efficiency, effectiveness and transparency, by implementing technology to enable core business processes that are integrated, simple and standardized across functional areas

Efficiency

- Streamlined business processes
- Optimized technology infrastructure
- Flexible workforce

Effectiveness

- Improved employee line-of-sight to customer
- Flexibility to meeting changing conditions
- Ability to attract & retain talent

Transparency

- Improved management reporting and visibility across the organization
- Access to accurate and reliable real-time data
- Clear accountability



Asset Management

68 work and asset management applications

- Majority of those focused on the work

20th century technology in a 21st century world

Reliance on PGE's employees to perform functions that should be performed by technology

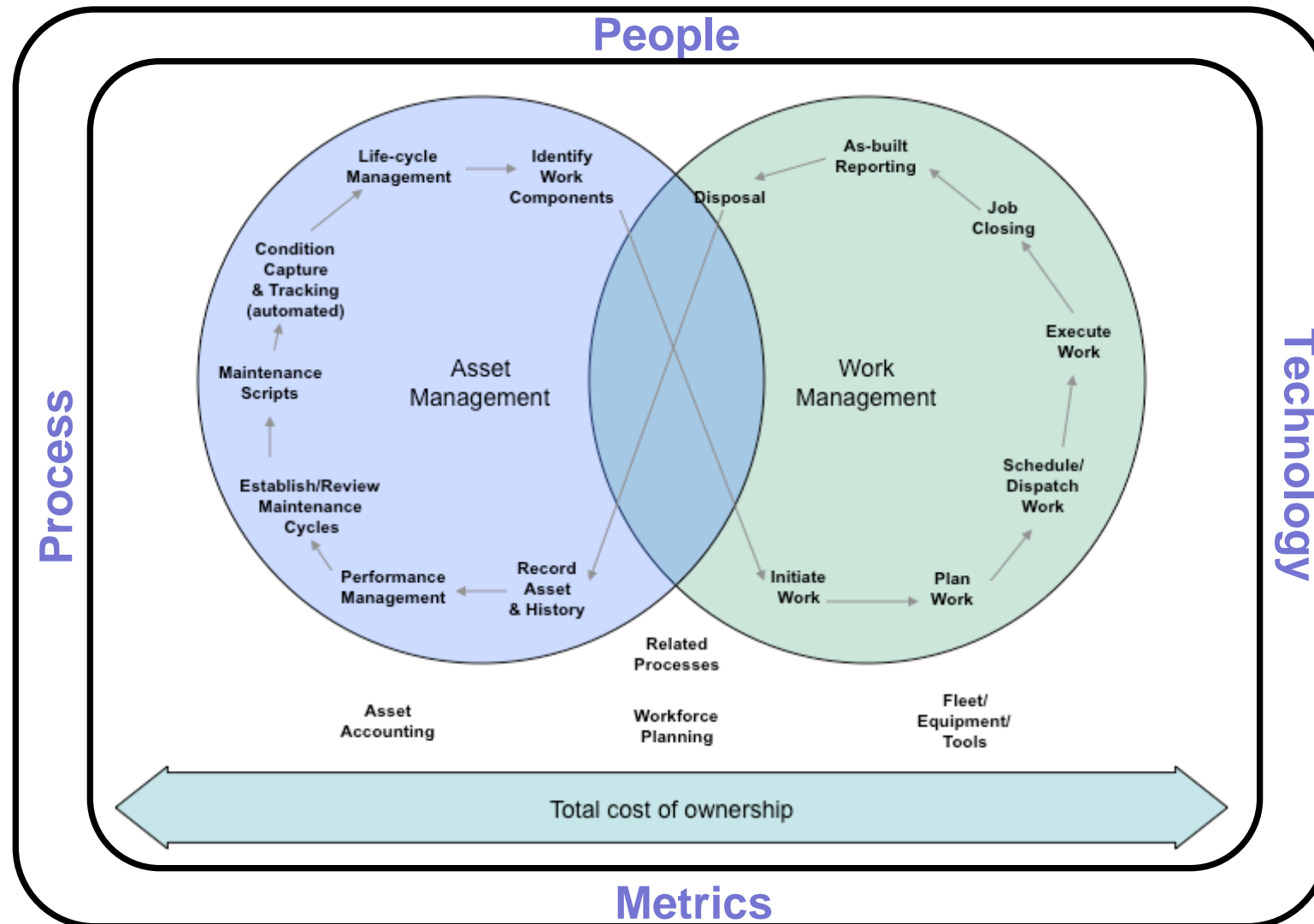
- Key personnel dependent

Patchwork of applications and work-arounds with no end-to-end consistency of work processes

No flexibility

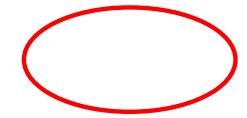


Work & Asset Management Relationship



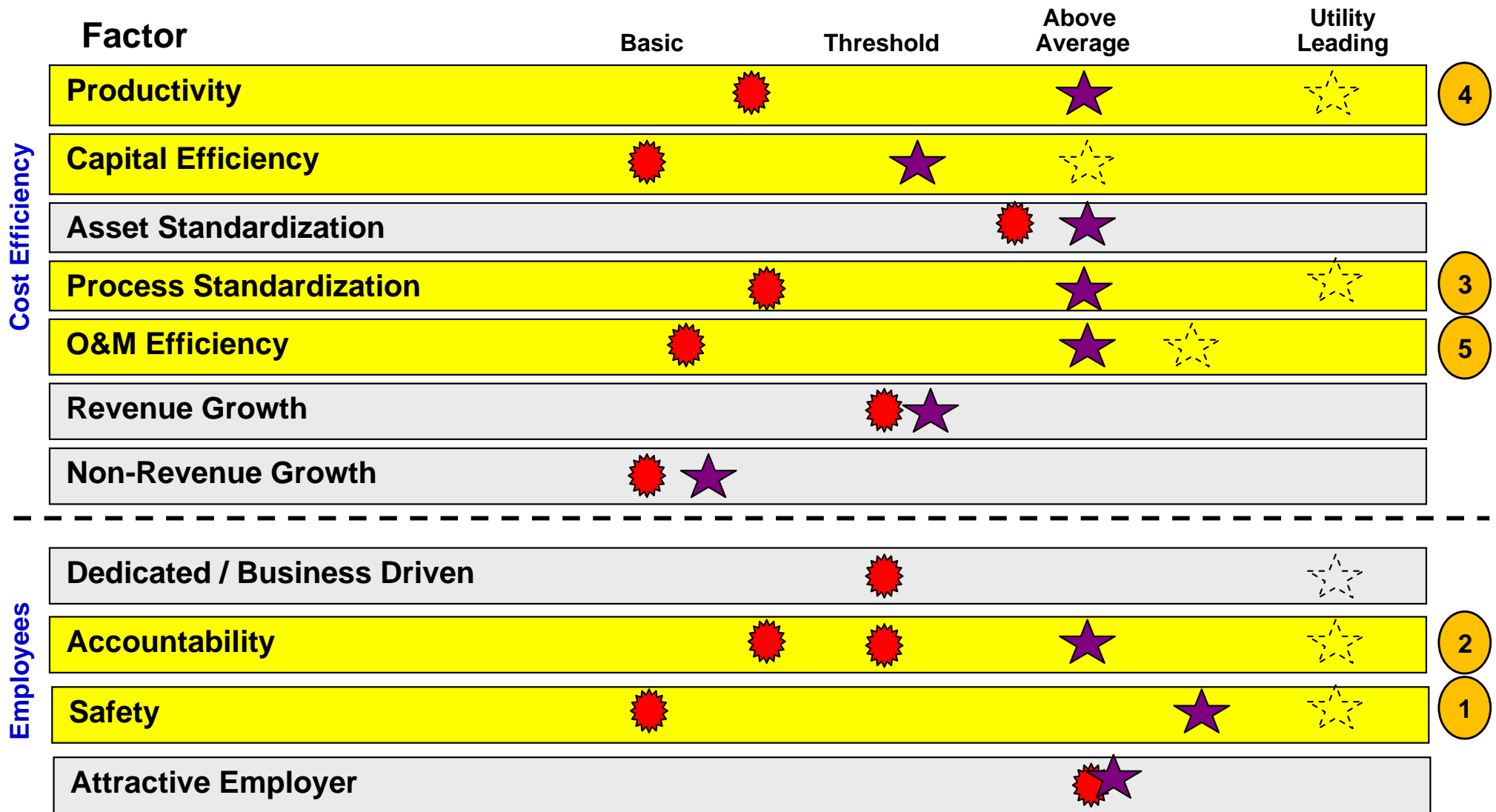
Asset Maturity Model

Rating Levels	Innocence	Awareness	Understanding	Competence	Excellence
1.Strategy	Mostly Reactive Breakdown Maintenance	Prevent Maintenance Improvement Program	Annual Improvement Plan	Long Term Improvement Plan	Established and Communicated Maintenance and Asset Strategy
2. Organization / Management	Highly Centralized	Partly Centralized for Some Trades	Decentralized Mixed Trade Teams	Some Level of Multi-Skilled Staff	Multi-Skilled Independent Trades
3. Data Mgmt / IT	Manual or Ad-hoc specialty Systems	*System that Allows for Some Scheduling and Parts Tracking	Fully Functional Asset Stand Alone System	Fully Functional Asset Mgmt System linked to Financials and/or Inventory Systems	Fully Integrated to common databases Data Standards in Place
4. Maintenance Tactics	Annual S/D Inspections Only	Time Based Inspections	Time and Use Based Inspections Some - NDT	Some CBM Some Prev. Maint. Few Surprises	All Tactics Based on Analysis
5. Materials Management	*Absence of storeroom management practices	*Some storeroom controls *Lack of performance measurements *Turns less than 1.0	System computerized Stock levels set - no Maint. Input. Lead time and Safety Stock Levels set - Rare;	*Alliances developed *(Free Issues) *Streamlined processes *Material Delivery Process Established *Automatic Matching of Invoices *Computerized inventory control system	*Service levels 95%+ *On line material requisitioning *Turns exceed 1.5
6. Planning and Scheduling	Little or No Formal Planning, Scheduling, or Engineering Support	Some Troubleshooting Support Inspection Scheduling	Maintenance Planning Group Established Ad-hoc Engineering	Solid General Planning and Scheduling Job Planning with Engineering Support	Long Term Major Project Planning for both Maintenance and Engineering
7. Performance Measures	No Systematic Approach. Maint. Cost Not Available	Some Downtime / Reliability Records Maint. Costs Not Segregated	Downtime by Cause Maintenance Costs Available	Mean Time to Failure / Repair Records Available Separate Maintenance Costs	OEM Benchmarking Full Cost Database
8. Reliability Centered Maintenance	No Failure Records	Collects Failure Data but make little use of it	Failure DB Established. Used for Analysis	Some FMECA used	RCM Program in Place Risk and Root Cause Analysis Program
9. Self Directed Work	Directed Workforce No Teamwork Maint. & Production relationship strained	Directed Workforce little Teamwork Good cooperation of Maint. And Production	Directed Workforce Some Teamwork Maint. / Production cooperation at working level	Self Directed teams Maint. / Production cooperation at all levels. Team work at organization levels	Decentralized teams Business based decisions Excellent cooperation with Maint. / Production Teamwork a hallmark of entire organization
10.Process Redesign	Processes not documented. Some procedures available High Reactive Work Percentage	Some processes documented. Moderate amount of procedures available High PM Workload	Processes Documented Planning and Scheduling disciplines are prevalent Medium amount of Reactive and PM Workload	Processes documented Evidence of periodic review. Procedures well documented and organized	Processes documented and coordinated with support areas (Inv. / Purc.) Evidence of regular review cycle



= PGE's current state

Strategy Canvas



PGE Current Performance



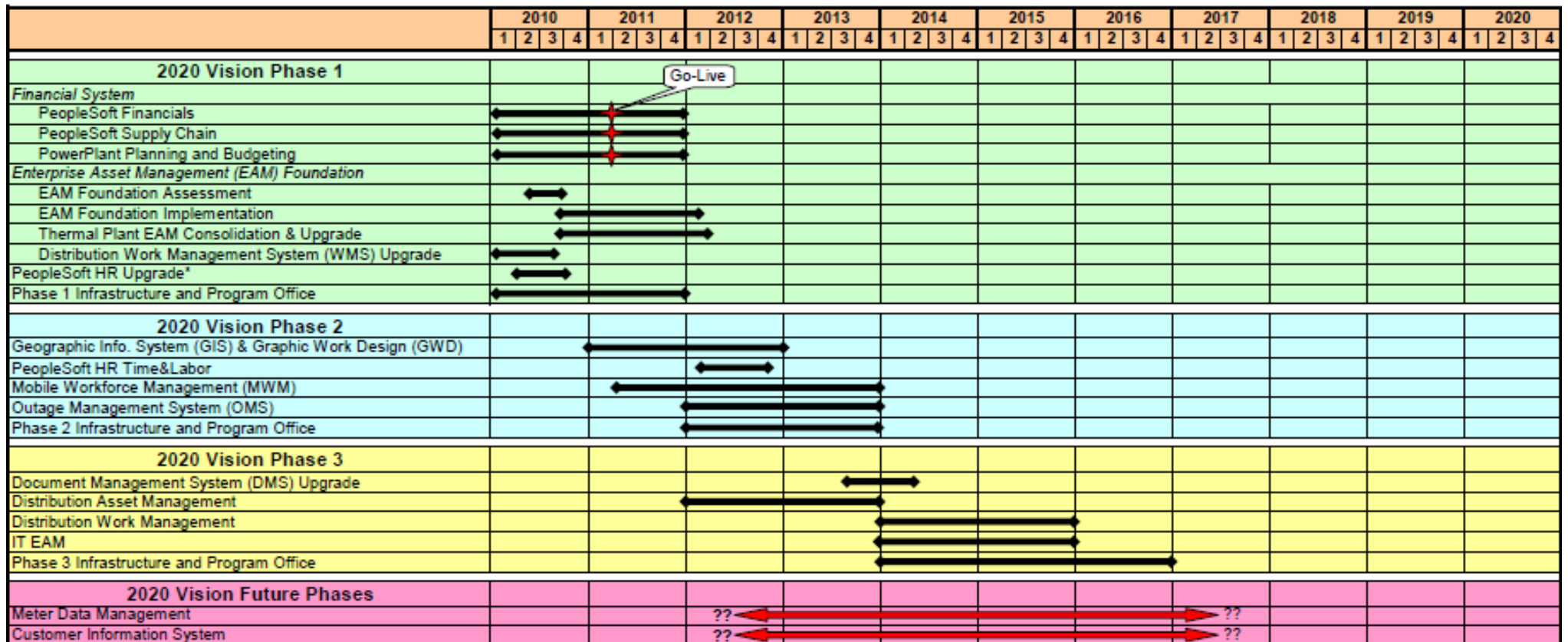
PGE Target within 5 yrs



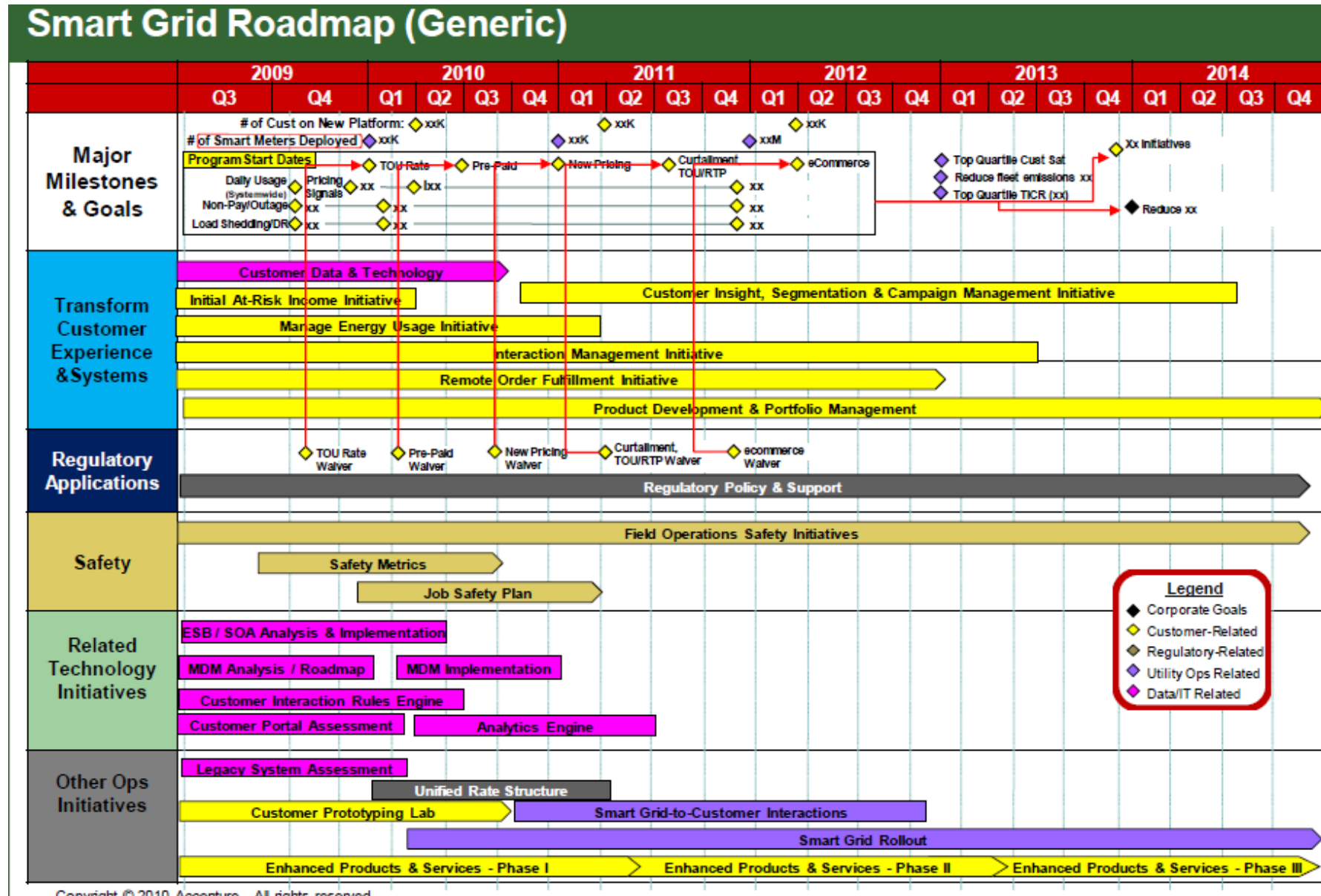
PGE Long-Term

Current Road Map

2020 Vision - Working Roadmap



Future Road Map Example



Key Challenges



Leadership alignment

**IT project vs. business
process improvement**

No business drivers

No vision

O&M costs

Q&A

