



Advanced Metering Infrastructure (AMI) Program

Energy Committee Briefing
May 28, 2014



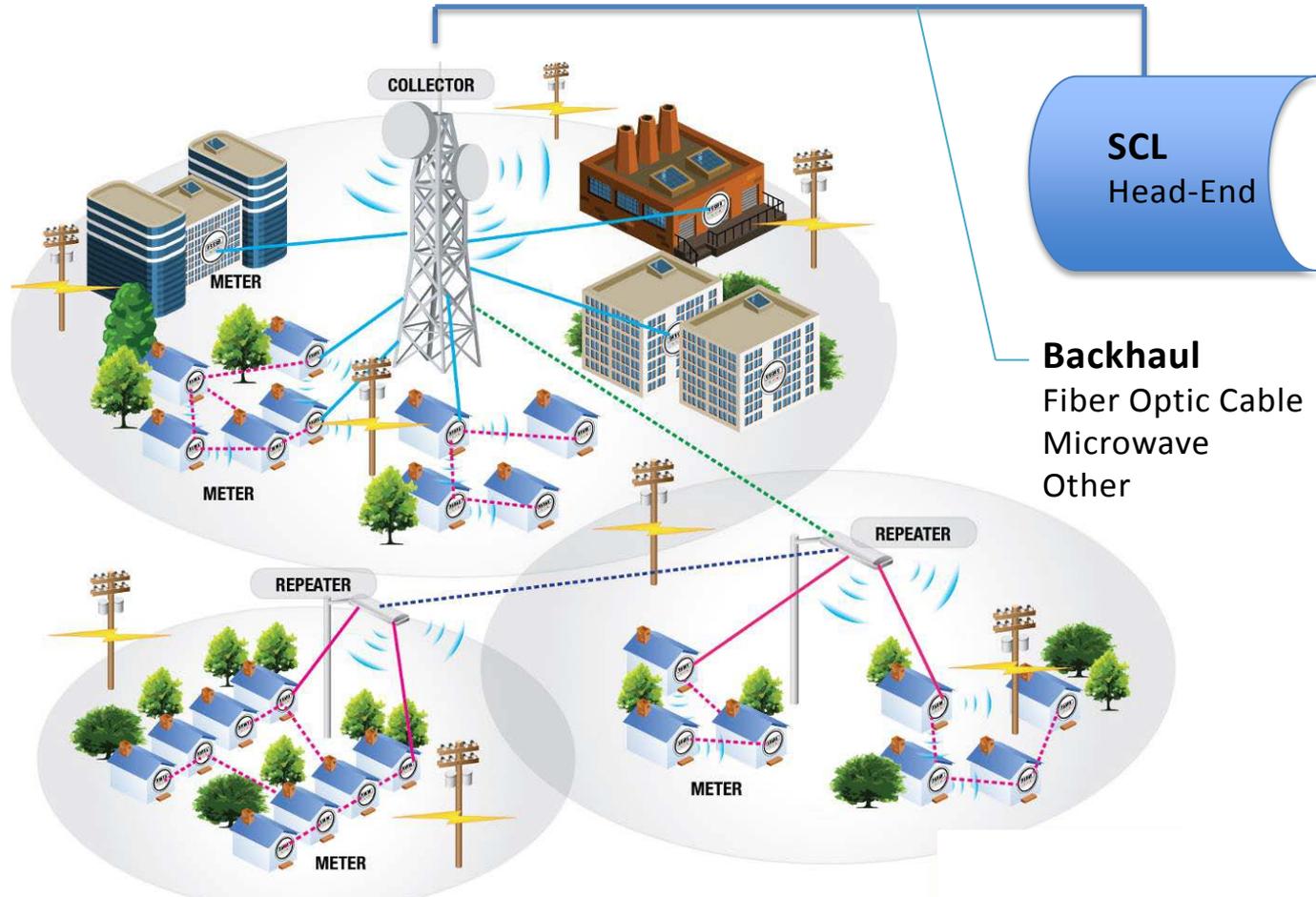
AGENDA

- Why AMI
- Typical AMI Network
- AMI Program – A Quick Update
- Policies
- Functions of AMI Meters
 - Residential
 - Commercial
- Next Steps for AMI Deployment
- Benefits

WHY AMI

- Because of its benefits, they are far reaching, particularly in the following areas:
 - Increase Customer Service
 - Improved Safety
 - Environmental Impact & Conservation
 - Improved Load Forecasting
 - Operational Efficiencies
- In addition, AMI provides the pathway for the Full Automated Infrastructure or Smart Grid at Seattle City Light (SCL)

TYPICAL AMI NETWORK



AMI PROGRAM - QUICK UPDATE

- **Core Team**

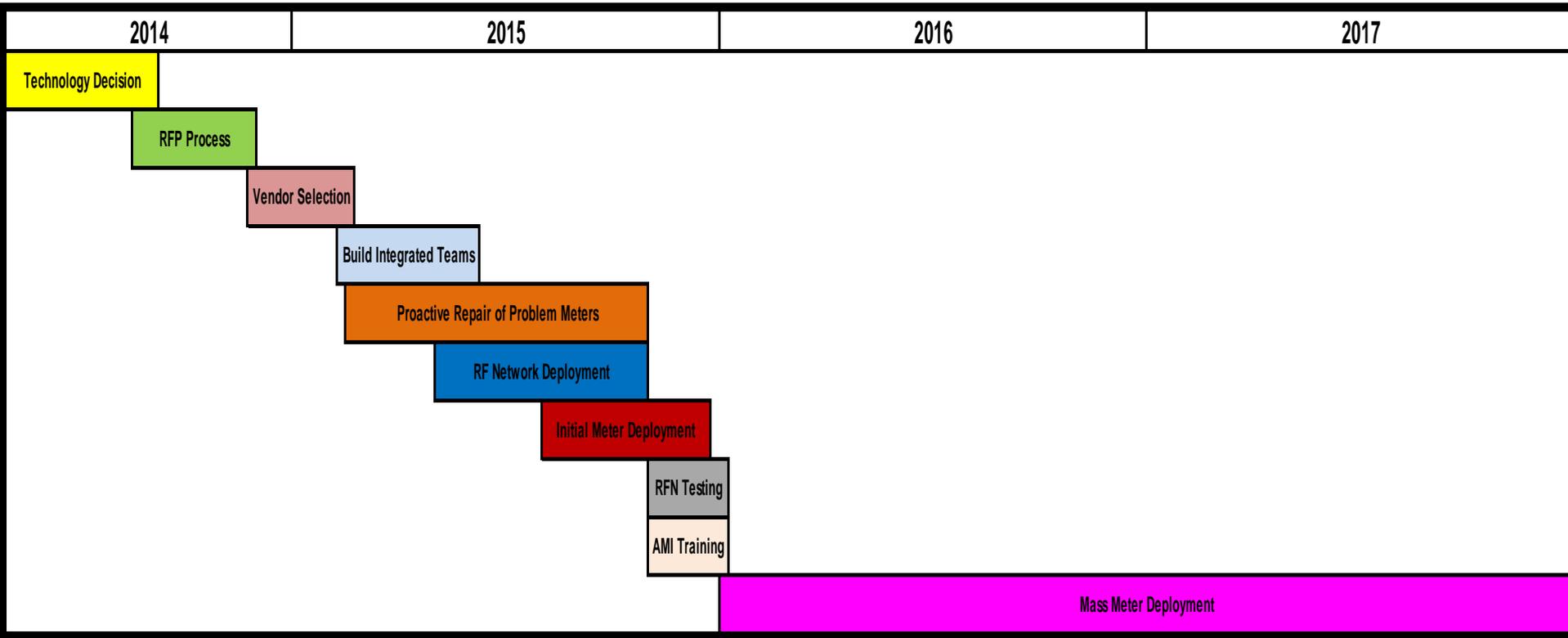
- Their role - Together assess all data and information to formulate the best solution for SCL's AMI/Smart Grid needs
- Composition
 - 15 members
 - Representing 14 different Org Units

- **Steering Committee**

- The primary purpose of the AMI Program Implementation Steering Committee is to ensure that the AMI project is planned and executed in a manner that delivers value to SCL and its ratepayers
- Composition
 - 7 Executives
- Steering Committee Charter Developed

AMI PROGRAM – QUICK UPDATE_(CONT.)

AMI – ROUGH “DRAFT TIMELINE”



AMI Program Policies

Driver of Customer Communication/Information Effort

- Meter Data Privacy
- Customer Data Interface – Web Portal
- Meter Data Services Demand Load Control (DLC)
- Time of Use (TOU)
- Remote Disconnect/Reconnect
- Customer Meter Problems
- Meter Room Access
- AMI Training Programs
 - Internal
 - External
- Customer Communication Strategy
- Topology – Radio Frequency (RF) Networks
- RF Fields – Federal Communication Commission’s (FCC) Maximum Permissible Exposure (MPE) Limits
- AMI Network Cyber Security
- Opt-Out
- Meter Installs Routes Automation

Typical AMI Meter

(380,000 Residential & 40,000 Commercial & Industrial)



The values we currently read from Residential and C&I meters are:

Residential - kWh

C&I – kW, kWh

Courtesy SENSUS

Functions Provided by the AMI Meters

Residential AMI Meter

- Power outage and restore notification
- Customer selectable voltage Alarm reporting
- kWh, kVARh and kVAh energy measurements
- Full net metering
- Up to four channels of load profile
- Up to eight seasons of time-of-use in up to seven tiers of data
- Remote disconnect with enhanced Load Limiting functionality
- Over-The-Air (OTA) remote radio and meter metrology firmware download functionality
- ZigBee with Public Key Infrastructure(PKI) authentication
- Internet Protocol (IP) addressable

C&I AMI Meter

- kVA, kVAR, Demand Meter
- TOU Meter
- Interruptible Rate Meter
- 20-Channel Recorder
- Current Recorder
- Power Quality Meter
- Sag and Swell Monitor
- Real-Time Multifunction Instrument
- Loss and Accuracy Compensation
- Q-Hour Meter (Impedance (Z), Power Factor (PF), Capacitance)
- Real Time Pricing Meter
- 4-Channel Recorder
- Voltage Recorder
- Bidirectional Meter
- Phasor Meter

NEXT STEPS

- **Define what is best for SCL (End of 2014)**
 - Address the AMI Policies for SCL
 - Evaluate what has been done over the past 7 years (Energy Policy Act 2005/2007)
 - Study the lessons learned by Portland General Electric, British Columbia Hydro, their decisions and what they would do differently if they had a chance
 - What information do we need and want from the AMI Meters
 - Evaluate Technology and RF Networks best suited for SCL's needs
 - Draft Scope of Work and Request for Proposal (RFP)
 - Evaluate RFP responses/Demo

THE BENEFITS

- **Increase Customer Service**

- Elimination of estimated bills
- Real-time or near real-time on-request meter reads
 - Automated and more precise real-time remote reads when opening and closing accounts
 - Expanded billing options (flexible billing schedules)
- Access to consumption data on-line
 - Web Portal
 - Historical daily usage
 - Load profile
 - Energy consumptions trend – daily, weekly and monthly
- Improved response to customer inquiries
- Time-based rates/TOU
- Outage notification
- Customer notification

THE BENEFITS_(CONT.)

• Improved Safety

- Proactively meter problems repair ahead of deployment
 - Every meter base will be inspected prior to meter replacement
- Every SCL customer will have a New Solid State meter
- Tamper detection
- Theft detection
- Faulty equipment



• Environmental Impact & Conservation

- Carbon Dioxide Reduction
 - At least 50 less vehicles on the roads annually
 - More efficient, and less frequent field investigations & work
- System support for Plug-in Electric Vehicles
- Net metering
 - Solar and distributed generation
- Greater conservation information and tools
- Potential to manage appliances and load remotely (Home Area Network)

THE BENEFITS_(CONT.)

- **Improved Load Forecasting**
 - More frequent data, real-time, inquiries, and hourly reads as needed
 - Accurate Real-Time Data, not estimates or averages
 - Better record keeping of historical data for forecasting estimates and studies
- **Operational Efficiencies**
 - Electrical Distribution Network Performance
 - Site diagnostics
 - Voltage quality data
 - Device status
 - Load balancing studies
 - Fusing coordination
 - Transformer loading
 - Outage Management
 - Voltage Regulation Conservation
 - Improved Reliability & Scalability to accept other applications: streetlights, etc.