

A blue circular logo with the text "Utility Service Group" inside.

Utility
Service
Group

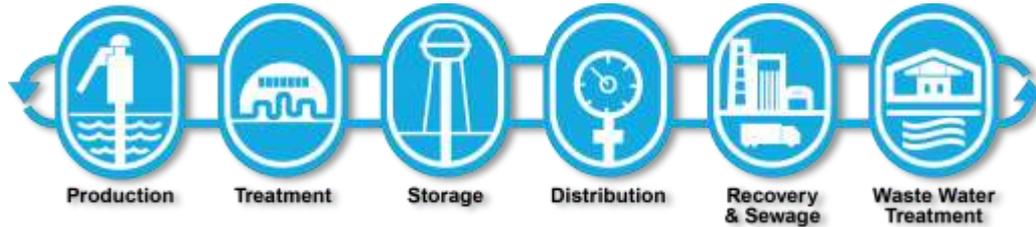
Smart Metering Maintenance Program

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Innovative Solutions

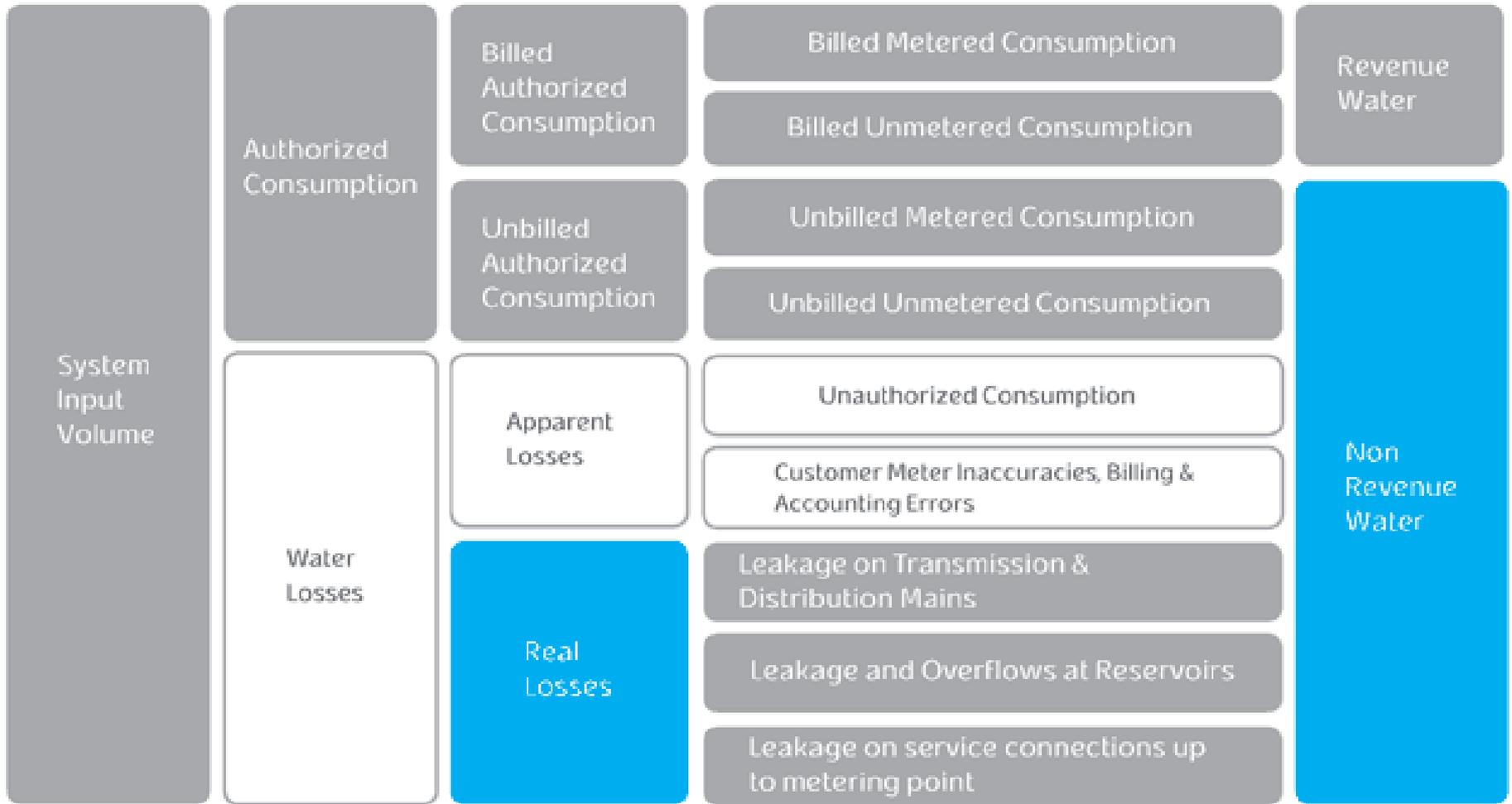


Provide water system Asset Management Services through Maintenance Program (MP) which cover:

- **Storage Tanks (Steel and Concrete)**
- **Water Quality (THM Removal, Tank Mixing, Filter Maintenance)**
- **Water Wells**
- **Distribution System (GIS, Pipe Cleaning, Valve & Hydrant, Leak Detection)**
- **Smart Metering**
- **Communications Site Management**
- **And More...**



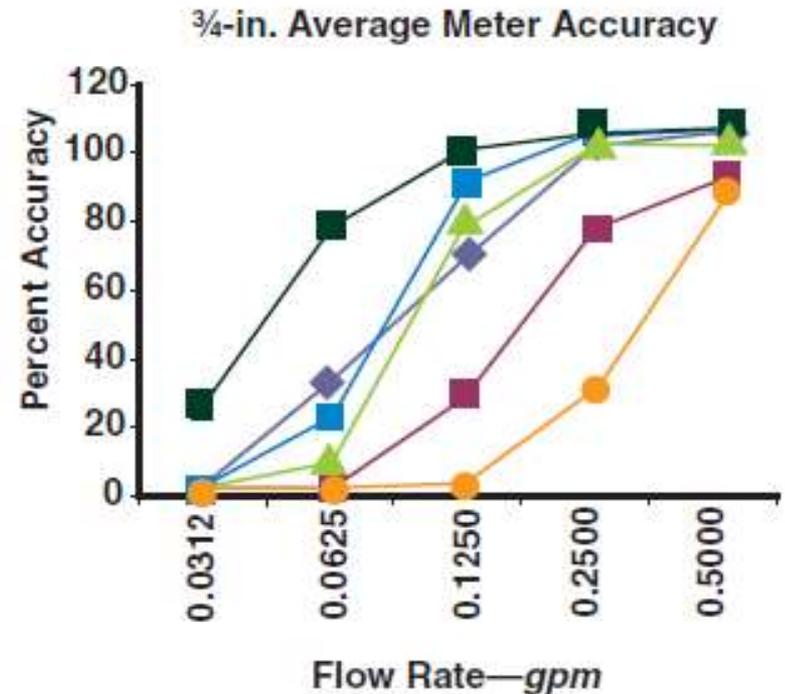
Water Balance



Apparent Losses From Meters

Based on test studies of anonymous water utilities, typical customer meter under registration is about 5 to 6 percent.

Source: Thornton, J., Strum, R. and G. Kunkel. Water Loss Control, McGraw-Hill, New York 2008



Smart Metering Definitions

Smart metering is the technology of automatically collecting consumption, diagnostic, and status data from water meter or energy metering devices (gas, electric) and transferring that data to a central database for billing, troubleshooting, or analyzing.

- ▶ Electronic Meter Reading – Touch Read
- ▶ AMR – Automatic Meter Reading (Drive By)
- ▶ Smart Meters – Data collection built into the meter
- ▶ AMI – Advanced Metering Infrastructure





AMI: Today's Meter Reading



Water Meter with a transmitter



Data Collector



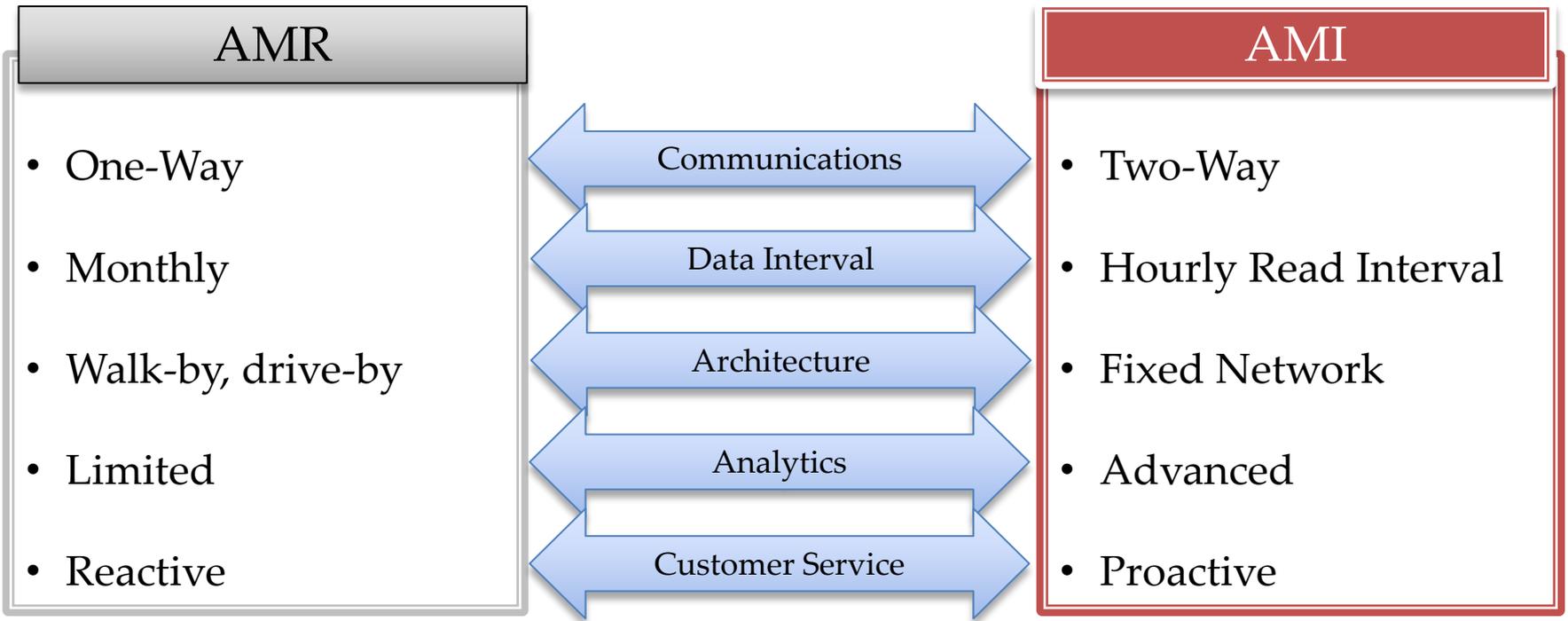
Meter Data Management System



Utility Company



AMR vs. AMI



Meter Transmitting Unit

- ▶ Hourly meter readings
 - Clock synchronization
 - Top of the hour reads
 - Transmit every 4-6 hours to save battery life
- ▶ Licensed or unlicensed
 - FCC approved
- ▶ Sealed units with 20 year battery life
 - Prorated warranty
- ▶ All environmental conditions
- ▶ Through the lid vs. under the lid



Data Collection Unit



- ▶ Receives data
- ▶ Two-way Communication
 - Reconfigure MTU
 - Synchronize clock
 - Installation verification
- ▶ AC/Solar Powered
- ▶ Tower or rooftop based
- ▶ Backhaul Communication:
 - Cellular, Wi-Fi, fiber optic, any IP based communications



Why AMI?

- ▶ **Cost Savings**
 - Meter Reading
 - Customer Service
- ▶ **Revenue Enhancements**
 - Reduced Theft
- ▶ **Customer Service Improvements**
 - Detailed Consumption Data
 - Move in / Move outs
- ▶ **Leak Detection**
- ▶ **Overall Water System Management**



Metering Maintenance Program



Hurdles for Utilities:

- ▶ Afraid of Choosing the “WRONG” System
- ▶ Lack of funds
- ▶ Lack of Resources and Expertise:
 - IT Expertise
 - Project Management Capabilities
- ▶ AMR/AMI units are battery powered.
 - Early battery failure can be very expensive
- ▶ Lack of Standards
 - Can get “stuck” with a manufacturer
- ▶ Technological Obsolescence
 - technology obsolete before payback
- ▶ Financial stability of vendors
 - industry consolidations continue



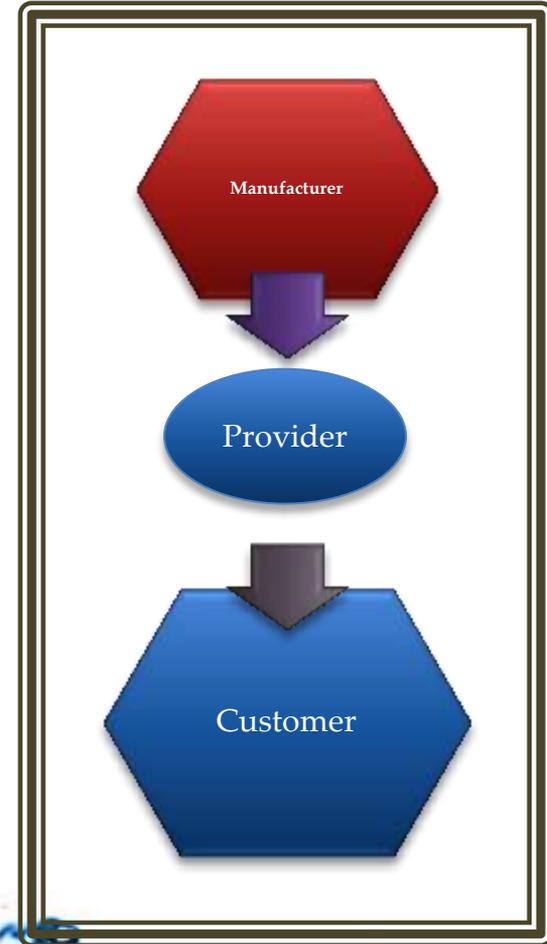
The MP Concept:

A new service offering for smart metering deployment and management: operations and maintenance program.

- ▶ Bundled meter optimization
 - includes initial meter replacement,
 - ongoing operations and maintenance
 - price per meter per month.
- ▶ Ideally projects will be self-funded from the resulting revenue increases and operating cost savings
- ▶ A full service, one stop shop that handles all aspects of a utility's metering program.
- ▶ Partnered with key market leaders:
 - Water Meters: Sensus, Neptune, Badger, Elster
 - Smart Metering System: Itron, Alcara
 - Installation and Integration: Vanguard, Corix, UPA



Traditional vs MP



- Single source of responsibility vs. multiple
- Service Solution vs. product

Metering Maintenance Program

Solution

- ✓ Meters
- ✓ Reading Technology
- ✓ Installation program
- ✓ Project management,
- ✓ Software as a Service
- ✓ On going Maintenance of all assets
- ✓ *Future Replacement*



Benefits

- ✓ Revenue Enhancement
- ✓ Operating Cost Savings
- ✓ Improved Customer Service
- ✓ Optimized Distribution System Operation
- ✓ Better Asset Management
- ✓ Responsible Resource Management



Metering Maintenance Program

Upfront Rehabilitation

- ▶ Project Management
- ▶ Supply water meters
- ▶ Supply Metering Technology
 - Hardware
 - Backhaul Communications
 - Software
- ▶ IT Implementation
- ▶ Provide Installation Services
 - Network
 - Meters/Endpoints

Operations and Maintenance

- ▶ Meter Warranty maintenance
- ▶ Transmitter Warranty Maintenance
- ▶ AMI Network Maintenance
- ▶ Software Support and Upgrades
- ▶ Hosting services and IT support
- ▶ Backhaul Communications



Supply Water Meters

- ▶ **Manufacturer and Technology Indifferent**
 - Meter quantities and timing will drive cost
- ▶ **Ordered by size and type**
 - Focus on best meters for C and I customers
- ▶ **Meter Registers**
 - Must be appropriate type – Pulse or encoder
 - Must be appropriate units
 - Must be appropriate resolution for adequate leak detection

Initial Deployment

- ✓ **Meters**
- ✓ Reading Technology
- ✓ Installation program
- ✓ Project management,
- ✓ Software as a Service
- ✓ On going Maintenance of all assets





Provide Reading Technology – (AMI)

Radio Point to Multi Point: Fixed collectors provide coverage and receive meter data via radio. Data from the collector is backhauled to a server.

- ▶ Coverage area varies
 - Collector height, Transmitter location, Transmission power, Receiver sensitivity, Radio frequency
- ▶ Components include
 - Radio Transmitters, Data Collectors/concentrators, Repeaters (if needed), Head end software with integration to billing system

Initial Deployment

- ✓ Meters
- ✓ Reading Technology
- ✓ Installation program
- ✓ Project management, Software as a Service
- ✓ On going Maintenance of all assets





Installation Program – Endpoints and Meters

- ▶ Install all meters targeted for replacement
- ▶ Set appointments, if necessary
- ▶ Replacement of meter pit lid, if necessary
- ▶ Establish a call center
- ▶ Scheduling and project coordination
- ▶ Documentation and completion of work orders
 - Manage work orders, perform quality control, transmit data to utility
 - Verification of field data

Initial Deployment

- ✓ Meters
- ✓ Reading Technology
- ✓ **Installation program**
- ✓ Project management, Software as a Service
- ✓ On going Maintenance of all assets



Software as a Service

Software:

- ▶ Head end system, as provided by system manufacturer (installed as a hosted environment)
- ▶ Software Configuration
- ▶ Integration into existing system(s)
 - CIS, SCADA, GIS
- ▶ Meter Data Management with analytics (hosted)
- ▶ Customer Training

Initial Deployment

- ✓ Meters
- ✓ Reading Technology
- ✓ Installation program
- ✓ Project management, **Software as a Service**
- ✓ On going Maintenance of all assets



Metering Maintenance Program

Upfront Rehabilitation

- ▶ Project Management
- ▶ Supply water meters
- ▶ Supply Metering Technology
 - Hardware
 - Backhaul Communications
 - Software
- ▶ IT Implementation
- ▶ Provide Installation Services
 - Network
 - Meters/Endpoints

Operations and Maintenance

- ▶ Meter Warranty maintenance
- ▶ Transmitter Warranty Maintenance
- ▶ AMI Network Maintenance
- ▶ Software Support and Upgrades
- ▶ Hosting services and IT support
- ▶ Backhaul Communications





Long Term Operations and Maintenance

- ▶ Manage the backhaul communications
- ▶ Water Meter Warranty issues
- ▶ Transmitter Warranty issues

Operations and Maintenance

- ✓ Meter Warranty maintenance
- ✓ Transmitter Warranty Maintenance
- ✓ AMI Network Maintenance
- ✓ Software Support and Upgrades
- ✓ Hosting services and IT support
- ✓ Backhaul Communications





AMI Network Maintenance

- ▶ Provide for extended maintenance of the AMI network components
 - Battery replacements
 - Solar panel maintenance
 - Component maintenance
 - Communications updates

- ▶ Contract with manufacturer annually
 - Service provided by the system manufacturer

Operations and Maintenance

- ✓ Meter Warranty maintenance
- ✓ Transmitter Warranty Maintenance
- ✓ **AMI Network Maintenance**
- ✓ Software Support and Upgrades
- ✓ Hosting services and IT support
- ✓ Backhaul Communications



Software as a Service Model

- ▶ Meter Data Management System
 - Hosting Services: DB Administration, Server Maintenance, Support
 - Provide access to Meter Data Management System
 - Manage SW upgrades and releases

- ▶ Establish a hosted environment through a third party provider
 - Database management: application of updates and patches
 - Redundant backups
 - UPS

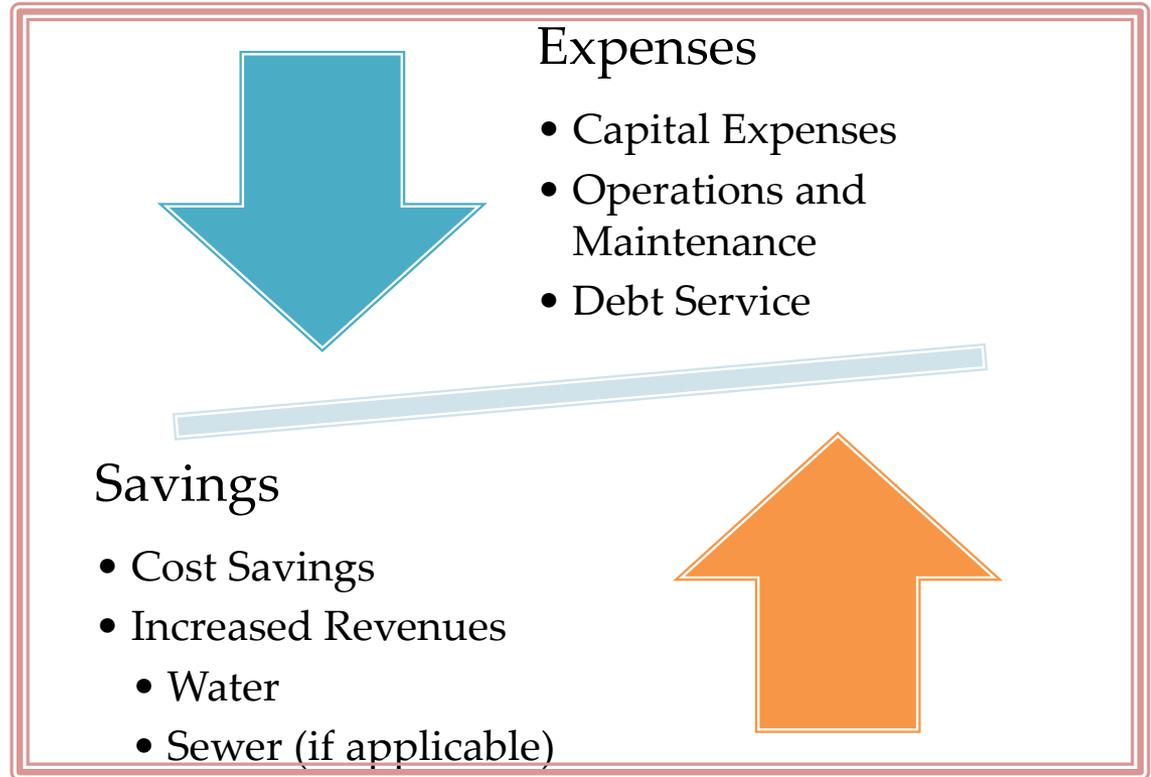
Operations and Maintenance

- ✓ Meter Warranty maintenance
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- ✓ AMI Network Maintenance
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Project Justification

- ▶ Life Cycle Costs
 - All expenses over the life of product
 - All savings and revenue enhancements



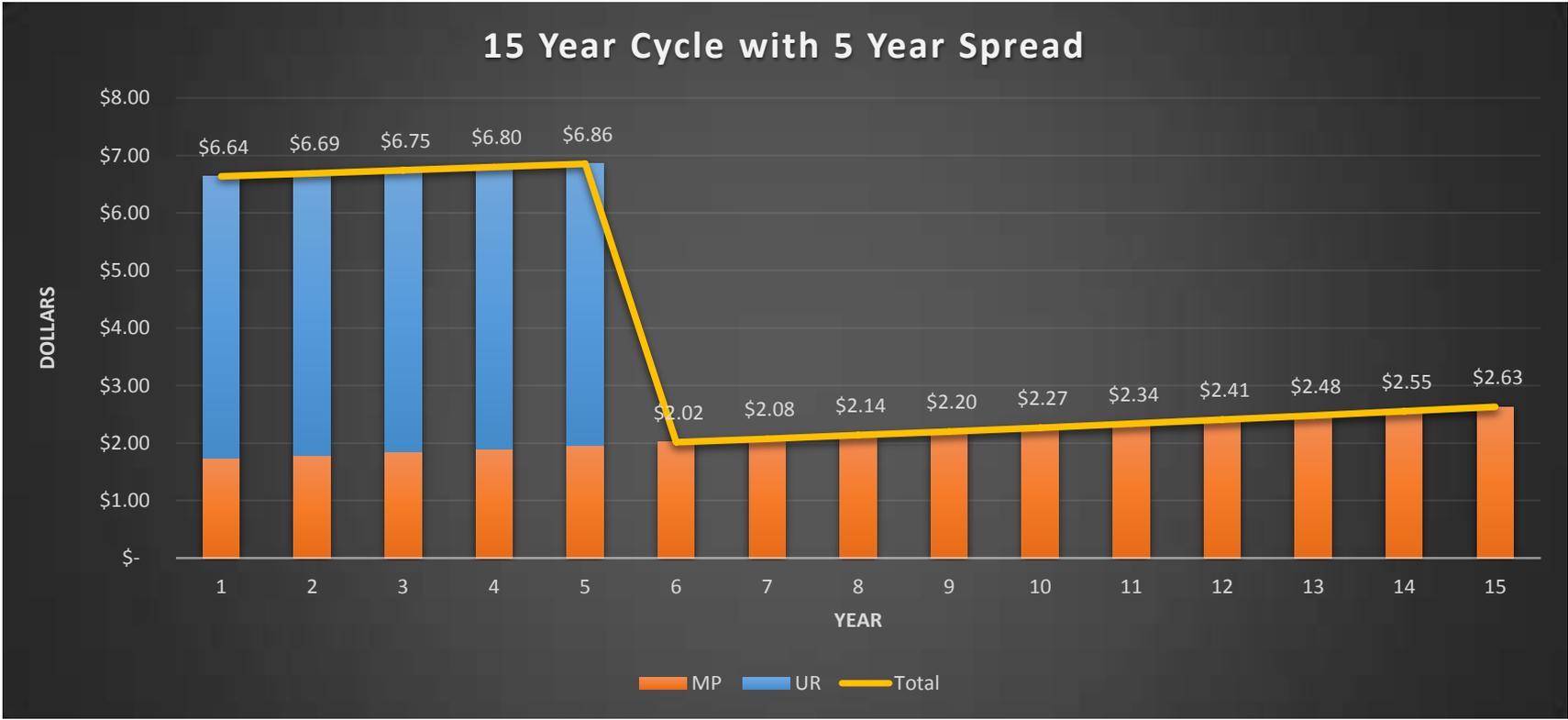
Example Project Justification – 3,000 Meter Deployment

- ▶ Demographics
 - Population 8,000
 - Meter Density: 600 meter per square mile
 - Consumption: 100 gpcd
 - Monthly Water Production: 24 MG
 - Non-Revenue Water: 30%
- ▶ Water Rate: \$3.00 per kgal
- ▶ Sewer Rate: \$3.50 per kgal
- ▶ Meter Reading Costs: \$2.50 per meter
- ▶ Number of meter related service calls per month: 60
- ▶ Cost per service call: \$75





Project Pricing per Meter per Month



Example Project Justification – 3,000 Meter Deployment

- ▶ **Costs:**
 - Upfront Rehabilitation: \$824,462
 - Spread over 5 years: \$164,892 per year
 - 1st Year O&M: \$62,590
- ▶ **Enhanced Revenue**
 - Scenario 1: 10% of NRW is meter related
 - Additional Water Billing: \$2,160 per month
 - Additional Sewer Billing: \$2,520 per month
- ▶ **Cost Savings**
 - Meter Reading: \$7,500 per month
 - Service Calls: \$4,500 per month



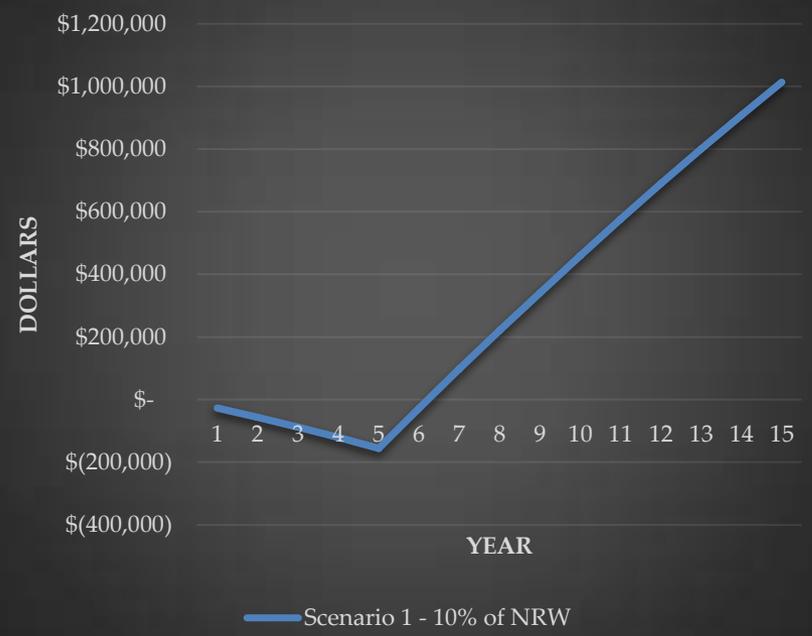


Example Project Justification – 3,000 Meter Deployment

Return on Investment



Accumulated Cash Flow



Example Project Justification – 3,000 Meter Deployment

- ▶ **Costs:**
 - Upfront Rehabilitation:
\$824,462
 - Spread over 5 years:
\$164,892 per year
 - 1st Year O&M: \$62,590
- ▶ **Enhanced Revenue**
 - Scenario 2: 20% of NRW is meter related
 - Additional Water Billing:
\$4,320 per month
 - Additional Sewer Billing:
\$5,040 per month
- ▶ **Cost Savings**
 - Meter Reading: \$7,500 per month
 - Service Calls: \$4,500 per month





Benefit of Metering Maintenance Program

- ▶ Financial Peace of Mind
 - Complete Turnkey Solution for a cost per meter per month
 - Better Budget Controls
 - Eliminate large capital requirements
 - Allow benefits to fund other projects



Benefit of Metering Maintenance Program

- ▶ Single Point of Contact
- ▶ All project elements integrated
 - Meters
 - AMI System
 - Installation
 - Software Integration
 - Operations and Maintenance



Benefit of Metering Maintenance Program

- ▶ Customizable solutions
 - Best of Breed for the particular requirements
- ▶ Agreements with industry leaders to provide the “best fit” for the utility – not tied to a single manufacturer or solution
- ▶ No fear of technological obsolescence



Benefit of Metering Maintenance Program

Total Transfer of Risk:

- ▶ Responsibility for all aspects of metering system
 - Committed to a successful deployment
- ▶ Provide all technical resources
 - IT
 - Project Management
- ▶ Warranty replacement responsibilities in the case of early component failure
- ▶ Committed to the long term success of the project



Chilling Questions?

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