Chicago Metropolitan Agency for Planning

Metering with Commodity Rates for New Connections and Retrofit of Existing Connections

Presentation to the NE IL RWSPG

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Presentation Content

- Metering: Definition & Purpose
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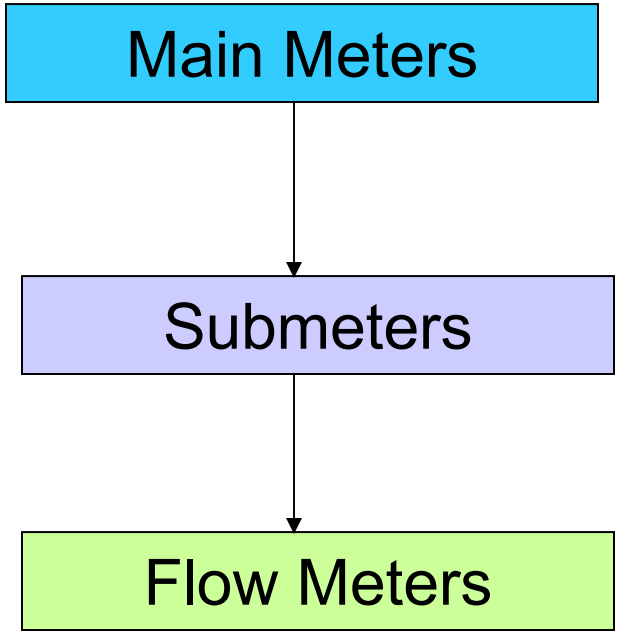
Metering: Definition & Purpose

- Installing (or replacing) water meters in existing customer sites and assuring new construction is metered
- Provides customers info needed to recognize volumetric price incentives
- Metering is necessary for implementing Conservation Pricing
- Monitor Water Use
  - How much
  - Where
  - Waste Identification
  - Opportunities for Savings

Categories of Meters



Categories of Meters (contin.)

- Main meters:
  - Installed by utilities
  - Measures total water inflows to facility
  - Shows baseline demand and use patterns
  - Water bill lists readings from main meter(s)
  - Verifies accuracy of water bills

Categories of Meters (contin.)

- Submeters:
  - Monitors specific water uses (cooling towers, irrigation)
  - Helps to assess water efficiency
  - Pinpoints opportunities to increase efficiency by tracking sources of potential inefficiencies
  - Helps reduce sewage costs by comparing amount of water used with sewer discharges
- Flow or Temporary Metering Devices:
  - Portable measurement devices used to measure flow rates or volume uses for specific sites, eqp. or processes

Types of Meters

Types of Meters	Positive Displacement	Turbine	Compound	Ultrasonic & Electronic
Features	Translate volume measurement into flow via rotating disc	Register flow to spin of rotor as water flows thru meter	Consist of 2 meters: turbine & displacement	Installed inside or outside a specific pipe
Benefits	Extremely accurate for low volumes of water	Accurate for medium & large flows	Used for facilities that require both hi & low flows	Used for specific process or eqp.
Ideal Use	Residential 5/8- 2" connections	2-8" connections	3-8" connections	Instantaneous or cumulative flow volumes
Cost for CII		$400- 2,500	$1,300- 2,500	$50- 900

Important Metering Considerations

- Meters are sensitive to pipe size (sized to match water service supply)
- Meters should comply with US standards
- Meters should be tested and calibrated regularly to insure their accuracy
- Water bills should be designed to communicate water consumption

Water Conservation thru Metering

- Insure that meter types and sizes match flows
  - Water & Sewer Dept in Boston launched a meter-downsizing program in 1989 that resulted in 2,070 meters being downsized.
    - Program Capital Costs: $700,000
    - Increased Department net revenue: >$5 million/year
- Use meters to insure more efficient water audits
- Separate meters for water lines attached to irrigation systems
- Separate meters for cooling towers & other industrial processes required for sewer allowances

Water Conservation thru Metering (contin.)

- Install submeters and record readings for large eqp. or processes
- Read meters on a monthly basis for sites that use <1 million gallons/yr (mgy), weekly for 1-1.75 mgy, daily for >7.5 mgy
- Read meters when facility is not in operation
- Resize meters when flow rates change significantly as a result of change in eqp. or processes

Metering Costs

- Staff time to develop meter program & new rate structures
- Meter installation
- Administration
- Contractors
- Marketing

Metering Costs (contin.)

Water Supplier	Avg Cost/Meter Installation ($)	Notes
Denver Water Dept, CO (1993)	425	Includes purchase, installation, repair & public education
CUWCC (2003)	500-1,000 for single family, 500-3,000 for multi & commercial	Costs for retrofits
Sacramento Suburban, CA (2002)	910/residential	Includes up to 28 sq. ft. landscape restoration
San Juan Water District, CA (2002)	453	246 for meter & box installation, 207 for upgrade

Case Study I

- Canadian National Research Council
  - > 50 buildings with labs & engineering research
  - Water used for eqp cooling, cooling towers & domestic use
  - Each building metered separately, meters read & reconciled monthly
  - Large discrepancies (>20%) between demand and water supplied investigated periodically
  - After completion of water audit and installation of conservation measures, water use declined by 20% and bill decreased by Can$100,000.

Source: Vickers, *Handbook of Water Use & Conservation.* 2001

Case Study II

- New York
  - 1994 analysis of 590 multi-family buildings in New York City and 676 in Jamaica, New York
  - Jamaica service area was metered while New York City buildings were not
  - Statistical model regressed housing density, median income/census tract, building size water use & dummy variable
  - Metered billing resulted in 36% decrease in water use, authors attributed to metering

Source: Speedwell, *The Impact of Metered Billing for Water and Sewer on Multifamily Housing in New York.* 1994

Others

- Denver, CO: universal metering program reported 28% water savings with summer peak reduction of 38.4% in 1995
- Greater Vancouver: 20% reduction in single family consumption due to meters, rate structure and bi-monthly billing
- CUWCC: estimates that metering with volumetric pricing reduces demand by 20%.* Water consumption in un-metered service areas is higher
- Regionally: City of Chicago is installing the Automated Meter Reading Program with a remote transmitter that will allow greater efficiency in data collection

*Note: other programs may have been concurrent with the metering program evaluations

Recommendations

- Provide utilities with financial means, e.g. grants, to install and retrofit meters in existing buildings
- Implement program to install meters in all existing buildings within a specific time span
- Require metering for all new construction
- Assess feasibility of installing dedicated landscape meters

Recommendations (contin.)

- Implement different rate structures for indoor & outdoor water uses to encourage water conservation during peak months- use dedicated landscape meters
- Conduct regular water audits thru use of meters in government buildings

Questions/Comments?

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