



# ULTRASONIC TECHNOLOGY AND ADVANCED METERING INFRASTRUCTURE

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# METERING SIMPLIFIED

Legacy Products vs Ultrasonic



## LEGACY PRODUCTS





# ULTRASONIC METERS

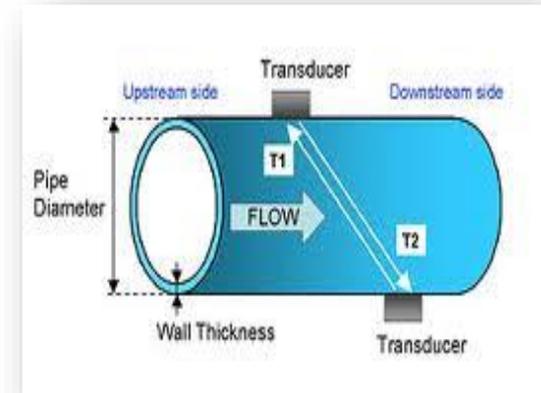
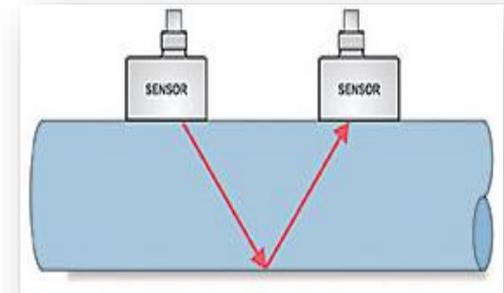




# WHAT IS ULTRASONIC?

## HOW ULTRASONIC WORKS

- Basic Operating Principle is Sound
- Two types:
  - Transit Time (the Octave)
    - Best suited for clean water.
    - Sound waves are generated by a transmitter and are either reflected to, or sent across the pipe to a receiver.
    - This same process happens in the opposite direction. (one with flow, one against flow).
    - Upstream and downstream times are compared. The difference in time equates to the water velocity.
      - No time difference = no flow



## HOW ULTRASONIC WORKS



- Dual Beam
- Ultrasonic Transit Time
- Sing Around

←  
Flow •  
Direction



*Meter & Automation Group*

## Key Features

Key Features	Octave/ (Ultrasonic Meters)	Turbine	Compound	Fire Assembly	Floating Ball
Solid-State (no moving parts)	•				
Sustained Accuracy	•				
Low Flow Measurement	•		•	•	•
High Flow Measurement	•	•		•	•
No Cross Over	•	•			•
Low Pressure Loss	•				•
Light Weight	•	•		•	
Does Not Require Strainer	•				
Multiple applications/services (fire or domestic)	•				
Submersible beyond 4 feet	•	•	•	•	
Internal Data Logging	•				•
Various Installation Orientations	•				
Smart Technology	•				Some



## ULTRASONIC VS TURBINES

### 3" TURBINE

3 GPM Average Low Flow @ -5% - +1%.  
5 GPM Normal Range @ + 1.5%

The 80/20  
Rule



• 0.5 - 0.7 GPM Average Flow



• Toilets ('92): Up to 1.6 USG per flush  
• Urinals ('92): Up to 0.5 USG per flush



## Why it is important?

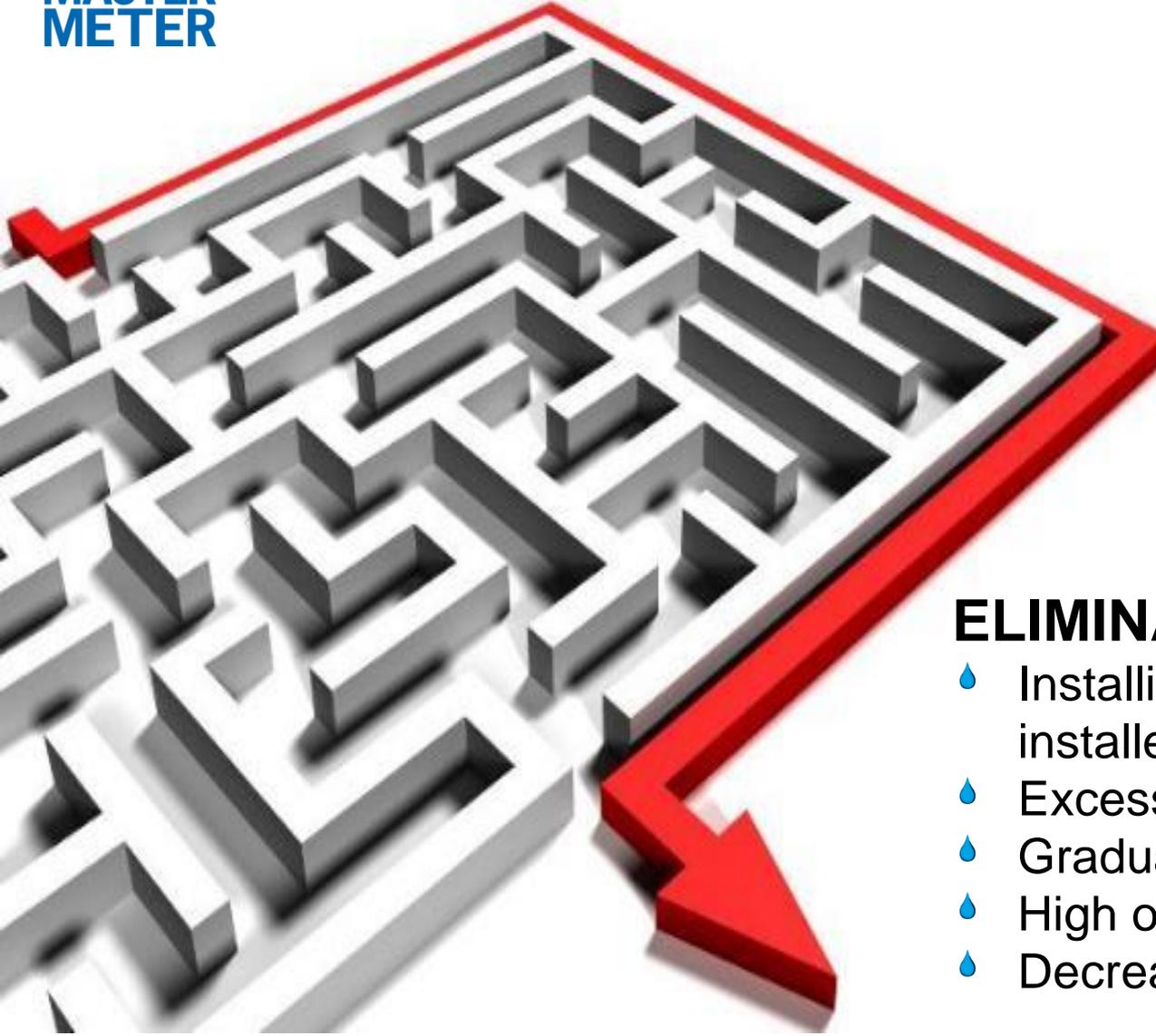
- 💧 Unmetered consumption
- 💧 Inaccurate meters
- 💧 Damaged meters
- 💧 Frequent repairs

***All lead to lost revenue***





Keep It Simple



## **ELIMINATE:**

- Installing the wrong meter type installed
- Excessive maintenance costs
- Gradual decrease in accuracy
- High overhead & inventory costs
- Decrease installation costs

## Simple Installation



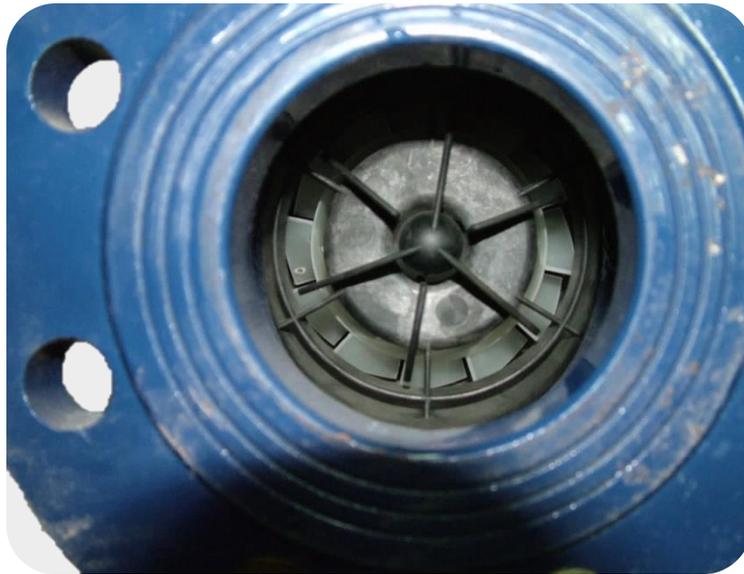
**VS.**



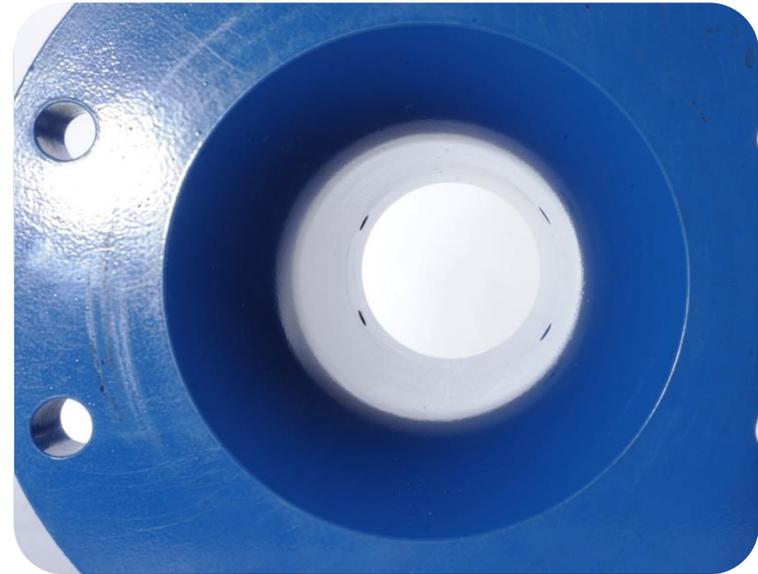
- 💧 Turbines up to 80% heavier
- 💧 Compounds up to 300% heavier
- 💧 Fire Assemblies up to 1800% heavier

No Moving Parts, No  
head loss

**Turbine**

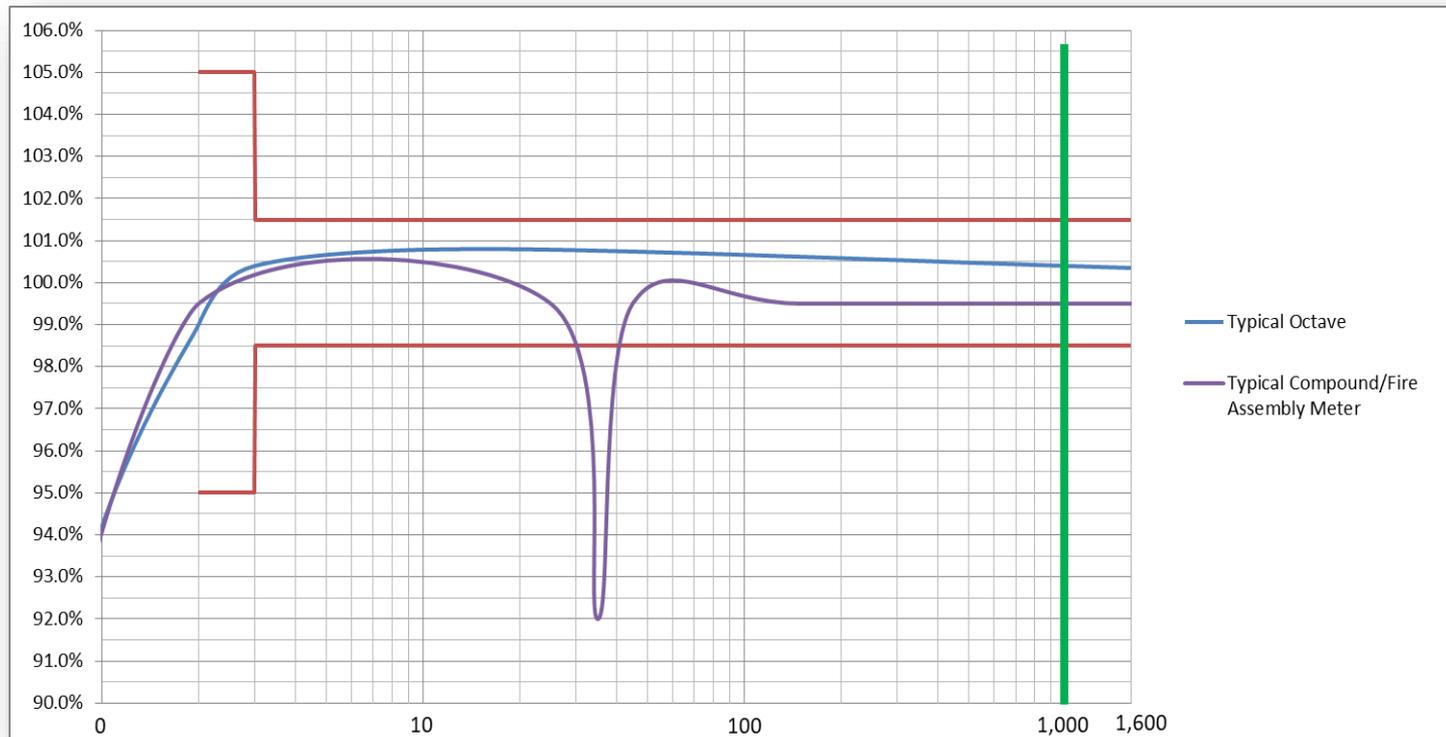


**Ultrasonic**





## Cross Over & Continuous Duty





## PD Comparison



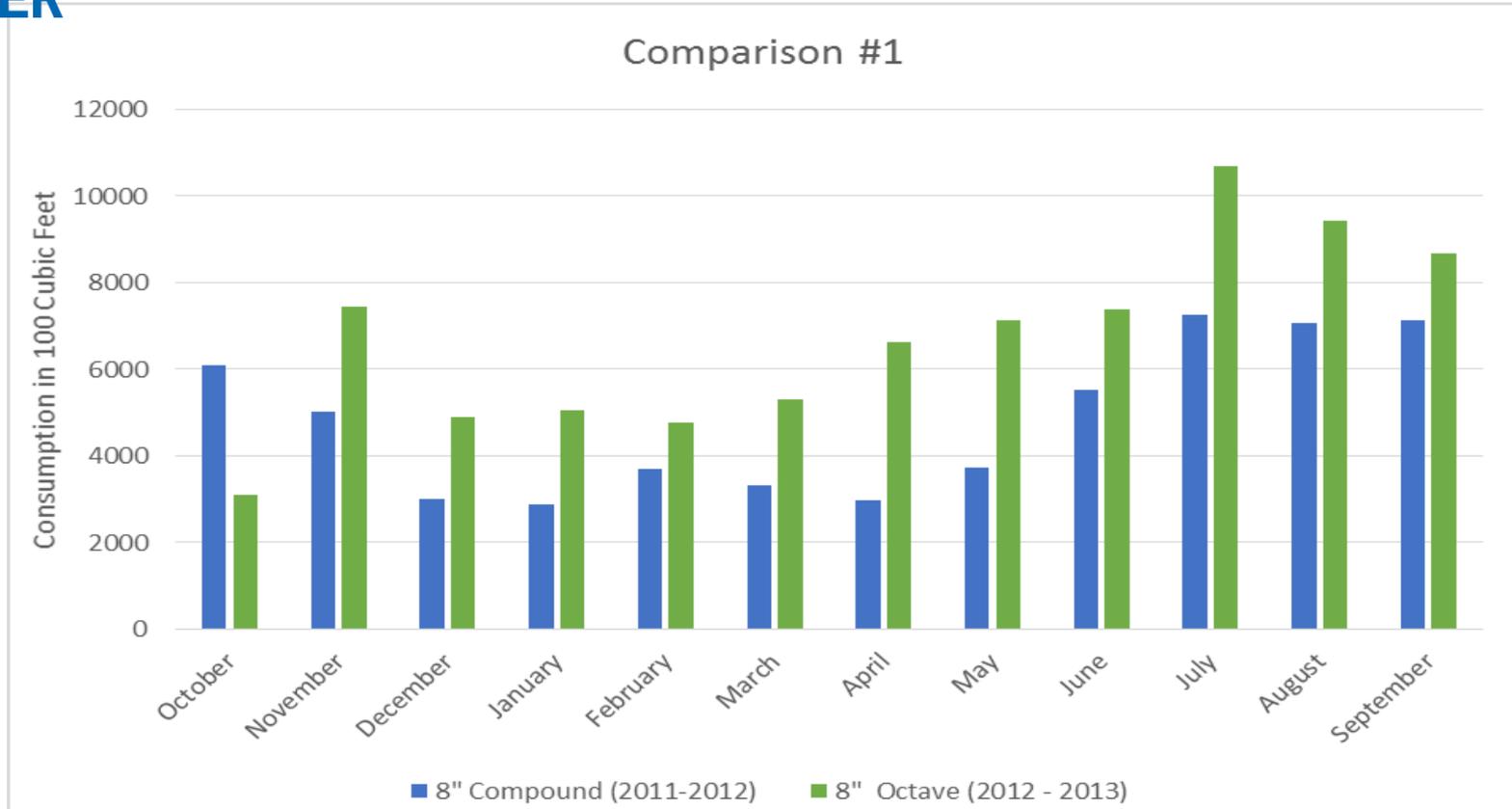
Size	Low Flow (>95%)	Intermediate (98.5%-101.5%)	High Flow (98.5%-101.5%)	Turndown Ratio	FM Approved
1-1/2" Octave	0.25 GPM	0.5 GPM	250 GPM	1000:1	Yes
1-1/2" PD	0.75 GPM	2.0 GPM	100 GPM	134:1	No
2" Octave	0.25 GPM	0.5 GPM	250 GPM	1000:1	Yes
2" PD	1.00 GPM	2.5 GPM	160 GPM	160:1	No



# REAL WORLD SUCCESS



# Real World ROI

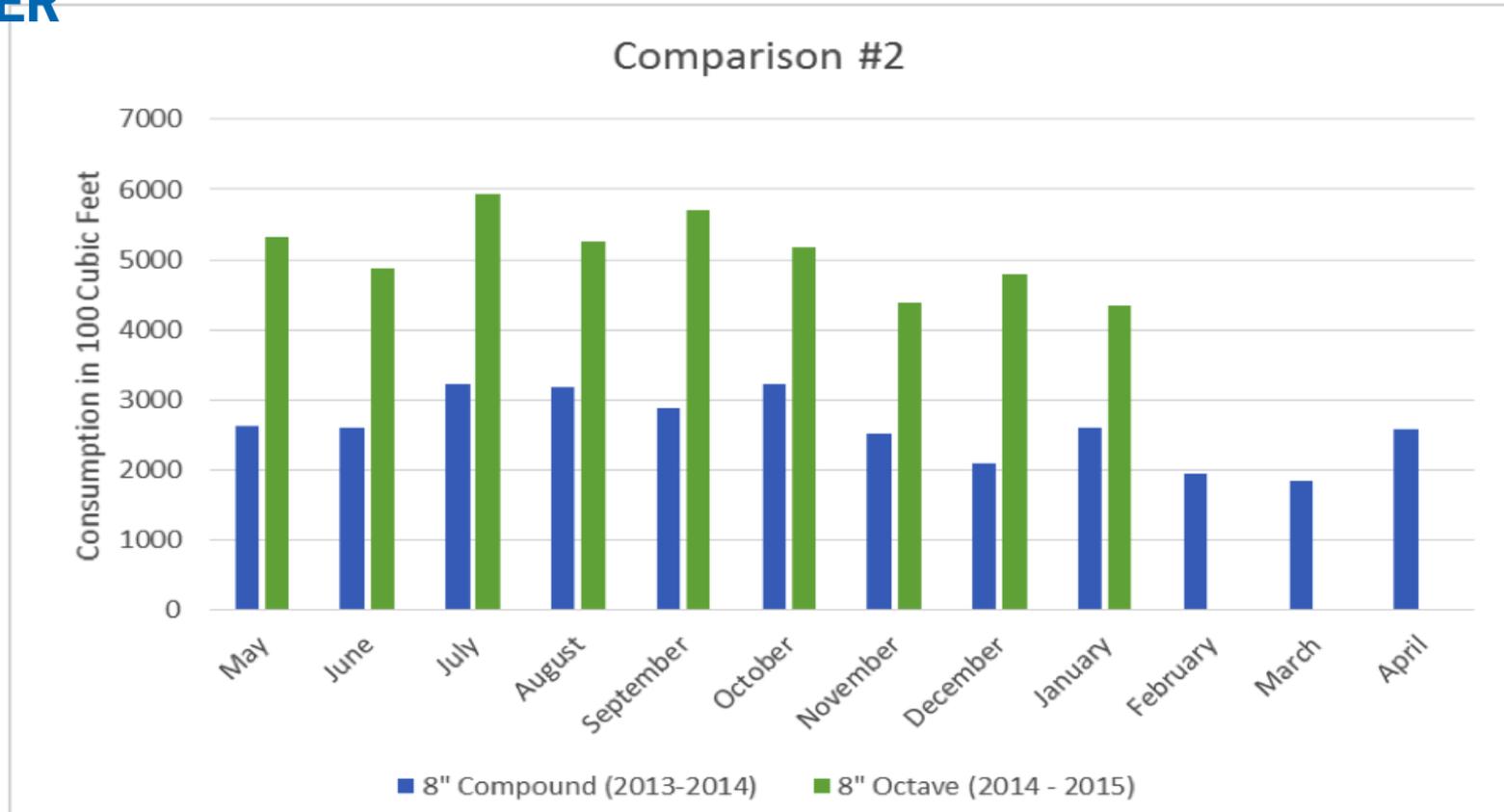


💧 **\$52,315.80** | Annual Increase in Revenue

💧 **39.38%** | Increased % of Consumption



# Real World ROI

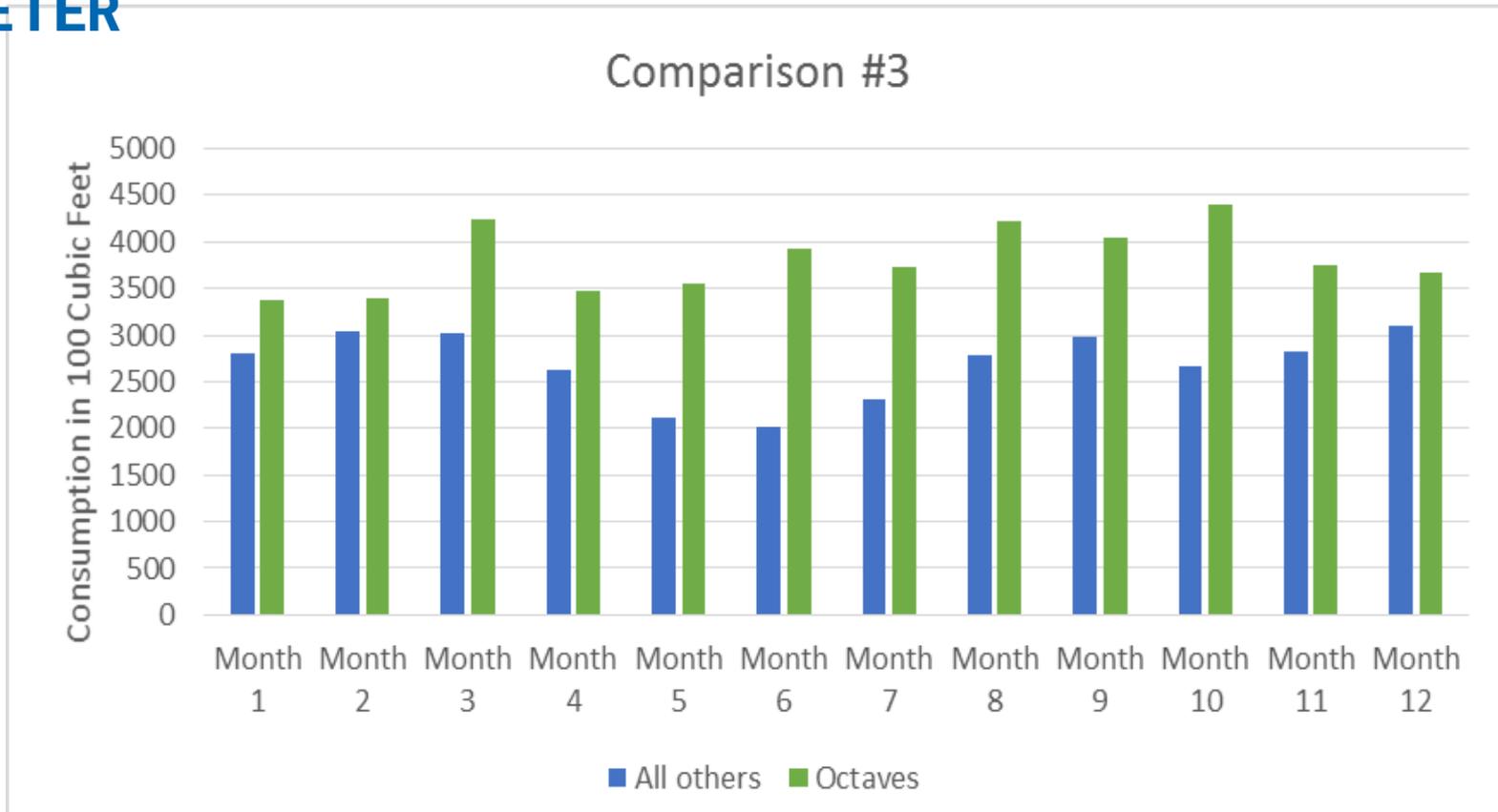


💧 **\$48,028.60** | Annual Increase in Revenue

💧 **46.47%** | Increased % of Consumption



# Real World ROI



💧 **\$31,001.70** | Annual Increase in Revenue

💧 **41.73%** | Increased % of Consumption



## Real World ROI



- 💧 **Hazelton, PA** | One meter increased revenue from \$6,000 per month to \$50,000 a month.
- 💧 **Bradford, PA** | After replacing a meter with the Octave Ultrasonic, the utility found a leak that amounted to 6,000 gallons a day.
- 💧 **Big Flats, NY** | Replace compound and increased revenue in by 900,000 gallons in one month. Projected to bring \$17,000 in revenue annually.
- 💧 **Peru, IN** | Replaced compound and increased consumption by 33%.



## Large Utility Users



Las Vegas, NV



Seattle, WA



Birmingham, AL



Tallahassee, FL



Philadelphia, PA



Columbus, OH



# AMR VS AMI



## AMR

- A technology which automatically collects metering data and transfers that data to a central database for analysis and billing purposes, generally called “smart meters”.
- Technology includes:
  - Touch read
  - Drive By

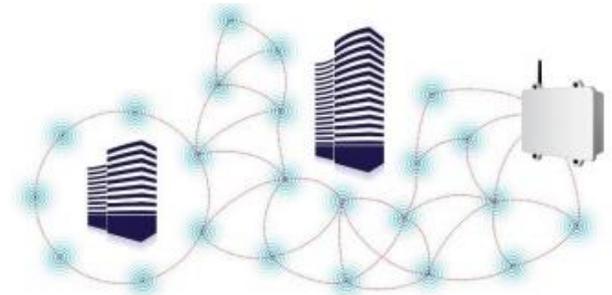
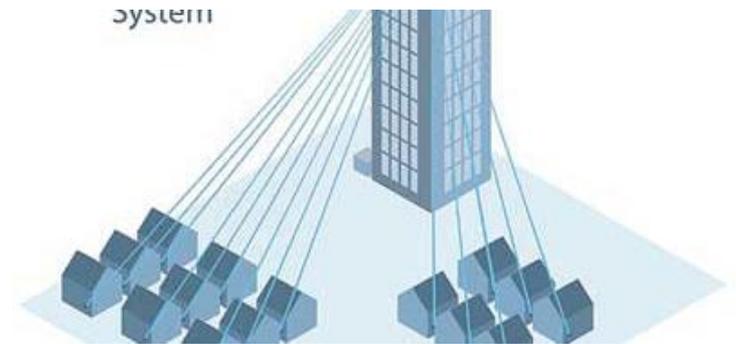
## AMI

- Advanced metering infrastructure starts with smart meters and adds two-way communication between the meter and utility, and between the meter and consumer. This means that in addition to providing readings, the meter can also receive (and often act on) instructions sent from the utility or consumer



## Benefits of AMI

- 3 Day Reading Becomes 3 Minute Reading
- AMI from AMR more challenging than Direct-AMR
- Automated Data logging
- Hourly Reads
- On Demand Reads
- Functional Leak/Theft Detection
- Customer Service Tool
- Remote Software Upgrades
- Shut-Off Valve Capable



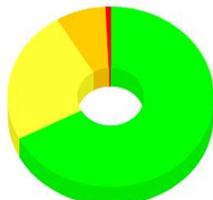
# AMI is all about analytics

Customer Care   Meters   GIS   Work Orders   Fixed Network   Administrative   Customer   Location   Meter

### System Status

Reception Quality by Meters

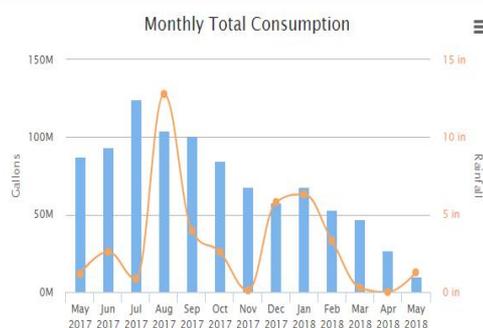
**99.2%**  
4654 Meters



■ RX Level 1  
 ■ RX Level 2  
 ■ RX Level 3  
 ■ Not Received

### Consumption

Monthly Total Consumption



■ Residential  
 — Rainfall

### Consumption Map



Map   Satellite

Low   High

Google

### Critical Alerts

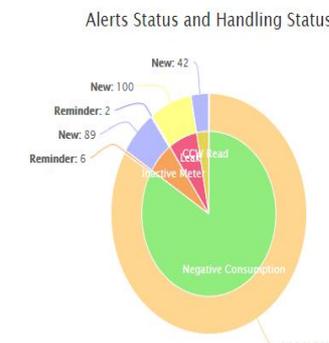
Meter ID	Alert Type	Severity
00010352253	Negative Consumption	High
00010351278	Leak	High
00010345645	Leak	High
00010348031	Tamper	Medium
00010354579	Leak	Medium
00010356482	Leak	Medium
00010349212	Leak	Medium
00010348892	Leak	Medium
00010352165	Leak	Medium
00010355987	Leak	Medium
00010349892	Leak	Medium
00010348696	Leak	Medium
00010356251	Leak	Medium
00010350135	Leak	Medium
00010349046	Leak	Medium

### Meters with no reception

Meter ID	Unit Type	Address
00010345548	Allegro 4GBL	1503 CIRCLE DR
00010356353	Allegro 4GBL	901 TIMBERWOOD DR
00010345469	Allegro 4GBL	2119 ANDOVER DR
00010345645	Allegro 4GBL	1001 WESTWOOD DR A
00010350964	Allegro 4GBL	710 BRAESCREEN DR
00010345949	Allegro 4GBL	1911 ASTER WY
00010683916	Allegro 4GBL	2105 SOUTHEASTERN TR
00010692840	Allegro 4GBL	1761 WINDY PARK CR
00010354985	Allegro 4GBL	404 PARKHILL CV
00010683399	Allegro 4GBL	2101 SOUTHEASTERN TR
00010679778	Allegro 4GBL	1616 WINDY PARK CT
00010678579	Allegro 4GBL	2203 STRATFORD DR
00010688893	Allegro 4GBL	901 MAYS ST S 3
00010356720	Allegro 4GBL	2208 STRATFORD DR
00010349351	Allegro 4GBL	1302 GLENDA DR B

### Alerts

Alerts Status and Handling Status



New: 1206  
 Read: 42  
 Reminder: 100  
 Inactive Meter: 89  
 Negative Consumption: 6



Meter & Automation Group

# Detailed Meter Profiles

Meter ID 00010345586 Back

Meter ID	00010345586	Account Number	02-1795-03	Customer Name	<a href="#">SMITH, JOSEPH W</a>	Last Read (Gallons)	186419.4	Email	<input type="text"/>
Serial No.	9387508	Location Number	02-1795	Location Address	<a href="#">518 KAROLYN DR</a>	Last Read Time	05/12/2018 1:00 PM	Mobile Phone	<input type="text"/>
Service Type	WAT	Meter Size	<input type="text"/>	Status	OK	Remarks	<input type="text"/>		

Dashboard

Meter Details

Alerts

Related Entities

Consumption

Charts

Events

**Additional Data** More

Electronic No.	10345586	Model	<input type="text"/>
Unit Type	Allegro 4GBL	Uplink RSSI	-102
Route Description	<input type="text"/>	Downlink RSSI	-93
Read Sequence	16900		

**Alerts** More

Severity	Alert Type	Status	Alert Time
No data			

**Daily Reads** More

Date	Last Read (Gallons)	Consumption	Meter Status
05/12/2018	186399.3	20.9	OK
05/11/2018	186378.4	220.9	OK

**Related Entities** More

Replaced Date	Old Electronic No.
No data	

Last Event: From Date: 04/04/2018 Letter Sent  
Sent By: admin.

**Events** More

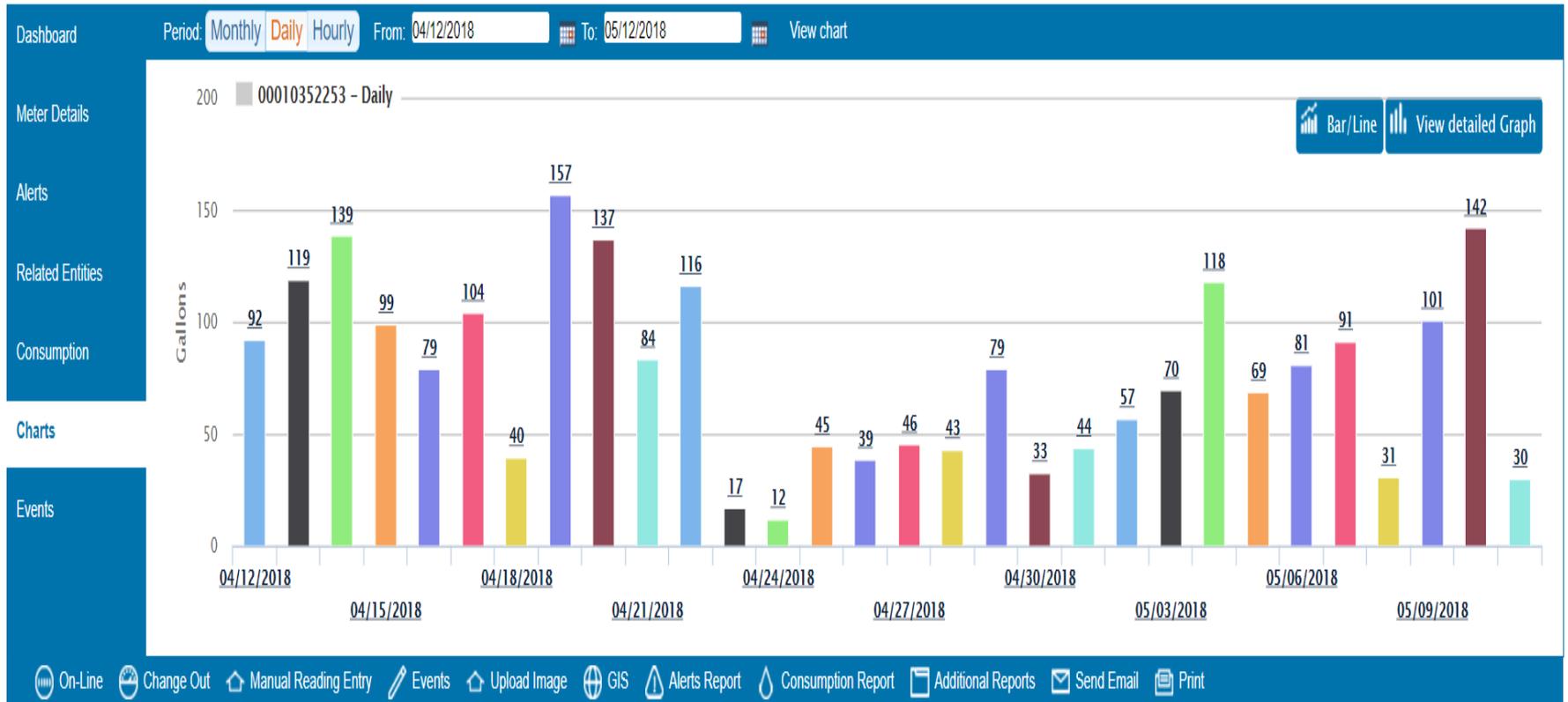
**Charts** More

Month	Consumption (Gallons)
May 17	2000
Jun 17	3000
Jul 17	8000
Aug 17	5000
Sep 17	3000
Oct 17	3000
Nov 17	3000
Dec 17	3000
Jan 18	3000
Feb 18	3000
Mar 18	5000
Apr 18	3000
May 18	1000

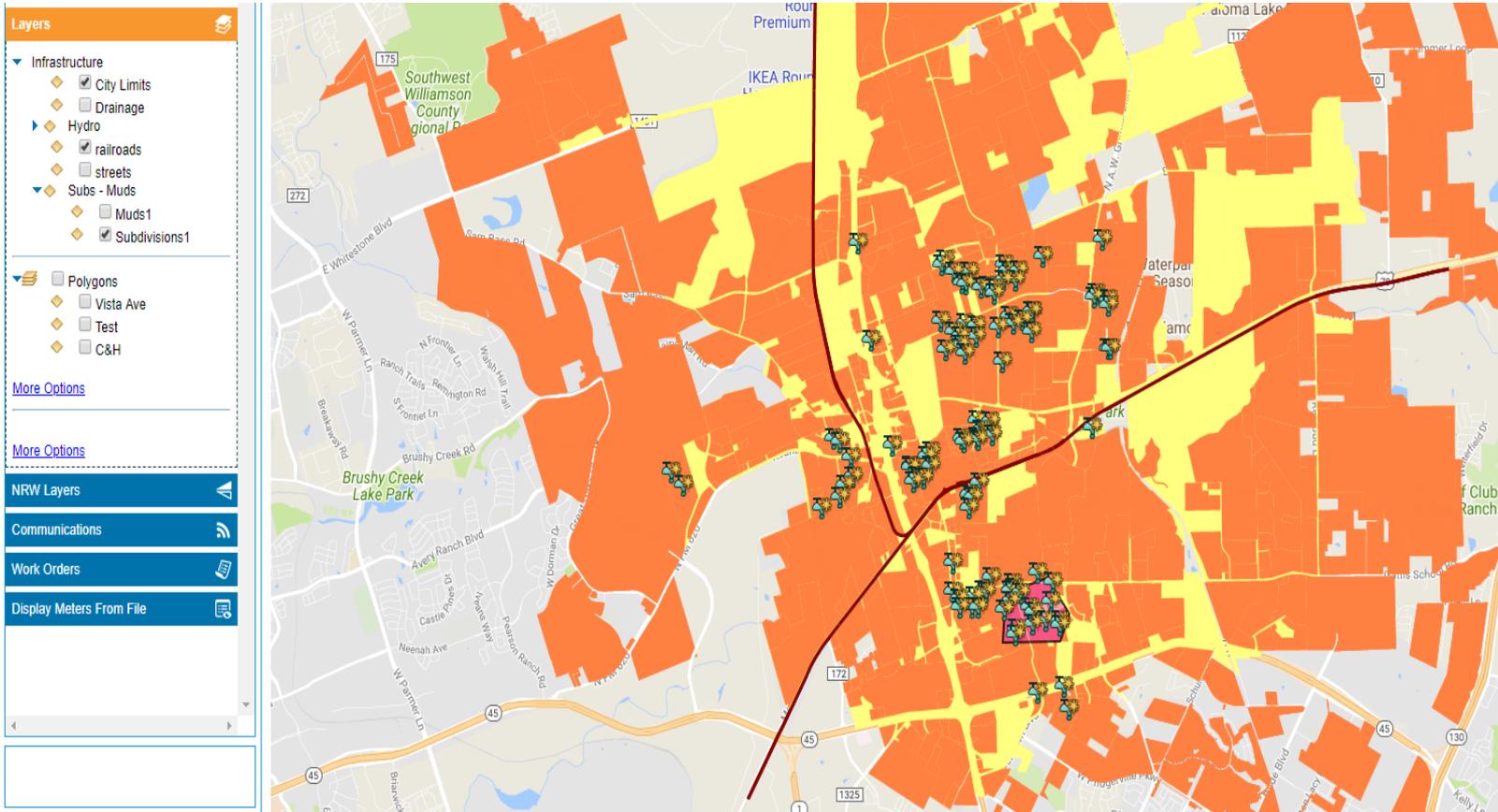
On-Line Change Out Manual Reading Entry Events Upload Image GIS Alerts Report Consumption Report Additional Reports Send Email Print



# Readily Available Consumption Reports



# Import GIS Data



## Customer Engagement Tools

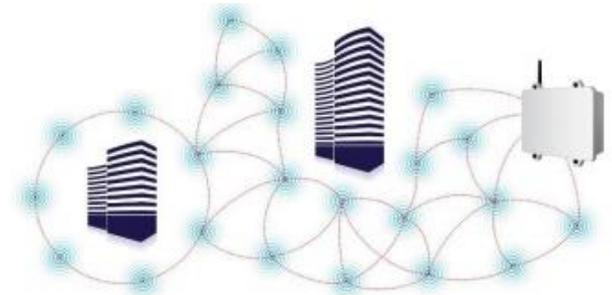
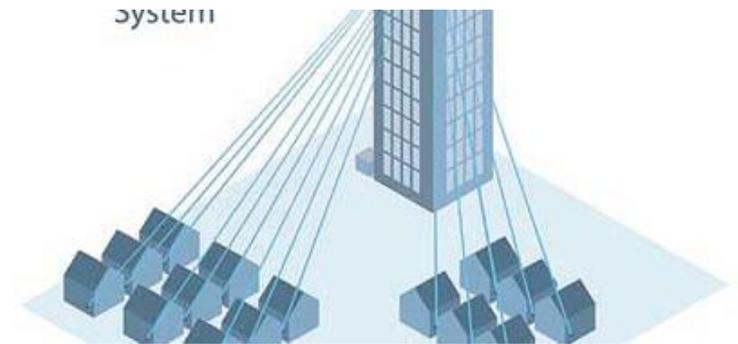


- Customer Premise Leak Alerts
- Household Water Budgeting
- Vacation Period Usage Notifications
- Email or Text Messaging
- Apple or Android Smartphone App



## Different types of AMI

- Master Meter
  - Line of Sight
- Sensus
  - Line of Sight
- Badger
  - Line of Sight/Cellular
- Neptune
  - Line of Sight
- Mueller
  - Mesh/Line of Sight
- Zenner
  - Mesh



**QUESTIONS?**