NARUC

2015 Summer Committee Meetings

New York City

Challenges:

Consumers, Convergence and Change

NARUC

2015 Summer Committee Meetings

Impact of Telecom Technology and Policy on the Energy and Water Sectors

Impact of Telecom on Energy and Water

A Natural Gas Utility Perspective

Jim Howe

July 15, 2015

Picarro Surveyor

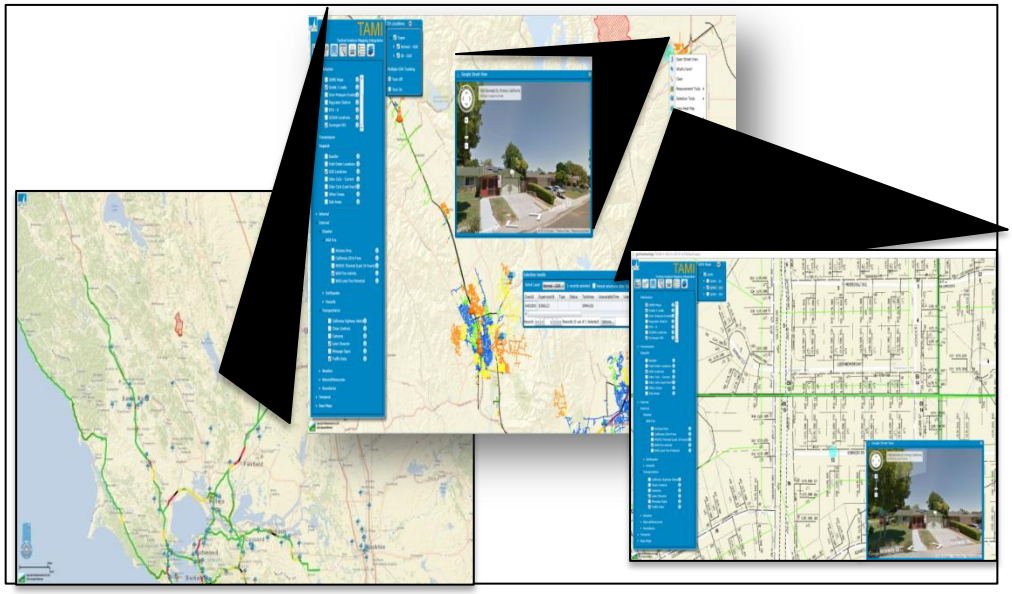
CRDS Technology:
World's most sensitive and stable technique for measuring methane and carbon isotopes in methane for gas source identification.

Mobile Form Factor:
System hardware designed to be easily vehicle-mounted and mobile, including mobile wireless connectivity, vehicle electrical power.

P-Cubed™ (Picarro Processing Platform):
Web-based repository and algorithmic engine for collecting, cataloguing, processing and displaying visually-rich geospatial survey data from multiple Picarro Surveyors.

The user also has the option to perform a real-time analysis to distinguish between natural gas and other biogenic sources.

Transforming Data to Intelligence



Video Wall
Situational Awareness

Smartboard
Increased field collaboration

Pipeline Simulator
Real-time data used for monitoring, trending, and analysis

Research Initiatives

Methane detection Technology

ILI Technology

JPL hand-held methane detector

Electronic Pipeline Markers

NARUC

2015 Summer Committee Meetings

Impact of Telecom Technology and Policy on the Energy and Water Sectors

Water, Energy, Telecom & Drought

NARUC Summer Meeting

New York, New York

July 2015

Presented by: Rich Svindland, Vice President- Operations, California American Water

Company Overview

California Drought

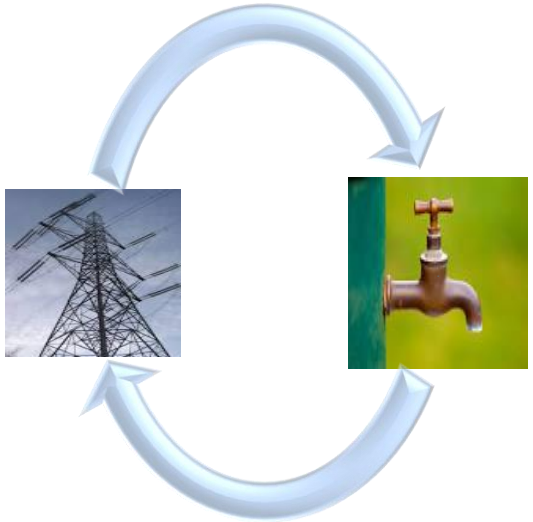
Water & Energy

Energy Efficiency

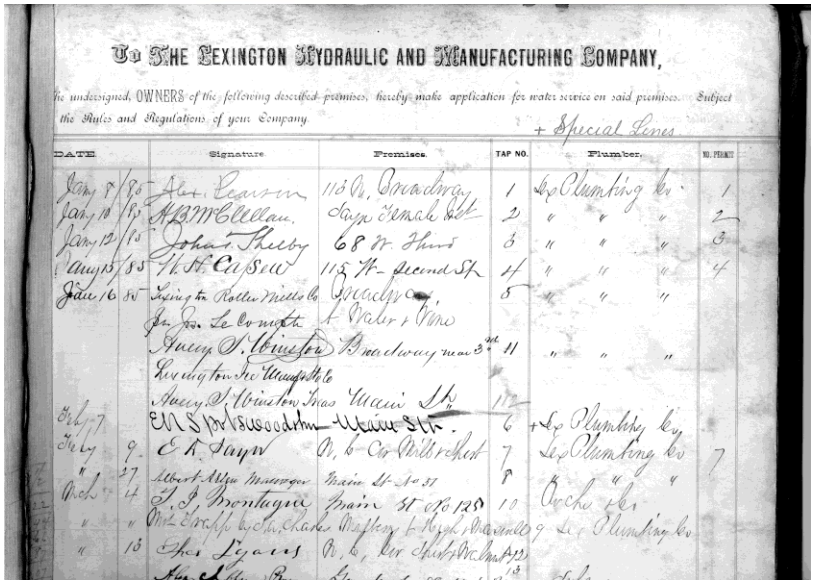
- 85% x 30%

- 50% x 50%

- 2% - 30%



Water & Telecom: Meter Reading


To The Lexington Hydraulic and Manufacturing Company,

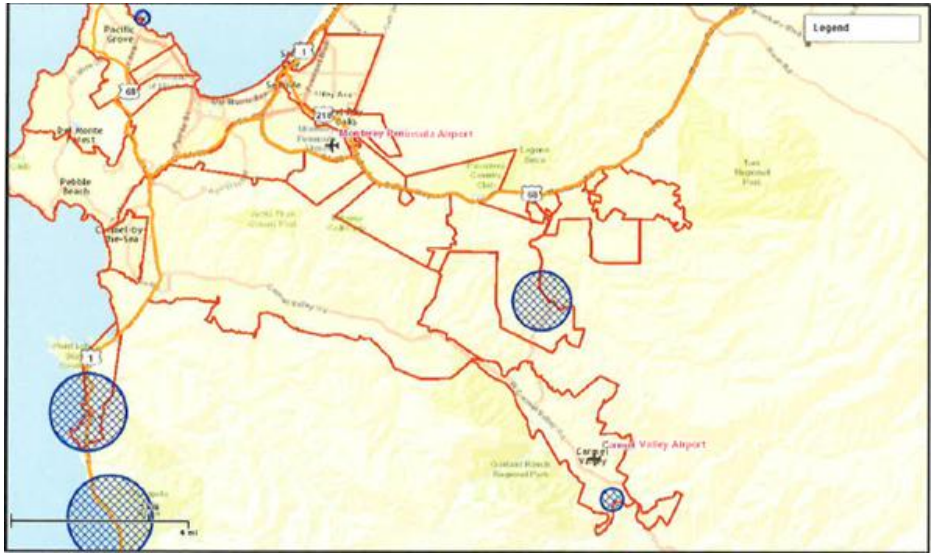
The undersigned, OWNERS of the following described premises, hereby make application for water service on said premises. Subject the Rules and Regulations of your Company.

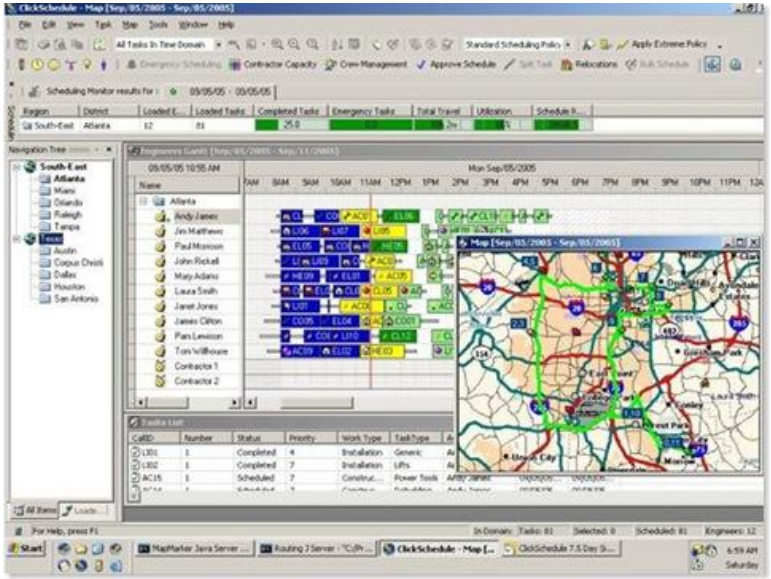
+ Special Terms

DATE	Signature	Premises	TAP NO.	Plumber	NO. PERMIT
Jany 8/85	Alex Pearson	110 N. Broadway	1	Lex Plumbing Co	1
Jany 10/85	A.B. McClellan	Lexington Female Inst	2	" " "	2
Jany 12/85	Johan Theby	68 N. Third	3	" " "	3
Aug 15/85	W St. Clair	115 N. Second St	4	" " "	4
June 16/85	Lexington Roller Mills Co	Broadway	5	" " "	
	Jas. Ro. Le Compte	S. Water & Vine			
	Avery S. Abington	Broadway near 3rd	11	" " "	
	Lexington Ice Manufacture				
	Avery S. Abington	Cor Main & Water Sts	12		
Oct 7	E.M. Spotswood Adm	Water St.	6	+ Lex Plumbing Co	
Nov 9	E.R. Sayre	N. b. Cor Nelson Street	7	Lex Plumbing Co	7
" 27	Robert Alex Manager	Main St. Lot 51	8	" " "	
Dec 4	T.J. Montague	Main St. Lot 120	10	Archer Co	
" "	Mrs. Evelyn Wm. Charles Walker	S. High & Nelson Sts	9	Lex Plumbing Co	
" 13	Chas Lyons	N. b. Cor Chas & Nelson Sts	13		

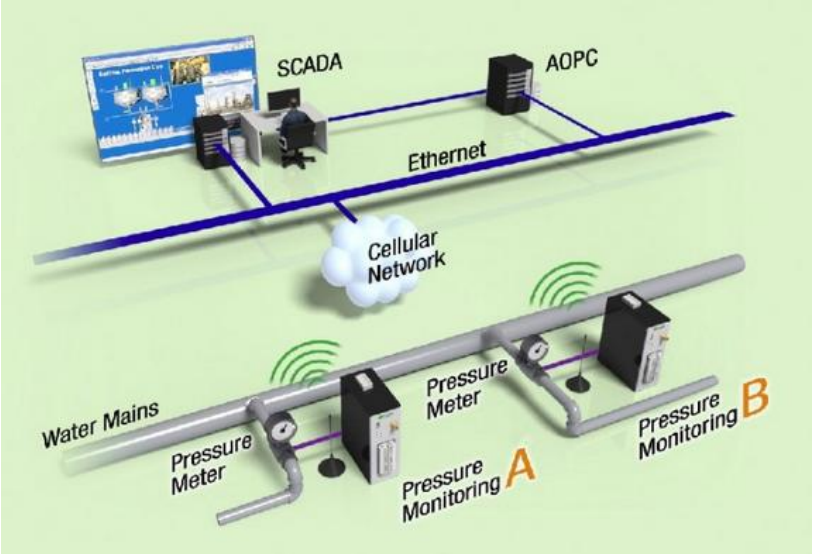
Water & Telecom: Workforce Deployment

AMERICAN WATER



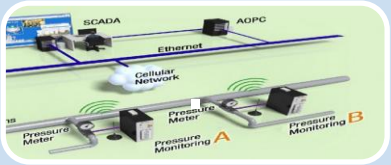


Water & Telecom: Intelligent Systems



Fighting Drought with Telecom & Energy

AMERICAN WATER



Supply Solution: Water Efficiency

AMERICAN WATER

How Companies Can Help…

Advanced Customer Communications

Outdoor Use Reduction Programs

Rate Designs

Fix Leaking Pipes

How Regulators Can Support…

Revenue Stabilization Policies that Support Fixed Cost Recovery

Infrastructure Surcharge Programs & Multi-Year Rate Plans

Other Solutions

AMERICAN WATER

How Companies Can Help…

Increase Energy Efficiency in the Water Sector

Increase Water Efficiency in the Energy Sector

Consolidate Systems

How Regulators Can Support It…

Desilo the Utility Sector

Consolidation Policies

Contact Information

Rich Svindland

Vice President of Operations

916-568-4296

richard.svindland@amwater.com

NARUC

2015 Summer Committee Meetings

Impact of Telecom Technology and Policy on the Energy and Water Sectors

Role of Telecommunications at Salt River Project

NARUC Conference

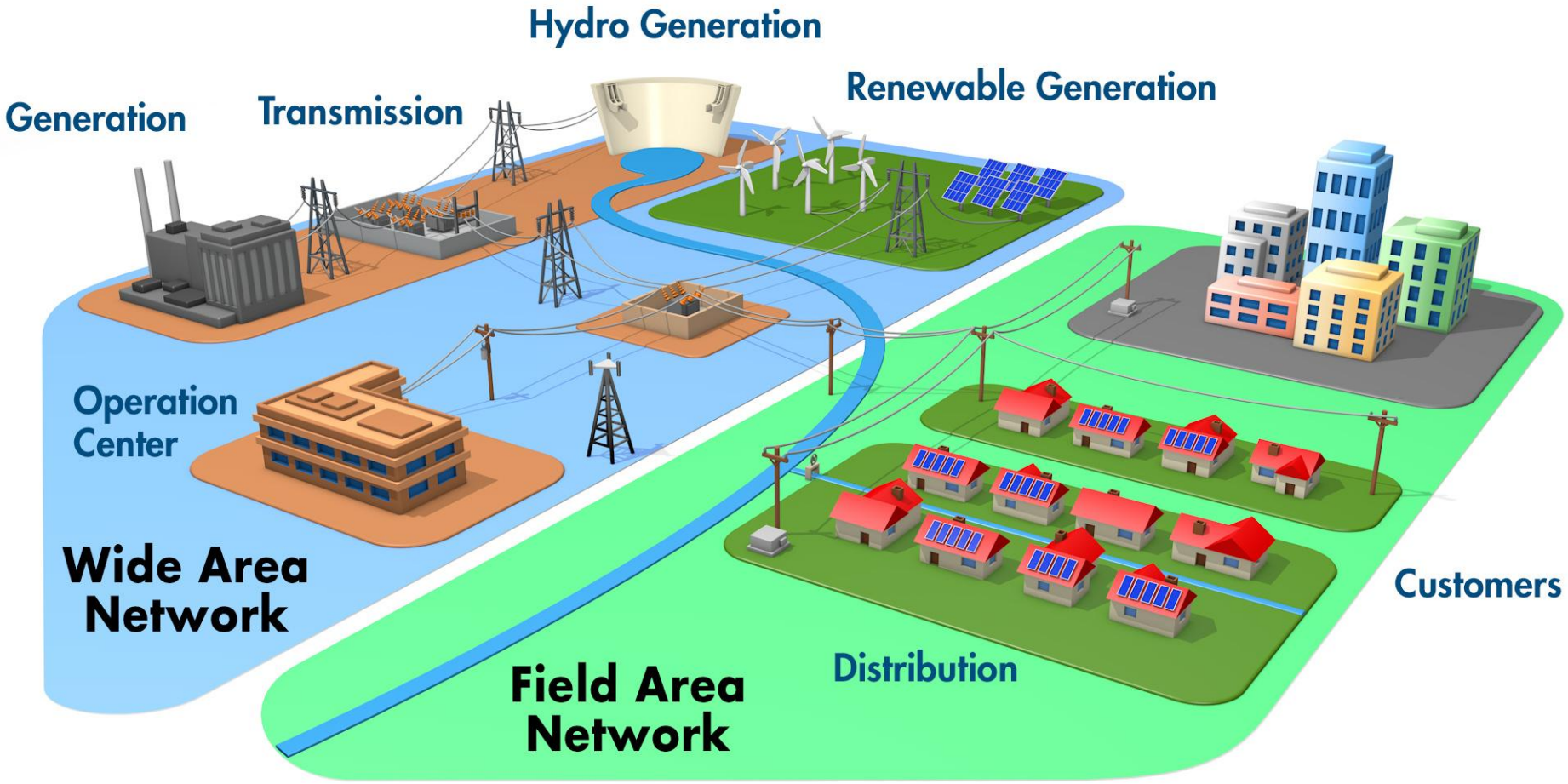
July 15th, 2015

Chris Campbell

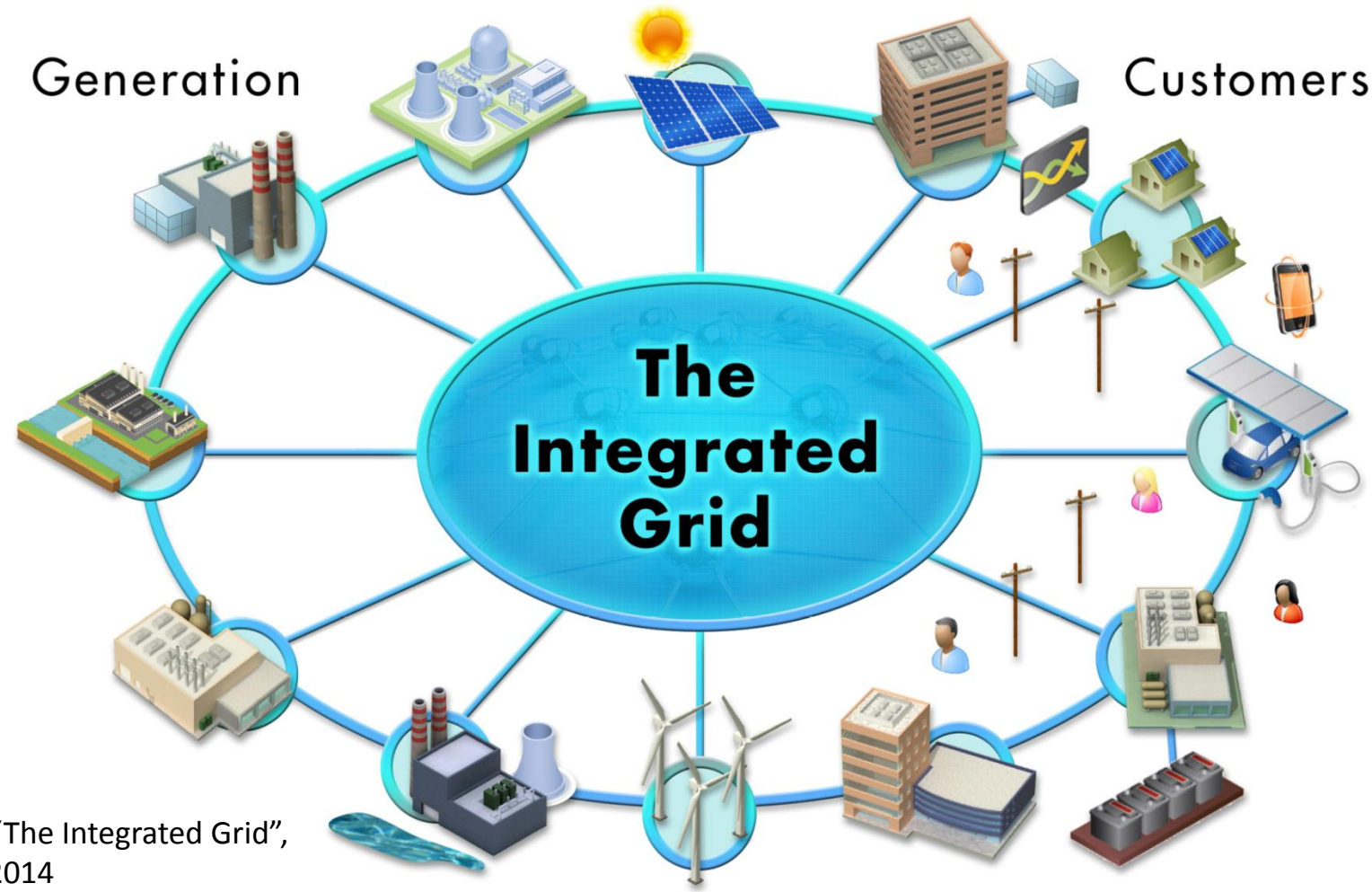
SRP Background

- Third largest public utility in the U.S. covering the Phoenix Metro area
- Provides customers with water, power & telecommunications
  - Watershed management and bulk delivery of water to Central Arizona
  - 1 million electric customers
  - Leased telecommunications capacity & cell site collocation

Utility Telecommunications



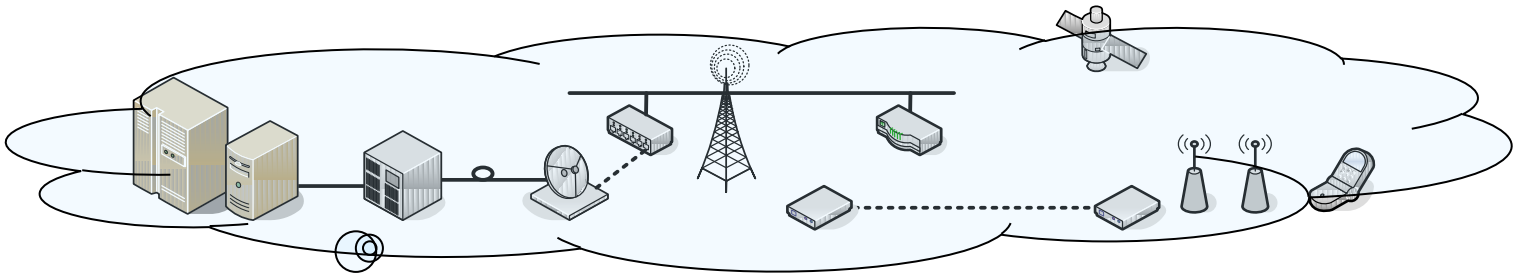
Grid Evolution



From "The Integrated Grid", EPRI, 2014

Utility Telecom Support

- Wireless Spectrum for Critical Infrastructure
- Public Safety Broadband Network
- Utility Telecom Value & Investment
- Advancement of Technology Standards & Demonstrations



NARUC

2015 Summer Committee Meetings

Impact of Telecom Technology and Policy on the Energy and Water Sectors

The Telecom & Energy Intersection

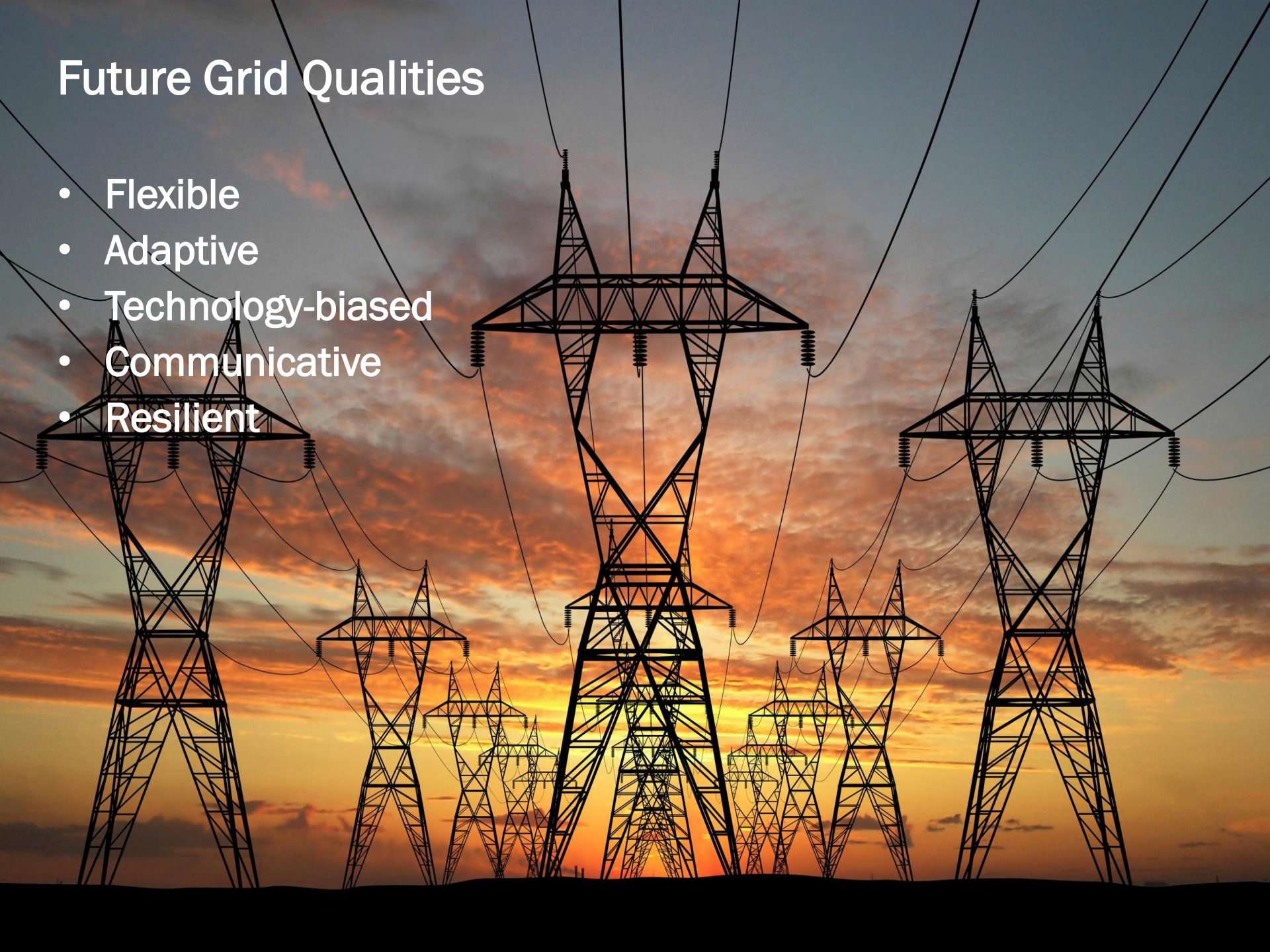
Michael Quinn
Chief Technology Officer
July 15, 2015

Electric Grid Challenges

- Edge of grid sophistication – distributed energy resources
- Customer expectations – no outages and more information
- Technology transition timelines
- Water and the environment
- Load growth or load reduction?

Future Grid Qualities

- Flexible
- Adaptive
- Technology-biased
- Communicative
- Resilient



Barriers to Communicative Characteristic

- Loss of available optionality – cooper transition
- Robustness of carrier-based wireless solutions
- Expensiveness of fiber
- Private wireless means spectrum access
- Significant cost pressures coming and recovery

NARUC

2015 Summer Committee Meetings

Impact of Telecom Technology and Policy on the Energy and Water Sectors

Impact of Telecom Technology and Policy on the Energy and Water Sectors

NARUC July 2015

POLYBRITE INTERNATIONAL

BOREALIS℠

Green Lighting for the Future

Sandra Goeken Miles 630-551-1533, or e-mail to: smiles@polybrite.com

A phone is no longer a phone and a light is no longer just a light

Phones can do more than make calls, they can control everything

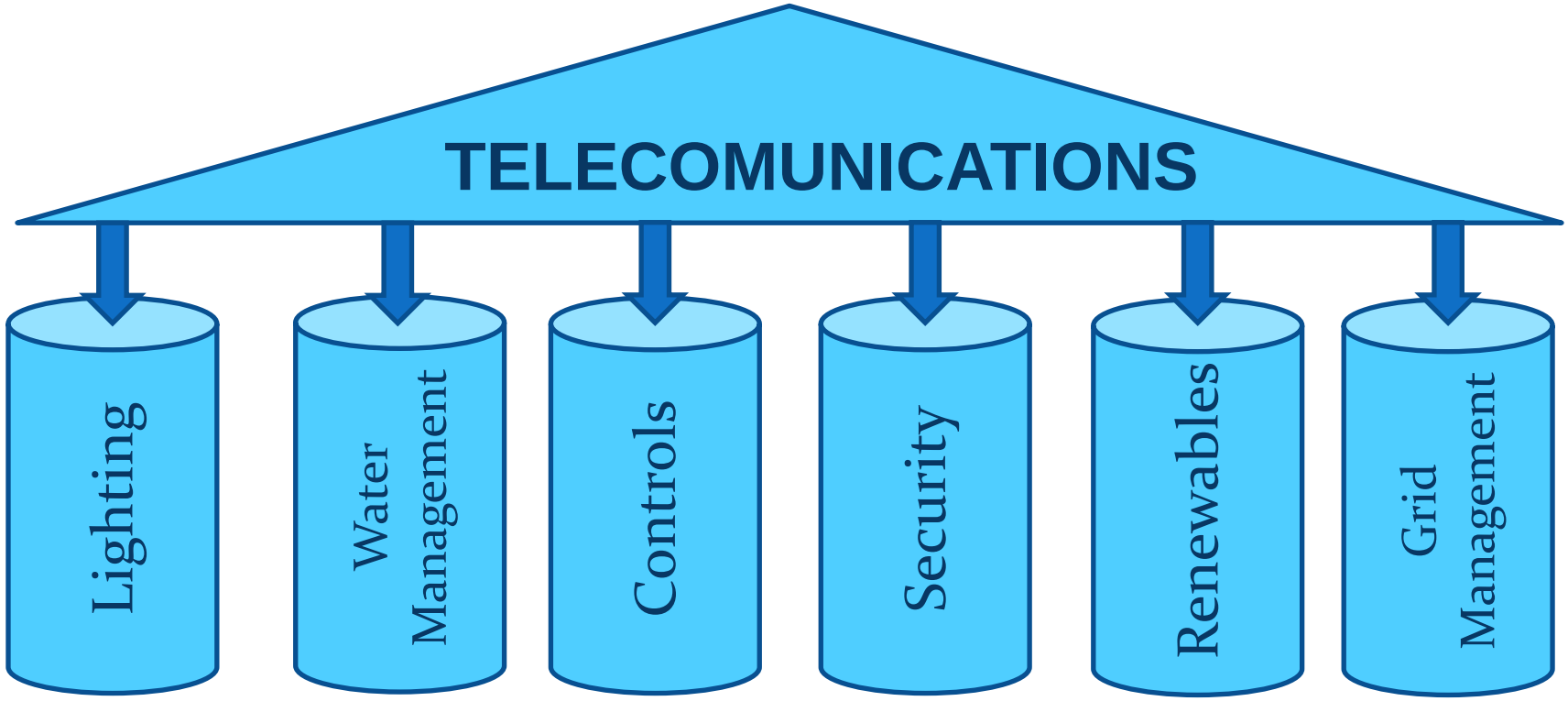
And the lights have moved beyond just lighting the dark

- Demand/Response
- Automatic Dimming
- Wi-Fi and Cellular Capabilities
- Motion /Infrared Sensor
- Temperature Control
- Data Collection of RFID

BOREALIS℠
Green Lighting for the Future

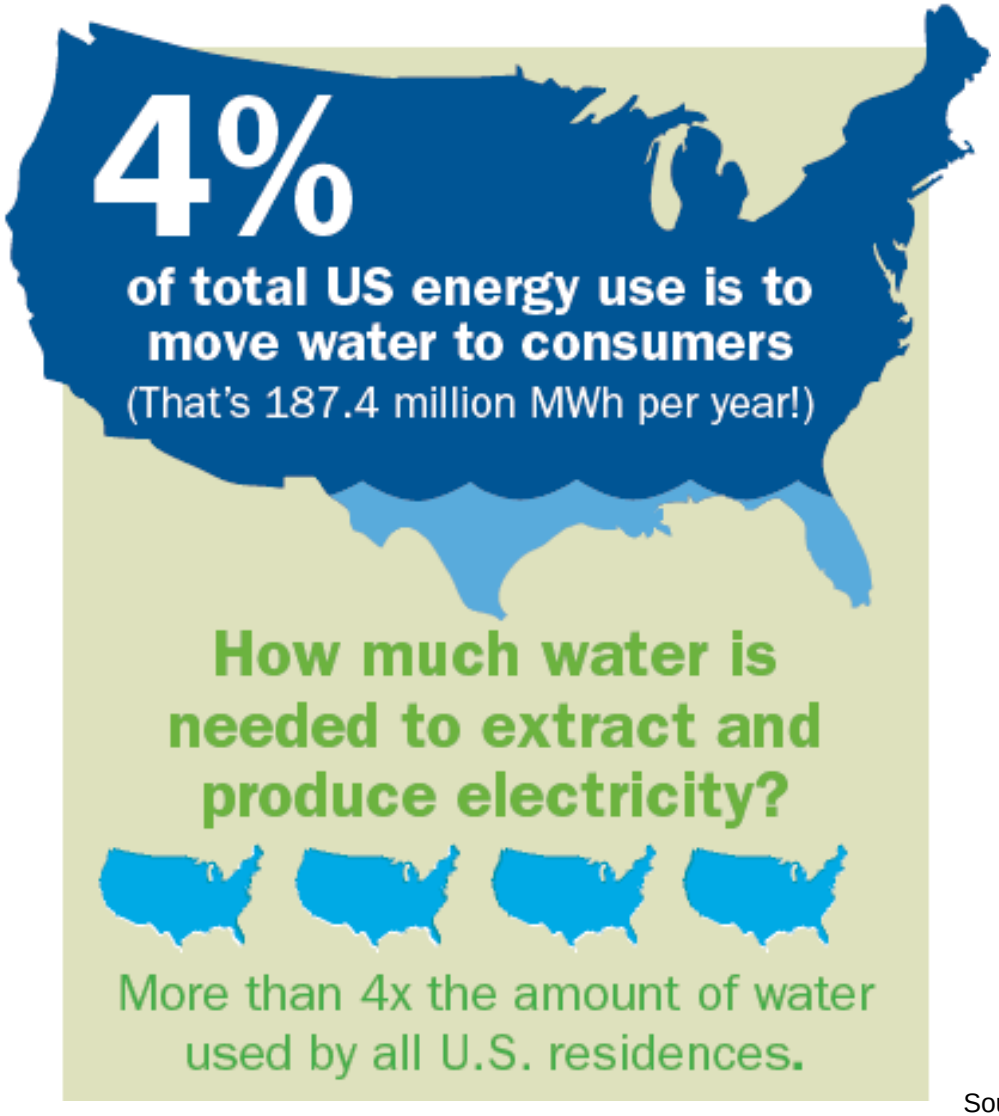
Telecom is the Life Blood that Ties Everything Together

Today Everyone Operates in Silos



Controls are only as good as the networks they operate over

Estimated 187.4 million MWh each year

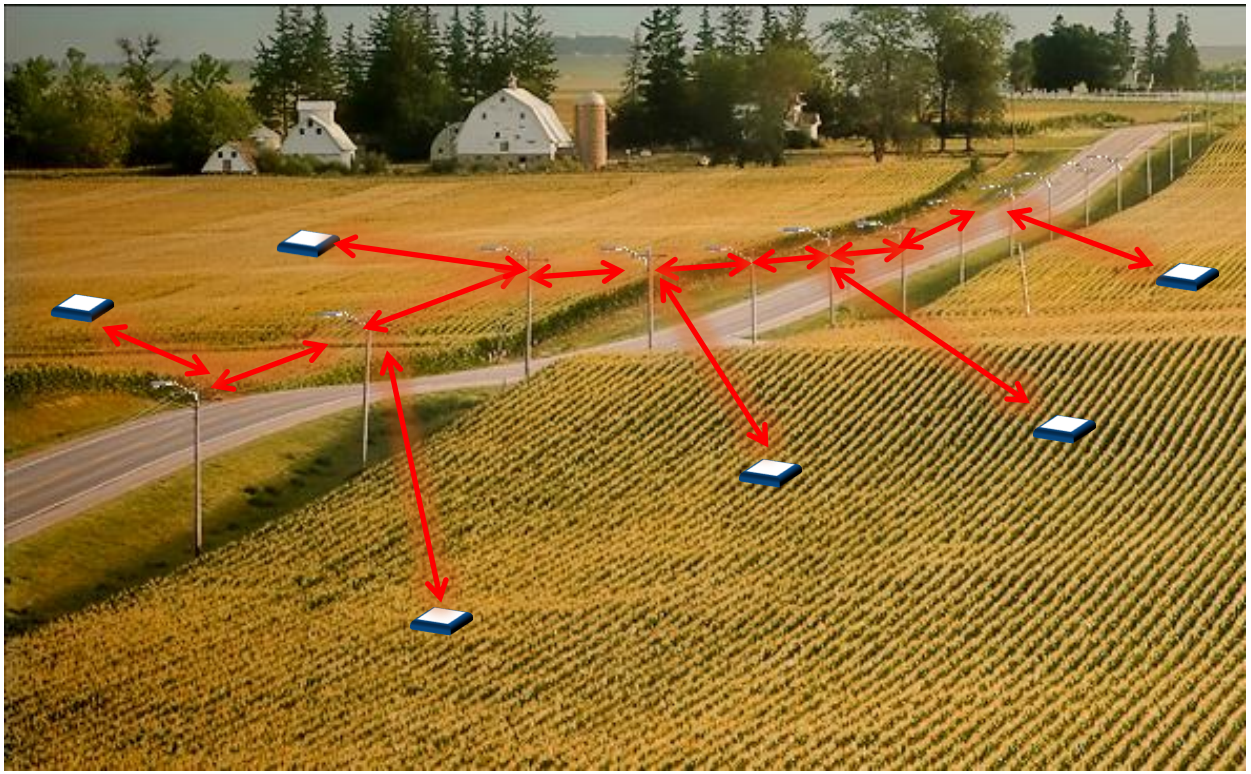


Source: American Water 2014

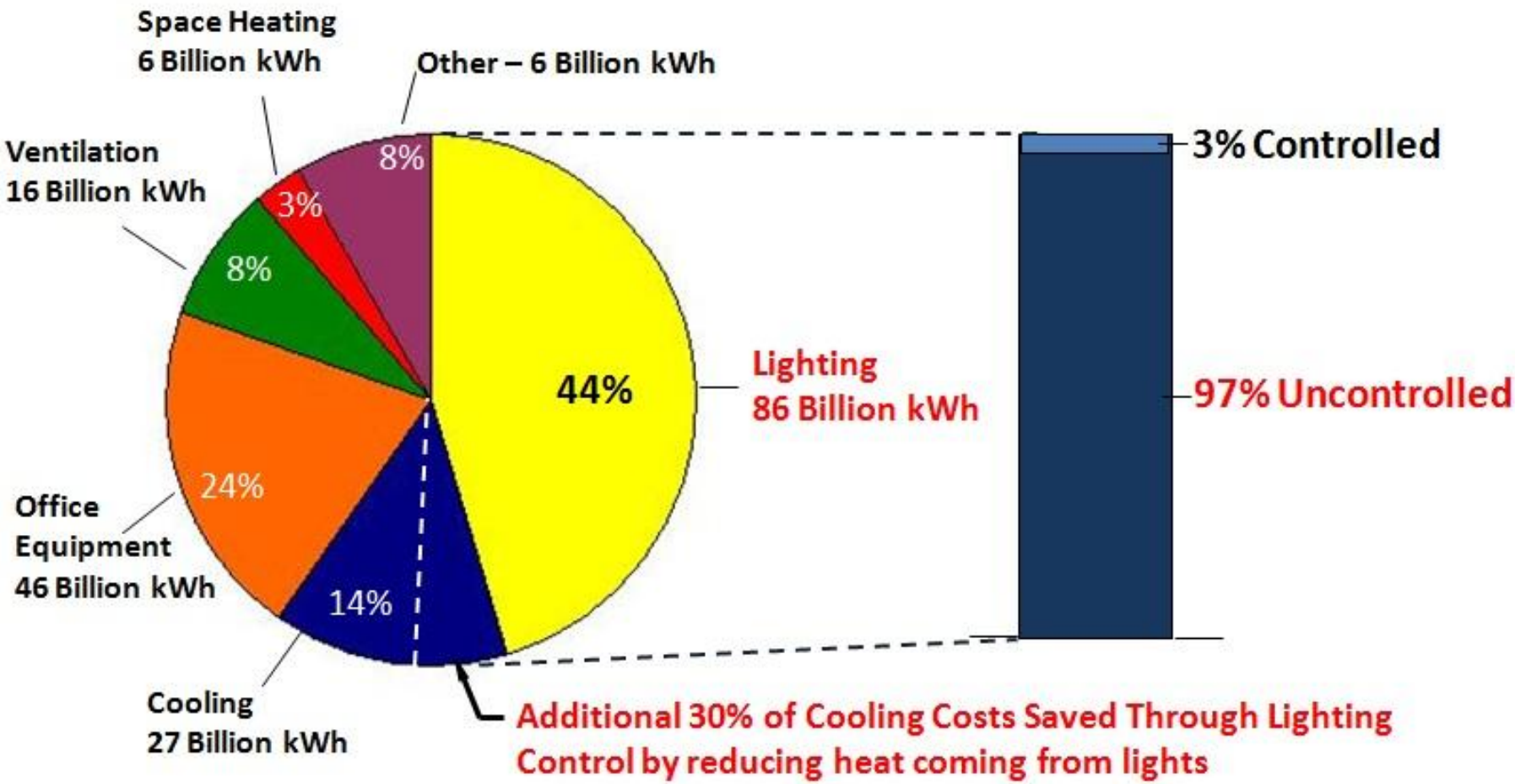
Water Utilities Need to Embrace Innovative Solutions

Rural Fields Waste Water Without Telemetry

Remote Sensors Frequency Hop to Streetlights which relay to Sprinkler Equipment

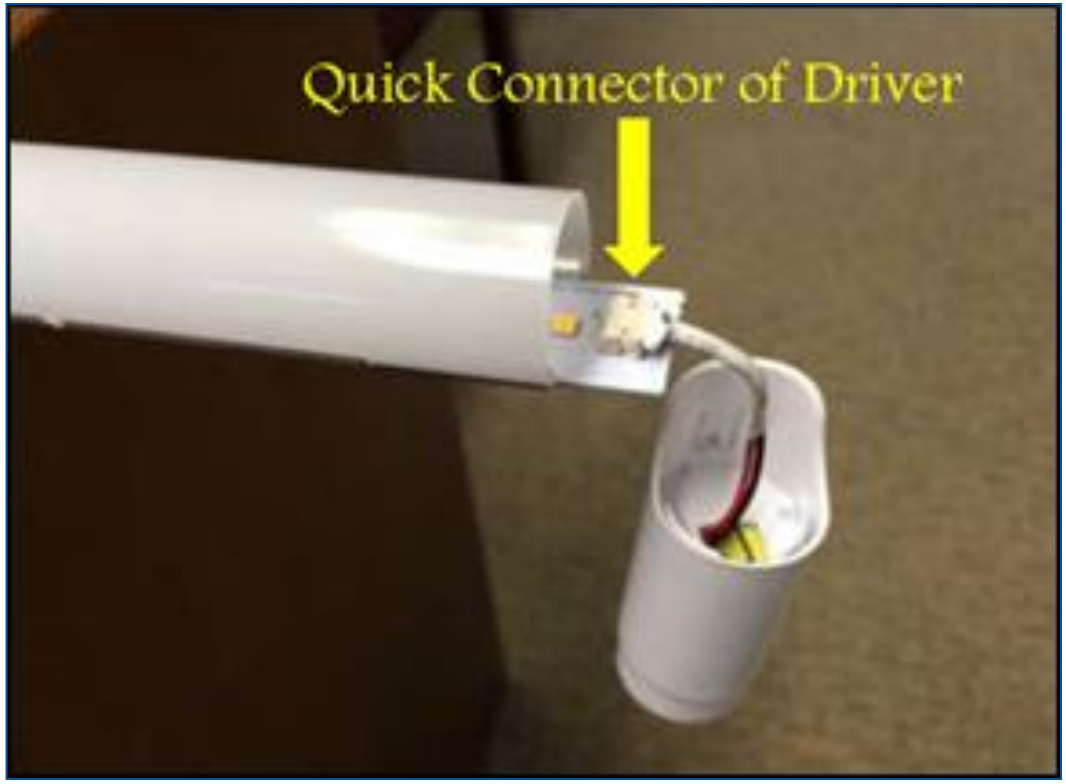


Lighting is the #1 Electricity Load Not HVAC & Still 97% Uncontrolled

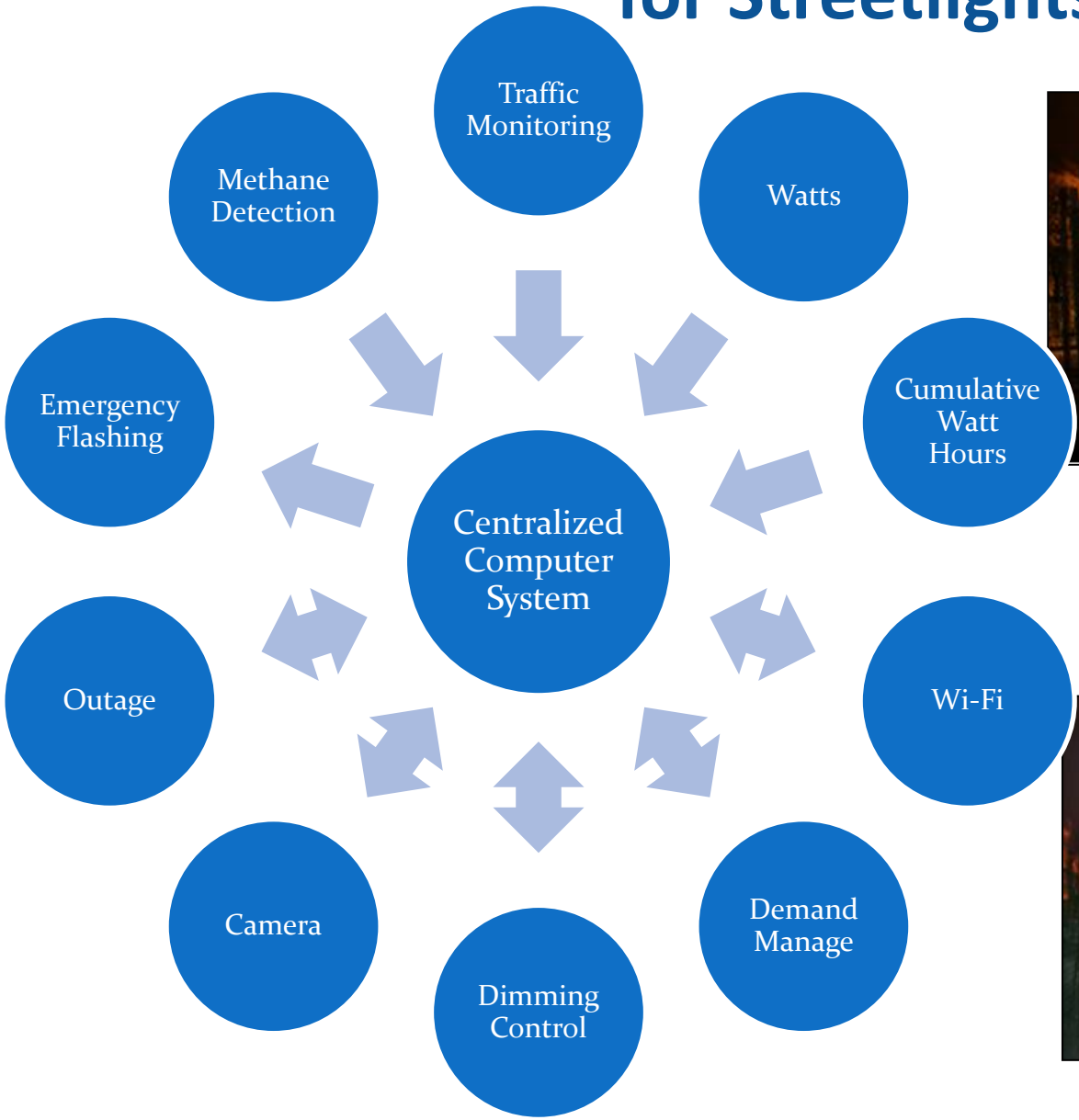


Sources: U.S. Energy Information Administration 2013, Building Energy Data Group & BOMA, 2010
BOMA Study: Lighting control reduces HVAC Load 30%

Controls and Sensors can be Integrated into Borealis Patented Chip Technology



Regulators Should Encourage Intelligent Networking for Streetlights



Before LED Streetlights

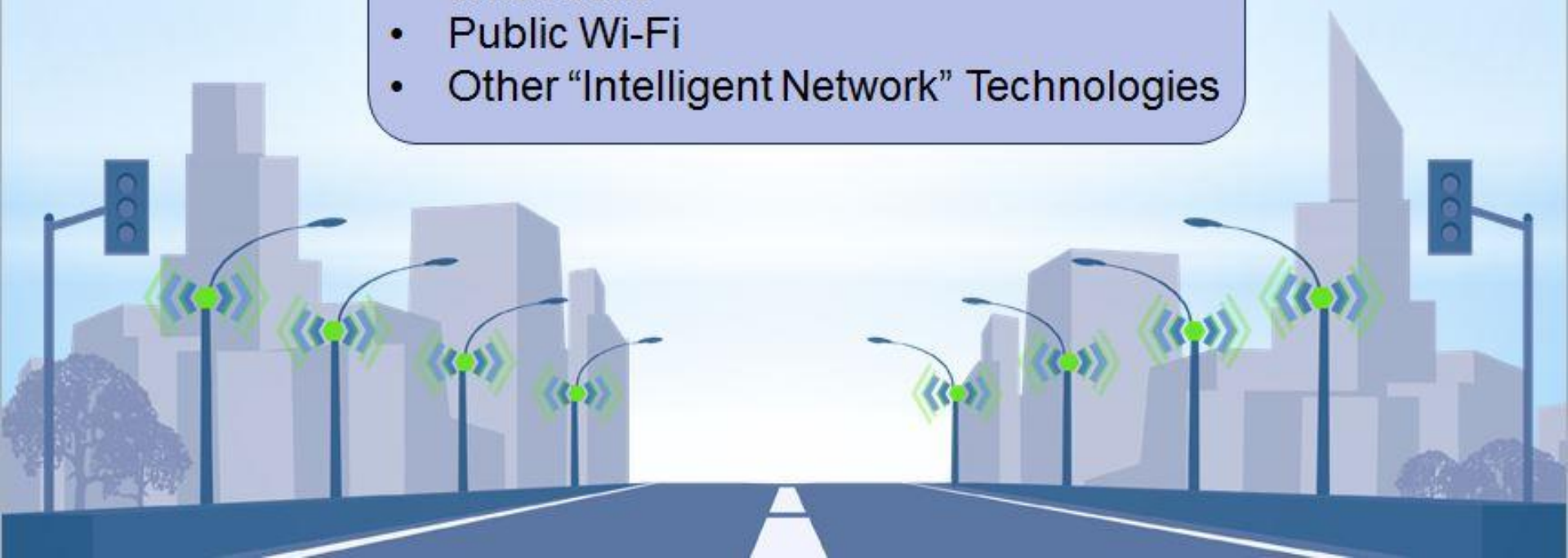
After LED Streetlights

Telecomm / Data Bandwidth Enhancement Opportunities

Street Lights as Network Infrastructure.
Municipal assets have value to network operators.

Light poles are ideal structures for distributed antenna systems

- Small cells
- Public Wi-Fi
- Other "Intelligent Network" Technologies

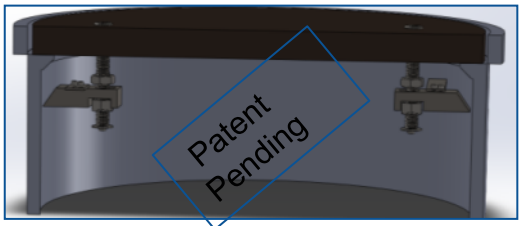


Electric Vehicle Public Transportation System

PolyBrite Streetlights integrated with WIFI, GPS and vehicle status for battery recharge into a managed system

Security Access is Vital

- Secure Access to Underground Utility and Connectivity Lines
- Secure Access to Traffic Control Signal Housings and Electronics
- Secure Access to Water Utility Meters and Lines
- Increase Utility Range, Reception, and Reliability of AMI/AMR Transponder Connectivity



Manhole Cover
Locking System

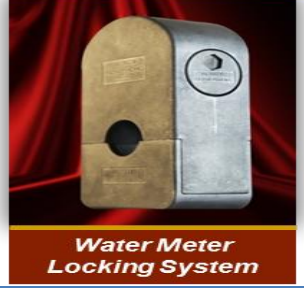
MLI-8300

Manhole Cover
Locking System

MLI-8100

Traffic Signal Cabinet
Lock

MLI-8800



Water Meter
Locking System

MLI-8000

Residential Water
Meter Extender

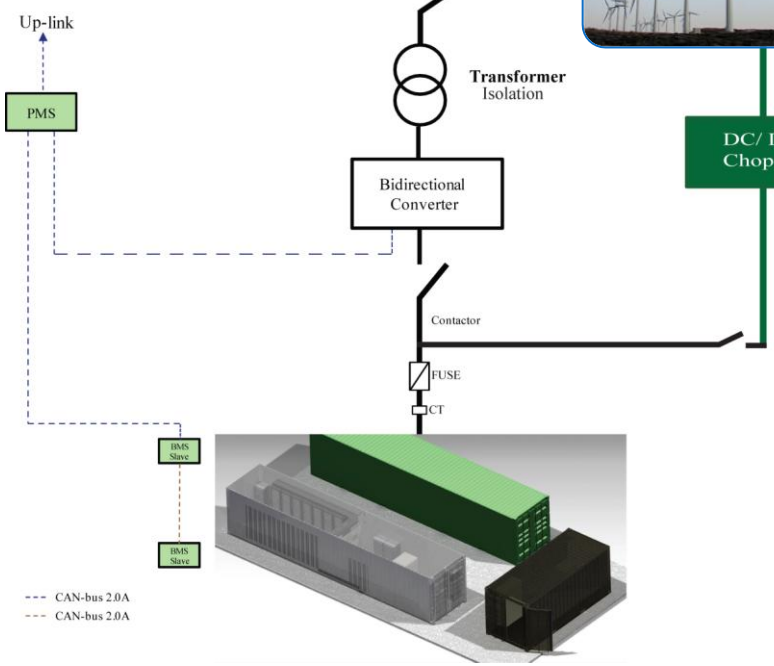
Battery Storage

Efficient Renewable

Residential Microgrid

Electric Vehicle Recharge

Utility Grid Support

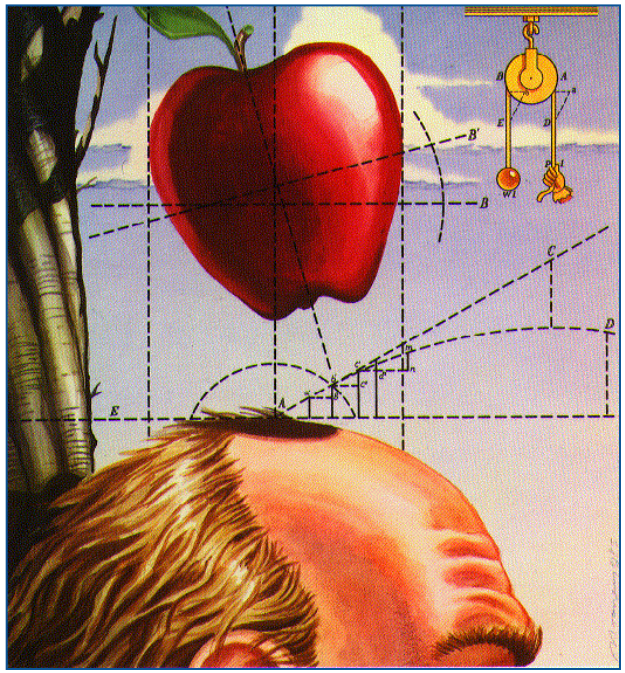


- Storage of Efficient Renewable Energy
- Reduce or Eliminate Intermittence of Supply
- Shift supply and boost transmission

Non Traditional Generation

Innovative Non-Fossil Fuel Technologies using

- Compressed Air
- Gravity
- Non Traditional Generation

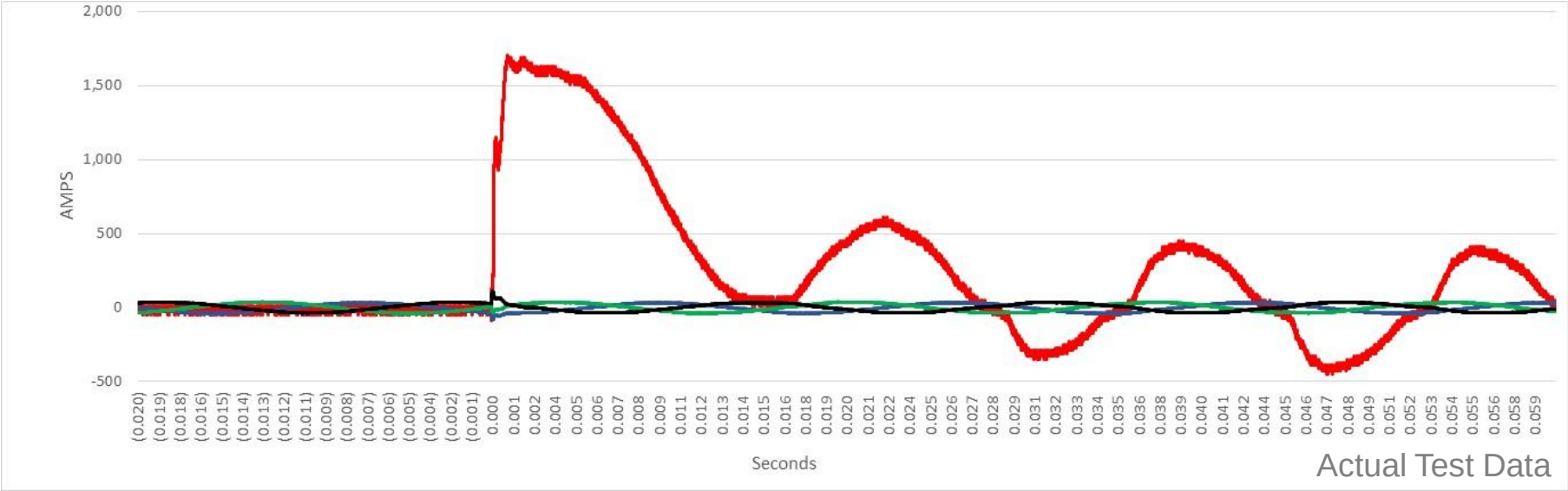


Result is amazing long-life 100% renewable Energy

Regulators must allocate funding for Pilot Projects to allow companies to obtain PPAs without giving up the rights to the intellectual property.

EMP Surge Suppression

- New technology that may prevent EMP and GMD from over saturating major transformers at power substations



With new emerging technology a surge is suppressed within a Nanosecond preventing damage to equipment

The lighting infrastructure is already there and paid for.

Which means less money is spent deploying our extensive IT based wireless network.

Lighting is already all around us, we should use telecom to make it do more than light the dark, creating a brighter greener and more energy efficient future.

NARUC

2015 Summer Committee Meetings

Impact of Telecom Technology and Policy on the Energy and Water Sectors

Kiva Allgood
Vice President, Business Development
Qualcomm Technologies, Inc.

Smart Cities

Reimagining city infrastructure

QUALCOMM®

July 2015

Smart Cities products and services are offered by Qualcomm Technologies, Inc. and/or its subsidiaries.

Qualcomm – A Leader in Wireless Connectivity

Mobile

- Smartphone App Processor
- Cellular modem share
- Wi-Fi designs with 8 of to

Smartphones

Computing

- Top 10 OEMs use our Wi-Fi
- 9 of 10 use our Bluetooth
- 8 of 10 use our Ethernet
- Qual G

Tablets, PCs, AIOs

Consumer Electronics

- Wi-Fi in eReaders
- Wi-Fi in mobile gaming
- 8 of top 10 TV OEMs use our Wi-Fi

Gaming, eReaders, DTV, STBs, PNDs

Networking

- Wi-Fi home networks
- Powerline
- Wi-Fi and PLC designs in top 5 retail OEMs
- A leader in enterprise W

Switches, Routers, Gateways, PLC, Small cell

Qualcomm Proprietary and Confidentia

The Water Crisis has been identified as No. 1 Global Impact

WORLD ECONOMIC FORUM

COMMITTED TO IMPROVING THE STATE OF THE WORLD

The Global Risks 2015 Report

The Ten Global Risks in Terms of Impact

Top 10 risks in terms of

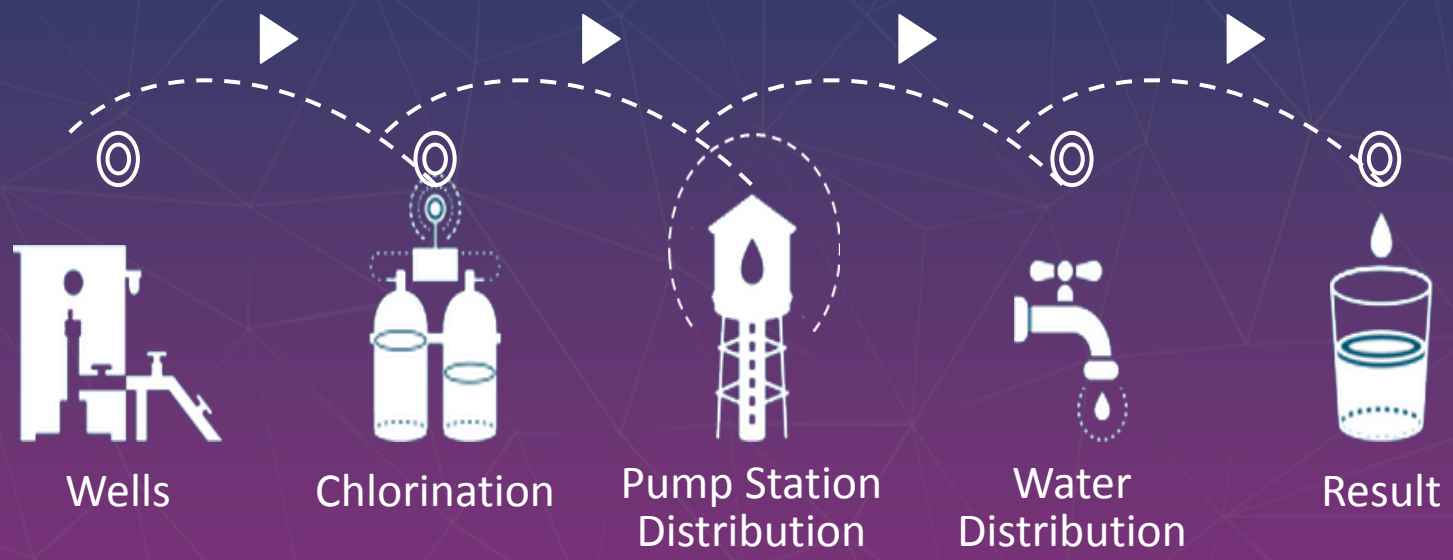
Impact

1. Water crises
2. Spread of infectious diseases
3. Weapons of mass destruction
4. Interstate conflict
5. Failure of climate-change adaptation
6. Energy price shock
7. Critical information infrastructure breakdown
8. Fiscal crises
9. Unemployment or underemployment
10. Biodiversity loss and ecosystem collapse

Categories

- Economic
- Environmental
- Geopolitical
- Societal
- Technological

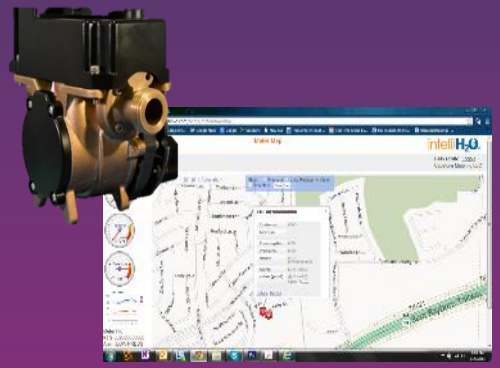
Tapping into a better system



Ensure Standardization → **Drive Interoperability** → **Add Value**

Qualcomm Proprietary and Confidentia

How can Water Loss be prevented or reduced?



1) Evaporation and Theft

2) Inaccurate or broken meters

3) Leaky Pipelines and Breaks

Evaporation: It is not practical to cover the long aqueducts of storage reservoirs where evaporation occurs. What can be done is to reduce surface area where evaporation occurs using M2M level sensors to measure surface elevation and to optimize operating levels.

Policy

Cross Agency Collaboration Required to Deliver:

- Standardized platform and data requirements to drive interoperability
- Provide proper incentives for non-revenue improvements
- Pilot Testing with innovative utilities
- Best practices

Thank you

Follow us on:

For more information on Qualcomm, visit us at:
www.qualcomm.com/smart-cities & www.qualcomm.com/blog

© 2015 Qualcomm Technologies, Inc. and/or its affiliated companies. All Rights Reserved.

Qualcomm is a trademark of Qualcomm Incorporated, registered in the United States and other countries.
Other products and brand names may be trademarks or registered trademarks of their respective owners.

References in this presentation to “Qualcomm” may mean Qualcomm Incorporated, Qualcomm Technologies, Inc., and/or other subsidiaries or business units within the Qualcomm corporate structure, as applicable.

Qualcomm Incorporated includes Qualcomm’s licensing business, QTL, and the vast majority of its patent portfolio. Qualcomm Technologies, Inc., a wholly-owned subsidiary of Qualcomm Incorporated, operates, along with its subsidiaries, substantially all of Qualcomm’s engineering

NARUC

2015 Summer Committee Meetings

Impact of Telecom Technology and Policy on the Energy and Water Sectors

NARUC

2015 Summer Committee Meetings

The Hon.

Lisa Edgar

Florida

NARUC President

NARUC

Thank you for attending the 2015 Summer Committee Meetings