Getting from Data to Intelligence

The Promise of Cloud Computing and Data Analytics

The Panel

Alex Laskey

Founder and President

Opower

Tim Healy

Co-Founder, Chairman, and CEO

EnerNOC

Eric Dresselhuys

Co-Founder and Executive Vice President

Silver Springs Networks

Linda Sullivan

Senior Vice President and CFO

American Water

Dave Kolata

Executive Director

Citizens' Utility Board

What is the Cloud?

The cloud, simply, refers to software and services that run on the Internet instead of your computer. --CNN

What is Data Analytics?

Big data analytics examines large amounts of data to uncover hidden patterns, correlations and other insights to help organizations make better decisions, operate more efficiently, and reduce costs . --SAS

A Revolution in Cloud Computing and Data Analytics

A Fourth Industrial Revolution is building. A revolution characterized by a fusion of technologies that are blurring the lines between the physical, digital, and biological spheres.

--Klaus Schwab
Founder and Executive Chairman of the World Economic Forum

ORACLE
OPOWER

Safe harbor statement

The following is intended to outline our general product direction. It is intended for information purposes only, and may not be incorporated into any contract. It is not a commitment to deliver any material, code, or functionality, and should not be relied upon in making purchasing decisions. The development, release, and timing of any features or functionality described for Oracle's products remains at the sole discretion of Oracle.

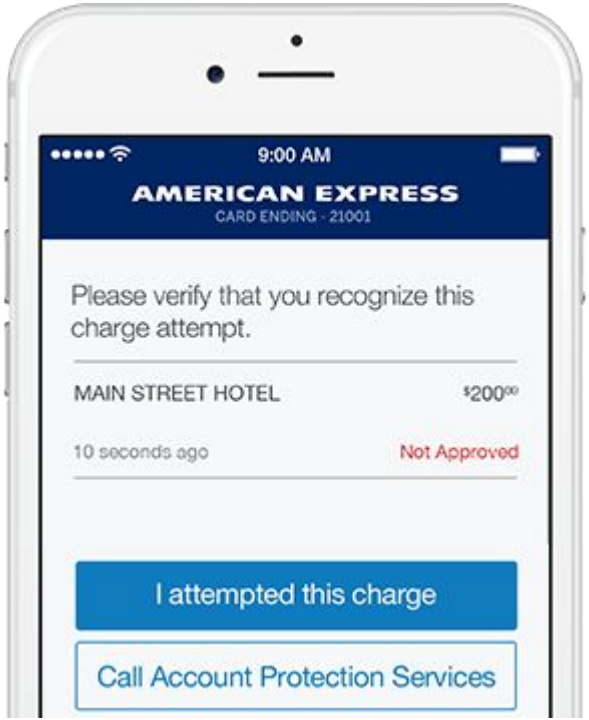
A simple definition of “SaaS”

“Software as a service (or SaaS) is a way of **delivering applications over the Internet**—as a service. Instead of installing and maintaining software, you simply access it via the Internet, freeing yourself from complex software and hardware management.”

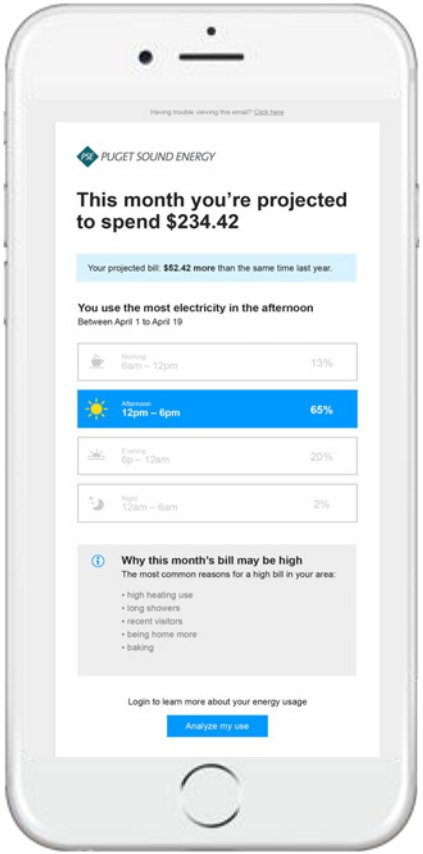
Until recently, technology didn’t use the cloud

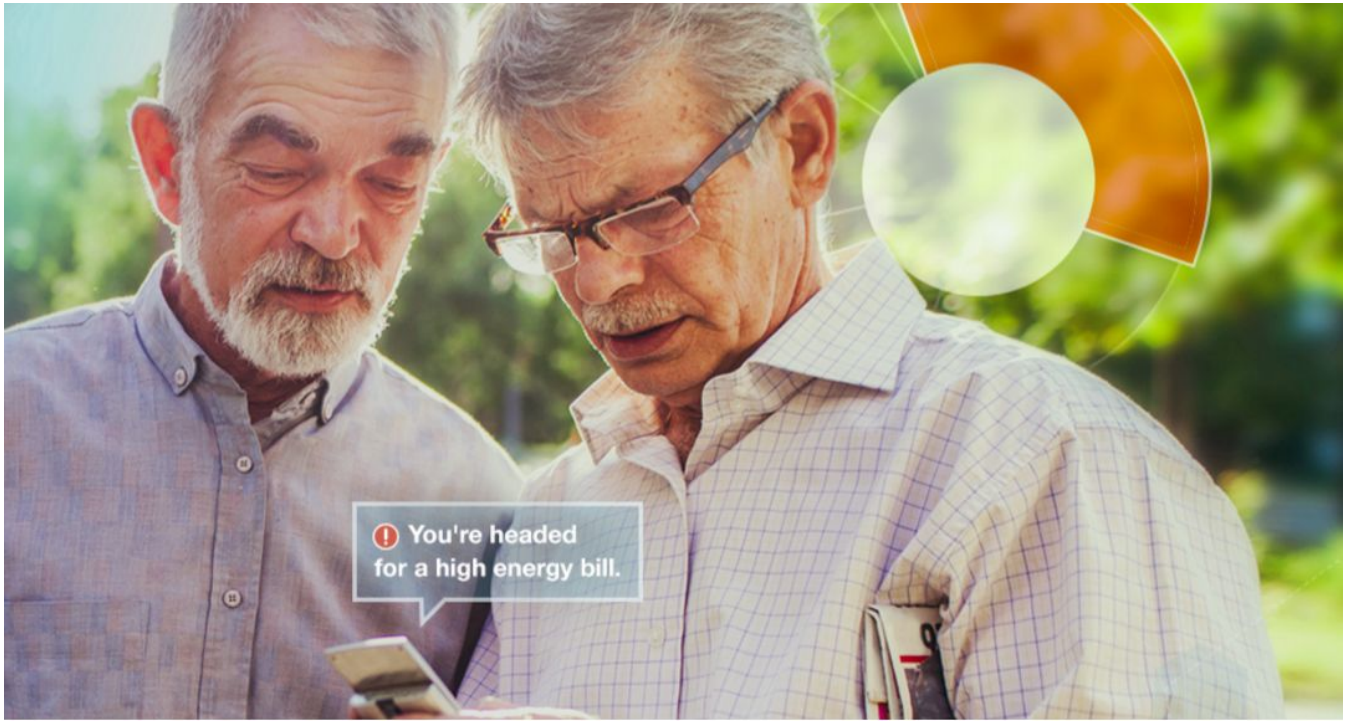
Now, we all have experience with the cloud

The cloud helps deliver tools that protect customers and businesses



Utilities are just starting to offer similar services

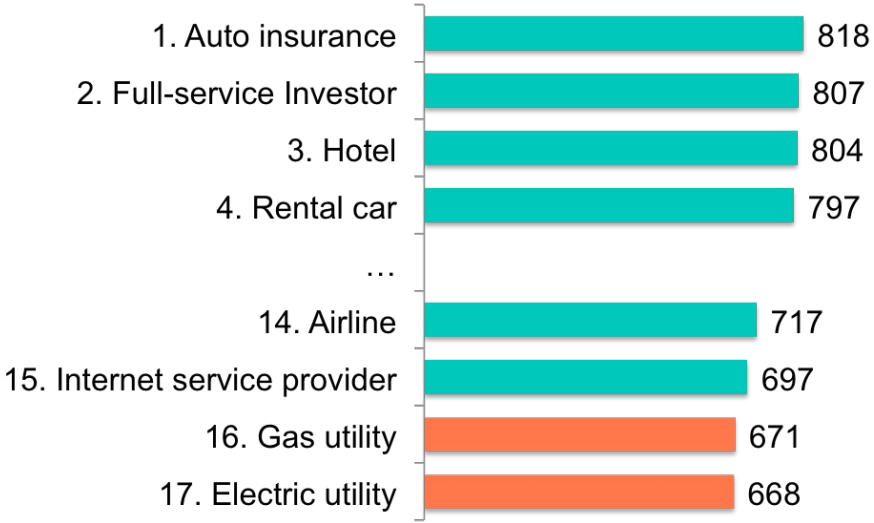




The cloud can help meet customer expectations

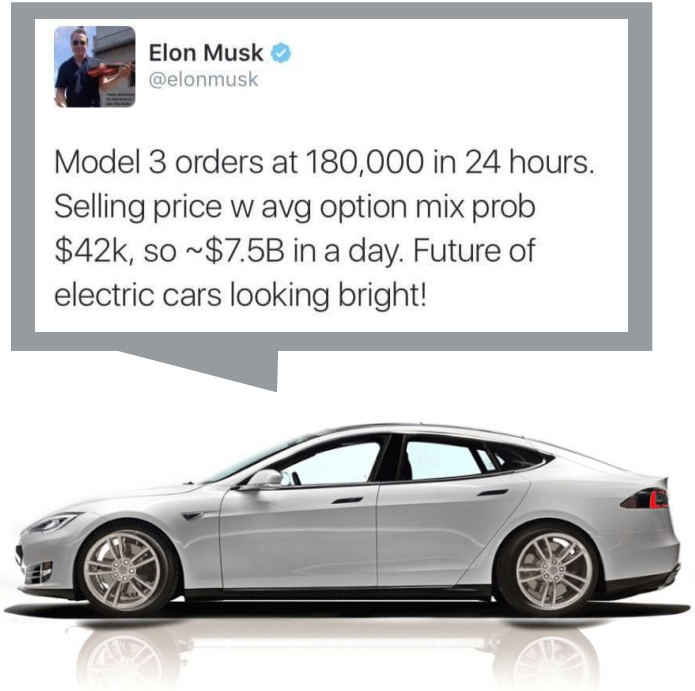
Customer service expectations have changed

2015 Overall Customer Satisfaction Index

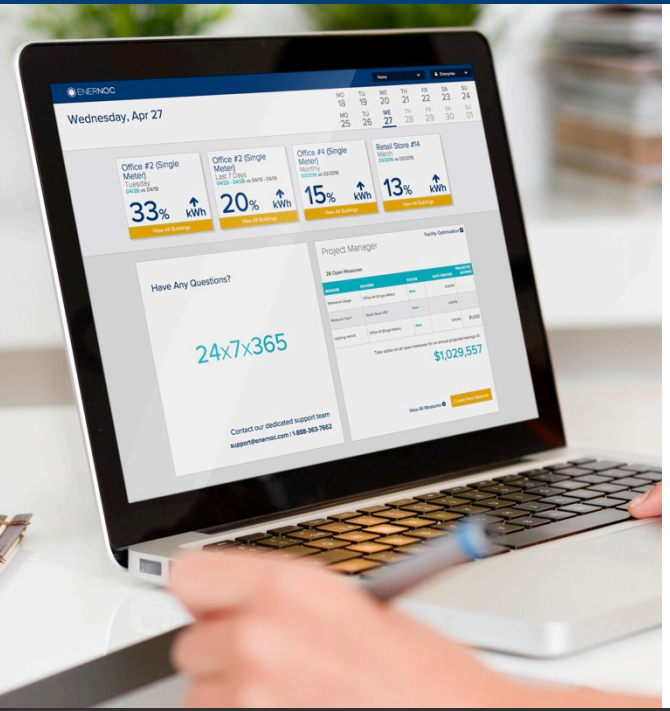


Source: JD Power and Associates

Customers are embracing new technology



EnerNOC at a glance



Proven Customer Track Record

- 1,000 software subscription customers
- 2,000+ procurement customers
- 5,000+ demand response customers
- US $1 billion+ in customer payments/savings to date
- Market leader in demand response

Full Value and Technology Offering

- Energy intelligence platform and applications
- Combines technology, professional services, and market access
- 24x7x365 Network Operations Center & customer support

World Class Team and Resources

- US $400M revenue in 2015
- Present in 100+ countries
- Offices in 12 countries
- More than 1,300 employees
- Publicly traded on the US NASDAQ (ENOC) exchange

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Technological breakthroughs

Radical transparency

Climate change and resource scarcity

Demographic shifts

Evolution of energy markets

New and emerging energy technologies

New forces are changing the business landscape

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NARUC Summer 2016

Getting from Data to Intelligence

Eric Dresselhuys, EVP and Co-Founder, Silver Spring Networks

Silver Spring NETWORKS

Data vs. Intelligence vs. Control

- The number and diversity of data sources growing rapidly
- Significant operational, quality and security value today
- Opportunities expanding faster than we are digesting them

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IoT is a Broad Application Space

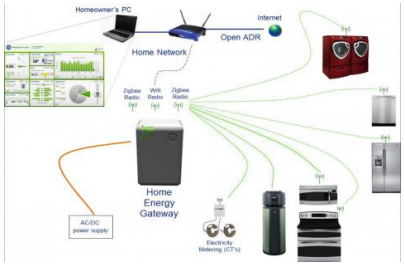
Mobile / Telemetry

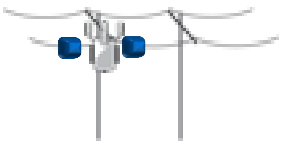
PAN / Wearables / Consumer

IoT Networking Space

Consumable IoT

Critical Infrastructure / Durable IoT





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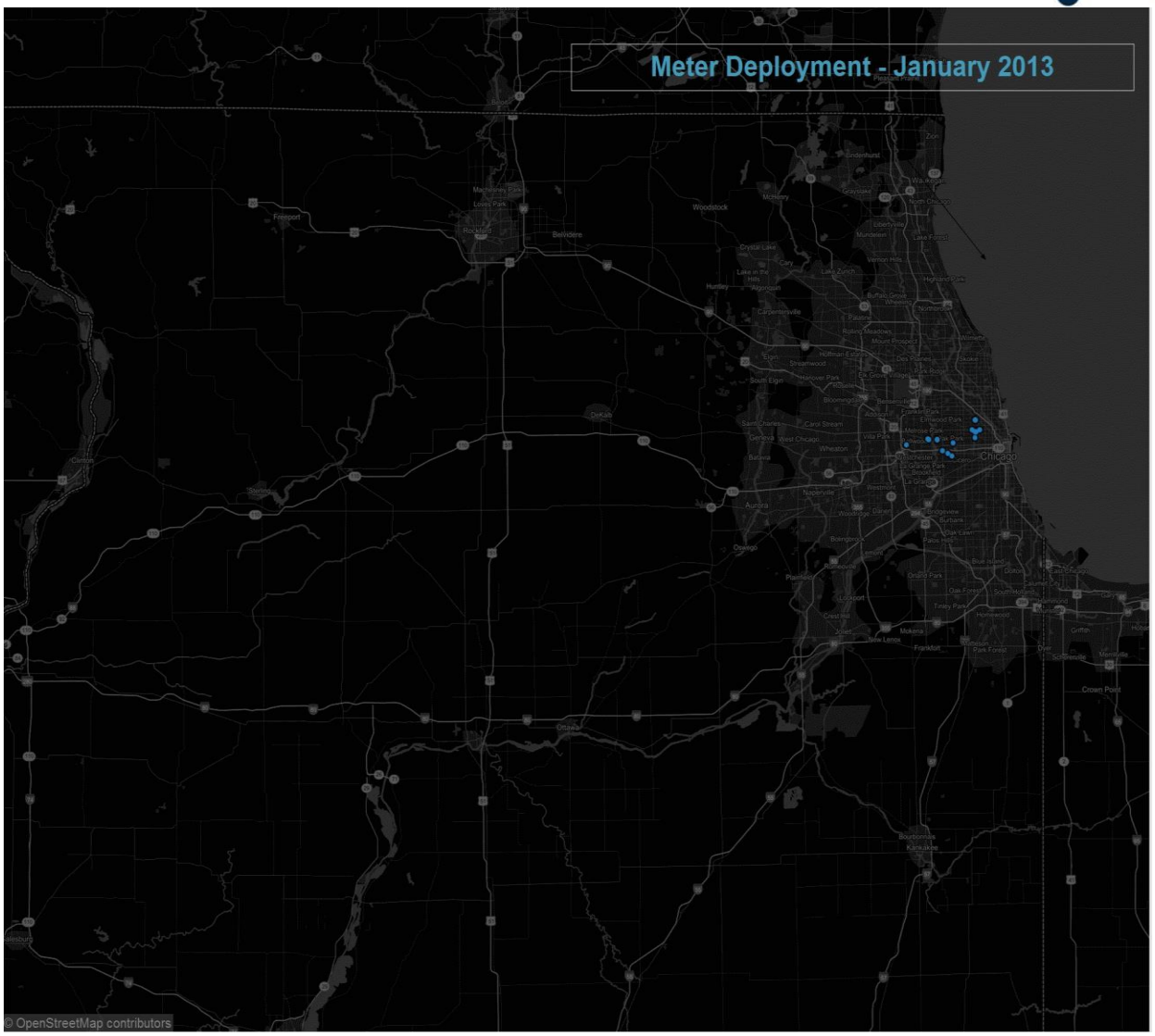
IoT Device Deployment

ComEd
An Exelon Company

- Over 2M Devices in 3 years
- Beginning 1/2013
- Current 6/2016
- Avg 55k/month

- Overtime – easy to imagine 8 utility connected devices per customer



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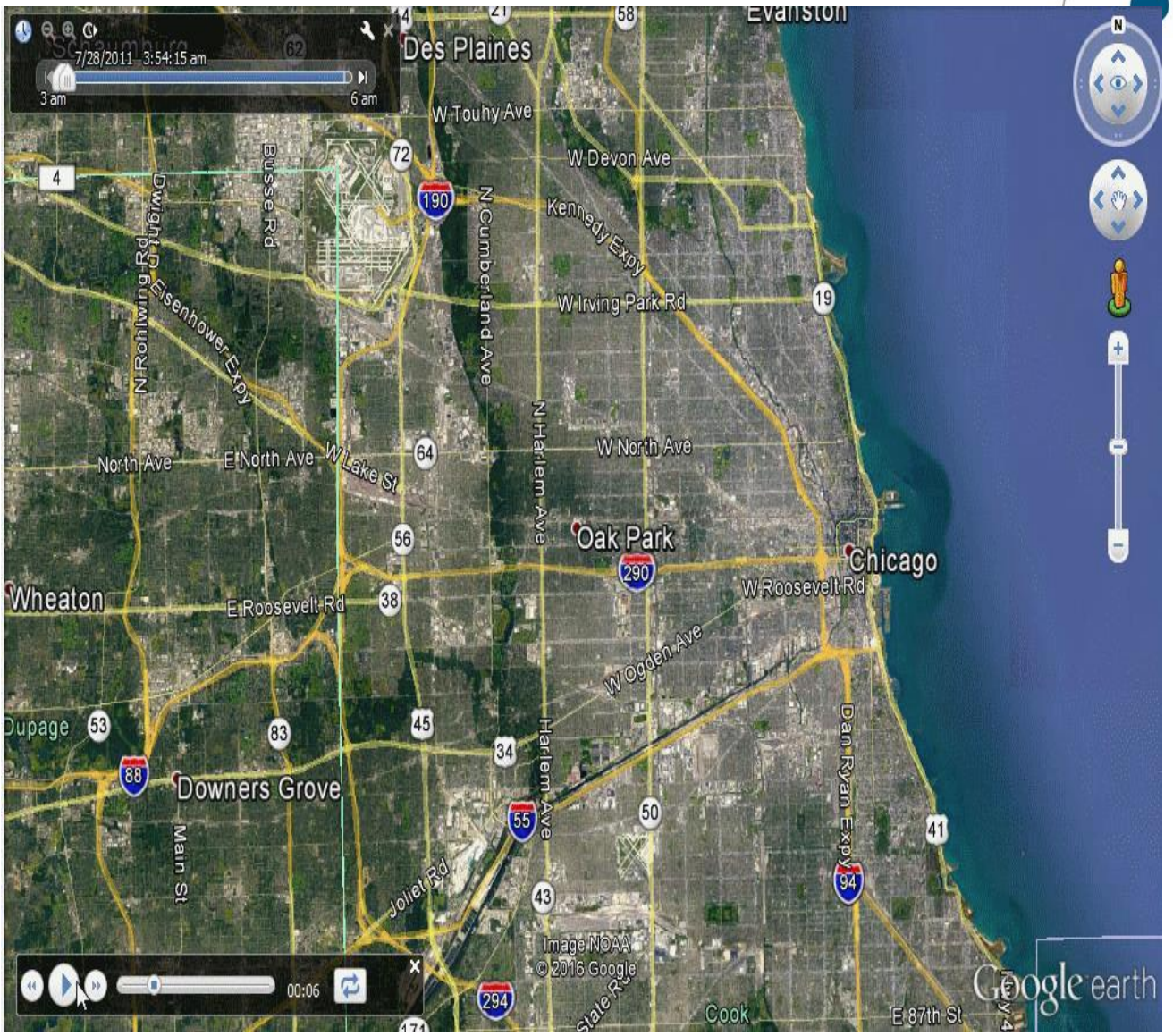
Monitoring / Controlling Restoration

ComEd
An Exelon Company

- Thunder Storm
- Yellow pins =
  - Lightning strike
- Red pins = Smart meter lose power
- Green pins = Smart meter power restored
- Reclosers rapidly isolate fault and restore

- Remaining red pins show permanent damage



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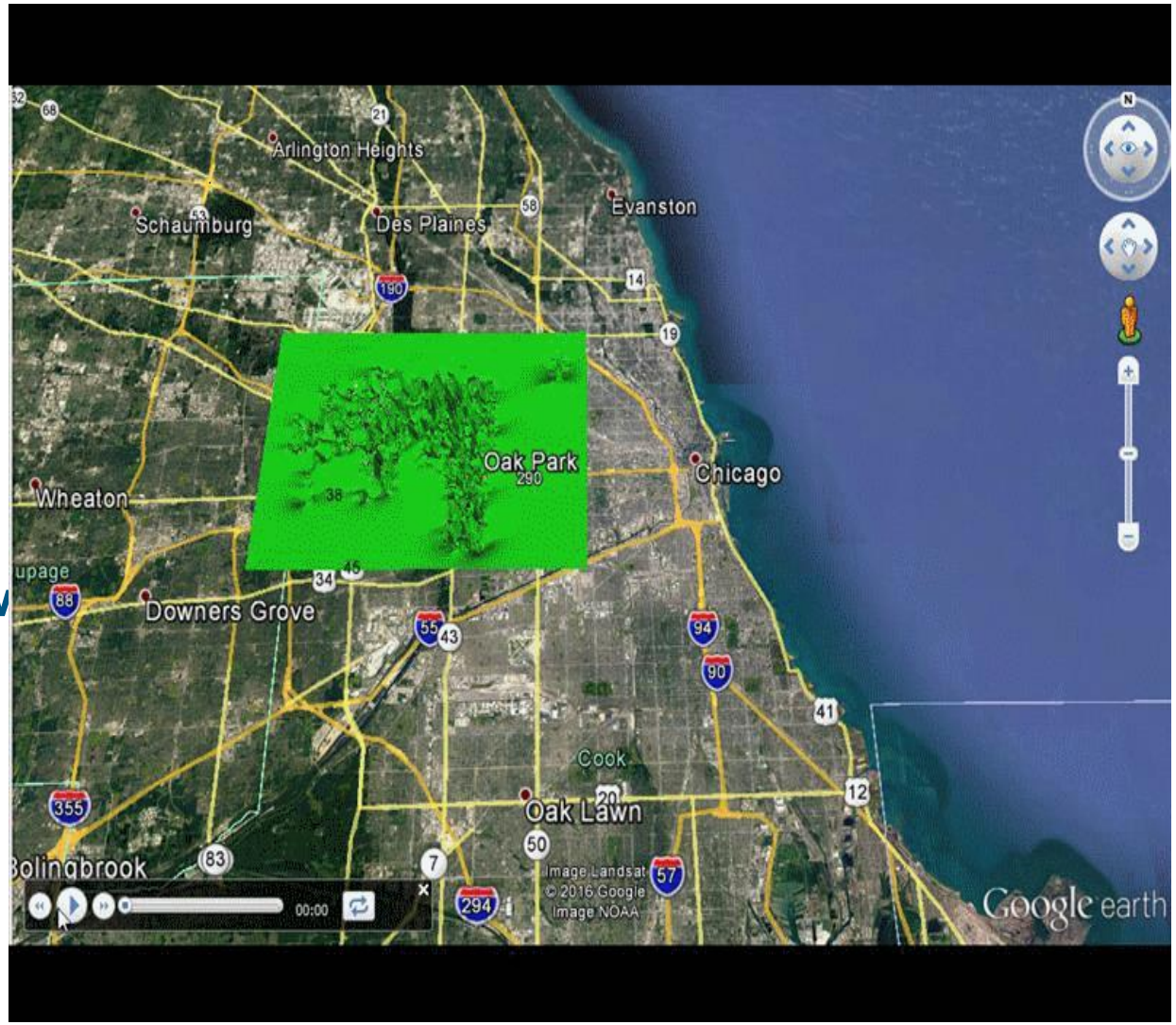
Voltage Sag/Swell Analysis

ComEd
An Exelon Company

Silver Spring Networks

- Hot Summers Day
- Voltage from all smart meters
- Baseline 240 volts
- Swell above baseline
- Sag below baseline
- One area especially low
- Truck rolled to identified area
- Tap Changing Transformer Failure



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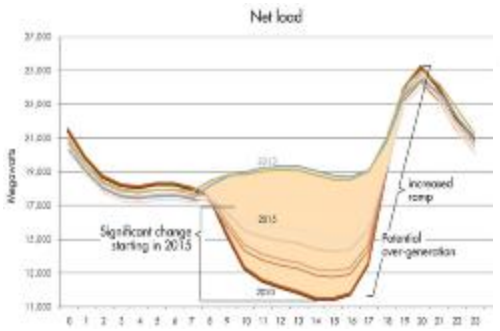
Solar Monitoring Maui



- Daily Energy Flow
- Green –> to home
- Red <– from home
- Only 8AM-4PM
  - Angle of roof
- Creates “Duck” curve
- Peak @ 7PM

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Challenges / Opportunities

- Pace of technical innovation > Pace of utility adoption
- Rate making / procurement struggle with ‘futures’
- Technology always outruns regulation

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Getting from Data to Intelligence

Linda Sullivan
Executive Vice President and Chief Financial Officer
American Water

NARUC Summer Meeting
July 26, 2016

Getting from Data to Intelligence: The Utility Perspective

Vision of Advanced Water & Wastewater System:

- *Customer centric intelligent & resilient system that integrates infrastructure assets with advanced technologies to enable a more real-time and predictive end-to-end view of the business*

Why it Matters:

- *To enable safe, secure, reliable, and affordable water and wastewater delivery for our customers and the public*

Customer Centric Intelligent & Resilient Utility

AMERICAN WATER

SOURCE OF SUPPLY
- Source water sensors & monitoring

DISTRIBUTION
- Geo Located (GIS)
- Connected sensors for leak detection
- Flexible AMI and District Metering

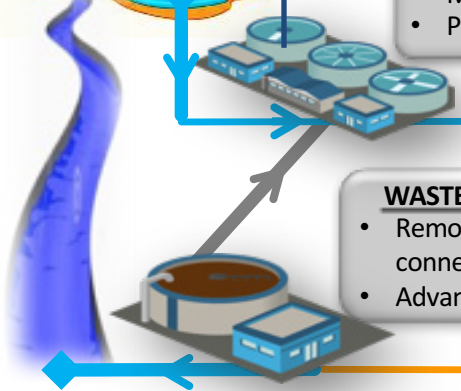
FIELD WORKER
- Digital field worker; mobile applications
- Mobile access to visually mapped work, assets, safety info and customers

CUSTOMER
- Usage management
- Self service
- Outage, usage and leak notification
- Customer segmentation

WATER TREATMENT
- SCADA systems, remote and automated sensors
- Mobile operators
- Plant analytics

FLEET
- Vehicle analytics
- Location awareness

EMPLOYEE / WORKFORCE
- Safe Working Environment
- Real-time Collaboration



WASTE WATER TREATMENT
- Remote, automated, & connected sensors
- Advanced treatment & Reuse

Environment & Water Quality
- Integrated Environment, Health and Safety system
- Remote mobile water quality management

REMOTE FACILITY
- Integrated sensors
- Real time hydraulic model
- Asset management & predictive maintenance

ENABLING TECHNOLOGY

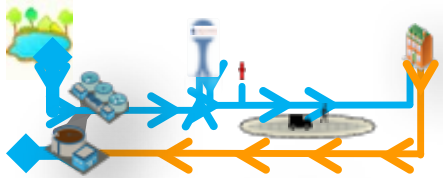
Networks, Integration, Cloud, Big Data Analytics, Mobile, Security

Big Data Analytics and the Cloud are key enablers for the Advanced Water System

Value

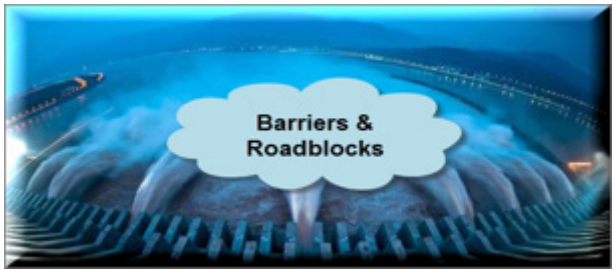
Data

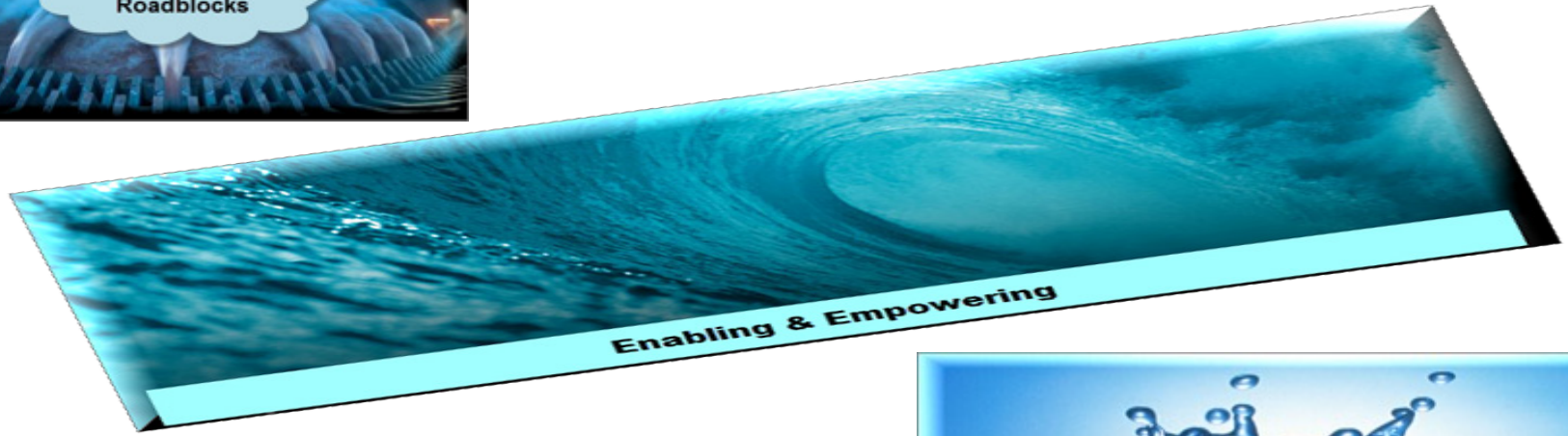
Customers, Employees & Public



- Provide proactive water cycle awareness to the public, customers and employees
- Enable innovation and real time information for business optimization
- Enhanced environmental sustainability and improved employee and public safety

Regulatory Policies Enabling Vision and Value





GETTING FROM DATA TO INTELLIGENCE

POTENTIAL CONSUMER BENEFITS OF CLOUD-BASED COMPUTING

DAVID KOLATA, EXECUTIVE DIRECTOR, CITIZENS UTILITY BOARD (CUB)

NASHVILLE, TN: JULY 26, 2016

IT SYSTEMS - PROBLEMS & OPPORTUNITIES

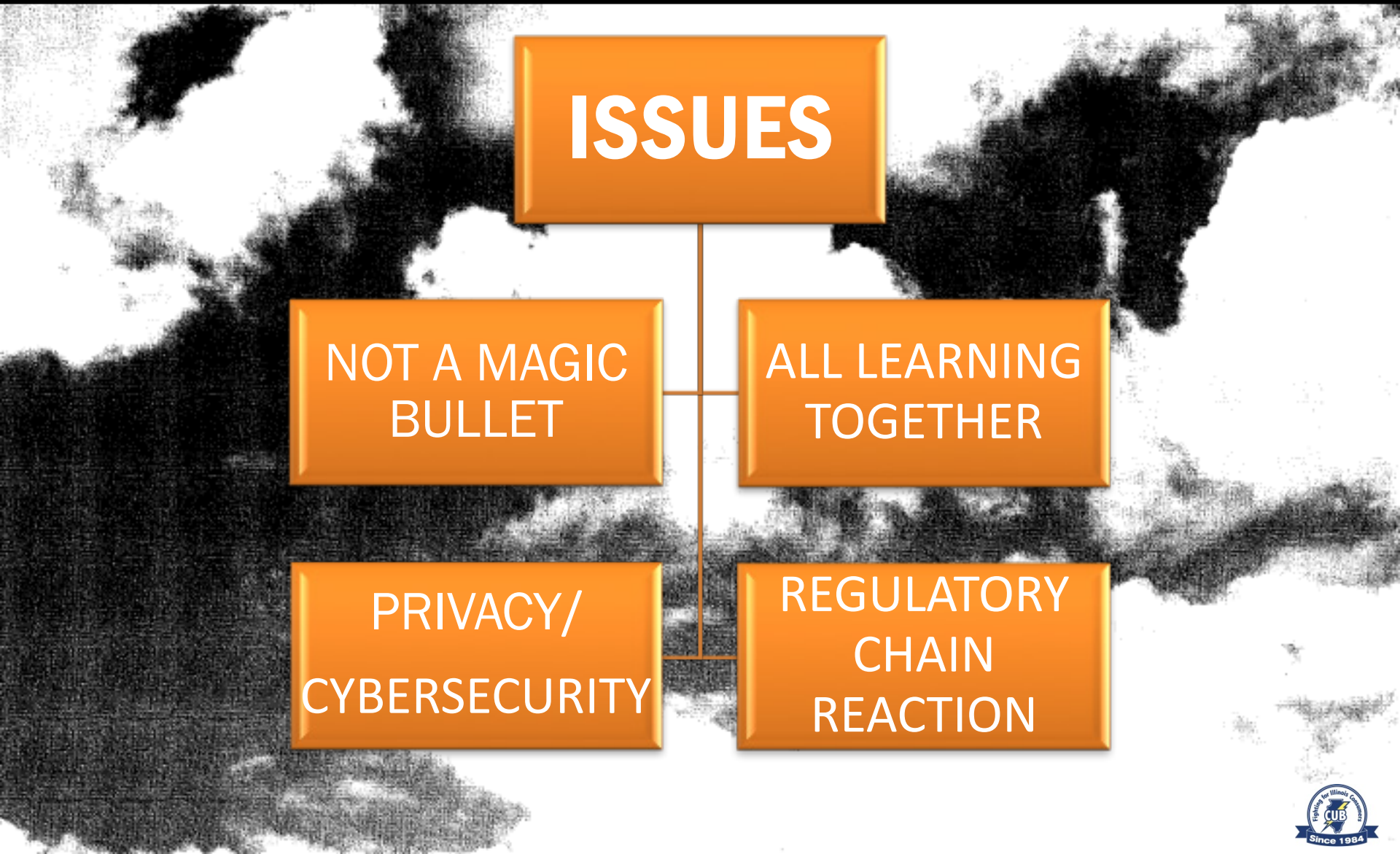
THE PROBLEMS

- ANTIQUATED
- EXPENSIVE
- CLOSED
- PROPRIETARY

THE OPPORTUNITIES

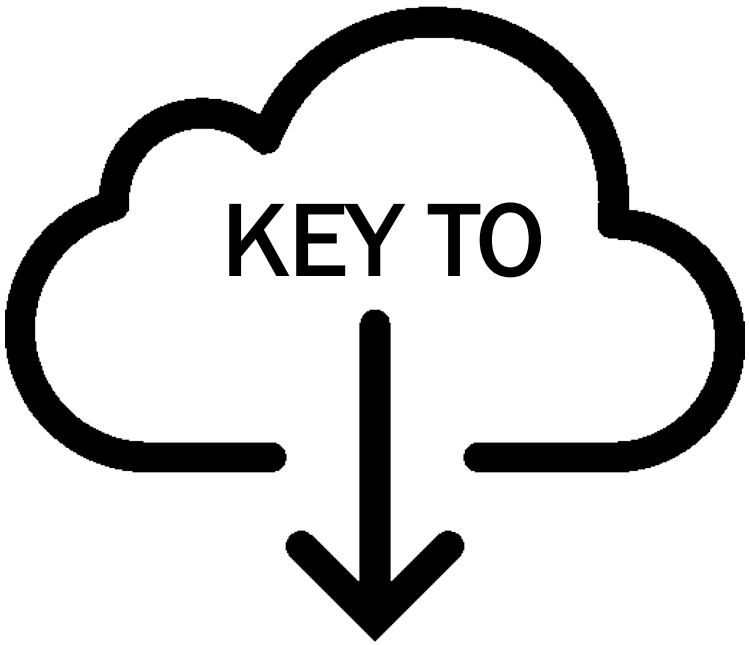
- CHEAPER, MORE FLEXIBLE
- NO NEED FOR EXPENSIVE HARDWARE
- NOT TETHERED TO PHYSICAL LOCATION
- MORE POWERFUL ANALYTICS
- IMPROVEMENTS TO SERVICES

THE CLOUD –UNDERLYING CHALLENGES



THE CLOUD - WHY DO WE CARE?

NEW SERVICES, IoT & DATA ANALYTICS



A LEAST-COST FUTURE