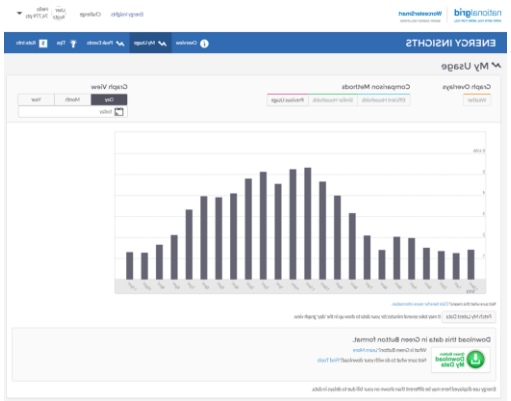
National Grid's Smart Energy Solutions Program



Bill Jones
Director, Smart Energy Solutions Program

Background of Worcester Pilot

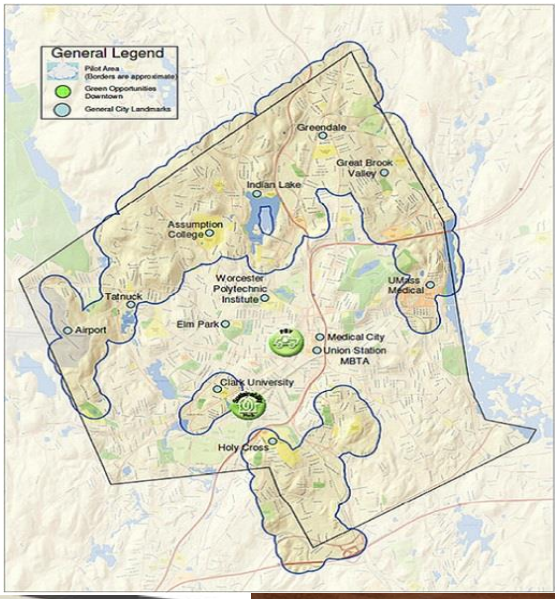
nationalgrid

- Pilot was a legislative mandate in Massachusetts (Section 85) from the 2008 Green Communities Act
- A specific objective of the pilot is to reduce, for those customers who actively participate in the pilot, peak and average loads by a minimum of 5 per cent
- The pilot programs were required to
  - utilize advanced technology to operate an integrated grid network communication system in a limited geographic area,
  - utilize advanced (“smart”) meters that provide real time measurement and communication of energy consumption,
  - implement time of use or hourly pricing for commodity service,
  - automated load management systems embedded within current demand-side management programs and
  - remote status detection and operation of distribution system equipment.

Worcester, Massachusetts
Smart Energy Solutions

nationalgrid

- Electric Distribution Scope
  - Eleven 13.8 kV Feeders have 188 distribution automation devices
  - Five Substations with various levels of automation
  - Mix of urban/suburban areas with OH and UG construction
  - Advanced Distribution Automation
  - Advanced Capacitor Controls
  - Advanced monitoring of Feeder, Transformer, DG, Solar and EV sites
- Customer Offerings
  - Customer Opt-out program
  - Time of Use Rate Plans with Bill Protection
  - AMI meters - 15,000 meters with remote reading capabilities
  - Web portal to access interval usage data
  - Home energy management devices/tools available
  - Sustainability Hub
  - Outreach and Education Program
  - Demand Response Capabilities
- Communications
  - Home Area Network (HAN) – Zigbee and WiFi
  - Local Area Network (LAN) – RF Mesh and cellular
  - Wide Area Network (WAN) – WiMAX and cellular



Customer Information Access

- For the Pilot, we support customer access to their usage information through:
  - web portal,
  - in-home energy tools,
  - mobile devices,
  - Green button download my data,
  - On-demand read feature, and
  - through email or paper reports

- For all customers, we provide customer usage data, following the requisite policies and procedures, for the following purposes:
  - Customer Choice (ESCOs) Enrollment
  - Energy Efficiency Programs
  - Community Aggregation

Data Analytics

nationalgrid

- For the pilot, we are collecting the following customer meter data:
  - Consumption Data - Interval data (kWh delivered), whether it be 5 or 15 minutes
  - Voltage Data - The voltage data are 5 or 15 minute readings which include kVarh, Voltage by phase (average, min, max), kWh delivered.
  - Outage Data - Meter alarm or event files
  - Other - Meters are configured differently based on whether it is commercial, residential, net-metered, etc. Other data points vary, but include items, such as the Max KW delivered, Max VA delivered, Vah delivered

- We maintain a customer data repository and a meter data analytics repository
  - Customer repository supports pilot evaluation and analysis of customer experience and results
  - Meter data analytics supports evaluation of the following use cases:
    - Identify High or Low Voltage Trends on Circuits
    - Troubleshoot and Resolve Voltage Related Customer Complaints
    - Volt-VAR Optimization/Conservation Voltage Reduction (CVR)
    - Meter Phase Identification and Meter-to-Transformer Connectivity
    - Identify Transformer Winding Failures
    - Strategic Monitoring via Bellwether Meters

Energy Profiler Online

nationalgrid

- Provides customers, who have interval data meters, with a tool to access a facility's interval load data and day-ahead hourly energy prices via the Internet.

- Energy Profiler Online™ (EPO) allows you to understand how your electricity is used within your operation over time.
  - Review load shapes by day, week and month, and compare them with the hourly energy supply prices for that particular time interval
  - Improve your budgeting and reporting capabilities
  - Password protected—you decide who can access and review the information
  - Manage your energy consumption—identify what's normal and abnormal usage
  - View load profiles, usage history and information for multiple sites from previous months or years
  - See the results of your energy efficiency and conservation efforts at each site
  - Data export capabilities
  - Shift your energy usage to lower-cost time periods and move dollars to your bottom line
  - Use the load data information as a guide for shopping wisely with power suppliers

Energy Profiler Online

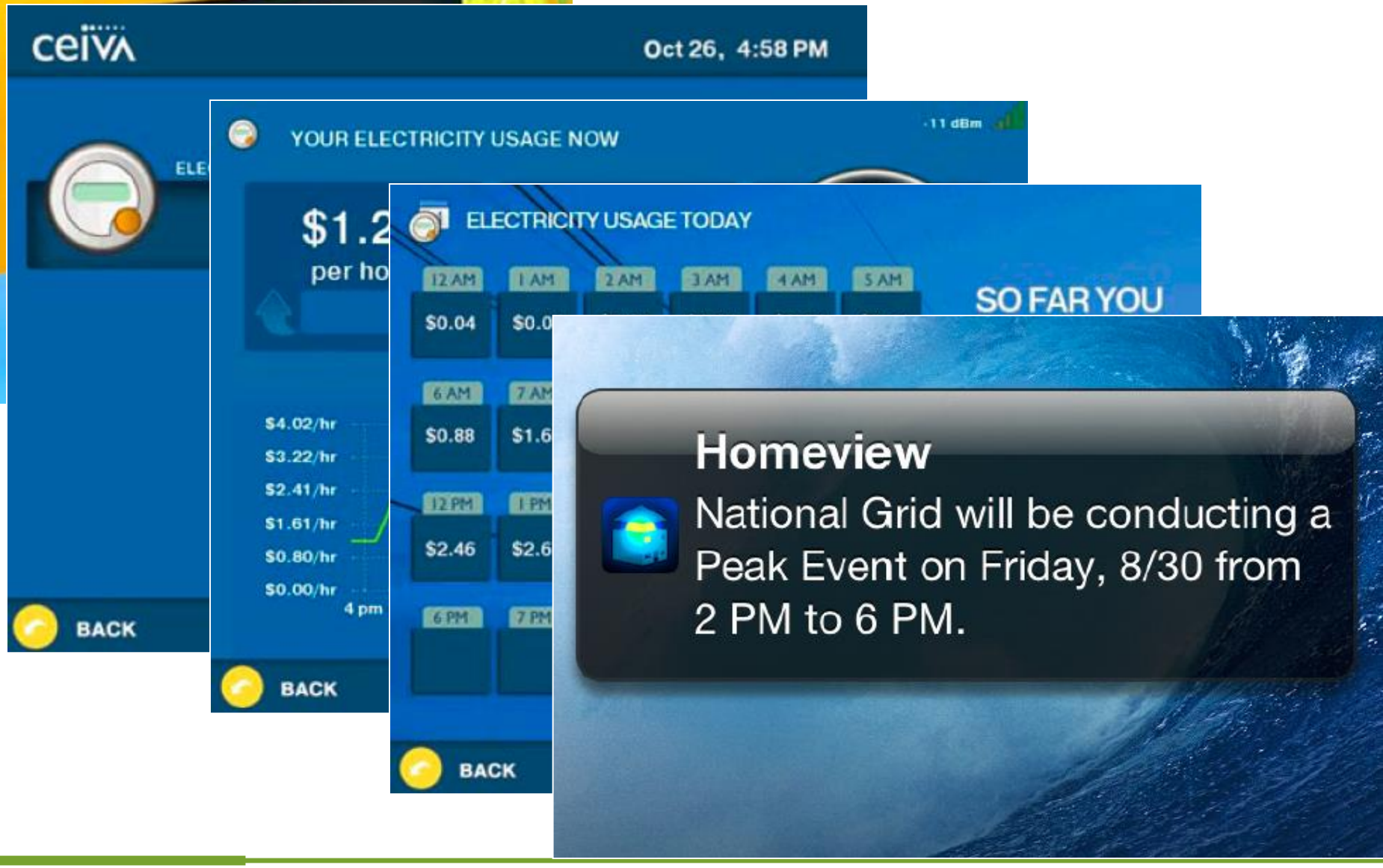
nationalgrid

Jurisdiction	Customer Eligibility	Installation Options	Subscription Cost	Non-Subscription Fees
Massachusetts **MDPU No. 1170**	Available to **customers receiving "metered retail delivery service"** from Mass. Electric. Includes cust. receiving service under Optional Enhanced Metering Service" or customers receiving metered retail delivery service who have a company owned IDR at their site.	**Option 1 – Complete Service** - Modem equipped service with remote reading provided and installed by NG. **Option 2 – Modem Service** - Pulse interface device through which customer can access meter data. Cust. Must purchase, own and maintain equipment.	➢ $154/yr for the first account ➢ $76.89/yr. for each additional account	➢ First request on an account during the year – Free ➢ 2nd Request on the same account in the same year - $83 ➢ Additional request made for other accounts at the same time if it is not the first request- $6.41
Narragansett **RIPUC No. 1155**	Available to **nonresidential customers** receiving metered retail delivery service. Includes nonresidential cust. receiving service under "Optional Enhanced Metering Service" or customers receiving metered retail delivery service who have a company owned IDR at their site	**Option 1 – Complete Service** Modem equipped service with remote reading provided and installed by NG. **Option 2 – Pulse Service** Pulse interface device through which customer can access meter data. Cust. Must purchase, own and maintain equipment.	➢ $321/yr for the first account ➢ $275/yr. for each additional account requested at the same time.	➢ First request on an account during the year – Free ➢ 2nd Request on the same account in the same year - $69 ➢ Additional request made for other accounts at the same time if it is not the first request- $23
New York **PSC 220, Section 25.2 and Section 25.1.1.1**	Customers who met the requirements of PSC 220 – Section 25.1.1.1 quality for Customer-Requested Enhanced metering. Section 25.1.1.1 includes those customers who have demands of 50kW or greater for 2 consecutive months during the most recent 12 consecutive months. The regulations for enhanced metering are defined in PSC 220 – Section 25.2.	➢ Customer may request NG to install pulse output initiators and power monitoring equipment at the point of delivery. ➢ Customer may request NG to install PSC-approved hourly interval recorders with remote reading capability even if it is not required by NG for billing purposes. All equipment referred to above is considered "enhanced metering."	➢ Annual subscription is $600/yr. for each account.	Not applicable. There is nothing in the tariff that requires NG to provide any interval data to customers who are not signed up for an EPO subscription.

EXAMPLES OF CUSTOMER DATA ACCESS

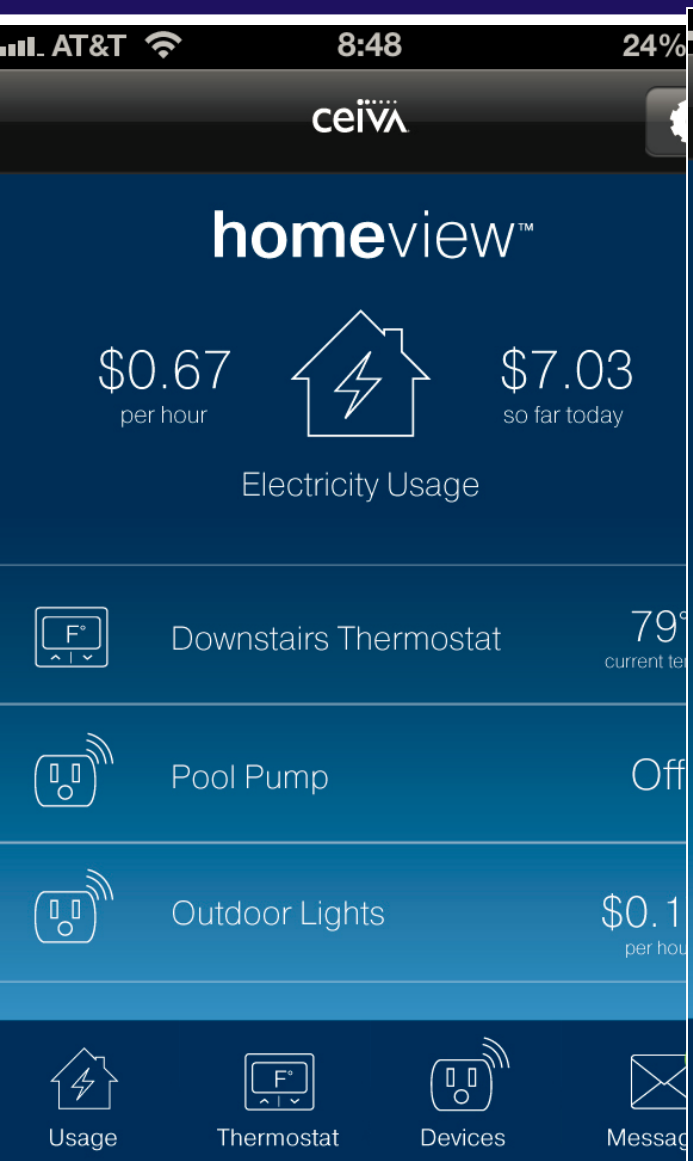
Digital Picture Frame with Energy Use Info

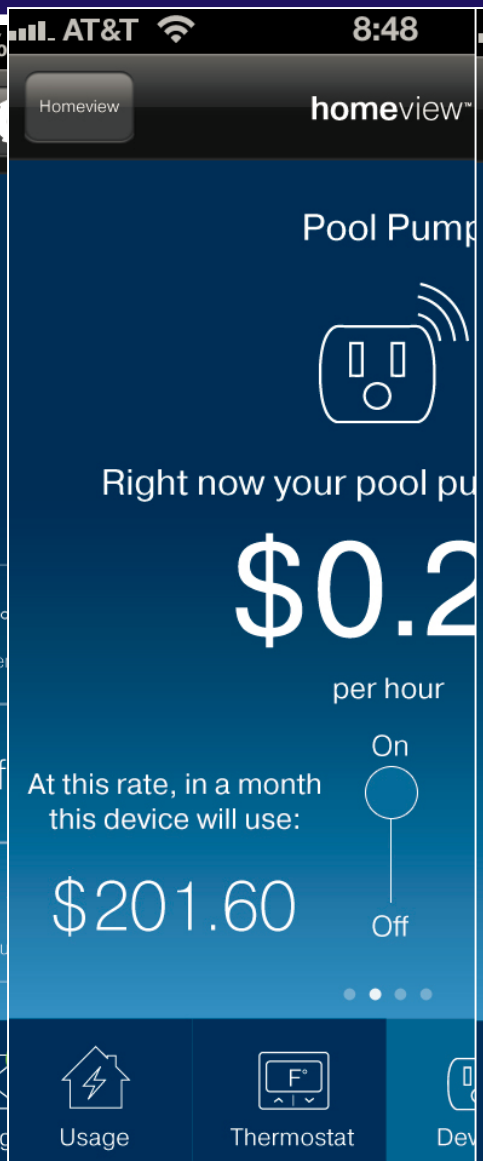
nationalgrid

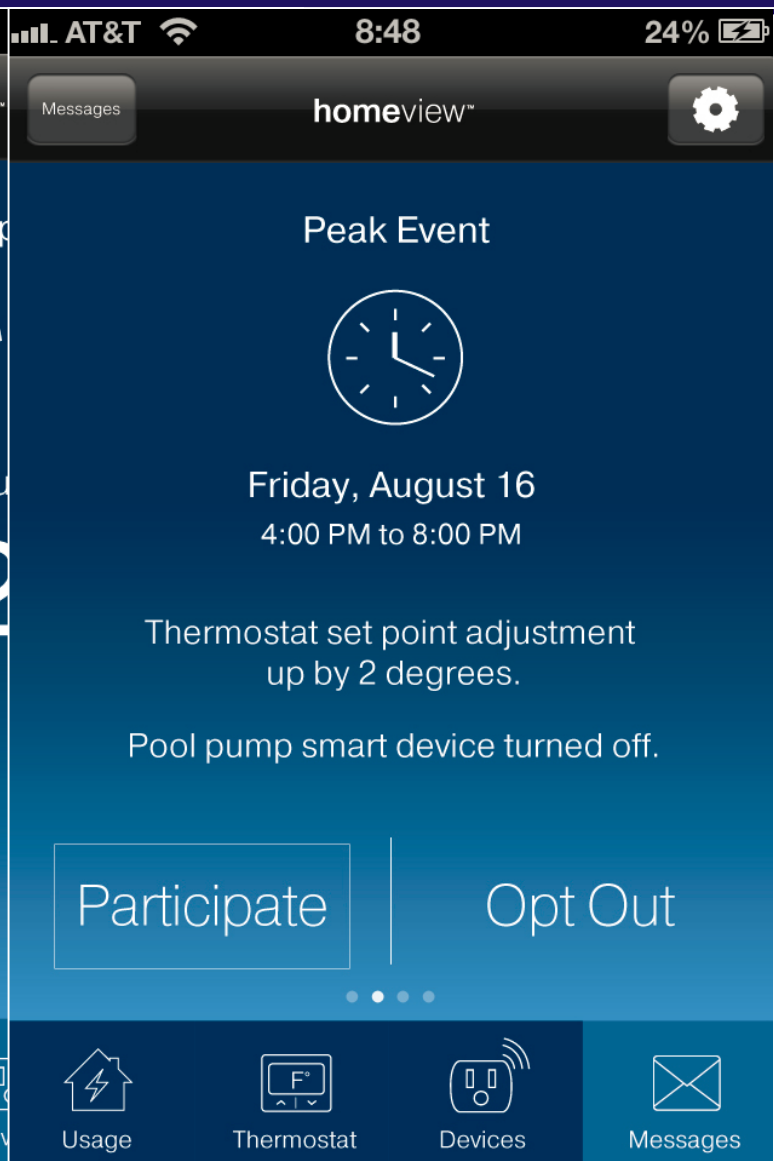


Mobile Solutions

nationalgrid







National Grid Web Portal

Electric usage | Electric service cost

Graph view | Table view

Zoom: 3m 6m YTD ◂ Previous months Next months ▸

Show estimated meter reading

Electricity

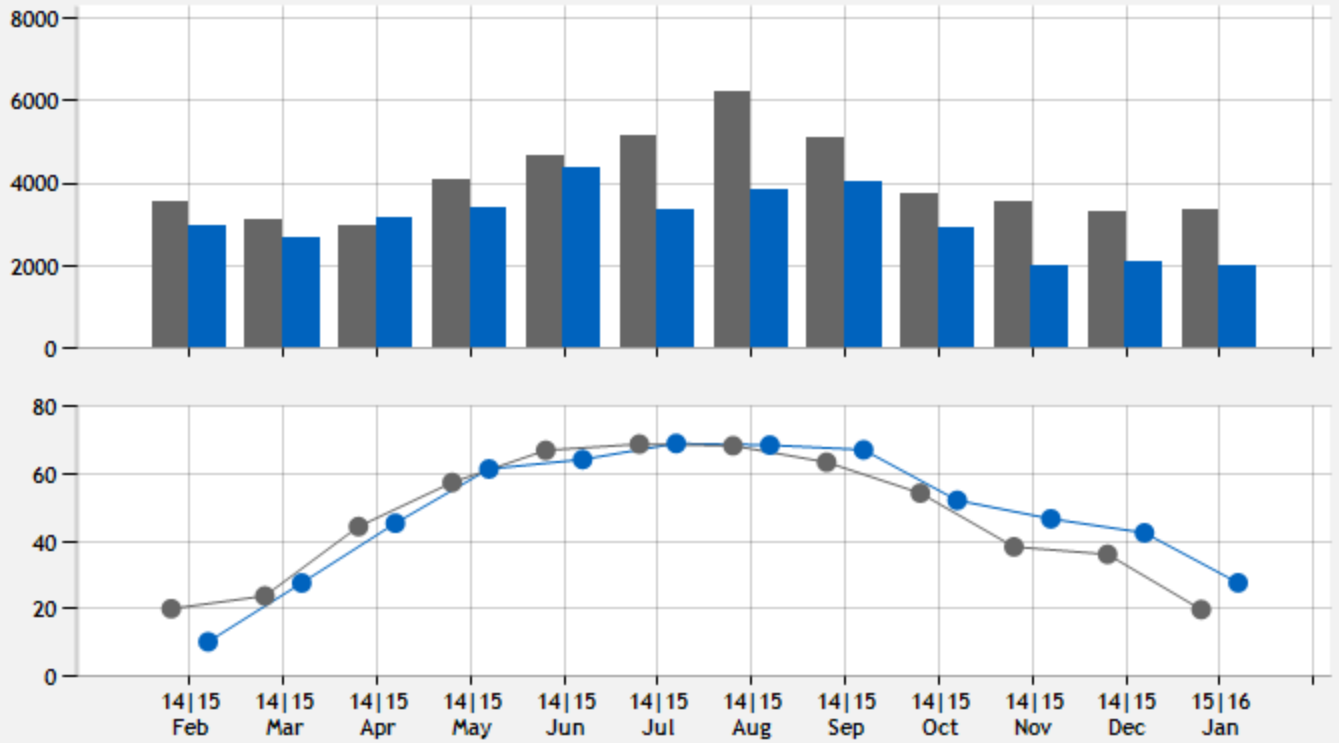
Monthly electricity usage (kWh)

- Current year
- Previous year

Temperature

Average outside temperature (°F)

- Current year
- Previous year



Download my data: Green Button(XML) | Excel spreadsheet(XLS)

What is this?

nationalgrid
HERE WITH YOU. HERE FOR YOU.

WorcesterSmart
SMART ENERGY SOLUTIONS

Pilot Web Portal

Energy Insights Challenge

ENERGY INSIGHTS

Overview My Usage Peak Events

My Usage

Graph Overlays

Weather

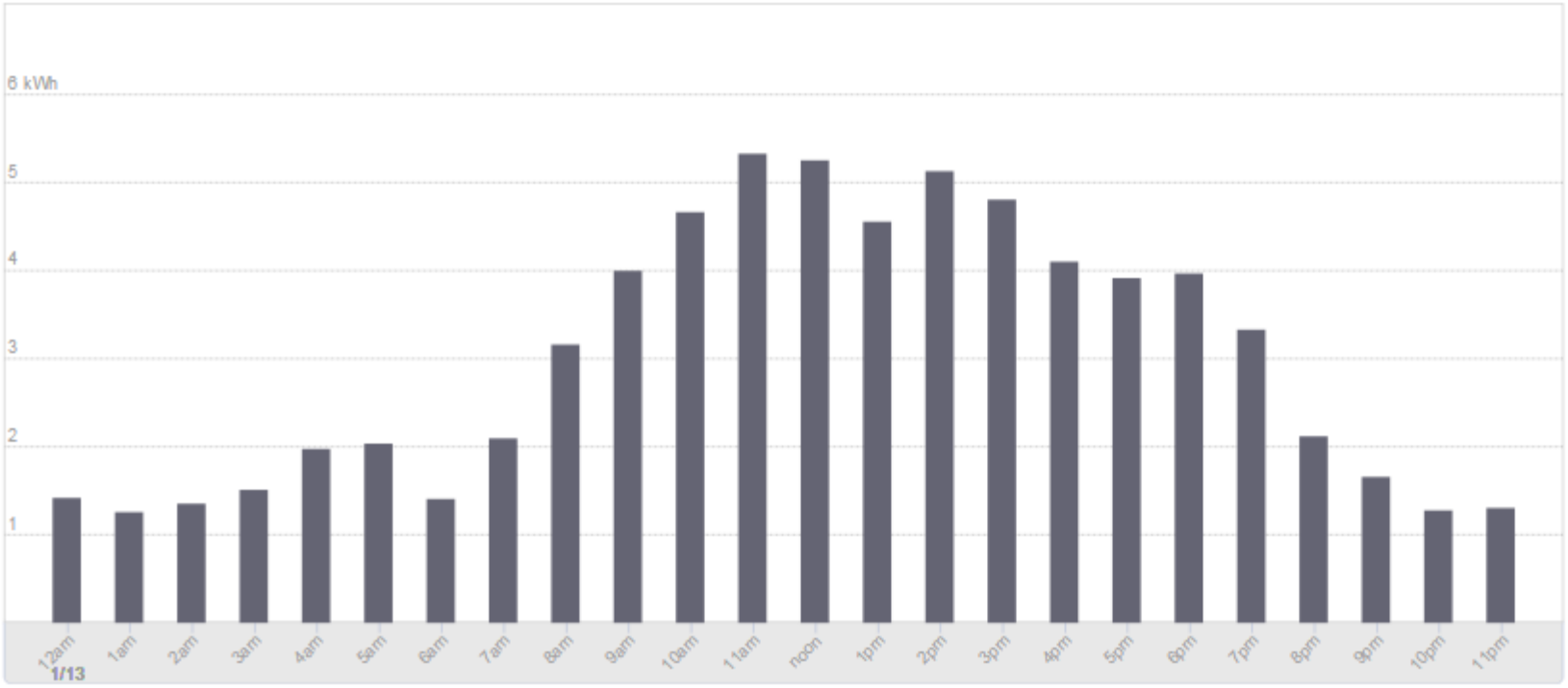
Comparison Methods

Efficient Households | Similar Households | Previous Usage

Graph View

Day | Month

today



Not sure what this means? Click here for more information.

Fetch My Latest Data *It may take several minutes for your data to show up in the 'day' graph view.*

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WorcesterSmart
SMART ENERGY SOLUTIONS

Pilot Web Portal

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Overview My Usage Peak Events

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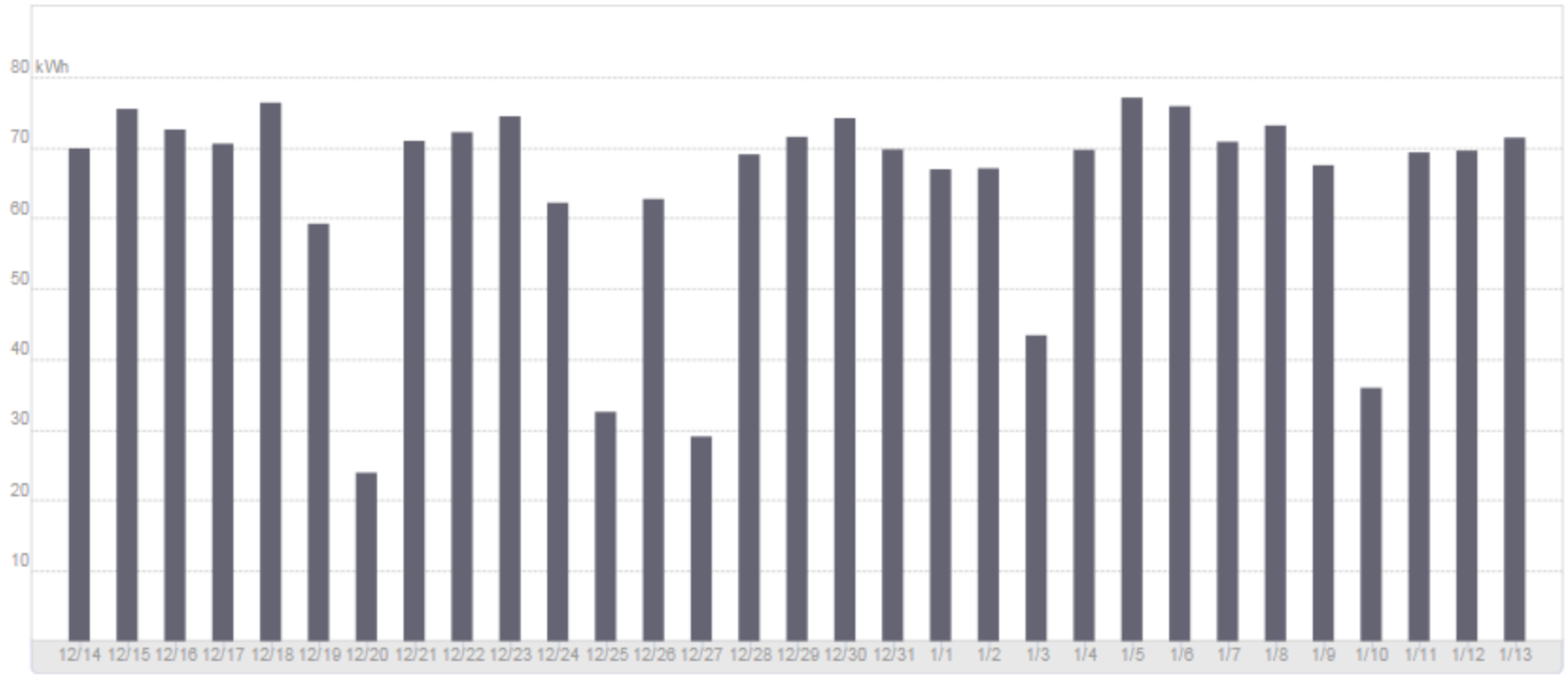


Not sure what this means? Click here for more information.

Fetch My Latest Data *It may take several minutes for your data to show up in the 'day' graph view.*

Download this data in Green Button format.

Leveraging Customer Data through Partnerships

NY PSC Technical Conference
January 20, 2016

OPOWER

Opower at a glance

Company

- Working with **over 95** utilities around the world
- Over **500 billion** meter reads under analysis
- **40%** of US household energy data under management; **75%** of smart meter data
- **600** people in San Francisco, Arlington, VA (HQ), Tokyo, Singapore, London

DNA

- Behavioral science
- Big data analytics
- Consumer marketing
- User-centric design

Impact

- **1.5-3%** reduction in per household consumption
- **8 TWh** saved to date; **12B** pounds of CO2 abated to date
- **$1+ billion** in customer bill savings to date
- **5%** reduction in peak demand
- **50-100%** increase in sales of new services and adoption of new tariffs (e.g., TOU)

Largest R&D investment in utility customers anywhere

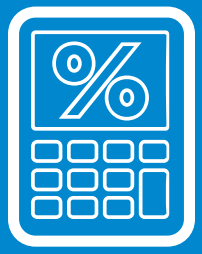
250+ behavioral designers, data scientists, engineers, and product managers

Behavioural science **Data science** **Computer science**

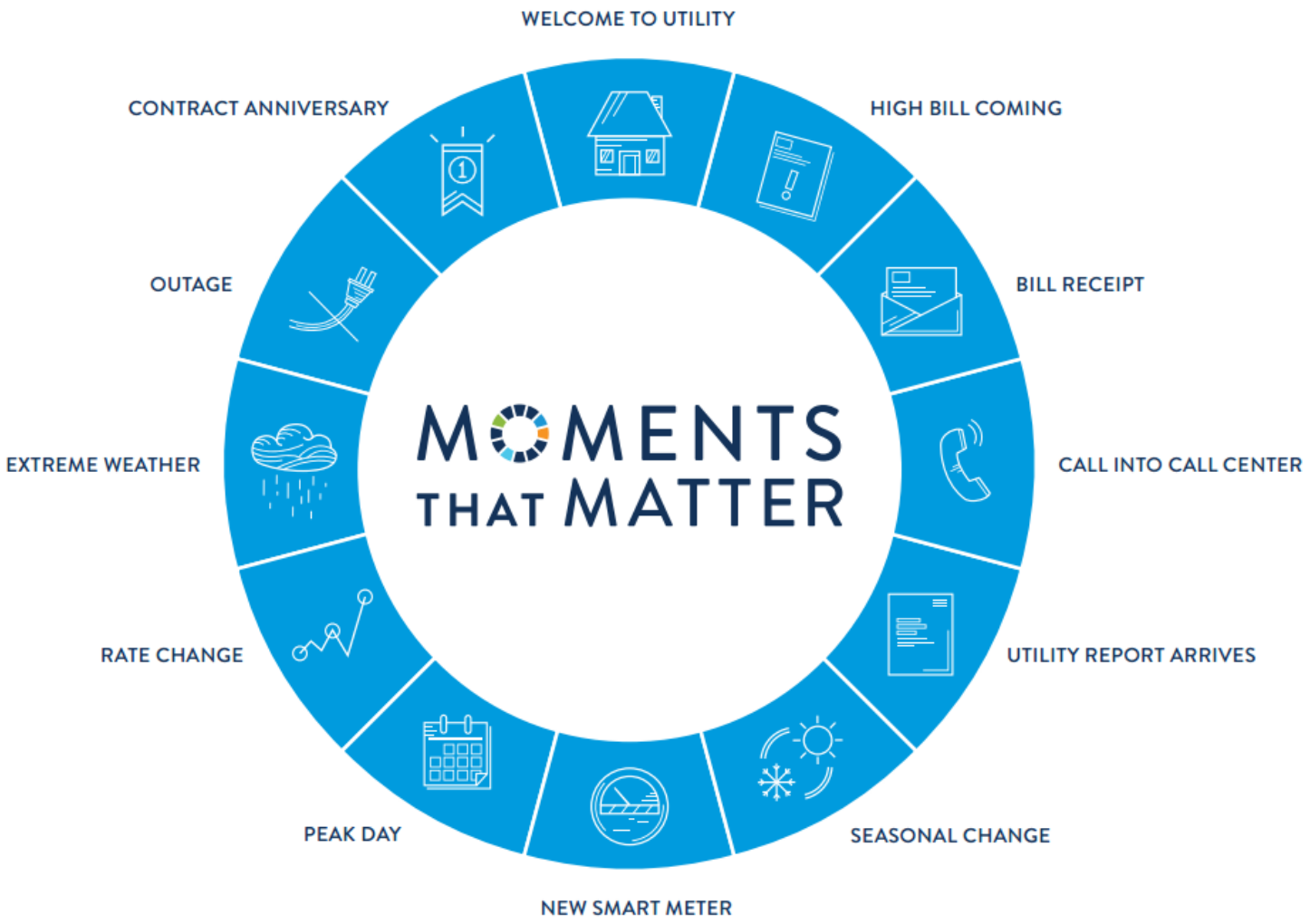
Our R&D talent comes from:

Google facebook NETFLIX Palantir LinkedIn Microsoft twitter amazon.com salesforce.com box

Utilities have an amazing amount of data at their disposal to help engage customers…

Consumer	Rate	Behavioral	Demographic	Psychographic	Weather
					
Cust ID	Rate Code	Avg. Usage	Age	Green	Avg. Temp
Premise	Rate ID	Peak Usage	Sq. Ft	Frugal	Peak Temp
Account	Rate History	Load Curve	Income	Techy	Current Temp

Opower partners with utilities to analyze data and deliver the right message, to the right customer, at the right time



Case Study: Engaging Customers on Peak Days

Large scale peak savings without a device or price

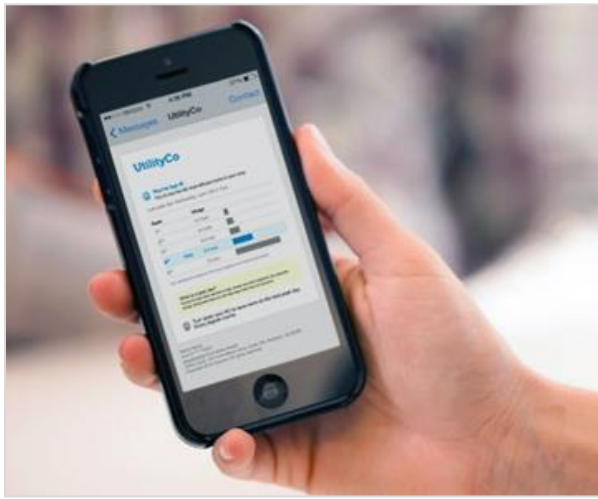
Peak day notification

- Targeted communication
- Channel of choice
- Opt-out program design

Personalized adjustments

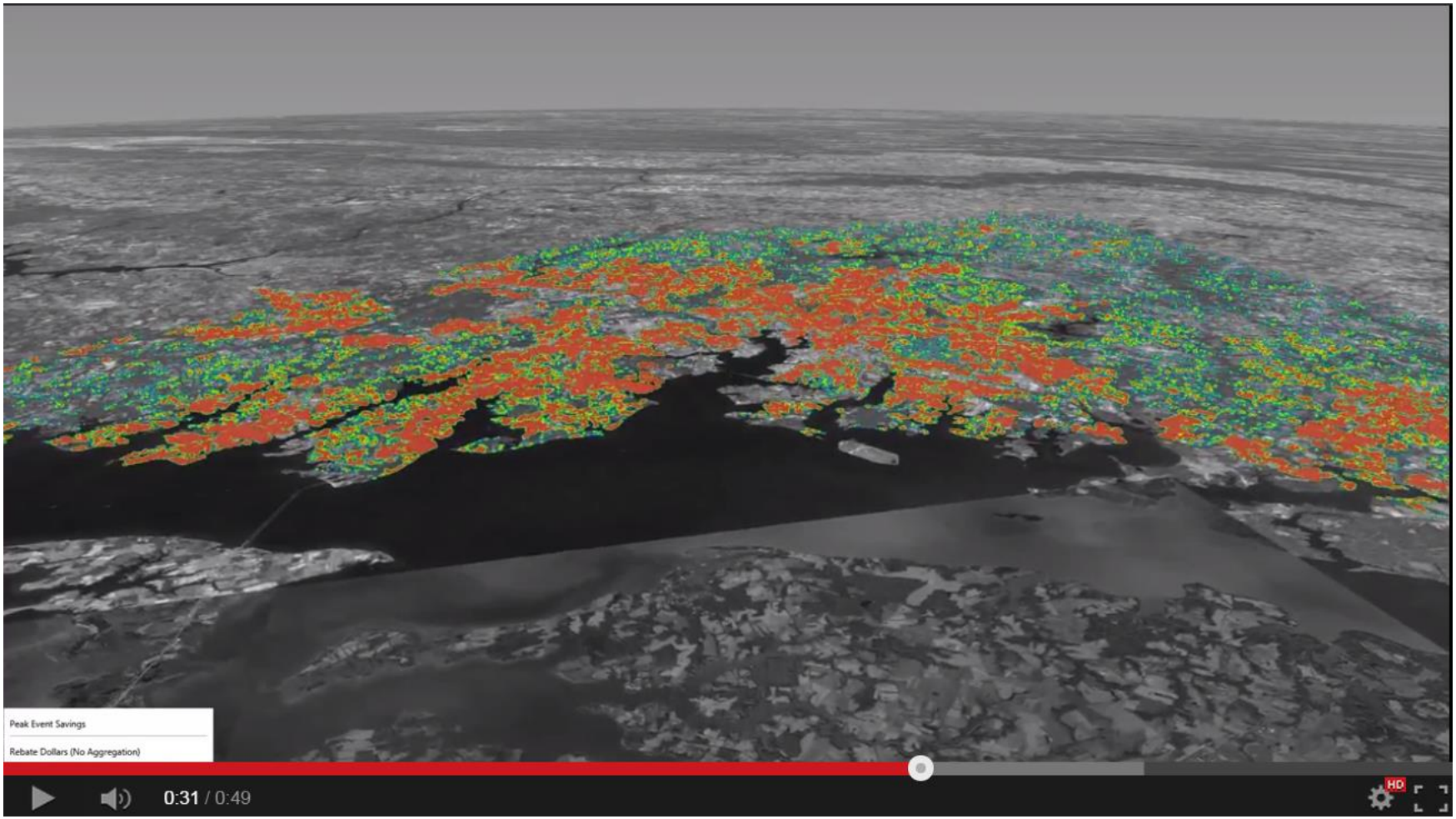
- Large-scale engagement
- Access to more load
- Highly accurate EM&V

Post-event feedback



- Immediate feedback
- Highly personalized results
- Ongoing encouragement

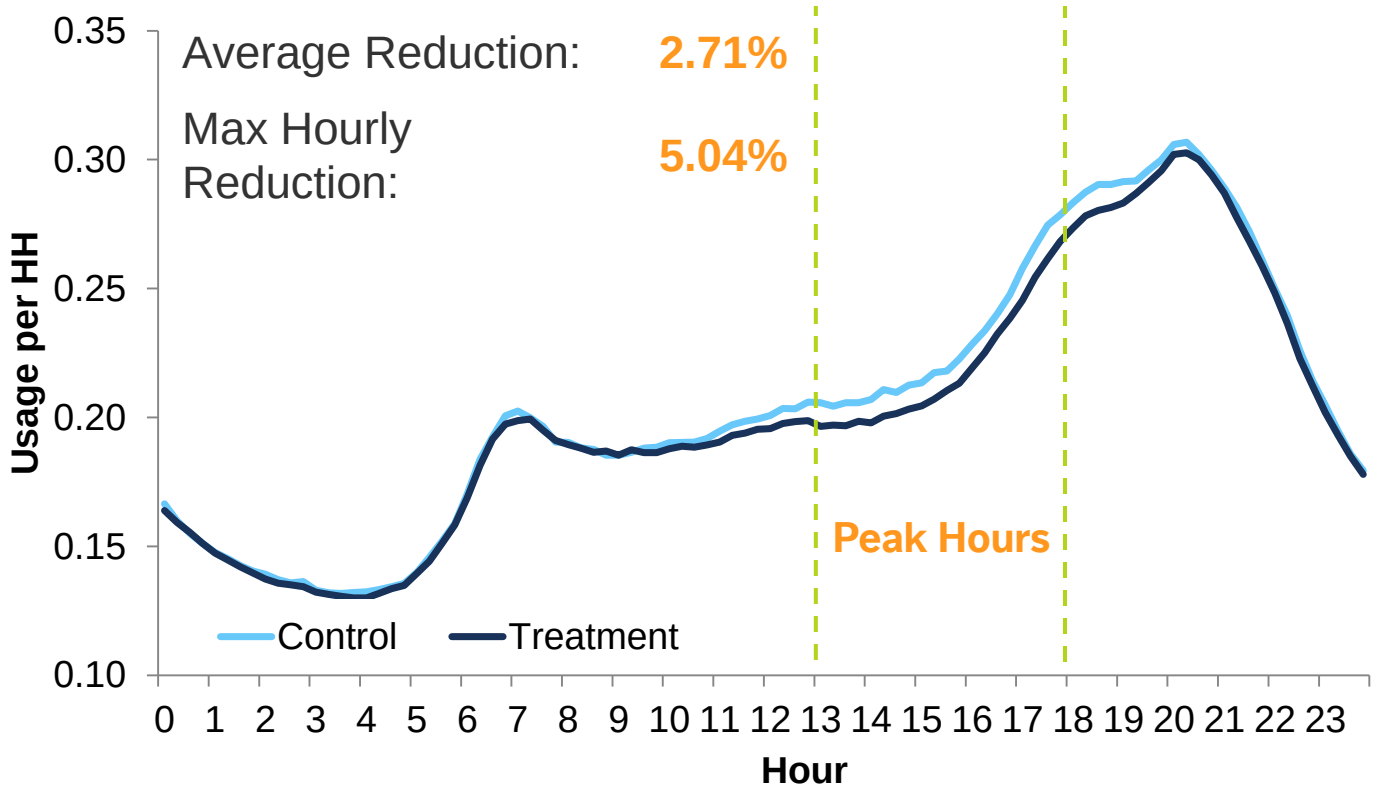
Technology + Customer Engagement = Widespread Reduced Peak Demand



Link to behavioral demand response video: https://vimeo.com/74122376

Engaging Customers on Peak Days: Deployed to 1.5M Homes, 6 Utilities, 5 ISO's

Performance across 32 events at 6 utilities



PG&E

City of Glendale Water & Power

Consumers Energy

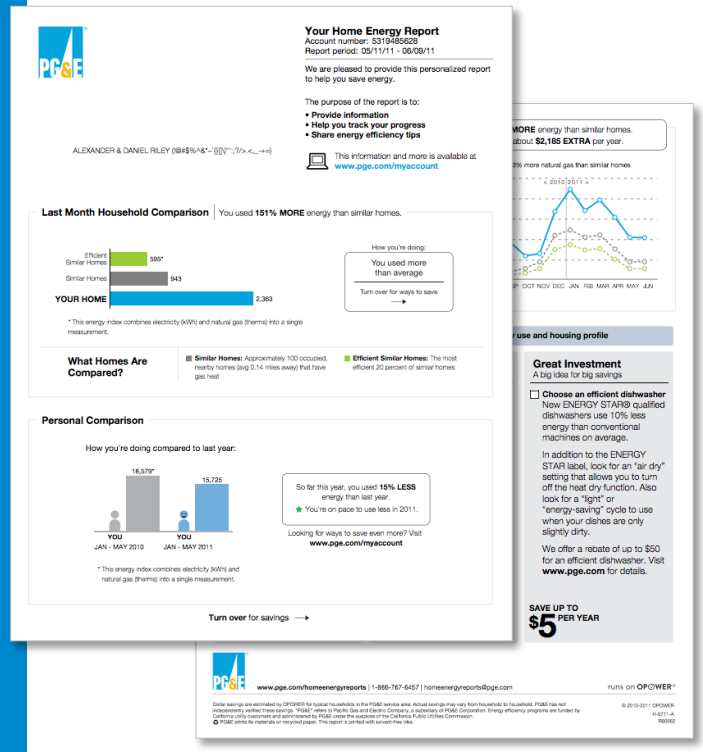
DTE Energy

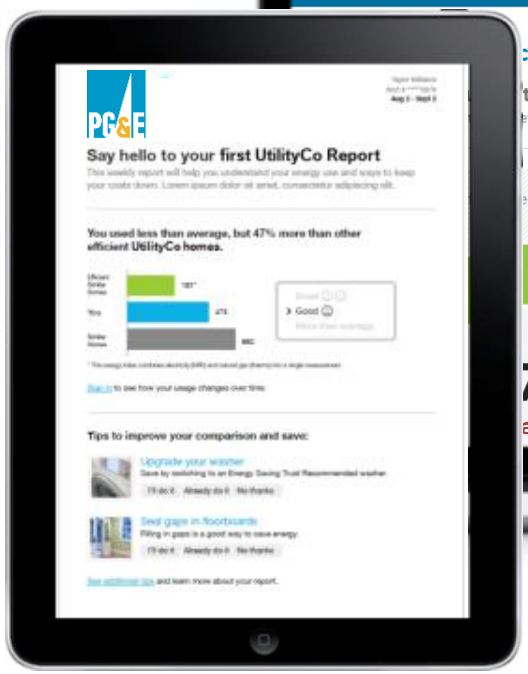
HydroOttawa

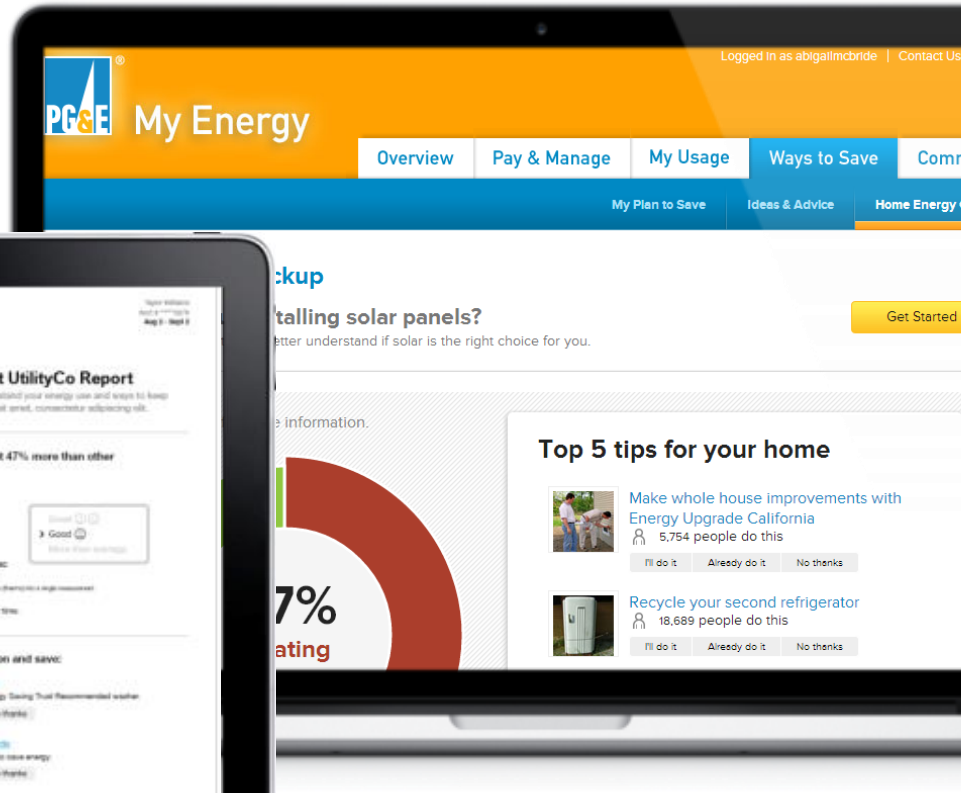
Efficiency Vermont

Case Study: Driving Customer Adoption of Efficiency

Engaging utility consumers with behavioral messaging and personalized insights leads to action

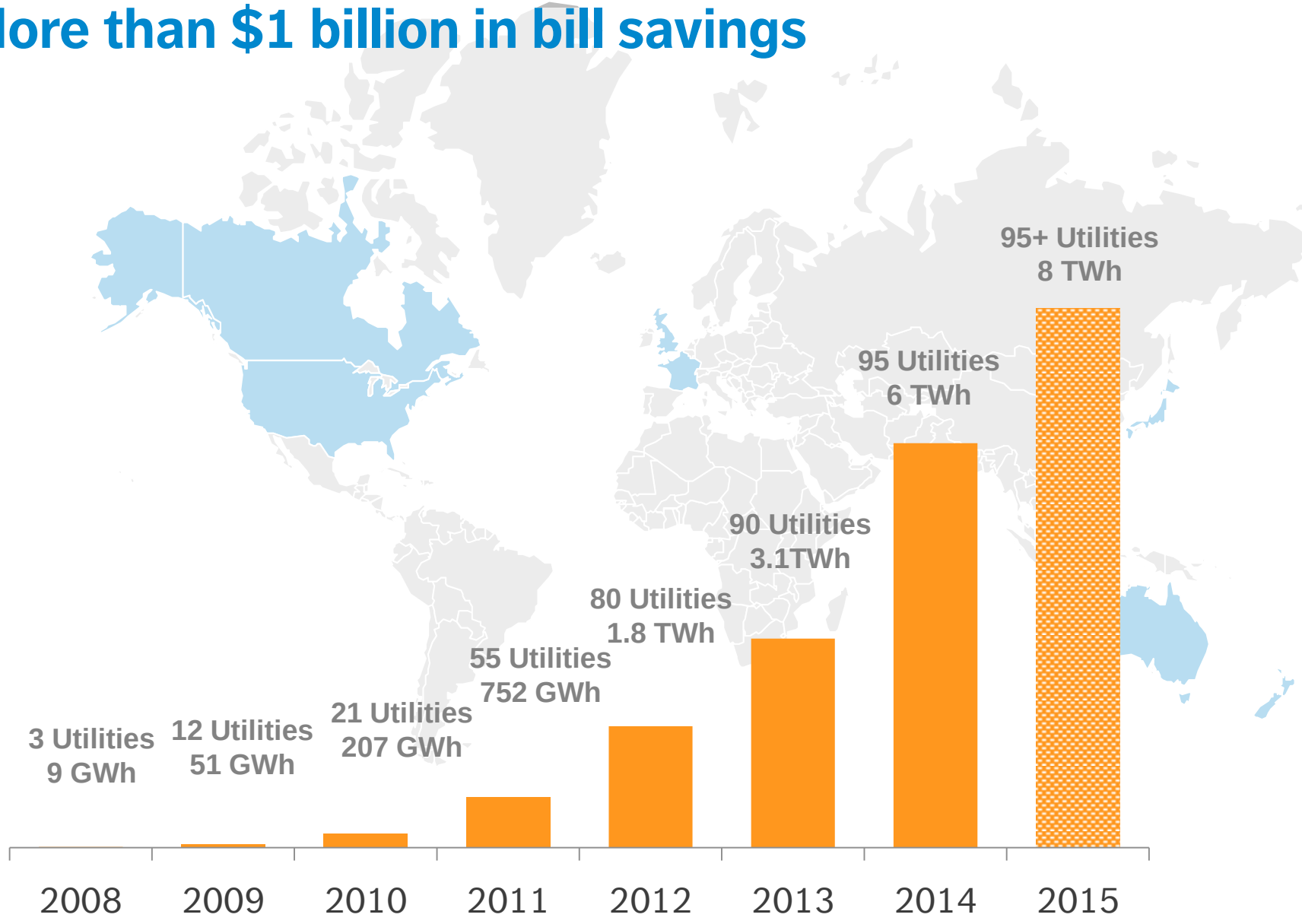






Home Energy Report **Email HER** **Web**

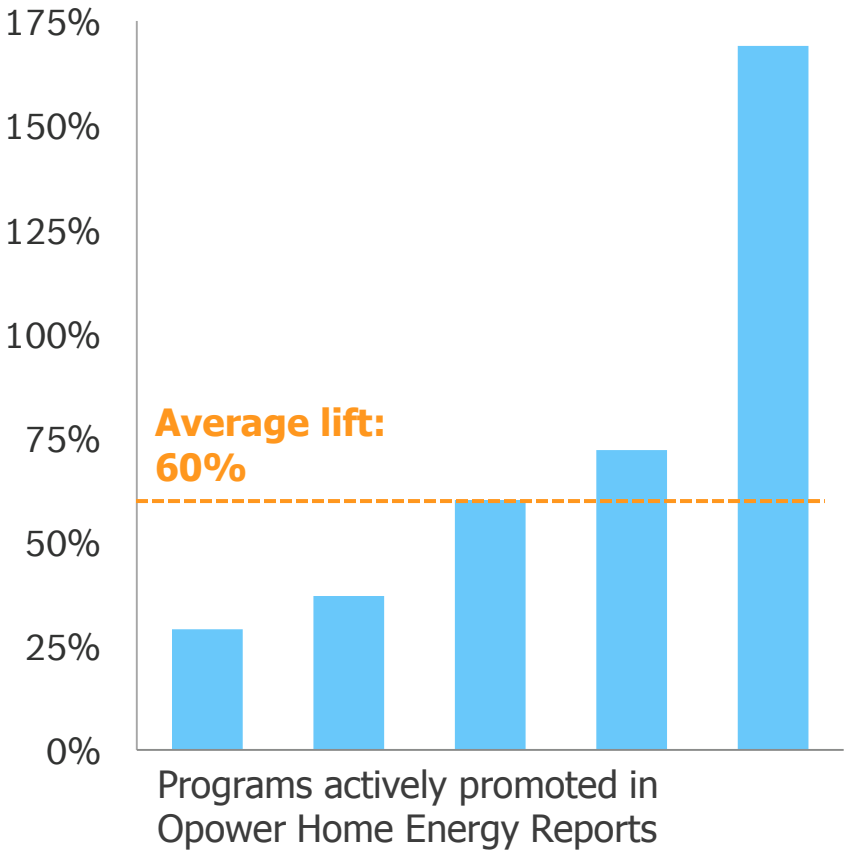
Customers have achieved massive impact: More than $1 billion in bill savings



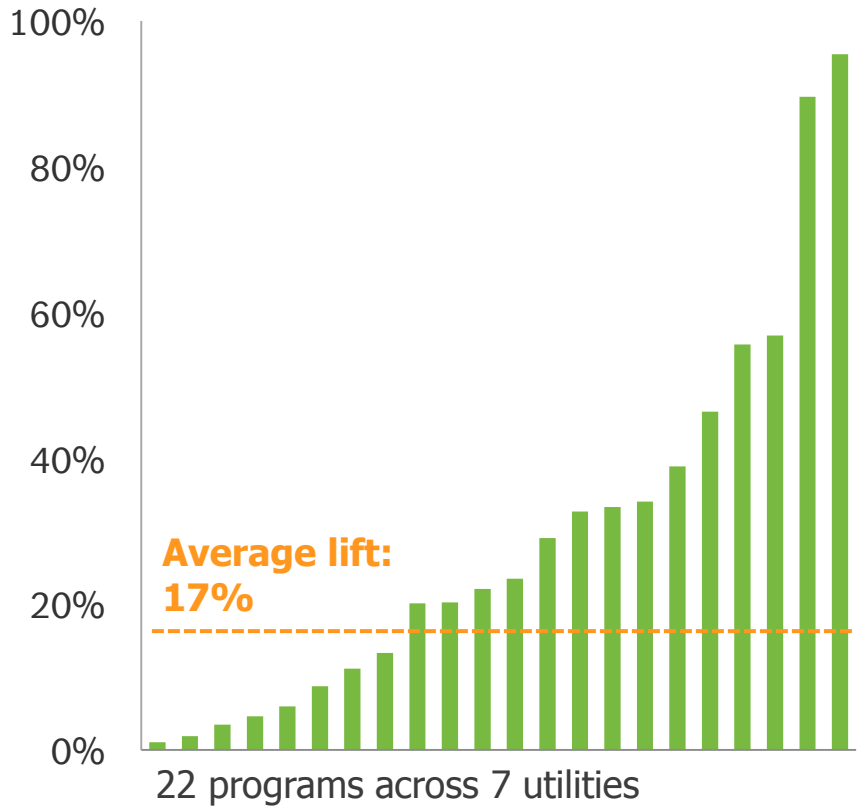
2015 results still being finalized

Right insights, offers, and messages drive participation

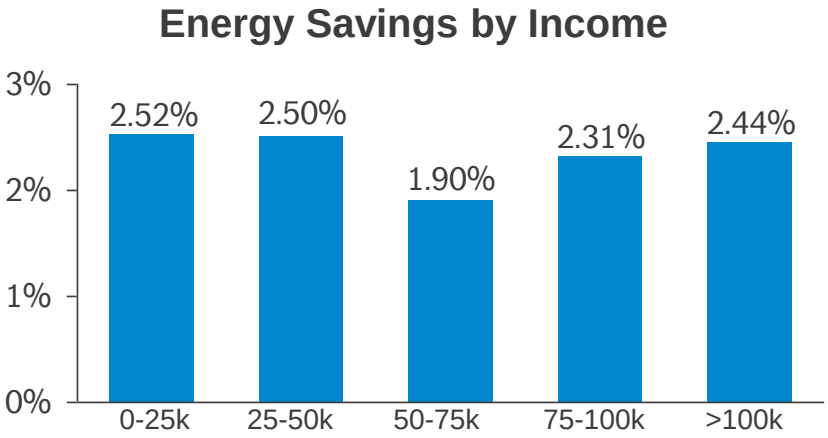
Customer participation lift from Opower promotion

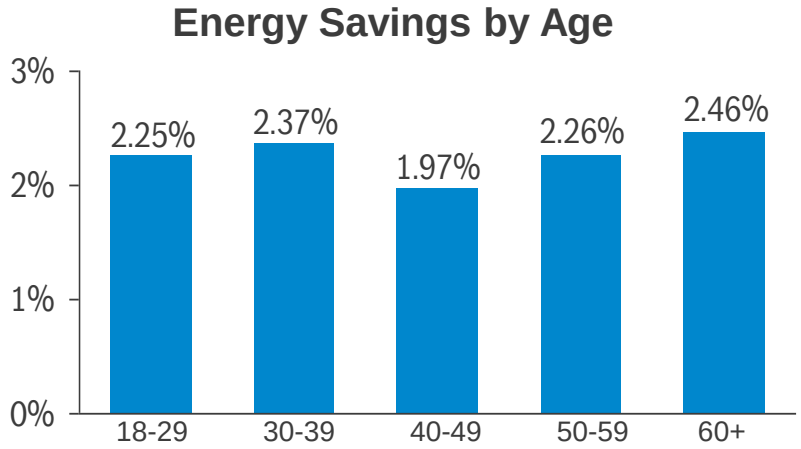


Customer participation lift resulting From halo effect



Scaling customer engagement to deliver benefits equally, regardless of income and age





Data Access Through Partnership to drive Customer Engagement at Scale

1

Utilities have…

- Lots of data
- Obligation to serve all customers
- Trusted relationship with customers
- Interface with customers at key moments

+

1

Opower has…

- Expertise in big data analytics
- Best in class software
- Global experience in regulated and competitive markets
- 100% focus on utility customer behavior

=

2

Data Access Through Partnership = Customer Engagement at Scale

OPOWER

Energy Data Interfaces for CDG

Nate Owen

Acadia Micro

EDI in Energy Markets

- What?
- Where?
- Who?
- How?
- Adventures in EDI

The Benefits of EDI

- Data availability
- Efficiency
- Common language
- Scalable
- Very tight integration (allowed for consolidated billing)

The Challenges of EDI

- Complexity
- Latency
- Extensibility
- Cost
- Security
- Too much integration (reliance on utility way of doing things)
- Doesn’t fit the DSO model

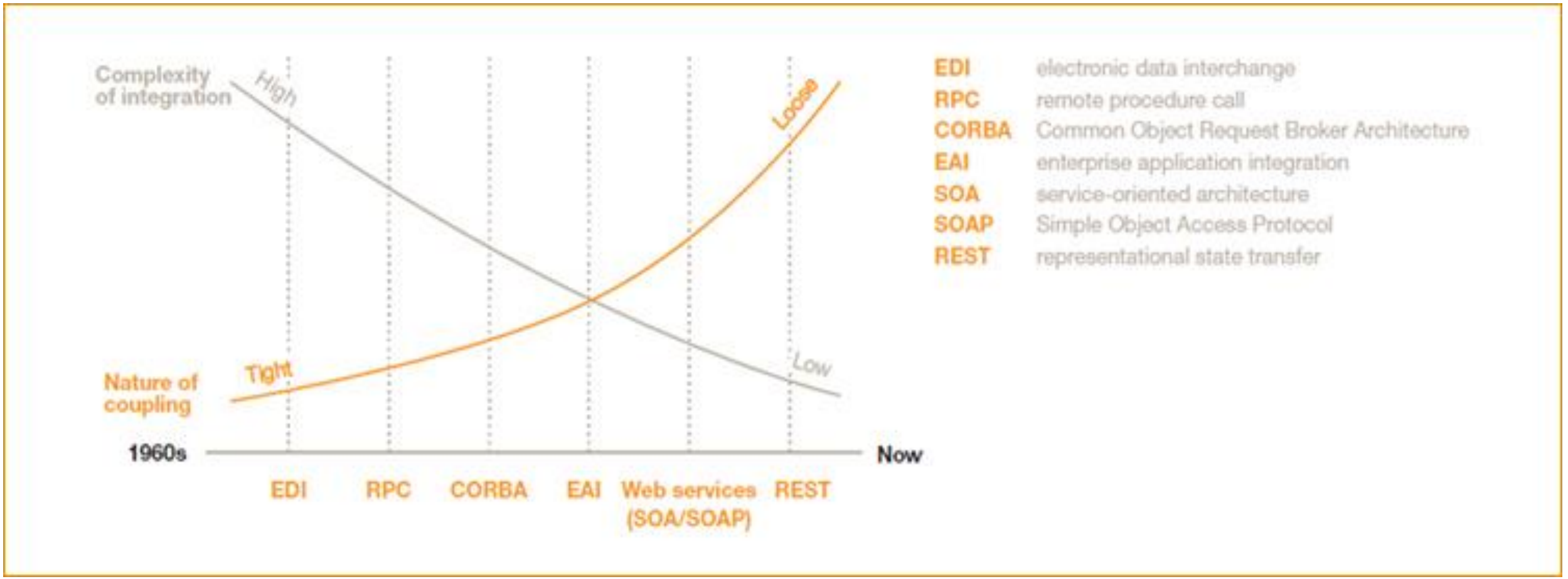
CDG Data Exchange

- Customer and Asset Production Data
- Privacy and LMI verification
- Password protected spreadsheets via email
- No timeframe requirements
- No uniformity
- Driving a tractor down I-95

RESTful APIs

- Modern data exchange
- Scalable
- Secure
- Accessible
- Cost Efficient
- Uniform

EDI vs. RESTful API



"Consumerization of APIs: Scaling integrations" *PricewaterhouseCoopers*. 2015.

Recommendations

- There is no market without data
- EDI is a complex market enabler and barrier
- RESTful APIs enable data sharing, which enables Community Distributed Generation, Energy Efficiency, and more
- Utilities must be ordered to make data available or the market will not happen

NY PSC Second Technical Conference on Customer Aggregated Energy Data and Related Issues

Jennifer Spinosi, Manager, Government & Regulatory Affairs

Jennifer.Spinosi@directenergy.com

January 20, 2016

Direct Energy®

Background on Direct Energy

Centrica plc

Direct Energy®

Direct Energy

Direct Energy – Our Snapshot

August 2000
Centrica acquired Direct Energy

Revenues of **US$19.5 billion** in 2014

Grown to more than **5,500** employees

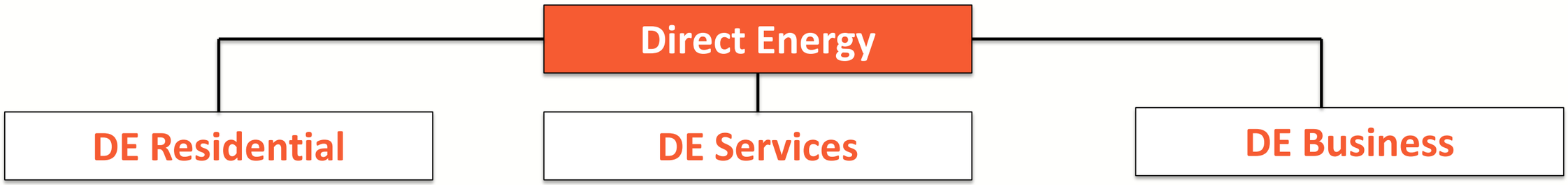
Largest Residential Retailer
One of the Largest
Home Services & B2B Retailers

Nearly 5 million
customer relationships

Direct Energy®

We Have Grown Through Many Acquistions

Direct Energy: Our Lines of Business



- **Largest** residential energy retailer in N.A. based on customer numbers
- Natural gas and electricity pricing plans with fixed and variable price options of varying term lengths
- Products available in 3 Canadian provinces and 13 U.S. states plus D.C.
- Offers innovative solutions, including devices and tools that empower customers to better control their energy and home
- Member of Plenti℠, the first U.S.-based loyalty coalition rewards program

- **One of the largest** home services companies in N.A.
- Affiliates One Hour Air Conditioning & Heating, Airtron, Benjamin Franklin Plumbing, and Mister Sparky offer residential and business customers installation, maintenance and repair support for HVAC, plumbing, and electrical services
- Home Warranty of America and Direct Energy Protection Plans offer protection, repair and replacement of appliances and devices within a residential customer's home
- Direct Energy Solar offers a premier solar experience for residential and commercial customers, from system design to installation and system maintenance
- Products & services available in 10 Canadian provinces and 50 U.S. states plus D.C.

- **One of the largest** commercial and industrial retailers in N.A. based on customer numbers serving more than 250,000 business customers
- Natural gas and electricity sales to small, medium and large national businesses as well as public institutions and government entities
- Products available in 4 Canadian provinces and 23 U.S. states plus D.C
- Offers enhanced solutions, such as protection plans for majority energy assets and infrastructure as well as building automation, facility maintenance, energy auditing and energy management services for business customers

Direct Energy’s New York Profile

Direct Energy in New York

- Offices in Henrietta, Middletown, Ronkonkoma, Syracuse, Montebello, and Melville
- Currently employs 144 people in the State
- Serves approximately 275,000 residential customers, 76,000 small business customers, and 18,500 commercial and industrial customers in NY
- Operates the following brand names:

GATEWAY ENERGY SERVICES | YOUR ENERGY® YOUR CHOICE

bounce energy®

NYSEG solutions
A DIRECT ENERGY® SUBSIDIARY

ENERGETIX Energy Services Company

Direct Energy Solar™

Benjamin Franklin THE PUNCTUAL PLUMBER®

Airtron® HEATING & AIR CONDITIONING A Direct Energy® Company

Mister Sparky® America's On-Time Electrician

ONE HOUR HEATING & AIR CONDITIONING® Always On Time...Or You Don't Pay A Dime!®

Direct Energy®

Best Practices: Interval Data Access

Variables to Consider

1) Interval Frequency - the number of times within a 24-hour period that data is captured and reported as a “block” (hourly interval data is the amount of energy used within a block of 60 minutes, 15-minute interval data represents the energy used within a block of 15 minutes, etc.)
2) Reporting Frequency - how often the utility provides data to retail suppliers and, at a minimum, should include “next-day” and “monthly” reporting for billing
3) Data Quality - whether the data is “raw” which may include brief gaps or lapses in recording (aka “AMI meter data”) or whether it has been validated, estimated, and edited (“VEE” or “bill quality” data)
4) Format of Data Exchange - the process for information to flow from the utility to third parties which could include a web portal, electronic data interchange (“EDI”), or file transfer protocol (“FTP” or “flat file”)

Minimum Requirements

- Customer provides ESCO with authorization to access their data pre-enrollment or during enrollment process
- ESCOs may access 12-24 months of historical data for pricing or other baseline analytics
- ESCOs receive monthly, bill quality hourly interval data via EDI; AND
- Next-day AMI meter data via a file transfer protocol (FTP) or web portal

Utilities that currently meet or are developing these requirements include:

- Commonwealth Edison, Ameren (IL)
- PPL (PA)
- United Illuminating (CT)
- Pepco (DC and MD have different data exchange protocols)

Smart Meter Texas

SMT is a website that stores daily, monthly and 15-minute interval electric usage data from smart meters and provides secure access to such data to customers and authorized market participates (including through the use of “Green Button”)

- Collaborative platform used by each of the TX IOUs (AEP TX, CenterPoint, Oncor, and Texas-New Mexico Power); retail providers, TX PUC, and ERCOT.
- Also enables secure communication with customer In-Home Devices (“HAN” devices) and allows customers to authorize market participants access to their electric usage information HAN device.

How it works - to register on SMT a customer must select their retail electric provider (“REP”) from a drop down list and enter the Electric Service Identified (“ESI ID”) and meter number for each meter

- Residential account:
  - You may view usage, meter and premise information for your premise and other properties for which you are responsible
  - Residential customers may designate up to five friends to view your usage information
- Business Account:
  - If you have a business and want multiple business associates to have access to your Company's usage, meter, and premise information; then you should register for a Business Account
  - Businesses may designate up to 4 administrators to register and manage their SMT accounts, and elect each User to have the ability to register on the SMT website.

*In TX, customers receive their monthly electric bills from their retailer, rather than the utility

Meter Data Management System Preferences

Priority	Interval Frequency	Reporting Frequency	Data Quality	Format
Phase 1	Hourly	12-Month Historical	AMI Meter Data	Web portal and EDI
Phase 1	Hourly	Monthly (Billing Cycle)	Bill Quality (VEE; gaps filled)	EDI
Phase 1	Hourly	Next Day	AMI Meter Data	FTP File
Phase 2	15-Minute	Next Day	AMI Meter Data	FTP File
Phase 2	15-Minute	Monthly (Billing Cycle)	Bill Quality (VEE; gaps filled)	EDI
Phase 2	1-Minute	Next Day	AMI Meter Data	FTP File
Phase 2	1-Minute	Monthly (Billing Cycle)	Bill Quality (VEE; gaps filled)	EDI
Phase 3	15-Minute	Live/Real-Time	Bill Quality (VEE; gaps filled)	URL providing real time data to be pushed to suppliers upon demand
Phase 3	1-Minute	Live/Real-Time	Bill Quality (VEE; gaps filled)	URL providing real time data to be pushed to suppliers upon demand

Direct Energy®

How Direct Energy Uses Interval Data to Make a Difference in Our Customers' Lives

Direct Energy®

Interval Data

- Direct Energy currently offers time of use (“TOU”) and other interval-data enabled products and services to residential and small business customers, including:
  - Free Power Day
  - Power To Go (Pre-Paid Electric Service)
  - Direct Your Plan
  - Direct Your Energy
  - Solar Advantage

Direct Energy: “Free Power Day”

Provides customers with free electricity from 12:00AM to 11:59PM on any day of the week the customer selects

- Customers pay a fixed rate during the rest of the week

Result? Customers are changing their usage behavior

What are customers saying about “Free Power Day”?

- “*This is simple, I don’t pay for electricity on Saturdays”*
- *“ I really was interested because it gives me free electricity on Saturdays”*
- *“Won’t be too hard for me to change since I’m not home much during the week”*

Direct Energy®

Direct Energy – “Power-To-Go”

Power-To-Go is a pre-paid electricity product offered in Texas. During enrollment, the customer pays for a specific amount of electricity to activate her account then continues to pay as often as she likes to keep the account balance above zero.

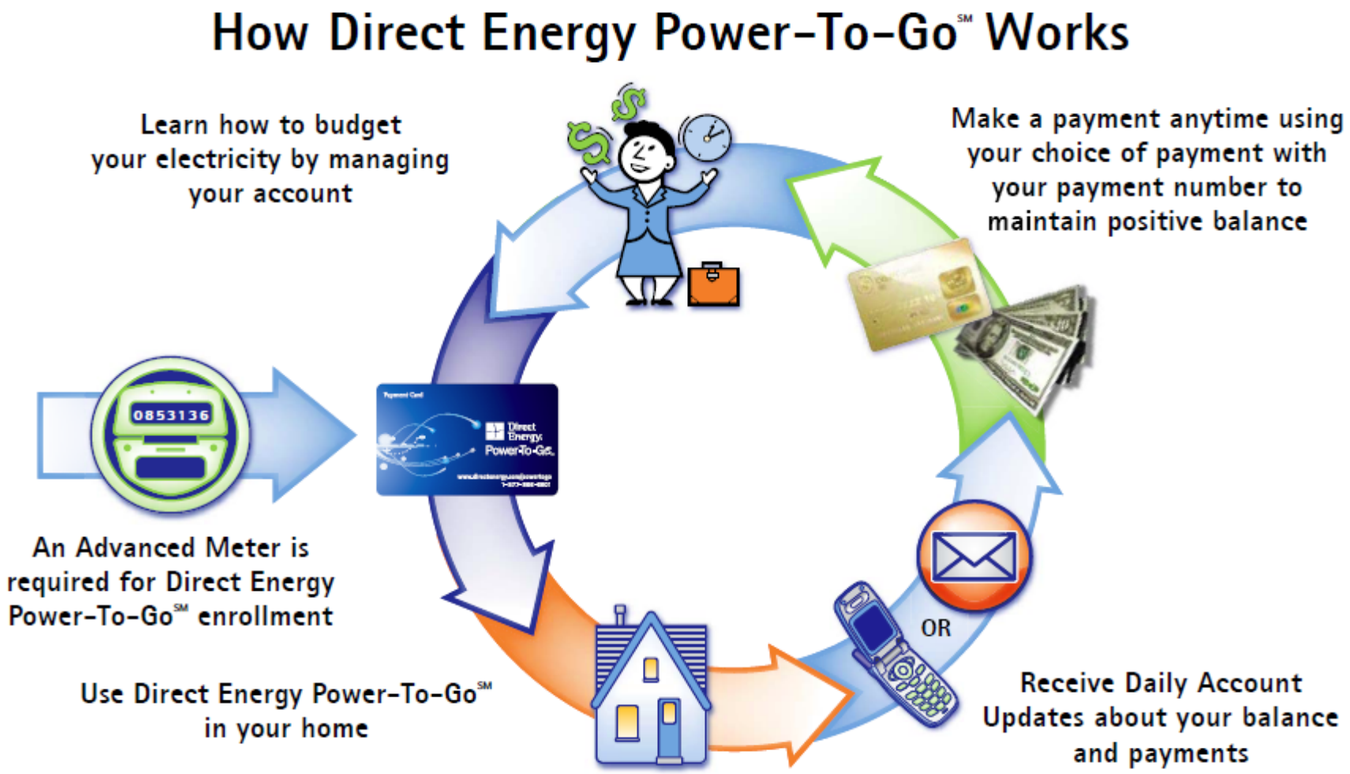
Features

- No Deposit
- Flexible day-to-day plan
- No reconnection fee
- Variable price product with a competitive price
- No Cancellation Fee
- Receive Payment Card Number via text or email

Benefits

- No surprises at the end of the month with summer bills
- Pay as often as you want, as much as you want
- You will be reconnected within 2 hours for no charge*
- Pay online with credit card or cash at authorized payment centers
- Daily Account Updates with your balance and usage
- Better management of your energy costs
- Low balance notifications are sent to you 3-7 days before your balance reaches $0
- You choose email or SMS text as your communication method so there is no need to deal with paper or missed mail**

Direct Energy®



"Being a single parent of four money is tight, but with daily email alerts I have been able to teach the importance of conserving and being aware of budgets."

"I love the fact that I can pay as much or little as I want to keep my electric on. I know what amount of electric I'm using…which lets me know if I do a lot of baking or if I run the air conditioner a lot that it will spike…so no surprises…I love that."

"What I like is the fact that I get text messages to keep me informed on how much I have on my account."

Direct Energy®

Direct Your Plan and Direct Your Energy

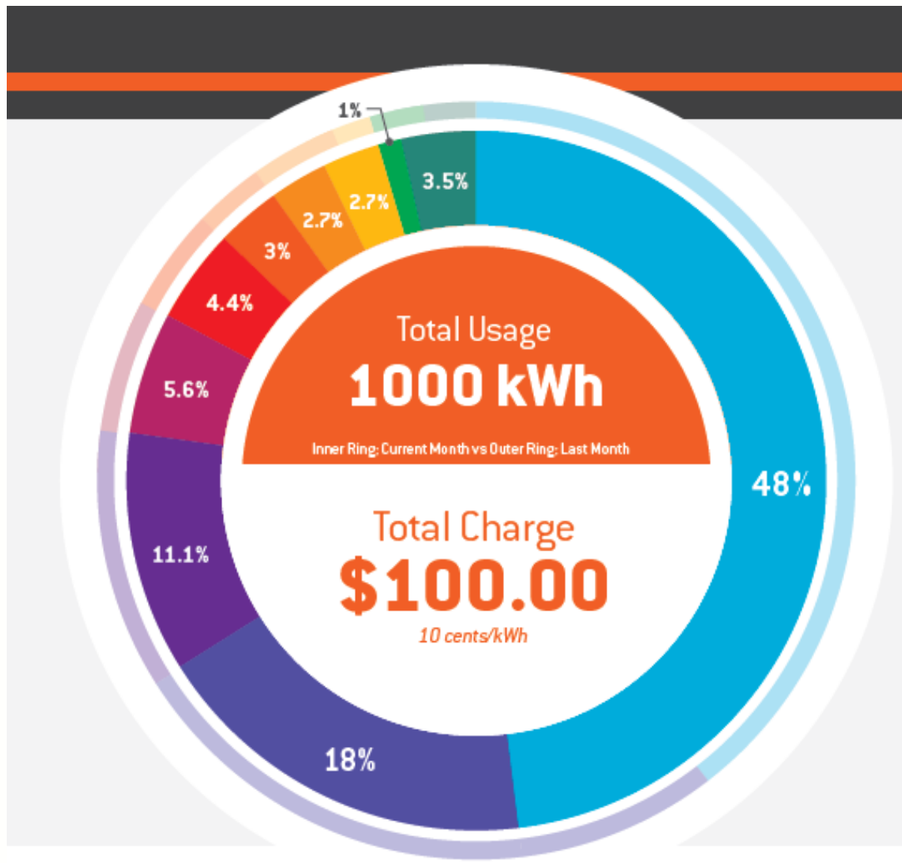
Direct Your Plan – completely customizable plan that allows the customer to select:

- Term Length
- Billing Options
- Smart Products, including TOU or Demand Response
- Energy Efficiency Options
- Rewards

To learn more, visit: www.directenergy.com/direct-your-energy

Direct Your Energy – Online dashboard that provides information and tools to help customers better understand and control energy usage

Energy Disaggregation – translating kWh into Dollars and Cents



Usage Information

Heating & Cooling
480 kWh – $48.00

Water Heater
180 kWh – $18.00

Lighting (15 light bulbs)
111 kWh – $11.10

Dryer
56 kWh – $5.60

Refrigerator
44 kWh – $4.40

Oven/Range
30 kWh – $3.00

Ceiling Fans (3)
27 kWh – $2.70

TV/Satellite Receiver
27 kWh – $2.70

Dishwasher
10 kWh – $1.00

Other
35 kWh – $3.50

A Look at Your Efficiency

Since you replaced your HVAC system with **One Hour Heating & Air Conditioning** in March, 2014, you have **reduced** your weather-adjusted HVAC usage by **14%**.

We show that you currently have 1 **Nest Learning Thermostat** installed in your home. On average, this thermostat has **reduced** your usage by **8%** since being installed in January, 2014.

Solar Advantage

12 month “zero rate” plan available to customers who install a residential solar system with Direct Energy Solar in NY, MA, CT, DE, and D.C. – potentially expanding to additional states in 2016

- Direct Energy uses RECs to offset energy consumption beyond what is produced by solar system at cost of $0.00/kWh

Today, this product is offered regardless of access to interval data but in the future, the ability to couple solar and TOU rates could create a new value proposition for customers.

Obstacles with Green Button

Obstacles with Green Button

- Designed to be a customer-facing platform that allows non-retailer third parties to access utility information with customer authorization
- Data received from Green Button is not billing quality data
- Customers have to designate a third party to receive their data
  - If a customer chooses a time of use (TOU) product but doesn't select the correct third party, we can't provide that product
  - Large customers will have to make this designation on an account-by-account basis which may be tedious and time consuming
- Retailers need an automated solution to serve customers efficiently

Additional Questions?

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Jennifer Spinosi, Manager, Gov’t. & Regulatory Affairs
(614) 506-8594; Jennifer.Spinosi@directenergy.com

THANK YOU

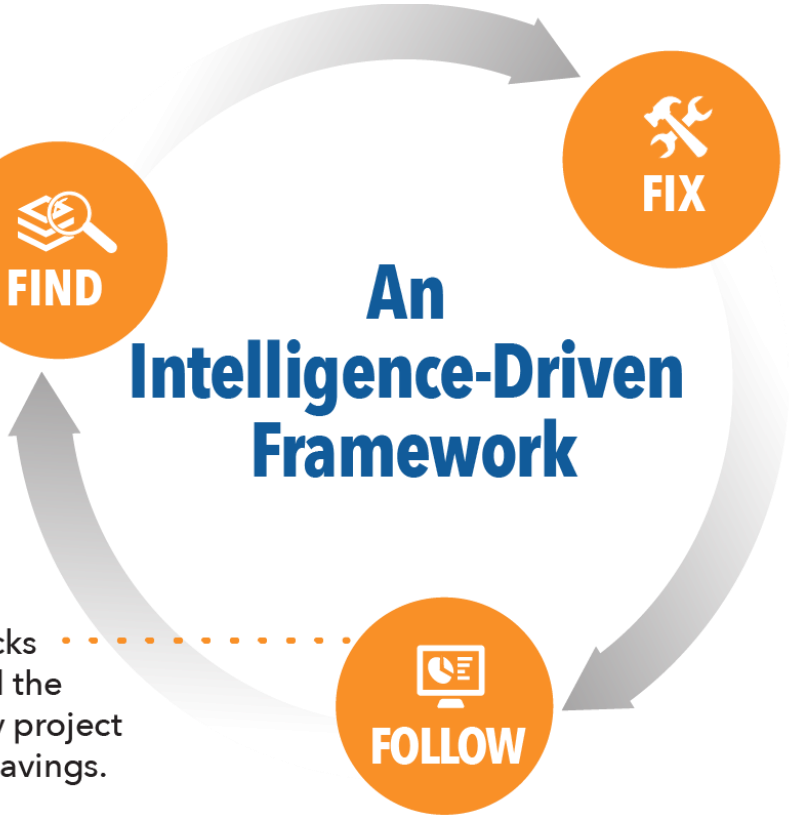
Direct Energy®

New York Public Service Commission January 20th technical conference Access to Customer and Aggregated Data

Klaar De Schepper
Director of Data Management, Bright Power

BRIGHT POWER

An Intelligence-Driven Framework



Energy experts pinpoint high-value opportunities via in-depth analysis of every building in your portfolio.

Practical solutions attack the root causes of wasted energy spend and improve portfolio returns.

Bright Power tracks every building and the results of every energy project to ensure maximum savings.

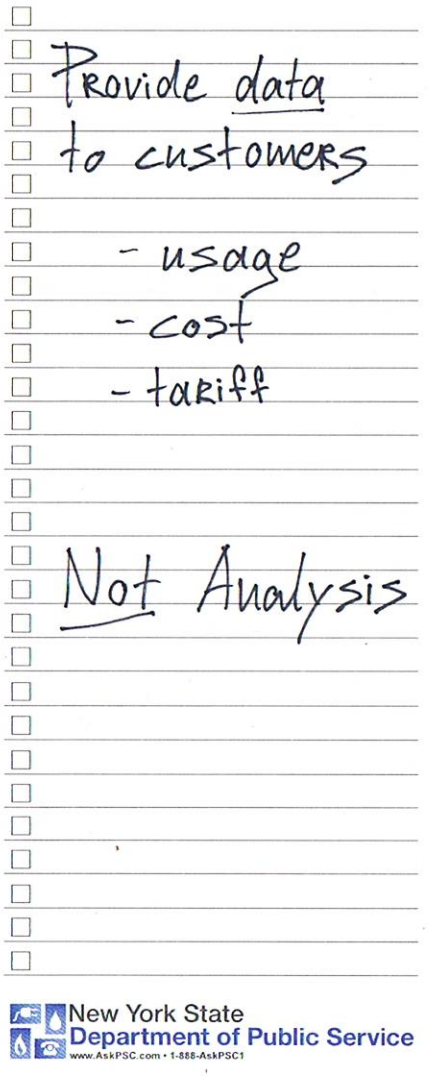
Bright Power's Business Model

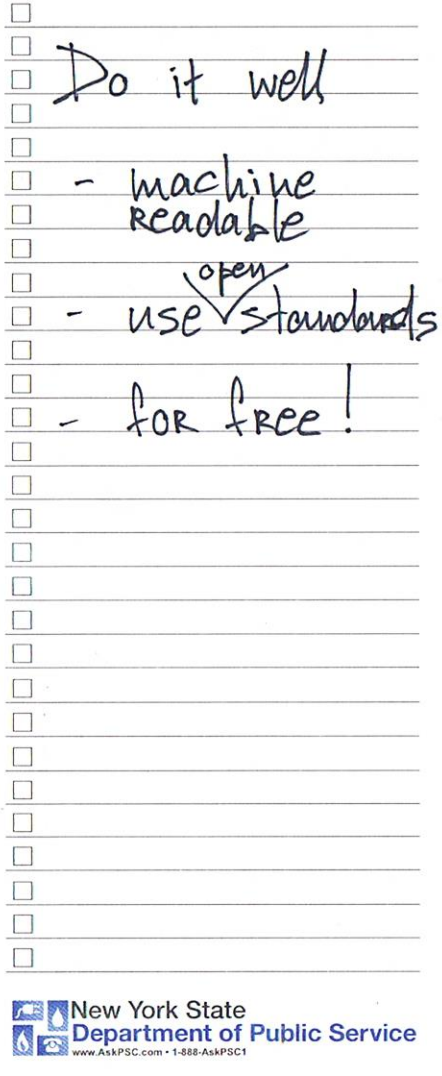
- Directly contract with customers (real estate owners)
  - Portfolios span geographic areas (inside and outside NYS)
- Comprehensively manage energy and water across customers' portfolios
  - from multiple utility companies per building
- Software for data analysis + engineers for implementation + supply brokerage for cost optimization
- Focus on multifamily with a strong concentration in affordable housing

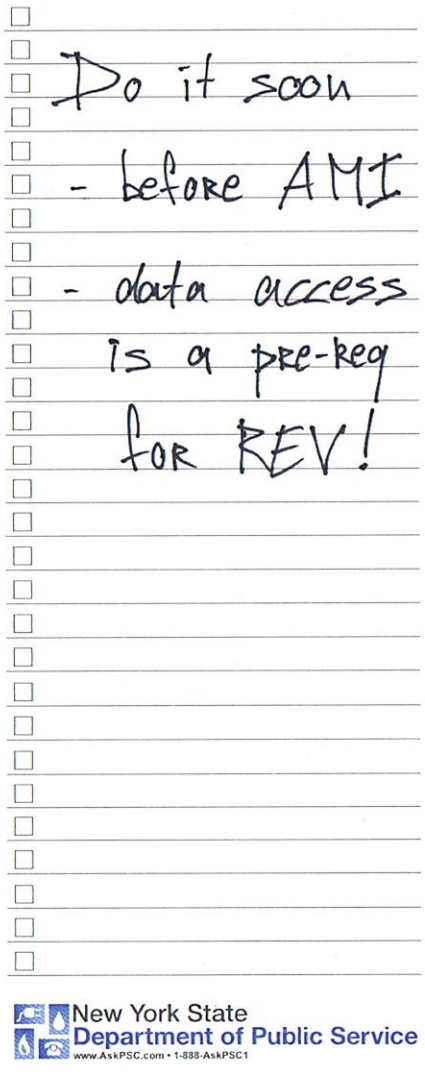
How We Gather Utility Data

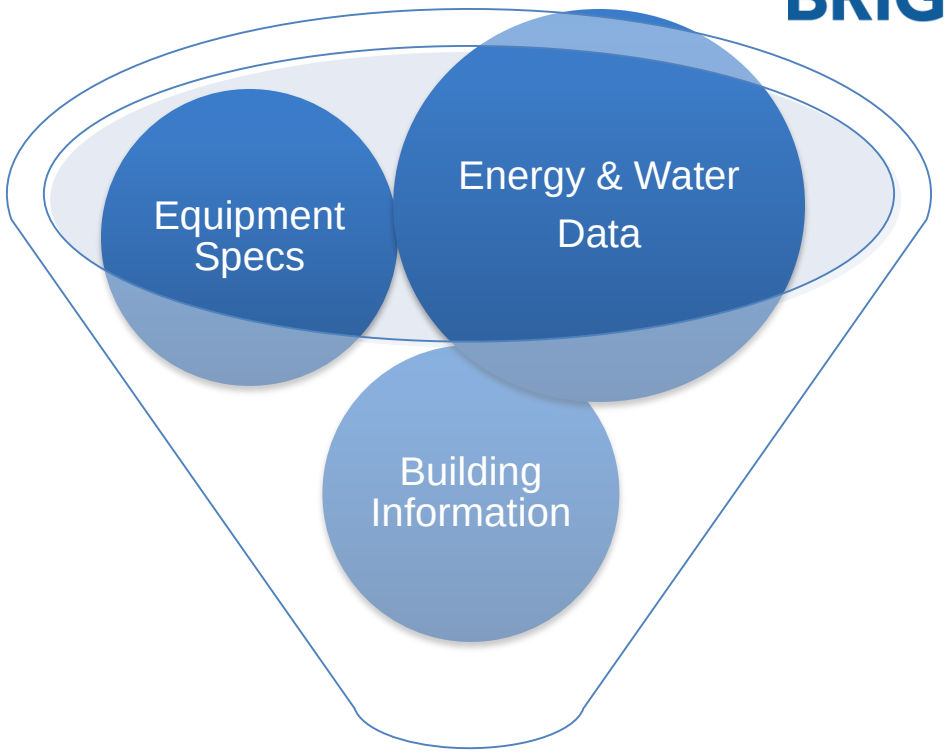
- Customers authorize us to use their login credentials to access their online utility accounts
- From our customers' bill pay companies
  - non-standard, unreliable data
- Directly from utility companies
  - Funded research projects: Custom reports
  - Tenant data for government programs
  - Aggregate whole building data for benchmarking compliance

Action items for utility companies







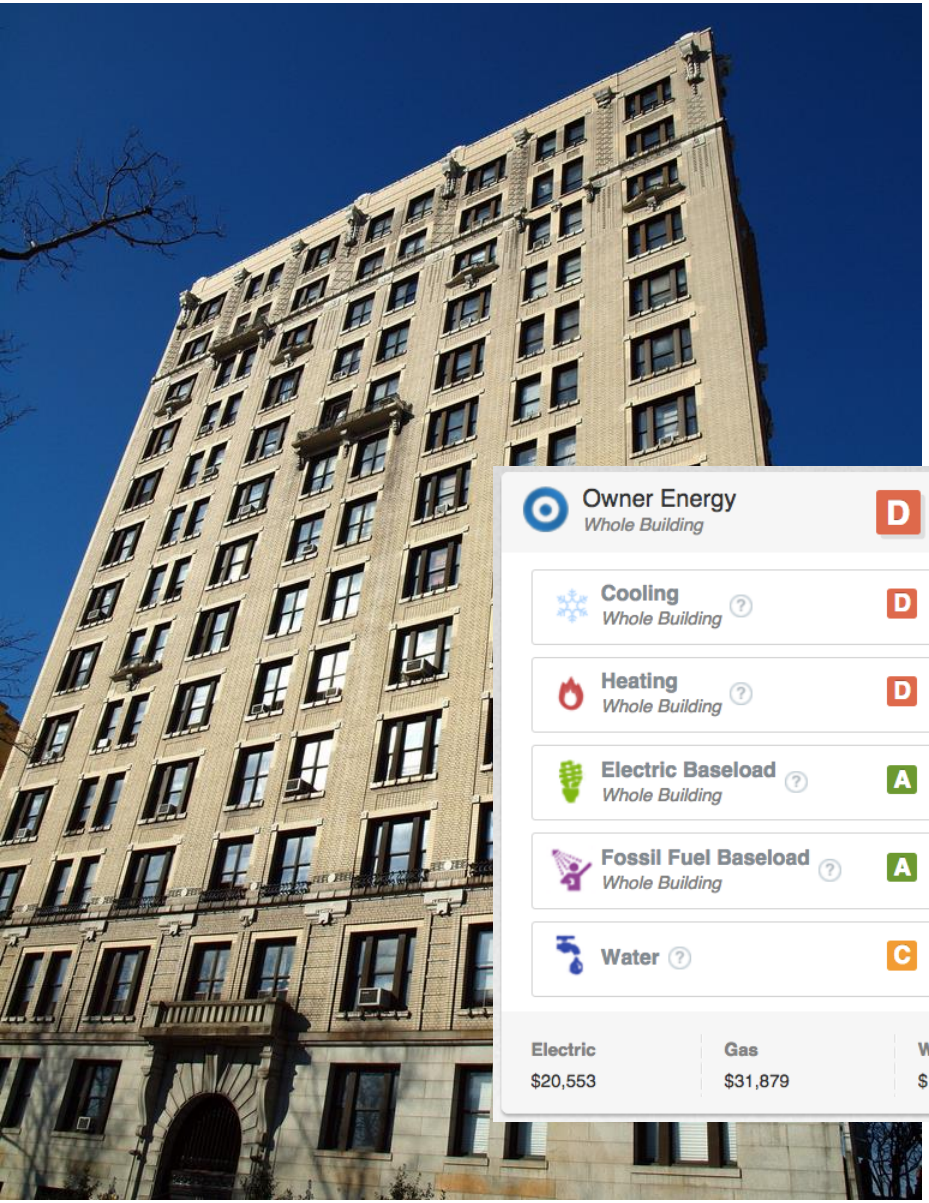


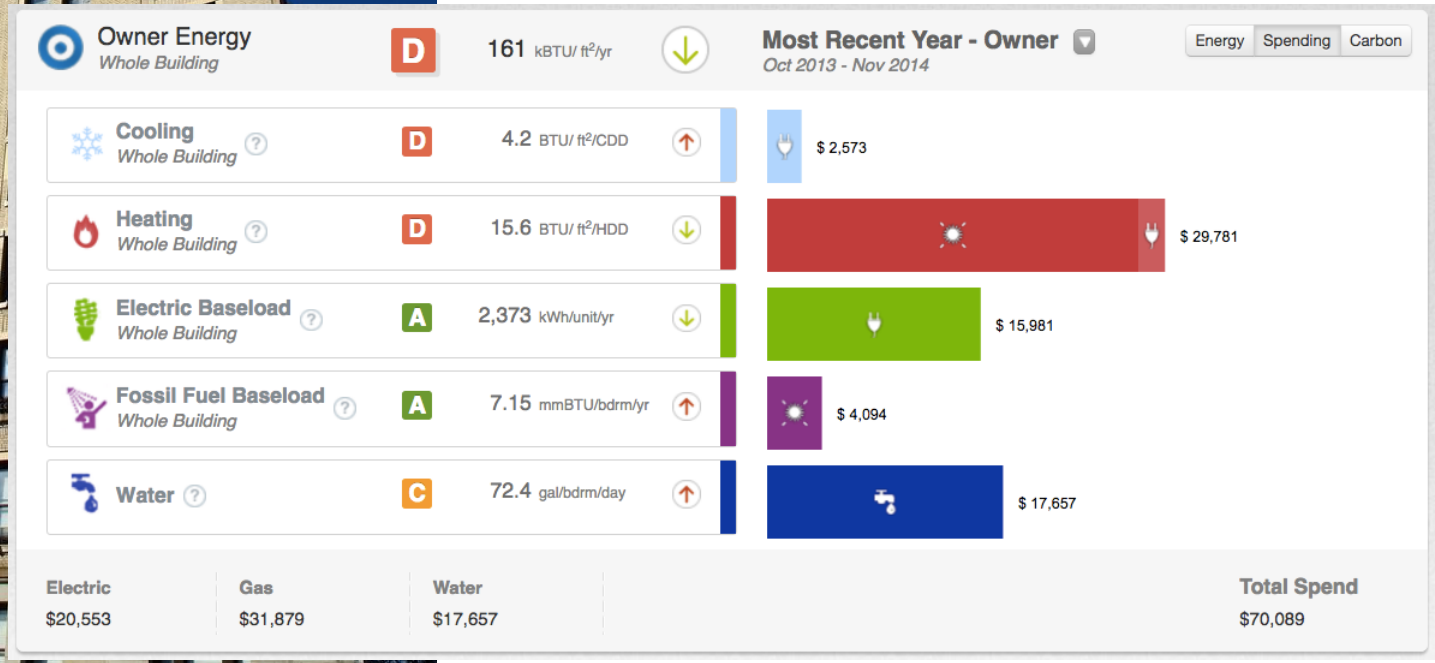
Analysis

Informed Purchasing Decisions

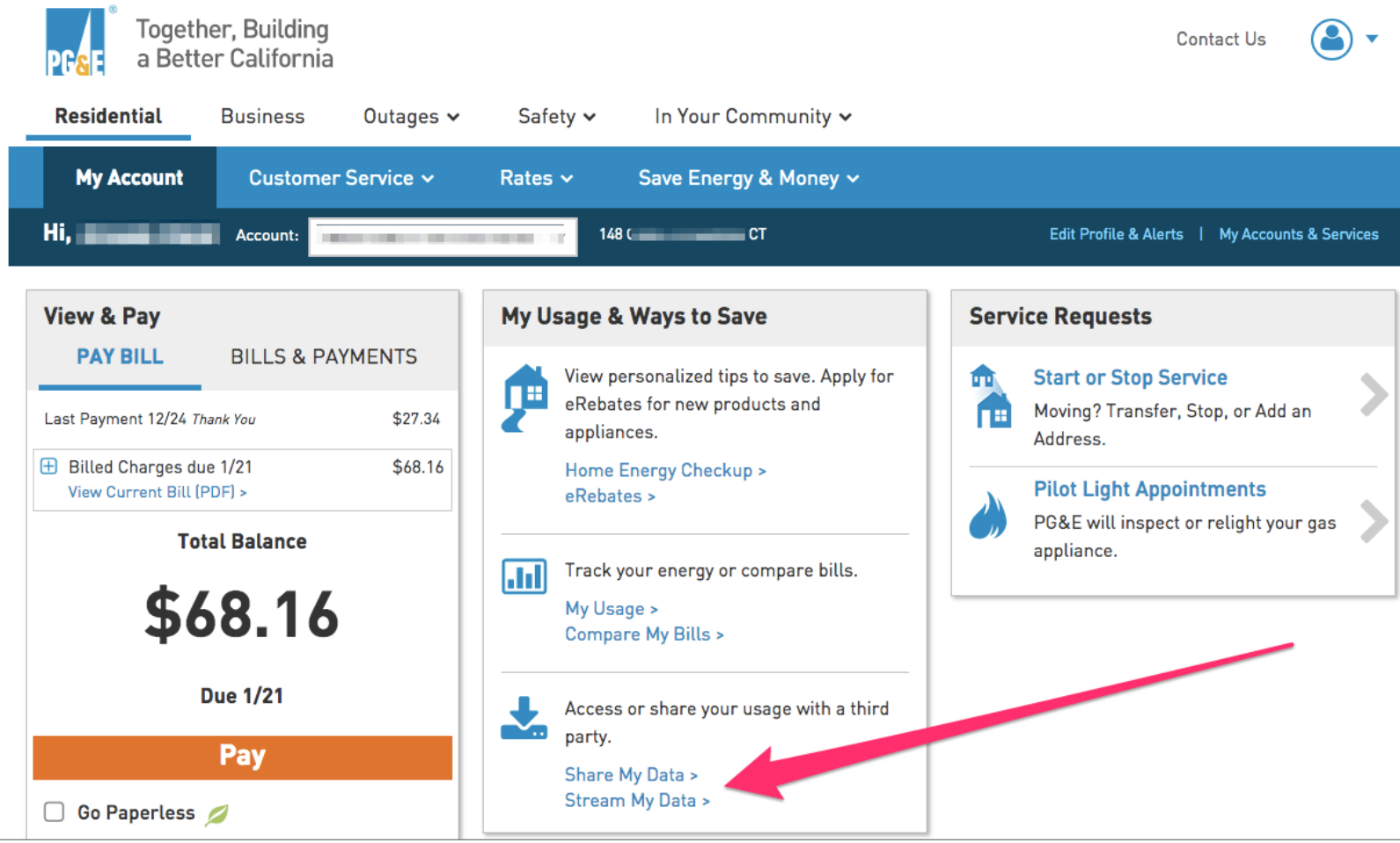
BRIGHT POWER

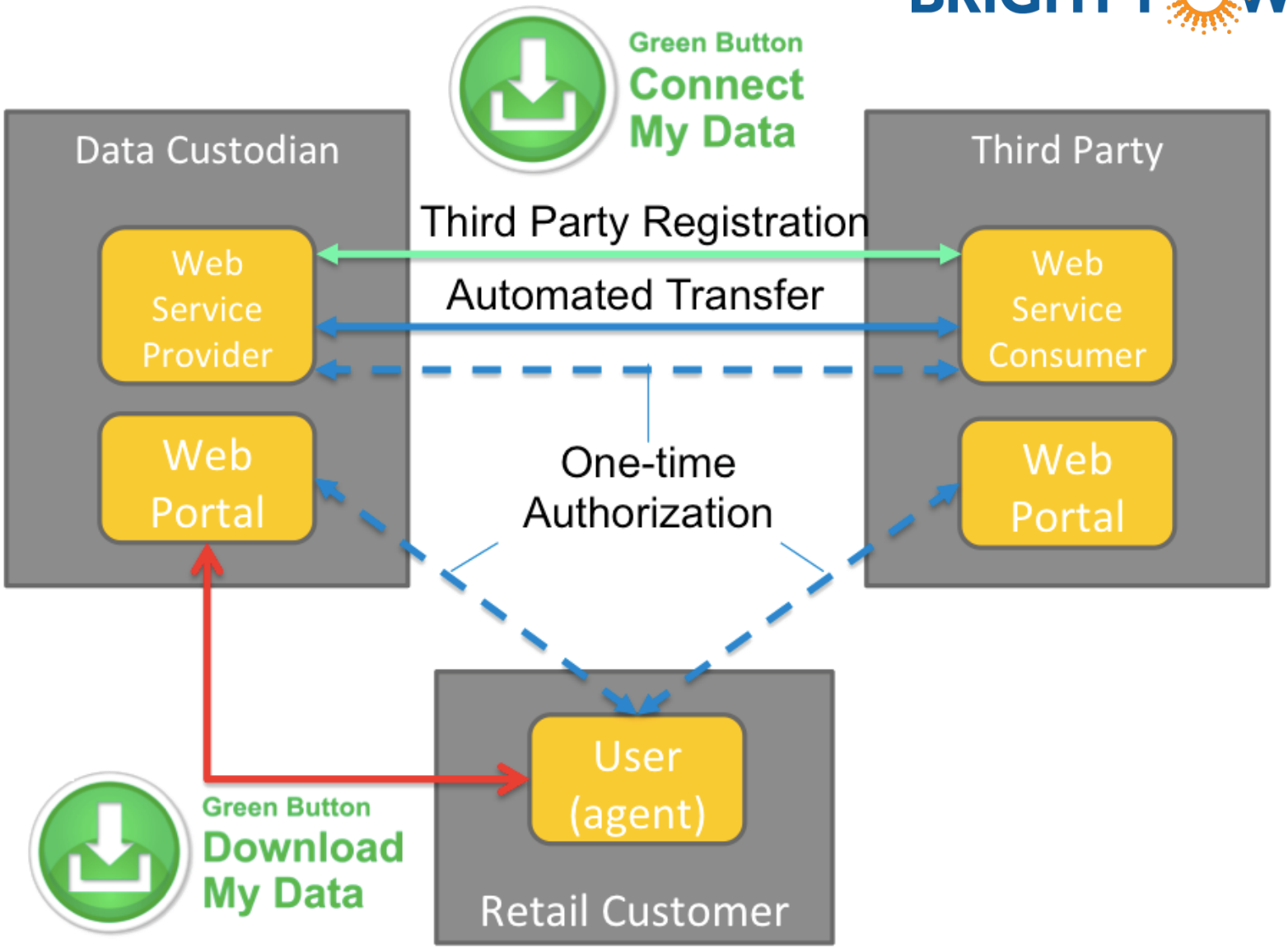
Detailed Analysis for Multifamily Buildings





BRIGHT POWER




Green Button
Connect
My Data
Data Custodian
Third Party
Third Party Registration
Automated Transfer
Web
Service
Provider
Web
Service
Consumer
Web
Portal
One-time
Authorization
Web
Portal
User
(agent)
Retail Customer
Green Button
Download
My Data

Make e-bills fully digital

conEdison

Working for you 24/7.

EAST 124TH STREET LLC

Your account number:

Service delivered to:

Your electric rate: EL9 General Large

Next meter reading date: Tuesday, Dec 15, 2015

Avoid estimated bills - please give us access to read your meter.

Your billing summary as of Nov 13, 2015

Your previous charges and payments

Total charges from your last bill	$8,158.94
Payments through Nov 10, thank you	-$8,067.55
Remaining balance	**$91.39**

Your new charges - details start on page 2

Billing period: Oct 14, 2015 to Nov 12, 2015

Electricity charges - for 29 days	$5,382.42
Adjustments	$1.37
Total new charges	**$5,383.79**

Total amount due $5,475.18

Payment is due upon receipt of this bill. To avoid a late payment charge of 1.5%, please pay the total amount due by **Dec 7, 2015.**

Message Center

Your payment was not received on time. Please make your payments on time regularly and help us avoid asking for a deposit or an additional deposit.

The "Adjustments" amount includes a Late Payment Charge of $1.37 calculated on the portion of your balance which is overdue.

AN OPPORTUNITY TO SAVE Sign up for your free energy survey today. Save energy, save money, help the environment and receive financial incentives on energy-efficient lighting, heating and cooling systems for your business. For more information call 1-877-870-6118, or visit www.coned.com/energyefficiency.

Con Edison's offices will be closed Thursday, November 26, and Friday, November 27, in observance of Thanksgiving. In the event of an emergency, our call center is available 24 hours a day, every day, including the holiday. However, we will experience very high call volumes on Monday, November 30. You can avoid an extended wait by not calling on that day.

YOUR DOLLAR FOR ENERGYSHARE CAN MAKE A DIFFERENCE. If you pay the total amount of this bill and exactly $1.00 more, that dollar will go into the EnergyShare fund sponsored by Con Edison. And, Con Edison matches each contribution. EnergyShare helps eligible residential customers who are struggling to pay their bills with one-time grants of up to $200.

Contact us 24 hours a day, 7 days a week

To report a service problem, call 1-800-75-CONED (1-800-752-6633) or visit www.conEd.com

Visit www.conEd.com

For payments, visit www.conEd.com or call 1-888-925-5016

Con Edison
Cooper Station
P.O. Box 138
New York, NY 10276-0138

For other information, call 1-800-75-CONED (1-800-752-6633)

Tear or Cut here

Wondering if you can get a better deal on your energy needs? Explore your choices at www.PowerYourWay.com

Page 1 of 4

conEdison

Payment slip

Please make checks payable to Consolidated Edison Company of N.Y. Inc.

To avoid a late payment charge of 1.5%, please pay the total amount due by **Dec 7, 2015.**

Your account number:

Total amount due: $5,475.18

Amount enclosed:

OAK BROOK IL 60522-3608

JAF STATION
P.O. BOX 1702
NEW YORK, NY 10116-1702

M79
003693

```
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      <start>1381734000</start>
    </interval>
    <IntervalReading>
      <cost>834000</cost>
      <timePeriod>
        <duration>2595600</duration>
        <start>1381734000</start>
      </timePeriod>
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    </IntervalReading>
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    </IntervalReading>
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Whole Building Aggregate Data

- Can be used for more than just energy benchmarking compliance
  - Measurement & Verification of Retrofits
  - Analysis for audits of buildings
  - etc.
- Problems
  - Authorization and request process
  - “Completeness”
  - Accuracy
  - Format

Whole Building Aggregate Data: PSC Actions

- Tie service addresses to “buildings”
  - California: AB 802 requirement
  - ConEd: using unique “BBL” building identifier
- Require optimal data definition
  - Aggregated by service address and service class
  - Accurate dates of service
  - Standardized machine readable format that is the same across utilities
- Make Aggregate Data Free of Charge

NY PSC Data Access To Do List

- Issue a clear directive to utility companies that while it ***is*** their responsibility to make data available to customers and their authorized third parties, they are ***not*** in the business of providing analysis to customers. There should be no rate increases to pay for customer facing data analysis.

- Issue concrete directives on timing and methods of data access for detailed usage data from advanced meters, billing and tariff data, and aggregate whole building usage data. Data should be provided to customers and their authorized third parties in standardized machine readable formats, on an ongoing basis, and at no additional charge.

- Require utilities to provide plans and budgets for short term (2016!) data access improvements, starting with Green Button Connect implementation.

Thanks!

Klaar De Schepper
Director of Data Management
T: 646.780.5540
kdeschepper@brightpower.com

Bright Power is a member of:

New York ENERGY CONSUMERS COUNCIL

MISSION DATA
empowering energy savings

Governmental Aggregation CCA in Illinois: a case study in data access

Gordon Boyd, EnergyNext Inc.

January 20, 2016

Energy Next Inc.

The Power of Partnership
MEGA
MUNICIPAL ELECTRIC & GAS ALLIANCE

Illinois Utility Background

- Two electric utilities
  - ✓ Ameren Illinois Company
  - ✓ Commonwealth Edison Company
- Governmental Aggregation Act of State Legislature
  - ✓ Section 1-92 of the Illinois Power Agency Act states:
  - ✓ "The corporate authorities of a municipality, township, or county board of a county may adopt an ordinance under which it may aggregate in accordance with this section (Section 1-92 (a)) residential and small commercial retail electrical loads located, respectively, within the municipality or the unincorporated areas of the county and, for that purpose, may solicit bids and enter into service agreements to facilitate for those loads the sale and purchase of electricity and related services and equipment."
  - ✓ Utility tariffs[1] outline terms and conditions

Energy Next Inc.

The Power of Partnership
MEGA
MUNICIPAL ELECTRIC & GAS ALLIANCE

CCA Experience in Illinois

- 40 communities represented since 2012
  - ✓ County, cities and villages
  - ✓ 50,000 MWhs
  - ✓ Over 40,000 accounts
  - ✓ $9 million in savings to date
- Residential and small commercial (<15,000 kwh/year)
  - ✓ Program Development (public hearings/referenda required)
  - ✓ Marketing/Education
  - ✓ Customer Service
  - ✓ Energy Efficiency Fund

Utility Data Request Process

- Municipality submits Govt. Authority Authorization Form[2]
  - ✓ Request aggregate data
  - ✓ Proof of ordinance and/or referendum and certified results
  - ✓ NDA and confidentiality requirements (all parties)
- Timeline: 10 business days
- Access procedure
  - ✓ Ameren: online portal (created for CCA)
  - ✓ ComEd: one-page form e-mailed

Utility Data Request Process

- All data are in spreadsheets
- Preliminary Premise List
  - ✓ Customer name, address, supply type, rate class
  - ✓ Remove customers served by ESCOs and with other limitations
- **Municipality must verify addresses are within jurisdiction**
- Summary Customer Usage Report
  - ✓ Aggregated usage/peak load contribution, monthly usage, supply type, rate class
  - ✓ To provide to bidding suppliers
- Detailed Customer Usage Report
  - ✓ Summary customer usage report + utility account number for each customer
  - ✓ To provide to selected supplier for customer enrollment

Data Cost

- Differs by Utility
- Ameren: no cost
- ComEd: nominal charge (by community)
  - ✓ Summary Customer Usage Report = $168
  - ✓ Refresh of Preliminary Premise List = $86
  - ✓ Detailed Customer Usage Report = $387

Key Points

- Data request = simple
  - ✓ About one page
- Data transfer = simple
  - ✓ Spreadsheet format
- Privacy concerns = standard procedure
  - ✓ NDA's signed by all
  - ✓ Compliance with existing confidentiality laws

Thank You!

Gordon Boyd
gordon@energynext.com

[1]Illinois Utility Company Tariffs

Ameren. (2016, January 8). Ameren Illinois Company: Government Aggregation Services. https://www.ameren.com/-/media/illinois-site/Files/Rates/AIel6otgas.pdf

ComEd. (2016, January 8). Commonwealth Edison Company: Rate Gap Government Aggregation Protocols. Pg:406. https://www.comed.com/documents/customer-service/rates-pricing/rates-information/current/ratebook.pdf?FileTracked=true

[2]Illinois Utility Company Government Aggregation Request Forms

Ameren. (2016, January 8). Ameren Illinois Company: Government Aggregation Registration and Customer Information Request Form. http://apps.ameren.com/AIUMAP/Government%20Aggregation%20Registration%20Form_370649.pdf

ComEd. (2016, January 8). Commonwealth Edison Company: Municipal Authority Aggregation Data Request Form. https://www.comed.com/documents/about-us/municipal-aggregation/municipalauthorityaggregationdatarequestform.pdf?FileTracked=true