



# ENERGY EFFICIENCY THROUGH ENERGY DATA ANALYTICS

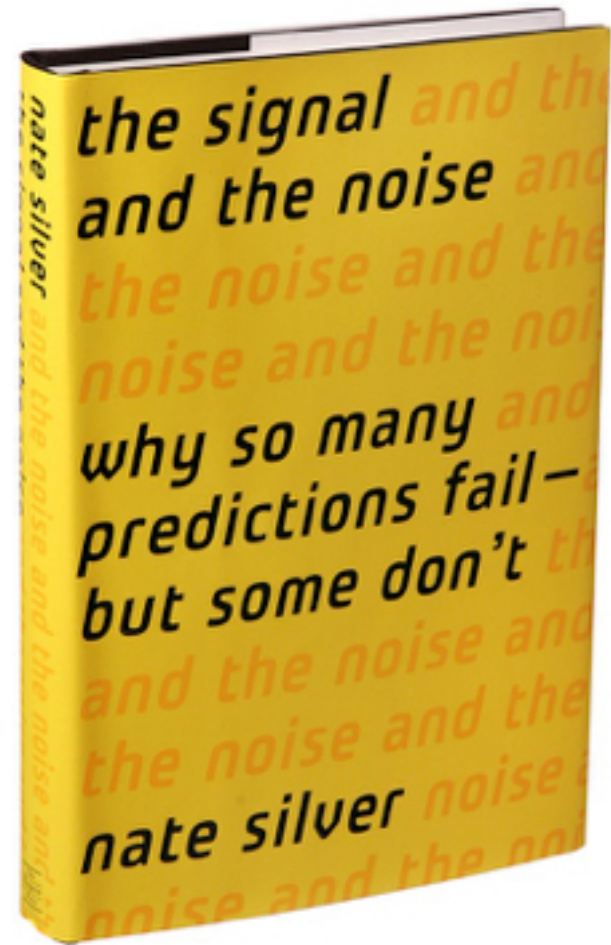
BRIAN BOWEN  
MICHIGAN EO COLLABORATIVE  
SEPTEMBER 15, 2015

**FIRSTFUEL**  
ANALYTICS | BUILDING SCIENCE | SOFTWARE


# THE SIGNAL AND THE NOISE

“IBM estimates that we are now generating **2.5 quintillion bytes of data each day...**

and 90 percent of global data was **created within the last two years.**”



# ENERGY DATA IN MICHIGAN



There are nearly 1.3 million smart meters in Michigan.

# ENERGY DATA IN MICHIGAN

At 15 minute intervals...

That's nearly **125 million data points...**

In a single day.

# CUSTOMER INTELLIGENCE PLATFORM FOR UTILITIES



We harvest the insights  
within your  
**energy meter data...**

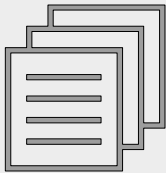
...to deliver  
**customer intelligence**  
via 'zero-touch' analytics...

...to enable you to **engage**  
**customers** and **meet energy**  
**savings targets** at scale

# CHALLENGES OF EXISTING CUSTOMER PROGRAMS

## CUSTOMER ENGAGEMENT

*Paper bills*



*Call centers*



RISING SERVICE COSTS  
LOW CUSTOMER SAT



*High touch sale*



*On-site audits*



RISING COSTS OF EE/DSM,  
LOW PARTICIPATION

## ENERGY EFFICIENCY/DSM

# BETTER INTELLIGENCE TO HELP MEET THE CHALLENGE

## 1 CONVERT EXISTING DATA

FROM UTILITY

BUILDING  
ADDRESS



1 YEAR ELECTRIC  
METER DATA  
+ GAS DATA



FROM FIRSTFUEL

LOCAL  
WEATHER DATA



GIS MAPPING/  
SEMANTIC SEARCH



# BETTER INTELLIGENCE TO HELP MEET THE CHALLENGE

## 1 CONVERT EXISTING DATA

## 2 INTO CUSTOMER INTELLIGENCE

FROM UTILITY

BUILDING ADDRESS



1 YEAR ELECTRIC METER DATA + GAS DATA



FROM FIRSTFUEL

LOCAL WEATHER DATA



GIS MAPPING/ SEMANTIC SEARCH



EX: END-USE DISAGGREGATION



EX: PERFORMANCE BASELINING



TECHNICALLY VALIDATED FOR ACCURACY



# BETTER INTELLIGENCE TO HELP MEET THE CHALLENGE

## 1 CONVERT EXISTING DATA

## 2 INTO CUSTOMER INTELLIGENCE

## 3 TO ADDRESS KEY OPPORTUNITIES

FROM UTILITY

BUILDING ADDRESS



1 YEAR ELECTRIC METER DATA + GAS DATA



FROM FIRSTFUEL

LOCAL WEATHER DATA



GIS MAPPING/ SEMANTIC SEARCH



EX: END-USE DISAGGREGATION



EX: PERFORMANCE BASELINING



TECHNICALLY VALIDATED FOR ACCURACY

## CUSTOMER ENGAGEMENT

- Right service and offer for right customer
- Improve satisfaction

## EE/DSM DELIVERY

- Reduce customer acquisition costs
- Improve participation

# THE PLATFORM FOR BUSINESS CUSTOMER INTELLIGENCE

## CUSTOMER ENGAGEMENT



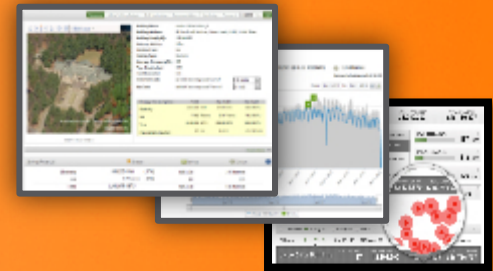
**FIRSTENGAGE**  
*Utility B2B  
Engagement Portal*



## EE/DSM DELIVERY



**FIRSTADVISOR**  
*'Zero-Touch' Screen, Audit  
and Monitoring*



## CUSTOMER INTELLIGENCE PLATFORM

METER ANALYTICS

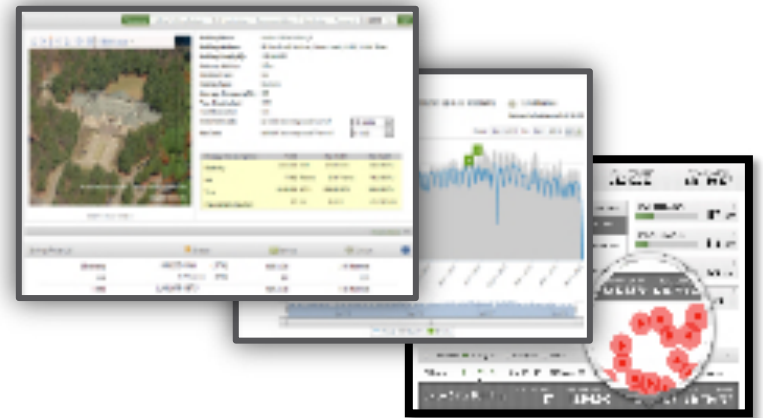
BUILDING ANALYTICS

DATA MAPPING

RECOMMENDATION ENGINE

# **FA** FIRSTADVISOR

*'Zero-Touch' Screening, Auditing  
and Monitoring for DSM Programs*



# THE CHALLENGES OF EFFICIENCY DELIVERY

**RANDOM. REACTIVE.**

**RETROFITS.**

**ONE BUILDING. ONE  
MEASURE.**

**kWh SAVINGS.**

**LOW SCALE. HIGH COST.**

# THE OPPORTUNITY OF DATA-DRIVEN EFFICIENCY

## EE PAST

RANDOM. REACTIVE.

RETROFITS.

ONE BUILDING. ONE  
MEASURE.

kWh SAVINGS.

LOW SCALE. HIGH COST.

## EE PRESENT + FUTURE

DATA-BACKED. STRATEGIC.

OPERATIONAL + RETROFITS = 2X.

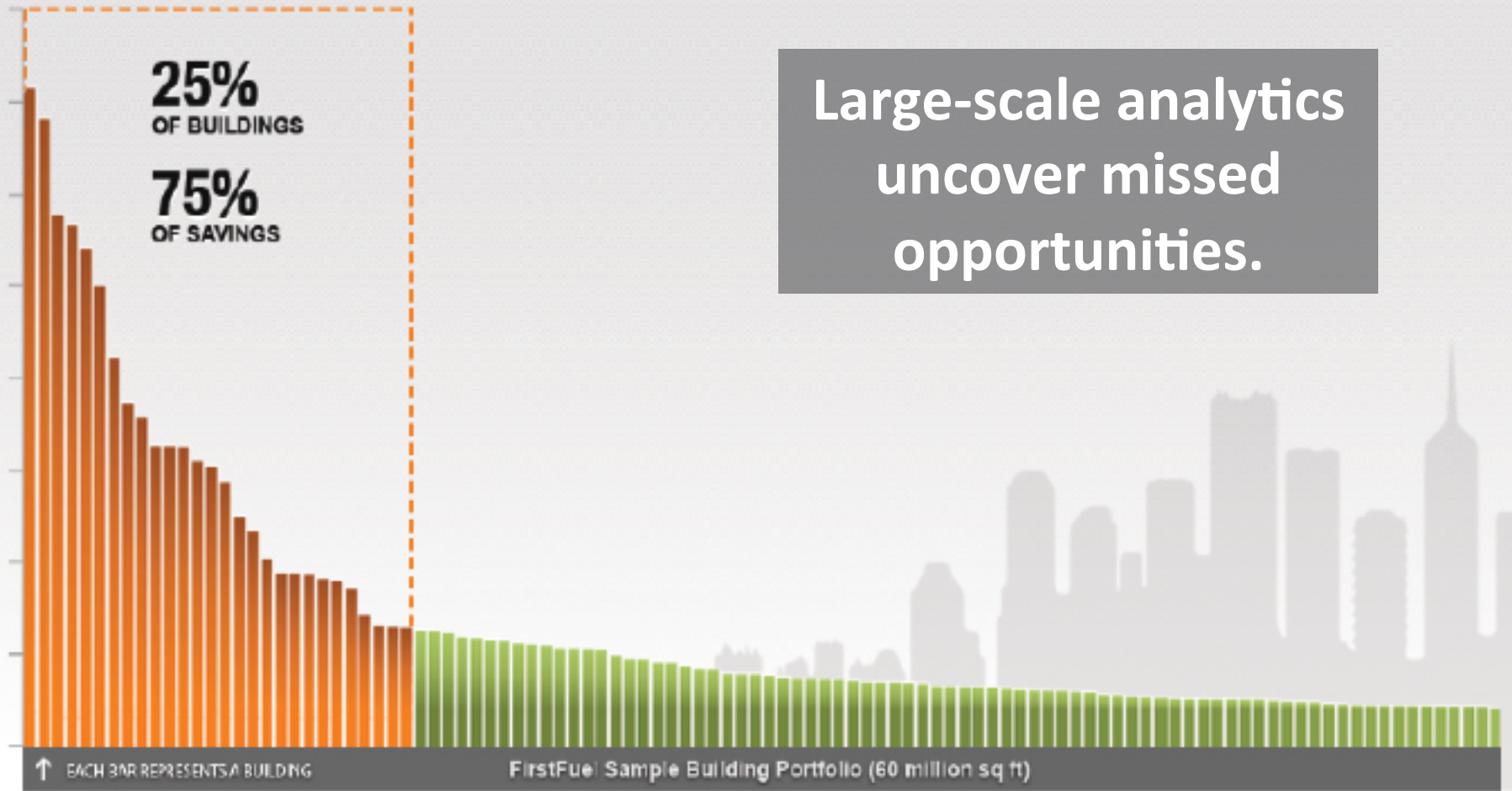
ALL BUILDINGS. DEEP SAVINGS.

INTEGRATED kWh + kW + THERM  
SAVINGS

HIGH SCALE. LOW COST.

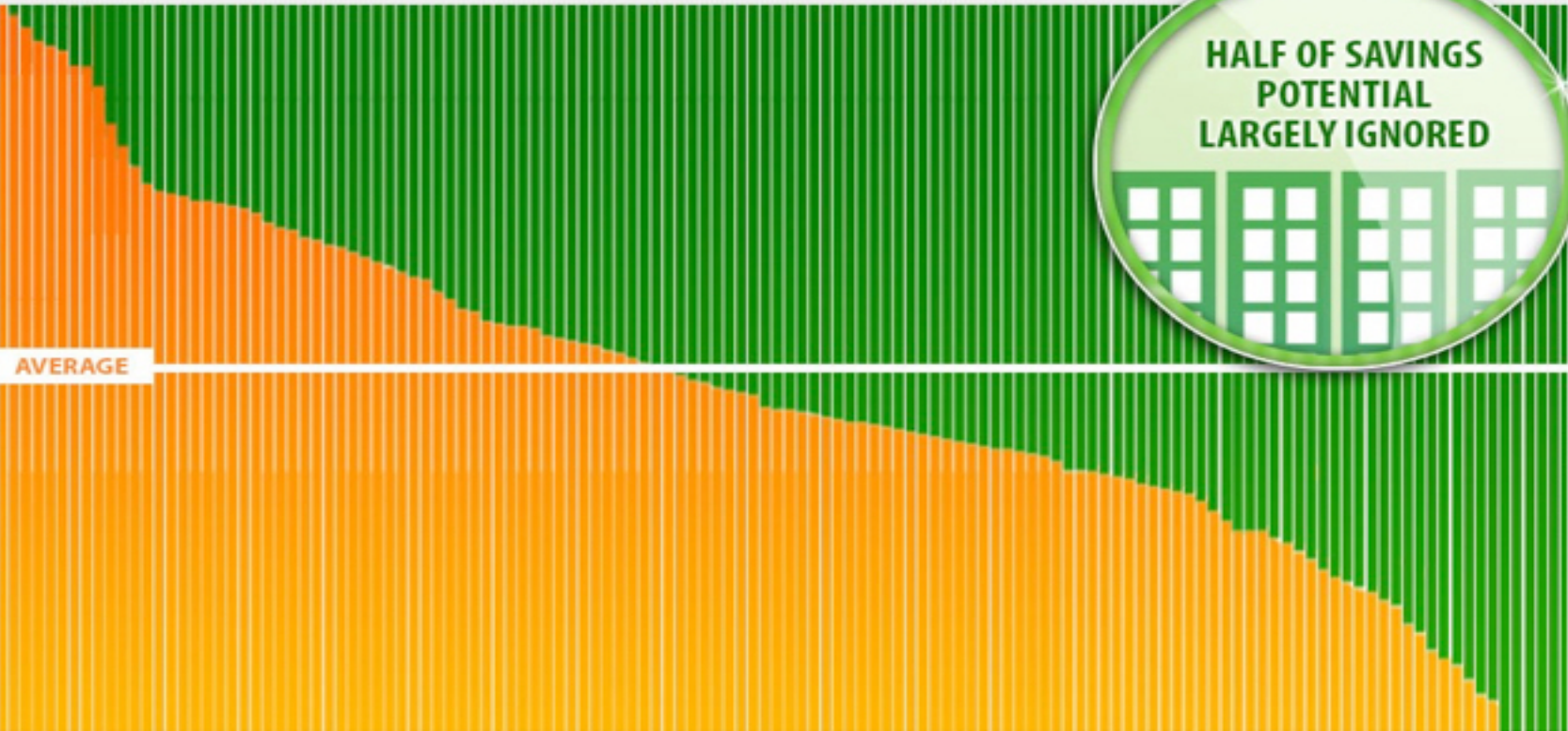
# 75% OF THE ENERGY EFFICIENCY OPPORTUNITY IS FOUND IN 25% OF BUILDINGS

Savings Potential (kWh)



# OPERATIONAL SAVINGS: MORE THAN 50% OF COMMERCIAL ENERGY EFFICIENCY POTENTIAL IS LOW / NO COST

RETROFIT VS. OPERATIONAL SAVINGS POTENTIAL SPLIT



↑ EACH BAR REPRESENTS A BUILDING

● % OF RETROFIT SAVINGS

● % OF OPERATIONAL SAVINGS

FIRSTFUEL SAMPLE BUILDING PORTFOLIO ( 60M SQFT )

51 percent of all energy efficiency savings in commercial buildings are achievable through operational improvements—many at little or no cost to building owners. The portfolio above represents a \$12M operational savings opportunity.

# ANALYTICS ACROSS THE LIFECYCLE



Webinar



Print/Email



Web Portal

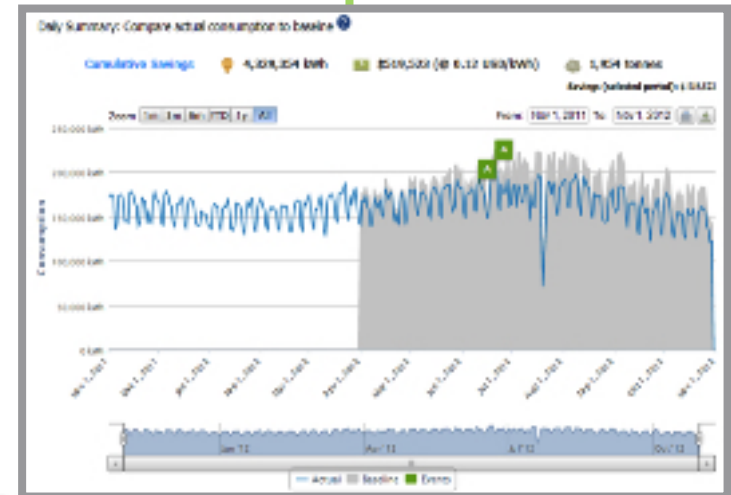


SCREEN AND RECRUIT

AUDIT

QUALIFY, ENGAGE AND IMPLEMENT

MONITOR & CONTINUOUSLY ENGAGE





# EE/DSM DELIVERY: CUSTOMER IMPACT



Marketing **3-5x** More customers targeted

Recruiting/Admin **1-3x** Lower cost per kWh

Technical/Engineering **~65%** Lower cost per audit

Savings ID **1.5x** More operational savings found

Engagement **6-8x** Faster time-to-initial customer commitment

ECMs/Projects **~25%** Improved program lift

# INDEPENDENT TECHNICAL VALIDATION

## PUBLISHED REPORTS



### COMPARISON TO:

Onsite audits

### FIRSTFUEL ANALYTICS RESULTS:

- 48 of 49 end-uses within margin of error
- Identified opportunities missed by on-sites



End-use sub-metered building

- Within 7% of building end-uses



End-use sub-metered building

- Within 1%-5% of building end-uses
- Identified opportunities missed by on-sites



Building expertise

- Analysis and recommendations on EPRI HQ building consistent with knowledge of expert onsite EPRI staff

## PRIVATE CUSTOMER RESULTS



US General Services Administration

End-use calculations, Onsite audits

- Within 2% of end-use calculations
- Consistent recommendations/savings
- Uncovered largest savings opportunity missed by onsite audits



End-use calculations, Onsite audits

- Within 5% of end-uses
- Consistent recommendations/savings

# FE FIRSTENGAGE

## *Utility B2B Engagement Portal*



# CUSTOMER EXPECTATIONS ARE CHANGING

*“Business Customer expectations are increasing and utilities need to keep up with them. The greatest struggle for utilities being left behind is their **business customers' online experience.**”*

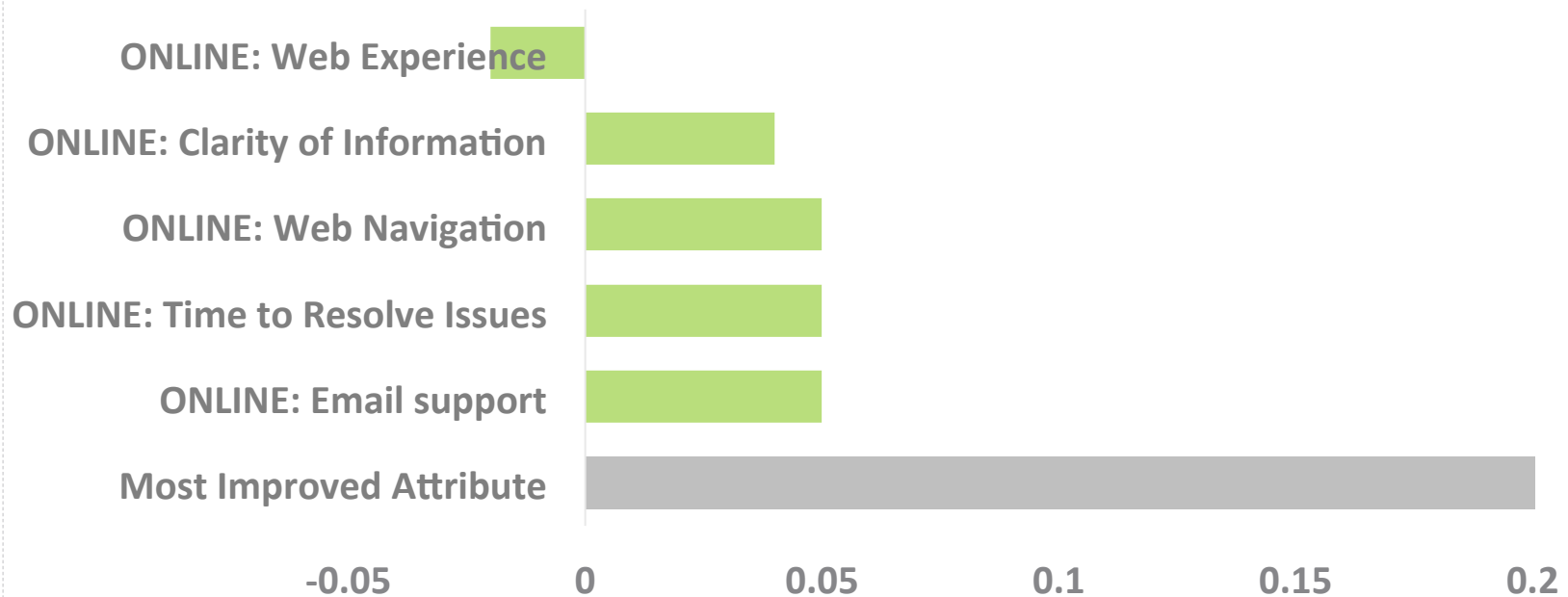
**J.D. Power Survey, 2014**

# THE IMPORTANCE OF WEB-BASED SOLUTIONS

## Customers Want a Better *Digital Experience*

### JD Power Business Survey: Least Improved Attributes

23,500 C&I Customers



# SMB CUSTOMERS EXPECT TAILORED SOLUTIONS

## SMB Customers Expect More *Personalization*

Accenture Survey  
2,200 SMB customers

**Importance: receiving targeted solutions for my business needs**

87%

**Satisfaction: my energy provider offers me targeted solutions**

35%

# FIRSTENGAGE: MULTICHANNEL ENGAGEMENT

A multi-channel platform that delivers energy intelligence to drive C&I customer engagement and empowerment



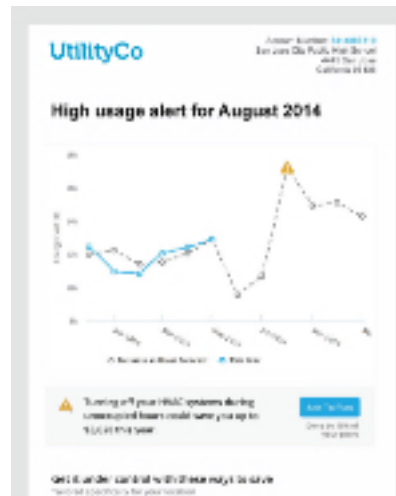
Web Portal



Outbound Comms



Utility Dashboard



# IMPROVED DIGITAL EXPERIENCE

- Customized insights
- Clear calls to action
- Better customer data
- Consistent look and feel





# E.ON UK: ENERGY TOOLKIT



*“Our Energy Toolkit provides advice on where savings can be made without the need for major investment in the building itself.”*

*Anthony Ainsworth  
Business Energy Director at E.ON*

*EON’s Energy Toolkit covers over 430,000 small-medium UK customers*

**Strengthen customer loyalty & retention**

**Lower cost-to-serve through toolkit**

**Drive product and service cross-sell**

**Improve customer engagement and satisfaction**



*"SMUD envisions the solution to provide a more interactive dialogue between customers and the utility, with tailored content and personalized feedback."*

SMUD

*SMUD launching FirstEngage for medium and large commercial & industrial customers*

**Increase customer engagement and satisfaction**

*Drive customer sentiment across C&I segment*

**Increase DSM program participation**

*Customer-specific energy tips linked directly to SMUD incentives*

**Improve customer education**

*Help customers understand time-of-use pricing*

**Lower cost to serve**

*Reduce operational costs across CSR teams etc.*

# CASE STUDY

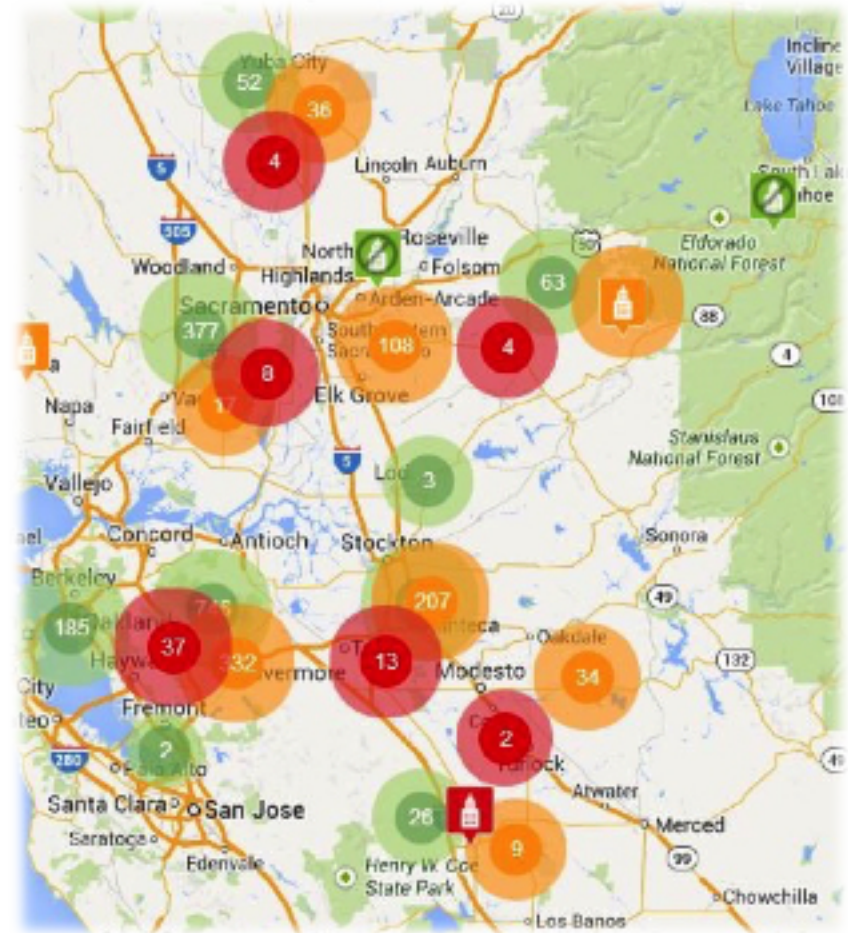
Using Geo-Targeted EE as a T&D Resource

# USING ENERGY EFFICIENCY AS A T&D RESOURCE

- “Energy efficiency programs can **defer or delay T&D investments** whose need is driven, at least in part, by economic conditions and/or **growing peak loads.**”
  - » NEEP, “Energy Efficiency as a T&D Resource”
- Energy efficiency **cannot** delay:
  - The need to replace aging T&D infrastructure;
  - The need to address unexpected equipment failures;
  - The need to connect new generation

# FIRSTFUEL EXAMPLE: CALIFORNIA UTILITY

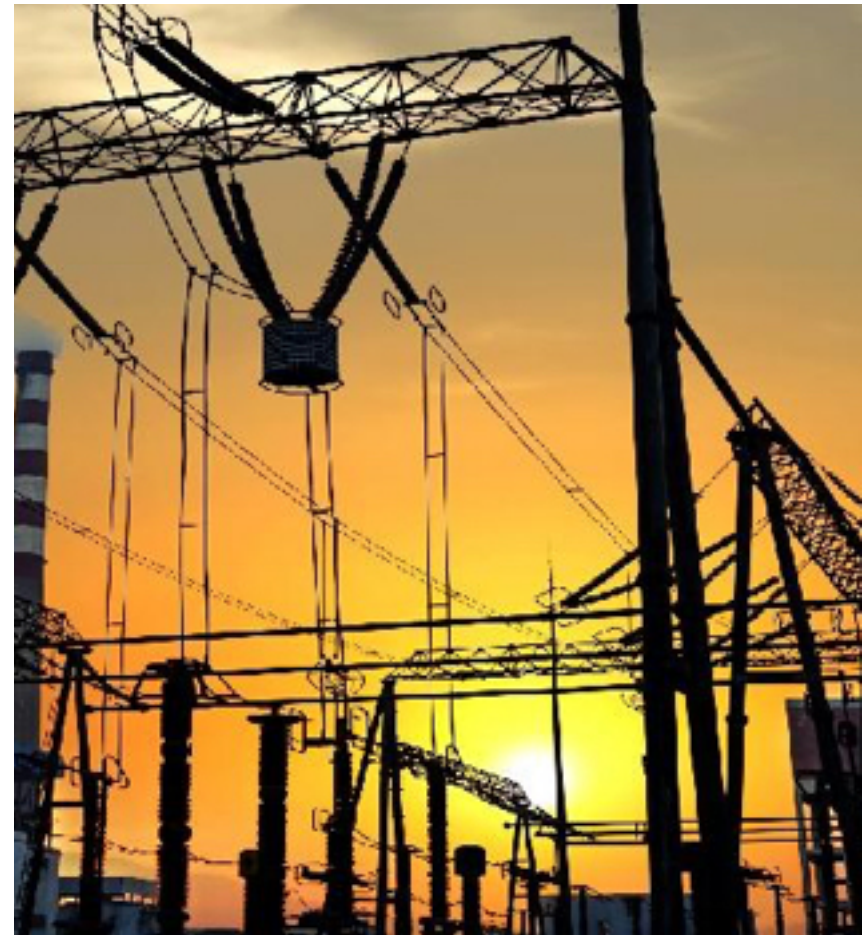
- Goal: Target peak demand (kW) reductions
- Specific substations identified
- Offered enhanced incentive, reflecting enhanced value
- NB: Not DR, but EE



# TARGETED EE IN MICHIGAN

- DTE Electric agreed to work cooperatively with NRDC to develop a pilot project that would **explore the potential for geographically targeted energy efficiency** to cost-effectively defer a distribution system upgrade.

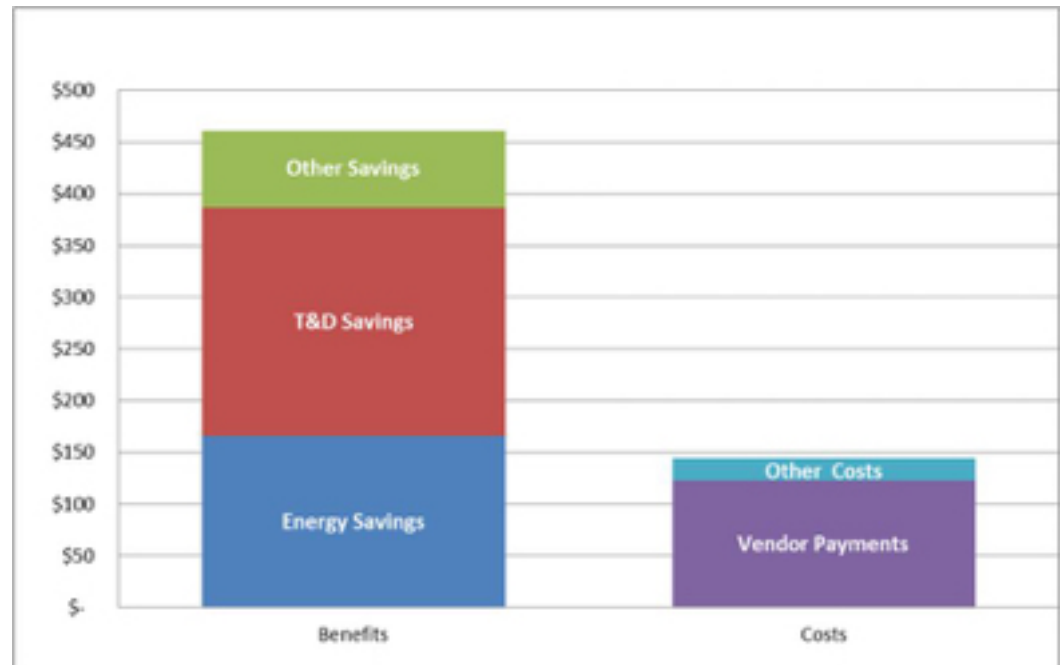
» MI PSC, Case No. U-17762, June 3, 2015



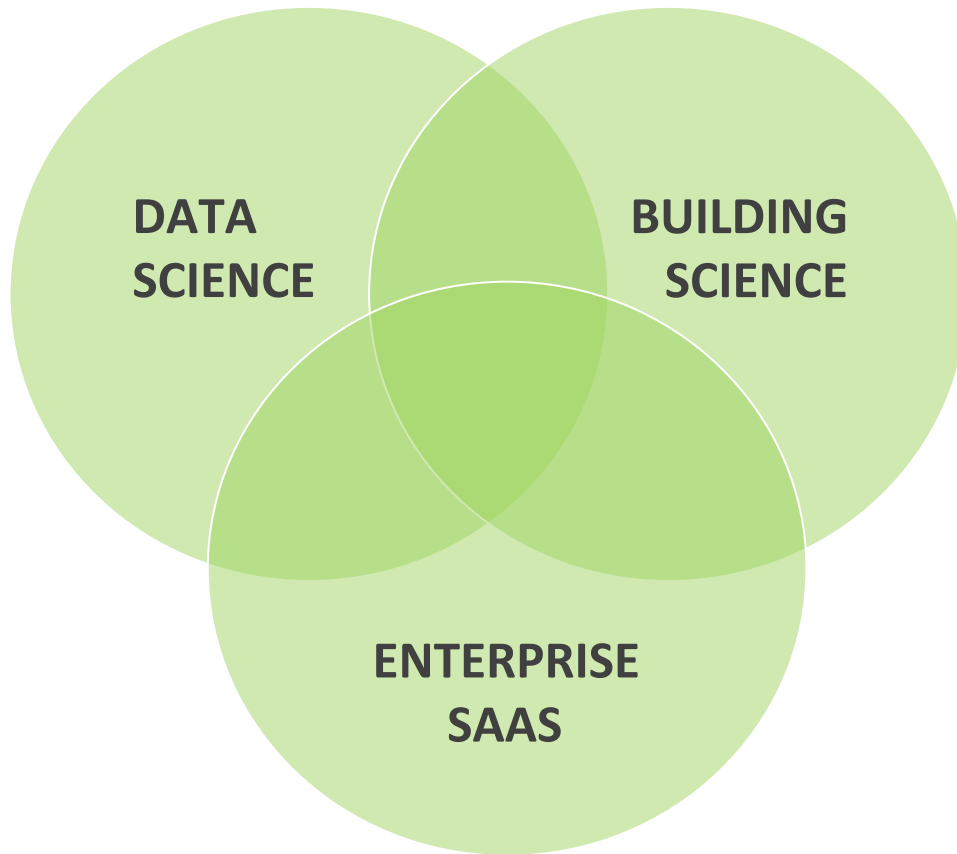
# CONED'S "BILLION-DOLLAR SUBSTATION"

- \$75M in avoided costs 2003-2010
- \$300M, when accounting for energy and capacity savings
- New \$200M Brooklyn-Queens project underway.

NPV of Net Benefits of Con Ed's 2003-2010 Non-Wires Projects



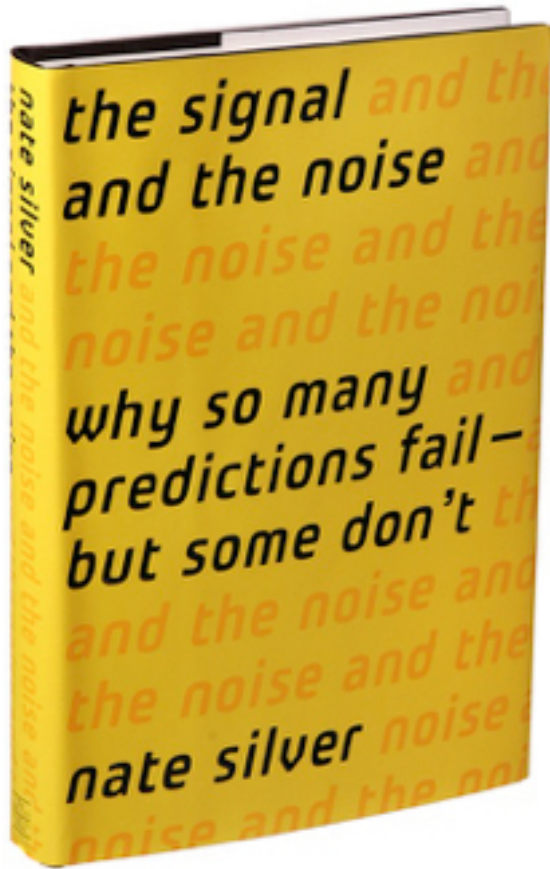
# THE VALUE OF INCREASED CUSTOMER INTELLIGENCE



- Better planning
- Targeted marketing
- Informed customers
- Increased market activity in energy efficiency



# SEPARATING THE SIGNAL AND THE NOISE



‘We think we want  
*information* when what  
we really want is  
*knowledge.*’

# THANK YOU

Brian Bowen

Regulatory Affairs Manager

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