Big Data 301:
THE MOST IMPORTANT DATA AND THE MOST IMPORTANT ACTIONS CUSTOMERS ARE EXECUTING ON TODAY
Our Data Management Series at a Glance:

- New Data Management 101, 201 and 301 focus on data and workflow management by categories:
  - **101**
    - Building Controls, Systems Data and Workflow Management
  - **201**
    - Utility Data, Systems Data and Workflow Management
  - **301**
    - Utility Data, Building Controls Systems Data, and Workflow Optimization
101 Recap
Integration of Data Sets Drives the ROI
Why invest in a program like this?

1. Reduce Energy Cost (kWh)
2. Connect and Control your Most Important Assets
3. Blending Workflow and Technology is key to ROI
201 Recap: New and Improved

1. Managing data for your company is no longer possible the old way - optimized workflow is the only way
2. Comparison between the “old” utility bills and the “new” EMS
3. Building out a platform to manage your new and revitalized, important data
Two Most Important Data Sets: EMS Data & Utility Bill Data
EMS Action - HVAC

To show us the Uncompliant Zone Temperature Across an Enterprise

But What If:

We Can Consolidate the Data we WANT

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Instead of Individual Changes

It Changes at the Push of a Button
EMS Action - Lighting

To show us the Uncompliant Set Points Across an Enterprise

But What If:

We Can Consolidate the Data we WANT

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One By One By One
EMS Action

Instead of Individual Changes

It Changes at the Push of a Button

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Managing Your Demand

• Would not be able to manage load effectively during peak season because you would not be able to see what was going on.

• Managing load can be done all the time.

• By developing specific internal strategies that focus on comfort limits and energy reduction – you can reduce overall peak cost.
Managing Your Demand

- Demand Response Builds on top on passive management based on level of aggression

Ex. 1 bank of lights, 2 banks of lights, 3 banks of lights, etc.
Manage Your Preventative Maintenance

Move from Calendar Maintenance

Use SPM (Statistical Preventative Maintenance)

Ex: Setting up Run-time meter and as it crosses a certain time, deploy PM Resources

Implement Strategies

Time
301 in Summary

For the RECORD.

KU

171 HEADS UP RECORD
5 NATIONAL CHAMPIONSHIPS
13 FINAL FOURS
54 CONFERENCE REGULAR SEASON CHAMPIONSHIPS

MU

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15

KU sports
Our goal is a cost-efficient and “green” facility

We create value by reducing cost, usage, and waste through best-in-class utilities procurement and innovation while reducing our footprint.
Managing and understanding our data is critical across our initiatives.

**A cost-efficient, “green” facility**

- **Pay less**
  - Regulatory intervention
  - Billing diligence
  - Contract administration
  - Demand reshaping

- **Use less**
  - Energy conservation
  - Energy efficiency
  - Building operations optimization

- **Reduce our footprint**
  - Renewable energy

- **Change the game**
  - Electric Vehicle charging
  - IoT and machine learning
  - Sub-metering and analytics

Reliable, resilient energy, waste, and water services that keep our facilities operating effectively.
Key **technology capabilities** drive outcomes

... but **people** and **processes** are also critical

- **Data**
  - Acquisition and management
  - Breadth, quality & normalization

- **Analytics**
  - Isolate drivers of cost
  - Grounded by domain knowledge

- **Features & Functionality**

- **Usability**

- **Business outcomes**
  - Engage with data
  - Business use cases
  - Business user adoption
  - Integration with other applications
Example: A rate engine for financial transparency

- Three work-streams enable the business outcomes:
  - Consumption and demand interval data including distributed generation
  - Electric Rates that are sufficiently detailed
  - Features and Functionality to enable insights and decisions

- Including **Investment Priorities** and **Optimized Operations**:
  - Renewable project viability
  - Efficiency projects viability
  - Alternative electricity supplies
  - Preventative maintenance decisions (partner w/IoT)
  - Demand management (partner w/IoT)
  - Operational anomalies
  - Forecasting and budgeting
  - Regulatory intervention & rate selection
  - Measurement & verification of projects

- ... and partnering with other key applications:
  - IoT Platform to aggregate the data, run analytics and enable business users
  - Energy Management System to control facility operations
  - Etc.
Example: Site Analysis

- **Purpose:** understand usage, costs and opportunities
  - Load shape views including sub-metering
  - Aggregation of data from utility metering, WMT-owned metering and distributed generation to understand total site consumption
  - Load duration curve to show consistency of electricity usage
  - Rate slider to understand the impact of reducing demand

- **Future:** proactive/automated comparison within and across stores based on similarity and/or historical performance
Example: Renewable project vetting

- **Purpose:** vet onsite technologies (e.g., solar) and operational changes by efficiently calculating Price to Beat and NPV
  - Compare different rates’ impact on a site given its usage
  - “What if” analyses for cost of money, technology deterioration, etc.
  - M&V for continuous improvements and outcomes tracking

- **Future:** heat-map of Price to Beat per technology; portfolio view of technology performance across sites

Using 8760 site interval data and solar PVWatts

```
Main Meter + Solar + Utility and PPA Rate financial impact = NPV and price to beat
```
How can we partner to grow the value for all stakeholders?

- **Utilities can enable transparency**
  - Prioritize AMI rollouts
  - Make interval data available, but also *accessible* and *affordable*
  - Simplify rates or make them easier to track
  - Communicate your plans and points of contact

- **Service providers can enable smaller customers to benefit from active energy management**

- **Customers communicate needs and consume services**