



# Northwestern University



utiliVisor

# Energy Conservation Through Sub-Metering at Northwestern University

June 25, 2018

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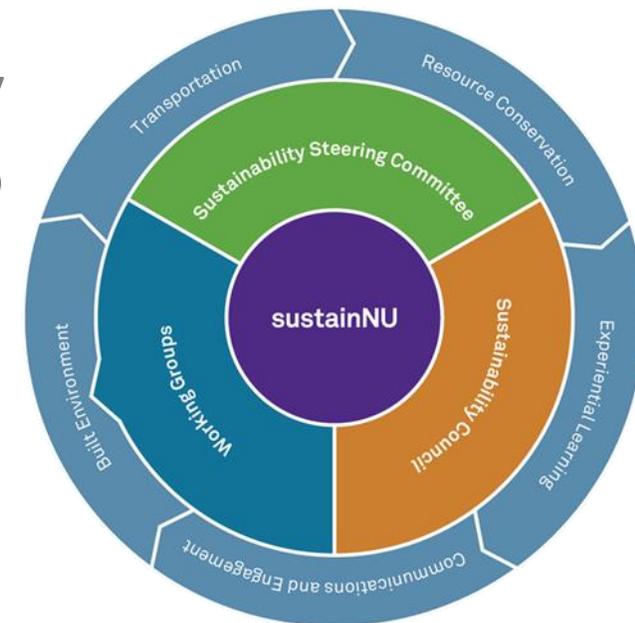
## Agenda

- Background
- Problem
- Objective
- Hiring a Third Party
- The Path to the Solution
- Energy Stack
- The Results

## Background

# Northwestern's Strategic Sustainability Plan

- Adopted in 2017
- Comprehensive initiatives covering five key program areas
- Reduce energy consumption by 20% by the year 2020 from the 2010 baseline
- Establish baseline usage and conservation goals via a water conservation plan by 2018
- Reduce greenhouse gas emissions 30% by 2030 from the 2012 baseline and net zero emissions by 2050



## Problem

- 1,000 utility meters on campus
- 224 buildings
- Everything was being handled with spreadsheets
- Large portfolio with a number of expense accounts and chart strings
- All manual data entry, and no way to validate processes
- Couldn't share actual energy usage

## Objectives

- Streamline and standardize the Recharge Process
- Centralize meter collection process
- Provide greater transparency of energy consumption to stakeholders
- Visualization of data
- Auditable method to allocating utility costs

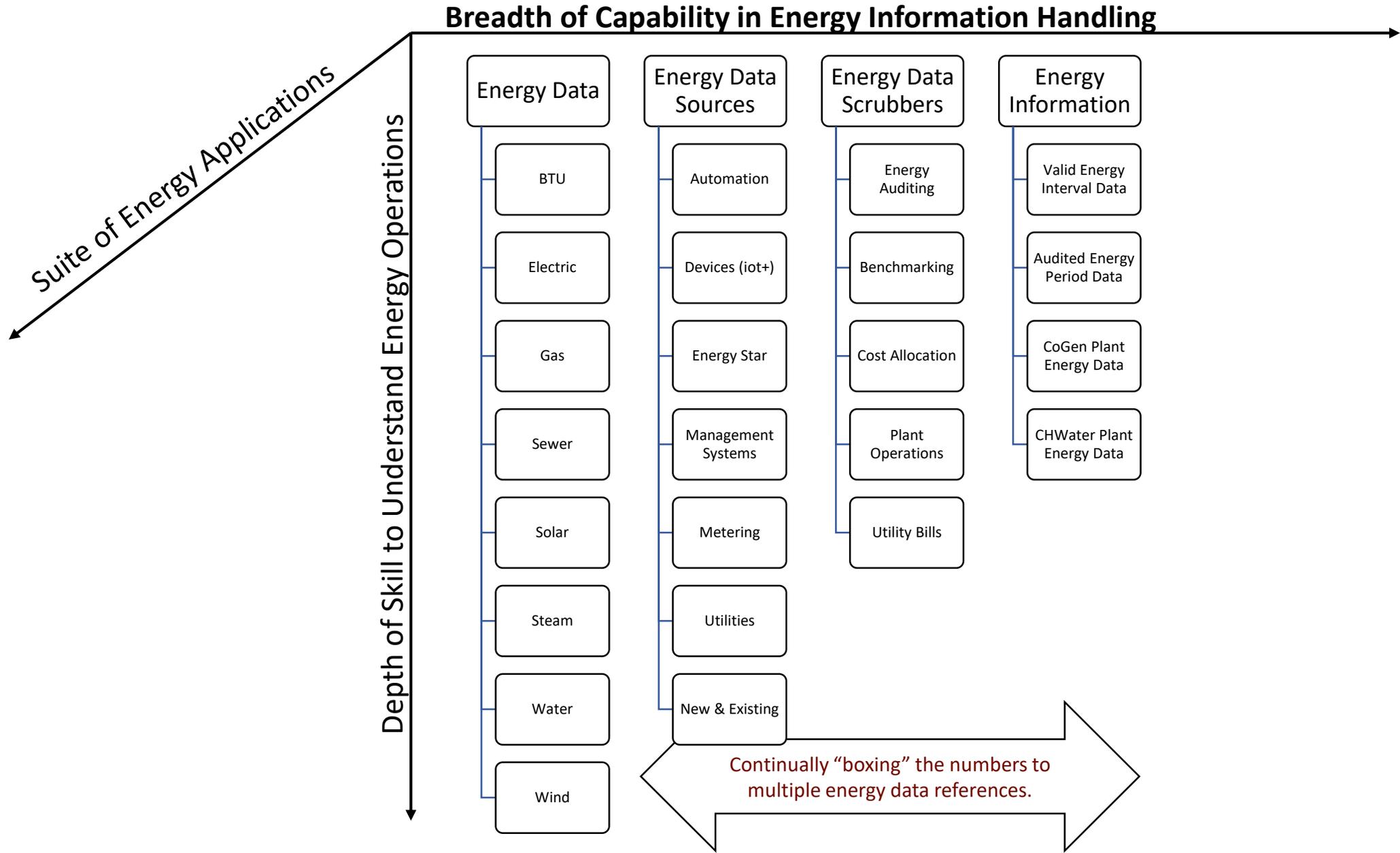
## Hiring a Third Party

Northwestern hires utiliVisor as the third party oversight to:

- Help assess energy data collection from internal sub meters and utility meters
- Develop auditable process – for collecting the information and understanding where there were major variances or discrepancies
- Accurately benchmark the university's energy usage
- Recover costs from the schools and colleges that pay for their utilities



# Energy Information Stack

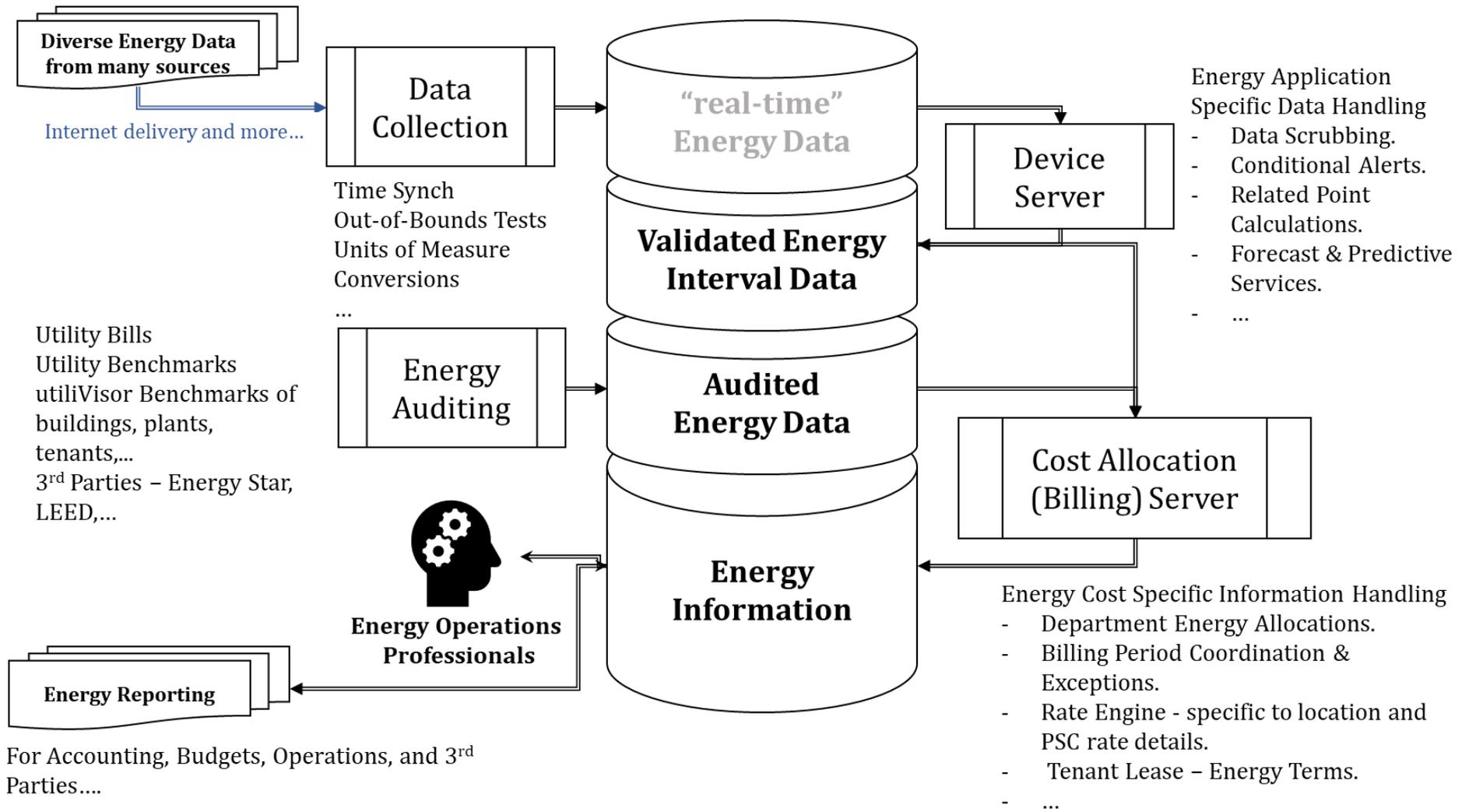


# Energy Information Stack

Depth of Skill to Understand Energy Operations – the “Energy Information Stack” with details!

Suite of Energy Applications

Breadth of Capability in Energy Information Handling



# Energy Information Stack

## Suite of Energy Applications

Energy Portal

Billing, Read, Audit, Calc. Invoice

Oversight

Alerts

Predictive

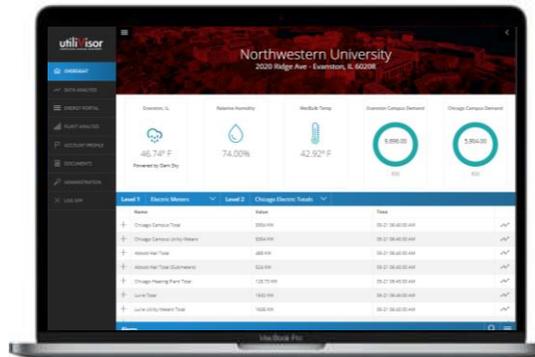
Plant Analysis



Handheld Unit



Phone & iPad Applications



Browser Access

Breadth of Capability in Energy Information Handling

## Monthly Deliverables

- Visualization of Energy Data through utiliVisor
- Accurate and timely billing
- Billing Package
  - Cover Letter
  - Tenant (Building) Invoices
  - Recap Report
  - Square Foot Analysis
  - Watts per Square Foot
  - Zero Analysis
  - Export to Accounting System
- Energy Platform for Exposure of Buildings from an indexed viewpoint

# Examples of utiliVisor's Monthly Deliverables

- Visualization of Energy Data through utiliVisor
- Accurate and timely billing
- Billing Package
  - Cover Letter
  - Tenant (Building) Invoices
  - Recap Report
  - Square Foot Analysis
  - Watts per Square Foot
  - Zero Analysis
  - Export to Accounting System

## Monthly Deliverables

**utiliVisor**  
commercial energy insight

135 West 30th Street  
 New York, NY 10018  
 Tel (212) 260-4800  
 Fax (212) 260-4848  
 www.utili-visor.com

February 16, 2017

Mr. Stephen McGinn  
 Brookfield Office Properties  
 One Liberty Plaza  
 165 Broadway, Concourse Level  
 New York, NY 10006

RE: 1 Liberty Plaza  
 165 Broadway  
 New York, NY  
 Electric Sub-Metering  
 Job #12791

Dear Mr. McGinn:

Enclosed are the sub-metered recap and invoices for covers January 3, 2017 through February 2, 2017.

In addition to the tenant invoices and summary attachments:

- Appendix A: Square Foot Analysis
- Appendix B: Square Foot Info Request
- Appendix C: Variance Analysis
- Appendix E: Zero Analysis

Please note:

A. utiliVisor commenced billing Guggenheim  
 - Per the lease, this tenant is bring l  
 - Per Shelly Wilson's 10/27/16 email  
 charged sales tax.  
 - The following meters were billed t  
 Museum as of 1/16/17.  
 o Meters #1L-20-51-01, #1

B. Vacant meters 1L-25-63-01 and 1L-27-69-01  
 inform utiliVisor if there has been a change

Should you have any questions, please contact me

Sincerely,  
 utiliVisor  
 Trissina Energy!

**Northwestern University**

ID #728017 (675400) STEAM

Service Period: From: 6/30/2016 To: 6/30/2016 29 days in Period

BASE Chg (NYPH - Steam)	Supplier Chg	Landlord fee	Meter/Road fee	Other fees	CR/DR Adjustment	Sewer Charge
\$ 0.000000	\$ 0.00	\$ 0.00	\$ 0.00	\$ 0.00	\$ 0.00	\$ 0.00
<b>TOTAL AMOUNT:</b>						\$ 62,142.07

**Historical Usage (MLBS)**

ID #728017 (675400) STEAM

Physicians and Surgeons  
 New York Presbyterian  
 New York, NY 10009

Total Amount: \$ 62,142.07

For more information contact [FMUtilityInquiry@northwestern.edu](mailto:FMUtilityInquiry@northwestern.edu)

**Appendix C: Variance Analysis**

**1 North End Avenue**  
 Usage & Demand Variance Report  
 1 North End Avenue - ELECTRIC  
 2/1/2017 - 3/1/2017

Tenant	Tenant ID #	Meter #	Usage %	ON %	Mid Usage %
New York Mercantile Exchange	INE/NYME	105			
New York Mercantile Exchange	INE/NYME	178			
New York Mercantile Exchange	INE/NYME	189			
New York Mercantile Exchange	INE/NYME	1943	ATS #2, UPS Bypass #2	33.03 %	0.00 %

**1 North End Avenue - BTU**  
 2/1/2017 - 3/1/2017

Tenant	Tenant ID #	Meter #	Meter Description	STD Usage %	ON %	Mid Usage %
New York Mercantile Exchange	INE/NYME	BTU-2		50.32 %	0.00 %	0.00 %

**Appendix D: Watts Per Square Foot**

**1 North End Avenue**

owable watts per square foot for your tenants:

Tenant ID #	Rentable Square Feet (RSF)	KW	Maximum Watts/RSF	Watts Used / RSF	Comment
INE/NYME	2,353,000	358.40		1,503,419	

**165 Broadway**  
 New York, NY 10006

**Summary of Electric Usage Charges (Recap)**

Service Period: From: 1/3/2017 To: 2/2/2017 30 days in Period

OFF USAGE	MID USAGE	TOTAL USAGE	ON DEMAND	OFF DEMAND	DIST DEMAND	TOTAL DEMAND
0.000	0.000	1075845.605	0.000	0.000	0.000	2711.660
0.000	0.000	662328.800	0.000	0.000	0.000	1167.050
0.000	0.000	1736174.605	0.000	0.000	0.000	3878.710

Base	Landlord	Supplier	Fees Subtotal
\$ 224,127.86	\$ 4,082.51	\$ 0.00	\$ 4,082.51
<b>Fees Subtotal Sales Tax</b>	<b>Total Landlord Revenue</b>	<b>Sub Metered</b>	<b>Landlord Absorbed</b>
\$ 353.62	\$ 160,935.34	\$ 248,341.69	\$ 87,408.35

**AVERAGE II:**

Rate	AVE.KWH	AVE.KW Cost/KW	AVE.KW Cost/KW
\$ 0.000000	\$ 0.091706	\$ 16.696001	

the electricity charged by the utility company (including rate, fuel adjustment, demand charges, applicable taxes impose) by the total kilowatt hours of electric consumed. The result of which shall be the average kilowatt hour cost y the tenant's sub meter(s).

cost of the electricity charged by the utility company (including rate, fuel adjustment, demand charges, applicable / may impose) by the total kilowatt hours of electric consumed. The result of which shall be the average kilowatt gastered by the tenant's sub meter(s).

cost of the electricity charged by the utility company (including rate, fuel adjustment, demand charges, applicable / may impose) by the total kilowatt hours of electric consumed. The result of which shall be the average kilowatt / ) registered by the tenant's sub meter(s).

the electricity charged by the Energy Service Company Provider (ESCO) (including applicable taxes and any other owait hours of electric consumed. The result of which is then applied to the consumption registered by the tenant's

**1 North End Avenue**

The following meters continue to record zero usage or demand:

**1 North End Avenue - ELECTRIC**  
 2/1/2017 - 3/1/2017

Tenant	Tenant ID #	Meter #	Meter Description	Comment
New York Mercantile Exchange	INE/NYME	195	Gen Fuel Oil #2	
New York Mercantile Exchange	INE/NYME	198	Spare	
New York Mercantile Exchange	INE/NYME	199	Spare	

Page 1 of 1  
 For information contact utilivisor at 135 West 30th Street New York, NY 10018 (212) 260-4800

**utiliVisor**  
commercial energy insight

# Live Interface to Data

## Monthly Deliverables

**Northwestern University**  
2020 Ridge Ave - Evanston, IL 60208

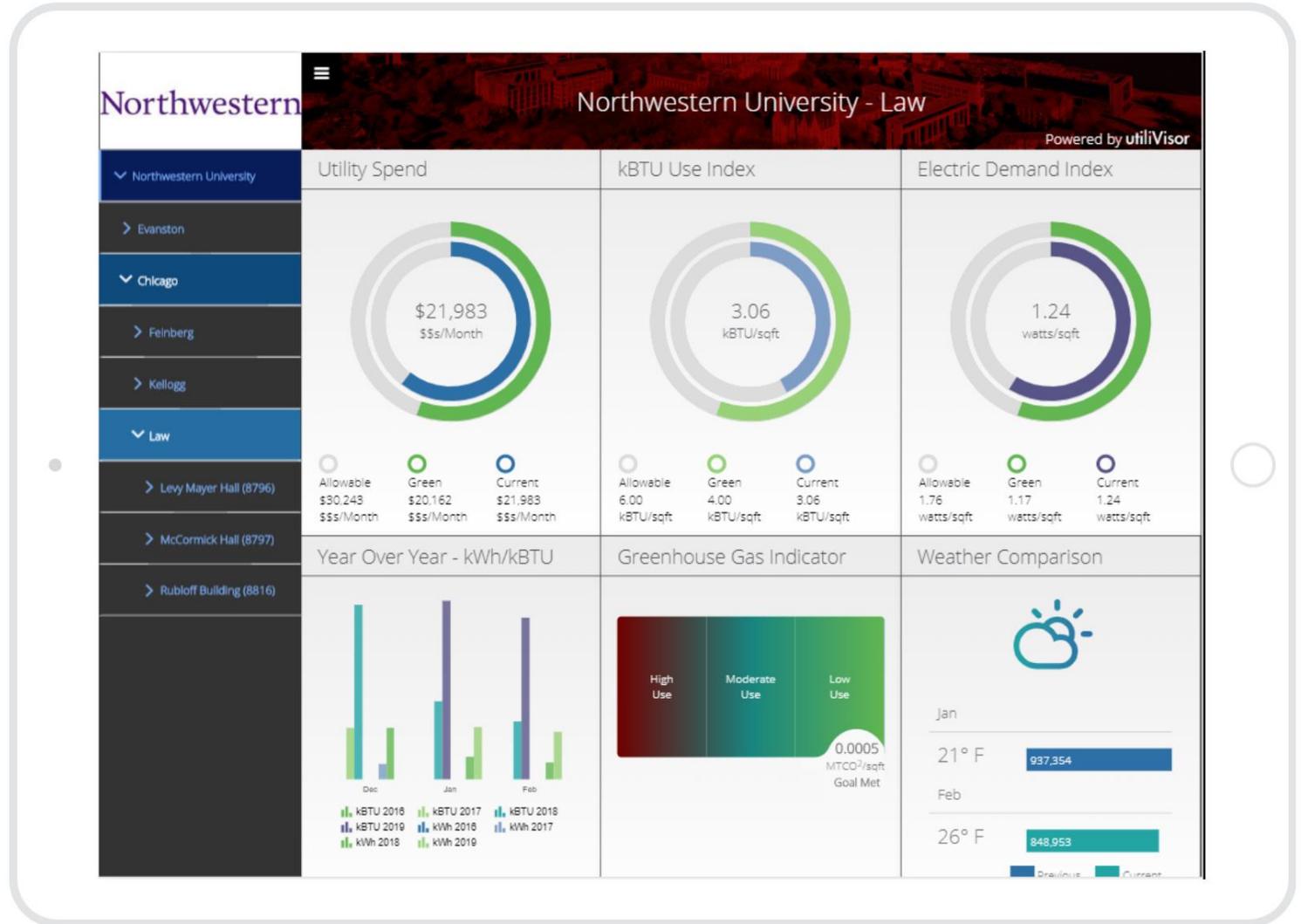
**Weather Data (Evanston, IL):**  
Temperature: 36.5° F  
Relative Humidity: 78%  
WetBulb Temp: 33.77° F

**Campus Demand:**  
Evanston Campus Demand: 10,724.00 KW  
Chicago Campus Demand: 6,860.00 KW

Level 1	Electric Meters	Level 2	Evanston Elect
	Name		Value
+	01-04A Phi Kappa Psi 2253		12 KW
+	01-05A Sigma Chi 2258		12 KW
+	01-06D 2251 Sheridan 8493		8 KW
+	01-09D Chi Psi 2245		16 KW
+	01-10D Lindgren House 8580		4 KW
+	01-11A Delta Upsilon 2247		4 KW
+	01-12A Delta Tau Delta 2246		8 KW

**Data Analysis Summary (02-55A Sargent Hall 8585):**  
Average: 124.78 KW  
Maximum: 172.00 KW  
Minimum: 84.00 KW  
Sum: 40,428.00 KW

# Energy Insight Platform

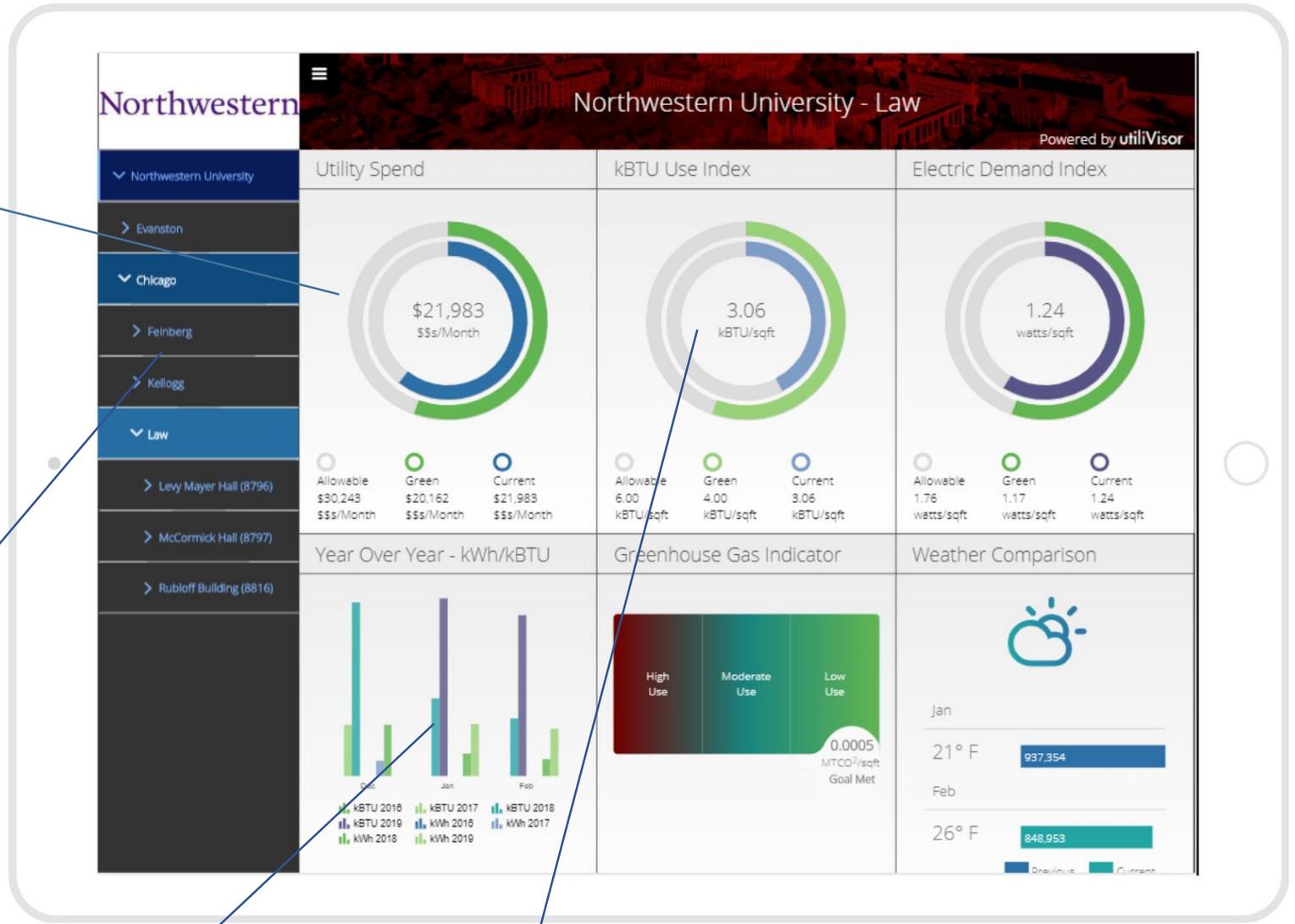


# Configurable

Each Icon can be configured to any specific metric we are receiving interval or period data from.

Infographics can be configured for metrics requested by specific sites; such as EUI or any KPI

Buildings can be aggregated and indexed against each other



Year over Year Consumption of utilities

Concentric Circles can be set showing Current/Allowable and The **Goal** of Energy Consumption which is determined by the local operations team

## Results

- Standardized and simplified the recharge process across utilities/campuses
- Streamlined the meter data collection process
- Identified steam/water metering issues
- Savings from:
  - Savings in Northwestern Labor – estimated 200 staff-hours per month
  - Additional Cost Recovery



# Northwestern University

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THANK YOU

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The logo for utiliVisor, with the word "utili" in white and "Visor" in white with a red "V".

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