



Northwestern University



utili**V**isor

Energy Conservation Through Sub-Metering at Northwestern University

June 25, 2018

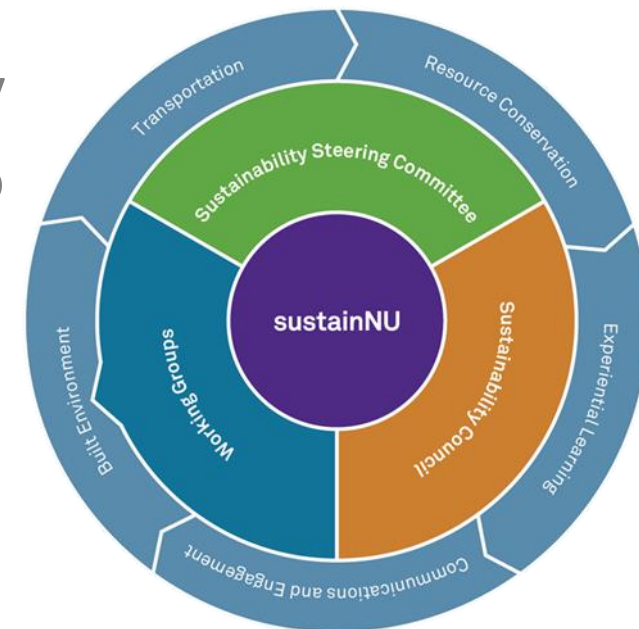
Agenda

- 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

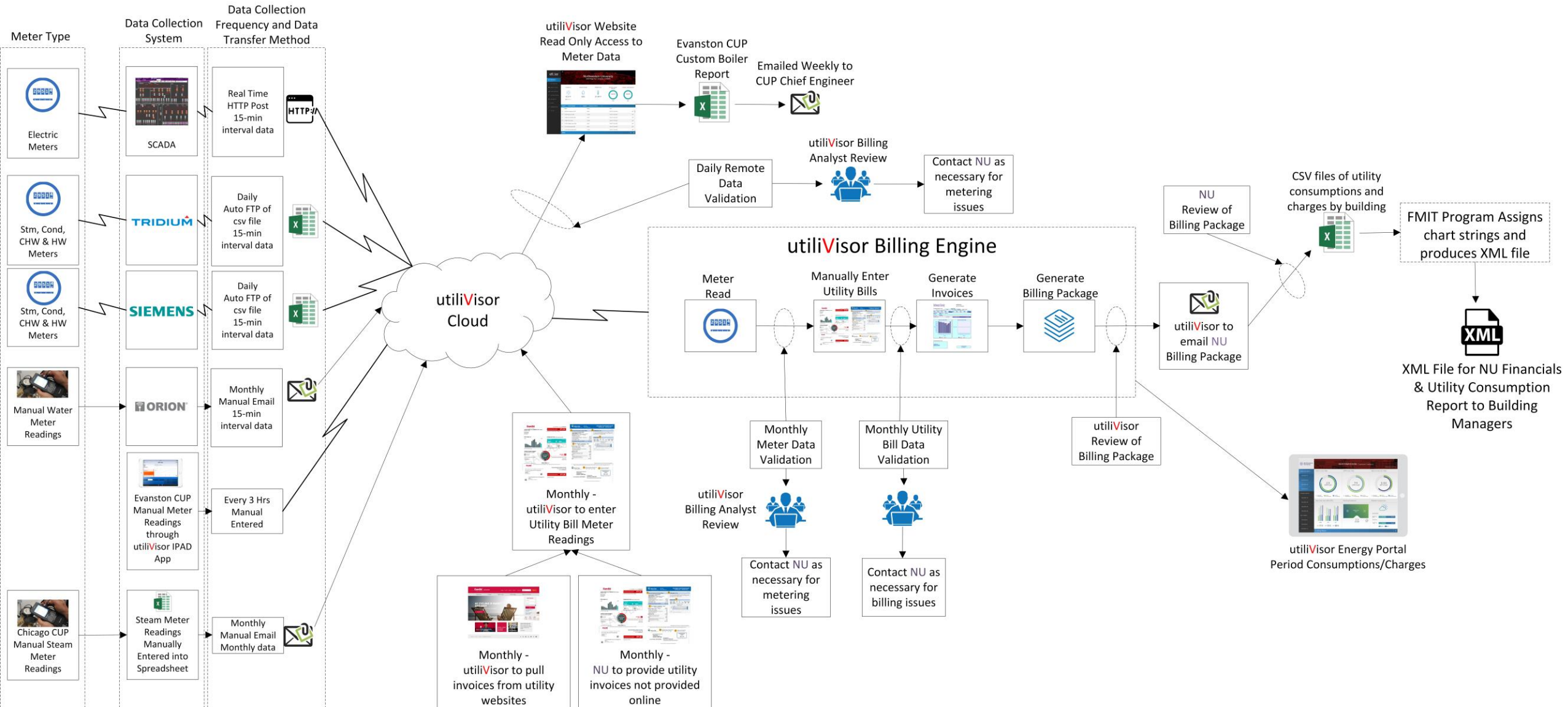
Hiring a Third Party

Northwestern hires utiliVisor as the third party oversight to:

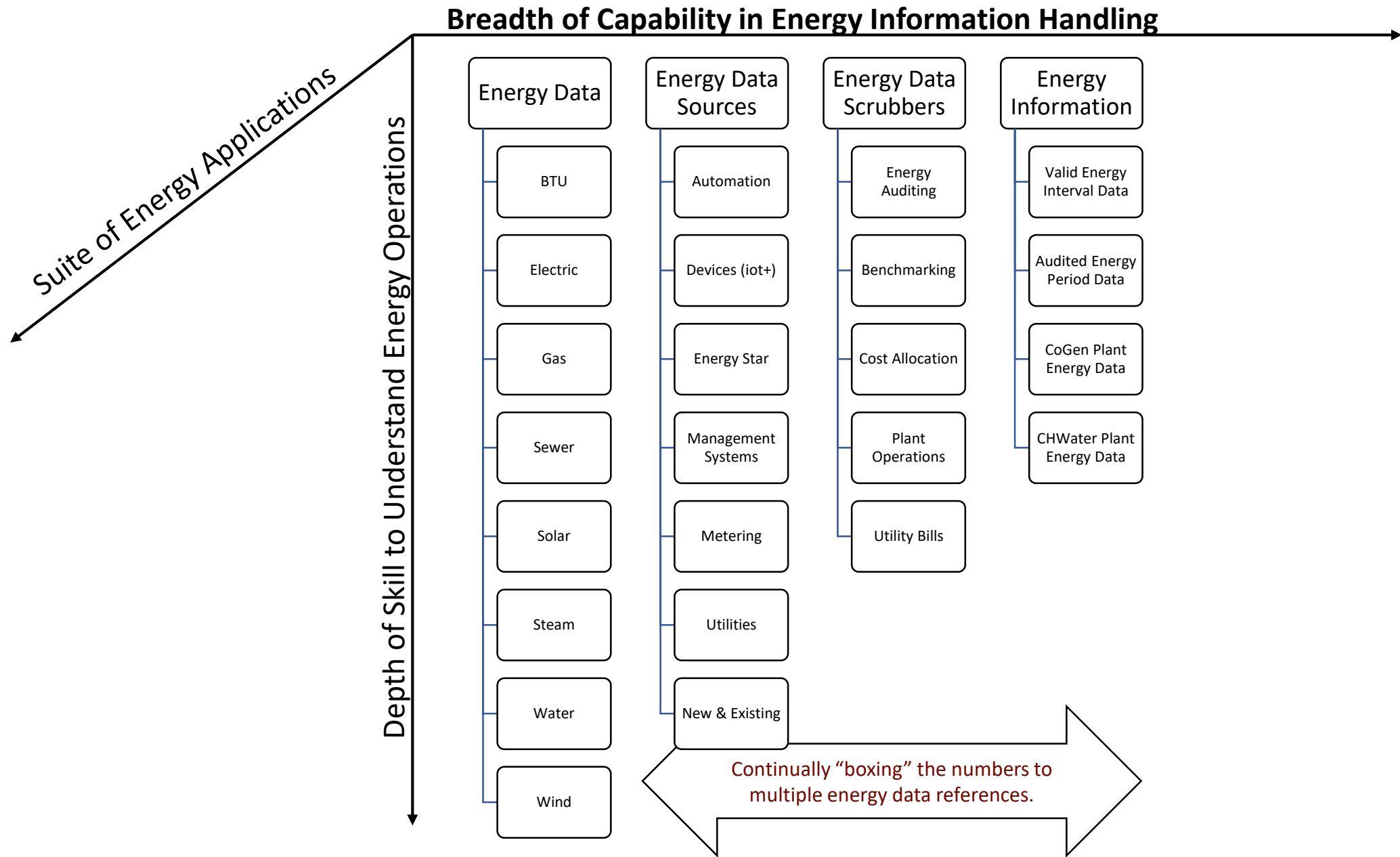
- Help assess energy data collection from internal sub meters and utility meters
- Develop auditable process – for collecting the information and understanding where there were major variances or discrepancies
- Accurately benchmark the university's energy usage
- Recover costs from the schools and colleges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

The Path to the Solution

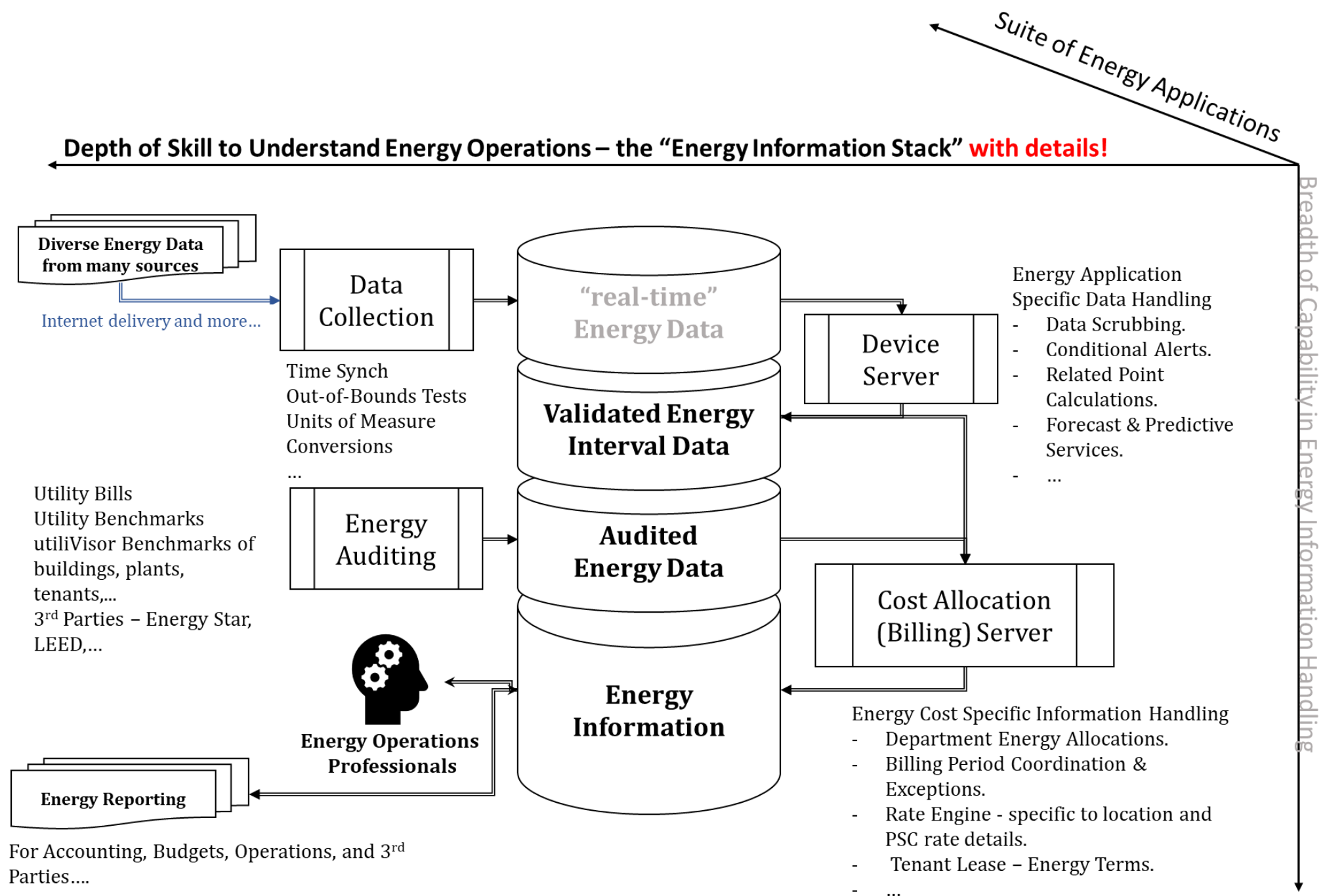
Northwestern – utiliVisor Recharge Process



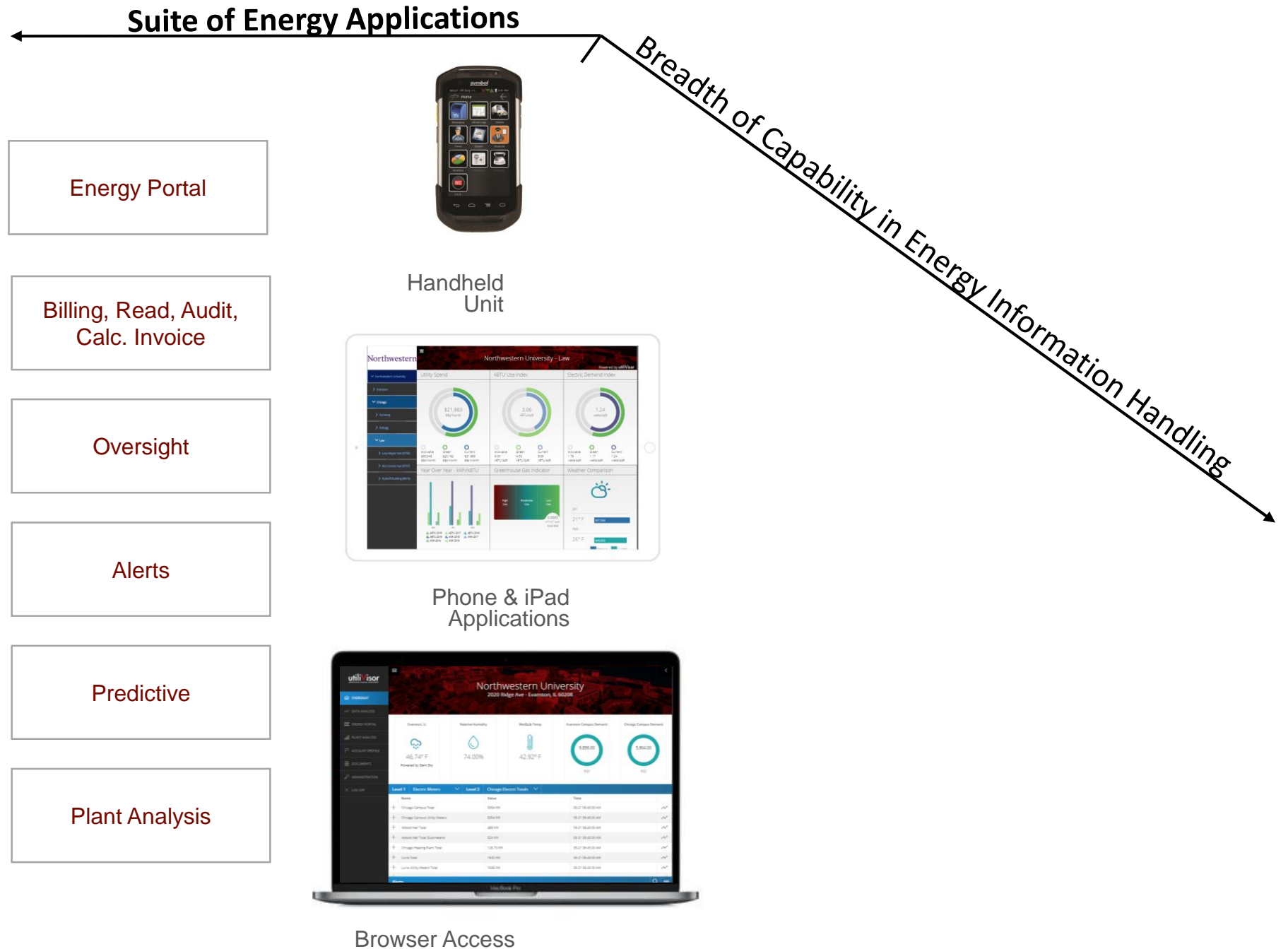
Energy Information Stack



Energy Information Stack



Energy Information Stack



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

Monthly Deliverables

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

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sustainable energy insight

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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 of 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 being billed
• Per Shelly Wilson's 10/27/16 email charged sales tax.
• The following meters were billed to 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!

Appendix C: Variance Analysis

1 North End Avenue

Usage & Demand Variance Report
1 North End Avenue - ELECTRIC

2/1/2017 - 2/1/2017

Tenant	Tenant ID #	Meter #
New York Mercantile Exchange	INE/NTME	105
New York Mercantile Exchange	INE/NTME	178
New York Mercantile Exchange	INE/NTME	189
New York Mercantile Exchange	INE/NTME	1943

1 North End Avenue - BTU

2/1/2017 - 2/1/2017

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

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ID #728017 (675400) STEAM

Service Period: From: 9/1/2016 To: 6/30/2016 29 days in Period

TENANT TOTAL USAGE (MLBS) 443,163.9

BASE Chg (KYPH - Steam) \$ 0.000000
Supplier Chg \$ 0.000000
Landlord fee \$ 0.000000
Meter/Read fee \$ 0.000000
Other fees \$ 0.000000
C&I/R Adjustment \$ 0.000000
Sewer Charge \$ 0.000000
TOTAL AMOUNT: \$ 0.00

Historical Usage (MLBS)

Bar chart showing usage over 12 periods. Legend: current (blue), prior (grey).

Physicians and Surgeons
New York Presbyterian
New York, NY 10005

Total Amount \$ 61,142.07

For more information contact FMUtilityInquiry@northwestern.edu

Appendix D: Watts Per Square Foot

1 North End Avenue

allowable watts per square foot for your tenants:

Tenant ID #	Rentable Square Feet (RSF)	KW	Maximum Watts/RSF	Watts Used / RSF	Comment
INE/NTME	2,353,90.00	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	1075645.605	0.000	0.000	0.000	2711.660
0.000	0.000	462328.800	0.000	0.000	0.000	1167.060
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

Fees Subtotal Sales Tax	Total Landlord Revenue	Sub Metered	Landlord Absorbed
\$ 353.62	\$ 160,935.34	\$ 248,341.69	\$ 87,406.35

AVERAGE II:

Per	(\$ 0.000000)	AVE.KWH	(\$ 0.091706)	AVE.KW Cost/KW	(\$ 16.896001)

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 gistered by the tenant's sub meter(s).

I 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 o watt 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

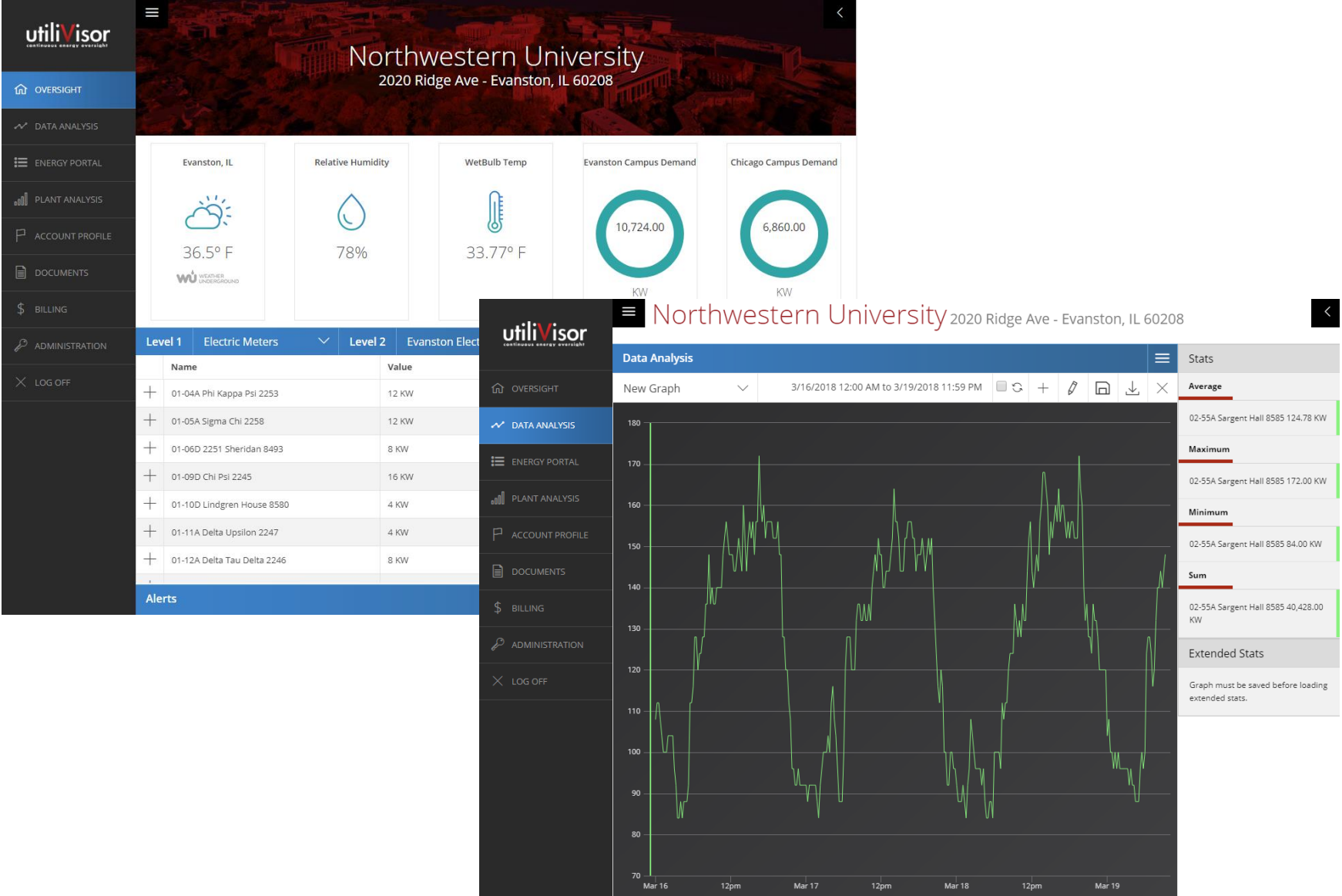
Tenant	Tenant ID #	Meter #	Meter Description	Comment
New York Mercantile Exchange	INE/NTME	195	Gen Fuel Oil #2	
New York Mercantile Exchange	INE/NTME	198	Spare	
New York Mercantile Exchange	INE/NTME	199	Spare	

Page 1 of 1
For information contact advisor at 135 West 50th Street New York, NY 10018 (212) 260-4800

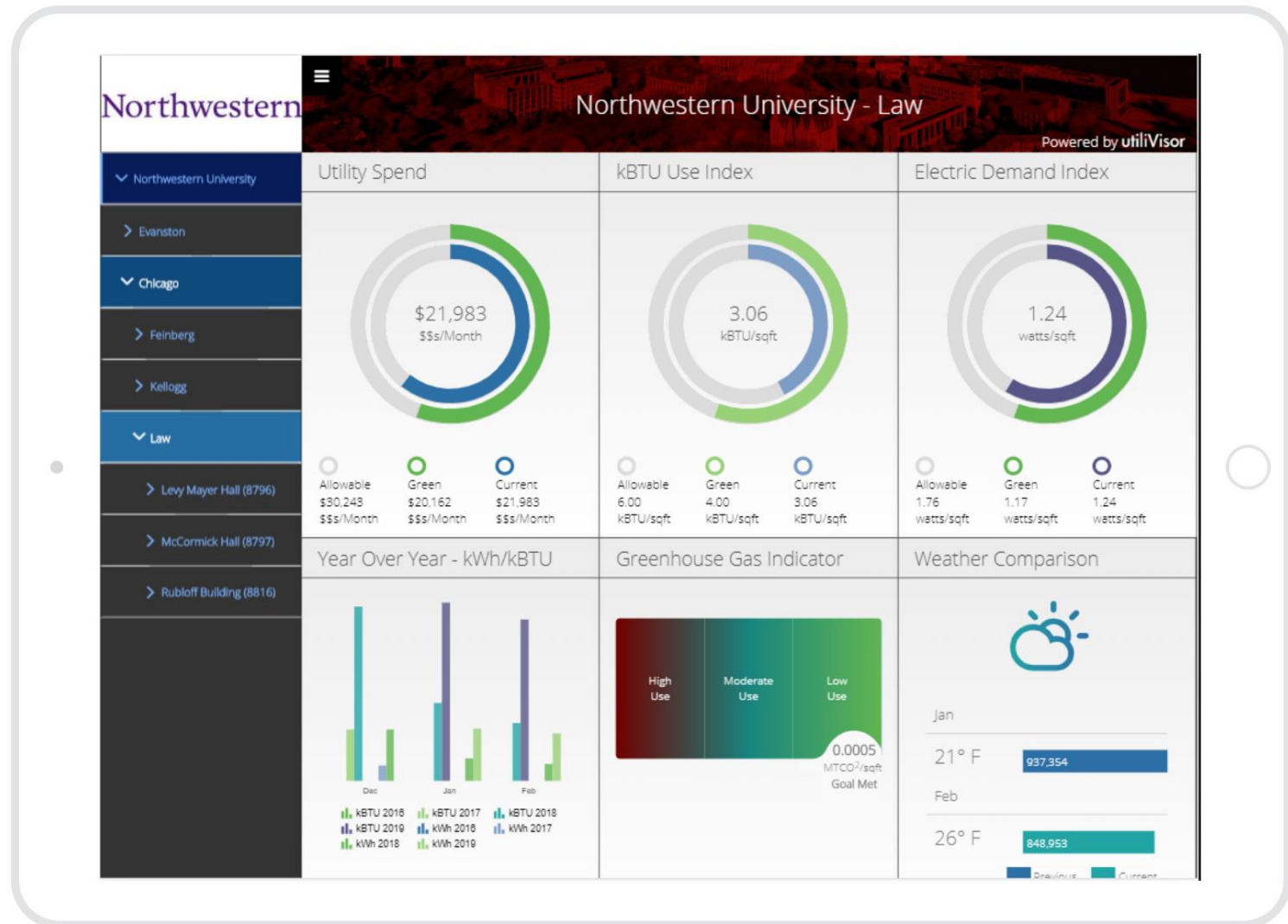
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Live Interface to Data

Monthly Deliverables



Energy Insight Platform

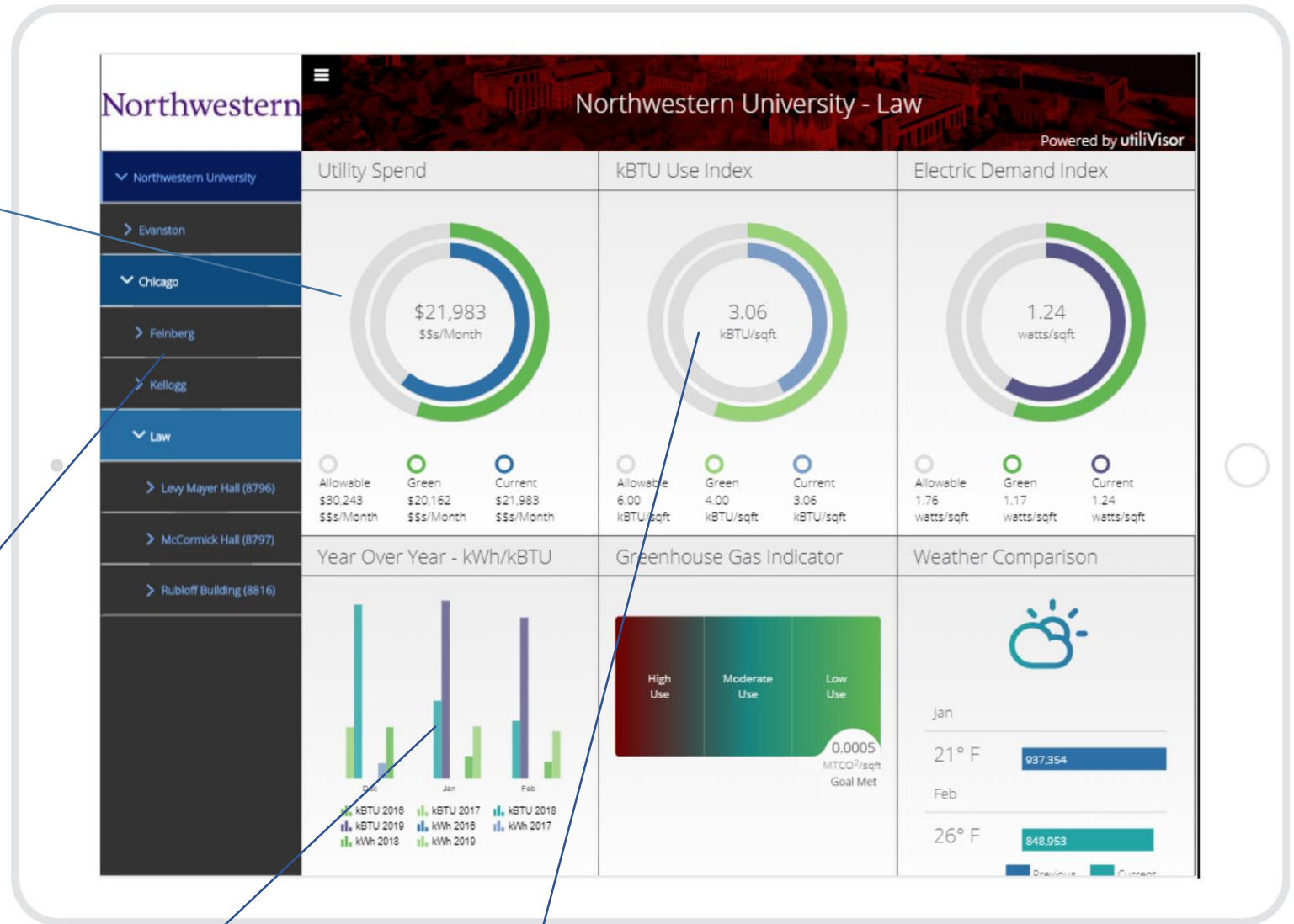


Configurable

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

THANK YOU

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