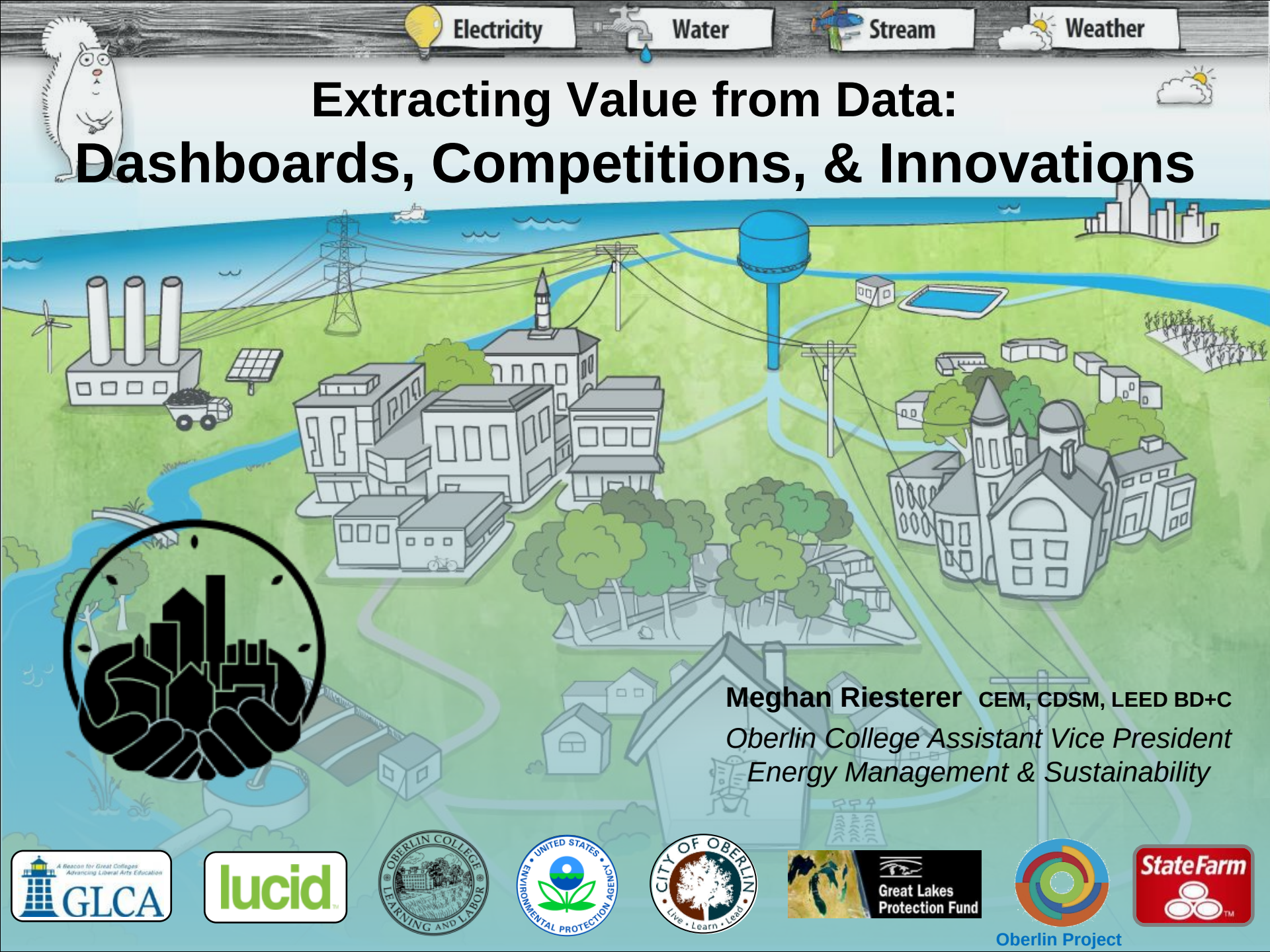


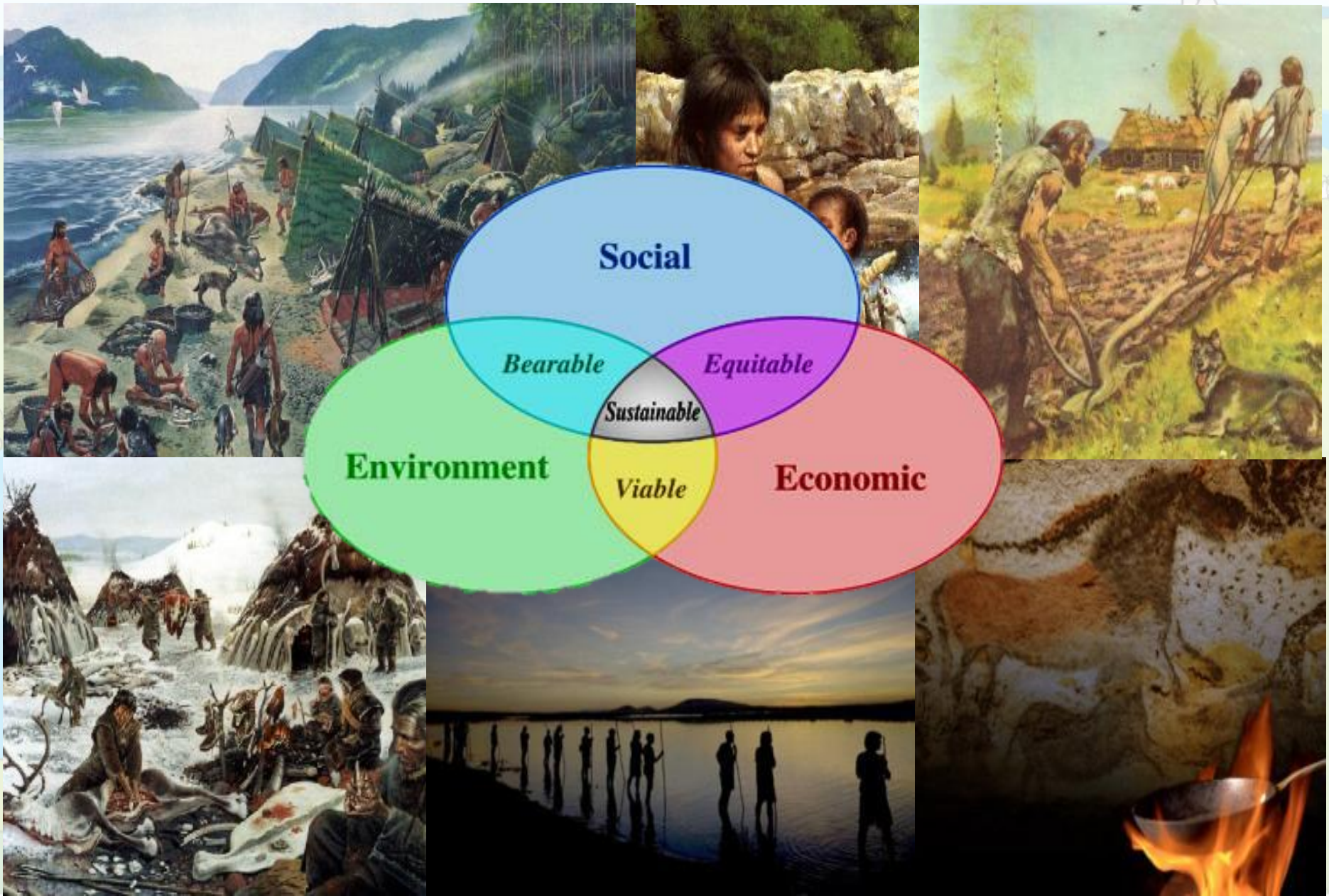
Extracting Value from Data:
Dashboards, Competitions, & Innovations

Meghan Riesterer **CEM, CDSM, LEED BD+C**

Oberlin College Assistant Vice President
Energy Management & Sustainability

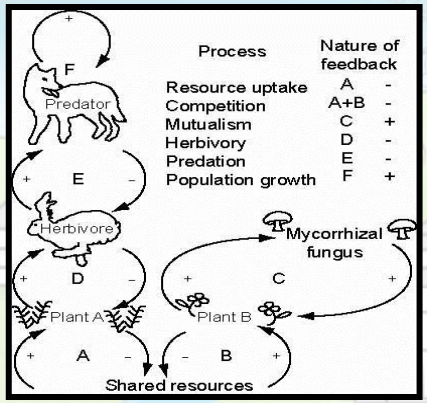
GLCA
lucid
Oberlin College Learning and Labor
United States Environmental Protection Agency
City of Oberlin Live • Learn • Lead
Great Lakes Protection Fund
Oberlin Project
State Farm

Feedback in Human Evolution

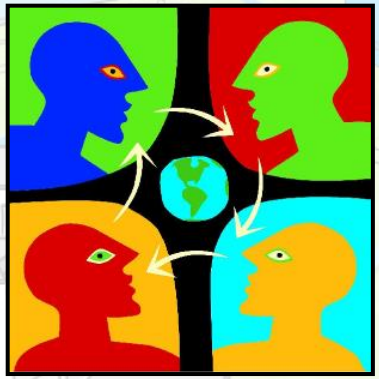


Feedback Control is Ubiquitous

Ecological

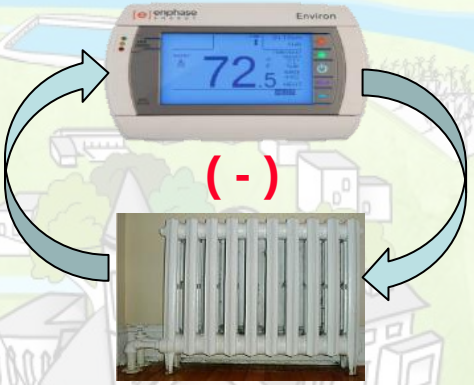


Psycho-social



Technological

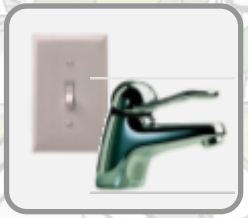
Room Temperature



Socio-technical, “eco-feedback”

Humans

Choices



Ecological Impact

How can we leverage the power of feedback to motivate and empower social, ecological and economic transformation?

Goal: Integrated technology & approach that promotes systems thinking and action

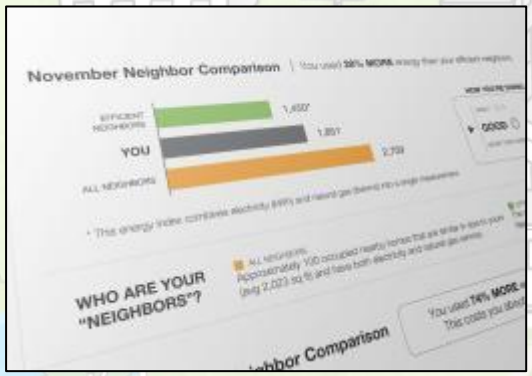
1. Foster sense of connectedness and belonging.
2. Situate individual decision-making in a community context.
3. Share and celebrates pro-environmental thought and action.
4. Positively change behavior to advance sustainability and resilience!

Research on Campus Residential Life

- ~50% of residential electricity use of campus is discretionary (i.e. lifestyle choices)
- Addition of feedback → ~4-12% electricity savings (e.g. ACEEE 2010)

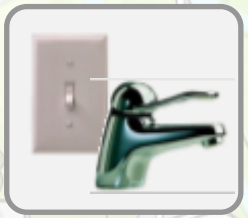
Feedback

Utility Bill



People

Choices



Meter

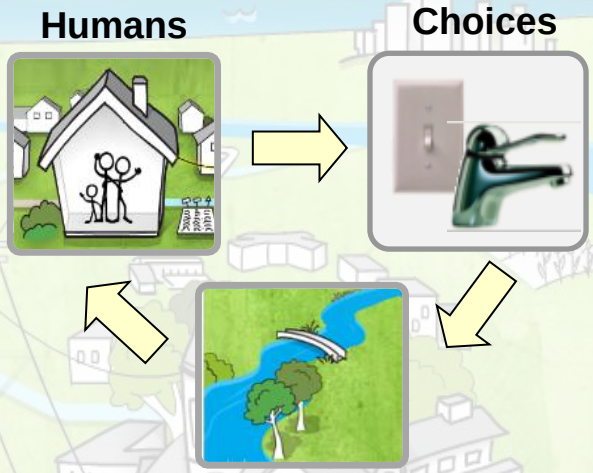
Impact

Realities

- Information alone does not change behavior
- Information plus economic incentives often does not change behavior
- Normal people don't care about things that concern us (kWh,BTU,gal water)
- Sophisticated messaging/psychological packaging is critical!

What Makes Socio-technical Feedback Effective?

1. Easily usable:
   - Accessible
   - Actionable information
   - Tight feedback cycle



2. Leverages power of social norms:
   - Socially comparative/competitive
   - Within monitored entities & among social groupings

3. Generates empathetically linking:
   - Emotionally connects individual and group consumption decisions to ecological and social communities

Environmental Dashboard

3 Feedback elements for public engagement

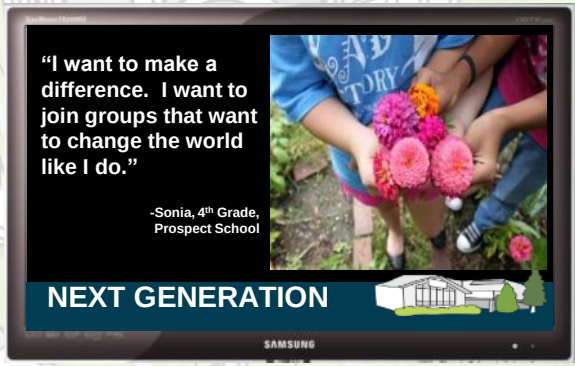
1 **Building Dashboard**

+

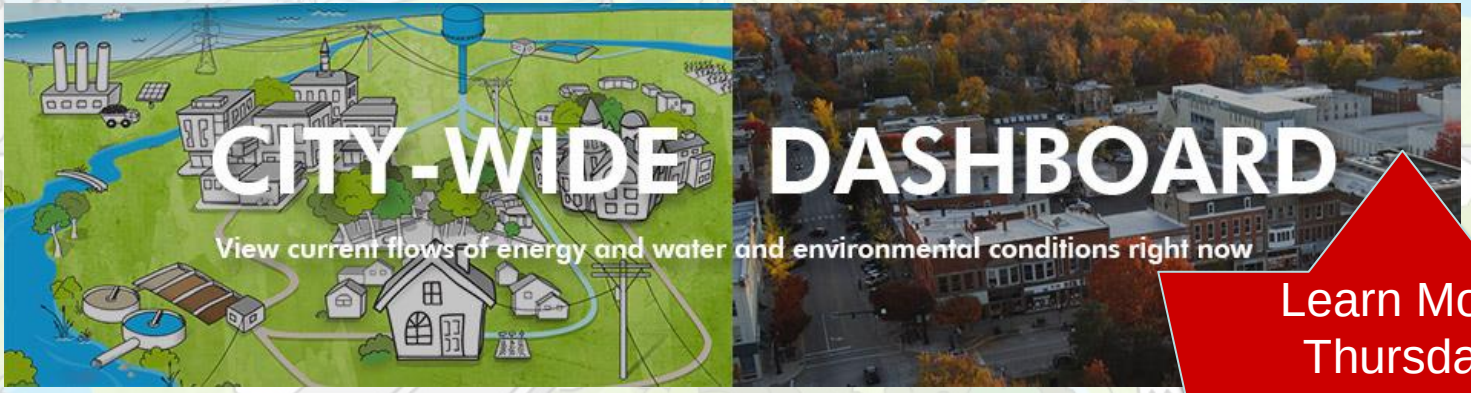
2 **Citywide Dashboard**

+

3 **Community Voices**



Environmental Dashboard



Learn More Thursday Morning at 9:00AM in Lone Star Salon F

Environmental Dashboard

3 Feedback elements for public engagement

1 Building Dashboard + 2 City-Wide Dashboard + 3 Community Voices

2 Delivery venues for the public

1 **Digital Displays**

2 **Website**

+

Environmental Dashboard

3 Feedback elements for public engagement

1 Building Dashboard + 2 City-Wide Dashboard + 3 Community Voices

2 Delivery venues for the public

1 Digital Displays + 2 Website

1 Resource Monitoring System

1 Platform

lucid

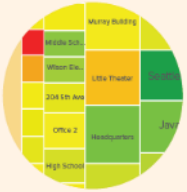
buildingOS

Bring a meter online in minutes

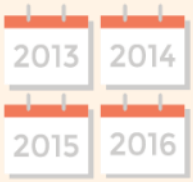
Optimize scheduling

Empower diverse building teams with usable tools

Automate bill data



Identify buildings with biggest savings opportunities



Simplify portfolio-wide reporting and benchmarking

Minimize peak demand charges

Drive behavioral efficiency through occupant engagement

- >350 Clients

- > 150 Integrations

Adam Joseph Lewis Center for Environmental Studies

Breakdown
4 end uses

LAST 12 MONTHS | TODAY | CUSTOM PERIOD

Start date: Jan 1, 2013 12 : 00 AM End date: Dec 31, 2013 11 : 59 PM GO

100,748 Kilowatt-hours from Jan 1 to Dec 31

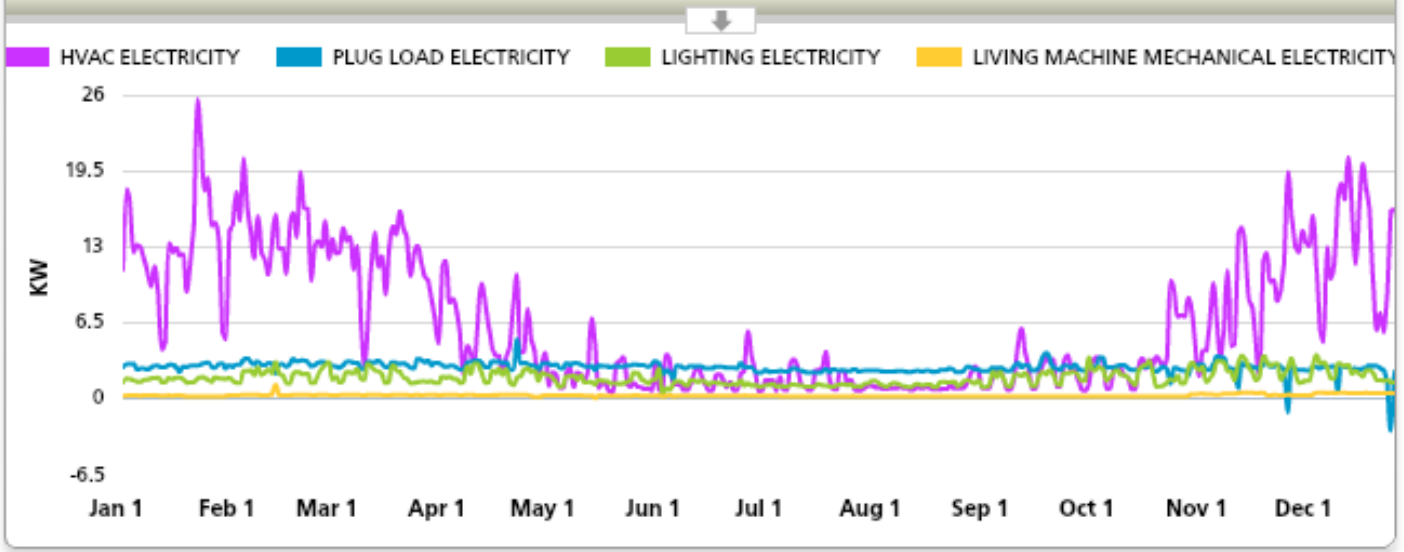
Total

HVAC ELECTRICITY 57,795 kWh

PLUG LOAD ELECTRICITY 24,002 kWh

LIGHTING ELECTRICITY 16,070 kWh

LIVING MACHINE MECHANICAL ELECTRICITY 2,882 kWh



AJLC Electricity Production and Consumption

2 Energy Use

LAST 12 MONTHS | TODAY | CUSTOM PERIOD

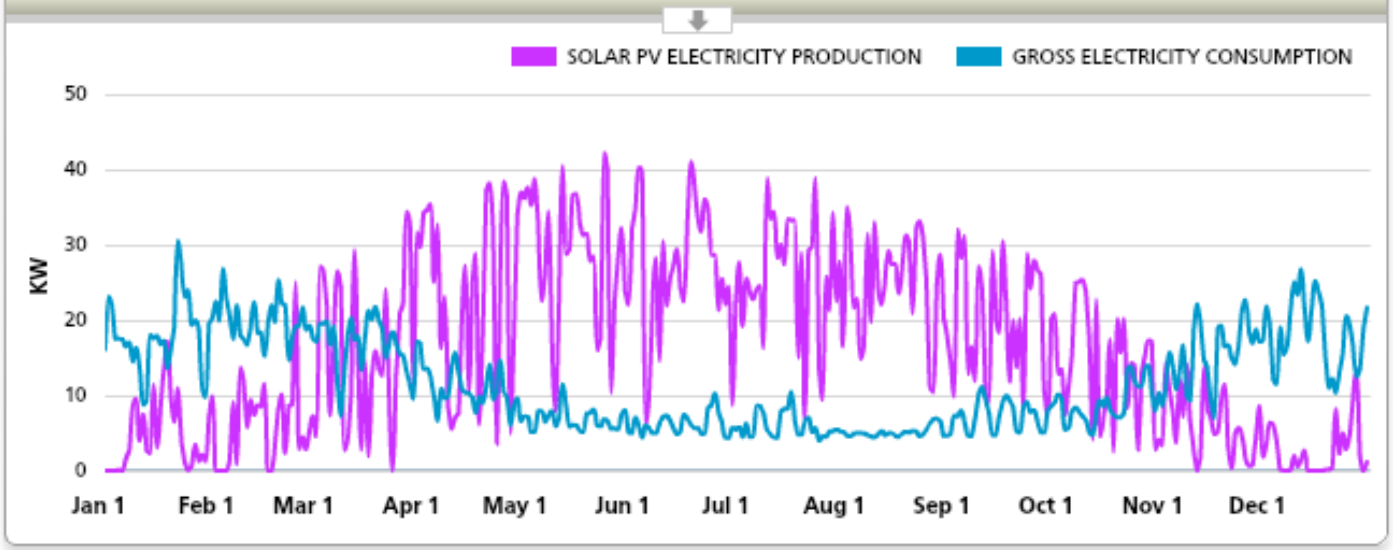
Start date: Jan 1, 2013 12 : 00 AM End date: Dec 31, 2013 11 : 59 PM GO

247,241 Kilowatt-hours from Jan 1 to Dec 31

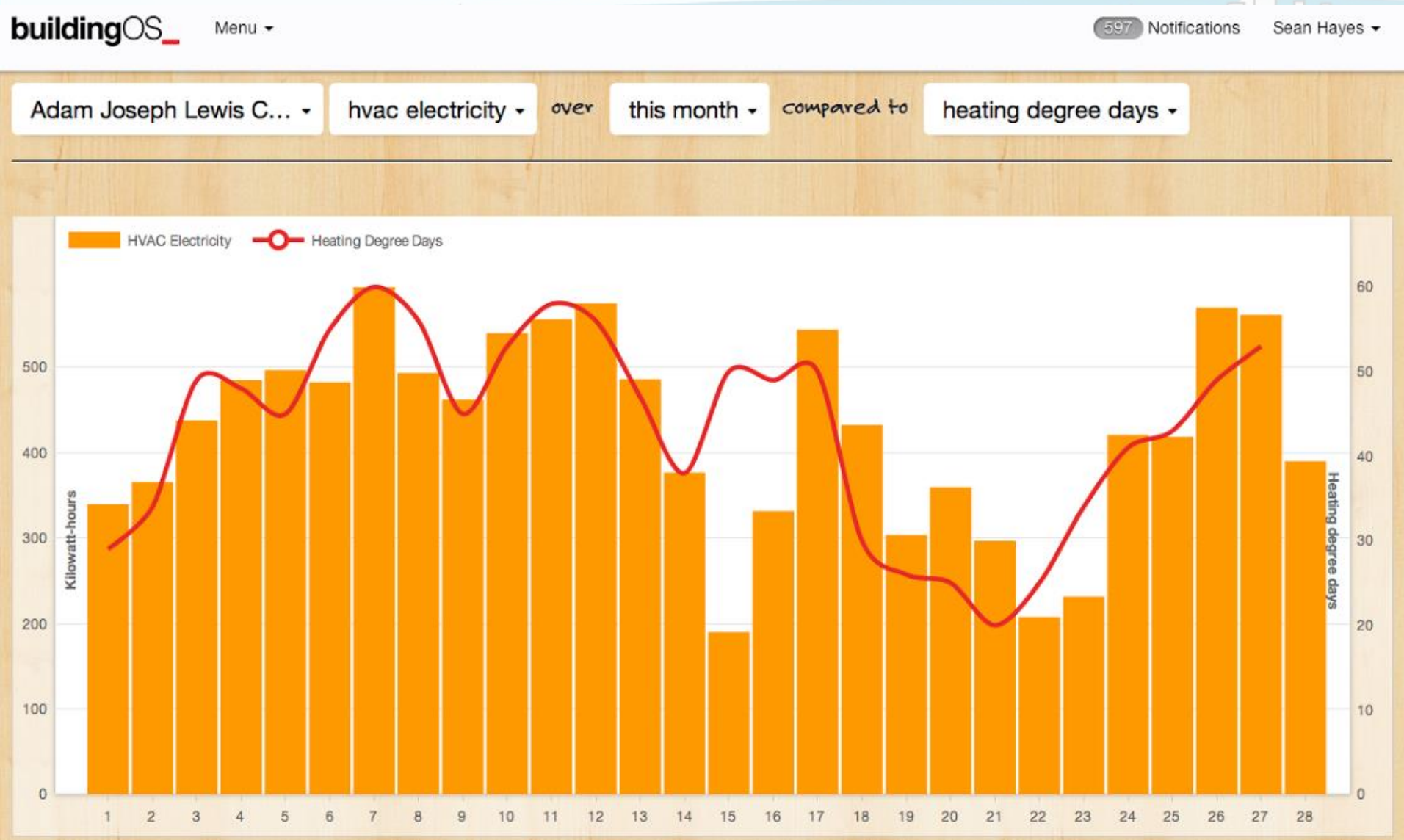
Total

SOLAR PV ELECTRICITY PRODUCTION 145,973 kWh

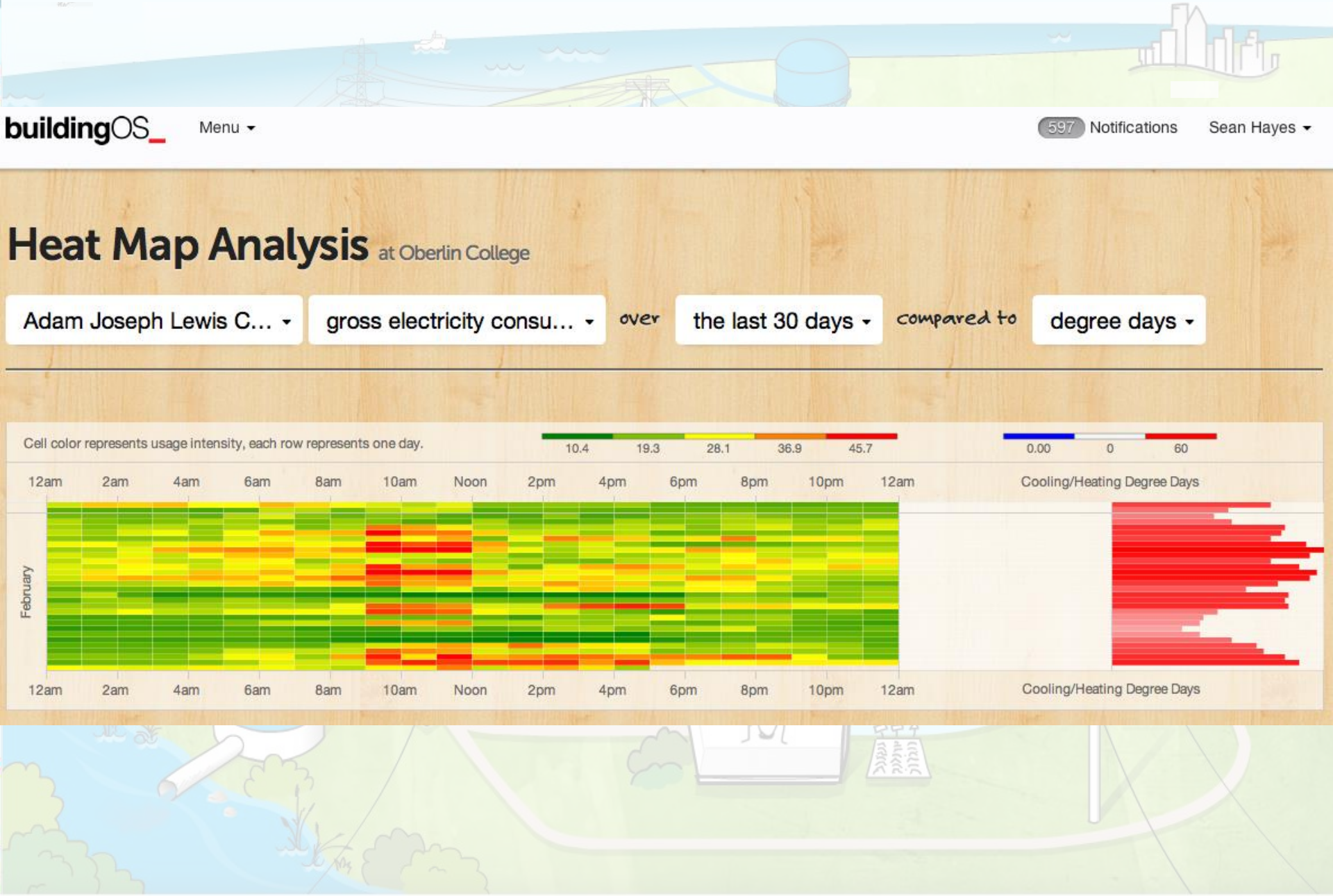
GROSS ELECTRICITY CONSUMPTION 101,268 kWh



Building Trends

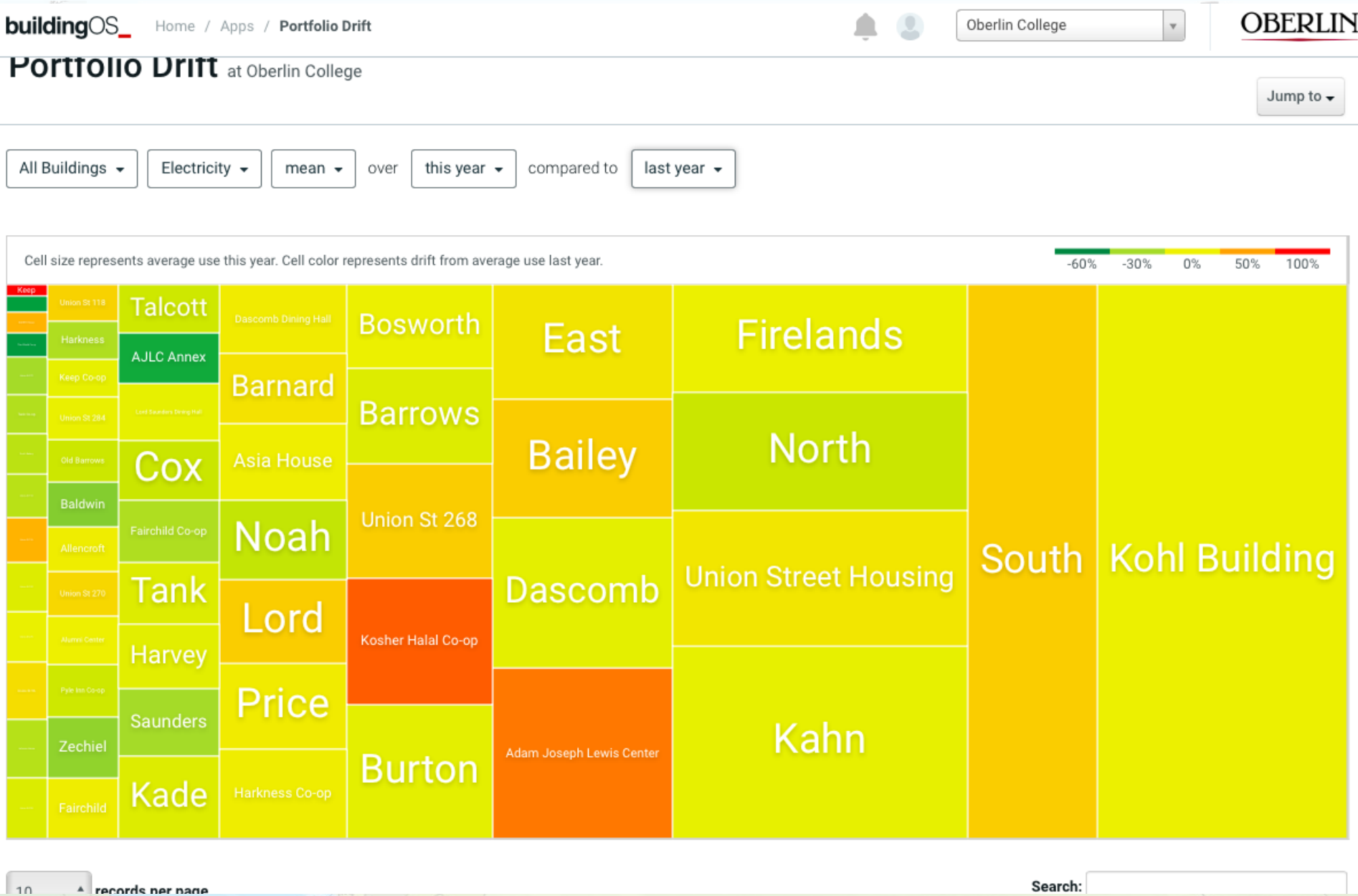


Optimize Building Scheduling

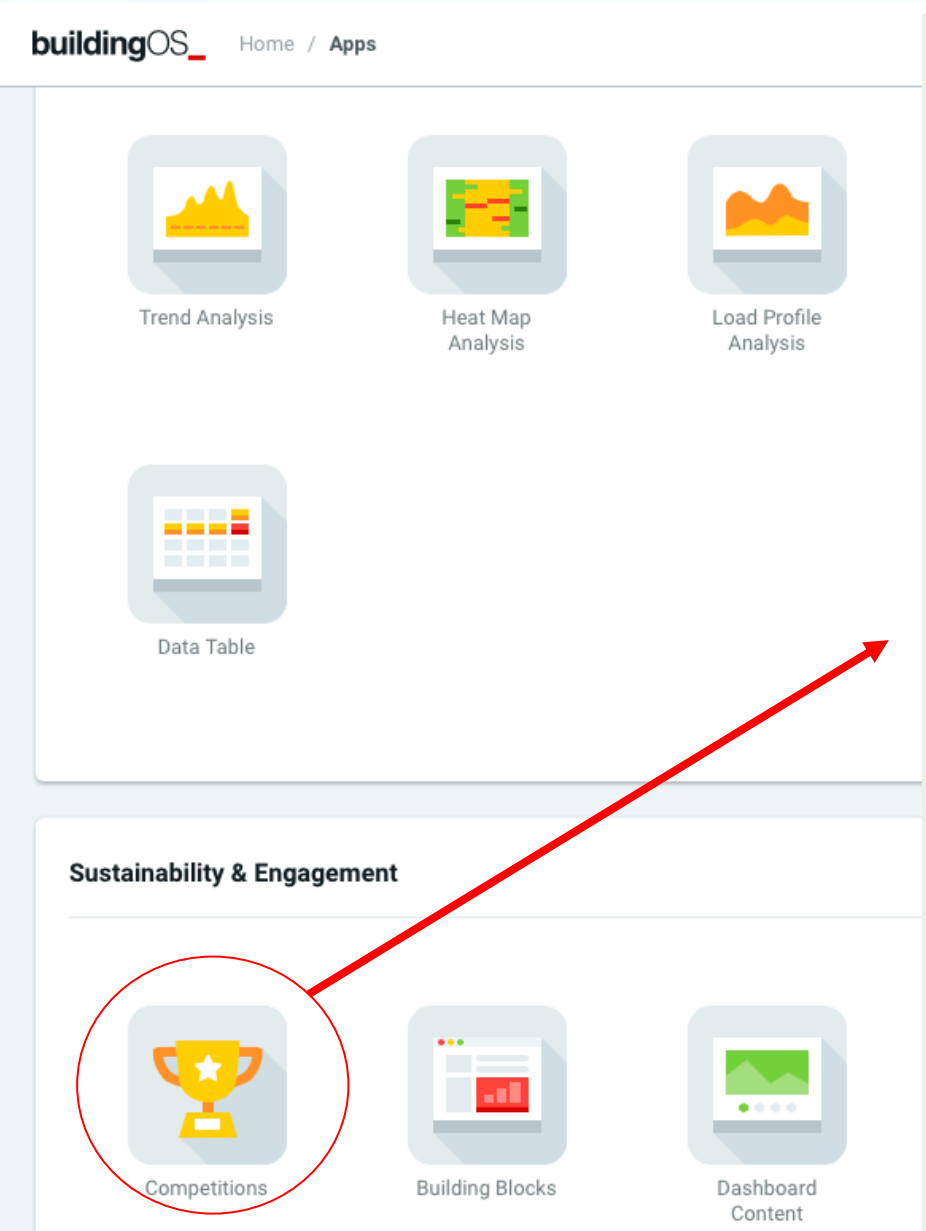


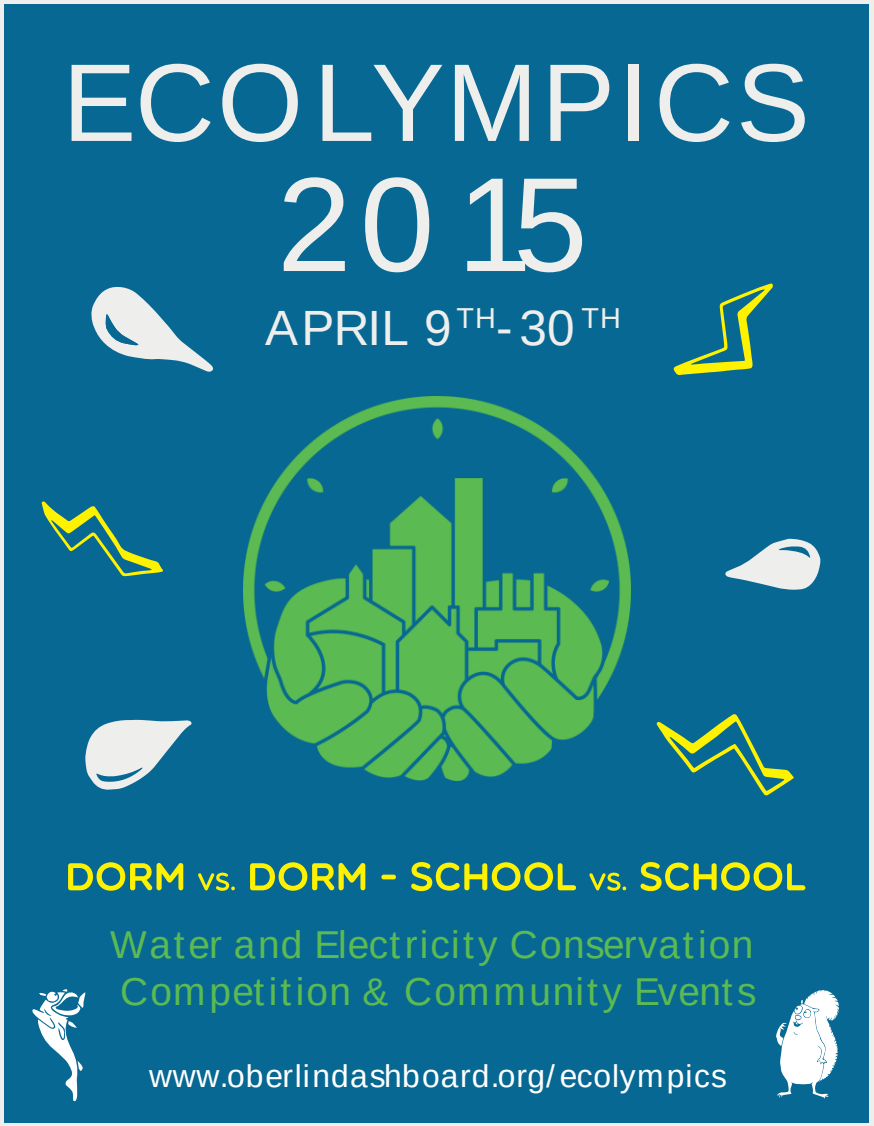
Comparison to Last Year

Comparison to Other Campus Buildings



Occupant Engagement through Competitions





READY,
SET,
REDUCE!

CAMPUS
CONSERVATION
NATIONALS 2013

ECOLYMPICS

april 5–26, 2013

dorm water & electricity competition

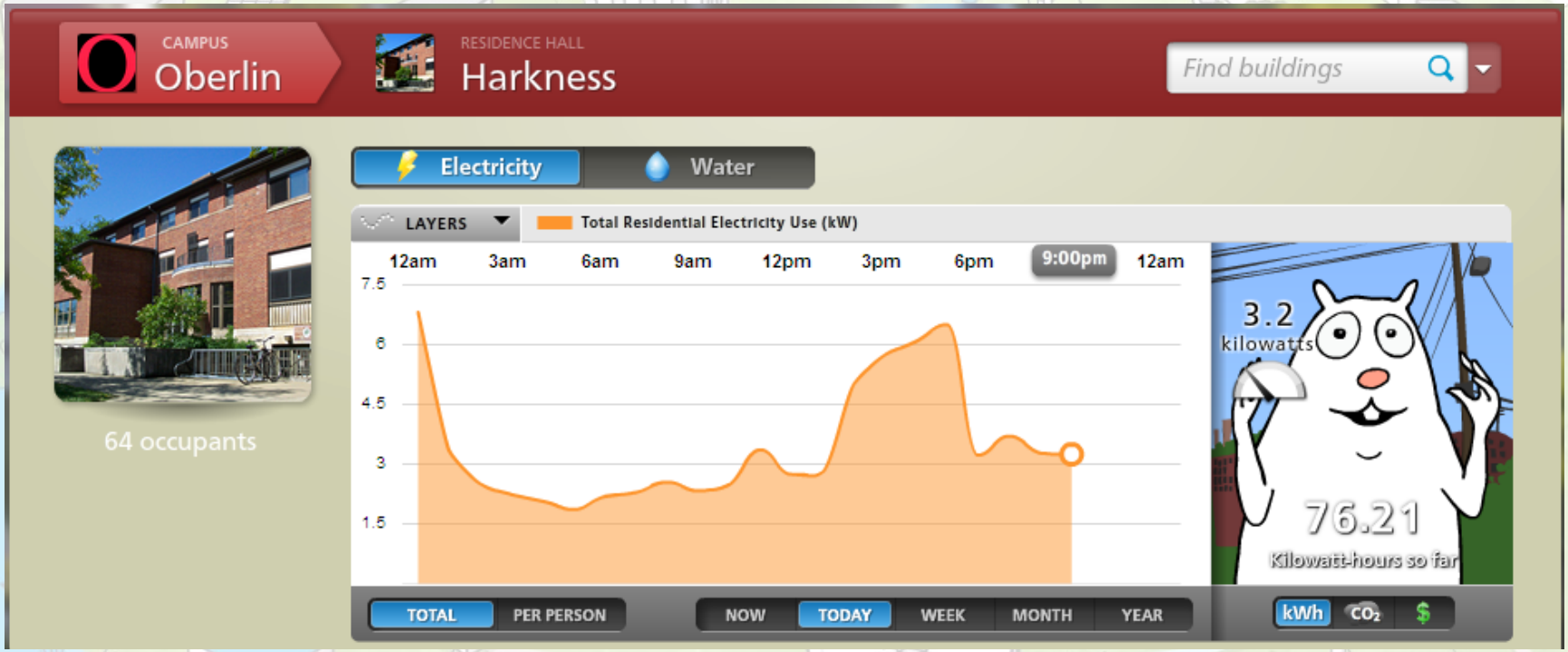
& campus events

KEEP
CALM
AND
KILL THE
VAMPIRE
(LOADS)

CAMPUS
CONSERVATION
NATIONALS 2013

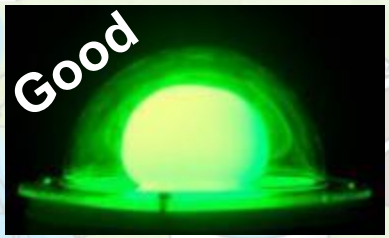
Building Dashboard

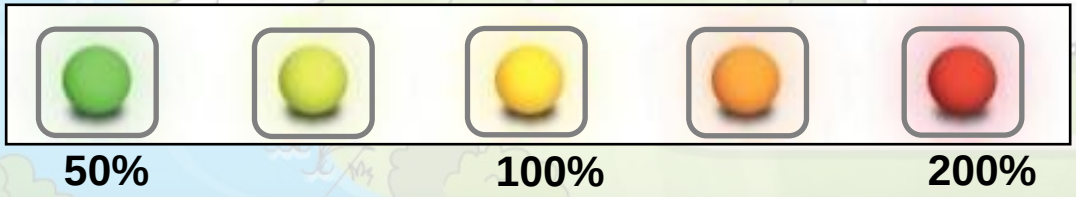
Technology to monitor and display electricity and water use in dorms



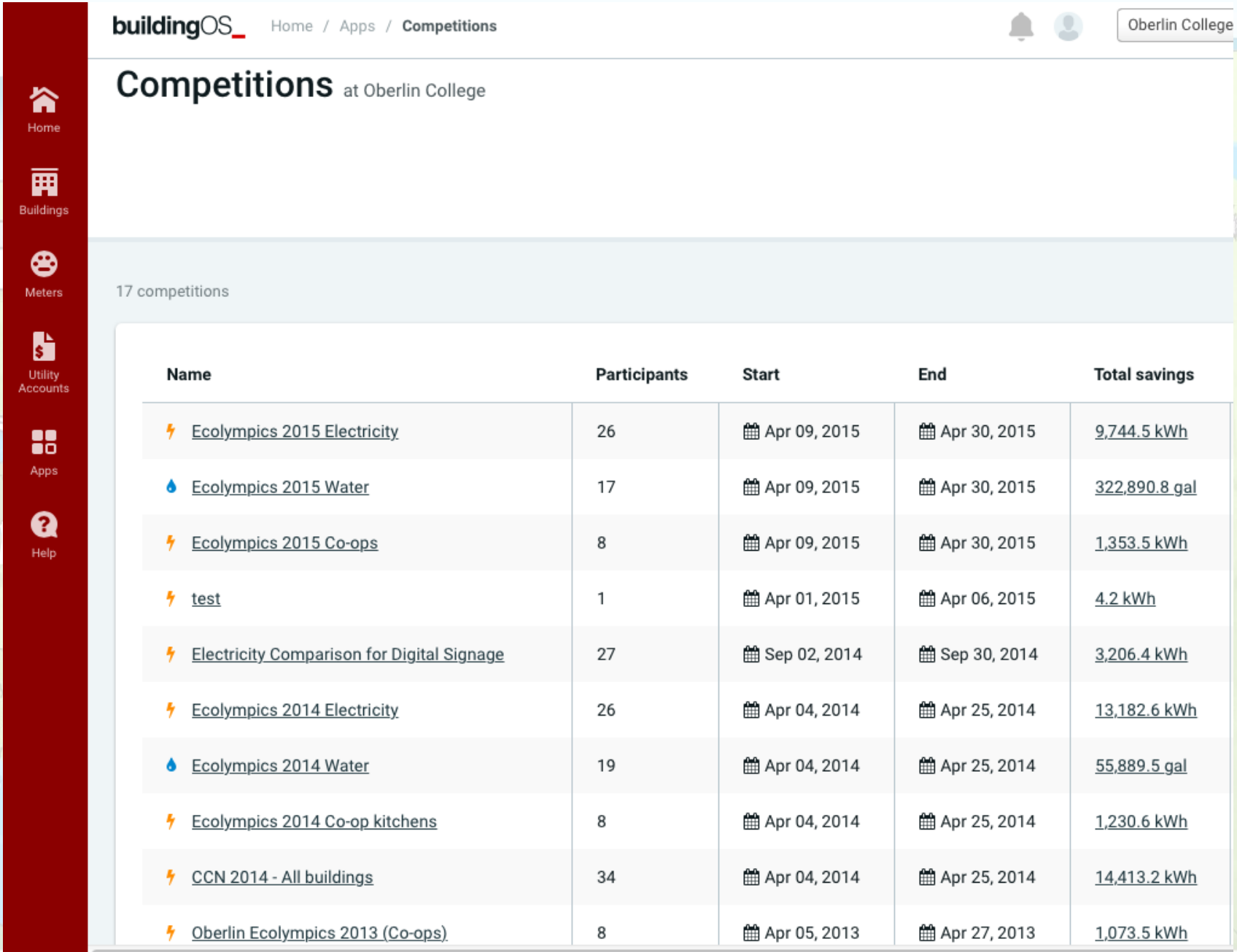
lucid

Ambient feedback with “Environmental Orbs”





Dorm Competitions



Ecolympics 2015 Water at Oberlin College in CCN 2015

322,890.8 gal saved by all participants
19.8% overall reduction

	Participant	Reduction	Baseline use	Competition use	Total savings
1st	Johnson House	56.9%	6.32 gal/hour	2.73 gal/hour	1,899.2 gal
2nd	East	32.6%	1,048.05 gal/hour	705.88 gal/hour	180,663.5 gal
3rd	South	30.2%	540.80 gal/hour	377.27 gal/hour	86,342.5 gal
4th	Noah	29.8%	114.51 gal/hour	80.42 gal/hour	18,003.9 gal
5th	Kahn	14.6%	76.54 gal/hour	65.36 gal/hour	5,900.6 gal
6th	Burton	11.5%	229.18 gal/hour	202.88 gal/hour	13,887.0 gal
7th	Tank	9.5%	87.27 gal/hour	78.94 gal/hour	4,399.3 gal
8th	Talcott	8.7%	112.45 gal/hour	102.64 gal/hour	5,183.1 gal
9th	Barnard	8.3%	30.19 gal/hour	27.69 gal/hour	1,319.1 gal

Ecolympics 2015 Electricity at Oberlin College in CCN 2015

9,744.5 kWh saved by all participants
5.8% overall reduction

	Participant	Reduction	Baseline use	Competition use	Total savings
1st	Harkness	30.4%	4.23 kW	2.95 kW	678.9 kWh
2nd	Baldwin	20.4%	5.13 kW	4.08 kW	553.1 kWh
3rd	Asia House	16.9%	14.03 kW	11.65 kW	1,255.4 kWh
4th	Allencroft	14.9%	3.15 kW	2.68 kW	247.4 kWh
5th	Price	13.9%	10.54 kW	9.07 kW	775.8 kWh
6th	Kahn	13.3%	11.75 kW	10.18 kW	825.2 kWh
7th	Dascomb	10.3%	25.75 kW	23.10 kW	1,401.2 kWh
8th	Barnard	9.3%	7.49 kW	6.80 kW	369.3 kWh
9th	Kade	6.8%	9.31 kW	8.67 kW	336.3 kWh

K-12 Education: Competition Engagement

PROSPECT ELEMENTARY

36.7% reduction

1st

OBERLIN HIGH SCHOOL

23.2%

2nd

EASTWOOD ELEMENTARY SCHOOL

22.3%

3rd

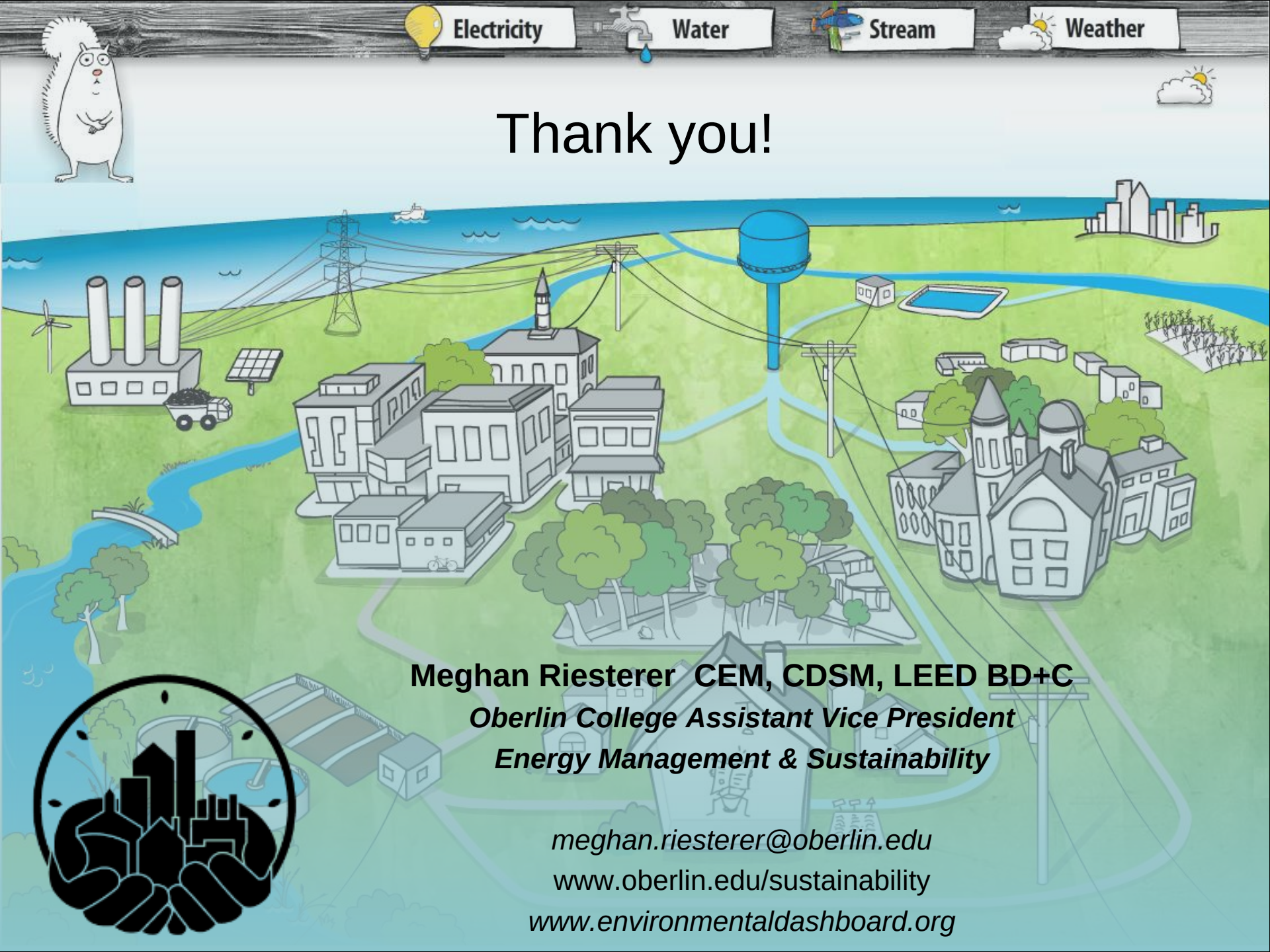
LANGSTON MIDDLE SCHOOL

12.5%

4th

Value from Data is Maximized with Feedback

1. Monitor electricity & water use in schools, homes, businesses
2. Provide real-time feedback display
3. Monitor flows & impacts in watershed and electrical grid
4. Empower sharing of pro-environmental thought and action



Thank you!

Meghan Riesterer CEM, CDSM, LEED BD+C

Oberlin College Assistant Vice President

Energy Management & Sustainability

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www.oberlin.edu/sustainability

www.environmentaldashboard.org