



Developing a Staff Culture of Sustainability

Thursday, July 11th

11:00-12:30pm



Monica Witt

LANL

U.S. DEPARTMENT OF
ENERGY

2019 Better Buildings Summit Developing a Staff Culture of Sustainability

Why do you need a Ventilation Coordinator?



Monica Witt
Sustainability Program Manager

7/11/2019



Agenda (list of questions... that I hope to answer)

- Where, What is Los Alamos National Laboratory?
- What is Smart Labs? Why Smart Labs? Why at LANL?
- How quickly did we realize we needed a Ventilation Coordinator?
- What does a Ventilation Coordinator do?
- How did we convince everyone to trust and depend on the Coordinator?

The role of Los Alamos for the nation

Office of Science Laboratories

- 1 Ames Laboratory
Ames, Iowa
- 2 Argonne National Laboratory
Argonne, Illinois
- 3 Brookhaven National Laboratory
Upton, New York
- 4 Fermi National Accelerator Laboratory
Batavia, Illinois
- 5 Lawrence Berkeley National Laboratory
Berkeley, California
- 6 Oak Ridge National Laboratory
Oak Ridge, Tennessee
- 7 Pacific Northwest National Laboratory
Richland, Washington
- 8 Princeton Plasma Physics Laboratory
Princeton, New Jersey
- 9 SLAC National Accelerator Laboratory
Menlo Park, California
- 10 Thomas Jefferson National Accelerator Facility
Newport News, Virginia

Other DOE Laboratories

- 1 Idaho National Laboratory
Idaho Falls, Idaho
- 2 National Energy Technology Laboratory
Morgantown, West Virginia
Pittsburgh, Pennsylvania
Albany, Oregon
- 3 National Renewable Energy Laboratory
Golden, Colorado
- 4 Savannah River National Laboratory
Aiken, South Carolina

NNSA Laboratories

- 1 Lawrence Livermore National Laboratory
Livermore, California
- 2 Los Alamos National Laboratory
Los Alamos, New Mexico
- 3 Sandia National Laboratory
Albuquerque, New Mexico
Livermore, California

Nuclear Security Enterprise

1. Kansas City Plant
2. Lawrence Livermore National Laboratory
3. Los Alamos National Laboratory
4. Nevada National Security Site
5. Pantex Plant
6. Sandia National Laboratories
7. Savannah River Site
8. Y-12 National Security Complex



LANL Infrastructure Statistics



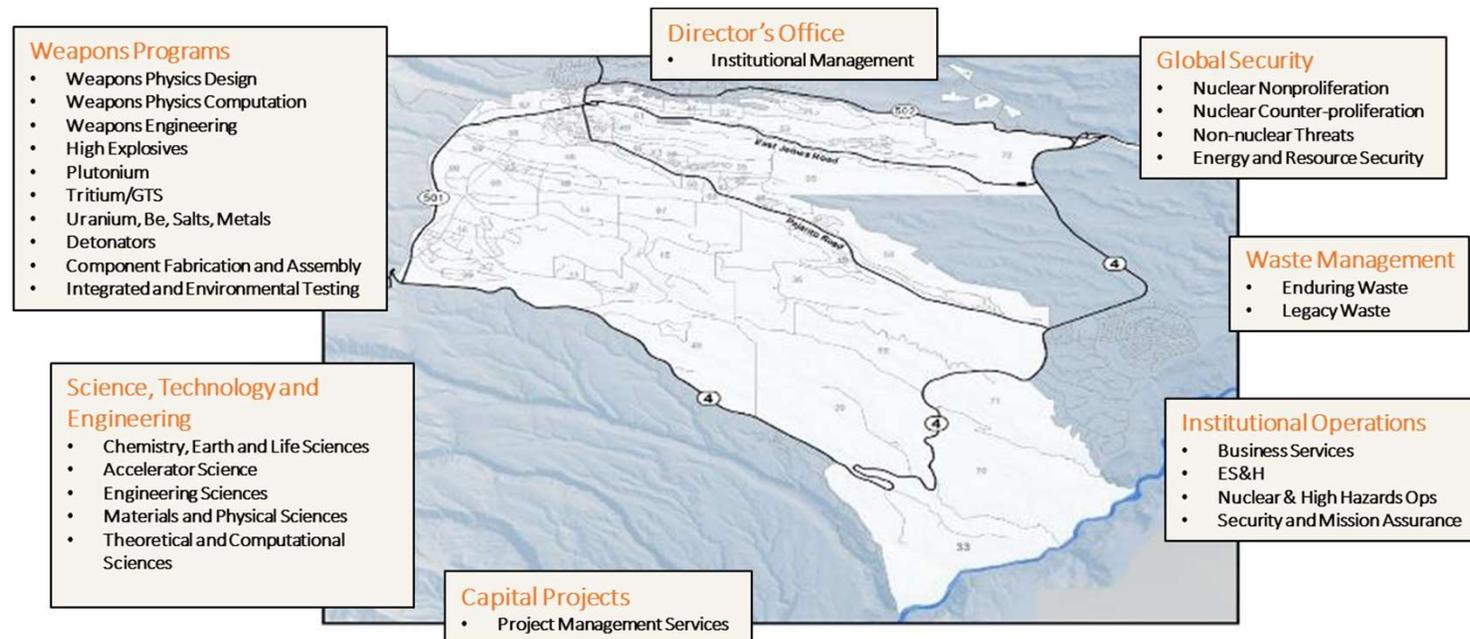
Land comparison of Washington, D.C. and the Los Alamos National Laboratory Site

- ~40 square miles
 - 7,500 ft. elevation
 - 13 nuclear facilities
- 920 owned buildings with 8.2M gross sq. ft. (owned)
 - 50% more than 40 years old
 - 295 occupied buildings
 - 0.43M gross sq. ft. of leased properties
 - 0.35M gross sq. ft. shutdown assets
- Roads
 - 22 miles of primary roads
 - 62 miles of secondary roads



- Utilities
 - 32 miles of primary power lines
 - 166 miles of secondary power lines
 - 57 miles of gas distribution lines
 - 109 miles of water distribution lines (fire and potable)
 - 28 miles of steam lines
 - 63 miles wastewater

The Laboratory is an integrated and dynamic system of people, facilities, equipment, materials and services that supports our national security mission

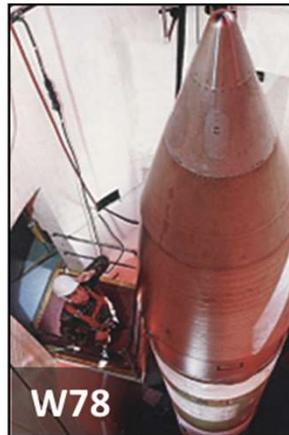


40 square miles	47 technical areas	1,280 buildings/9M sq. ft.	11 nuclear facilities	268 miles of roads
8,000 career employees	2,250 R&D scientists and engineers	350 postdocs	1,600 students at peak	
\$2.5B budget	60% Weapons Program	4,700 projects	600 B&R codes	
5 PADS	14 Directorates	80 Divisions		



Los Alamos is essential to ensuring the U.S. nuclear deterrent – we are responsible for four of the seven weapons systems in the nation’s arsenal

- Los Alamos helps ensure the safety, security, and effectiveness of the nation’s deterrent
- Los Alamos is the design agency for four of seven weapons systems in the nation’s arsenal



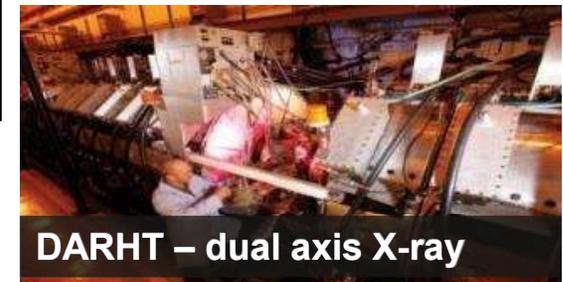
W78



W76
W88



Supercomputing



DARHT – dual axis X-ray



B61

Non-nuclear testing, modeling, simulation, and other tools and capabilities provide assurance

We use science to annually certify to the Secretary of Energy, Secretary of Defense, and the President that the stockpile will perform as intended

What is a “Smart Lab”?

“Smart Labs” are newly constructed or retrofitted laboratories that improve safety protocols, reduce building energy consumption, and effectively monitor and continuously commission the building improving operational control and mission responsiveness.

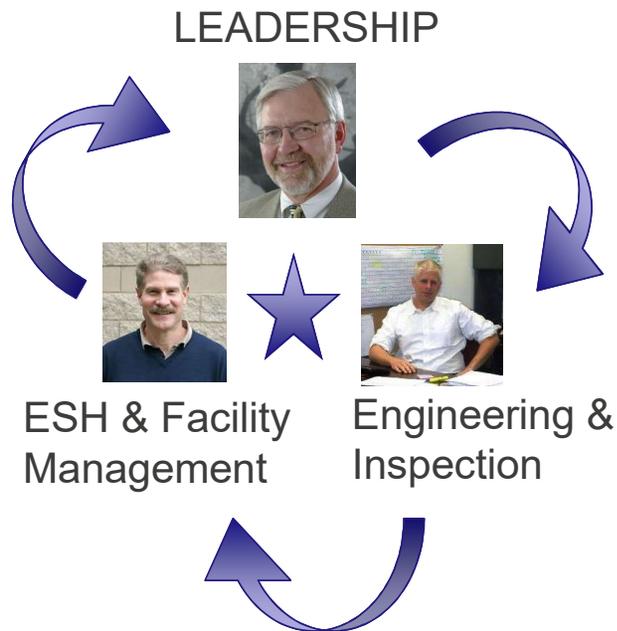
1. Fundamental platform of dynamic, digital control systems
2. Demand-based ventilation
3. Low power density, demand based lighting
4. Exhaust fan discharge velocity optimization
5. Pressure drop optimization
6. Fume hood flow optimization
7. Commissioning with automated cross platform fault detection

Smart Labs should be:

- Effective
- Safe
- Efficient
- Sustainable



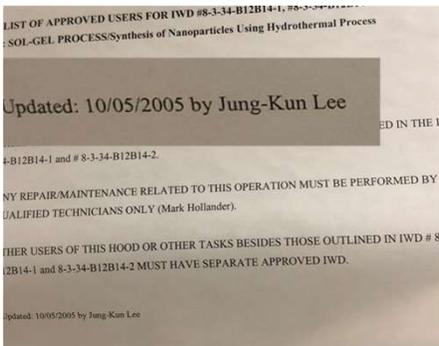
UC Irvine set the example



Important Lessons Learned

- Core team approach is key
- Still works after 14 years
- Improved safety, fewer incidents
- Reduced energy use by over 50% on average
- Both new construction and existing buildings
- Tenant involvement is key from very beginning

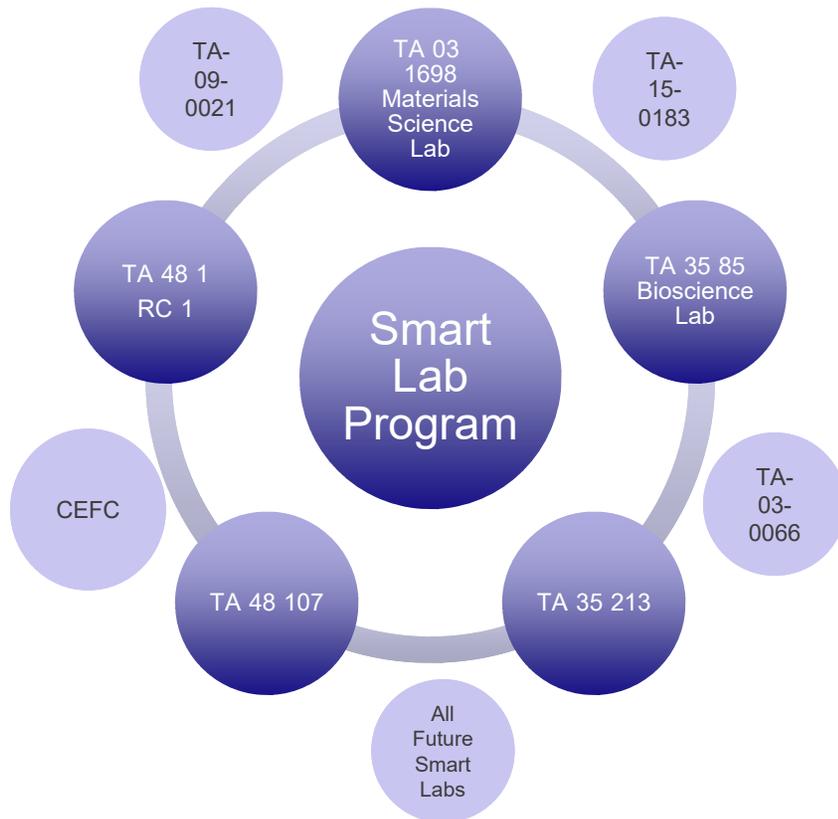
Minimizing the potential for degradation and failure is the key to minimizing the risk of airborne hazards in labs



Good maintenance = Improved rigor and efficiency



Smart Lab vs. Smart Lab Program



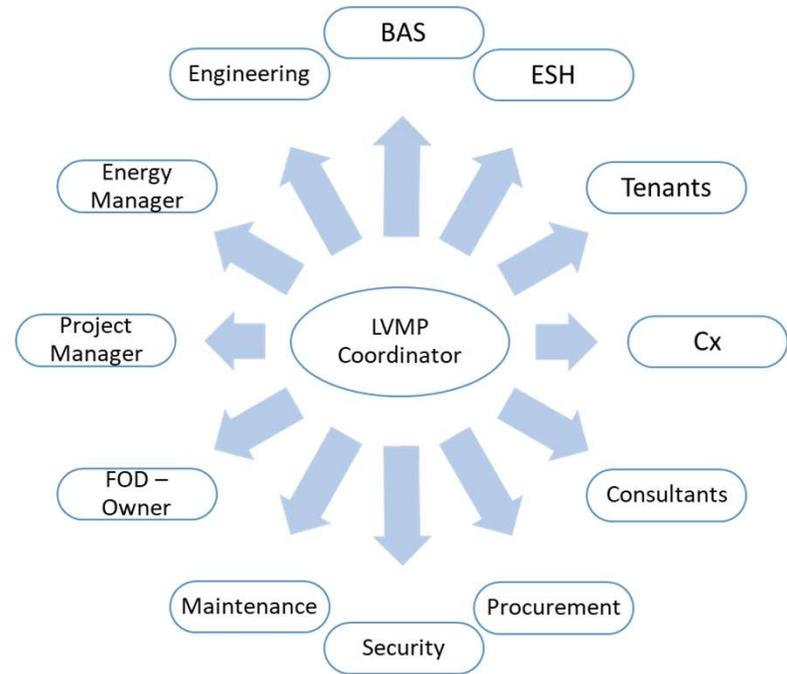
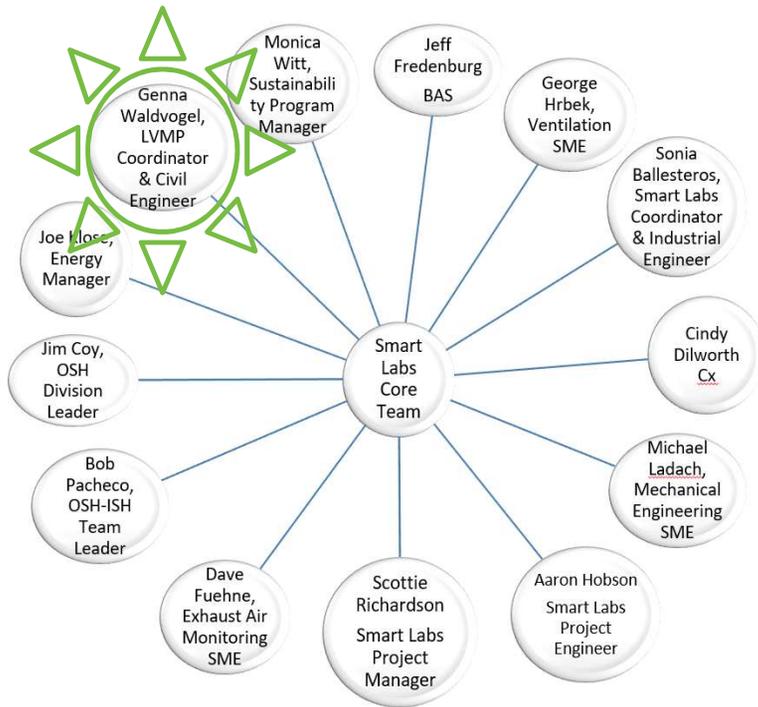
Smart Labs have constructible parts:

- LED lighting w/ controls
- VAV/DDC HVAC
- Information layer
- Demand Ventilation Systems

A Smart Lab Program:

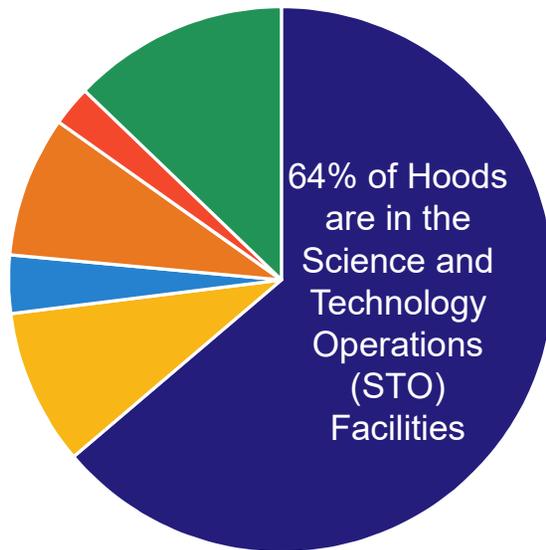
- Puts in place processes and procedures
- Manages change
- Documents the expectations and results

Smart Labs Core Team & Ventilation Coordinator

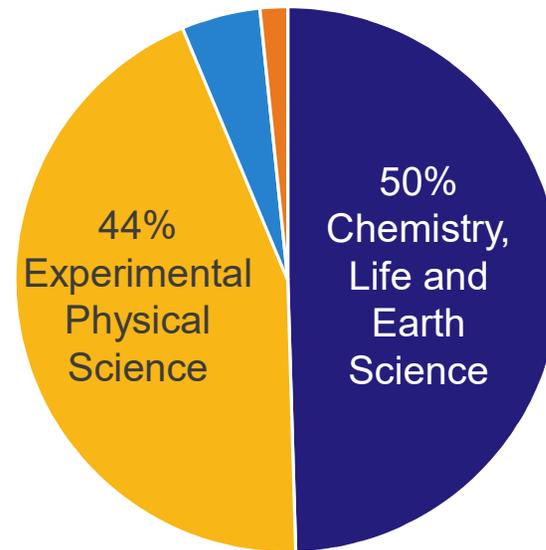


But in the Ventilation World, we care about **FUME HOODS!**

Fume Hood Distribution at LANL



STO Fume Hood Distribution



Current Status – Unstable & High Risk Conditions

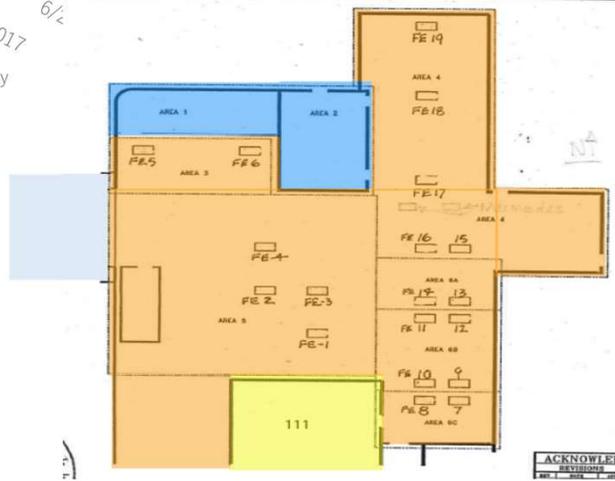
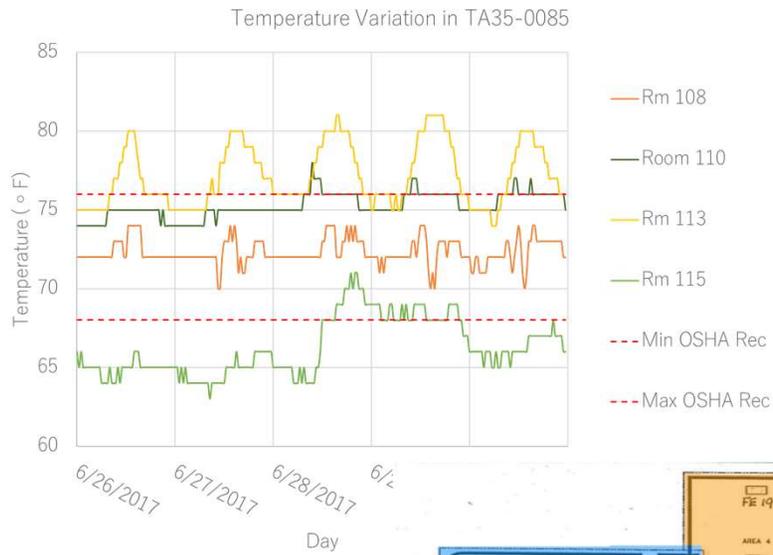


Table 1 Description of Risk Control Bands

0	Negligible
1	Low
2	Moderate
3	High
4	Very High
5	Extreme

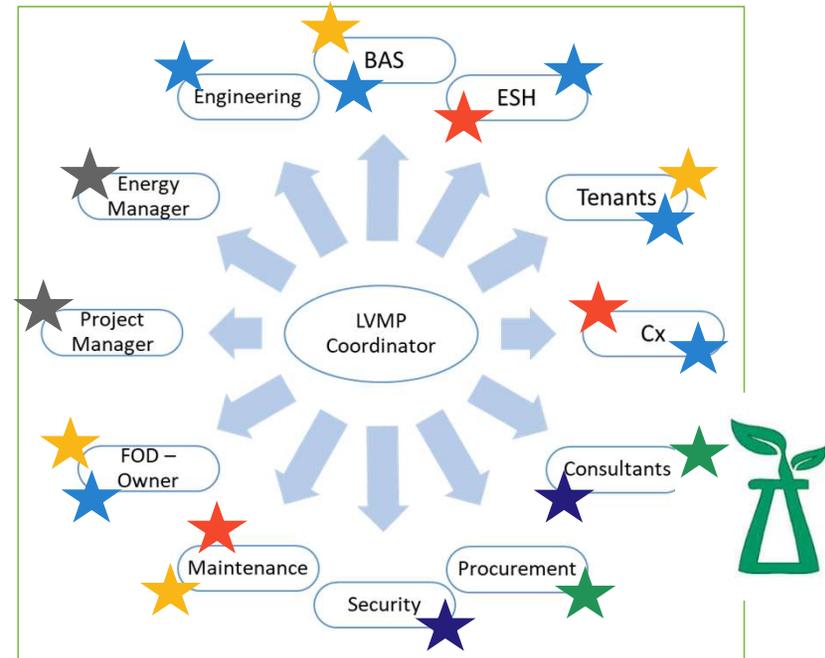
Laboratory Ventilation Management Needs

- **We Needed Training:** with ESH, Maintenance, Cx and BAS to understand how the Demand for Ventilation Analysis is conducted and how to develop a Building Management Plan (BMP)
- **We Needed New Programs and More Efficient Processes:**
 - Fume Hood Preventative Maintenance Plan
 - A Dedicated Hood Maintenance Team
 - Hibernation Protocol for Ventilation Systems
 - Streamline Fume Hood Certification Process & Connection to Program Needs
 - Exhaust Fan and Fume Hood Database in our Material and Equipment List
 - CEREBRO 
- **We Need Continuous Monitoring:** with Building Automation System, meters and lots of...
- **COMMUNICATION:** between team members and laboratory tenants
(cliché → but the most important part of the entire process)



Future Projects

- Complete Fume Hood Preventative Maintenance Pilot
- Risk Control Banding Pilot
- Hibernation Protocol Pilot
- CEREBRO Pilot
- My Green Lab
- Benchmark Progress



Questions?

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Sarah Edwards

Cook County, IL

U.S. DEPARTMENT OF
ENERGY

Monitoring Good Behavior: Cook County Employees Save Energy at Work

Sarah Edwards

Department of Environment and
Sustainability

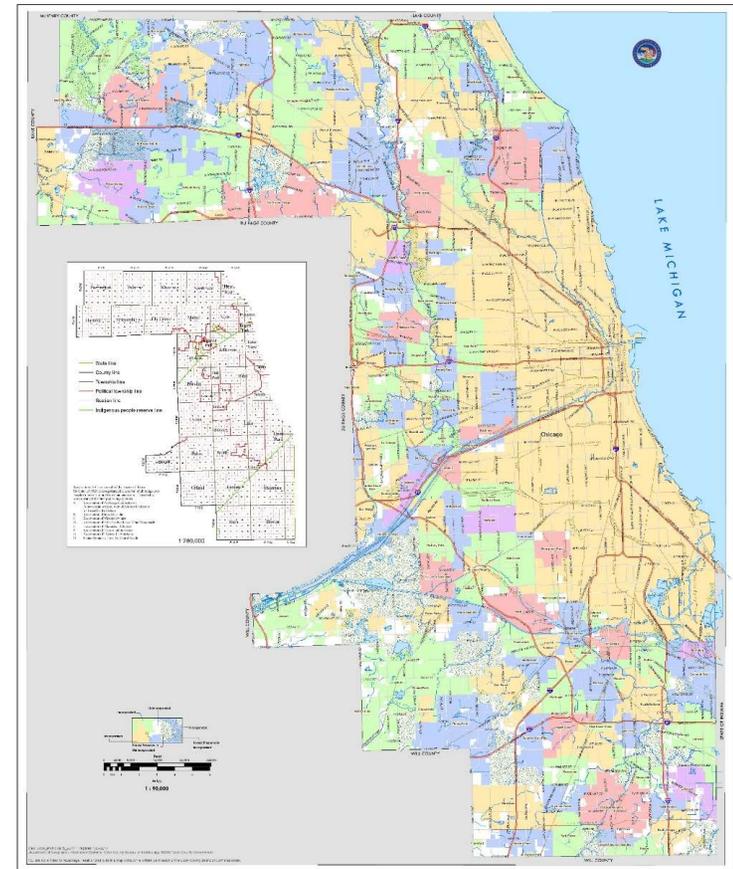
Cook County

Better Buildings Summit: July 11, 2019



Cook County

- Home to 5.2 million people, 2.44 million in suburban Cook (beyond the city of Chicago)
- 22,000 Cook County employees
- 171 County Owned Buildings
- 230,600,000 kWh used in 2018



Current Goals

- Creating a 100% renewable energy plan for electricity use in County buildings
- Resolution to be Carbon Neutral by 2050
- Behavior change work: create an awareness among employees of the importance of energy savings for the County
 - 2% energy reduction would be \$382,000/year in avoided utility expenses

Previous Behavior Change Work with Cook County Employees

- Occurring in 2015-16, “Green Champion” program sponsored through an ESCO where employees would volunteer to be a sustainability advocate in their department through a one time training and distribution of sustainability materials.
 - Covered reduced lighting, plug load, and waste.
 - Estimated Savings was a **2%** reduction in total building electricity consumption for sites with Behavior Change programming.

Previous Behavior Change Work with Cook County Employees



Benefits:

- Comprehensive survey to understand gaps in sustainability knowledge and areas to target.
- Helpful lighting and plug load visuals/demonstrations.

Challenges:

- Difficult communication channels
- Not enough repetition
- Challenge incentivizing participation in a voluntary program.

Energy Efficiency Behavior Change Pilot

- Chose to focus on County buildings that have yet to receive significant energy efficiency upgrades, or have high energy usage
- Chose two courthouses as our pilot locations
 - They both were scheduled to receive larger energy efficiency upgrades, and this pilot aimed to dovetail behavior change work with these larger visible upgrades.

Pilot Site: Domestic Violence Courthouse

- Located at 555 W. Harrison St., Chicago
- A 4-story courthouse built in 2005
- 187,268 sq ft with occupied hours from 7am-6pm, M-F
- LEED certified in 2005 but hadn't been upgraded since 2005



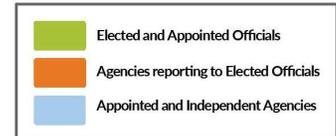
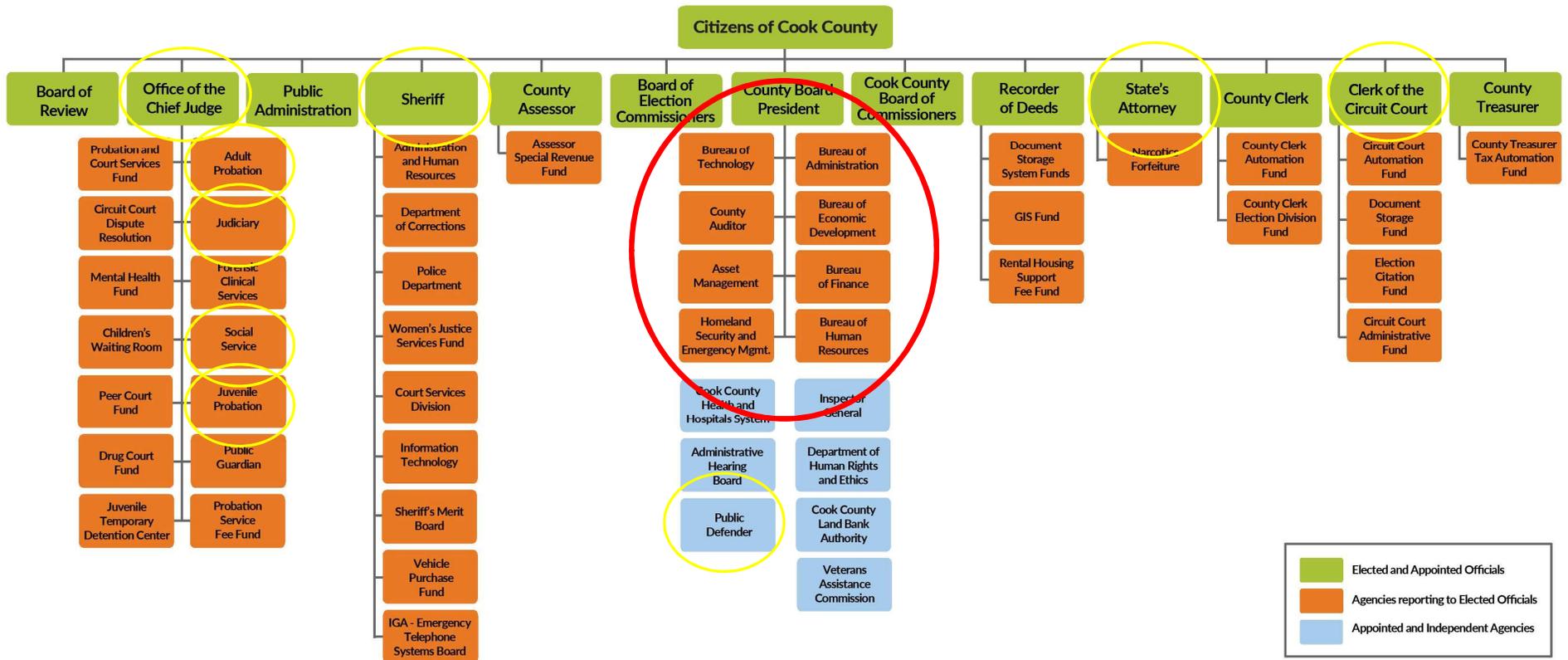
Pilot site: Maywood Courthouse

- Located at 1500 Maybrook Dr., Maywood, IL)
- Built in 1973
- 184,841 sq ft with public operating hours from 8:30am-4:30pm, M-F
- Has had minimal upgrades since the 1970s



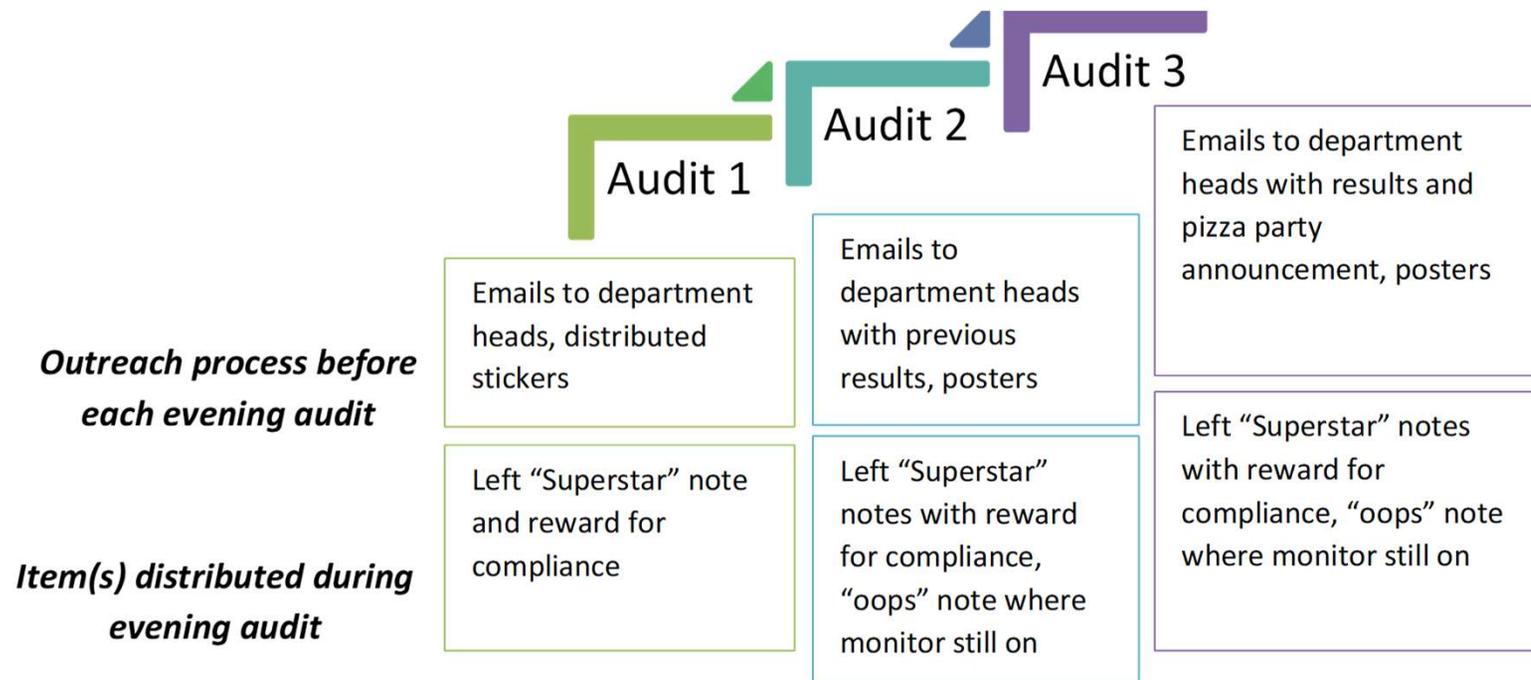


Cook County Organizational Chart



Current as of September 2016

Turn Off Your Monitor Campaign



Campaign Materials

Remember:

Please turn off your computer monitor when you leave work for the day. This helps to conserve energy at work.

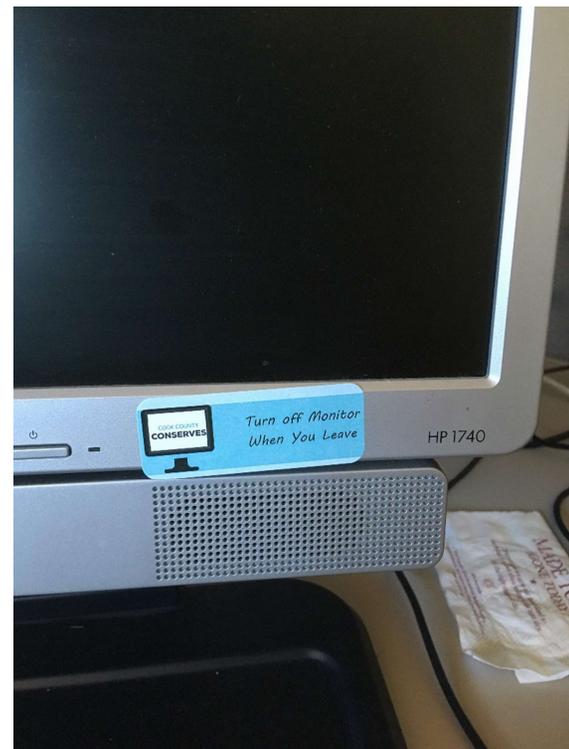
When it's time to go home, make sure there is no longer a yellow or white light blinking at you.



*Turn Off Your Monitor
When You Leave*



Reminder Posters in Hallways



Monitor Reminder Sticker

Campaign Materials

Way to be an energy-saving super star!

Thank you for turning off your computer monitor at the end of the day.

You can save energy and money at home too with free smart meter and energy efficiency programs. Learn more here: www.cookcountyil.gov/service/energy-efficiency

Positive Reward Note: Provided at every audit



Oops Reminder Note: Started during the 2nd evening audit

OOPS!

It looks like you left on your computer monitor overnight.

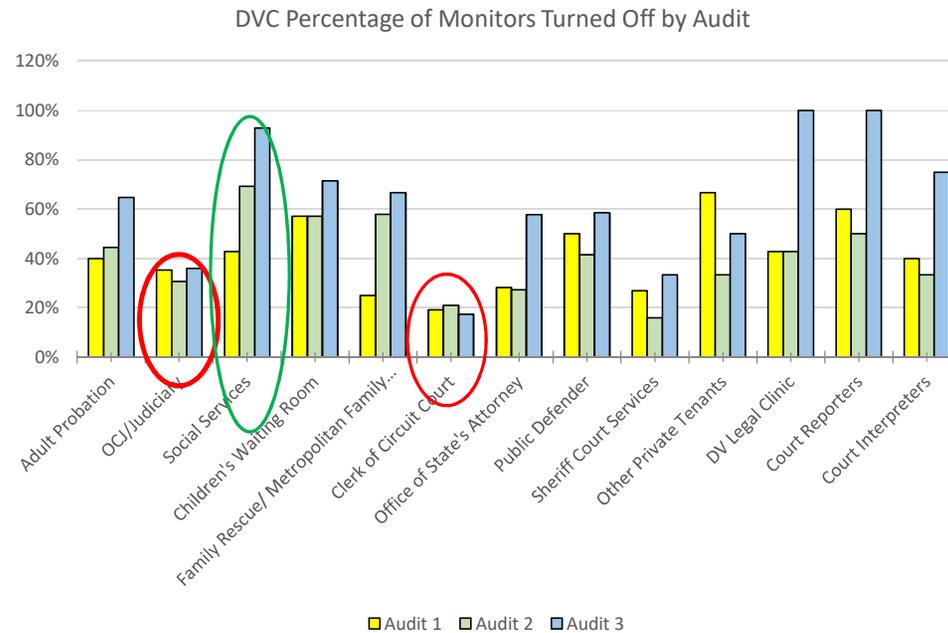
Turning off your monitor at night helps conserve energy. When it's time to go home, make sure there is no longer a yellow or white light blinking at you.



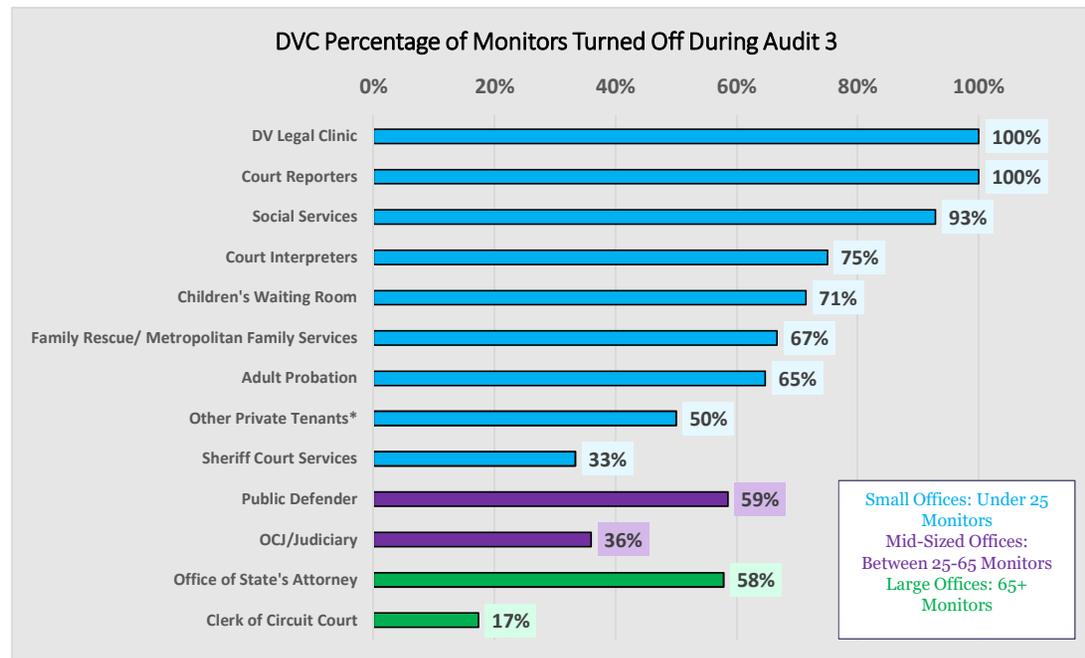
Please Turn Off Your Monitor When You Leave

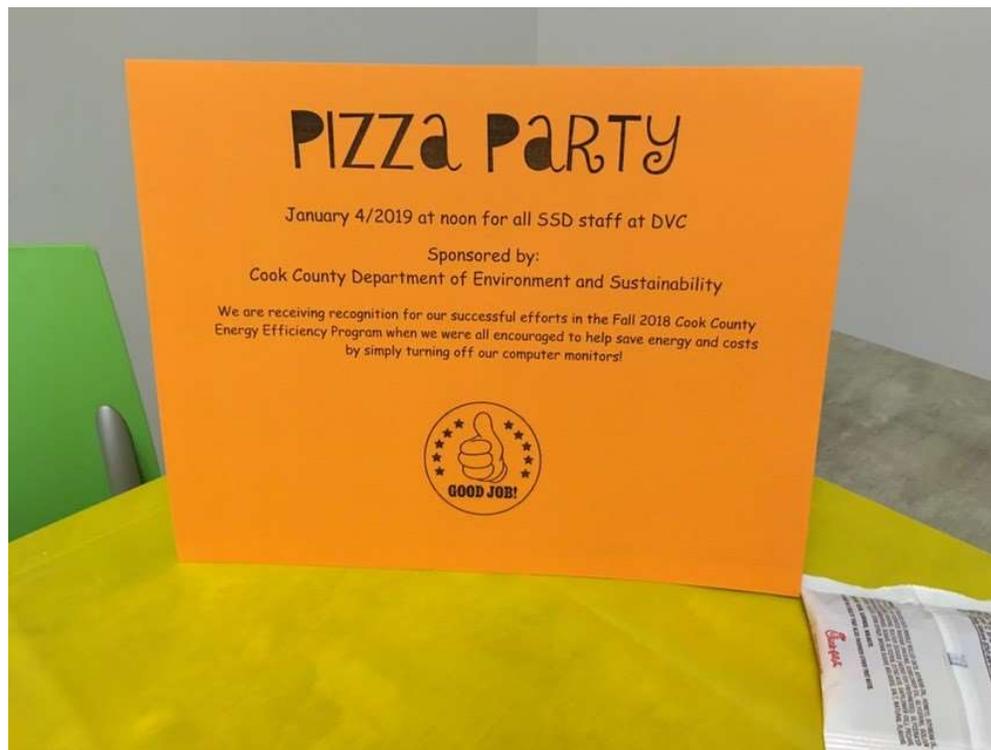
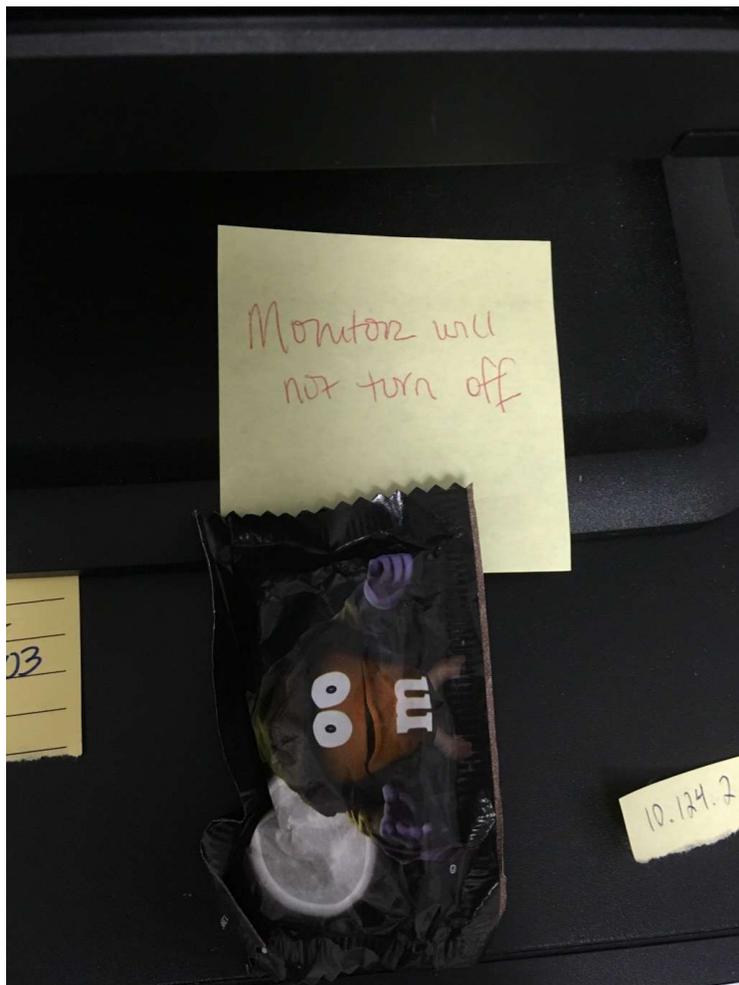


Results from Campaign: DVC

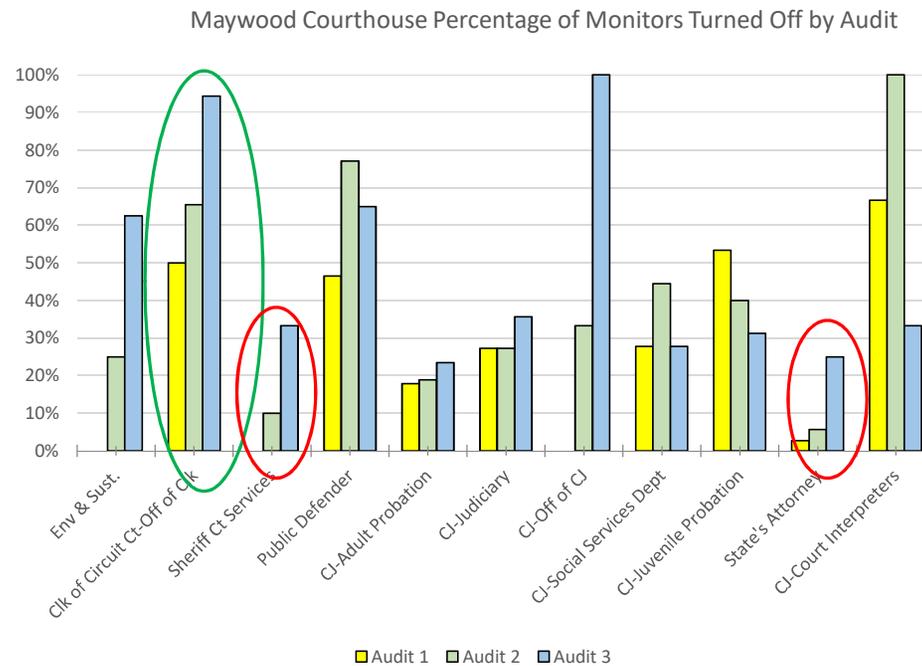


Result from Campaign: DVC

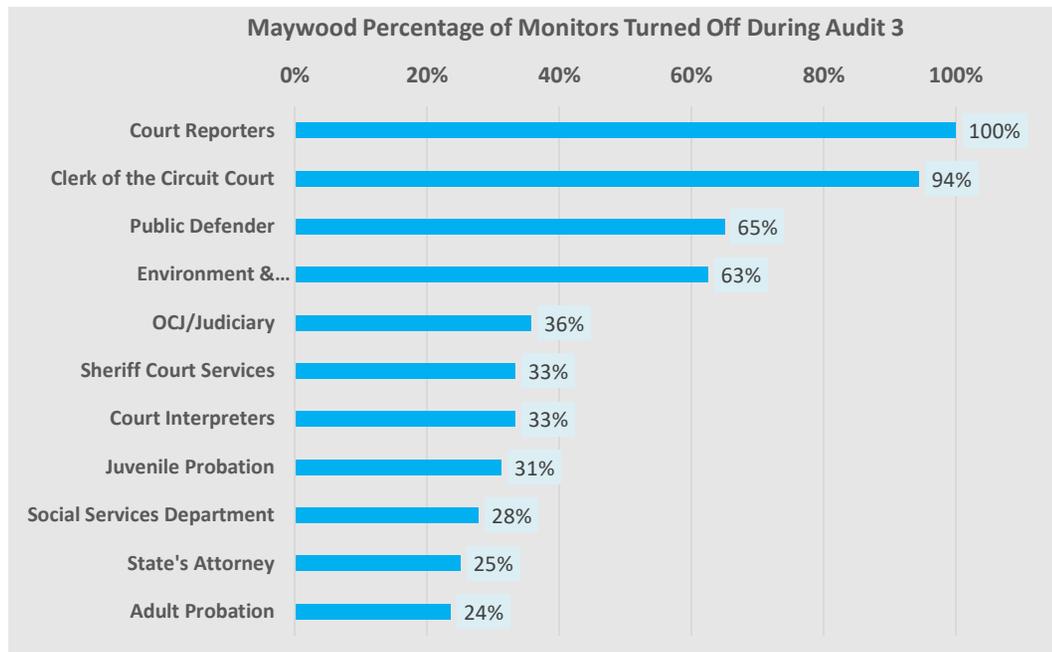


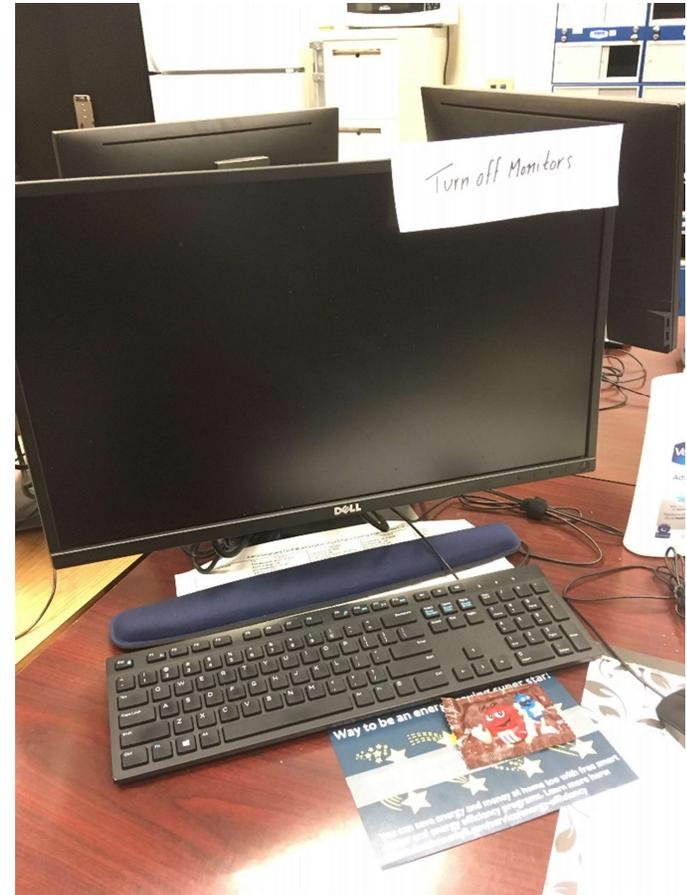
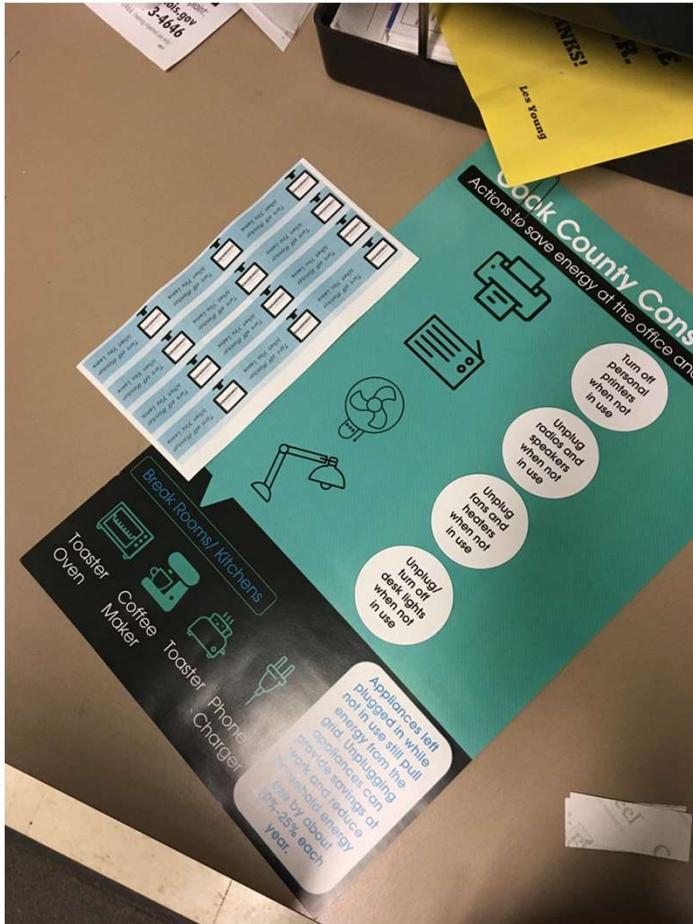


Results from Campaign: Maywood



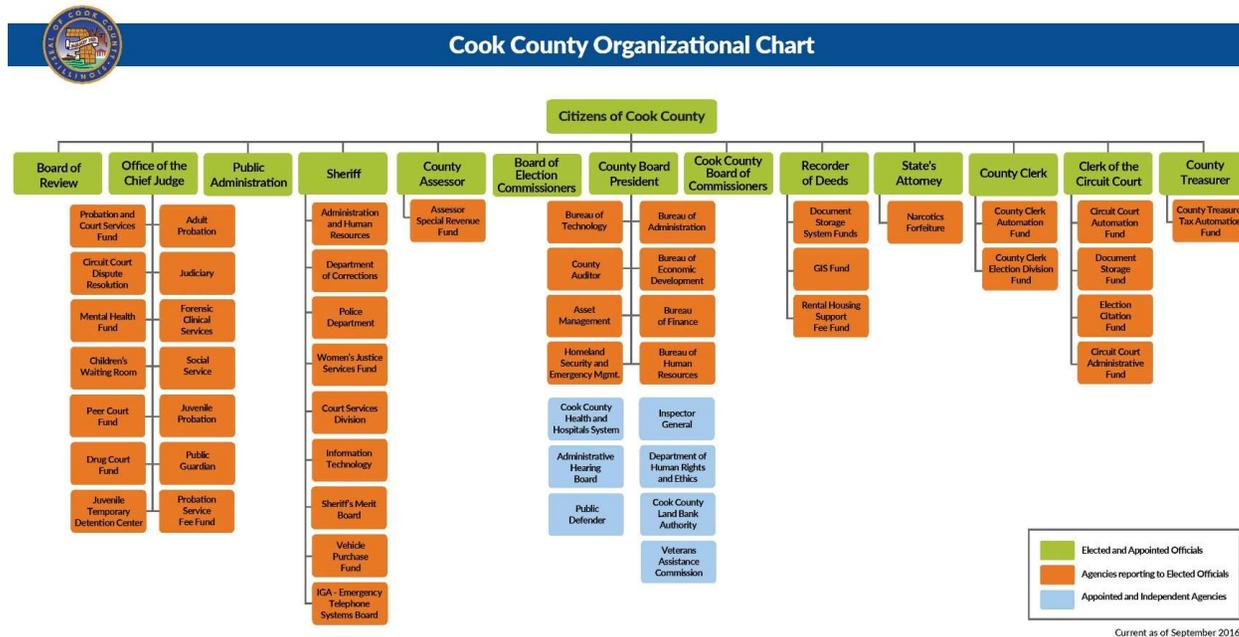
Results from Campaign: Maywood





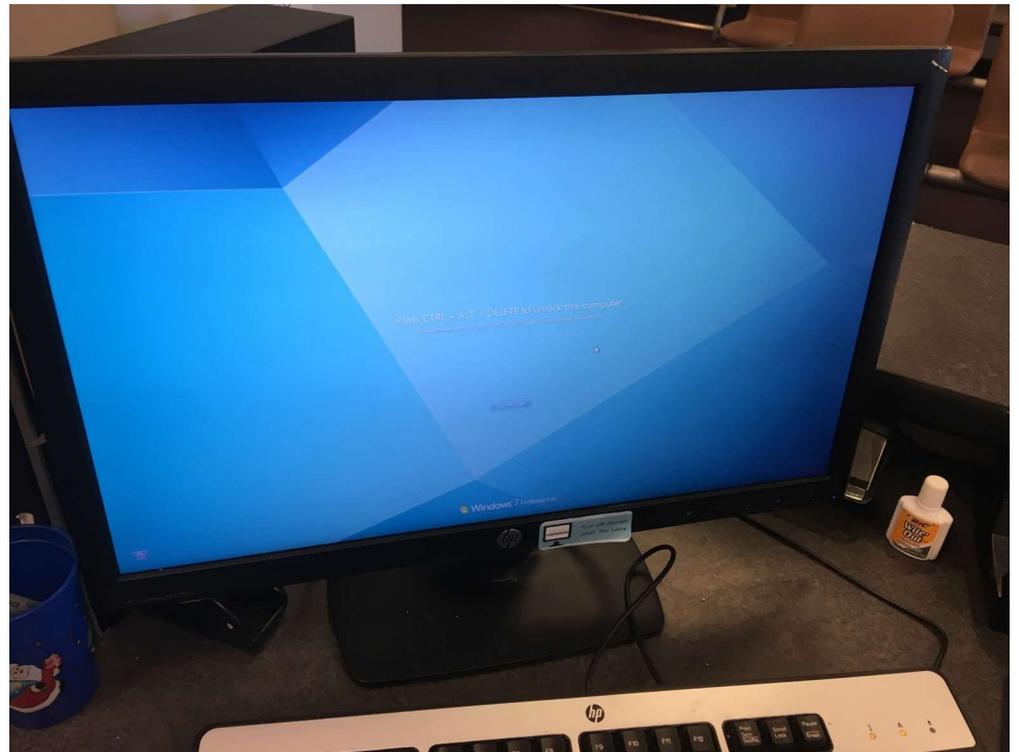
Lessons Learned

- Larger reward was a better motivator
- Department head buy-in is a huge indicator of success
- Communication is... complicated



Lessons Learned (continued)

- Oops notes were surprising helpful
- Monitor reminder sticker didn't correlate to turning off the monitor



Next Steps

- Utilize the County Green Buildings Program to develop future campaigns across the Cook County building portfolio for monitors and other energy plug load campaigns, provide lessons learned, etc.
 - We started at 118 N. Clark St, the main County building with 1100 employees. If 50% success rate again, this could save an estimated 76,986 kWh.
- Develop new or communicate existing power management policies with elected officials
- Integrate the use of Smart power strips in employee spaces and break rooms with funding from Green Buildings Fund
- Adopt a policy/procedure for personal printer usage to reduce plug load impacts

Questions?

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312-603-3459

Jonathan Bauer

The Tower Companies

U.S. DEPARTMENT OF
ENERGY

Developing a Staff Culture of Sustainability

July 11, 2019

2019 Better Buildings Summit

Jonathan Bauer, Sustainability Manager



Company Overview

THE TOWER COMPANIES AT A GLANCE

6 MILLION

square foot portfolio
(Tower and partner-operated)

13 MILLION

square feet in development

100

employees

90%

of portfolio operating under a green lease

100%

renewable energy commitment

Fitwel

Champion

2,000

employee volunteering hours used since 2012

15%

staff have been with the company for 20 years or more

42%

of our Senior Leadership team are women

95%

LEED Certified

80%

of Office Building Portfolio is ENERGY STAR® Certified

Two

dedicated sustainability team members, including senior leadership position

All data in this report represents tower owned and managed properties unless otherwise noted

AQUATERRA - ROOFTOP AT THE PEARL OVERLOOKING ROCK CREEK PARK
PHOTO CREDIT: 2018 JOHN HARRINGTON

THE TOWER COMPANIES 2019 CORPORATE RESPONSIBILITY REPORT

PEOPLE. PROPERTIES. PURPOSE.

At The Tower Companies, we are committed to making a difference through our business and community. We develop, own, and manage commercial, retail, and multifamily residential properties in the Washington D.C.-metro area while being mindful of our global impact. Our dedication to the nation's capital has allowed us to build long-term relationships and foster lasting community impact.

Since our founding in 1947, we have continued to thrive while staying true to the belief that our actions and business can positively benefit the health of our people and planet.

OUR VISION

We envision a world where buildings inspire and enrich the lives of their occupants. In this world, people seek out buildings that create positive social change by helping to sustain the environment, better their health and well-being, and connect them to thriving communities.

DC Based Portfolio



Our Commitment

At every decision point, we consider our ability to advance the real estate industry, impact on the environment, and commitment to the well-being of people and local communities.



Sustainability Touches Everyone

1. Ownership
2. HR
3. Legal
4. Tenant Leasing & Construction
5. Property Management
6. Engineering & Maintenance
7. Accounting/Tax
8. IT

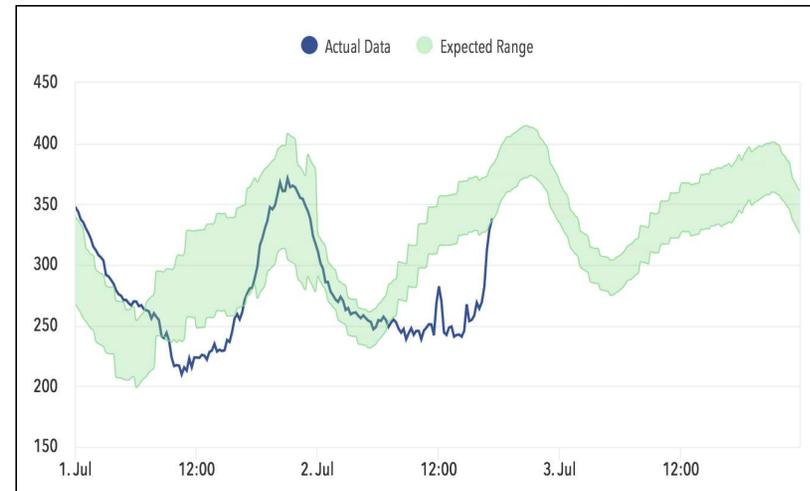
How has Tower built a sustainability culture?

1. Energy & Water Efficiency
2. Green Leasing
3. Waste Management Program & Training
4. Environmental Holidays & Events
5. Wellness Program
6. Community Service



Energy & Water Efficiency

- ✓ Benchmarking & Goal Setting
- ✓ Green Building Standards
- ✓ Green Lease Requirements
- ✓ Preventative Maintenance
- ✓ Energy and Water Conservation Measures
- ✓ Work Tickets for Client Issues
- ✓ Real-Time Energy and Water Monitoring
- ✓ Tenant Engagement
- ✓ Energy Procurement
- ✓ Demand Response
- ✓ Renewable Energy



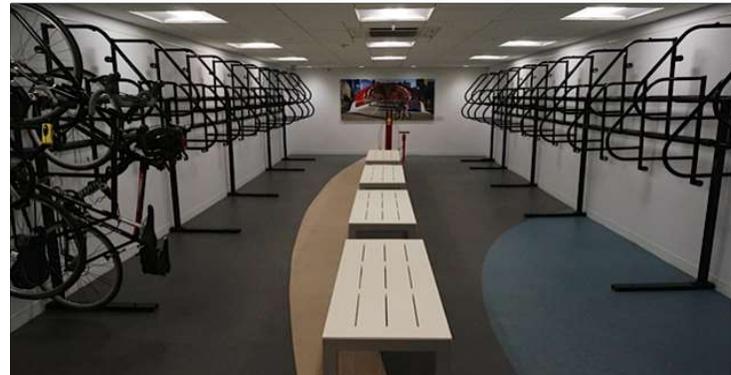
Green Leasing

Green Lease Categories

- Water Efficiency
- Energy Efficiency
- Materials & Resources
- Indoor Environmental Quality

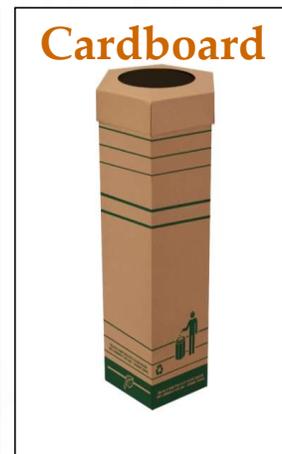
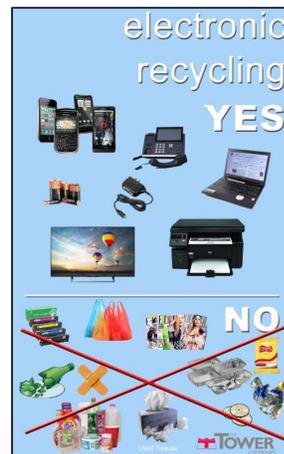
Types of Requirements

- Design
- Construction
- Operational



Waste Management Program & Training

- Mixed Paper
- Commingled Recycling
- Compost
- Electronic Recycling
- Large Cardboard
- Landfill



Tayst - Zero Waste Coffee & Tea Operation

100% COMPOSTABLE KEURIG COMPATIBLE POD

THE LID

A combination of paper & other compostable materials with new compostable inks



THE RING

Made from a blend of bioreins from renewable sources & coffee chaff



THE MESH

Innovative bio-based substance that composts. The mesh allows brew to flow evenly through coffee for smoother taste



THE COFFEE

Superior beans are roasted fresh and cooled slow, then portioned into our pods for a consistent flavor



Environmental Holidays & Events



SUSTAINABILITY SNAPSHOT










In 2012, Tower pledged to reduce portfolio-wide energy and water consumption by 20% by 2020. We exceeded that goal ahead of schedule in 2017.

THANK YOU TO ALL OF OUR EMPLOYEES, CLIENTS, AND BUILDING TEAMS FOR THEIR DEDICATION TO SUSTAINABILITY BEST PRACTICES.



61 MILLION kWh OF ELECTRICITY CONSERVED



92 MILLION GALLONS OF WATER SAVED

Reduced greenhouse gas emissions equivalent to carbon sequestered by

88,000 ACRES OF U.S. FORESTS IN ONE YEAR





187,000 POUNDS COMPOSTED



58% OF WASTE DIVERTED FROM LANDFILLS



On-site solar photovoltaic installations



100% of energy consumption is offset with renewable energy & carbon credits



Electric Vehicle charging stations available on-site



Secure bike storage and fitness center to promote health and well-being

*TOTAL METRICS ABOVE ARE MEASURED FROM a 2010

Please Join us to Celebrate:

America Recycles Day!

November 15, 2018



Take the Pledge! www.AmericaRecyclesDay.org/pledge

2000 Tower Oaks Program Reminders

Commingled Recycling: In Montgomery County, commingled items like glass, aluminum, and plastic materials are recycled separately from mixed paper.

Mixed Paper Recycling: Mixed paper, including office paper, newspaper, and junk mail can all be recycled together in Montgomery County.

Composting: Composting is available throughout the building including the café and common area restrooms! Compost sends nutrients to the soil, rather than to the landfill.

Cardboard: Large cardboard boxes can be collected separately. Please ask your office manager to request pickup using Building Engines.

Electronic Recycling: This includes computers, printers, batteries, cell phones, etc. These items are collected year-round. Please ask your office manager to request pickup using Building Engines.

Landfill Waste: Any materials that can't be recycled or composted are sent to the landfill. Please consider the 3 R's: Reduce, Reuse, and Recycle, before sending waste to the landfill.



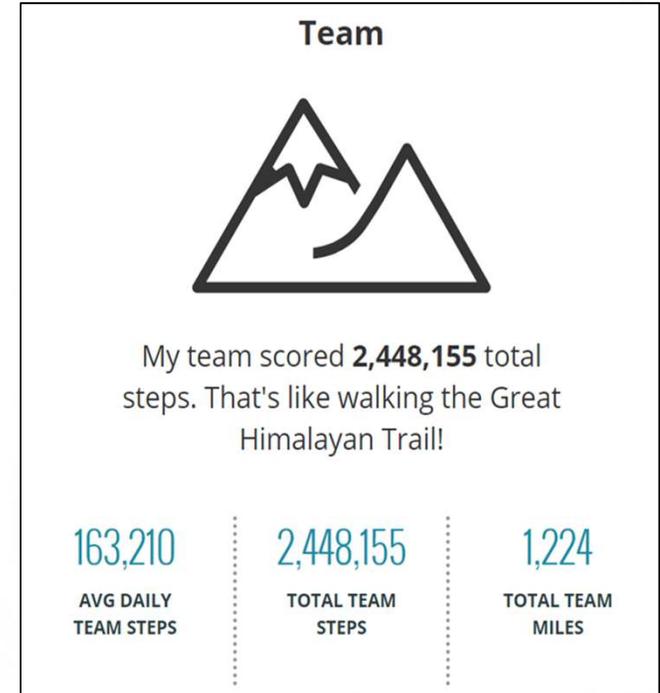
On average, 66% of the building's waste is diverted from the landfill. Help us reach our portfolio-wide goal to achieve 70% waste diversion by 2020!

Did you know? The average person produces ~7 pounds of waste each day equivalent to more than 1 ton each year!

Tip: Reducing your waste, reusing materials, and recycling are the best ways to minimize your impact. Take 30 seconds each day to remember this when disposing of waste.

Tower Tree Program

- CDC Scorecard
- Virgin Pulse Program
- Transcendental Meditation
- Infinity Wellness
- Fitwel



Tower's Community Service Program

- All employees receive 8 hours per year for community service, which must be used during work hours
- 80% participation in 2018
- Events often focus on environmental issues



Recommendations

- Find internal champions
- Patience...it won't happen overnight
- Be realistic...if everyone cared about sustainability we wouldn't be talking right now. Don't put too much effort into changing everyone.
- Bring high energy and have fun!





Developing a Staff Culture of Sustainability

Jonathan Bauer, Sustainability Manager

Jonathan.Bauer@TowerCompanies.com

Read Tower's Inaugural Corporate Responsibility Report to Learn More:

<https://towercompanies.com/corporate-responsibility/>

Thank You

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