



AUGUST 21-23, 2018 • CLEVELAND, OHIO

Healthcare Sector Meet-up

Wednesday August 22nd, 2018

4:00pm – 5:30pm



AGENDA

- 4:00 PM – 4:05 PM Welcome and Introductions
- 4:05 PM – 4:10 PM Sector Overview and Partner Recognition
- 4:10 PM – 4:25 PM Program Engagement Opportunities
- 4:25 PM – 4:35 PM Sector Priorities and Highlights
- 4:35 PM – 4:50 PM Retail Industry Leaders Association's
Financial Literacy
- 4:50 PM – 5:20 PM Open Discussion and Brainstorm
- 5:20 PM – 5:25 PM Navigating the Better Buildings Summit

Welcome and Introductions

Nate Allen



Healthcare Sector Lead,
U.S. Department of Energy

Allison Nozza



Healthcare Account Manager,
RE Tech Advisors

Erin Hiatt



Director of Energy, Sustainability &
Research
Retail Industry Leaders Association (RILA)

Linda Sandahl



Energy Policy & Economics Group
Program Manager
Pacific Northwest National Laboratory
(PNNL)

Sector Overview and Partner Recognition

Better Buildings Healthcare Sector

42

UNIQUE
SECTOR
PARTNERS

9

CHALLENGE
PARTNERS

33

ALLIANCE
PARTNERS

490 MILLION SQUARE FEET

12 TRILLION BTU ENERGY SAVINGS SINCE 2011

\$119 MILLION SAVED SINCE 2011

PARTNERS

- Abbott Northwestern Hospital
- **Ascension**
- Baptist Memorial Hospital Desoto
- Beaumont Health System
- Catholic Health Initiative
- CentraCare Health
- **Cleveland Clinic Foundation**
- DaVita
- Defense Health Agency
- Guam Memorial Hospital Authority
- Gundersen Health System
- **Hackensack University Medical Center**
- HealthSouth
- Kaiser Permanente
- Legacy Health
- Mayo Clinic
- **Montefiore Medical Center**
- **NewYork-Presbyterian Hospital**
- Oregon Health & Science University
- Summa Health System
- **University of Maryland Medical Center**
- **University of Nebraska Medical Center**
- **UPMC: University of Pittsburgh Medical Center**
- University of South Alabama Medical Center
- University of Utah Health Care
- **UW Health**
- Welltower

BOLDED partners are in the Better Buildings Challenge



Thank you Healthcare Steering Committee Members!

- Richie Stever, University of Maryland Medical Center (*Co-chair*)
- Ken Hansen, University of Maryland Medical Center (*Co-chair*)
- Corey Zarecki, Gundersen Health System
- Edna Lorenz, Beaumont Health System
- Jon Utech, Cleveland Clinic Foundation
- Kyle Tafuri, Hackensack Meridian Health
- Mary Evers Statz, UW Health
- Pat Lydon, Legacy Health
- Shea Jameel, Welltower

Congratulations Goal Achievers!



- 3.2% average annual EUI improvement
- 22% EUI improvement from 2008 baseline



- 24% EUI improvement from a 2013 baseline
- Re-pledged: 34% EUI improvement by 2027 from a 2013 baseline

Program Engagement Opportunities

Smart Labs Accelerator (SLA) – Interested in healthcare participants

Goals

Demonstrate best practice approaches

Develop recommendations for post-Accelerator next steps

Detail no-and low-cost energy saving practices

Identify code-related barriers and develop recommendations for change

Advance industry-driven guidance on metering and benchmarking

If all laboratory buildings in the country improved energy efficiency by 20%, annual energy savings could:

- Reduce 40 trillion BTUs
- Avoid \$1 billion in cost



For more information:

<https://betterbuildingsinitiative.energy.gov/accelerators/smart-labs>

*Affiliate partners



SLA Goals & Timeline

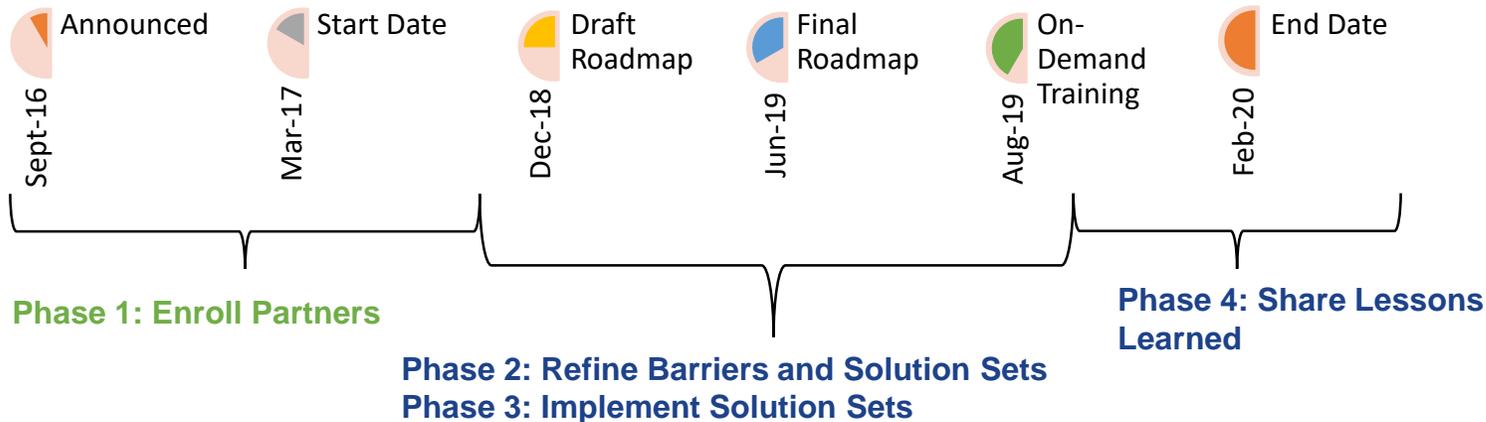
Participant Goal: At least 20% energy reduction over portfolio of laboratory buildings in 10 years or less

Participant Sub-Goal: At least 5% energy reduction in one laboratory by the end of the accelerator

Participant Commitments: Submit data, develop a Smart Labs Program Roadmap

DOE Commitments: Develop a Smart Labs Program Toolkit, develop and conduct trainings, update Labs21 benchmarking tool

Participant Engagement: Monthly webinars, quarterly calls, special events



Existing Partners

- University of California Irvine
- University of Illinois (Chicago)
- University of Minnesota
- University of New Hampshire
- Colorado University (Boulder)
- Las Alamos National Laboratory
- Pacific Northwest National Laboratory
- Lawrence Berkeley National Laboratory
- National Renewable Energy Laboratory
- The Association for Advancement of Sustainability in Higher Education*

Recently Joined Partners

- USDA ARS – Edward T. Schafer Agricultural Research Center
- GSA – FDA Bothell Laboratory
- Wesleyan University
- Emory University
- University of California Irvine Health
- International Institute for Sustainable Laboratories*

*Affiliate partners



Lighting and Electrical Technology Research Team Interior Lighting Campaign

Linda Sandahl, Program Manager
Michael Myer, Principal Investigator
Pacific Northwest National Laboratory



Lighting and Electrical Technology Research Team

- Team conference calls
 - Topics include lighting controls research, demonstration opportunities, campaign updates
 - End users can share goals or needs
 - Quarterly: next is September 13, 2018
- PNNL available for technical assistance
- Development of technical specifications
 - LED surgical light
 - Parking lots & structure lighting
 - High efficiency troffers

Through the Lighting and Electrical Technology Research Team, partners work together to reduce lighting energy use by sharing cost-effective solutions to interior and exterior lighting challenges and developing lighting specifications to build confidence and demand for higher efficiency technology.

Interior Lighting Campaign

Interior Lighting Campaign

Recognition and guidance initiative to help facility managers take advantage of savings opportunities from high efficiency interior lighting solutions

- Get recognized
 - Join the Campaign and get recognized for your achievements
 - Recognition to sites that demonstrate exemplary performance
- Take advantage of high efficiency lighting resources and free technical assistance
 - Lighting system applications supported: troffers, high bay, low bay, suspended linear, lighting controls
- We're on a roll!!
 - So far, over 2.8 million existing troffers to high efficiency LED systems



Interior Lighting Campaign

Tools and Resources (continued)

■ Fact Sheets

- Better Buildings High Efficiency Troffer Lighting
- Upgrading Troffers to LED
- Wireless Occupancy Sensors Application Guide published by FEMP

■ Case Studies and Demonstration Results

- ILC Sites recognized for exemplary performance
- GSA Green Proving Ground Demonstrations
- DesignLights™ Consortium Demonstrations



Interior Lighting Campaign 2018 – Overall Results

- 2.8 million fixtures installed
- \$68 million in savings
- 15 organizations recognized
- 54% average savings



Interior Lighting Campaign 2018



University of Utah - Health

- Highest Percentage of Annual Energy Savings for Lighting New Construction – Large Project
 - 113,000 kWh annual energy saved
 - 48% energy savings compared to code



Beaumont Health

- Exemplary Healthcare Site
 - 2.2 M kWh annual energy saved
 - 54% energy reduction compared to existing use

Lighting Research & Support

Lighting Research

- Lighting is the largest input into circadian system
- Tunable lighting being evaluated by DOE in healthcare facilities
- Lighting is largest electricity use in healthcare facilities

U.S. DEPARTMENT OF ENERGY | Energy Efficiency & Renewable Energy

SOLID-STATE LIGHTING

SSL DEMONSTRATION: Tunable-White Lighting at the ACC Care Center

At a residential senior-care center, tunable LED lighting provides energy, lighting quality, and possible other benefits for the residents and caregivers.

The Sacramento Municipal Utility District (SMUD) recently conducted a trial installation of tunable-white LED lighting at the ACC Care Center in Sacramento, CA, and invited the U.S. Department of Energy's (DOE) GATEWAY program to document the performance of the new lighting systems. Among the primary goals identified by SMUD and ACC were to learn more about how tunable-white lighting affects the sleep patterns, nighttime safety, and other behaviors of the residents; and to better equip the staff to provide excellent care by improving the lighting quality (e.g., reduced glare, better controllability) relative to the incumbent system.



The new tunable LED lighting in the ACC Care Center corridor, shown at the morning setting (specified as 6500K at 66% output, left), the afternoon setting (specified as 4000K at 66% output, center), and the nighttime setting (specified as 2700K at 20% output, right).
Photo: Sacramento Municipal Utility District

A Trial Installation

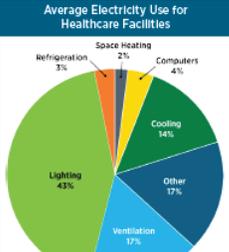
DOE's role in the project was to take pre- and post-installation field measurements of illuminance and color quality, advise SMUD on equipment specifications, and compare the estimated energy consumption of the new system with that of the old one. The lighting solutions followed guidelines published by the Lighting Research Center of Rensselaer Polytechnic Institute, which are based on the role light is believed to play in suppressing the release of melatonin, a hormone that helps control the sleep-wake cycle. Disturbed sleep patterns are common among the residents of senior-care facilities, due not only to the results of aging but also to such ailments as Alzheimer's disease.

At the time of specification, there were very few tunable-spectrum luminaires available that were suitable for replacing the incumbent fluorescent systems. Several different tunable-white LED systems were chosen and were installed in one corridor, two resident rooms (including bathrooms), the nurse station, the common family room, and the administrator's office. The incumbent fluorescent systems were evaluated in August 2015 and the trial LED systems in December 2015.



The incumbent fluorescent lighting system in the ACC Care Center corridor.
Photo: Sacramento Municipal Utility District

Average Electricity Use for Healthcare Facilities

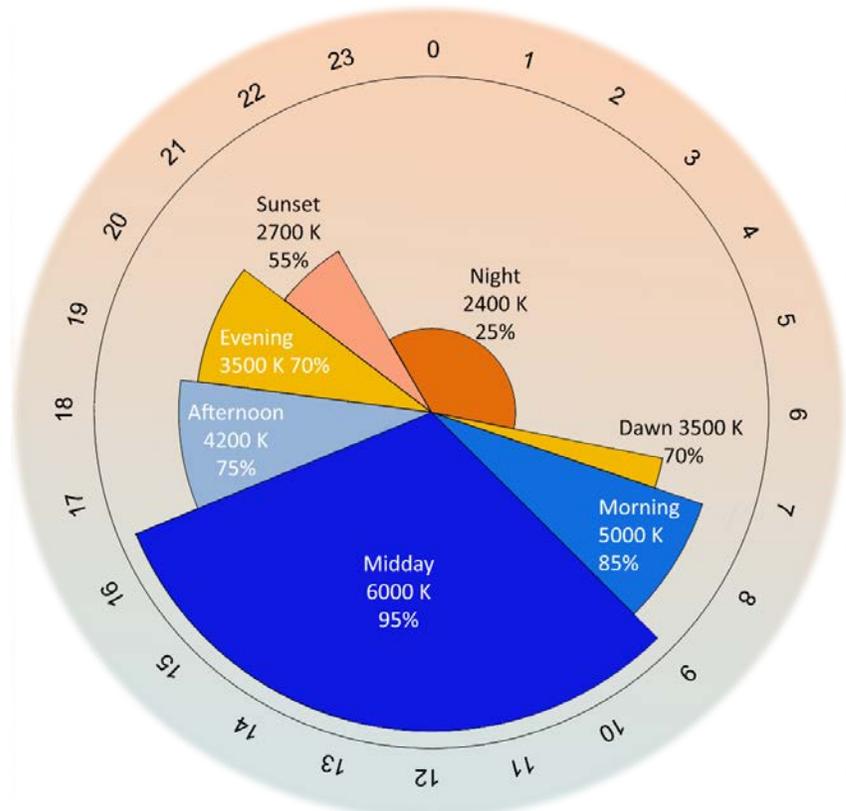


Category	Percentage
Lighting	43%
Other	17%
Ventilation	17%
Cooling	14%
Computers	4%
Refrigeration	3%
Space Heating	2%

Statistics from U.S. Energy Information Administration Commercial Building Energy Consumption Survey (2003).

BUILDING TECHNOLOGIES OFFICE

Evaluating Tunable LED Lighting in the Swedish Medical Behavioral Health Unit



SSL DEMONSTRATION Evaluating Tunable LED Lighting in the Swedish Medical Behavioral Health Unit

A hospital-unit renovation provided a chance to better understand how LED systems are delivering value to end users, and how those systems can be improved to deliver better quality and efficiency.

The new Swedish Medical Behavioral Health Unit (BHU) in Seattle serves adult patients who are struggling with mental-health conditions. Part of the region's largest nonprofit healthcare provider, it houses 22 beds in 14,911 square feet and required the renovation of two floors in



The serenity room, which provides a quiet space for patients to spend time. They can adjust the SPD of the wall-wash luminaire to suit their mood.



View of dining/activity area from nurse station. The SPD and intensity changed throughout the day. The photo at left shows the initial night scene, and the one at right shows the afternoon scene. The downlights were originally programmed to stay on all night, as shown, but were later reprogrammed by the nursing staff to turn off at night.

a wing of an existing hospital. Since the new space was a renovation of existing infrastructure, the design sought to compensate for the differences between the old environment—which featured a dedicated outdoor space as well as a large skylight in the common space—and the new, by leveraging biophilic design tenets. The new BHU incorporates color-tunable luminaires in common areas, and the lighting system uses advanced controls for dimming and color tuning, with the goal of providing a better environment for staff and patients.

Controlling the Intensity and Spectrum of Light

ZGF Architects, which headed the renovation, invited the U.S. Department of Energy's (DOE) Solid-State Lighting (SSL) program to document the performance of the LED lighting systems as part of a GATEWAY evaluation—the first DOE documentation of a color-tunable system specified and installed by building-industry professionals as part of a large-scale renovation project. SSL technology provides new opportunities for controlling the intensity, distribution, and spectrum of light. Tunable LED systems enable adjustments in spectral power distribution (SPD) and light output that are easier to implement than with conventional fluorescent lighting systems.

The availability of these new systems, combined with a growing understanding of the nonvisual effects of light, has generated awareness and excitement.

The lighting system for the new BHU's corridors and dining/activity space was designed to operate according to a daily schedule developed by the ZGF team, including a change in the SPD of the downlights throughout the day. The CCT ranged from 2400 K at night to 6000 K midday, aligning with daily color variation of the sky. The intensity level also varied, with lower levels of light through the evening and night, and higher levels in the morning and early afternoon.

Lessons Learned

Following are key takeaways from the project, which provided an ideal opportunity to document possible benefits as well as concerns in the design, installation, and operation of tunable LED lighting systems intended to achieve biophilic and circadian goals in a specialized healthcare application:

- Tunable LED systems can provide significant energy savings. For this application, where biophilic and circadian design goals required a tunable lighting system with the ability to vary both spectrum and intensity, the reduced intensity levels

BUILDING TECHNOLOGIES OFFICE



MGM Solutions: 6000 Hours Per Month Wasted on Nurses Finding Lost Equipment

February 13, 2018

[Like](#) [Follow @HFToday](#)

A NursingTimes.net survey polled 1000 nurses and found that at least one in three spent an hour or more per shift searching for medical equipment to use with their patients. This totals about 6000 hours wasted a month just searching for missing equipment. These findings suggest that nurses could be spending the equivalent of 40 hours per month searching for equipment and in 16% of cases, respondents said that they had given up the search after failing to find a piece of equipment. (1) MGM Solutions has developed reliable methods for tracking equipment that protect the financial investment of the institution as well as creating more staff efficiency. (2)

- Hospital chain in Midwest testing using sensors in light fixtures to track equipment carts
- PNNL has provided technical assistance related to the lighting and Internet of Things research

Lighting Research



Next Steps

- Join the Lighting & Electrical Team
- Join the Interior Lighting Campaign
 - www.interiorlightingcampaign.org
- Contact:
 - Linda Sandahl, Pacific Northwest National Laboratory
Email - linda.sandahl@pnnl.gov

Sector Priorities and Highlights

Improve water management and efficiency

- Discussed water efficiency challenges during multiple peer exchanges and provided resources
- University of Nebraska Medical Center - Official water partner!
- Developing water efficiency toolkit to include Pacific Northwest National Laboratory [water management resources](#)
- *Making a Splash: Targeting Water Saving Measures for Maximum Impact* session on Thursday 8:30 AM – 10:00 AM

Have an interesting story to tell?
Share your water-focused projects!

Build and educate workforce on energy and water efficient operations

- University of Maryland Medical Center speaking (UMMC) in *Building a Next Generation Workforce for Next Generation Buildings* Thursday 4 PM-5:30 PM
 - [Skilled Trades Apprenticeship Implementation Model](#)
 - Healthcare Facilities Today “[Training, efficiency and cost savings: Fostering the next generation facilities professionals](#)”
- [Developing an Energy Management Policy Through Public-Private Partnership](#) (Legacy Health)



Showcase and encourage internal engagement on sustainability

- Engaged with partners during check-in calls, facilitated peer exchanges, and communicated resources
- Incorporated element into various solutions
 - [UW Health University Hospital Showcase Project](#) (27% savings!)
- ASHE's [Innovative Funding for Energy Efficiency & Facility Infrastructure Projects in Health Care](#) webinar on Wednesday, August 29 from 12pm-1pm CST

Overcoming financing challenges

- UW Health and Hackensack Meridian Health presented at CleanMed [Saving More Together: Greater Energy Efficiency Through Strategic Collaboration](#) session
 - Check out the [blog post!](#)
- Green Revolving Fund [case study](#) (Cleveland Clinic) and [toolkit](#)



Case Study: Establishing Green Revolving Funds in Healthcare

BETTER BUILDINGS CHALLENGE

Cleveland Clinic Shows Leadership on Green Revolving Funds

Cleveland Clinic announced at the 2016 Better Buildings Summit that it had established an unprecedented \$7.5 million Green Revolving Fund to strengthen its commitment to energy efficiency. The fund stands out as one of the largest annual commitments in any U.S. business sector and as the largest for healthcare.

As a participant in the Sustainable Endowments Institute's Billion Dollar Green Challenge¹, Cleveland Clinic joins a collaborative network of institutions committed to the establishment of this innovative financing model. The challenge encourages colleges, universities, and other nonprofit institutions to invest in self-managed green revolving funds, with the goal of creating a combined total of \$1 billion in funding. As of 2017, 62 institutions have committed a total of \$131 million to energy efficiency upgrades².

Path to Success

For Cleveland Clinic, making the business case for its Green Revolving Fund centered around the opportunity to support its mission of putting patients first. Utilizing this financing mechanism allows the organization to establish a permanent funding source for energy efficiency projects, redirect resources to patient care, and make its communities healthier. Cleveland Clinic continues to set an example for the industry in responsible healthcare operations.

The evolution of the fund began through a collaboration of multiple departments, including the Office for a Healthy Environment, Buildings & Properties, and Finance. To develop the fund, initial seed capital was sourced from the departments' operating budgets. Once established, energy saving projects with a high return on investment were prioritized to provide both an initial fast payback and rapid reinvestment; this strategy created the revolving cycle of monetary capital known as a green revolving fund.

In addition to other low- and no-cost efficiency opportunities, Cleveland Clinic has implemented the following capital expenditure projects to drive energy efficiency:

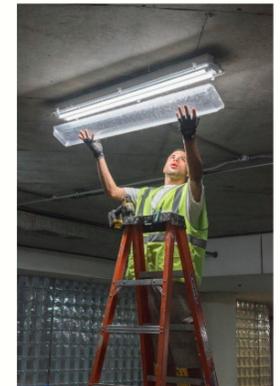


Photo Credit: Cleveland Clinic

“As a leader in healthcare, we are continually looking for ways to improve the health of the communities we serve and reduce our operating costs in order to make care more affordable for our patients.”

—Jon Utech, Cleveland Clinic's Senior



Other Noteworthy Partner Reads

- [Beat Blog:](#)
 - [New Healthcare Case Study Spotlights Green Revolving Funds](#)
 - [Establish a Sustainable Funding Cycle with the Green Revolving Funds Toolkit](#)
 - [Better Buildings at CleanMed 2018: Collaboration Gives Power to Greater Energy Efficiency](#)
 - [UW Health Reaches, Exceeds Better Buildings Challenge Goal](#)

Financial Literacy

Erin Hiatt

Director of Energy, Sustainability, and Research
Retail Industry Leaders Association (RILA)

Financial Literacy for Retail Curriculum

- Released June 2018
- Based on content from in-person workshops
- Created with support from DOE cooperative agreement
- Eligible for many continuing education programs
- Preapproved for USGBC and BOMI accreditations CEUs

www.retailcrc.org/training

The screenshot shows the RILA landing page for the Financial Literacy for Retail Curriculum. It features a green header with the RILA logo, a 'Welcome!' message, and a horizontal line. Below the line, there is a welcome message and a list of two courses: Finance 101 and Finance 201. At the bottom, there are two buttons with arrows pointing left and right, labeled 'Finance 101' and 'Finance 201' respectively.

RILA

Welcome!

Welcome to the Financial Literacy for Retail Curriculum.
Within this unit are two courses: Finance 101 and Finance 201.

You can complete one or both modules - or just visit the parts of each course that you need.

Finance 101: Understanding the CFO and Translating Metrics for Retail Energy & Sustainability Professionals
This course highlights the importance of aligning energy initiatives with the company-wide aim of maximizing shareholder value, and provides some tips for success and business acumen you can use when creating proposals. This course is well suited for retail energy and sustainability professionals.

Finance 201: Innovative and Alternative Options for Retail Energy & Sustainability Professionals
This course explains the different internal and external financing options available for energy and/or sustainability projects. This course is well suited for retail energy professionals, retail finance professionals, and energy and sustainability professionals across sectors.

Select a course to begin.

← Finance 101 Finance 201 →

Finance 101

Understanding the CFO and Translating Metrics for Retail Energy & Sustainability Professionals

This course highlights the importance of aligning energy initiatives with the company-wide aim of maximizing shareholder value, and how building effective relationships with the finance team is key to achieving sufficient funding for initiatives.

This course provides learners with the financial acumen needed to interact with their company's finance team when trying to secure funds for energy projects.

By the end of this course, learners should be able to understand how to confidently approach the finance team with a well-articulated plan, and in the timing most appropriate to secure funding.

This course is about 60 minutes long.

Select each icon to learn more.

INTRODUCTION

3 MINS

WORKING WITH THE FINANCE TEAM

20 MINS

MEASURES OF SUCCESS

20 MINS

CASE STUDY

15 MINS

SUMMARY AND RESOURCES

2 MIN

Finance 201

Innovative and Alternative Options for Retail Energy & Sustainability Professionals

This course explains the different internal and external financing options available.

By the end of this course, learners should be able to identify which types of financing options are best suited to their project need(s), and how to articulate this match in order to secure funding.

This course is about 75 minutes long.

Select each icon to learn more.

INTRODUCTION

2 MINS

INTERNAL
FINANCING

30 MINS

EXTERNAL
FINANCING

35 MINS

SUMMARY AND
RESOURCES

5 MINS

RETURN TO HOME

TOPIC 3: MEASURES OF SUCCESS

Quiz

Complete this short quiz to test your understanding of some key financial measurements.

Which of the following is a ratio to measure the benefit of the investment of capital?

- ROI
- Hurdle rate
- IRR
- Benefit-to-cost

Confirm

Which of the following is the minimum rate of return that a project must earn in order to be funded?

- ROI
- Hurdle rate
- IRR
- Benefit-to-cost

Confirm

TOPIC 3: MEASURES OF SUCCESS

Internal Rate of Return (IRR)

Select each topic below.

DEFINITION

ANALYSIS

- This calculation is an iterative process of inputting interest rates to test which one equals an NPV of zero (and is most easily found using a computing function like the IRR function in Excel).
- Your project's IRR **should equal or be greater than** the hurdle rate/discount rate. This measure shows how your project compares to other project proposals. Companies will likely pursue projects with the highest positive difference between IRR and hurdle rate/discount rate.
- When it comes to comparing projects of different sizes, you want to be able to show **how much greater** your IRR is compared to the hurdle rate/discount rate.

EXAMPLE

Return to [Measures of Success](#).

TOPIC 4: SUMMARY AND RESOURCES

Next Steps

Regardless of the financing option you may be considering, always remember to reach out to your finance team and find out how you can craft a proposal that meets all the needs and values of the organization.

Assessment and Certificate

You now have the option to take a final graded assessment to gauge your understanding of the content, and to generate a completion certificate. This may allow you to apply for continuing education units (CEUs) with an accrediting organization.

Select the down arrow to continue.

SELECT THE ICON BELOW TO
PROCEED TO THE ASSESSMENT
AND CERTIFICATE.



Open floor discussion and brainstorm

- How can DOE help you overcome your workforce challenges?
- What internal and/or external funding methods have you used or are interested in?
- How are you presenting efficiency/renewable projects to your C-suite?
- Are you integrating on-site and off-site renewables?
- What's the latest technology trend?
- Are you measuring and managing laboratory energy consumption?
- Have you set a water goal? Why or why not? Are you benchmarking your water consumption?
- How do you engage with architects, engineers, and construction contractors on efficiency for new facilities?
- What are the hot button topics related to energy efficiency and sustainability for healthcare?

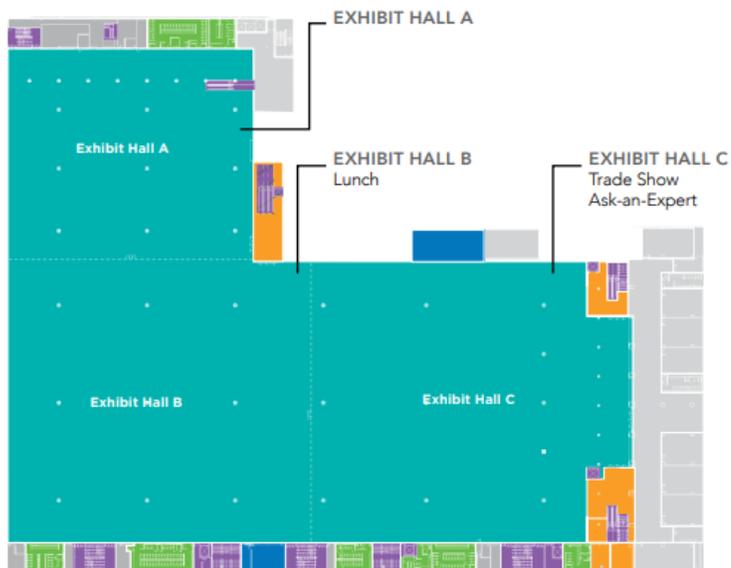
Recommended Thursday Summit Sessions

- 8:30 AM- 10:00 AM
 - Energy is Everyone's Job: Harnessing the Human Power of your Organization
 - Water's Impact on Energy Cost and Consumption
 - Ready to Save Energy: Using DOE's Free 50001 Ready Tool
- 10:30 AM – 12:00 PM
 - Making the Business Case for Resilience Projects
 - Work Smarter: EMIS, Commissioning Case Studies, and the SEA Campaign
 - Sustainable Water/Wastewater Infrastructure: "Selling" Your Facility Upgrades
- 2:00 PM – 3:30 PM
 - Cooling Tower Water Management Best Practices
 - Learning What Works: Energy Data Management
- 4:00 PM – 5:30 PM
 - Water Reuse: Successful Outcomes and Innovative Strategies
 - **Building a Next Generation Workforce for Next Generation Buildings – UMMC's Richie Stever**

ASK-AN-EXPERT

Technical experts are available to answer questions and discuss energy performance trends in technology, process, data, and tools.

EXHIBIT LEVEL



WHEN: Tuesday - Thursday, 10:00 AM – 4:00 PM*
WHERE: Exhibit Hall C (at the Trade Show entrance)

Experts on space conditioning, plug & process loads, building envelope, and much more

**Check the program for a complete schedule!*

THURSDAY NIGHT! Sector Networking Event

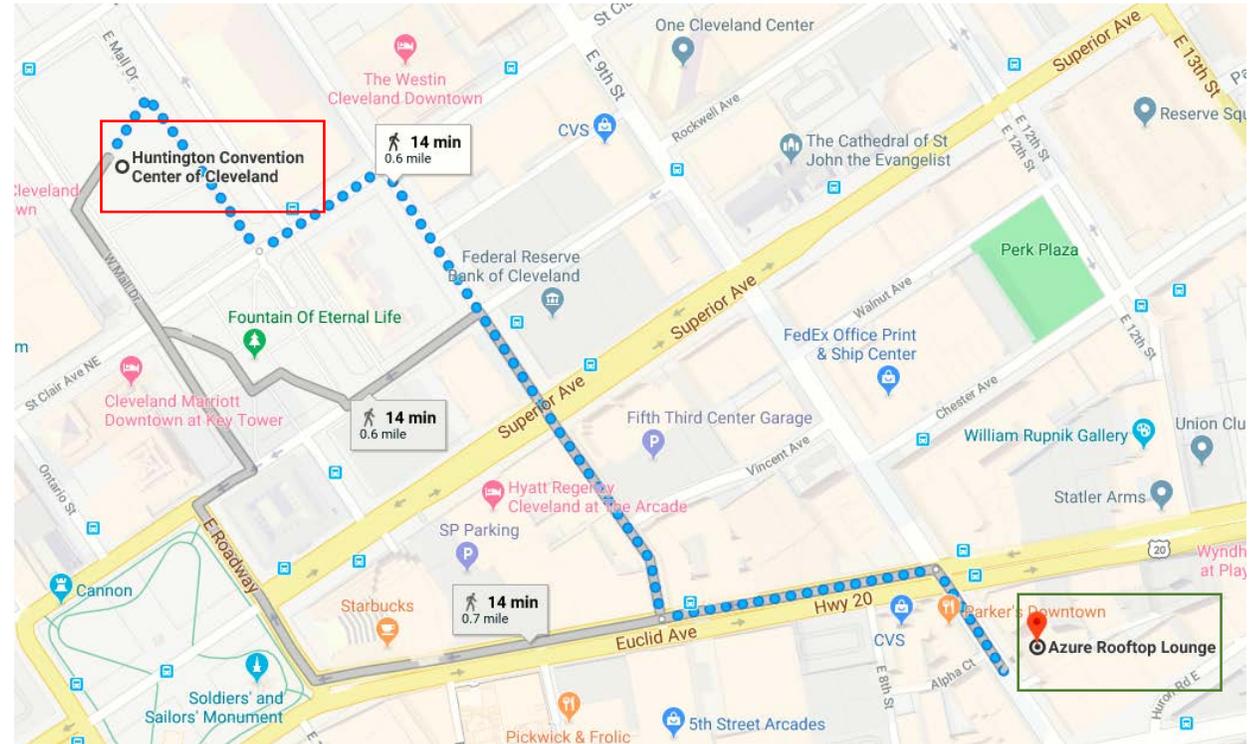
THURSDAY NIGHT!

~5:30pm

Azure Rooftop Lounge

2017 E 9th Street

Cleveland, OH 44115



Thank you!

Nate Allen



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