Better Buildings®
SUMMIT

AUGUST 21-23, 2018 • CLEVELAND, OHIO

Education Meet Up: Part I

Wednesday, August 22nd

8:30am-10am

Energy Exchange | Better Buildings SUMMIT

Agenda

- **Welcome and Introductions**
  - Crystal McDonald and Nate Allen, U.S. Department of Energy
- **ENERGY STAR Score Updates**
  - Katy Hatcher, U.S. Environmental Protection Agency
- **Sustainability Master Planning**
  - Kathia Benitez, Northwestern University
- **Successful Student Engagement Strategies**
  - Christos Chrysiliou, Los Angeles Unified School District
- **Advanced Energy Guides**
  - Paul Torcellini, National Renewable Energy Laboratory
- **Questions & Answers**

Welcome and Introductions

Crystal McDonald and Nate Allen

U.S. Department of Energy

ENERGY STAR Score Updates

Katy Hatcher, ENERGY STAR National Manager
U.S. Environmental Protection Agency

ENERGY STAR® Portfolio Manager Updates

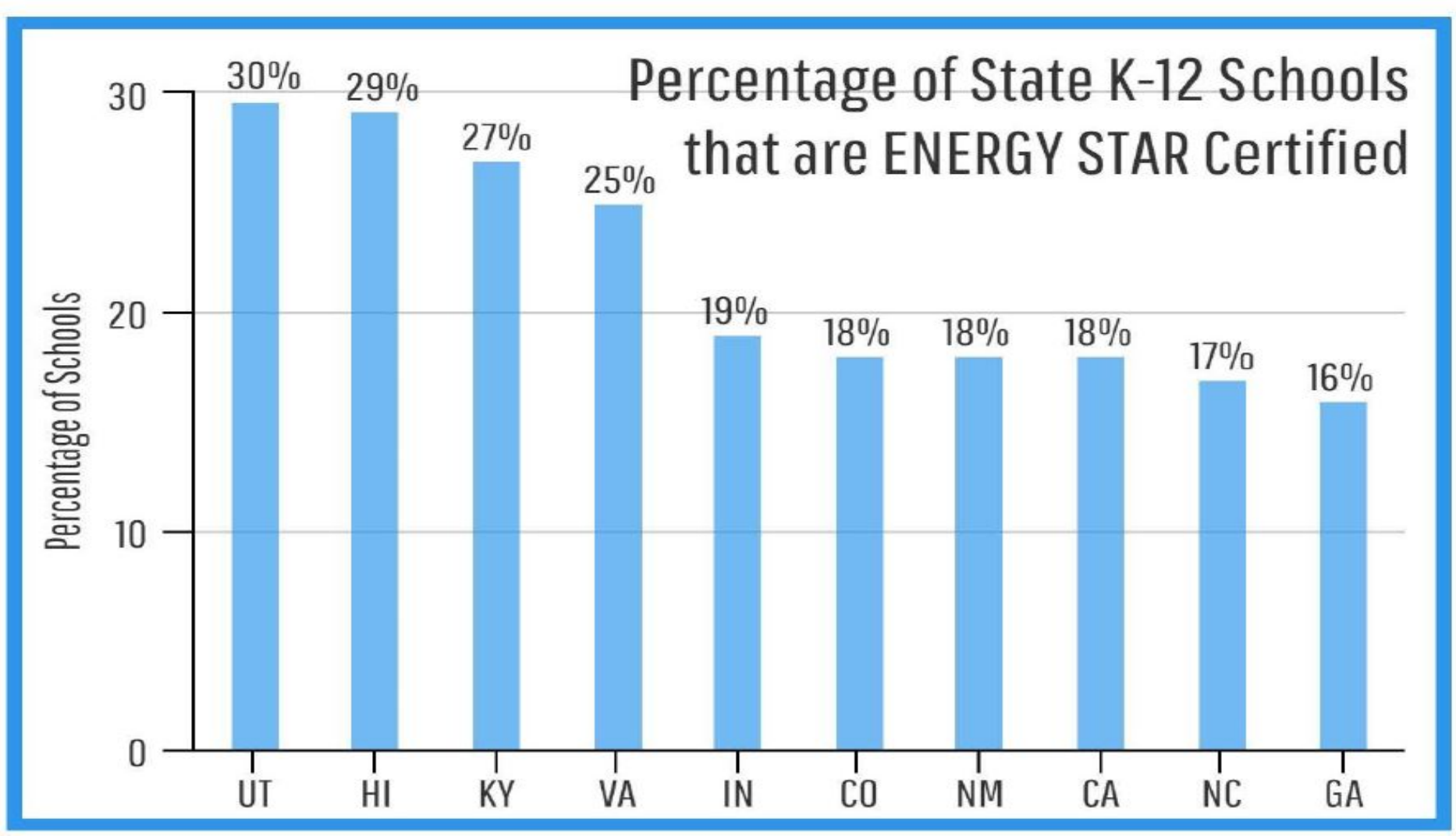
Caterina Hatcher

US EPA ENERGY STAR

2018 Better Buildings Summit/Energy Exchange Conference

- **Hundreds of thousands** of buildings benchmarking
- **Two dozen** local benchmarking policies
- **One** foreign government partnership (Canada)

More than 10,000 ENERGY STAR Certified Schools Across the Nation!



ENERGY STAR®
PortfolioManager®

Management Tool

Assess whole building energy and water consumption, plus waste

Track changes in energy, water, greenhouse gas emissions, and cost over time

Track green power purchase

Create custom reports

Share/report data with others

Apply for ENERGY STAR certification

ENERGY STAR® Portfolio Manager®

Hundreds of metrics, including:

Energy use
Source, site, weather normalized, demand

Water use
Water use intensity, Water Score (for Multifamily)

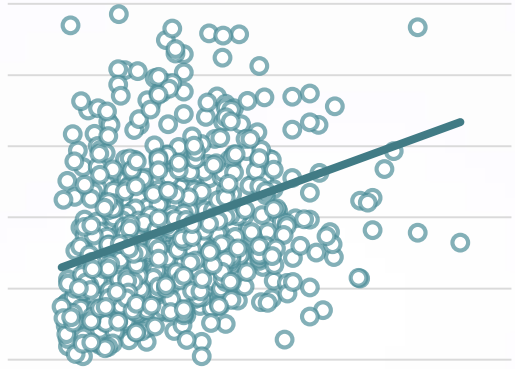
Waste & Materials
Waste intensity, diversion rate

1-100 ENERGY STAR score

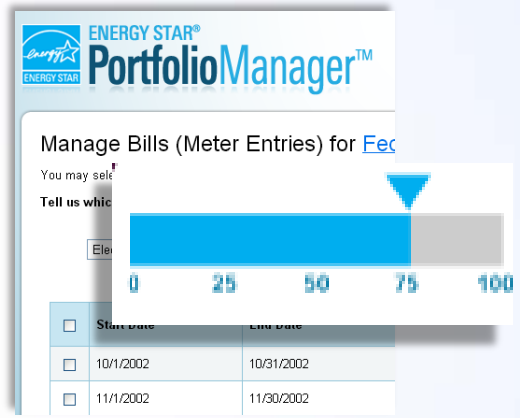
GHG emissions
Indirect, direct, total, avoided

EPA's 1 – 100 ENERGY STAR scores are based on market data

Nationally representative survey - CBECS gathers data on building characteristics and energy use from thousands of buildings across the U.S.



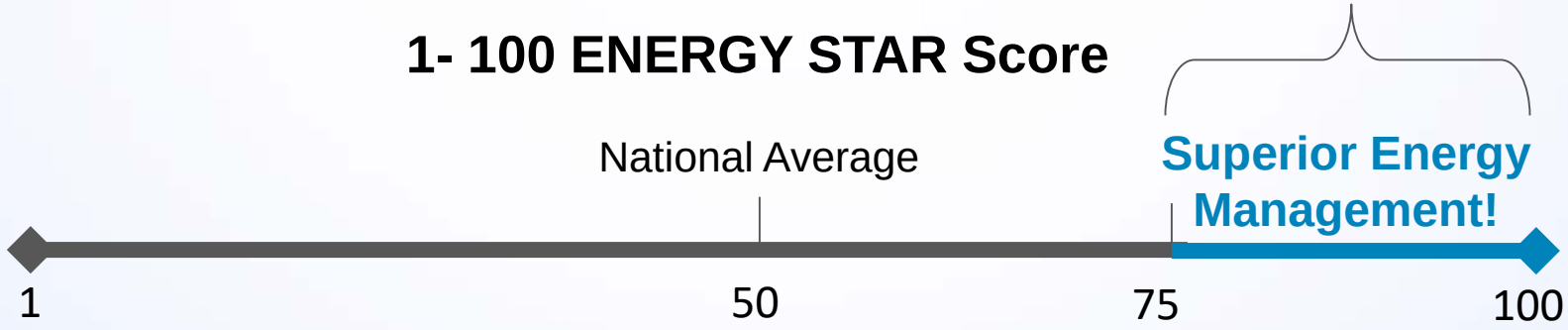
EPA creates a **statistical model** that correlates the energy data of the property use details to identify the key drivers of energy use, accounting for weather variations



Compares the actual energy data for a building to the modeled estimate to determine where the building ranks relative to its peers on a 1-100 scale

ENERGY STAR certification for commercial buildings

- Building must be in the United States, US territories, or Canada (Canadian certification launched March 2018!)
- Achieve an ENERGY STAR score of 75 or higher
- Apply for ENERGY STAR recognition via Portfolio Manager
- Application must be verified by a licensed professional
- Awarded based on the calendar year of application



Property types with 1-100 ENERGY STAR scores

Score based on CBECS data


Bank Branch


Barracks*


Financial Offices


K-12 Schools


Supermarkets


Wholesale club/ Supercenters


Medical Offices*


Hotels


Residence Hall/Dormitory*


Office Buildings


Courthouses


Worship Facilities


Retail Stores


Distribution Centers


Warehouses

Score based on other survey data


Data Centers


Hospitals


Senior Care Communities


Wastewater Treatment Plants*


Multifamily Housing

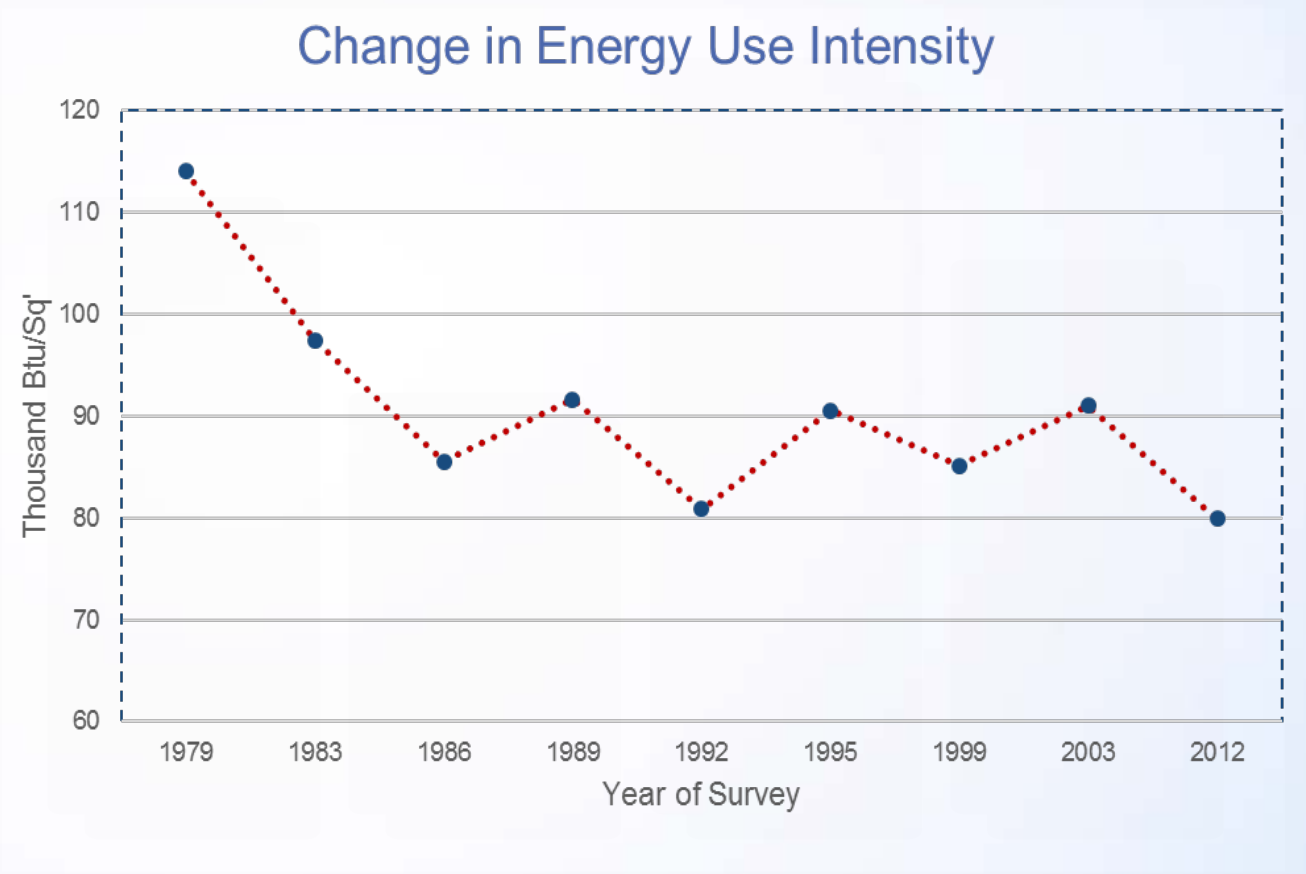
*These building types are not eligible for ENERGY STAR certification.

What's getting updated? Scheduled for August 26, 2018

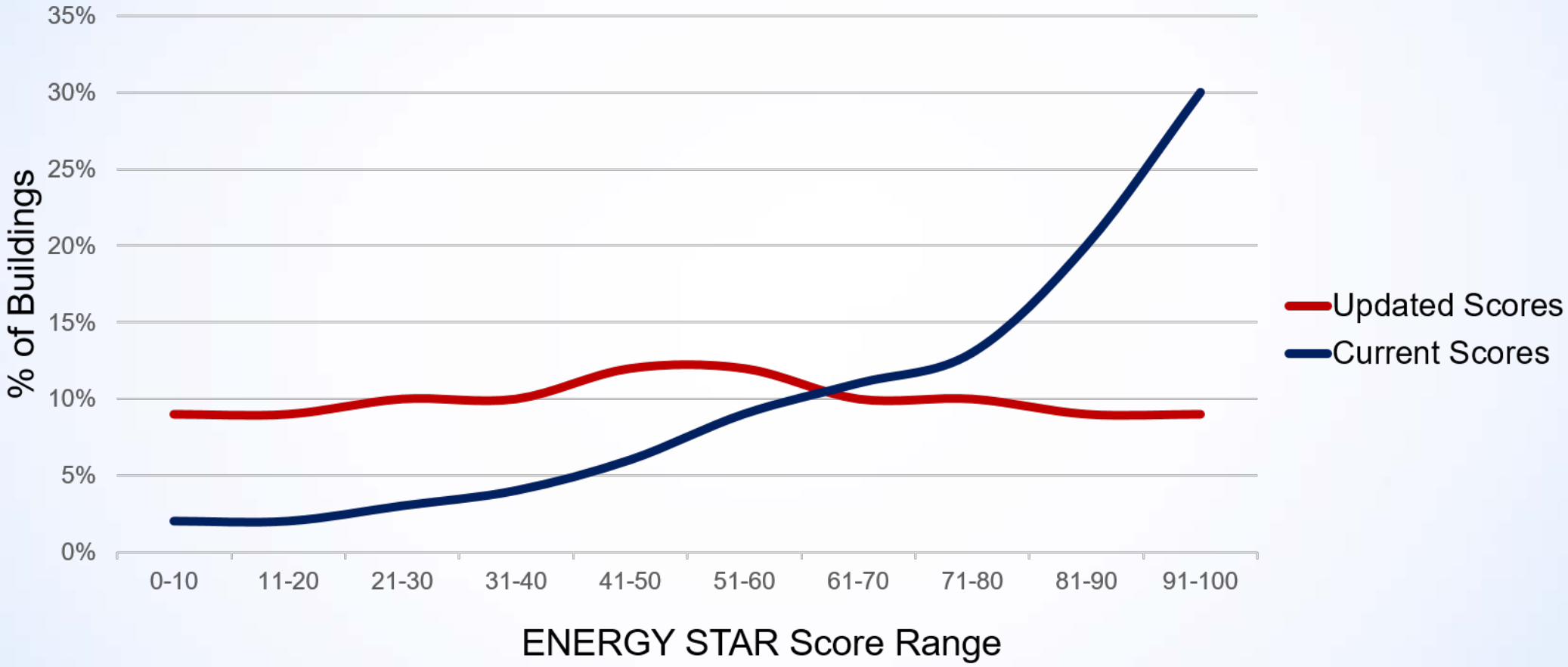
- 1-100 ENERGY STAR score models for US buildings (based on CBECS 2012)
  - **Offices**
    - Financial offices
    - Bank branches
    - Courthouses
  - **K-12 Schools**
  - **Retail**
    - Retail store
    - Warehouse club/ supercenter
  - **Supermarkets**
  - **Hotels**
  - **Warehouses**
    - Refrigerated
    - Non-refrigerated
    - Distribution centers
  - **Houses of Worship**
- National source energy factor
- Data center benchmarking options

Overall trend in U.S. building energy use

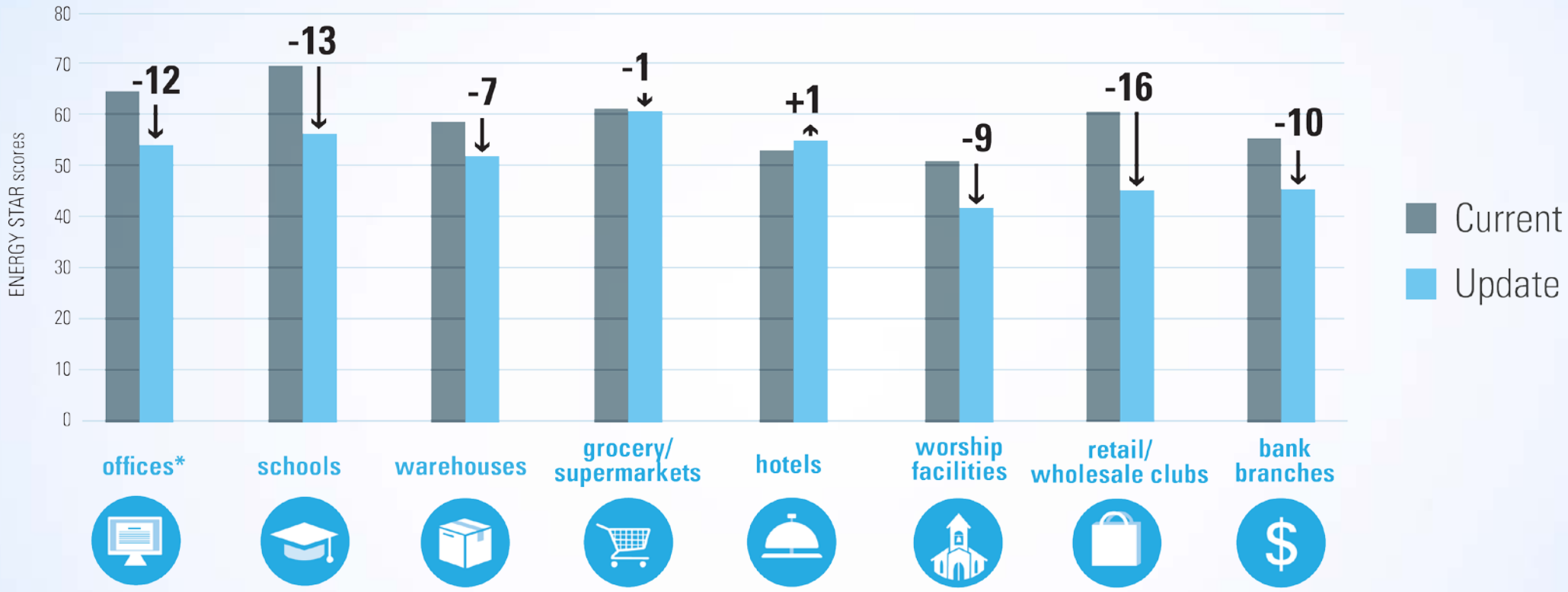
- Long-term trend has been relatively stable over the last 30 years.
- 2012 survey shows lower aggregate intensity as compared with 2003.
- This is a good trend. It also means that ENERGY STAR scores will shift.



ENERGY STAR scores need to be recalibrated over time



Working estimated average ENERGY STAR score change by space type



*office, financial office, courthouse

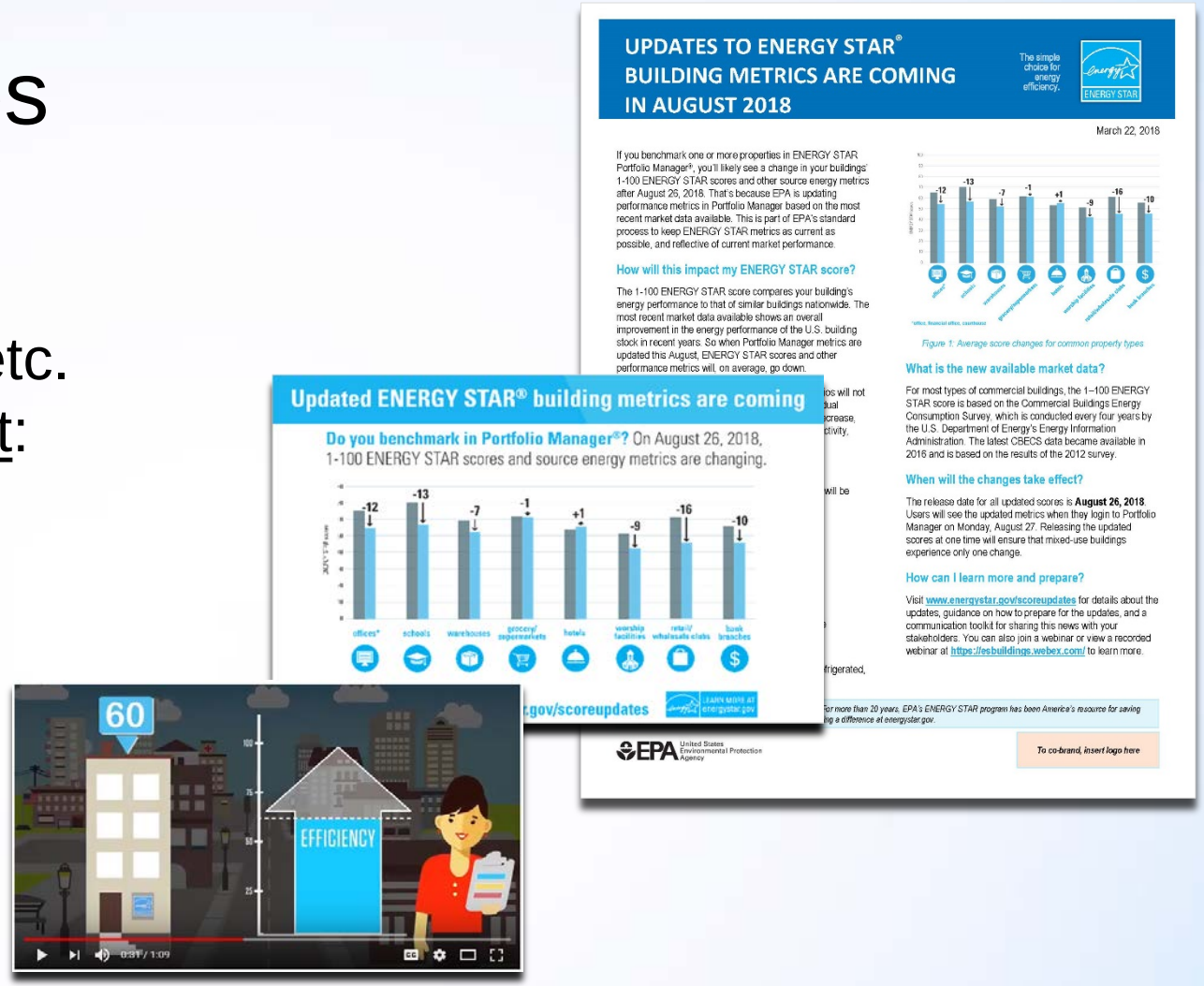
These are average score changes for these building types. An individual building's score change is likely to differ from the average change shown above.

Electric Source Factor: grid electricity from renewable energy

- **Past approach**
  - Grid electricity generated from renewable energy treated as requiring the same raw fuel inputs as fossil fuel energy.
- **New approach**
  - Offsite renewables lower the national average electric source factor. Electricity generated from renewable energy sources have lower raw fuel inputs than electricity generated from fossil fuels.
- **New electric source factor releasing Aug 2018**
  - Dropping from 3.1 to 2.8 (more efficient grid)
  - Will impact ENERGY STAR score & all source energy metrics
  - ENERGY STAR score could increase or decrease depending on a building's fuel-mix ratio
  - Changes based on this update alone will be small in magnitude comparatively

Preparing for the updates

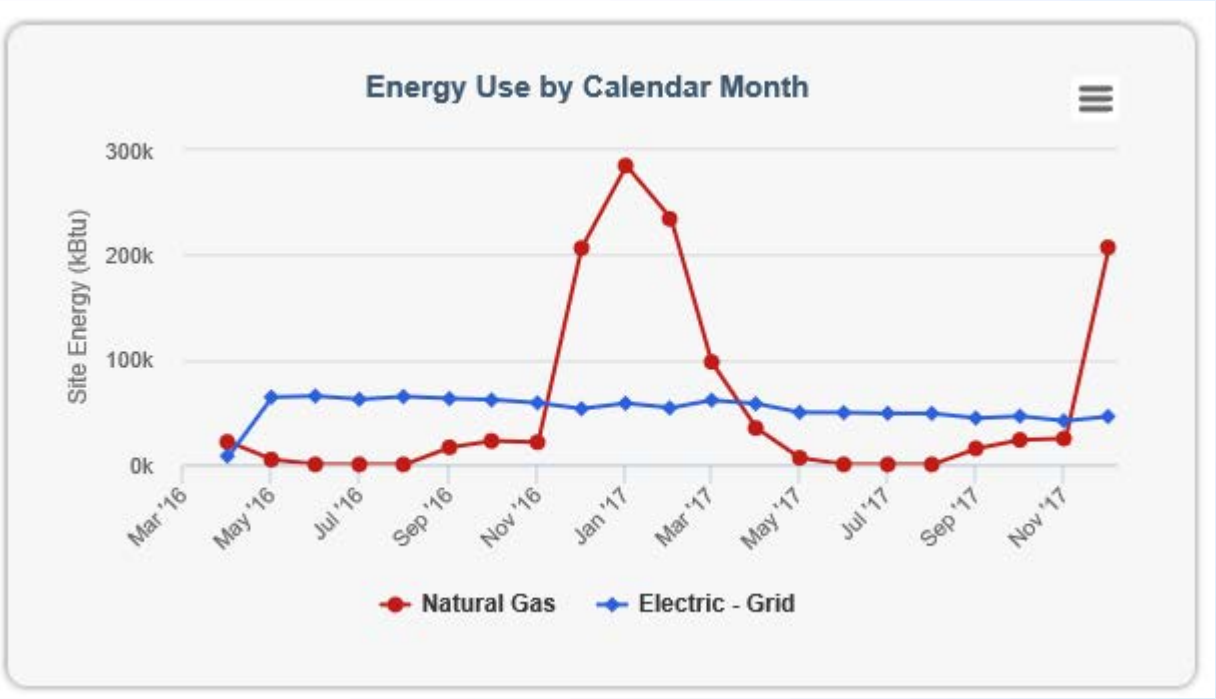
- Communicate metric updates to colleagues, clients, stakeholders, etc. using EPA's communications toolkit:
  - ✓ Co-brandable fact sheet
  - ✓ Shareable graphic
  - ✓ Template social media content
  - ✓ Template training slides
  - ✓ Quick video tutorial about the 1-100 ENERGY STAR score



Download EPA's score update materials at: www.energystar.gov/scoreupdates

New in this Fall! Monthly Usage Totals by Fuel Type

- New monthly metrics will be available in the Reporting tab to pull aggregated monthly consumption for:
  - Electricity
  - Natural Gas
- Will be calculated similarly to the values in the monthly chart exports on the Energy tab

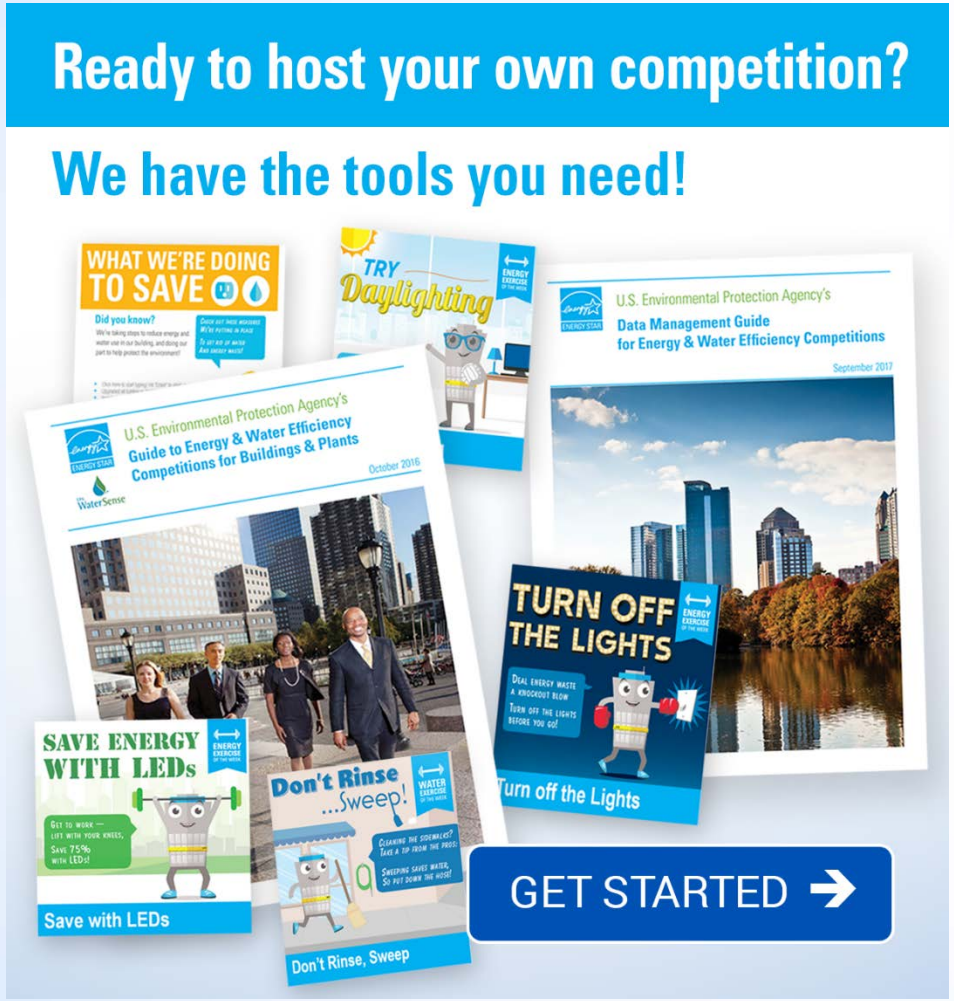


Host Your Own Competition!

- Makes energy efficiency more exciting
- Provides a flexible, fun, and engaging platform to save energy and money
- Generates camaraderie, strengthens relationships, and creates networking opportunities
- Provides an opportunity for positive publicity and media exposure

Visit:
energystar.gov/battleofthebuildings

Check out the resources at www.energystar.gov/BattleoftheBuildings



Everything you need to get started:

- Template rules, timeline, communications
- Competition Guide
- Data Management Guide and Template Data Tracker
- Activity kits
- …and more!

Treasure Hunt – Energy Efficiency

ENERGY STAR® Energy Efficiency Student Toolkit

Activity 4: Conducting an Energy Efficiency Treasure Hunt at Your School

For more information, view the ENERGY STAR Building Upgrade Manual, Chapter 10: K-12 Schools.

Energy Management Program				
Feature	Y	N	Room for improvement?	Location (ex. Classroom 101)
Energy management program in place				
School has an energy efficiency goal or target				
School is consistently benchmarked in EPA's Portfolio Manager				
School has a designated staff person responsible for energy management				
Communication plan in place to promote energy management program				
Summer shutdown program in place (if school unoccupied during summer)				
School has an active energy or energy efficiency club or committee				
Energy efficiency included in science curriculum				
Lighting				
Starting Question(s)	Y	N	Describe	
Has your school implemented a lighting upgrade in the past 5 years?				
Feature	Y	N	Room for improvement?	Location (ex. Classroom 101)
ENERGY STAR qualified lighting in place				
Lights are off in unoccupied rooms, gymnasiums, and at athletic fields				
Natural light used where possible instead of artificial lighting				
Window shades in place to regulate light and block excess heat				

K-12 ENERGY STAR National Building Competition Winners

- 2016: Strasburg-Franklin Local Schools K-12 Building
  - 20% energy savings, $50,800 est. savings
- 2015: School at St. George Place (Houston ISD)
  - 36.5% energy savings, $118,500 est. savings
- 2014: Findley Elementary (Des Moines)
  - 29% energy savings, $33,700 est. savings

QUESTIONS?

CONTACTS

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Hatcher.Caterina@epa.gov

Kudret Utebay, The Cadmus Group LLC

Kudret.Utebay@cadmusgroup.com

Sustainability Master Planning

Kathia Benitez, Director of Sustainability

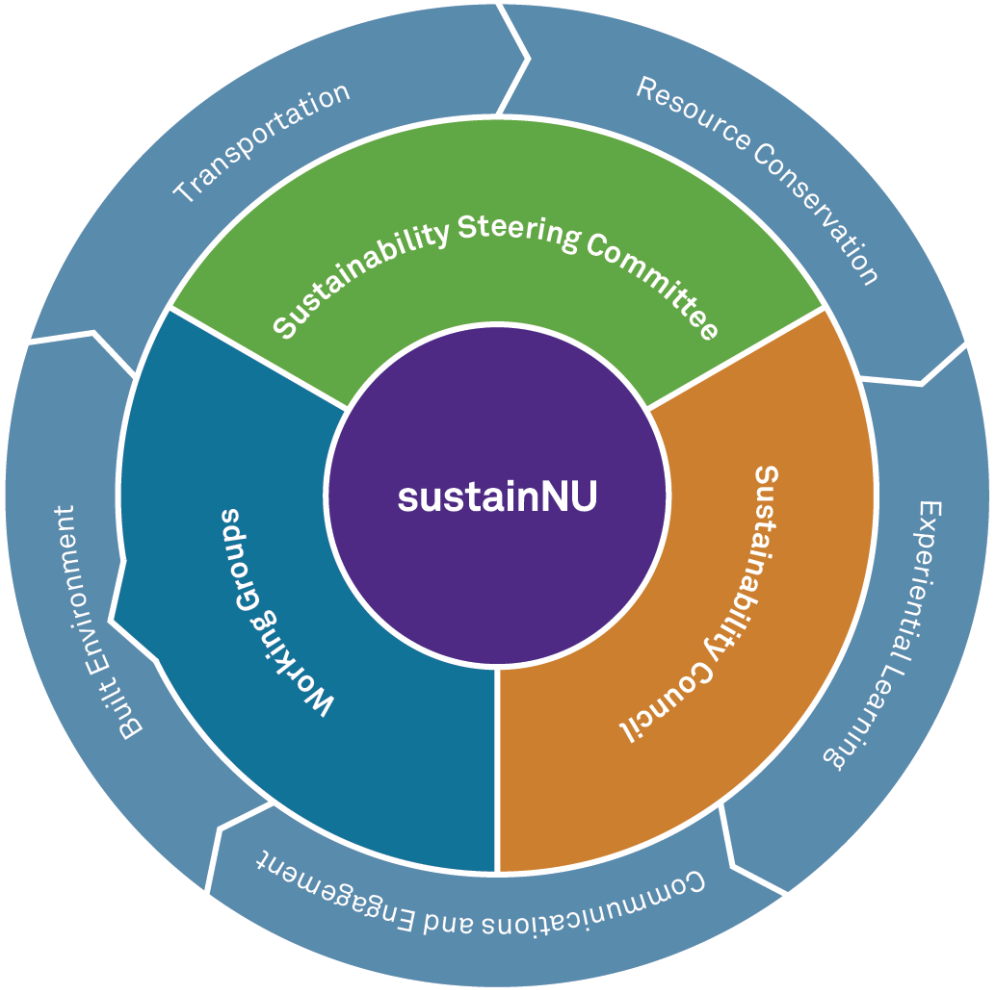
Northwestern University

Northwestern Strategic Sustainability Plan

Northwestern | sustainNU

Program Development & Governance

- 2013: President Shapiro appoints Sustainability Council; 1st meeting of the council.
- 2013-2015: Establishment of Working Groups; Development of initial plan under former Director of Sustainability.
- 2015-2017: New VP, New Director of Sustainability; Expand staffing/expand working groups with subject matter experts / support for sustainNU and revision/refinement of strategic plan.



Strategic Sustainability Plan: Purpose

- Northwestern's Strategic Sustainability Plan supports an important objective of the University's strategic plan, NorthWEstern Will: “We will contribute to the solutions for renewable energy and a sustainable environment”

- The Strategic Sustainability Plan:
  - Identifies targets for reducing University greenhouse gas emissions and waste
  - Outlines strategies for increasing efficiency in energy, water, and resource use
  - Offers measures for incorporating sustainability into University purchasing and operation practices
  - Plan has been drafted and reviewed using a collaborative process over the last five years with very broad support from students, faculty and staff
  - Measures are designed to produce net cost savings that will be reviewed with Board on an annual basis

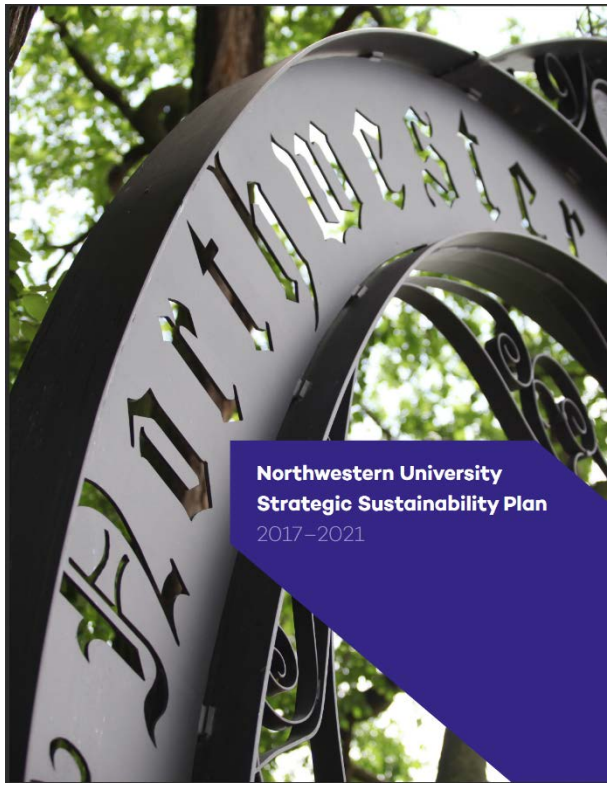
Strategic Sustainability Plan: Context

- Northwestern currently spends $35M per year on electricity and natural gas procurement ($1.11 per second)
  - This energy use is about 80% of the University's carbon footprint
  - Northwestern has reduced its energy usage per square foot by 13% since 2010
  - Energy savings fund this initiative and return operating funds to the University's bottom line

- Northwestern currently spends $1.1M per year on waste removal
  - Waste removal is the second largest contributor to the University's carbon footprint
  - Recycling and reuse have reduced Northwestern's waste hauling costs by 8% over the past year and saved $100,000
  - Waste savings fund this initiative and return operating funds to the University's bottom line

Strategic Sustainability Plan: Overview

- Northwestern's Strategic Sustainability Plan provides a comprehensive, "umbrella" program to guide all faculty, student, and staff initiatives by creating a framework targeting five key program areas:
  - Built Environment
  - Transportation
  - Resource Conservation
  - Experiential Learning
  - Communication and Engagement



Strategic Sustainability Plan: Implementation Roadmap

- Each key program area is accompanied by goals with measurable objectives

1. BUILT ENVIRONMENT

NO.	OBJECTIVES	STRATEGIES / ACTIONS	TARGET
Initiative: Energy			
1.1	Establish an energy conservation policy.	Draft energy conservation policy.	2017
		Submit draft to the Policy Review Committee for review and approval.	2017
		Finalize draft, send to University Policies and Publication Review Committee for approval.	2017
		Review, update, and assess policy effectiveness.	Annually
1.2	Implement an ongoing energy management program based on ENERGY STAR® Guidelines for Energy Management.	Establish a dedicated Energy Efficiency Committee (EEC), set program objectives, and commit to continuous improvement.	2016
		Complete the Energy Management Assessment Matrix.	2016
		Audit Portfolio Manager data to identify improvement opportunities and ensure all utilities are benchmarked appropriately.	2017
		Assess kBtu/SF per building type to identify level of performance.	Monthly
		Establish action plan to improve energy efficiency throughout building portfolio.	2017
		Evaluate energy management program progress.	Annually
		Submit ENERGY STAR® Partner of the Year Award application for program recognition.	Annually
1.3	Implement an energy management information system.		2018
		Develop and issue request for proposal for energy management information system.	2017
		Execute software contract and begin implementation.	2018
		Develop a utility production and distribution submetering master plan.	2019

Strategic Sustainability Plan: Built Environment Goals

- Improve campus energy efficiency 20% by the year 2020 from the 2010 baseline
- Improve water efficiency in existing buildings and grounds and establish a water conservation plan by 2018
- Reduce greenhouse gas emissions 30% by 2030 from the 2010 baseline and net zero emissions by 2050
- Establish a retro-commissioning program for existing buildings by 2018

Ryan West Parking Lot Bioswale Rainwater Detention

Kresge Centennial Hall Solar Array

Strategic Sustainability Plan: Transportation Goals

- Increase campus commuter use of public transportation 5% by 2021 from the 2016 baseline
- Reduce Northwestern fleet greenhouse gas emissions 100% by 2030 from the 2017 baseline
- Increase bicycle commuting 10% by 2021 from the 2016 baseline

Divvy Bike Share Program

Facilities Management Service Electric Vehicles

Strategic Sustainability Plan: Experiential Learning Goals

- Establish a living laboratory program by 2018
- Faculty identify existing and new courses and programs that foster student entrepreneurship and hands-on learning by 2018

House By Northwestern – Department of Energy Solar Decathlon

Strategic Sustainability Plan: Communication and Engagement Goals

- Establish a green labs program by 2020
- Increase the visibility of campus sustainability activities among faculty, students, and staff as measured in the number of subscriptions to and open rate of Northwestern's sustainNU newsletter
- Promote Northwestern's initiatives to outside audiences via publications and peer networks

Tree Planting - Earth Month 2017

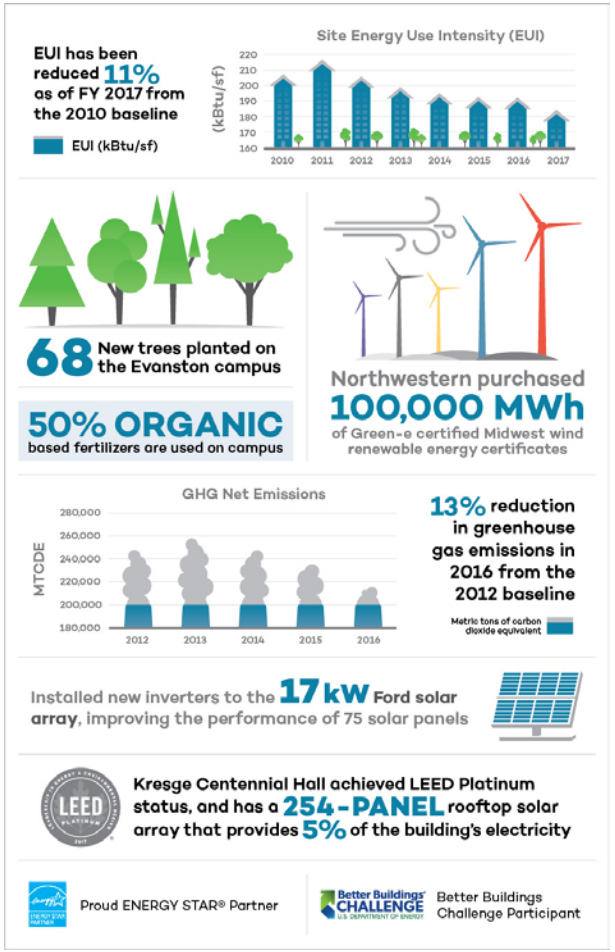
City of Evanston – Streets Alive Community Event

Strategic Sustainability Plan: Successes to Date

- Northwestern received a silver rating through the Sustainability Tracking, Assessment, and Rating System (STARS), which is administered by the Association for the Advancement of Sustainability in Higher Education (AASHE)
- Northwestern ranked 31st among schools for sustainability in Sierra Club's Cool Schools rankings in 2017
- Northwestern received a silver "Bike Friendly University" designation from the League of American Bicyclists in 2016
- 2018 ENERGY STAR Partner of the Year
- LEED Platinum certification for Kresge Renovation and Expansion project and LEED Platinum for Kellogg's Global Hub

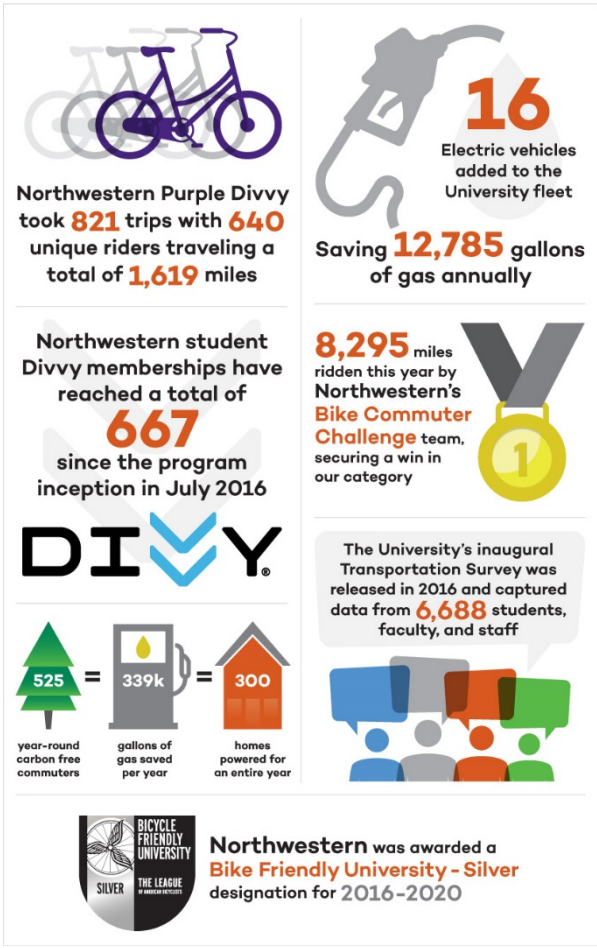
Strategic Sustainability Plan: Year in Review

Built Environment



Resource Conservation

Transportation



https://www.northwestern.edu/sustainability/program-areas/annual-report/2016-2017.html

Kathia Benitez
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(847) 467-3772

Northwestern | sustainNU

ENERGY STAR AWARD 2018
PARTNER OF THE YEAR

Successful Student Engagement Strategies

Christos Chrysiliou, Director of Architectural & Engineering Services
Los Angeles Unified School District

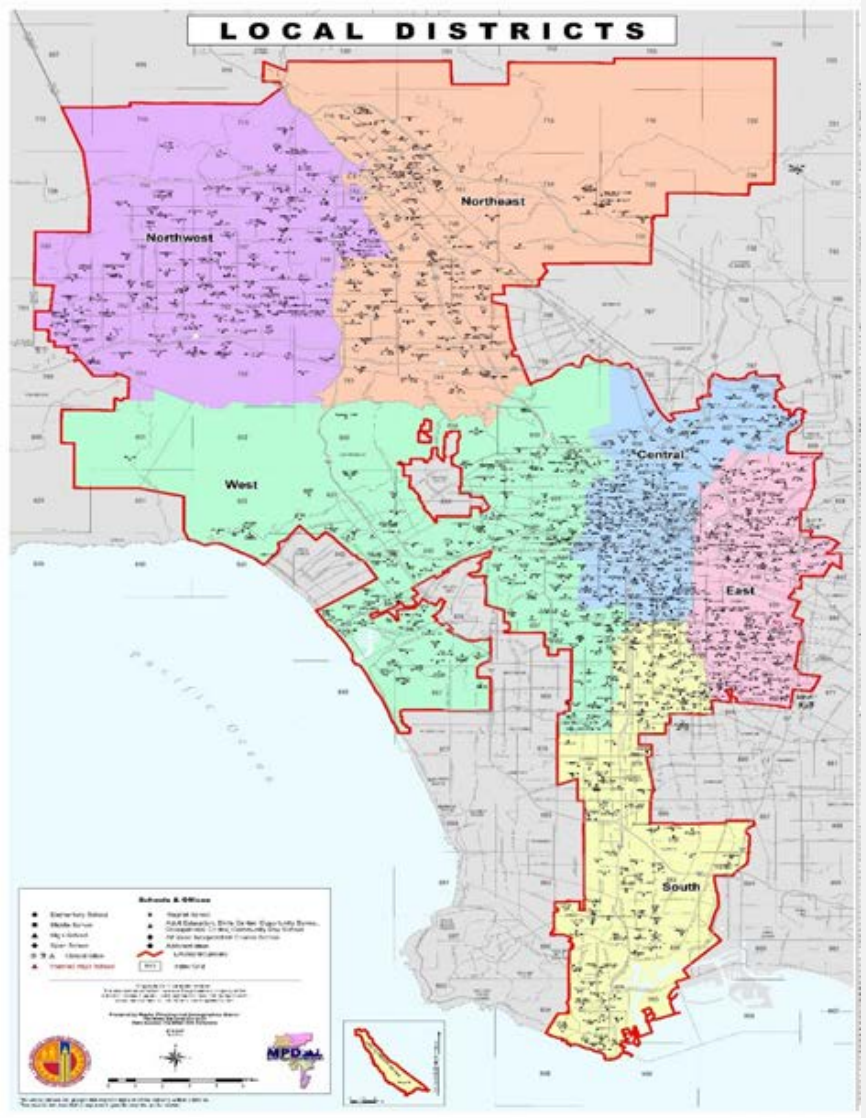
LAUSD Student Engagement Programs

Shaping the educational landscape through Eco-literacy

Christos Chrysiliou, AIA, CCM, LEED AP BD+C
Director of Architecture and Engineering Services
LAUSD M&O Branch – Sustainability Initiatives Unit
August 22, 2018

- ✓ About LAUSD
- Our Commitment
- Engagement Programs


Water Conservation
Energy Conservation
Awareness & Outreach
Campus Ecology
High Performance Schools
Emerging Technologies
LOS ANGELES UNIFIED SCHOOL DISTRICT • BOARD OF EDUCATION •
Sustainability Initiatives Unit
Focus Areas



713,000 students (K-12)

60,000 employees

710 square miles of site boundaries

6,657 acres of land

13,000 buildings

800+ campuses

Source: achieve.lausd.net (Fingertip Facts)
laschools.org/new-site/fingertip-facts/

- ✓ About LAUSD
- ✓ Our Commitment
- Engagement Programs

Mission

LAUSD's Sustainability Initiatives mission is to **be the most sustainable school district in the nation** by developing and implementing programs that support energy efficiency, water conservation, and educational and awareness programs.

Goals

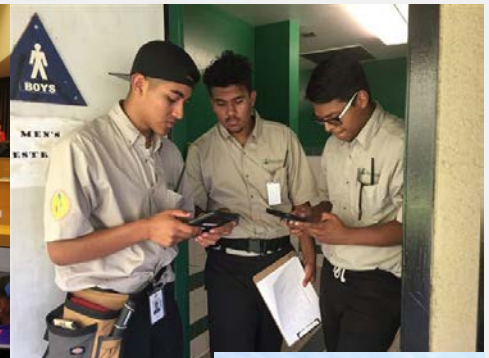
- 20% Energy Intensity Reduction by 2024
- 20% Water Consumption Reduction by 2024
- Support High Performance Design
- Support Education and Awareness Programs
- Support Campus Ecology Programs
- Identify, Evaluate and Implement Emerging Technologies

www.learninggreen.laschools.org

- ✓ About LAUSD
- ✓ Our Commitment
- ✓ Engagement Programs

Complementing the District's core educational mission by **identifying opportunities for education, training, and community engagement** as we implement each of our initiatives.

- **Raise awareness of environmental stewardship**
- **Develop partnerships**
- **Link projects with learning & workforce development**
- **Encourage and celebrate school-based sustainability efforts**



Awareness & Outreach

- **Heroes for Zero**
- **LAUSD em*Power***
- **Prop 39 SEAT Training**
- **Website/Social Media**
- **Save the Drop**
- **DROPS**

HEROES FOR ZERO

ZNE FORMULA:

EE + RE = ZE

OUR FOCUS:

EE

- Applying EE measures and avoiding waste
- Reducing waste through energy education & awareness
- Using technology to understand the facility
- Collaboration for greater efficiency

EE – SCHOOL FACILITY SYSTEMS AND CONSERVATION AWARENESS

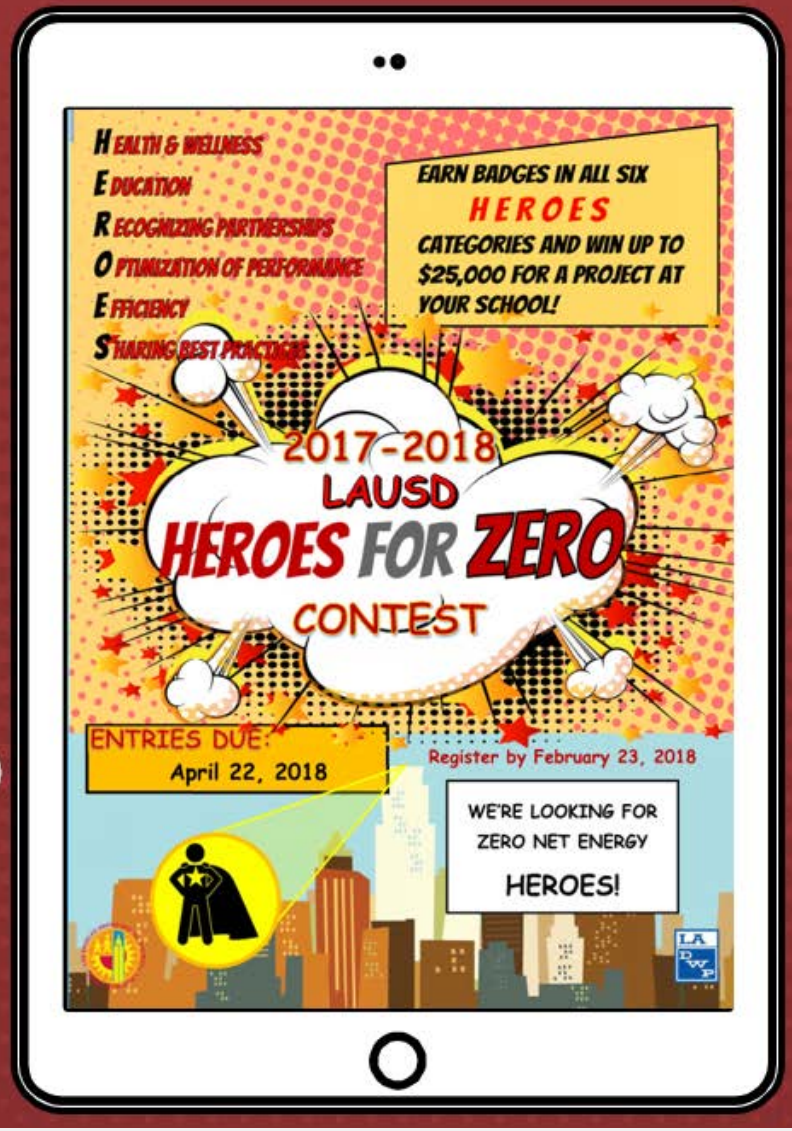
S CIENCE
T ECHNOLOGY
E NGINEERING
A RT
M ATHEMATICS

OBJECTIVE:

- Encourage schools to engage in activities that help make them "ZNE Ready"

ELIGIBILITY:

- Open to all Student Teams at all grade levels (K–12)
- Schools can form more than one team, but will submit only one Team's plan as their entry,



ELEMENTS:

H – Demonstrate how ZNE can also lead to a healthier space or community

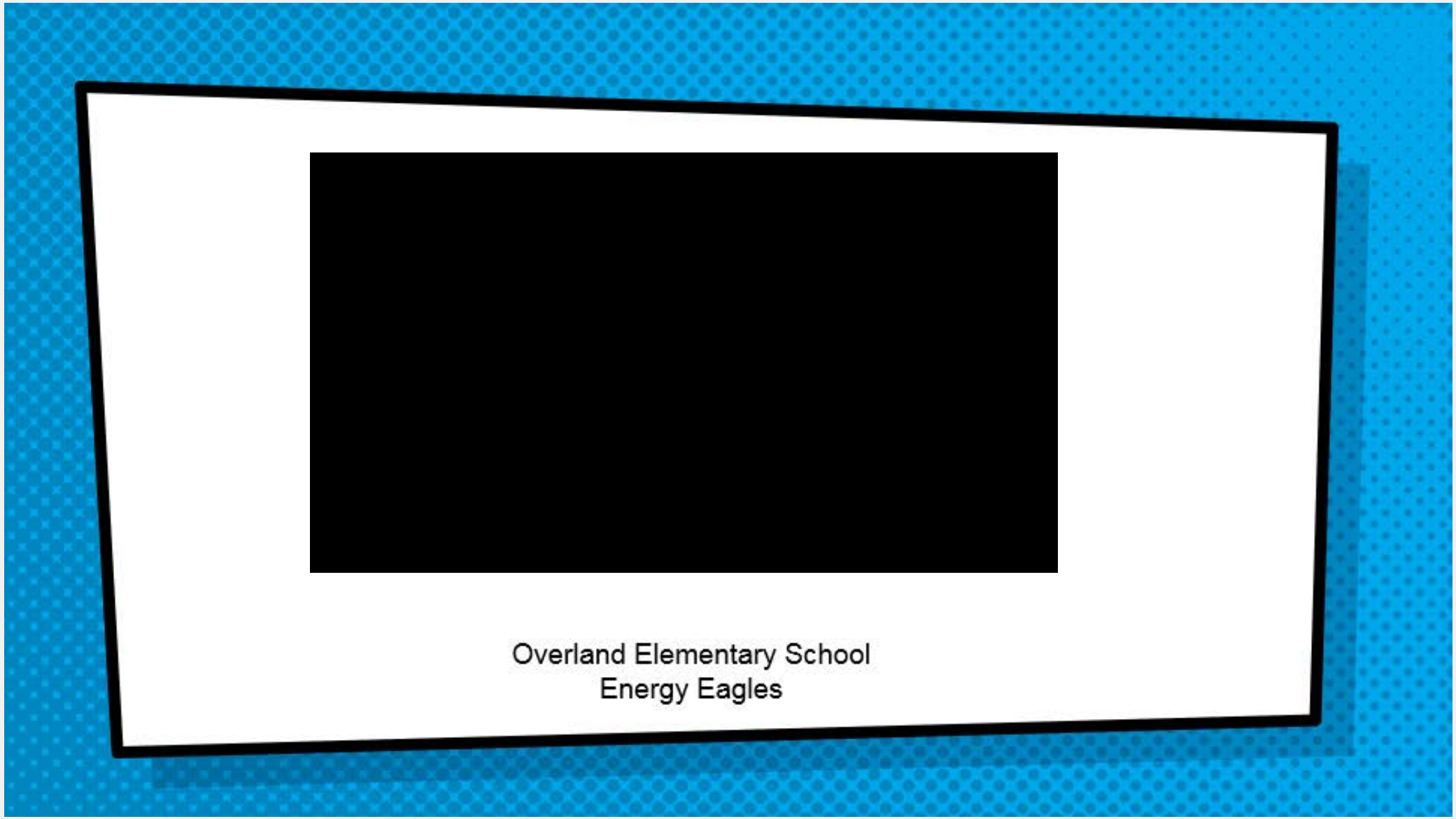
E – Tie in Curriculum Module/Awareness Program

R – Work with Subject Matter Partner or Community-Based Organization

O – Conduct a school energy audit & develop an efficiency plan

E – Develop & implement a strategy to reduce consumption

S – Mentor another school, group, or neighborhood about ZNE


Overland Elementary School
Energy Eagles

Engagement Programs

Overland ES Students talk about their experience.

Team Arroyo accepts their award.

“One planet. One ecosystem. Together, we can be ‘eco-stewards,’ as we continue to be inspired by our youth’s eagerness for a brighter, more sustainable future.”

Christos Chrysiliou,
LAUSD Director of Architecture & Engineering Services
2018 Best of Green Schools Ambassador

Thank you!

Questions?

Website: learninggreen.laschools.org
Contact us by email: learninggreen@lausd.net
Telephone: (213) 241-1000

Learn more about Heroes for Zero:
http://learninggreen.laschools.org/heroes-for-zero-contest.html

Advanced Energy Design Guides

Paul Torcellini, Principal Engineer

National Renewable Energy Laboratory

Advanced Energy Design Guides

Paul A. Torcellini, Ph.D., P.E.
National Renewable Energy Laboratory
Principal Engineer

Advanced Energy Design Guides Background

Six 30% Guides published
(2004-2008)
Highway Lodging, K-12 Schools, Small Hospitals and Healthcare Facilities, Small Office Buildings, Small Retail Buildings, Small Warehouses and Self Storage

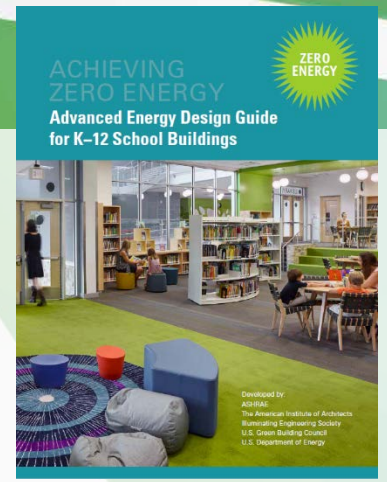
Five 50% Guides published
(2009-2013)
Grocery Stores, K-12 Schools, Large Hospitals, Small to Medium Office Buildings, Medium to Big Box Retail Buildings

One Zero Energy Guide Published
(2018-current)
K-12 Schools
Offices (in development)

As of June 24, 2018

All versions (12 total)
606,241 downloaded
26,384 distributed in print
632,625 total
157,831 registrants account for free AEDG downloads

ZE K-12
2,775 copies
(Jan 20, 2018 release)



- Industry partnership with top professional organizations and DOE, with oversight and constant validation process with industry experts
- Specialized volunteer experts on the Project Committee for each guide, representing the different professional organizations
- Supported by and leveraging DOE's national laboratory research, energy simulation, and technical analysis

Energy Use Intensity Targets

Did exhaustive simulations to determine energy use intensity targets

- Can show that zero is possible and the types of strategies that can be used to get there

Set of design decisions that can achieve the targets

- Zero Energy Ready Buildings—buildings so efficient that on-site renewables can offset the energy needs

Background

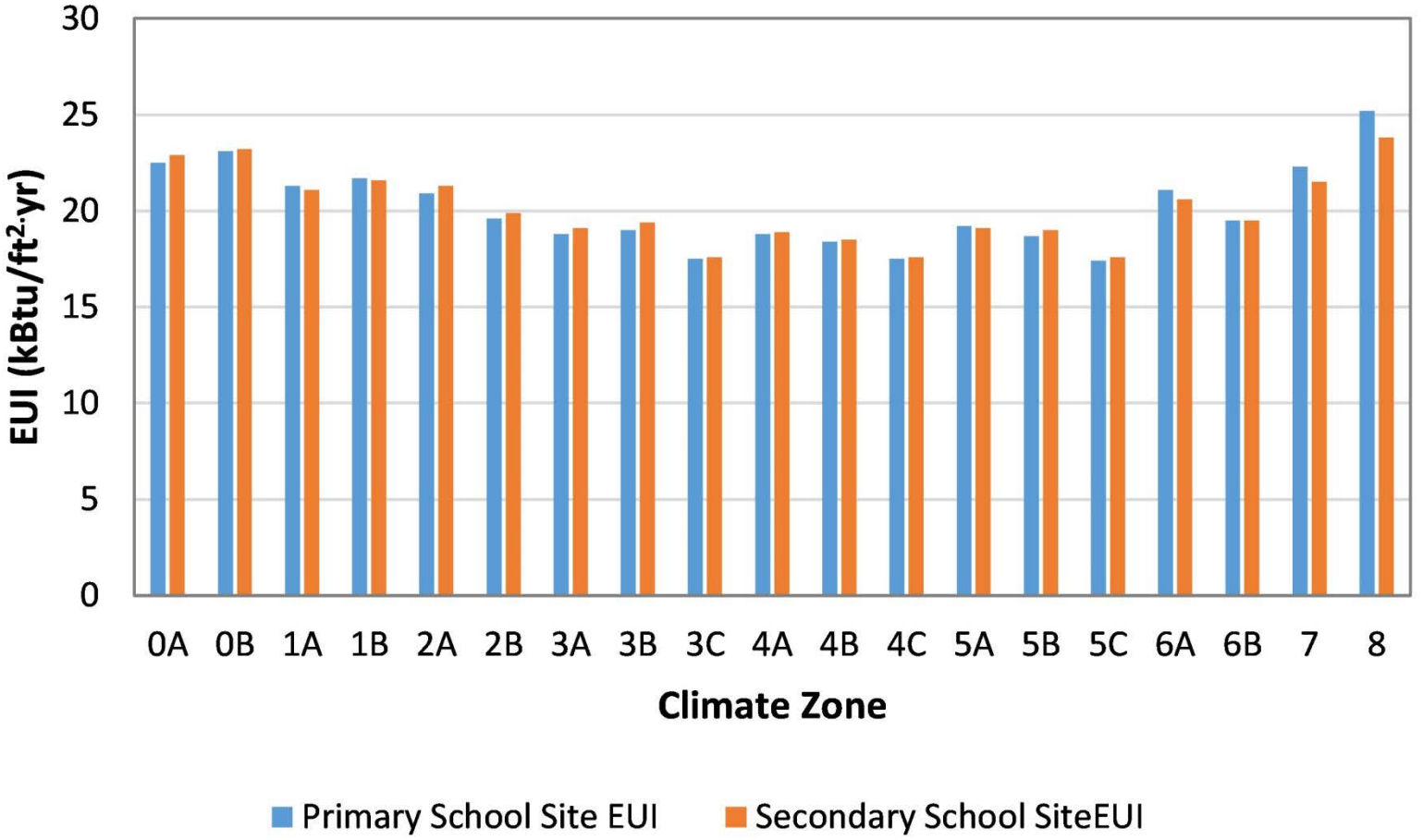
Educational guidance—not a code; not a standard; not a guideline

- Intended audience are owners, architects, and engineers looking for beyond code guidance for implementing energy efficiency strategies

Available for free as a PDF download from www.ashrae.org/aedg

Developed by professional experts appointed by sponsoring organizations

School ZER Simulations



What is in the Guide?

Chapter 1 – Introduction

Chapter 2 – Rationale for Zero Energy

Chapter 3 – Keys to Success

Chapter 4 – Building Simulation

Chapter 5 – How to Strategies

Dearing Elem. School EUI=23.5

Discovery Elem. School EUI=15.8

Friends School EUI=11.7

Chapter 5: How-to Strategies

Table showing how the strategies can be applied

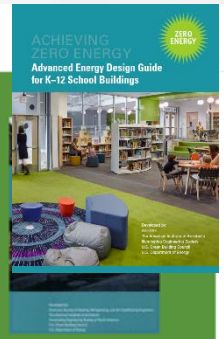
Collection of small pieces of text with strategies to help move towards zero.

- Building and Site Planning
- Envelope
- Lighting (daylighting and electric lighting)
- Plug Loads and Power Distribution
- Kitchen Equipment
- Service Water Heating
- HVAC Systems
- Renewable Energy

sue Library

BOOK REVIEW:
ADVANCED ENERGY DESIGN GUIDE FOR K-12 SCHOOL BUILDINGS – ACHIEVING ZERO ENERGY

Philip M. Donovan



Nelson Mandela once said, "Education is the most powerful weapon which you can use to change the world." Broad access to meaningful education is at the core of that belief. As the economics of sustainable living and cleaner forms of energy become part of the mainstream focus, there is ever increasing demand for the tools, resources, and knowledge to implement fundamental change at a local level. The distribution of this knowledge is a part of the fundamental mission of the American Society of Heating, Refrigerating, and Air-Conditioning Engineers (ASHRAE). In addition to establishing code and performance standards for building system operations, ASHRAE has developed Advanced Energy Design Guides as resources for those who design and construct buildings to achieve energy savings over the baseline standards required by code.

In its latest version of the Advanced Energy Design Guide (AEDG) for K-12 School Buildings, ASHRAE collaborated with the American Institute of Architects, Illuminating Engineering Society of North America, U.S. Green Building Council, and the U.S. Department of Energy to develop a guide that provides recommendations on how to achieve zero energy in K-12 school buildings. The group of authors for this guide includes stakeholders involved in every aspect of school planning, design, and construction including school administrators, architects, and engineers, all of whom have project experience on zero energy-certified schools. Their experience and lessons learned formulate a powerful document with how-to tips, financial planning steps, curriculum integration, and case studies of successful projects.

While seemingly a simple question, the reader begins to discern through thoughtful dialogue that there [illegible] in the zero energy process then initial philosophical or technical assumptions suggest. The reader also [illegible] shared between high-performance buildings, immersive learning space typologies, [illegible] engagement, and curriculum development focused around energy conservation and production and easily support each other's missions within one of our most significant community building types.

The AEDG presents the rationale for designing schools and is inclusive of the key interests that many of the varied stakeholders represent. These interests and the zero energy design processes that respond to them are presented as a road map of steps from initial planning to project close-out and beyond. The AEDG also makes clear that once stakeholders have embraced the culture of zero energy it will begin to shape the way they plan and execute future projects. Beginning with education, the AEDG details ways in which a zero energy facility supports the learning environment. Additionally, the guide illustrates the ways in which the school building becomes a teaching tool that supports and enhances curriculum, provides a healthy indoor environment, and nurtures student and teacher performance and development. It also describes the benefits gained by reducing a building's energy footprint, including reductions in energy costs, reduced maintenance time and costs, reduced absenteeism for students and staff, increased student and staff performance, and increased community interest and involvement. The AEDG then leads the reader through the key principles for creating and maintaining a successful project. It stresses the fundamental principles that are the foundation for effectively building a culture of zero energy, which is critical for team members to adopt and use as a lens through which all decision-making must be viewed and assessed.

Following the presentation of project goals and design drivers, the AEDG presents the technical actions for each step of the zero energy process. [illegible] simulations that identify the physical and behavioral implementations and considerations for the facility [illegible] various parameters effect the building energy performance. This helps project stakeholders make [illegible] decisions [illegible] associated with energy use/cost, first costs, life cycle costs, maintenance requirements, and local influences [illegible] climate, construction techniques, [illegible] These simulations are worked intensively until the key energy and educational aspects of the facility have been vetted and selected. Finally, the AEDG instructs the reader on strategies that must be implemented by all stakeholders to achieve a zero energy school facility. These are addressed through several categories including building and site planning, envelope selection and design, daylighting strategies, electric lighting, plug loads and power distribution, kitchen equipment selection, service water heating, HVAC systems and equipment, and renewable energy.

The AEDG is an easy to follow, clearly articulated handbook that is accessible in its language, theories, and instruction to anyone with an interest in this topic. It is evident that careful consideration was given to avoid overly technical jargon, instead offering strategies for zero energy achievement based on standard concepts of design and construction re-ordered and re-developed based on a deep level of experience by its authors. Through the use of current case studies, diagrams, details, and [illegible] the AEDG smartly describes the [illegible] guiding principles of achieving a zero energy school. It focuses on a data driven approach to decision making and shows the reader [illegible] that data during the planning, design, and construction process. The AEDG also helps subdue any anxiety a reader might feel over [illegible] and schedule impacts associated with zero energy design, which are often main drivers with school facility planning. The reader is reassured that zero energy is realistic within current design and construction budgets and that it represents a sound fiscal stewardship of capital improvement and ongoing operations funding. Finally, the AEDG embraces the fact that zero energy and educational environments are closely aligned and support a common goal of creating a better future for our most precious resources, our children.

The guide is available as a free download from www.ashrae.org/freeaedg.

ASHRAE. (2018). *Advanced Energy Design Guide for K-12 School Buildings: Achieving Zero Energy.* Atlanta, GA: ASHRAE.

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"The AEDG helps subdue anxiety over additional cost and schedule impacts associated with zero energy design, which are main drivers in school facility planning"

Zero Energy Office Guide

Targets Small and Medium Office Buildings

Timeline

- Project committee met in June
- Initial simulation input received
- Now - Committee working on 60% draft
- Aug 31-17, 2018
  - First peer review (60% draft)
  - Conceptual review/content
- Nov 2-19, 2018
  - Second peer review (90% draft)
  - Fact checking/concept details
- June 2019- Final publication

Want to Get Involved?

Feedback?

Peer Reviewers Needed : Lpratt@ashrae.org

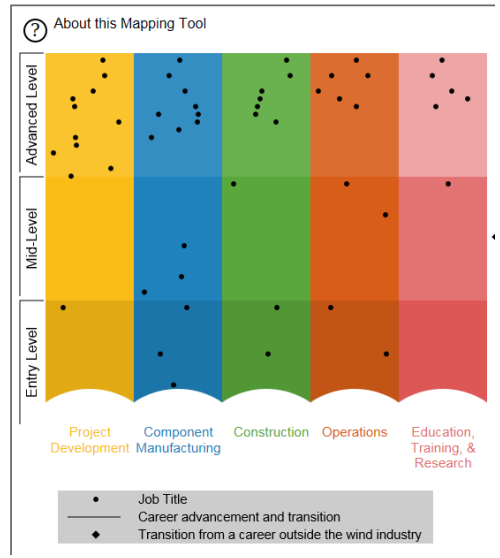
Office Case Studies Needed : Lpratt@ashrae.org

Questions: Paul.Torcellini@nrel.gov

Other DOE Education Resources

- STEM Rising, a project of the U.S. Department of Energy bringing STEM skills to the market through online learning and hands-on science (internships, contests, competitions, events)

- Career Maps for Wind, Bioenergy, and Solar, exploring expanding universe of energy occupations, describing diverse jobs across the industry and charting possible progression between them, and identifying the high-quality training necessary to do them well.



Education Meet Up: Part II

Wednesday, August 22nd

10:30am-12pm

Energy Exchange | Better Buildings SUMMIT

Agenda: Part II

- **Round Table Discussions**
- **Tool Presentations**
  - DER CAM
  - PV Watts
  - Better Buildings Financing Navigator 2.0
  - HVAC Resource Map
  - Building Energy Asset Score
  - RE-OPT Tool
- **Questions & Answers**