



Energy and Decarbonization Roadmaps: Have you started your journey?

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Introductions



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Agenda

- Orange County Public Schools Sustainability Plan 2030
- What comprises an energy and decarbonization roadmap
- What we see throughout the United States
- What resources exist to help schools undertake energy and decarbonization roadmaps
- Orange County Public Schools accomplishments
- How do you start your journey?





Why 2030?



Sustainability Plan Development

Local



International



National



Internal



Stakeholder Engagement

- Student Sustainability Advisory Council
- Staff
 - Faculty Advisory Council
 - Inter-departmental Advisory Council
- Community Advisory Council
- District Family Survey

47,549

SURVEY
RESPONSES

12

DEPARTMENTS
PARTICIPATED IN
THE LISTENING
TOUR

239

MEMBERS IN
INTERNAL AND
EXTERNAL
COUNCILS

40

SCHOOLS
REPRESENTED IN
COUNCIL

Sustainability Plan Organization

- Five (5) Main Target
 - Each target has a corresponding Objective
 - Each target is aligned with OCPS Strategic Plan Objectives
- Plan Published
 - https://www.ocps.net/departments/environmental_compliance_sustainability/sustainability



Waste Reduction



Water Conservation



Health and Wellness



Energy Conservation and
Renewable Energy



Transportation

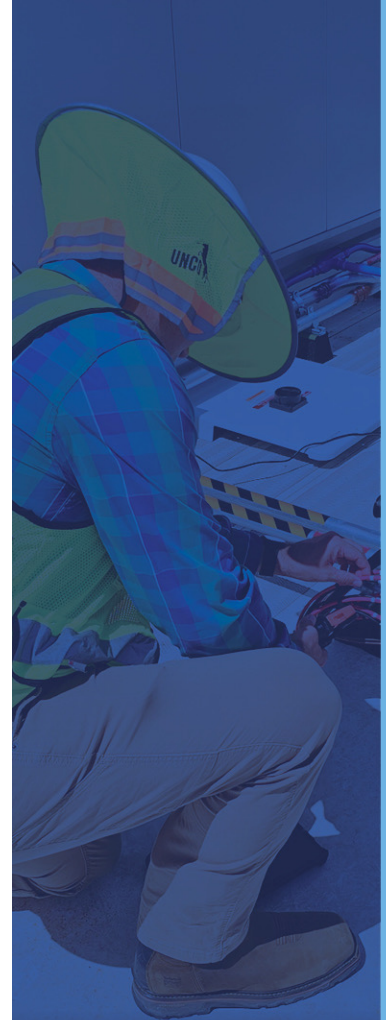


Sustainability Plan Roadmap



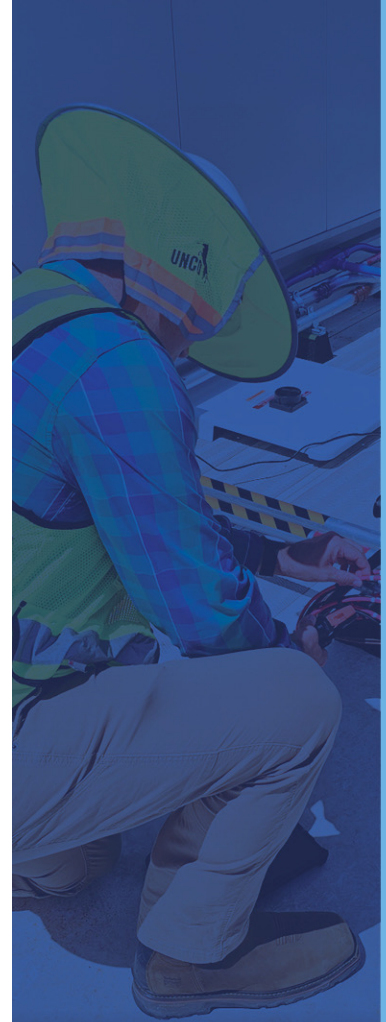
What comprises an energy and decarbonization roadmap?

- Understand and document existing energy infrastructure
- Review existing audits and commissioning reports
- Benchmark current energy use
- Identify Facility Improvement Measures (FIMs)
 - Energy audits and tactical retro-commissioning
- Survey best practices: latest technology and strategies
- Establish conservation goals to reduce baseline



What comprises an energy and decarbonization roadmap? (cont.)

- Develop dashboard
- Implement initial and no / low-cost recommendations
- Develop energy forecasts
- Investigate renewable or alternative energy sources
- Identify potential funding sources and revenue streams
- Update FIMs with savings and probable cost estimates
- Finalize Roadmap



Sustainability Targets

The Five (5) Sustainability Targets are:



Waste Reduction



Water Conservation



Health and Wellness



Energy Conservation
and Renewable Energy



Transportation

Energy Conservation and Renewable Energy Goals				
Decrease Energy Use Intensity (EUI)	Decrease Carbon Emissions	Increase use of renewable energy	Increase energy conservation and renewable energy awareness	Increase sustainable building design construction rating

Target 4: Energy Conservation and Renewable Energy

Goal	Key Performance Indicator	2029-2030 Target	Current Strategies
ECRE-G-1: Decrease energy use intensity*	EUI (kBtu/sf)	45.0	Conservation Inspections and Comprehensive Renovations
ECRE-G-2: Decrease carbon emissions*	Metric tons of CO ₂ e	122,401	CarbonHub – data analysis platform Duke Clean Energy Connections
ECRE-G-3: Increase use of renewable energy*	Total (%) of renewable energy consumption	75% of total consumption	Duke Clean Energy Connections Grant Applications OTC West

- OCPS Strategic Plan Objective Alignment: Efficient Operations

Target 4: Energy Conservation and Renewable Energy

Goal	Key Performance Indicator	2029-2030 Target	Current Strategies
ECRE-G-4: Increase energy conservation and renewable energy education and awareness	Presence/absence of classroom lesson (reported by Green Coordinator), or other outreach activity	At least 1 energy conservation and/or renewable energy lesson at every school each year	Green Schools Recognition Program Sustainability Canvas Courses Teacher PD
ECRE-G-5: Increase sustainable building design construction rating	Projects Green Globes rating	Three green globes on all newly constructed buildings after 2030	Facilities Construction Design Guidelines for high performance designs





- OCPS Strategic Plan Objective Alignment: Efficient Operations, Support of Student Resiliency

What we see throughout the U.S. - Federal

- Executive Order 14057, signed December 8, 2021
 - Achieve 100% carbon pollution-free electricity by 2030, including 50% on a 24/7 basis.
 - Reach 100% Zero-emission vehicle acquisition by 2035, including 100% light duty acquisitions by 2027
 - Achieve net-zero building emissions by 2045, including 50% reduction by 2032
- Decarbonizing the U.S. Economy by 2050: A National Blueprint for the Buildings Sector, DOE, April 2024
 - Comprehensive plan to reduce GHG emissions from buildings by 65% by 2035 and 90% by 2050
 - Buildings account for more than 1/3 of domestic climate pollution and \$370B in annual energy costs

What we see throughout the U.S.– Colleges & Universities

- Over 800 U.S. colleges and universities have signed the American College and University Presidents' Climate Commitment, to achieve carbon neutrality as soon as possible
 - University of Central Florida
 - Duke University
 - University of Colorado
 - Brown University
 - University of Maryland
 - Boston University
 - UCLA
 - And many others!

 University of Central Florida Orlando, FL CREOL Lab Level II Energy Audit	 John F. Kennedy Intl'l Airport Jamaica, NY Terminal 4 Energy Roadmap	 Osceola County Osceola County, FL 4 Energy Audits	 University of North Carolina-Charlotte Charlotte, NC Storrs Hall Energy Audit
9 No/Low Cost FIMs <small>(doesn't require external services)</small>	426 No/Low Cost FIMs <small>(doesn't require external services)</small>	18 No/Low Cost FIMs <small>(doesn't require external services)</small>	21 No/Low Cost FIMs <small>(doesn't require external services)</small>
5 Capital Expenditure FIMs <small>(Payback expected in less than 3 years)</small>	65 Capital Expenditure FIMs <small>(Payback expected in less than 3 years)</small>	9 Capital Expenditure FIMs <small>(Payback expected in less than 3 years)</small>	18 Capital Expenditure FIMs <small>(Payback expected in less than 3 years)</small>
21 Capital Expenditure FIMs <small>(Payback expected in greater than 3 years)</small>	173 Capital Expenditure FIMs <small>(Payback expected in greater than 3 years)</small>	56 Capital Expenditure FIMs <small>(Payback expected in greater than 3 years)</small>	0 Capital Expenditure FIMs <small>(Payback expected in greater than 3 years)</small>
633,347 kWh Energy Reduction Annually	21,895,560 kWh Energy Reduction Annually	4,451,756 kWh Energy Reduction Annually	1,328,000 kWh Energy Reduction Annually
422 MTCO₂e Carbon Emissions Annual Reduction	5,924 MTCO₂e Carbon Emissions Annual Reduction	3,110 MTCO₂e Carbon Emissions Annual Reduction	928 MTCO₂e Carbon Emissions Annual Reduction
37% Reduction From Baseline Energy Use	15% Reduction From Baseline Energy Use	29% Reduction From Baseline Energy Use	36% Reduction From Baseline Energy Use

What we see throughout the U.S.— Colleges and Universities

- Valencia College

- Energy Transition Plan

- Signatory of Second Nature’s Climate Leadership Network
- More than 65,000 students, eight campuses
- 4.449 MSF of space and approx. 65 buildings
- In 2019 Valencia’s gross total emissions were 88,472 MTCO2e with 14,079 MTCO2e attributed to Scope 2 emissions

- Goal

- Develop an energy transition plan for the College to use as a roadmap to achieve carbon neutrality solely for Scope 2 GHG emissions Collegewide

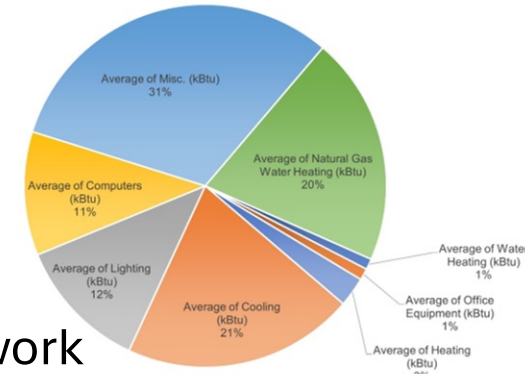


Figure 1 End-Use Energy Breakdown

Scenario	Annual Energy Use (kBTu)	Energy Use Reduction	Savings per Year	Total Electric Cost	Average Payback (yrs)	GHG Reductions (mtCO2e)
Current	2,625,771	0%	\$0	\$71,000	0	0
Recommended without PV	1,969,662	25%	\$19,000	\$52,000	3.6	85.5
Recommended with PV	1,203,398	54%	\$41,700	\$29,300	7.0	186.2

What we see throughout the U.S. - other

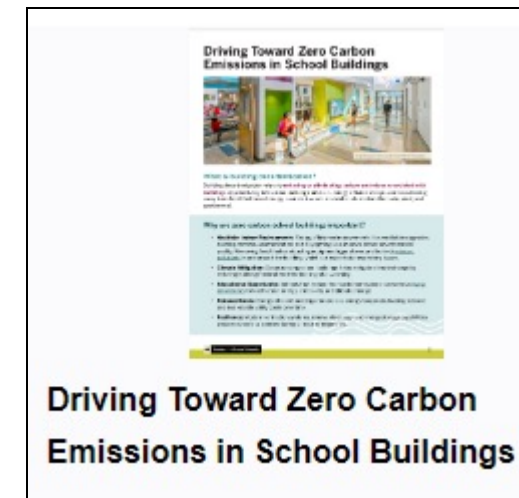
- Healthcare – HHS Health Sector Climate Pledge
 - “...reduce organizational emissions by 50% by 2030 ... and achieve net-zero by 2050.”
 - 139 healthcare organizations representing 943 hospitals have signed the pledge
 - Including federal health systems, over 1,180 federal and private sector hospitals have signed the pledge which is more than 15% of U.S. Hospitals
- Aviation
 - JFK International Air Terminal 4
 - Raleigh-Durham International Airport
 - Orlando International Airport

GREENHOUSE GAS EMISSIONS (MTCO ₂ e)	2018	2019	change
Scope 1	151	119	-21%
Scope 2	28,783	28,028	-3%
Scope 3	N/A	28,398	N/A
Total Scope 1 + 2	28,934	28,147¹	-3%

JFKIAT 2019 Sustainability Report

K-12 Throughout the U.S.

- Center for Green Schools:



- <https://centerforgreenschools.org/>

K-12 in Florida

- Florida Schools Sustainability Network
- Purpose
 - The purpose of the Florida Schools Sustainability Network is to create an unbiased space for sharing the sustainability work school districts are doing while learning how each district approaches similar sustainability issues as well. Members remain in touch throughout the year assisting each other with work challenges and questions as they arise.
- Meeting Times
 - 3rd Wednesday of the Month
 - Virtual

Accomplishments

Renewable Resources

- Duke Energy Community Solar Program:
 - 116 Schools powered by solar by June 2024
- Orange Technical College – Westside Campus:
 - Rooftop Solar

Total Electric Emissions Reduction

- Reduced from 169,045 to 148,837 MTCO₂e from FY2022 to FY2023



How do you start your journey?

- Understand what you are currently doing
- Do you have energy and sustainability standards
- Develop an energy and sustainability plan
- Identify funding sources
 - US EPA/US DOE/USDA
 - Collaborative/Multi-District Submittals
 - Community Benefits Plan

Conclusion

- Education is seeing the importance of reducing energy and increasing decarbonization
- Many are successfully accomplishing this
- There are templates to follow and people to assist
- There are resources available for grants and funding
- What are you waiting for?



Questions

