



AASHE Webinar

Academic Collaborations that Achieve Sustainable Operations



THE OHIO STATE
UNIVERSITY

Today's Speakers



Serdar Tufekci

Vice President of
Major Partnerships



Caitlin Holley

Program Manager,
Capital Projects



Kate Bartter

Executive Director of the
Sustainability Institute



Jeffrey Bielicki

Associate Professor, Civil, Environ. & Geodetic
Engineering & Glenn College of Public Affairs,
EmPOWERment Program Director



Delivering comprehensive, integrated services across the entire energy value chain. A preferred provider to universities, healthcare companies, cities, counties, school districts, and other social infrastructure organizations.

#1 Clean Energy Provider

48+ Years' Experience

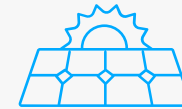
in the U.S. researching, designing, operating, and investing in a wide range of energy solutions

350 District Energy Systems

managed worldwide

1,740 Public Serving Organizations

served in the U.S. (municipalities, universities, schools and hospitals)



31.1 GW

of renewable energy capacity worldwide in 2020



21 Mt

of CO₂eq emissions avoided globally by ENGIE projects with customers



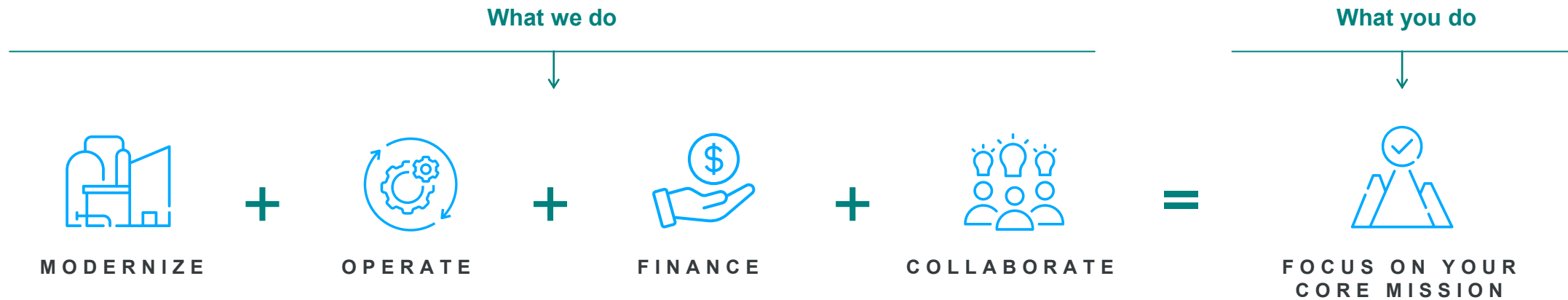
Common Campus Energy Challenges

- **Addressing** deferred maintenance
- **Achieving sustainability goals** and reducing campus energy footprint
- **Access to funding** for modernization of aging infrastructure
- **Identifying challenges** associated with capital project delivery
- **Desire for upgrade and expansion** of educational and medical facilities



Comprehensive Energy Management Partnerships

A modern approach to unlocking value – allowing universities to focus on their core mission



› ENGIE builds **long-lasting partnerships** to finance, modernize and operate onsite utility assets, responding to the needs of your business without draining capital budgets.

› Our solutions **achieve reliability, cost and carbon emission targets** to support fiscal objectives (University's ROI) and meet sustainable energy consumption targets (EUI reduction).

› Through comprehensive energy management partnerships, ENGIE can improve cost predictability and **guarantee performance** outcomes for the long term.

Structuring Partnerships to Achieve Sustainability Goals

- 1 Aligned, contractual incentives to reduce carbon emissions
- 2 Long-term, holistic and collaborative planning
- 3 CAPEX project financing and implementation
- 4 Improved efficiency in daily operations



Ohio State Energy Partners (OSEP)

Comprehensive Utility Infrastructure Upgrades and Operations

Need to Improve Sustainability, Operations, and Academic Collaboration

As one of the top 20 public universities in the U.S., The Ohio State University has long been committed to excellence. It also has an ambitious goal to become an international pioneer in sustainability.

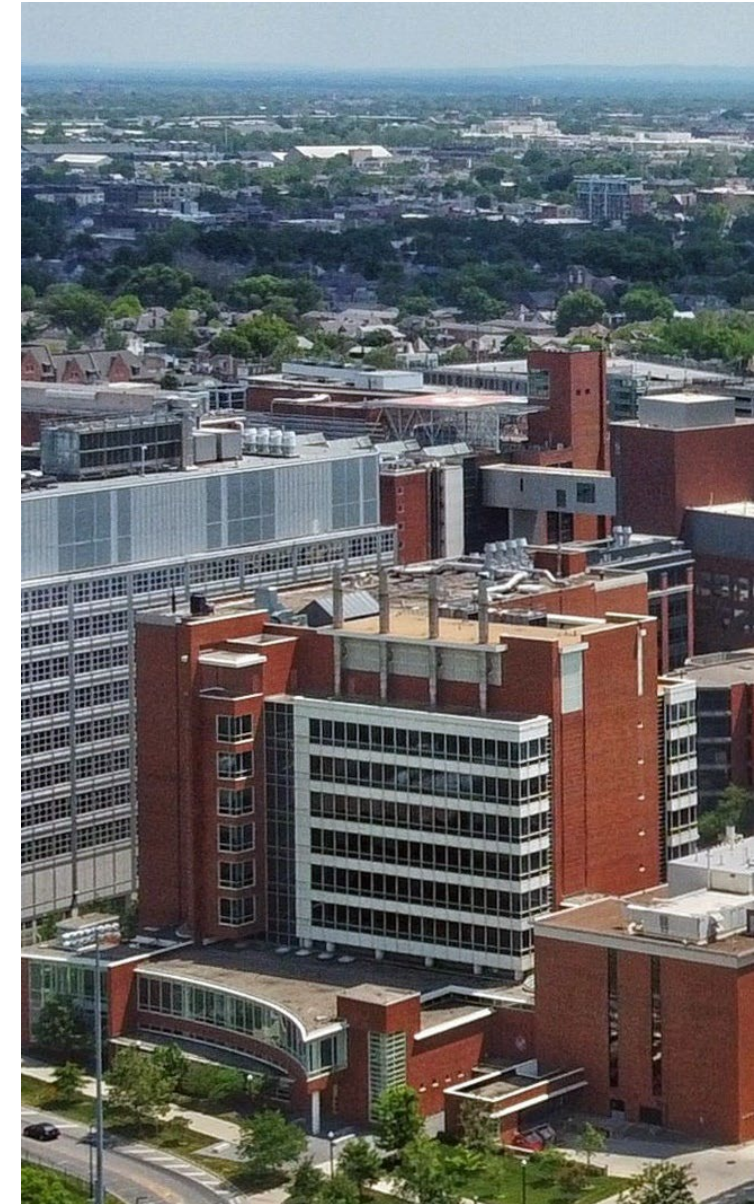
Solution

OSEP is a public-private partnership between the university, ENGIE North America, and Axiom Infrastructure. It includes:

- **50-year** agreement to operate and maintain the university's energy assets
- Extensive energy conservation projects
- Improvements to energy procurement processes
- **\$150 million commitment** to support academic, research, and community interests
- Annual utility fee covers ongoing operations and implementation of conservation measures

Benefits

- **\$1.015 billion upfront payment** to the university
- **Sustainability improvements**, including smart metering, lighting upgrades, and utility system upgrades within various facilities on campus
- Projected achievement of the university's goal of **25% improvement in energy efficiency** within the first 10 years of the partnership
- **Development of academic collaboration** through internships, student competitions, community events, and The Energy and Advancement Innovation Center



Engagement with the University



Faculty Workshop Planning an Innovative Energy Collaboration Project



WestFest: West Campus Science and Sustainability Festival



Women in Engineering ENGIE Site Visit; Tour Hosted by OSEP Intern and Program Manager



OSEP Capital Projects team with our Valued Interns – 2020-21



Hosted Construction Site tour for the College of Engineering's College Committee on Academic Affairs and CORE Teaching and Learning for College of Engineering teams.

Partnering for Sustainability at Ohio State

Kate Bartter
Executive Director, Sustainability Institute
The Ohio State University

February 16, 2023

The Ohio State University, Columbus Campus



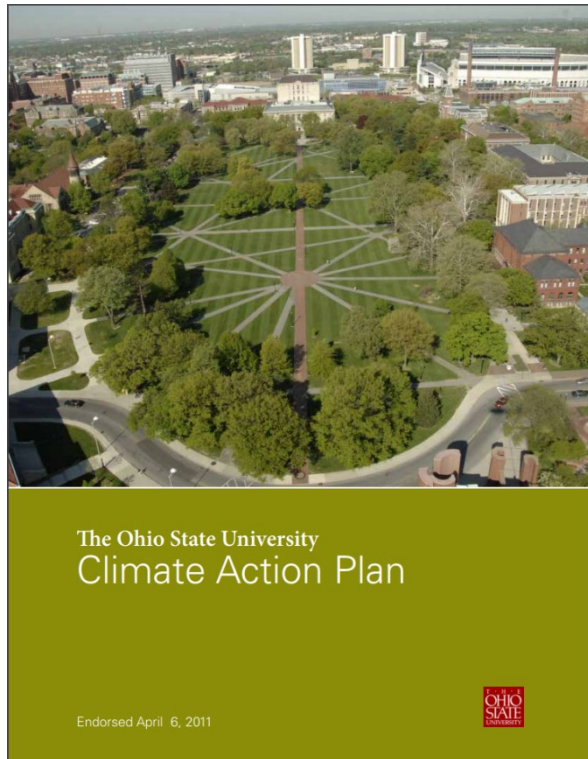
Third largest university in the U.S.

- 490 buildings
- 2,000 acres in urban environment
- 59,800 students
- 100,000 people daily
- 38 on-campus residence halls
- 14,000 student residence beds
- Major medical center
- Three stadiums



The Beginning....

Spring 2008 - Ohio State committed to carbon neutrality by 2050



Ohio State's First Climate Action Plan

Published in 2011

- Described approach to developing carbon footprint) outlined pending/potential actions
- Did not establish a forward-looking strategy

Success since initial CAP

- Regional chiller plants
- Geothermal heating and cooling expansion
- 50MW power purchase of wind Energy
- Transportation strategies: employee transit and near campus living incentives
- CNG Refueling station for campus buses



Ohio State strengthens commitment to sustainability

In 2015, Ohio State adopted **7*** strategic sustainability goals to guide a **new** strategic vision around sustainability:



Teaching & Learning

Foster next generation of sustainability research and creative expression through student outcomes



Research & Innovation

Develop leading national sustainability scholars



Outreach & Engagement

Leverage partnerships and stakeholder engagement for larger sustainability solutions



Resource Stewardship

Implement world-leading, university-wide operational goals to reduce consumption, neutralize carbon emissions, and minimize waste



2011 -A BIG IDEA emerges

Innovative private/public partnership around campus energy management that will provide new resources for our academic mission.



Comprehensive Energy Management

- Achieve optimization through an enterprise-wide systems approach to energy
- Operate, maintain and expand utility systems with a constant focus on impacts and benefits to the enterprise
- Enable redirection of existing financial resources to support the core academic mission





Keys to a Successful Partnership: Alignment



- ▶ University and the company must have close alignment of needs, capabilities, and corporate values
- ▶ Decision to enter into 50-year Long Term Lease/ Concession Agreement was made only after Ohio State was confident that the deal would be mutually beneficial partnership capable of advancing values and goals
- ▶ ENGIE-OSU partnership helps Ohio State achieve energy, sustainability, and academic goals

Ohio State Energy Partners (ENGIE-Axium)

Academic Collaboration Goals

- Create value beyond the \$\$s in the Concession Agreement for Ohio State and the Partners
- Help make energy efficiency and sustainability a significant research pillar at Ohio State
- Create the premier innovation center in energy advancement and sustainability that will propel brand values of Ohio State, Axium, and ENGIE

Elements of Academic Collaboration - \$150 million

Scholarships: \$25 million

- \$12.5 million for undergraduates
- \$12.5 million for graduates/professional students

Faculty Endowments: \$9.5 million

- Five endowed positions

Sustainability Endowment: \$15 million

Sustainability Curriculum and Staff Endowment: \$5 million

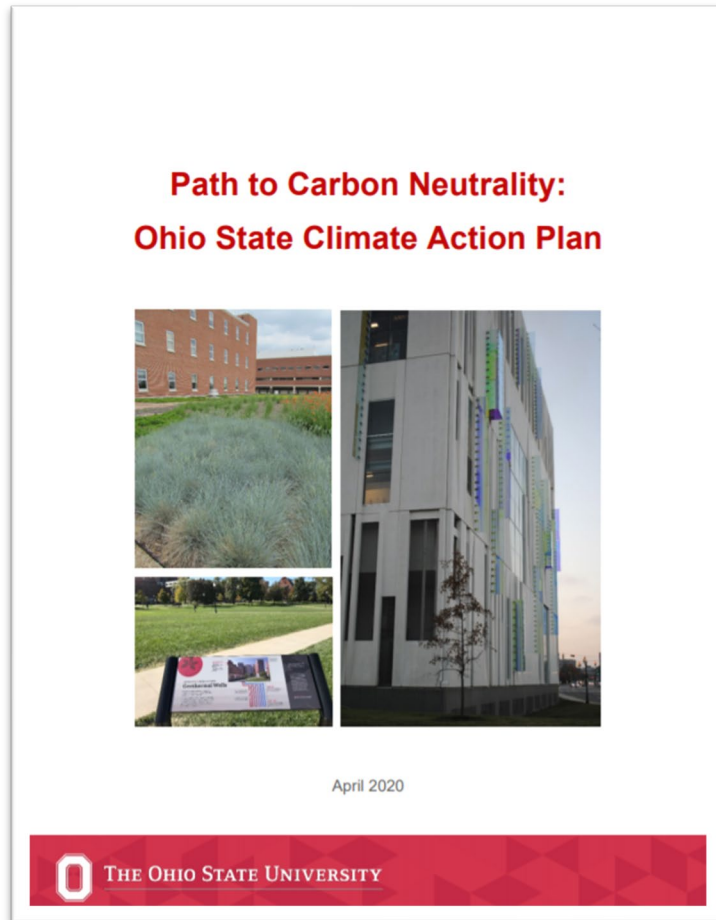
Internships: \$100,000 per year paid directly to interns (10 per year)

Philanthropic Support: \$810,000 annually for 50 years

Visionary Project: \$50 million (Energy Advancement Innovation Ctr)

- Building: \$35 million
- Operating for five years: \$7.5 million
- Research: \$7.5 million

Success to Date - Operations



Achieve carbon neutrality by 2050

- ***30.3% emissions decline***

2020 Climate Action Plan

- ***Address 55% of university FY19 emissions by 2030***

62 Building level Energy Conservation Measures Implemented across campus

Sustainable Design and Construction Policy

Success to Date - Academic Collaboration

- Over 107 Scholarships awarded
 - Undergraduate, graduate and professional students
- Three endowed faculty chairs filled
- Dozens of faculty and student sustainability projects funded on campus
- Six new Curricular programs and new courses supported
- 98 campus and community projects supported from annual Philanthropic Contributions
- Two New Technology platforms developed to enhance student learning and track sustainability in action on our campuses and communities
- New Energy Advancement and Innovation Center scheduled to open in Summer, 2023



Academic Collaboration Beyond the Contract

Partner on external research proposals

- Advanced vehicle technologies, energy storage, sustainability buildings
- \$3 million new NSF graduate training program in sustainable energy
- Using the campus as a living lab to study sustainable behavior

Enhancing the student experience

- Student energy competitions
- ENGIE leaders in the classroom
- New career development program for interns

Partner in campus and external events

- SMART=Energy Community Research Innovation Series
- Buck-i-Frenzy
- HackOHI/O

EMPOWERMENT: AN NSF NATIONAL RESEARCH TRAINEESHIP IN CONVERGENT GRADUATE TRAINING FOR A SUSTAINABLE ENERGY FUTURE

Association for the Advancement of Sustainability in Higher
Education Webinar

Academic Collaborations that Achieve Sustainable Operations

February 16, 2023



THE OHIO STATE UNIVERSITY

1922666: NRT-HDR: Convergent Graduate Training and
EmPOWERment for a Sustainable Energy Future
energyfuture.osu.edu





NRT-HDR: CONVERGENT GRADUATE TRAINING AND EMPOWERMENT FOR A SUSTAINABLE ENERGY FUTURE

Characteristics of the *EmPOWERment* Program:

- \$3 million over 5 years (2019-2024)
- Core group of **sixteen faculty** from **seven colleges** (Engineering, Agricultural and Environmental Science, Arts and Sciences, Education and Human Ecology, Public Affairs, Business, Law)
- Several university **centers and institutes** (Sustainability Institute, Institute for Materials Research, Battelle Center for Science, Engineering, and Public Policy, Translational Data Analytics)
- Multiple university **offices/programs** (Graduate School, Office of Diversity and Inclusion)
- Over a **dozen external partners**, led by ENGIE
- NRT funds support **1-year fellowships** for Ph.D. fellows targeted to **female and underrepresented minority** students.

THE *EMPOWERMENT* PROGRAM TRAINS THE NEXT GENERATION OF ENERGY INNOVATORS
TO ADDRESS A PRESSING SOCIETAL NEED TO:



Reduce greenhouse gas emissions from energy systems in ways that are environmentally, socially, and economically benign



Ohio State EmPOWERment Leadership and Core Team



PI: Dr. Jeff Bielicki,
Associate Professor,
Civil, Environ. &
Geodetic Engineering
& Glenn College of
Public Affairs
EmPOWERment
Program Director



Katie Zimmerman
EmPOWERment
Program Manager



THE OHIO STATE UNIVERSITY

1922666: NRT-HDR: Convergent Graduate Training and
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PROGRAM GOALS

To augment graduate education through interdisciplinary training in sustainable energy systems for Ph.D. students

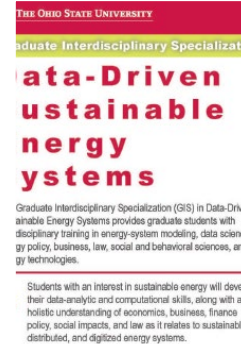


PROGRAMS AVAILABLE TO EMPOWERMENT TRAINEES



Bootcamp

- Sustainable energy challenge
- opportunity to work in small teams
- Interact with professionals
- Learn valuable professional and communication skills
- Receive technical training related to data science



Graduate Interdisciplinary Specialization (GIS)

- Data-driven Sustainable Energy Systems
- Interdisciplinary training
- Foundations Course
- Four electives from five thematic areas
- Capstone course



Student Community of Practice and Engagement (SCOPE)

- Mix of formal and informal activities
- Combination professional development, psychosocial support, networking, and discovery.
- Built to explore the complex world of sustainability energy.



(Internal and External) Mentoring and Advising

- Meet and speak with the students
- Help build a professional network
- Experiential learning opportunities
- Interview subject
- Audience for trainee presentations
- Providing feedback.



EmPOWERment Program Components

Coursework

Demonstrating Concepts
Mastery

Experiential Learning & Guidance

Graduate
Interdisciplinary
Specialization (GIS)

Research
Component

Presentation Skills

Teaching
Opportunities

Applied Research Experiences

Student
Community of
Practice and
Engagement
(SCOPE)

Mentoring

Foundations Course

Electives (4)

Capstone Course (project-based)

Thesis Research

Research Project (Fellowship)

STEAM Factory & Science Pub

Conferences

Annual Research Expo

TA Program Courses

Level-setting Bootcamp

Internships, Externships & Co-ops

INNOVATE-O-thon

RISE Summer Program

Level-setting Bootcamp

Skills Workshops

Mentoring & Coaching by Battelle
Center staff

Industry Mentor

Faculty Advisor



THE OHIO STATE UNIVERSITY

**1922666: NRT-HDR: Convergent Graduate Training and
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energyfuture.osu.edu



COLLABORATIVE ACADEMIC ACTIVITIES – EMPOWERMENT NRT



ENGIE SUPPORT OF EMPOWERMENT PROGRAMS



EmPOWERment Capstone topics

October 2021

Valentin GAVAN, ENGE Lab CRIGEN France




EmPOWERment Bootcamp - 2022

The Intersection of Infrastructure | Energy | Mobility

THE OHIO STATE UNIVERSITY

ENGIE

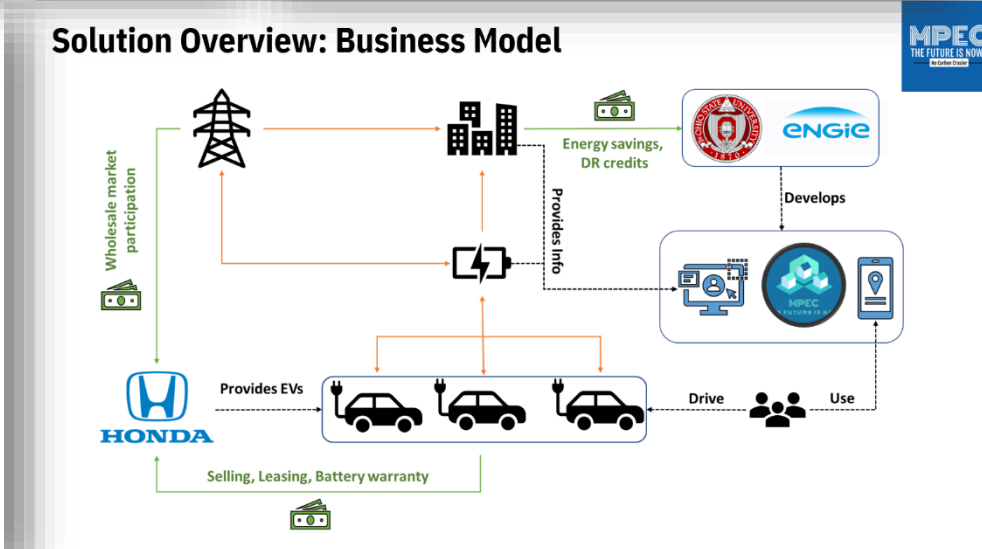
- ### Fall Semester Schedule of Speakers
- September 1 - Welcome to Energy SCOPE
 - September 8 - Chris Swanson, Bill King, Layne Toops, ENGIE ★
 - September 15 - Prof. Chris Atkinson, Smart Mobility, OSU
 - September 22 - DuWayne Baird, Columbus 2030 District
 - September 29 - Brad Chadwell, American Electric Power
 - October 6 - Dick Munson, Environmental Defense Fund
 - October 13 - Susanne Buckley, Scioto Energy
 - October 20 - Prof Andy Thomas, CSU
 - October 27 - Kathiann Kowalski, Energy News Network
 - November 3 - Mr. Dana Saucier, JobsOhio
 - November 10 - John Seryak, Go Sustainable Energy
 - November 17 - Ryan Augsburger, Ohio Manufacturers' Association
 - November 24 - Social Event with Students, Building Community



MANAGING AND PREDICTING ENERGY CONSUMPTION (MPEC): ELECTRIC VEHICLE INTEGRATION AT OHIO STATE

Final Report for PUBAFRS 5620: Rapid Innovation for Public Impact
The Ohio State University, John Glenn College of Public Affairs

April 29, 2022



Q&A



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