

# *LEADING THE WAY* **CampusEnergy**2022

Feb. 15-18 | Westin Boston Seaport District Hotel | Boston, Mass.



INTERNATIONAL  
DISTRICT ENERGY  
ASSOCIATION

# LONG-TERM CONCESSION

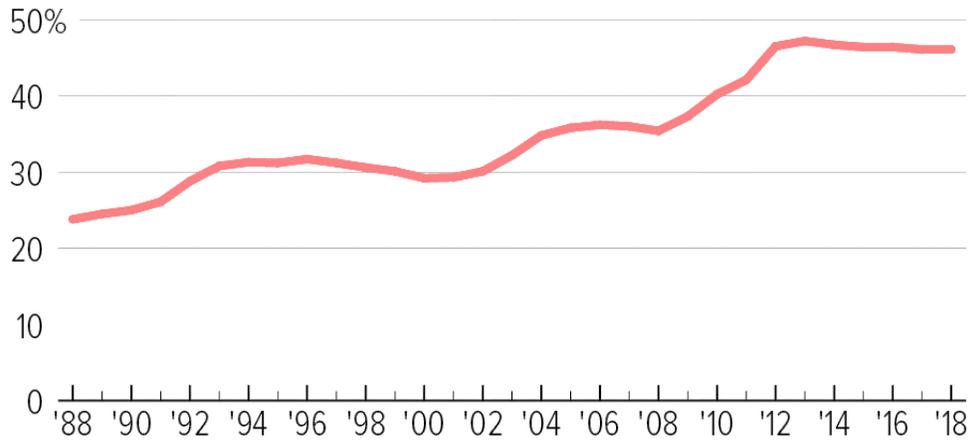
## A New Model for Comprehensive Energy Management

Francois Gressier, ENGIE

# The Changed Environment in Public Higher Education Finance

## Students Funding Larger Share of Higher Education After Recessions

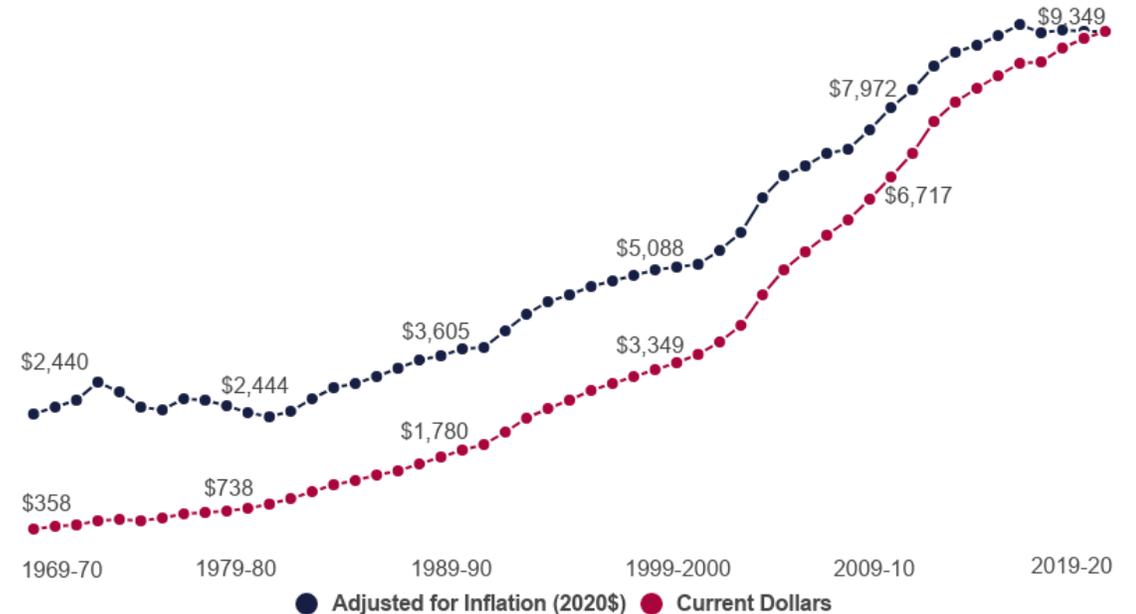
Tuition as a percent of total educational revenue, 1988-2018



Source: CBPP analysis using SHEEO State Higher Education Finance Report

- Increased student funding share (up 20% since 2000)
- Decreased state funding for public institutions

## Average Annual Tuition & Fees at Public 4-Year Institutions



- Rising tuition costs outpace inflation, 84% increase since 2000 after adjusting for inflation

# Key Principles

1. Government support is permanently smaller

2. Students and families alone cannot shoulder the cost

3. We need to identify new sources of support

4. We need to use existing resources responsibly

# Shifting Operation Risk to Energy Partner

*Risk to Energy Partner* 

Client Decision Criteria	Design Build Agreement	Performance contracting Agreement	Thermal Services Agreement	Power Purchase Agreement	Master Energy Agreement	Concession Agreement
Typical Tenor	1 to 3 Years	10 to 15 Years	25 Years (Typical)	25 Years (Typical)	25 Years (Typical)	25-99 Years
Funding Source	Client	Client or ENGIE	ENGIE	ENGIE	ENGIE	ENGIE
Funding Type	KHC	Client/ENGIE/Project Finance	ENGIE/ Project Finance	ENGIE/Project Finance	ENGIE/Project Finance	ENGIE/Project Finance
Technical Scope: Main Focus	ALL	ECMs	Central Plant	Solar/Wind/CHP	All including ECM	All including ECM
Turn-Key (EPC, O&M, Funding)	YES	YES	YES	YES	YES	YES
Life Cycle Risk Transfer	NO	NO	YES	YES	YES	YES
Performance Guarantees	NO	YES	YES	YES	YES	YES
End of Term Buyout Provisions	None	To be Negotiated	To be Negotiated	To be Negotiated	To be Negotiated	To be Negotiated
Option for Value Monetization	NO	NO	YES	YES	YES	YES

# A Transformational Partnership

## The IDEA

### ***Comprehensive Energy Management***

*Achieving optimization  
through an enterprise-wide  
systems approach to energy*

- **Systems operations management**
  - Operate, maintain, and expand utility systems with a constant focus on the impacts and benefits to the institution
  - One company with extensive relevant expertise, scale, and reach
- **Energy Efficiency management**
  - Overcome a one-building-at-a-time approach
- **Financial resource management**
  - Enables redirection of existing financial resources (debt capacity) to support its core academic missions

# Benefits to the Partners

## *Higher Education Institution*

- **Stable, long-term investor/ operator**
  - Achieve efficiency and sustainability goals
  - Steady and predictable cash flows
- **Distributed utility system operations**
  - Not the university's core strengths
  - Campus systems, single company
- **Opportunity to be a university leader**
  - Redirect capital to academic mission
  - Showcase a new energy management model

## *Company*

- **Stable, long-term investment in assets**
  - Positive history and forecast
  - Steady and predictable returns and cash flows
- **Distributed utility system operations**
  - Aligns with core strengths
  - District systems, single owner/customer
- **Opportunity to be an industry leader**
  - Academic collaboration and Innovation
  - Showcase a new energy management model

# A Comprehensive Approach To Energy Management – Ohio State University

## System Operations

- Ohio State received upfront payment in exchange for a 50-year lease agreement on the following utility systems:
  - Electricity
  - Chilled Water / Cooling
  - Steam / Heating
  - Natural Gas
  - Geothermal

## Energy Supply

- Ohio State Energy Partners (OSEP) works to enhance Ohio State's effectiveness in the procurement process for electricity, natural gas and other energy sources
- The University continues to buy directly from providers, and Ohio State continues to determine its priorities in terms of sources

## System Design

- Partnership allows and promotes wholistic approach to energy infrastructure design to support sustainable campus development

## Sustainability

- Focus on Columbus campus (485 buildings)
  - Guaranteed minimum 25% energy use reduction over 10-years with estimated capital need \$250M
- Potential to include regional campuses & other facilities
- OSEP required to deploy smart meters to the entire Columbus campus at no cost to Ohio State

## Academic Collaboration

- \$50M for new Energy Innovation Center
- \$25M for student financial aid
- 500 internships (\$5M)
- \$20M for sustainability curriculum, staff development
- \$9.5M for five faculty positions
- \$40.5M for philanthropy

 THE OHIO STATE UNIVERSITY

 / 

# Concession Agreement – Financial structure

**Utility Fee** is the Annual Payment equal to the sum of the following components



## Fixed Fee

1

### Fixed amount escalating annually

- Flat, annual amount paid by the University to the Concessionaire; Zero if no upfront payment

## Operating Fee

2

### O&M Costs are a pass through

- Pass through of all O&M Costs defined in the Concession Agreement subject to a cap; fuel supplies (gas, electricity) are not included as the University will pay for those directly

## Variable Fee

3

### Return on capital deployed

- Return on Capital Improvement Costs, based on ROE (benchmarked against local utilities) and coverage of debt financing costs (benchmarked against market cost of debt)

### Capital recovery amount over 20-year period

- The annual amortization amount for all new capital improvements costs funded by the Concessionaire; veto rights by university on all projects.

# Smart Campus<sup>E</sup> - Ohio State University



The Future of  
Campus Energy

02 Campus Energy

Combined  
Heat & Power  
Plant (CHP)

03 Physical Energy Infrastructure

- Chilled H<sub>2</sub>O
- Steam & HW Lines
- Electricity
- Natural Gas

The Ohio State University,  
Columbus Campus

Imagery ©2019 Google

01 Digital Infrastructure



- Market Info
- Building Info
- Occupancy Data
- Smart Meters
- Production Decisions
- BMS Control
- Demand Response
- Weather Forecasting



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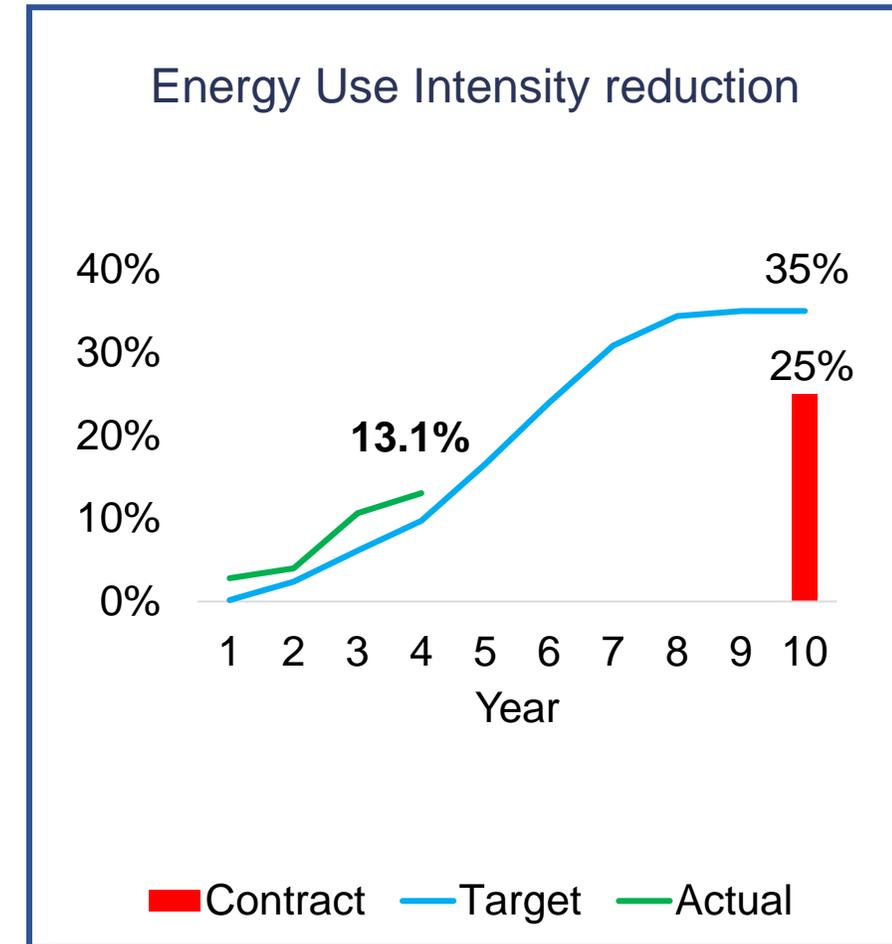
# Energy Conservation Program - Ohio State University

## Energy Use Intensity (BTU/ sqft) at Campus Level:

- Maximum budget: **\$250M**
- Minimum reduction: **25%**
- Deadline: **2027**

## Projects in progress/ completed

- **Plant Level**
  - Steam to Heating Hot Water conversion with Heat Recovery Chillers
  - Geothermal expansion with additional heat pump
  - Chilled Water network consolidation
  - Campus Exterior Lighting upgrades with Wi-Fi coverage
- **Building Level**
  - Controls Optimization
  - Lighting Upgrades
  - VFD Installations
  - Bi-Polar Ionization



# Energy Advancement and Innovation Center - Ohio State University

- A platform for Ohio State faculty members, students, alumni, local entrepreneurs and industry experts to work together on the next generation of **smart energy systems, artificial intelligence, renewable energy and green mobility solutions**.
- The 66,000-square-foot building will prioritize strategies to reduce energy usage. The project will include the installation of a **direct current (DC) microgrid** with future plans to install photovoltaics/solar panels on the roof.
- Groundbreaking was November 12<sup>th</sup>, 2021.
- Total project budget of \$48.4M.



# DOE Funding – a successful team

**Connected Community:** automated **BU**ilding **C**ontrol with **K**nowledge of distributed **E**nerg**Y** resources and **E**lectrical **S**ystems for **G**rid **O**fferings (**BUCKEYES GO!**)

Prime recipient: Ohio State (PI: Michael Hagenberger); Subrecipients/KPs from ENGIE, NREL, UC-Berkeley

## Summary

**20 centrally** connected and controlled **buildings** (10 MW peak demand), 65k ft<sup>2</sup> photovoltaics, 29 EV charging stations, combined heat and power plant & co-located central chiller plant.

Demonstrate **automated, secure community-level energy and demand management to provide economic and environmental value** to asset owners (Ohio State), operators (ENGIE) and grid partners (PJM & AEP) while maintaining or improving occupant experience.

## Baseline and Targets

- **Energy Efficiency:** 35% energy reduction
- **Demand Flexibility** >2 MW flexibility at peak times
- **Asset Value:** 20% increase in NPV of renewable assets (vs 2019)

## Impacts

- **Sustainable value streams** for owners, operators, occupants, and grid operators
- **Replicable operations & business templates**
- **AI-driven, automated control software**
- **Template for renewable integration** in solar & wind-poor, natural gas-rich Midwest PJM service territory

**Key Takeaway** Uniquely qualified team piloting template for rapid transition to renewables in one of US's most difficult regions

# Keys to a Successful Journey – A True Partnership

## Keys to Success

### *Partners Strength*

*Make it easier to succeed than to fail*

- **Balanced risks and rewards**
- **Flexibility**
- **A dispute resolution staircase**
- **Diligent attention and advocacy**
- **Alignment**

# Lessons Learned: Why Partnerships Have Worked

- Evaluate each opportunity based on its merits and risks
- Develop the right oversight structures and performance requirements
- Build flexibility into contract to allow for change over time
- Identify risks and mitigate them carefully
- Engage with campus community
  - Utilize expertise
  - Identify touch points – opportunities for collaboration
  - Answer questions to build confidence
- Demonstrate value proposition with tangible benefits



# Questions?

Thank You!

**Francois Gressier**

