



A Model for Sustainability Success: The Ohio State University's Integrated Energy Solution

A Quest to Advance Visionary Sustainability Objectives Provides a First-of-Its-Kind Opportunity to Enhance the University's Academic Mission While Increasing Energy Efficiency, Furthering Environmental Commitments, and Ensuring Reliable Supply

For nearly 150 years, The Ohio State University's campus in Columbus has been a place of achievement, leadership, and innovation.

As one of the largest individual campuses of any university or college in the United States, The Ohio State University's Columbus campus serves approximately 59,400 students and 43,800 employees. More than 100,000 people rely daily on its 485 buildings, occupying a 25-million-square-foot footprint that spans nearly 2,000 acres.

In a move to strengthen its position as a leading academic institution, Ohio State in 2014 embarked on an ambitious path toward becoming an international pioneer in sustainability. A call for proposals was issued for a concession agreement covering the university's energy management program. The goal was to find a private-sector partner with critical operational, technical, and financial expertise.

An intensive evaluation process lasted nearly three years, as the University

conducted detailed reviews of 40 qualified bidders. Proposals were analyzed on the basis of academic collaboration, technical qualification, human resources components, and financial commitment.

ENGIE Emerges as the Strongest Bidder

It was concluded that Ohio State Energy Partners – a consortium made up of ENGIE North America and Axiom Infrastructure – was the strongest bidder. ENGIE and Axiom are long-term operators and investors with an extensive track record of successfully partnering to manage a portfolio of large-scale wind and solar installations in Canada totaling 680 MW.

With the infrastructure investment strength of Axiom, ENGIE is well positioned to help commercial and industrial customers operationalize energy management in ways that maximize the opportunities available in the marketplace. Operating in North America for more than 45 years, ENGIE manages a range of energy businesses

in the United States and Canada that can be leveraged to develop cleaner, smarter, more innovative solutions.

As Ohio State Energy Partners, ENGIE and Axiom proposed a plan to create a \$1.165 billion public-private partnership contracted under a 50-year integrated solutions agreement to provide the following services: utility system management, supply procurement consulting, implementation of sustainability programs, and investment in new academic opportunities.

"Financial close of this 50-year concession is a milestone in a truly groundbreaking partnership," said Frank Demaille, CEO of ENGIE North America. "ENGIE, together with Axiom, looks forward to advancing new possibilities with the Ohio State community, from improving ways to heat, cool, and power the campus to collaborating on potentially transformational technologies and services that someday could be shared far beyond Columbus."





Utility System Management

The plan includes implementation of a solution to operate and manage Ohio State's utility system, which includes the annual production of 1,896,860 kLbs of steam, 67,055 kTon-hrs of chilled water, and 2,400 tons of cooling and 26,000 MBH of heating – the last two via a geothermal system.

ENGIE operates 250 district energy systems globally, making the company one of the most qualified operators of such utility systems in the world. With a broad background in utility asset operations and energy efficiency services, ENGIE is well versed in proposing and developing capital improvement projects and managing their construction.

Since 2004, Ohio State has invested nearly \$340 million to upgrade its utility system. Ohio State Energy Partners is now executing a plan to deliver higher rates of return for the energy infrastructure investments on campus while improving energy efficiency to achieve sustainability goals.

Ohio State's research and medical facilities have always been significant drivers of energy use, and strategic expansions of these facilities are expected to increase future energy demand. The recent construction of new student housing, initial construction of an Athletics District, and potential construction of an interdisciplinary health sciences center, a new hospital tower and an ambulatory services building will also intensify consumption growth and utility system demands in the near term.



Supply Procurement Consulting

ENGIE will manage the strategic investments and operations related to the utility system while also providing supply procurement consulting. As one of the largest electricity customers in the Buckeye State, Ohio State's Columbus campus consumes 676 GWh of power, 4 BCF of natural gas, and large amounts of other energy commodities.



Customized

Customer at a Glance: The Ohio State University

Utility System Management



485 buildings

24 million square feet

Consumes **676** GWh of power

1,896,860 kLbs of steam

67,055K kTon-hrs chilled water



Supply Procurement Consulting

676 GWh of power

4 BCF of natural gas and other energy commodities



Sustainability Program Implementation

Guaranteed minimum **25% reduction**

in energy consumption per square foot

within 10 years

within a \$250 million or less ECM program



Academic Collaboration

\$150 million investment in

academic initiatives

\$50 million of which is devoted to a new

Energy Innovation Center

ENGIE's ability to balance investments in the utility system and anticipated demands on it while also identifying key procurement opportunities in the market was critical in its selection.

“Our strengths in facility management, supply, distributed generation, and efficiency allowed us to provide a portfolio of solutions specifically tailored to Ohio State’s near-term and long-term plans,” said Ken Cowan, Vice President of Solution Sales and Marketing at ENGIE.

“These comprehensive capabilities will prove particularly beneficial as the university may consider the installation of a combined heat and power facility.”

With 100 percent of Ohio State’s utility system operating on electric power, a combined heat and power facility would provide significant opportunities to increase efficiency and resiliency while hedging against rising utility costs. The combined heat and power infrastructure would be the first microgrid on campus, allowing for future microgrids and other distributed energy and demand-side management solutions to be integrated as potential components of the plan. Doing so would further improve power

quality and reliability while establishing new revenue potential.



Sustainability Program Implementation

In addition to reducing energy costs and consumption per square foot through optimization and further investments in the utility system, the partnership plans to implement a number of energy conservation measures. Considering everything from lighting to HVAC systems, these turnkey efficiency solutions represent a significant capital investment toward the goal of achieving a 25 percent reduction in energy use intensity per square foot within the first 10 years of the agreement.



Academic Collaboration

As part of the Ohio State Energy Partners agreement, a \$1.015 billion upfront payment was made to the university, representing the largest single investment in support of Ohio State’s academic mission to date. An additional \$150 million commitment was made to support academics in those specific areas requested by students, faculty, and staff during the bidding process. These include:

- **A \$50 million Energy Advancement and Innovation Center for energy research and technology commercialization.** The center will be a hub where faculty members, students, alumni, ENGIE researchers, local entrepreneurs, and industry experts can work together on the next

generation of smart energy systems, renewable energy, and green mobility solutions.

- **A \$25 million endowment for undergraduate, graduate, and post-grad/professional student financial aid projected to generate at least \$1 million a year in student support for at least 50 years.**
- **Funding of \$5 million for at least 500 internships over the life of the agreement.**
- **An investment of \$20 million in sustainability and staff development,** including \$15 million to support sustainability initiatives outside the scope of the Ohio State Energy Partners.
- **The dedication of \$9.5 million in endowment funds to support five faculty positions.**
- **Contributions of \$40.5 million to university-related philanthropic organizations.**

ENGIE’s Integrated Business Solution: A Unified Approach for Optimization

By leveraging its broad-based industry expertise to combine supply, demand, and operational solutions into a single strategy, ENGIE is delivering a unified approach to comprehensive energy management for Ohio State.

Ensuring reliable service continuity will avoid disruptions in energy supply. New revenue opportunities will be unlocked as procurement is more closely aligned with key market opportunities.

And reducing supply-price risks will provide more predictable and stable costs over time.

Operational costs will be reduced as facilities are optimized, drawing on ENGIE's experience and expertise in all phases of the energy value chain. Improvements in energy efficiency and reductions in energy consumption per square foot will be achieved through

technological advancements and increased data access. And improved energy independence will support long-term contingency planning to mitigate risks related to the changing environment and energy availability.

Ohio State's aspirations to build this pioneering model for sustainability can be applied to a wide range of industries. Other higher education organizations

as well as businesses in healthcare, food services, and business services can reap similar benefits. To see how ENGIE's integrated business solutions can support your energy management, budgeting, and sustainability objectives, visit www.engie-na.com.

ENGIE at a Glance



ENGIE is in **70 countries**
and employs 153,000 experts

An unparalleled
balance sheet
you can leverage.

"A/A1"
credit rating
from Standard & Poor's/Moody's



No. 1
Independent power
producer in the world



No. 4
Electricity supplier
to non-residential U.S. customers



Nearly **100%**
of ENGIE's generation in North
America is low carbon or carbon free



No. 1
Energy efficiency services
provider in the world



No. 1 LNG Supplier
in the United States

160 MW



of on-site solar installed for customers in the U.S.



More than **48 MWh**
of energy storage projects