



SUNY-ESF

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Progression of Campus Sustainability Planning

2003: ESF adopts Vision 2020 strategic plan

2008: King & King completes Combined Program of Study

2009: Architerra begins Gateway Center design

ESF submits its climate action plan, ECN 2015

2010: ESF breaks ground on Gateway Center

2013: Gateway Center opens



The Design Firm

Architerra Inc. is a Boston-based architecture and planning firm dedicated to advancing sustainable design across a broad range of project types. The firm was established in 2004 by Ellen Watts and Dan Aros, who were soon joined by a third principal, Daniel Bernstein. Architerra's staff is 100 percent LEED accredited.

Architerra has been responsible for the planning and design of 28 green buildings and sustainable campus plans, including seven buildings designed to LEED Gold and Platinum standards.

ESF's Gateway Center

Innovative, integrated, high-performance design generates significantly more energy than the building consumes.



The ESF Gateway Center overlooks Forestry Drive.

ESF's Gateway to Sustainability

The SUNY College of Environmental Science and Forestry's (ESF) Gateway Center houses space for conferences, events, exhibitions, administrative offices and food services. As part of the transformational expansion of the ESF campus, the Gateway Center gives visitors a snapshot of what ESF represents. The design of this high-performance building explores financially feasible and technologically sound strategies to operate using renewable energy, produce its own power, create a carbon-neutral facility, and conserve resources in innovative ways. The building is designed to achieve LEED Platinum certification.

How Is U.S. Green Building Council LEED Platinum Certification Determined?

LEED certifications are awarded according to credits earned in seven topic areas, such as water efficiency, energy and atmosphere, and materials and resources. A Platinum distinction requires the highest standards in these areas, as determined by the following point distributions:

- Certified 40–49 points
- Silver 50–59 points
- Gold 60–79 points
- Platinum 80 points and above

To learn more about the U.S. Green Building Council and LEED certification visit: www.usgbc.org/.

Environmental Innovations

Utilizing green building standards makes the Gateway Center a representation of ESF's academic programs.

Gateway Center Energy Features

- Contains 50,000 square feet of space
- Produces significantly more energy than it consumes
- Features a roof-mounted solar thermal system
- Houses a biomass-fueled combined heat and power system
- Employs a natural ventilation system with radiant floor heating
- Features lighting occupancy sensors and natural day lighting controls

Learn more about existing green building features at ESF:

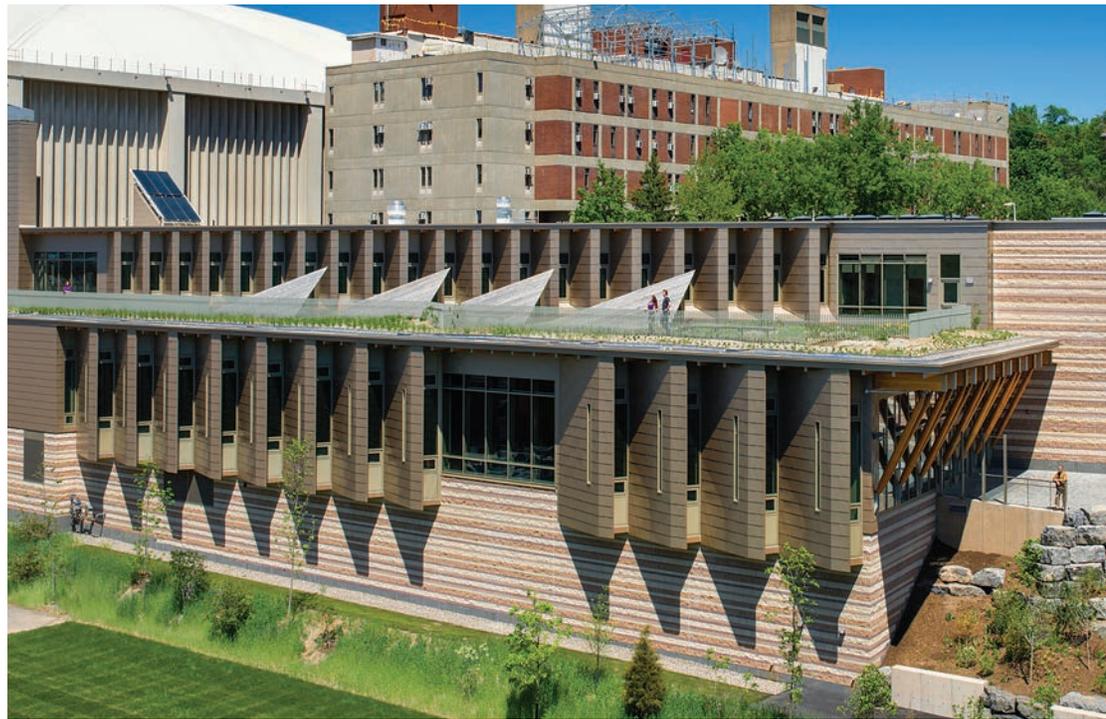
www.esf.edu/sustainability

The Gateway Center's Other Features

The Gateway Center includes a number of elements that enhance student life and fulfill a variety of needs for the campus community.

They include:

- An event center
- A new and larger College Bookstore
- An exhibition gallery
- A new College cafeteria
- A sustainable green roof made from native plants with a walkout observation deck
- Roof-mounted photovoltaic and solar thermal systems
- A fitness center



The Gateway Center's green roof consists of native plants.

Gateway Center Features

- Serves as the “gateway” to the ESF community and a benchmark for the College’s second century of leadership in environmental education
- Acts as the physical representation of ESF’s academic programs and institutional commitment to sustainability
- Decreases ESF’s fossil fuel dependence and energy costs
- Reduces campus carbon footprint
- Utilizes the local biomass effectively and efficiently
- Features a vegetated roof consisting of specialized plant communities to provide teaching and research opportunities

Systems Design

- Begins with a high-performance building envelope; a bioclimatic façade controls thermal loss and solar gain to minimize building design loads
- Integrates building design with innovative energy systems connecting to campus infrastructure
- Uses renewable fuels to contribute to the reduction of ESF’s carbon footprint
- Showcases a variety of technologies to further research, community engagement and ESF’s educational mission

Creating Sustainable Energy

The Gateway Center was designed to use 36 percent of the energy consumed by a typical, comparable building.

Gateway Center Energy Use

- Annual energy use: 1,874 million Btu
- Energy intensity: approximately 37 kBtu/sf/yr

Gateway Center Energy Technologies

- 8,000 MBtu CHP wood pellet steam boiler
- 8,000 MBtu natural gas boiler
- 200 kW back-pressure steam turbine
- Three 65 kW CHP natural gas microturbines
- Solar thermal demonstration project
- 100 kW solar PV array

CHP System Output

Thermal Output

Provides more than 65 percent of campus heating needs (35,000+MMBtu/yr)

Electrical Output

Provides more than 20 percent of campus electrical needs (2,000+ MWh/yr)

Environmental Impact

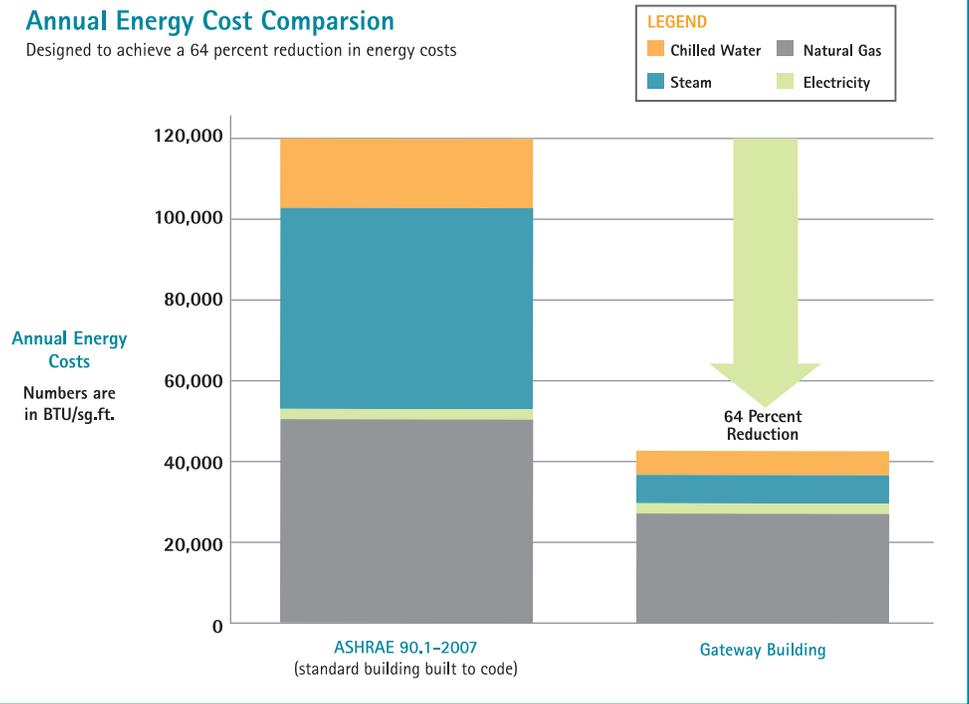
Targets more than 22 percent reduction in campus carbon footprint (2,700 MTCO₂e/yr)

Additional Savings

- 25 percent improvement to overall efficiency of energy produced for the Gateway Center and ESF campus
- Annual savings is the fossil-fuel offset equivalent of some 9,000 barrels of oil or 2,500 short tons of coal

Annual Energy Cost Comparison

Designed to achieve a 64 percent reduction in energy costs



Gateway Center Energy System Overview

The Gateway Center includes the construction of a new combined heat-and-power (CHP) system that provides steam and electricity to the Gateway Center and four additional campus buildings.

While the four turbines generate electricity, the resulting heat is recovered from both the steam boiler and turbine exhausts for distribution to the campus and for use, via heat exchangers, in the Gateway Center itself. Cooling is provided by the existing high-performance chiller plant in ESF's Jahn Laboratory.

Benefits of CHP System

- Twice as efficient as traditional technology
- Heating system captures waste energy and converts it to electricity so there is minimal thermal energy waste output; electricity-generating systems capture waste energy and use it for heating; low-quality energy is not wasted and is instead used for heating
- Runs on biomass

Cost of a CHP System

- Total cost: \$3.2 million
- Annual savings: \$350,000
- Grants and incentives: \$963,000 (from NYSERDA)
- 15-year net present value: \$1.5 million

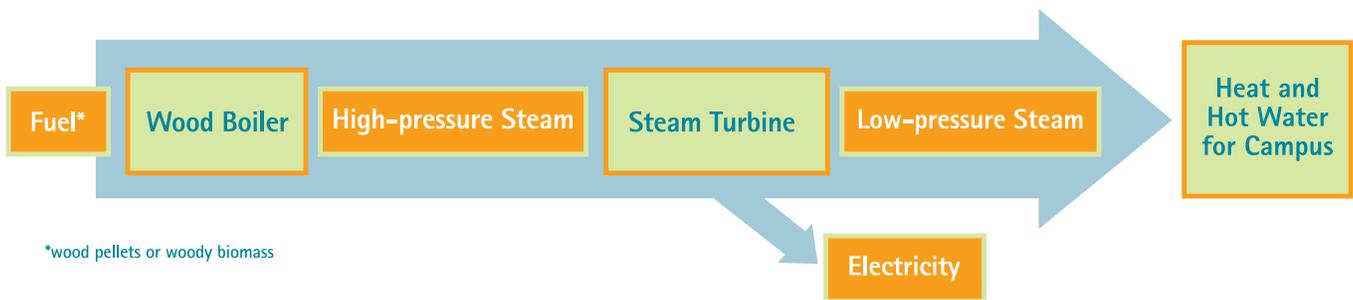
Using Sustainable Energy

How Combined Heat and Power (CHP) Works



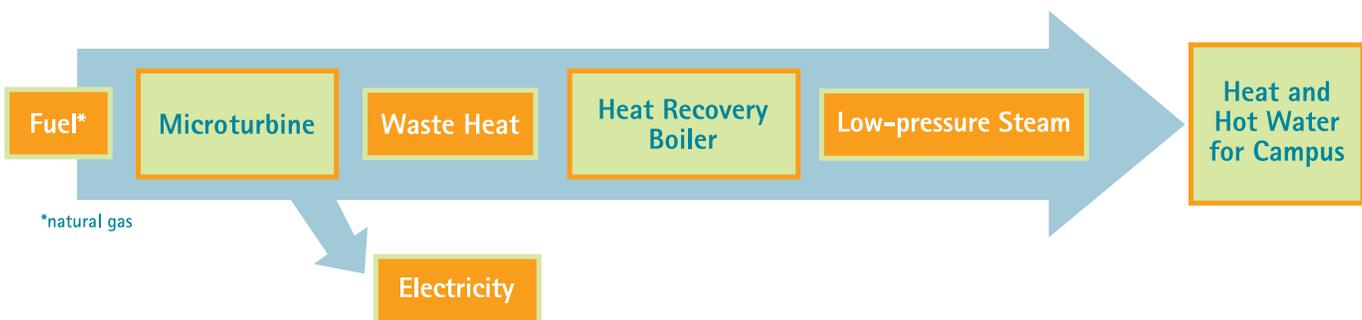
Gateway Center Biomass System

The CHP System operates consistent with ESF's thermal (heat and hot water) needs. The thermal-rich biomass system operates eight to nine months per year to meet campus heating needs.



Gateway Center Natural Gas Microturbine System

The natural gas microturbines with more balanced electric and thermal output operate 12 months per year to meet campus electric and heating needs.



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