HIGHER EDUCATION

DECARBONIZATION STRATEGIES FOR A NET ZERO CAMPUS

SUSTAINABLE CAMPUS INITIATIVES ATTRACTING A NEW GENERATION OF ENVIRONMENTALLY CONSCIOUS STUDENTS

"With increasing concern about climate change, particularly among younger people who will be most affected by its long-term impact, we are seeing increasing interest among college applicants in attending green colleges," said Rob Franek, Editor-in-Chief of the Princeton Review.[1]

In a time where sustainability and environmental consciousness is at the forefront of conversation, the role of higher education institutions is rapidly evolving. Today's college students are not just seeking education; they're also looking for institutions that align with their values, particularly when it comes to sustainability and combating global warming. This shift in mindset makes decarbonization efforts critical for universities to embrace, not just for moral obligation, but also for strategic recruitment and retainment.
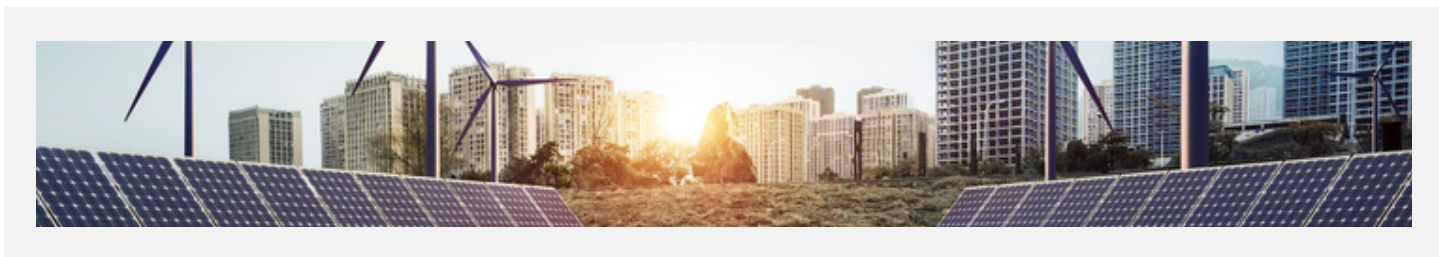

Attracting the New Generation of Students

Universities that prioritize decarbonization, energy efficiency, and sustainability are more likely to attract the new generation of students. Campuses with green initiatives, renewable energy sources, and sustainable practices not only draw in environmentally conscious students but also foster a culture of eco-awareness and activism.

There are a variety of strategies that higher education institutions can implement to decrease their carbon footprint and achieve decarbonization goals.

- Develop a decarbonization roadmap to set and achieve defined goals and objectives.
- Invest in smart building technologies to optimize energy usage, monitor performance, and identify areas of improvement.
- Upgrade old, energy-intensive building equipment to smart, high-efficiency equipment.
- Incorporate renewable energy resources to future-proof operations against regulatory changes and requirements.

1. The Princeton Review. "The Princeton Review's Guide to Green Colleges: 2024 Edition." The Princeton Review, 7 July 2024, https://www.princetonreview.com/press/green-guide/press-release-2024. Accessed 11 July 2024.

DEVELOP A DECARBONIZATION ROADMAP

Every customer's journey towards decarbonization is different. Developing a customized roadmap outlines a strategic plan for colleges and universities to transition towards a low-carbon or carbon-neutral future.

Decarbonization roadmaps include a series of steps, goals, and initiatives aimed at reducing greenhouse gas emissions, increasing energy efficiencies, and promoting sustainability across campus operations. Starting with energy benchmarking, universities can track campus energy consumption and usage and compare the data against historical performance and industry standards. The data collected supports identification of inefficiencies on campus and helps establish realistic goals for improvement.

In addition, the process assists in the development of methodologies and practices to minimize or even prevent greenhouse gas emissions during installation, operation, maintenance, retrofit, and decommissioning of buildings and mechanical systems. Furthermore, advanced metering provides live-data information into overall energy performance and offers insights that reduce unplanned outages and premature equipment failures and helps reduce overall energy consumption.

Developing and implementing a decarbonization roadmap is crucial for institutions because it provides a structured approach to address environmental challenges, align with global climate goals, and meet the expectations of environmentally conscious students and stakeholders. By setting clear targets, identifying key actions, and tracking progress, universities can drive meaningful change, foster innovation, and position themselves as leaders in sustainability within the higher education sector and beyond.

What Does a Decarbonization Roadmap Entail?

Energy master plans that pull data from multiple sources including energy meters, building management systems, controls, and other mechanical and electrical equipment to benchmark energy performance.

INVEST IN SMART BUILDING TECHNOLOGIES

Advancements in smart building technology have transformed how higher education institutions operate and offer services. By adopting these cutting-edge technologies, universities and colleges can boost sustainability, safety, and efficiency, while enhancing the teaching and learning experience.

Smart building technologies optimize learning environments through a single pane of glass via Internet of Things (IOT)-based smart sensors and controls. The smart sensors automatically adjust to user-specified settings when a space is occupied vs. unoccupied. This capability ensures consistent student and staff comfort while saving on maintenance time and costs. In addition, the sensors provide facility staff with actionable insights into daily operations.

Building management systems (BMS), which integrate and streamline the IOT-based sensors, allow for programming that can attain the highest efficiency standards tailored to each space. Furthermore, customizable dashboards provide insights into performance which further help save time and costs associated with maintenance and operations. These data insights can be used to proactively maintain and respond to faults detected within the BMS.

Achieve Your Facility Optimization Goals with Smart Building Technologies

- Master Systems Integration
- Energy Metering, Reporting, & Tracking
- Thermal Control (Temperature & Humidity)
- Smart Lighting Controls
- Mechanical System Integrations
- Fault Detection & Diagnostics

UPGRADE OLD, ENERGY-INTENSIVE BUILDING EQUIPMENT

Installing energy-efficient boilers, chillers, heat pump technology, and LED lighting can lead to substantial energy savings.

Upgrading mechanical and electrical equipment to energy-efficient models is a significant step towards enhancing sustainability on college campuses. These modern systems not only contribute to reducing energy consumption and greenhouse gas emissions, but also offer additional benefits that positively impact the overall learning environment and well-being of students, faculty, and staff on campus.

Energy-efficient HVAC, boiler, and critical power equipment are designed to operate with greater efficiency, meaning they use less energy to achieve the same level of heating, cooling, ventilation, and power compared to older, less efficient models. By lowering energy demand, energy-efficient equipment and systems help decrease the college or universities' carbon footprint.

Equipment Solutions for Both New and Existing Infrastructure

HVAC
Applications that support energy efficiency upgrades, design requirements, and support of thermal management & heat rejection.

Boiler & Combustion
Boiler, combustion, and burner products and services to support energy reduction and optimized performance through engineering, system implementation, & operation.

Critical Power
Facility power distribution, life safety, and mission-critical reserve power system support. Engineering, planned, & emergency services.

Data Center
Specializing in Vertiv Thermal Management and IT infrastructure products with support services for IT Network Edge, Enterprise Server Room, & colocation environments.

Parts Inventory
Local parts inventory and regional access to OEM HVAC, Boiler, and Generator systems. Stocking programs and spare parts management.

Service Support
Factory-trained and OEM certified to implement, startup, test, and commission to specification requirements. Planned maintenance & emergency response.

INCORPORATE RENEWABLE ENERGY RESOURCES TO FUTURE-PROOF OPERATIONS

Integrating renewable energy sources into campus infrastructure goes hand in hand with upgrading building controls and equipment to achieve comprehensive decarbonization goals.

With all the technology available for colleges and universities to power their campuses, those that are early adapters of renewable energy initiatives have seen immediate results. Battery energy storage solutions, microgrid applications, and solar technologies offer sustainable alternatives that not only reduce reliance on fossil fuels but also contribute to lower carbon footprints and long-term environmental sustainability.

Battery Energy Storage & Microgrids

Microgrids make it possible for the lights to stay on when the power goes out. For large energy consumers like colleges and universities, this means ensuring uptime of business-critical loads, all while reducing operating costs and meeting sustainability goals.

Microgrids co-locate electricity generation and consumption. Unlike the utility grid, which generates electricity in a centralized power plant and then distributes it along hundreds of miles of transmission lines, a microgrid generates electricity on-site.

In addition, microgrids support multiple use cases, including demand response, power factor correction, renewable energy integration and resiliency, critical load support, and backup generation.

According to the United States Environmental Protection Agency (EPA), more than 40 colleges and universities in the U.S. currently obtain 100% or more of their electricity from renewable energy sources.

Solar Development

Solar energy has become increasingly popular for campuses that are focused on utilizing clean and renewable power. Solar panels installed on rooftops, parking structures, or open areas can generate electricity directly from sunlight, providing a reliable and sustainable energy source.

By utilizing solar energy, universities can reduce their dependence on grid electricity, decrease greenhouse gas emissions associated with conventional power generation, and lower energy costs over time.

Renewable Energy Initiatives to Implement

- ◢ Battery Energy Storage (BESS)
- ◢ Microgrid on a Skid
- ◢ Solar Development

INVEST IN YOUR SCHOOL'S FUTURE

State and federal funding programs, incentives, and grants are readily available for colleges and universities to invest in energy upgrades.

Recognizing the importance of decarbonization in mitigating climate change, state and federal incentives, grants, and funding programs have been established to support higher education institutions in their sustainability and decarbonization efforts.

Many states have established green funds or sustainability grant programs specifically aimed at higher education institutions. These programs often provide financial incentives for implementing energy-efficient equipment, installing solar panels, or developing microgrid and battery storage solutions. Additionally, state utility companies may offer rebates or performance-based incentives for schools that achieve measurable reductions in energy consumption.

Stark Tech works directly with higher education institutions and engineering firms to analyze, design, and implement sustainability strategies that help accomplish the unique goals of the campus. Our team collaborates with your in-house facilities team to meet compliance codes and state guidelines to qualify for funding assistance.
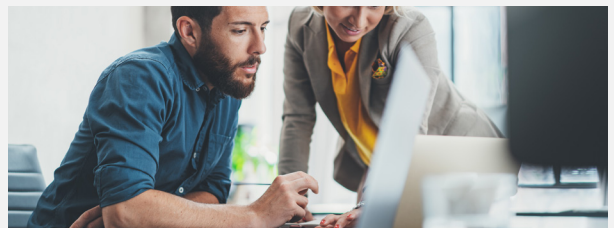
DECARBONIZE FOR THE FUTURE.

State and Federal Funding Programs & Grants

- NYSERDA Clean Green Campuses
- NYSERDA C&I Carbon Challenge
- DASNY Environmental Programs
- US Department of Energy
- BuildSmart 2025

Support for Services Including:

- Energy Audits & Energy Master Planning
- Indoor Air Quality Studies
- Energy Efficiency Modifications
- Clean Heating/Cooling
- Renewable Energy Integration
- Smart Temperature and Lighting Controls
- Turnkey Project Management

For more information on how Stark Tech can advance your institution's sustainability goals, and help you obtain the funding to do so, visit starktech.com.