Berkeley Clean Energy Campus

Update: November 2023

First phase is underway with expected completion in 2028!

The Clean Energy Campus will replace UC Berkeley's natural gas-fueled cogen plant that supplies 90% of campus energy -- and has less than 10 years of usable life -- with a model 21st century, clean energy microgrid.

Implementation of the Clean Energy Campus began in 2023 with a capital investment of $249 million from the State of California. Engineering and design studies are nearing completion, and pre-construction designs will be complete in 2024. **Construction is ready to begin in 2025 on the first of two project phases.**

Phase one is on-track be completed as early as 2028 and includes the new electrified central plant for heating and cooling and a distribution network required to connect a majority of campus buildings. The most energy-intensive buildings will be prioritized for connection in the first phase, and the remaining buildings will be connected in phase two that will take an additional two years to complete.

Phase one benefits realized in 2028:

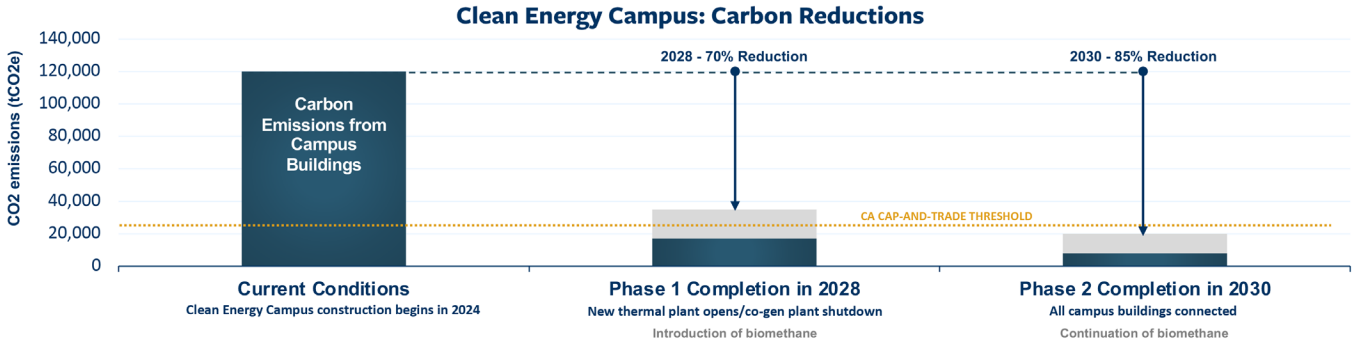
- 70% — Reduction in carbon emissions from campus buildings.
- 75% — Campus building thermal needs facilitated by the new central plant.
- 100% — Fully-operational central plant with capacity for every building.
- Shutdown and decomissioning of existing cogeneration plant.
- **$200 million** in avoided costs from upkeep of existing systems.

Phase one also introduces on-site solar energy production, large-scale battery storage, geothermal heat exchange, and fuel cells. Critically, completion of the first phase of the Clean Energy Campus will also provide for the total shutdown of the aged natural gas-fueled cogeneration plant.

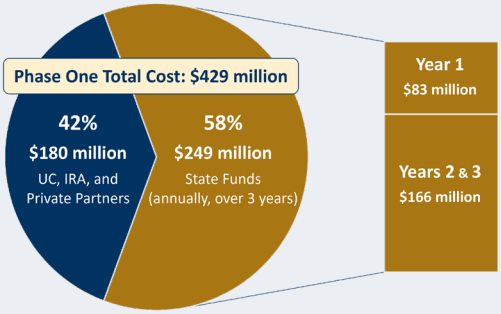
Carbon reduction impacts of phase one actions alone are transformative.

Phase one will reduce campus fossil-fuel combustion by 85% and achieve a 70% reduction in related carbon emissions. These substantial reductions combined with biomethane credits will move UC Berkeley below California's cap-and-trade regulatory threshold in 2028. When the second phase of the Clean Energy Campus is complete two years later, the campus will achieve an astounding 85% reduction in fossil fuel carbon emissions from building energy use.

The Clean Energy Campus is a model for all of California and demonstrates on the scale of a medium-sized city the transition to a 100% clean energy future. UC Berkeley will become an invaluable resource for others seeking to rapidly decarbonize and a living laboratory for testing and implementing future green technologies developed in California and throughout the world.



Leveraging funds for the first phase of the Clean Energy Campus.



State funds:

- Completion of designs and technical schematics for the entire new system, including new plant, distribution, and distributed energy resources.
- Implements essential make-ready projects to accommodate increased campus-wide electrical demand and central cooling towers.
- Detailed plans and drawings to begin construction.
- Construction funding to build phase one.

The Inflation Reduction Act (IRA) will play an ever-more important role in funding the Clean Energy Campus. The campus is identifying how the IRA can significantly leverage funding allocated by the State.

Realizing substantial cost savings. Phase one alone will achieve **$200 million in avoided costs** associated with the upkeep of cogen plant and the aged steam system, and replacements of in-building equipment if the old system was left in place. Phase two will achieve another $100 million in similar avoided costs. Additionally, the Clean Energy Campus is estimated to bring a total 20-year operational savings.

State investment is our catalyst. The faster the Clean Energy Campus can be completed, the greater the savings that will be realized, and the quicker UC Berkeley can move significantly away from fossil fuel combustion and demonstrate for others rapid large-scale decarbonization.

New central thermal plant and building connectivity.

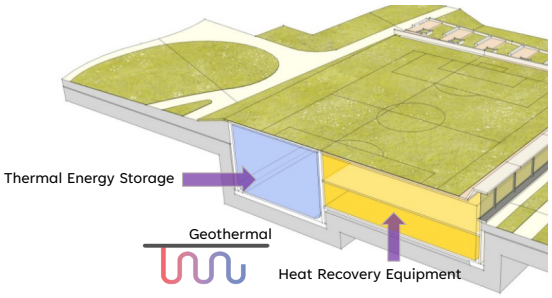
When construction of phase one is completed, UC Berkeley's fully-functional clean energy microgrid will include:

- A new central electrified heating and cooling plant capable of serving more than 12 million square feet of building space.
- Thermal storage in the new plant that is enhanced by geothermal heat exchange wells underground and designed to use recycled water.
- Thousands of feet of thermal distribution piping and new in-building equipment to replace aged steam systems with efficient hot and cold water systems.
- A new electrical switch station in a restored historic building that is currently vacant, which will power the new central plant.
- 15 MW of on-site rooftop, carport, and ground-mounted solar photovoltaic (PV) systems.
- 8 MW of green hydrogen-ready fuel cells.
- 30 MWh of battery storage.

Realizing benefits for all of California.

Construction will generate hundreds of regional construction jobs at the prevailing wage, stimulate tens of millions of dollars into the California economy, and activate vital job training programs and apprenticeships in the energy field. The Clean Energy Campus presents a unique opportunity to advance knowledge in renewable energy, project finance, and data science through engagement in the system's design and operations.

UC Berkeley is ready to model the transition to California's low-carbon, resilient, and equitable energy future. The Clean Energy Campus provides state-wide economic benefits, facilitates traditional labor into skilled green-energy jobs of tomorrow, and creates a living repository of clean energy knowledge and know-how. The campus is ready to demonstrate to the world that meaningful, large-scale rapid impacts are possible in the limited amount of time remaining to address the exponential impacts of climate change.



Above: The new plant will utilize an underused field in the central campus and a majority of the core energy systems will be underground, including plant equipment, thermal energy storage tanks, and geothermal systems. A new recreation field will be installed on the roof.

Above: The new plant will provide views into the inner workings of the facility and offer a community learning center.

Berkeley
UNIVERSITY OF CALIFORNIA

Marc Fisher, Administrative Vice Chancellor
Sally McGarrahan, Associate Vice Chancellor for Facilities Services
Kira Stoll, Chief Sustainability & Carbon Solutions Officer

cleanenergycampus.berkeley.edu

cleanenergycampus@berkeley.edu