

NET ZERO ENERGY SYSTEM TUTT LIBRARY

SUSTAINABILITY AT COLORADO COLLEGE

Off-Campus Solar Array Located in Colorado Springs to further offset emissions.

Tutt Library Solar Array
Solar supplies a portion of the library's electrical usage. The rest is fed back into the municipal grid.

Grid-Tied Solar Power
Excess on-roof solar power is sent back to the Colorado Springs Utility grid, replacing highly carbon-intensive coal energy with zero emission energy.

Green Roofs
Building planters add beauty and habitat, insulate, and control heat gains.

VRF
Is a high-tech system that effectively and precisely moves heat throughout the building.

This means rooms receiving less or more sun can be conditioned appropriately.

Why Natural Gas?
The CHP system uses 100% natural gas to generate electricity. This cleaner burning fuel source produces a 1/3 less carbon than the nearby coal power plant.

CHP
Combined Heat and Power [CHP]
Heat from the exhaust is either pumped into the building's heating system or sent to the campus heat distribution system.

Natural Gas Generator
A portion of the electricity for the building is generated from an on-site generator that runs on cleaner burning Natural Gas.

Rain Screen
The red-orange ribbon circumnavigating the library is held away from the building, creating shading to avoid solar gains and an air channel behind the screen to dissipate heat that would otherwise be absorbed by the wall and into the building.

Achieving Net-Zero Carbon

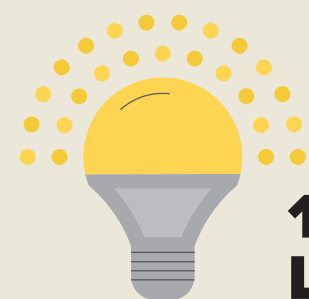
- Switch to a cleaner energy source: **Natural Gas**
- Utilize excess heat energy from the natural gas generator
- Upgrade systems to improve overall building performance
- Offset carbon output from natural gas generator by putting renewable power back on to the grid.

Geothermal Heat Exchange

Dual-Direction Flow

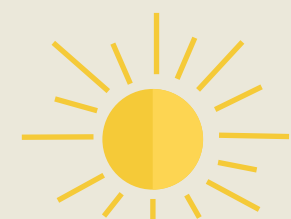
80 geothermal boreholes were drilled 400ft deep under the Armstrong Quad to circulate water to and from the library. During the cooling season, heat is expelled from the building and stored in the ground or sent to other buildings on campus. In the heating season, the library draws on that stored heat and existing geothermal heat to efficiently warm Tutt Library.

Efficient Design Elements

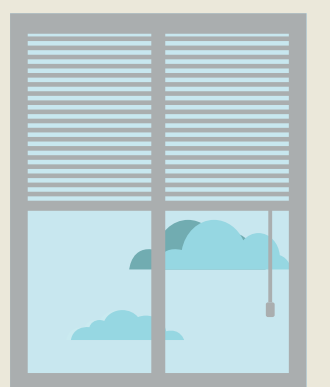


100% LED Lighting

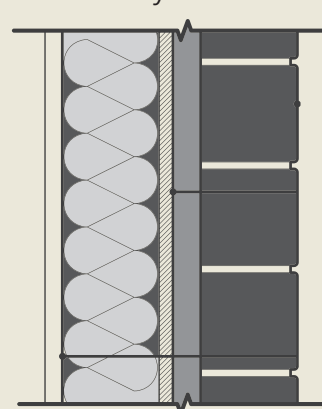
Occupancy sensors and daylight sensors ensure maximum energy efficiency.



Daylit Windows & Blinds



Glazing is placed to let the sun into the building to naturally light the interior space reducing the need for artificial lighting. Strategically placed blinds keep the building cool during the hottest parts of the day.



Increased Insulation

Improves energy efficiency and helps to keep the building warm during cooler months of the year and cool during warmer months of the year.