



SHOWCASE PROJECT: REI NET ZERO ENERGY DISTRIBUTION CENTER

SOLUTION OVERVIEW

REI's LEED® Platinum distribution center in Goodyear, Arizona, which opened in July 2016, was designed to be a zero energy facility. The 400,000 square-foot facility is located on 34 acres outside of Phoenix. It employs more than 200 people and supports more than 40 percent of the co-op's sales.

SECTOR TYPE

Commercial

LOCATION

Goodyear, Arizona

PROJECT SIZE

400,000 square feet

SOLUTIONS

The Rocky Mountain Institute led a three-day design session early in the process, and Environmental Defense Fund Climate Corps fellows helped determine the financial feasibility of the project. To encourage further innovation, REI is making the design information of the facility available to the public, so that others can learn from and leverage REI's sustainable design advances.

REI set a clear expectation of zero energy for all project stakeholders, which pushed the team to find innovative approaches to save energy and to collaborate more closely. It also set high expectations for subcontractors to right-size equipment.

To achieve its goals, the following renewable energy, energy efficiency, and water efficiency solutions were implemented:

- A 2.2 megawatt solar system was installed, which produces enough renewable energy on-site to power 390 homes for a year. It is expected to power the entire facility, bringing REI's overall energy savings to 101.6% and providing REI with the equivalent of 20 years of free energy. The size of the solar array was modeled to allow for skylights to provide natural

light at workstations throughout the building.

- A solar array covers 280,000 square feet of roof space, and the city of Goodyear's power station is located adjacent to the facility, which helps reduce energy loss through transmission. The public electric grid acts as a "continuous battery," with power being sent to the grid during the day and pulled back at night. REI plans to store power onsite using banks of batteries in the future.
- The distribution center also features a non-evaporative cooling system which helps reduce the number of roof-top-units needed down to just four units, as opposed to the roughly 100 that would typically be required in a desert environment. This saves millions of gallons of water every year, and is helped by the fact that REI uses fans to stir the air within the building to reduce the temperature differential between floor and ceiling to just a few degrees.
- REI also prioritized employee comfort when designing this building. Employees can control their own microclimate through innovative hyperchairs, which incorporate individual fans and heating elements, allowing them to heat or cool individual office chairs. This increases comfort while using less overall energy by allowing set points to be higher than they otherwise would be. In the future, REI hopes to connect these chairs to the EMIS system, which can adjust responsively to the collective needs of the staff.

OTHER BENEFITS

A major benefit of this project is that it will help restore the nearby Verde River, enhancing water flows and recreation access. In partnership with Bonneville Environmental Foundation (BEF) and The Nature Conservancy of Arizona, REI will also help modernize irrigation infrastructure to conserve water and enhance flows for recreation and wildlife, protect farmland and limit development and water extraction in sensitive areas, and remove invasive plants to restore river habitat. This project has led the USGBC to recognize Water Restoration Certificates for LEED points, and REI is the first company to apply for these credits. To learn more, [click here](#).

This facility is also the industry's first omni-channel one-touch fulfillment system, which enables one person to process items eight times faster than at a typical distribution center by using robotic shuttles to move products to staff. This allows REI to combine retail and customer orders at each workstation.

Annual Energy Use

(Source EUI)

BaselineASHRAE
90.1-2007()

45 kBtu/sq. ft.

Actual(2019)

30 kBtu/sq. ft.

Energy Savings

33%

Annual Energy Cost

BaselineASHRAE
90.1-2007()

\$450,000

Actual(2019)

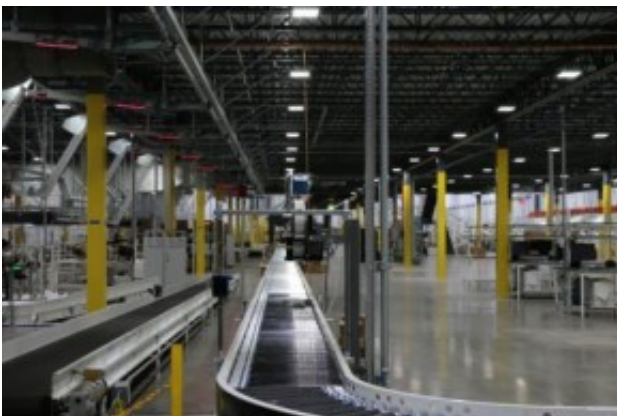
\$220,000

Cost Savings

51%



REI's net zero distribution center



Inside the REI distribution center



REI's net zero distribution center