CLEER's Navigator Helping Garfield County Buildings Take a Bite out of Energy Use

Most residents of Garfield County are well aware of the many solar panels on area buildings' roofs and nut there's a new device that's doing the heavy lifting when it comes to cutting fossil-fuel-based energy use in the county.

The Energy Navigator (garfieldenergynavigator.org) is a web-based tool that provides data on energy use in any building it's connected to. It tracks energy use, then displays the used energy in a simple-to-understand format on any computer.

While the solar arrays on town halls, water treatment facilities, and libraries make a very public statement about clean energy use in Garfield County, the Navigator does something more important—it changes how the building operates.

Nearly all buildings are operated without regard to the energy they use. Lights, heating and cooling equipment, and other systems are generally operated with timers or building-computers that simply turn equipment on or off according to a setting made by a facility manager. Sometimes the settings don't match when people are actually using the building, too. We've all seen empty buildings lit up and/or heated at night, when no one's in them. Unfortunately, about the only interaction building managers have with the energy their facilities use comes in the form of a bill, which is passed along to an accounting department—so no one really questions how the building uses energy or notices if usage goes up or down.

In early 2011, CLEER, a Carbondale-based non-profit that does clean energy work, developed the Navigator to address energy use in buildings.

The Navigator uses energy data from buildings' utility bills and get up-

Garfield County administration building. This chart shows daily electricity use for one month. This is the first full month of energy savings: 19 percent savings, with further savings and comfort improvements achieved since this snapshot was taken.
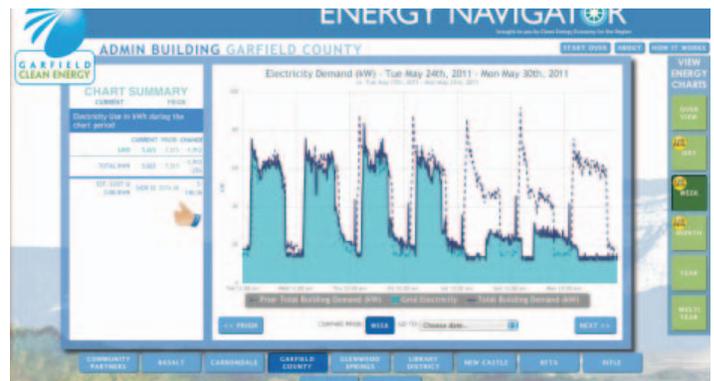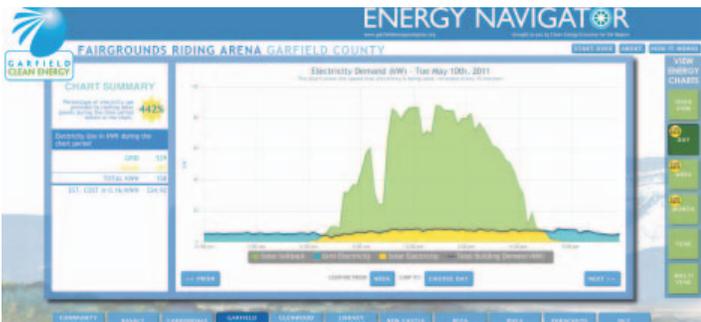

This chart shows one week of electricity use, reported every 15 minutes. The dotted line in the background is the prior week. What you see is the first weekend of energy savings, including Memorial Day (on the right) compared to the prior week. Software changes saved 25 percent of electricity use!

loaded into "Utility Manager," a type of energy accounting software. The data then gets put in the Navigator where it becomes accessible to anyone with an internet connection. The easy-to-use display shows monthly energy use and cost in dollars as well
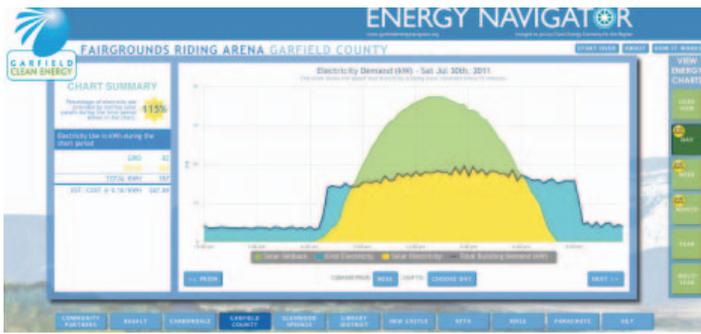
Garfield County Riding Arena: This chart shows one day of electricity use. The dark blue line shows facility energy usage. Yellow indicates solar energy powering the building. The green section is excess solar sold back to the grid. On a this sunny day with normal building usage, solar energy provided 115 percent of usage, with the excess sold back and credited to the building's solar "bank" with Xcel Energy. This "bank" of energy is saved for use in cloudy months. At the end of the year, Xcel sends the county a check for any excess banked energy.

RIDING ARENA ACTIVE ENERGY MANAGEMENT: This chart shows 1 day of electricity use. The dark blue line shows facility energy usage. Yellow indicates solar energy powering the building. The green section is excess solar sold back to the grid. Facility managers achieved energy savings of 40%-70% by ensuring equipment is off when the facility is not in use by scheduled events. On this day the building stayed off and solar energy was 442% of facility needs, with the excess energy sold back to the grid and credited to the building's "solar bank" on their Xcel utility bill

RIDING ARENA ACTIVE ENERGY MANAGEMENT, 2 : This chart shows 30 days of energy usage. The dark blue line shows facility energy usage. Yellow indicates solar energy powering the building. The green section is excess solar sold back to the grid. During periods where the dark blue line is high, the building was in use. During periods where it is low, facility managers have made changes to save energy by shutting off equipment because the building is not hosting scheduled events. Their smart management means that solar was able to meet 152% of the building's electricity needs for these 30 days.

as the carbon emissions associated with the electricity use. Then, those in charge of running the buildings can adjust how they're heated, cooled, ventilated, and lit.

"We can make lots of energy with solar panels and other devices, but if were making all that energy and then using it wastefully, there's not much point," said Mike Ogburn, an energy engineer with CLEER, Clean Energy Economy for the Region. "The Navigator is a unique energy solution because it gives us the detailed information about energy us so we can use it more more efficiently."

As of early August the Navigator was tracking 69 buildings across Garfield County, including libraries, town halls, recreation centers, and wastewater treatment plants. Alpine Bank, recently added its Central Operations facility to the Navigator.

For 23 specially selected buildings— including Parachute's town hall—the Navigator can be used to view 15-minute "live" electricity use by day, week, and month. Eleven of the 23 buildings include live solar tracking. The information is displayed on a screen according to physical location (Parachute, Rifle, Glenwood Springs, etc.) and building type (town hall, recreation center, etc.). When energy use information is then used with "Active Energy Management"— CLEER's term for actively managing how a building is operated—the drop in energy use can be dramatic.

Active Energy Management
Several years ago, Parachute remodeled its town hall and installed a state-of-the-art heating and cooling system. After moving into the building in December 2008, it became apparent to town officials the system was not operating as expected. Parachute had multiple service calls from a variety of vendors with no improvement to the system.

"With only a two-hour visit from CLEER engineer Mike Ogburn the issue was identified and corrections made to the system," explained town administrator Robert Knight. "The building now operates at a consistent temperature, which will result in energy savings in addition to the solar panels already installed. This has been a great partnership and Parachute looks forward to do our part in