

GROWING SOLAR

IN YOUR COMMUNITY

by Eugene Buchanan

The community-owned solar garden:
a revelation in clean energy adoption.

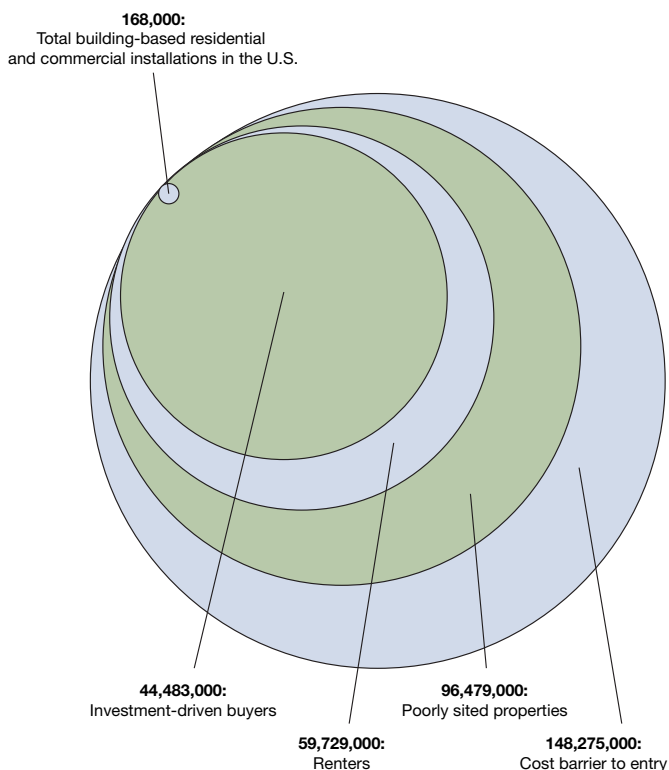


A solar concept in Carbondale, Colorado, allows those who can't have PV systems—either because of financial hurdles, shady sites, or rental situations—to still reap the benefits of renewable energy. The Clean Energy Collective (CEC) allows people shift to locally produced, renewable energy by buying into a community array and receiving credits on their monthly utility bills.

“It opens solar ownership to everyone with a utility bill,” says founder Paul Spencer, estimating that it will increase Colorado’s solar adoption in megawatts by 67% in the next five years. “It’s not supplanting people who can and want to put it on their house, but rather expanding the market to the other 98% of electricity users.”

The concept is based on an organization that builds, operates, and maintains community-based clean energy facilities, collectively owned by participating utility customers. And its members reap the benefits of solar energy—including net metering, tax credits, and rebates—without having to install their own systems.

How the CEC’s Model Could Leverage PV Installation Potential



Courtesy: Tim Braun

Clean Energy Collective founder Paul Spencer says that the solar garden model can “open solar ownership to everyone with a utility bill.”

The Key

The idea of collective ownership in a “solar garden”—a centralized, community-shared array—isn’t new. Spencer’s model takes it a step further than previous efforts in other communities by providing the legal, tax, monitoring, and billing interface to integrate it all with local utilities.

Behind it all is the CEC’s RemoteMeter, a custom software package providing remote metering capabilities for CEC customers. The system integrates with utility billing systems to track and apply monthly clean energy production credits directly to the customer’s bill. It also lets customers and the utility monitor real-time energy production and account information online or via mobile devices, such as smart phones.

The first hurdle was devising an organizational and legal structure that avoided complex operational and administrative burdens, navigated securities regulations, and let members qualify for tax and rebate incentives. The billing structure also had to account for and automate monthly solar production credits on members’ utility bills without burdening the utility. “It had to be simple for everyone involved,” says Spencer.

RemoteMeter tracks the energy production of each individual owner/member’s portion of a collective energy facility. This data, driven by real-time meter and telemetry readings, is stored for processing and reporting to the utility, enabling customers to realize net-metering benefits directly on their utility bills. Customers are credited directly on their utility bills for the energy their portion of the PV system produces. Depending on the utility, the credit can take the form of a dollar amount reduction—typically through a Power Purchase Agreement (PPA)—or as a kilowatt-hour credit through either a PPA, net-metering agreement or other mechanism in place.

Customers can acquire PV modules—and their resulting power production—in the facility by either direct purchase or a “financing sale” model. Purchases are made on a per-module basis and the customer holds title to the modules purchased. All the customer has to do is contact the CEC, look

at a few utility bills to determine historical energy use, and then decide how many modules to purchase.

Also Beneficial to Utilities

While the CEC's model makes PV energy available to everyone on the grid, it's also appealing for utilities, providing them with reliable, utility-scale clean energy—with the capital provided by utility customers. "It's great to get local renewable energy off the ground, and this is one more arrow in our quiver to meet our renewable energy quota by 2015," says Del Worley, CEO of Holy Cross Energy, which provides electricity to most of Colorado's Roaring Fork Valley consumers.

The utility doesn't have to maintain or monitor the array. "A vital benefit is that it's a utility-scale community system that's fully integrated with the utility and, more importantly, one that's operated and maintained outside the utility," adds Holy Cross Energy's Steve Casey.

CEC facilities are maintained for 50 years through a self-funded operations and maintenance escrow trust, initially capitalized through a portion of PV module sales and then continually fed by a small percentage of earnings for the energy produced, which is designated to the escrow trust. This trust provides funds for cleaning and, if necessary, replacing modules or making needed repairs to or replacement of other components.

The Impetus

Going green is nothing new to Spencer. An electrical engineer, in 2004, he designed and built his own off-grid home, heated by the sun, and powered by PV and wind-electric systems. Later, he spearheaded the development of sustainably developed neighborhoods and homes, including a pending 89-home development to be powered by a 300 kW central PV array.

Supported by Holy Cross Energy, that project set the stage for the community energy concept. Spencer realized that the most efficient way to incorporate clean energy into the project wasn't to put a system on each home, but to aggregate the production into a single site. After vetting this idea with the local utility, his vision grew and the CEC was born.

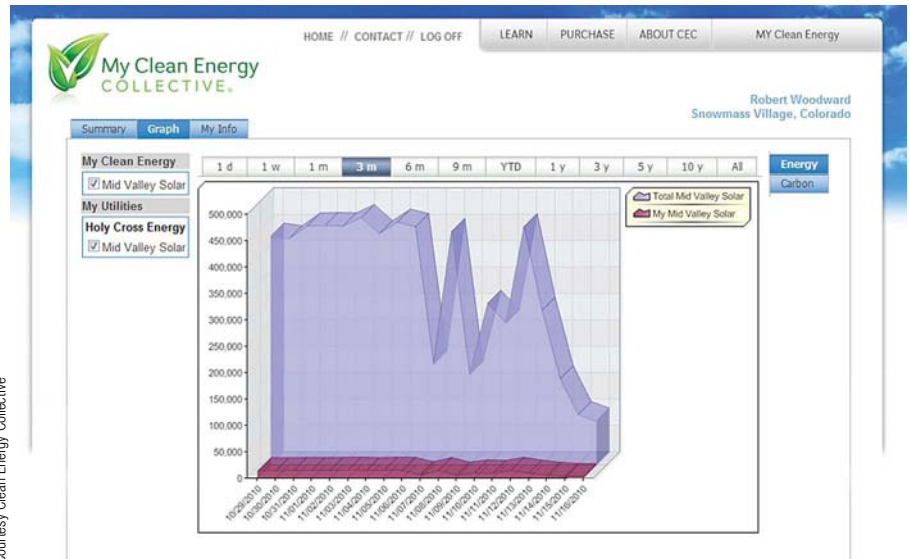
Getting Off the Ground

In the spring of 2010, the CEC closed on a long-term lease to build its first member-owned array on land owned by the Mid Valley Metropolitan District (MVMD) in El Jebel. Housed on a $\frac{1}{3}$ -acre parcel of land unsuitable for development, the facility now hosts a 338-module array (77.7 kW) serving 19 CEC members. The \$500,000 investment—including the land lease and cost of the PV array—was funded in a few weeks with 83 customers paying \$6 per watt for ownership (the actual price was as low as \$2.45 per watt after rebates, discounts and credits).

The CEC's first member-owned PV array in El Jebel, Colorado.



PV system output data can be accessed via any web-enabled computer or smart phone.



Courtesy Clean Energy Collective

The system began producing energy in August, with members receiving their first credits in October, the lag due to the CEC ensuring that the array was performing up to standards prior to transferring ownership to its 19 homeowners. Spencer says the wait period will not occur in the future.

"It's a great use of the land," says MVMD executive director Bill Reynolds, who explains that the power generated by the array goes directly onto the Holy Cross Energy grid. "And CEC members actually own the system."

While the pilot facility is the second-largest PV array in the Roaring Fork Valley, it's a drop in the bucket compared to the CEC's other plans. In July, the CEC closed on its second lease for an array that will also send energy to Holy Cross Energy. Located at the Garfield County Airport near Rifle, the 5-acre site will produce 15 times the electricity as the El Jebel site. With 5,200 modules, the 1.2 MW facility will be the largest privately owned PV array in the state, serving as many as 500 CEC members. It is scheduled to go online by this summer.

The CEC is far from done. It's currently in negotiations to build several more systems, including a 2 MW facility in Eagle County on 8 acres of capped landfill near Wolcott; a 400 kW site on 1.5 acres in Snowmass Village; and a second site in El Jebel—1.2 MW on 5 acres. "We're rolling," says Spencer. "We want to start making clean energy available to absolutely everyone in the Valley and beyond."

Politicians Seeing the Light

Like any good idea, timing is everything—and Spencer's couldn't have been better. While he was launching his first project, local politicians were also championing the solar cause. U.S. Senator Mark Udall (D-CO) announced a new bill to create jobs, strengthen the clean energy industry, reduce taxes and increase the nation's use of solar energy. His Solar Uniting Neighborhoods (SUN) Act of 2010 modernizes the federal tax code regarding solar energy. If it passes, homeowners who invest in community solar projects would be able to take a 30% tax credit—just like those who install PV systems at their houses.

This push for clean energy use shows: Colorado currently ranks fourth in the nation in clean-energy employment and has the second-highest renewable energy standard for utilities.

The Economics

Aside from environmental and social benefits, consumers want affordability. And that's where the CEC model shines. The solar garden "has a very low entry cost for ownership," says Spencer. "Our members leverage their collective purchasing power and buy as little or as much energy equipment as they choose at reduced prices." Economies of scale give the CEC excellent cost per watt.

At the El Jebel site, the gross consumer cost, including installation, was about \$466,000 (\$6 per W). After rebates and incentives, the 19 members paid an average of \$3.15 per W. Some members bought only one module, while others purchased up to 87, with the restriction that an individual's modules could not produce more than 120% of their household electricity consumption. The buy-in was a 30% refundable deposit. The remaining 70% of the net cost was paid after the facility was completed. The CEC is working on consumer financing solutions for future projects.

Each month, Holy Cross Energy credits the members' utility bills at \$0.11 per kWh (a premium over HCE's conventional \$0.08 retail rate). Credits are calculated based on the number of modules owned and the amount of energy produced by the facility each month. If utility rates increase, the credit for the CEC-generated kWh will continue to be 37% above those future rates.

Catching on with Consumers

So far, it's been a relatively easy sell. With the CEC model, customers reap the same federal tax benefits of PV ownership at home (currently a 30% credit), without having systems installed at their residences. Because it's a managed, reliable system with power coming from one source, customers also get better electricity rates. Through the Power Purchase



Courtesy Mark Boyer

Through the “solar garden” concept, homeowners in Colorado can reap the clean energy benefits of this PV system, even though it is not installed at their homes.

Agreement (PPA), the utility pays a higher rate to community solar members than it does to home-sited PV customers (\$0.11 per watt versus \$0.08 per watt).

“I love the fact that we can own a solar power [system] that will be maintained, up-to-date and hassle-free,” says Katie Ertl, one of the first members of the Mid Valley array. “It lets us pay attention to the environment and use green energy, with the experts supporting us along the way.”

Plus, there’s another attribute: “Many people can buy renewable energy [through utility companies’ green energy programs], but that energy is usually sourced from far away or traded, and the customer doesn’t own the energy source. This is like buying the cow, not the milk,” says Spencer. “This is based where you live, improving the air quality and economy locally. And when milk goes to \$5 a gallon, you’ll be glad you own a cow that produces your milk for free.”

And that resonates well with locals around the outdoor meccas of Aspen and Vail. “We’ve been trying to reduce our fossil-fuel consumption for years, but when it came to making the switch to solar, there were some issues we couldn’t overcome,” adds Aspen resident Chris Davenport. “The first was price; the second was our roofline. Now, we can own the renewable energy we want and at a fraction of the cost. And the energy is generated in our own valley.”

Support from the local governments is vital. In November, Eagle County commissioners modified its ECO-Build Rebate program to allow “off-site” PV customers to apply for the same incentives as individual customers. The decision lets residents who invest in community arrays enjoy the same rebates as homeowners—reflecting the county’s commitment to encourage all residents to invest in solar electricity. “The Eagle County decision is a big step forward for community-owned PV owners being treated the same as homeowners with individual rooftop systems,” says Spencer. “Many counties and states are following suit.”

The Sky’s the Limit

The CEC’s program is good news for RE in Colorado, and the company hopes to expand even further. From the onset, it focused on ensuring the model could be replicated and exported, and those efforts are paying off.

The CEC is currently in conversations with more than three dozen potential licensees interested in exporting the model across the country. The company is working on a joint venture with two other partners—a finance company and a multi-billion-dollar solar integrator—to deploy the model in 10 key solar states, including Florida, Texas, and California.

“We’re even getting inquiries from businesses in other countries that want to franchise what we’re doing,” says Spencer, adding that he’s also in discussions with other Colorado utilities that are assessing how the model fits into their clean energy strategies. “We’ve proved the concept locally and now want to take that blueprint to branch out elsewhere.”

By the end of 2011, Spencer estimates the CEC’s community-owned arrays will provide 5 to 10 MW of capacity in and outside their local area, with that number eclipsing 100 MW nationally by 2015. “It could go from there to gigawatts very quickly. In my dream world, [the program] is a catalyst that creates a quantum leap in the adoption of clean energy.”

Access

A former reporter for the *Denver Business Journal*, Eugene Buchanan (ebuchanan@steamboatpilot.com) has written about the environment and outdoors for more than 25 years, with his works appearing in *Outside*, *Men’s Journal*, *National Geographic Adventure*, and *Sierra* magazines, and ESPN. While community PV options don’t exist yet in his home in Steamboat Springs, Colorado, he’s looking forward to their arrival.

