

Storing the Sun



The Tesla Powerwall is coming to Central Oregon — bringing with it innovations in energy storage.

by Jaclyn Brandt, for The Bulletin Special Projects
photos by Kari Mauser

While solar panels have become more common in Central Oregon, with their building company — SolAire Homebuilders — Mike and Cindi O'Neil are bringing the next step in green building to the area with the introduction of the Tesla Powerwall. Though not specifically new technology, having made it onto the building scene a couple of years ago, the Tesla Powerwall has not yet made it into home design and construction in Bend or the surrounding communities. The O'Neils aim to change that, starting with the Eagle Crest home they're featuring in the upcoming Central Oregon Builders Association (COBA) Tour of Homes.

"The Tesla Powerwall has been out and has been talked about for almost two years now," said Cindi O'Neil, vice president of SolAire Homebuilders. "SolAire loves to innovate when we have clients who are interested in taking it to that level," she added, in reference to innovations in green building. The Tesla

Powerwall is essentially a home battery that stores solar energy that's collected, making it available to be used at a later time when it's needed.

SolAire has been building energy-efficient homes locally since 1995 and beginning about four years ago, made a commitment to become experts at building custom net-zero homes — homes that create at least as much energy as they use — the Tour of Homes home will be their sixth net-zero build. The new Tesla Powerwall will add an exciting new element to the many other energy-efficiency measures they already incorporate when building a home.

SolAire worked with Sunlight Solar on the project, a Bend-based solar company that installs approximately 100 residential solar electric systems in Central Oregon each year, plus five to 10 commercial systems. According to Joe Mazarella, system designer at Sunlight, the Tesla Powerwall can complement solar in many ways.

SolAire Homebuilders' Tour of Homes showcase property in Eagle Crest features an expanse of solar panels, which will be complemented by the home's Tesla Powerwall, the first to be installed in Central Oregon. The bright kitchen space takes advantage of natural lighting, helping to decrease the energy demand and contribute to overall energy-efficiency.



"If the grid goes down, it will supply emergency power to dedicated emergency loads," he said. "This usually is the refrigerator, some lights, and a computer system/router. The Powerwall also has the ability to utilize 'self consumption,' where it is programmed to supply electricity from its batteries instead of the grid when the solar is not producing enough for the loads, or when there is a higher time of usage rate."

The battery pulls from the solar system on the home, which in the featured SolAire home is tied to the Central Electric Coop (CEC) grid.

"So in the summer you are producing excess energy, and in the winter you have a higher call for energy, either for heating or because there is snow on your panels, and weather can interfere with your generation of power on the home," said O'Neil. "So CEC will, over the course of the year, keep records of

how much power you generate and how much power you use and will hold your credits for 12 months."

The addition of the battery also means that the homeowners have some say over energy supply and demand in their own home.

"What these owners have now is control from their cell phone or computer of when energy comes from the grid or from their battery," O'Neil said. "So when the sun goes down, they can pull power from their battery to charge their cars at night. Or if it snows and there is a storm and there is an electrical outage, the Tesla Powerwall will, in a few seconds, power the house's critical power load."

A homeowner could also pull energy from the battery at times when energy rates on the grid are higher, generally at peak times.

Homeowners Reed and Jean Sloss grew up to appreciate the environment

and outdoors, and made the commitment years ago to try to make a difference.

"We recycle, use biodegradable products, turn off lights and appliances when not in use – good habits most families follow. We've owned Hybrid cars since 2006," Reed Sloss said. "However, with the Tesla Model S purchase two years ago, we were hoping to set an example for our sons and future generations. And with our new home, we hope we're doing the same. We are endeavoring to reduce our 'carbon footprint' as low as possible yet still enjoy comforts of a Central Oregon lifestyle."

The Sloss couple had not heard of SolAire Homebuilders when first setting out to build their home, but after meeting with the O'Neils, they knew the company was the right fit for their goals.

"We reviewed as many Central Oregon contractors as we could find that specialized in, or had experience with,

building green homes. From that exercise, we learned much more about building techniques, materials, terminology and standards," Reed Sloss said. Ultimately, he added, the O'Neils' commitment to using state-of-the-art techniques and their emphasis on establishing a close working relationship with their customers during the building process was exactly what they were looking for.

Building their net-zero home has been an exciting transition from their current home, and both Reed and Jean are happy to be opening their dream for others to tour during the COBA Tour of Homes, to showcase the latest in green building design and technology.

SolAire Homebuilders takes into account many factors when designing a home.

"The first step in getting to zero is building an energy-efficient home shell," O'Neil said, explaining that 10-inch thick

Cindi and Mike O'Neil, owners of SolAire Homebuilders, meet with their client, Reed Sloss, in the home he hired the builders to construct for him in Eagle Crest. The home, which is SolAire's sixth net-zero build and features a Tesla Powerwall, will be open for guests during the COBA Tour of Homes.

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Reed Sloss takes a moment to appreciate having a Tesla car-charging station installed in his new home's garage.



Reed Sloss explains some of the features of his new energy-efficient exercise pool to Cindi and Mike O'Neil.

walls around the exterior of the home, along with exceptionally insulated floor and ceiling, ensures that the amount of energy needed to heat and cool the home is reduced significantly.

The home's orientation, she added, is another major factor in reaching a net-zero state. Orientation means many things, including that the long access of the house faces south, the primarily living areas are located on the south, the arrangement and depth of eaves, and many other things that create a passive solar outcome.

The Tesla Powerwall offers the homeowners a way to take further advantage of the long, sunny Central Oregon days, ultimately reducing or even eliminating the home heating utility bill and cutting the electric bill by at least 90 percent. The home also features two Tesla car chargers, much to the homeowners' delight, and an energy-efficient exercise pool.

The desert landscaping in place of an expanse of grass reduces the demand for water, and will effectively reduce the couple's water bill.

"Our monthly expenses will be greatly reduced," Reed Sloss said. "But, we made a financial investment to do this, and feel proud and satisfied we've done this."

"There will be a learning curve to see how close to net zero we can get after moving in," added Jean Sloss. "Our belief is during the summer months at least, we will only be supplying the grid with electrons, not consuming any

because power will be drawn from the Tesla PowerWall batteries during evening hours."

Solar panels have increased in popularity in the last few decades, and many expect the battery to be an important addition to any home with a solar system.

Although this home is in CEC's district, Pacific Power also works with many solar clients in Central Oregon, and have been a part of the storage conversation for years.

"In general, we expect energy storage to be a significant technology in the future of the energy infrastructure," said Tom Gauntt, spokesperson for Pacific Power. "The move toward a more renewable energy supply is happening on many fronts. Storage can be a part of that, as it enables us to store renewable energy created by the sun for use after dark, or the wind for use during calm times.

"The benefit of battery storage is the ability to use the stored power at a different time. Peak demand for energy is typically in the evening when everybody gets home from work," explained Gauntt. "Reducing peak demand has benefits, so Pacific Power does have a time-of-use metering option that encourages power use in off-peak times. Depending upon a customer's usage pattern, that could reduce energy costs. Whether that would offset the cost of the Powerwall would depend upon the customer's usage."

The current iteration of the Tesla Powerwall includes an integrated inverter

(which automatically converts the energy from DC to AC), which can power one two-bedroom home for a day, and sells at \$5,500 before installation. The solar system has a much different range, and can vary greatly based on many factors, including roof size.

Those costs mean not everyone is ready for a Tesla Powerwall, or even a solar system, but SolAire tries to design homes to create the most efficiency for any budget.

"It requires homebuyers to shift priorities when it comes to tight budgets," said O'Neil. "When someone's budget is ample, those choices become less difficult. But, when you talk about producing homes like this for the masses you really need to be looking at ways to do it so that the homes are high performance, energy efficient, healthy to live in, full of light, and a lot of that doesn't cost more. But when you try to get to zero, the cost of the panels and something like the Tesla Powerwall are definitely an upgrade."

However, according to O'Neil, 30 percent of a solar-power unit qualifies as a renewable energy tax credit from the federal government, on top of a \$6,000 residential energy tax credit from the State of Oregon, and utilities such as Pacific Power give cash rebates for returned energy.

"Not everyone can afford going all the way to zero on an energy path, but these clients are really dedicated to the whole idea. It's in their blood, it's their lifestyle," O'Neil said.

While the cost of building a net-zero home can be cost prohibitive for most homeowners, the O'Neils, along with their clients, hope that eventually price reductions in solar equipment, storage batteries and other green building technologies will eventually make the practice more widespread.

"Until then," Reed Sloss noted, "we will continue to need early adopters — builders and buyers — to spur innovation and lower costs."

To create an energy efficient home, SolAire works with local designers, architects (in this case, Neal Huston & Associates Architects Inc.), and Sunlight Solar.

"Sunlight Solar has partnered with SolAire for many years in Central Oregon, including some of the first net zero homes in the region," Sunlight Solar's Mazzarella said. "The timing worked out, as Sunlight Solar was in the process of becoming a Tesla Authorized Installer and Dealer when SolAire reached out to us about this project. We then had a number of meetings with the homeowners and SolAire to determine the best PV system and Tesla Powerwall Battery System to meet their goals."

"It's a highly integrated process, which is the part we play with the architect, the client's aesthetic and budget. So it's like this three-pronged puzzle: budget, aesthetic, and energy," explained O'Neil. "We partner with our clients to realize their highest priorities, with the best energy technologies and within the constraints of their target budget."