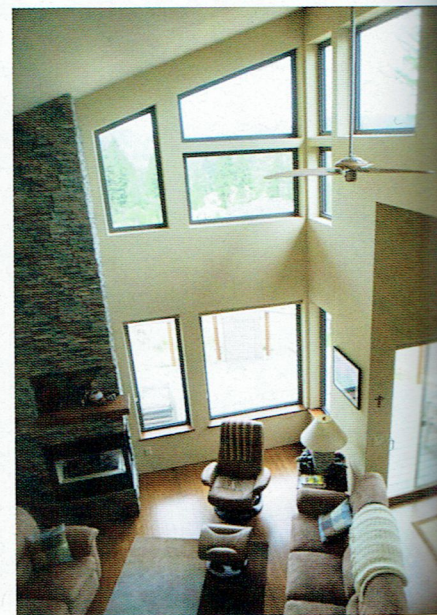




LEFT
Emily and Doug Boleyn
outside their net zero energy
house in Happy Valley.
BELOW
Large windows provide solar
heat collection in the winter
and filter sun rays in the
summer.



Morning Sun, Happy Valley

Following the 1973 energy crisis, native Oregonians Doug and Emily Boleyn, became solar pioneers. A year later, the couple had built the state's second solar home, near the end of the Oregon Trail in Gladstone. Over the next thirty-five years there, the Boleyns added and made upgrades to existing solar panels that provided heat and warm water, as well as an electric system. In April of 2009, with their children long since grown up, the couple took on their next adventure and broke ground on an ultra-efficient, net zero energy home in Happy Valley, just southeast of Portland.

As soon as the Boleyns moved in to the new 2,800-square-foot light-filled house that they called Morning Sun, they began collecting data on its energy use. This number set, updated every fifteen minutes, documents precisely where the house exceeds and falls short on the path to the net zero energy ideal.

In a true net zero home, explains Doug Boleyn, who works by day as a commercial solar program manager with Energy Trust of Oregon, the net energy consumption is zero. Though debate surrounds the true definition of this term, the general concept is that such buildings produce as much energy as they use. But the broader definition of net zero currently includes those homes that save 80 to 90 percent as compared to standard homes of comparable size, Boleyn adds. So far, the annual energy

bills for Morning Sun hover right around 10 percent of most comparable residential dwellings in the United States.

To arrive at this significant reduction in utility bills, the Boleyns worked with veteran green architect Matthew Daby of Portland-based M.O.Daby Design and John Mead of McMinnville green builder Cellar Ridge Custom Homes to create a dwelling that relied equally on state-of-the-art solar technology and simple time-tested principles and design.

Though notable for its efficiency, the Boleyn home's clean, contemporary appeal is stunning. "Beautiful and high efficiency are never at odds with each other when designed correctly," explains Daby.

While some net zero homes have dark interiors, a "vision of light," hatched during the planning stages, characterizes the Boleyn residence. "It was an important image for us, as well as from a practical point of view," says Boleyn.

The windows in the house, from Serious Materials Windows, were customized for ultimate efficiency, to let in magnificent views of Mt. Hood and are oriented to minimize the need for artificial lights. On the south side of the house, for instance, where solar collection is optimal, the windows were calibrated to a high heat-gain coefficient (a value which relates to how successful a window is at permitting the sun to enter a space) and a low U-value (or how effectively a window contains heat inside a home).



On the west side, where the afternoon sun can be intense, the windows filter the sun comparatively more, but still maintain an excellent heat-saving value. Strategically placed outdoor overhangs provide additional protection from overpowering solar rays.

Though Doug and Emily live alone now, they frequently host guests, including their two daughters, Elena, 33, and Lisa, 35. A two-bedroom lower-level suite is ideally suited to their houseguests and is heated separately with a ductless mini split-pump system. That same system also heats three other zones of the house, allowing the couple to live comfortably in small areas of their choice with minimal heat waste.

A series of twenty-one photovoltaic and seven thermal rooftop panels produce 4.7 kilowatts of electricity and power for space and water heating. On cold days, the system moves warm air captured behind the photovoltaic panels into the house. Water is pre-heated for the tankless gas hot water heater by passing through an air-to-water exchange system. On balmy nights, the Boleyns can open their windows and within minutes, the house cools to a comfortable sleeping temperature.

To the Boleyns, this net zero energy home is a lifestyle. To their neighbors, it's an inspiration. A neighbor recently confessed to Boleyn, "I look up at your house and hope you never put a fence up between our homes, because every time I see yours, it makes me feel good."

Resources

M.O.Daby Design, modabydesign.net
 Cellar Ridge Custom Homes, cellarridge.com
 Serious Materials Windows, seriousmaterials.com/
 PVT Solar, pvt solar.com
 SunPower, us.sunpowercorp.com

Solar in Oregon: Does it Add Up?

At first glance, installing solar panels, particularly in the western portion of the state, seems slightly counterintuitive. As it turns out, however, western Oregon is sunnier than Germany, the world's leader in solar installations, says Kathryn Gray, longtime Solar Oregon member and founder of solar design firm UrbanSun. In fact, with today's solar collectors, any time you see a shadow, solar energy has the potential to be produced. This power is harnessed most effectively from April through October in western Oregon, but can be produced even in January on cold sunny days.

SOLAR SITE CONSIDERATIONS

The most crucial factor when considering solar is unobstructed access to the path of the south-facing sun. Oversized evergreen trees or buildings that shade south-facing rooftops are the greatest obstacles.

THE COSTS AND BENEFITS OF TAPPING INTO THE SUN

All solar systems offer basic financial incentives such as state and federal tax credits for the homeowner and rebates for the contractor. Most often, vendors will assess the projected solar performance and available incentives and provide an "out-of-pocket" quote to the homeowner. The environmental benefits of installing solar systems are numerous. Where financial matters are concerned, for passive solar space heating, the typical payback period is one to two years. For an active solar hot water heater, that period is four to six years. For an active solar electric system, it's ten to twenty years. Payback periods assume good solar access, are based on the projected increases in utility costs, current financial incentives and the lifestyle habits of a home's occupants. In the event of a resale, solar energy systems add around 8 to 12 percent value to the home.

NEXT BEST STEPS

Attend a Solar Oregon workshop or the Annual Goal Net Zero Home Tour to educate yourself about the benefits of installing solar. You can also look on the Solar Oregon website or contact the Energy Trust of Oregon to locate a solar professional in your area to request a quote.

RESOURCES

Solar Oregon
solaroregon.org

UrbanSun
sunsmarthomes.com

Energy Trust of Oregon
energytrust.org

72 Hours
in Ashland
The Ultimate Guide p. 30

Golf Adventure
3 friends . 3 days . 6 courses

Bike-to-Brew
best rides and brewpubs

Oregon Coast
where to eat and stay

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Oregon's Magazine

The Oregon Bucket List

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