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Lopez Island housing project built for 'net zero' energy use

By [KATIE ZEMTSEFF](#)

Journal Staff Reporter



Image courtesy of LCLT [\[enlarge\]](#)

Common Ground has 11 single-family homes, two apartments and a small office space. The total project cost including land was \$3.5 million. This weekend the Lopez Community Land Trust will celebrate completion of an affordable housing complex that produces all of the energy it uses on an annual basis.

The Lopez Common Ground Project is designed to meet its “net zero” energy goal without buying any additional carbon offsets. The team also developed a manual showing how the project achieved its energy goals, and how other projects can too.

Sandy Bishop, executive director of the land trust and project manager, said the effort began in 2005 when the organization decided to develop a project that was sustainable on a neighborhood level. “We wanted to develop a project that took a system approach and could be replicated not based on component by component but (on) understanding the systems.”

The manual was funded by a grant from the Washington State Department of Ecology and will be available soon on its Web site at <http://www.lopezclt.org>.

Affordable housing

The land trust is a 20-year-old nonprofit formed in response to rapidly inflating real estate prices on Lopez Island. In 1989, Bishop said, the average cost of a home on the island rose 198 percent.

The trust buys land, develops neighborhoods and sells homes while retaining ownership of the land. The goal is to provide housing for people who are part of the community but cannot afford its prices. Houses in Common Ground cost between \$80,000 and \$150,000.

According to Washington State University's Washington Center for Real Estate Research, the median home price in San Juan County is \$684,000.

The trust's homes are tied to a limited equity resale formula, meaning they will remain affordable for 198 years. Buyers must have lived on the island for two years.

Common Ground is the trust's fourth affordable housing complex on Lopez Island. It has 11 single-family homes, two apartments and 870 square feet of office space for the land trust. The construction cost was \$2.4 million; the total project cost including land was \$3.5 million.

The trust's projects are paid for in a variety of ways. About half the cost of the houses are paid for through 30-year mortgages on each unit. The rest of the money, as well as land and infrastructure funding, comes through the state Housing Trust Fund, donations and from the local community, which Bishop said is very generous.

People in the community invest in these homes, she said, because having affordable housing benefits the island and makes it possible for people who provide valuable services to live there.

Residents moved into Common Ground in April and include teachers, small business owners, a retiree, a self-employed person and a construction worker. Before Common Ground was built, Bishop said, the residents lived in substandard housing or had to move several times a year. Residents also helped construct their houses, putting in "sweat equity," she said.

People stay on Lopez because of the community and it's "veil of beauty," she said, but "just behind that there's these threads of disparity up here."

She said affordable housing "inspires a healthier economic situation in our community and we're a small place. We need to be economically viable."

Net-zero project

To figure out how to develop a sustainable neighborhood, the team first organized a three-day design charette. Attendees were invited from 15 disciplines including architecture firms, farmers, bureaucrats, landscape experts, subcontractors and stormwater experts. The team decided that in this climate, energy use could be reduced by 48 percent through passive measures. Then, the team produced a manual that set out goals.

The land trust picked Mithun to be the architect, planner and landscape architect. Wellman and Zuck Residential was general contractor for the 11 homes. Pamela Pauly of On the Level was general contractor for the office. The trust was project manager. Tammie Schacher, project director for Mithun, said the integrated design process and the client's determination were critical. Setting goals as a group got everyone committed to doing a net-zero project.

"If the client wasn't pushing as hard as she was to reach the goals... we could have easily taken a much less expensive route in some respects (and not met the goals). It's too easy to take the easy route sometimes," Schacher said.

Bishop said getting to net zero took a lot of discipline during the design phase, both in sticking with the goals and in not cutting important components due to cost. When the first estimates come in, she said, everyone starts slashing. The team had to remind itself that it couldn't afford not to invest in expensive but more efficient technologies. "Somebody's going to have to step up and start doing this."

The team started by designing small houses. They range from 760 to 1,100 square feet, with the average size being 800 square feet. Next it focused on passive measures like passive solar design, high insulation, natural ventilation and installing insulated fiberglass windows that don't leak when closed. Schacher said the windows are expensive but they were a high priority for the land trust.

Schacher said simple ideas like orienting homes and windows toward the south and insulating the north sides were crucial to the project's success.

The team also used a solar hot water system. Bishop said heating water is the second largest user of energy in a home after heating space. About 33.8 kilowatts of electricity is produced through solar photovoltaics on site.

The complex should reach net-zero energy this year, Schacher said.

Of course, whether the project achieves this will depend on energy use by the residents. Each home is individually metered, and includes energy detectors to show users how much energy they are using. Those who conserve will not pay energy bills; those who don't conserve will get a bill. Bishop said this has educated and shocked residents. "We're trying to make this fun and educational and not trying to create a guilt complex with anyone."

Bishop said four out of the 11 households use very little energy and will reach net-zero energy. Another four should get there with some basic education. But a couple of the residents "are not understanding yet how their daily habits affect their energy use."

Water, gardens

Each house also has a water meter. Water that falls on the complex is captured and sent into a 38,000-gallon rainwater catchment tank before it is pumped back into houses for use in washing machines and toilet flushing. Rainwater is used for the gardens and landscaping.

The site has gardens. Plants will be chosen for multiple purposes such as food, medicinal purposes or shade, Schacher said. The project uses straw bale and earthen plaster construction. The ceiling has core bond and blown in cellulose R50 insulation.

Bishop said she would love to share information about how the project performs over the years.

If the trust develops another project, she said, it will likely build on this experience and go further. Next time, Bishop said, she would have a more stringent interview process for subcontractors to ensure everyone is committed to sustainable systems. She would also not take on such a large project at one time.

The grand opening celebration will be Saturday at 25 Tuatara Road starting at 1:30 p.m., and will feature tours of the site.

Other project members included Webb and Associates; Hart Pacific Engineering; Yu & Trochalakis; Sound Mechanical Consulting; Ecotech Energy Systems; and more than 60 interns from around the world.

Katie Zemtseff can be reached by [email](#) or by phone at (206) 622-8272.

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