

HPA's energy lab hailed as one of the best in the country

By Hadley Catalano

Wednesday, November 11, 2009 10:50 AM HST

The newest building at Hawai'i Preparatory Academy (HPA) in Waimea, the Energy Lab, is being considered one of the latest and most environmentally comprehensive structures in the country, according to its application as a "living building."

The 6,112-square-foot complex housed on the upper campus will not only receive LEED (Leadership in Energy and Environmental Design) Platinum certification in green building technology but it's intricate plan and dedication to self-sufficiency qualifies it for the Living Building Challenge (LBC), marking it the only school facility in the world to reach the benchmark, according to international engineering firm Buro Happold. This information comes from an HPA newsletter.

"We are designing a building more effectively, lessening our impact on the planet," said principal engineer behind the lab's design and development, HPA teacher Dr. Bill Wiecking. He said the LBC mandates that all materials used from the production, use and disposal phases are non-toxic, incorporates the Forest Stewardship Council and centers its building around localized eco-regional characteristics. The building is required to generate all of its own electricity with renewable resources, capture and treat its water and operate efficiently.

He said because the building is being built to new regulations there is opportunities to enhance the building's design. Even upon completion the structure will be adaptable.

Wiecking has aided in the physical and technical design, building, modifying and creating many aspect of the lab personally. (For example, there is now an i-phone application that notifies Wiecking about the lab's physical status levels as well as a computer program that can determine the proper learning conditions of each room and adjust the room's temperature accordingly.)

To be completed in early January, the Energy Lab's ultimate focus, Wiecking said, is to operate a sustainable facility that caters to educational outreach, interactive learning, 21st century teaching and the global engagement of environmentally committed projects.

The Energy Lab will have 23 kilowatts of solar power and five kilowatts of wind power on site and will the first building to use it's own renewable energy during the construction phase.

"We want to create a nucleus, a one-stop shop for international sustainability education," said the teacher, noting the school has established overseas connections and recently has partnering interest from Hawai'i and mainland universities.

The lab's was conceived as the result of four piles of sticky notes plastered on the walls of an energy meeting during HPA's 2007 "Go Green" charette.

"The kids just kept bring up the concept of an energy lab," Wiecking said about the conference attended by parents, students and community members. "Ideas were written down about alternative energy, recycling, self-sufficiency and using the energy lab to do these experiments."

He said because of Hawai'i's land mass, small population size, established infrastructure and abundant available eco-resources -- in contrast with it's staggering energy costs -- the actualization of the Energy Lab would be a "living" example of the island's ability to hone natural elements for self-reliability.

At the meeting Wiecking collaborated with an HPA parent, who has expert experience in green energy, and who would later become the anonymous donor for the roughly \$8 million project.



HPA teacher, Dr. Bill Wiecking, sits in front of the Hawai'i Preparatory Academy's the Energy Lab in Waimea. - Hadley Catalano

"He said, ' every day we don't do this is a day wasted. We are running out of time.' We need to not just survive but thrive," said the teacher, who said because the project was backed by the generous contribution and the support from the school board, the Energy Lab concept moved forward.

Breaking ground on August 14, 2008 the project is on time in its commitment to open for classes on January 5, 2010. (An open house for the public will follow in mid-April.)

The physical structure has been built to resemble the shape of a wing, allowing natural air flow through vents near the base of the building to cross ventilate and cool the interior of the building.

Wiecking and architect David Croteau of AIA Flansburgh Architects in Boston said this will be done with HPA's greatest asset -- the wind.

Also harnessing the potency of the campus' sun exposure, the two-story building includes extensive glass paneling and features a number of new bifacial solar panels and solar charged appliances such as telescopes that will be housed on the building's large front lanai.

The layout of the building, which has an open classroom concept, will feature state of the art computer equipment and teaching tools. There will be a large open room which will be equipped with three large screens hanging in a triangular formation from the ceiling, visible to all and allowing the instructor to face the crowd.

The floor plan is divided into three zones, collaboration, research, and design. Mimicking the learning process, the zones are intended to allow the students access to global exploration, creative brainstorming and physical construction.

"Students can collaborate ideas about projects and experiences in interactive classrooms designed to facilitate video conferencing and webinars with students all over the world," said Wiecking, adding students will be researching, developing and testing new renewable and sustainable technologies and theories based on the access to resources housed on campus. "Then students can gather, record information, store their experiments and ideas in a large library system before physically building the project in the workshops and testing their ideas on site."

Wiecking said the purpose behind the multi-dimensional learning facility is to engage and entice the community at large. First, for the betterment of the students' education and secondly, allowing families and individuals accessibility to life changing renewable energy methods, resources and ideas.

"As a teacher I am very excited about this. In five to 10 years green building and use of natural resources will be the standard and our children will have been part of the process," Wiecking said. "They will have access to experience, develop and be involved with the study of solar, wind and photovoltaic. Kids will want to come here to learn about sustainable practices and will be prepared when they enter college."