HPA opens new Energy Lab at Waimea campus | Hawaii247.org | Hawaii 24/7

MEDIA RELEASE

The new Energy Lab at Hawaii Preparatory Academy is envisioned as a catalyst for change

Kahu Danny Akaka officially opens the Energy Lab with a blessing ceremony on January 5, 2010.
"This is a place where we will actually change the future," sais Upper School science teacher and Energy Lab director Dr. Bill Wiecking, who was intimately involved with the development and design of the Energy Lab. "We are in a position to make a tremendous mark on the whole green alternate energy future of how energy is produced, used, and handled."

Kahu Danny Akaka officially opened the Energy Lab with a blessing ceremony Tuesday, Jan. 5. Students, faculty and staff members, administrators, and project team members attended the event. A grand opening is planned for April.

Dr. Bill Wiecking, director of the Energy Lab at Hawaii Preparatory Academy, addresses the audience during the blessing ceremony on January 5, 2010.
Hawaii is subject to the highest energy costs in the United States, partially because of its dependency on non-renewable energy sources. Robbie Alm, executive vice president of the Hawaiian Electric Co., recently said, “Hawaii takes $7 billion from our economy for fuel alone and sends it overseas. It was reported recently that tourism spending has brought in almost $9 billion this year. We basically take a huge chunk of that income and give it away.”

The good news is Hawaii also is in one of the best places in the world for renewable energy.

“The biggest energy resource we have at HPA is wind,” Wiecking said. “We have access to wind and solar and all of the other alternate resources that are here, including the Natural Energy Lab in Kona, the wind farm at Upolu Point, Puna Geothermal, and the Mauna Loa Observatory, which is where the whole carbon dioxide curve first documented global warming.”

Lower School students "test drive" the Energy Lab's videoconference room with K-8 school counselor Mariah Dodd.
The Energy Lab concept developed at a Go Green charrette (workshop) in May 2007, when a group of students, faculty, administrators, and parents met for an intensive day-long session to create a vision for a sustainable campus.

“The idea of the Energy Lab kept coming up in our small group discussion, which was focused on energy,” Wiecking said. “In an hour, we had covered the walls with sticky notes. There were tremendous ideas — from all the things we could do in alternate energy, recycling, co-generation, and wind, to metering electricity on every building on campus, to becoming energy self-sufficient and possibly even an energy exporter.”

An HPA parent with extensive experience in green energy utilities participated in the energy group discussion and saw the Energy Lab as a “logical necessity.” He and his wife made a commitment to fund the Energy Lab.

HPA Headmaster Lindsay Barnes (right) receives the certificate of occupancy from Project Manager Ken Melrose during the blessing ceremony of the school's Energy Lab on January 5, 2010
“Our generation will not change,” said the donor, who wishes to remain anonymous. “The alarm is getting louder and louder, and the sad thing is that we are consuming our kids’ future. They are receptive, they are enthusiastic about learning and trying to find solutions to problems at their level. Education is a very, very essential need. The children

are the key to the future."

Architect David Croteau of Flansburgh Architects in Boston, along with his team of consultants, designed the 6,112-square-foot Energy Lab with input from the donors, Wiecking, students, and others, including project manager Ken Melrose.

Croteau's inspiration came from three sources. "The architectural form of the building is influenced by the architecture of Vladimir Ossipoff and harnessing the natural forces of the wind and the sun," he said. "The plan of the building was driven by the science program's team-based and process-based pedagogy. The trick of the project was to take these three influences and combine them into something new and exciting."

The two-story building, which also has a basement for storage, features open classroom areas and outdoor courtyards and decks, protected from the wind, which will encourage collaborative learning. The Lab consists of three "zones" that mimic the creative process students experience when working on projects, from brainstorming to design to physical construction.

The long, mauka building features individual project rooms equipped with computers and SmartBoards that also can be used as monitoring labs and a video conference room for 12-15 people. The central structure is a collaborative, carpeted flexible open space with a central set of screens configured in a triangular shape so no matter where a student is in the room, the screens are visible.

The front section is a workshop where all building and testing will take place. Tools and materials also will be stored here.

This design supports an educational model for the 21st century that Wiecking described as "teacher moving from sage on a stage to more of a facilitator or resource; it's a learning style where students work together in teams instead of being in a classroom with the teacher up front."

In addition to being designed for implementing best practices in education, the Energy Lab is designed to be a working example of the benefits of sustainable design.

Wind turbines and an array of roof-mounted photovoltaic panels will strive to produce 100 percent on-site renewable energy for the lab on a net annual basis. All wood is Forest Stewardship Council (FSC) Certified or from salvaged sources.

Every occupiable space has operable windows and the building is almost entirely naturally ventilated. An innovative radiant cooling system, which uses colder nighttime air to chill water, is used to condition warm spaces during the day.

Project manager Melrose said, "It's a living building; it will teach through its operation with all of its systems clearly illustrated for learning purposes. It's intended to be a utilities-neutral building with hopes of exporting power. It's the first of its kind for a school building in Hawaii."

Energy use in all campus buildings will be monitored from the Energy Lab, including a "test house," one of the faculty cottages.

"We'll do the research and find out the best way to do things, model best practices with the kids, and share what we learn with the community," said Wiecking, who sees the outreach component extending beyond local communities and schools to hosting national and international summer conferences, which is a natural extension of the Lab's mission of education, monitoring, and outreach.

The Energy Lab could very well be the nucleus of a global student network in learning. HPA already has established relationships with schools in Germany, Alaska, and around the state through its first Student Congress on Sustainability held in June 2008. The Third Annual Student Congress on Sustainability is June 1-4, 2010.

The Energy Lab also is attracting interest in partnerships from colleges here and on the mainland, including the University of Hawaii's College of Tropical Agriculture and Human Resources (CTAHR), Stanford University, and Cornell University.

Headmaster Lindsay Barnes sees tremendous potential in the Energy Lab.

“First and foremost, the lab will be an instructional facility where our students can begin to learn about the functional imperatives of a post-Age of Petroleum world. Those educated in sustainability and the dozens of disciplines (e.g., agricultural production, commerce, law, business, manufacturing, and engineering) touched by the quest for cleaner and renewable energy sources will be tomorrow’s leaders, and the Energy Lab will give our students a ‘head start’ in becoming the leaders of their generation.

“Second, we see the Energy Lab as an extraordinary resource for the Big Island. In the field of agriculture alone, the outreach possibilities are enormous.

“Third, the Energy Lab is envisioned as creating a flagship identity for HPA, an identity to which no other school can lay claim and this can pay tremendous dividends in the recruitment of students and faculty, not to mention what it can mean in terms of friend-raising for the school.”

Wiecking adds, “A lot of the things we’re doing with the Energy Lab haven’t been done anywhere. The building will be so completely off the grid and energy efficient with water catchment, passive water cooling…this building will do things that haven’t been done in any separate situation, let alone combined. It will be a clarion of where a building can be environmentally.”

In fact, according to Buro Happold, an international engineering firm that has developed innovative building technologies for some of the world’s most renowned architects, HPA’s Energy Lab could be the first K-12 school facility in the world to meet the Living Building Challenge, a criteria that exceeds LEED Platinum certification, which the school also is pursuing.

“I am not aware of another independent school with such an ambitious facility,” Croteau said.

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