

# SPACES LEARN

## WHO SAYS YOU NEED AIR CONDITIONING?

With Edmonds ecoPOWER hybrid rooftop ventilator, a new university building received a LEED Gold Certification and eliminated AC in nearly half of its rooms

By Maura Welch

Seattle summers have been unusually hot in recent years, but students and researchers at the **University of Washington's** new Molecular Engineering Laboratory have managed to stay quite comfortable. And it may come as a surprise that they do so without the help of air conditioning.

In 2013, the university partnered up with **Affiliated Engineers, Inc.** and architecture firm **ZGF Architects** to begin designing and constructing the new lab. Engineers from AEI searched for ventilation solutions that would create a comfortable environment while keeping costs low. They stumbled upon a new system by **Edmonds**, a leading producer of energy efficient ventilation solutions. Edmonds had blended gravity and mechanical ventilation to achieve serious energy efficiency with a product that suited the university's needs perfectly—the **ecoPOWER Hybrid Roof Ventilator**.

"They didn't start out looking for a hybrid roof ventilator because none existed before this!" explains director of Edmonds USA **Kurt Shafer**. "The ecoPOWER is the first one of its kind. And the Edmonds product happened to fit their needs perfectly."

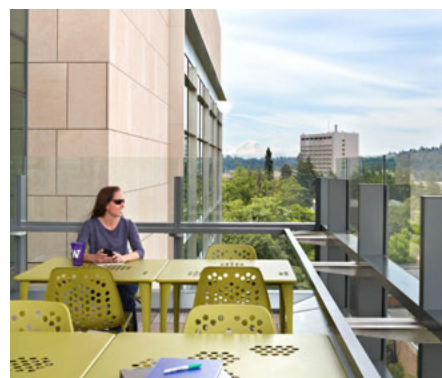
**Bruce McLay** of Affiliated Engineers, Inc. served as the project manager for AEI on the UW project; he explains why the hybrid design suited the University's needs. "We decided to incorporate solar chimneys into the design of the gravity ventilation system,

and adding some type of wind-driven feature made sense for us. The fact that the system can be passive or active was important," he says.

### ► Breathing Fresh Air into Ventilation Methods

To understand why the ecoPOWER is so effective, one first needs to understand what exactly distinguishes a hybrid roof ventilator from traditional models. Purely gravity roof ventilators use upward movement of warm air, as well as the power of the wind to turn turbines, which draw air up and out of a building. Mechanical roof ventilators rely on electric motors to actively move the air up the shaft and out through the ventilator.

Edmonds's ecoPOWER Hybrid Roof Ven-



PHOTOS: BEN BENSCHNEIDER



**Noteworthy:** This is the first UW lab building with offices that use natural ventilation instead of mechanical air conditioning. In addition to the ecoPOWER hybrid roof ventilators that draw hot air up and out, natural ventilation in office spaces is provided by windows that open and electronically controlled ceiling fans. To add to the sustainability of the building, two rain gardens control storm water, and three rooftop gardens absorb and filter storm water and moderate building temperatures.

## ECOPOWER VENTILATORS BY THE NUMBERS

125MPH

Wind speeds up to which the ecoPOWER ventilators are warranted

63-76%

Energy savings in areas where ecoPOWER ventilators eliminate the need for air conditioning

40%

Percentage of the above-ground square footage where the ecoPOWER ventilators have eliminated the need for air conditioning

260

Maximum running power consumption (in watts) of each ecoPOWER vent in mechanical mode (for perspective, a typical window air conditioning unit would consume approximately 1400 watts)

45.5

Decibels emitted in power mode (for perspective, a single residential air conditioning unit at 100 feet emits 60 decibels)

10

Year warranty—history shows all units deployed are still in operation after 12 years and counting



tilator is unique because it combines both gravity and mechanical modes. On many days, upward momentum of warm air and the wind-actuated turbines are enough to cool the facility. On very hot days when the gravity mode is not enough, it switches to mechanical mode, which engages the motor to actively move more warm air out. The two modes can also work simultaneously.

“The engineers who do research here like the idea that engineering solved this problem,” says **Steve Tatge**, executive director of Major Capital Projects at the University. “And people who are in a lab environment many hours a day appreciate the fact that you can open the windows to the fresh air outside. You can’t do that in a more controlled air conditioned environment.”

► *Clean, Quiet, and Low Maintenance*

The ecoPOWER ventilators are much quieter than traditional motorized ventilators (essentially inaudible in typical background noise), and are also low-maintenance. They are made from marine grade aluminum, which makes them lightweight and easy to install. **Allan Ramsay**, export manager for Edmonds, credits the motor, which is manufactured by **ebm papst** of Germany, for the system’s reliability.

“It’s an electronically commutated motor, which is the newest of motor technologies,” he explains. “ebm papst was really the fore-runner on these. They don’t have brushes; they work with magnetism. So there is nothing to maintain in them. They don’t need oil, grease, nothing.”

► *What Hybrid Designs Mean for the Future of Ventilation*

The university credits the ecoPOWER ventilators for helping the laboratory achieve **LEED Gold** certification. They have been deemed such a success that they will also be used in the school’s construction of a new Nano Engineering and Sciences building, which is slated for completion by April 2017.

ABOVE By utilizing ecoPOWER ventilators, you can have comfortable office spaces that are not air conditioned.

Tatge will also oversee this upcoming installation of ecoPOWER ventilators and says that the installation is a symbol for the university’s movement toward greater energy efficiency. “It’s not even so much about the specific success of the Molecular Engineering lab or the upcoming Nano Lab project,” he says. “By utilizing ecoPOWER ventilators you can have comfortable office spaces that are not air conditioned. That’s an even bigger story for me. This could influence how we design campus buildings in the future.” **gb&d**

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- **Best suited project for the ecoPOWER hybrid rooftop ventilator:** Perfect for LEED Silver & Gold certification or any projects that need lower power and higher performance energy saving rooftop ventilation.
  - **The standard return on the investment can be:** As high as 90% depending on application and usage. Wind will increase its performance, so at no wind, it has one of the lowest power consumption rates in the industry, and with wind, the power consumption can decrease by an additional 20%.
  - **Total energy saved by the product:** Estimated to be in the billions of kilowatt hours.



1. Purely gravity roof ventilators use upward movement of warm air, as well as the power of the wind to turn turbines, which draw air up and out of a building. Mechanical roof ventilators rely on electric motors to actively move the air up the shaft and out through the ventilator. Edmonds’s ecoPOWER Hybrid Roof Ventilator is unique because it combines both gravity and mechanical modes.
2. The ecoPOWER ventilators are much quieter than traditional motorized ventilators (essentially inaudible in typical background noise), and are also low-maintenance.
3. On very hot days when the gravity mode of the ventilators is not enough, it switches to mechanical mode, which engages the motor to actively move more warm air out. The two modes can also work simultaneously.

PHOTOS: BEN BENSCHNEIDER

RENDERING: COURTESY OF ZGF ARCHITECTS