COMPANY

Freiezo®, LLC
freiezo.com

LOCATION

St. Louis, Missouri, United States

SOFTWARE

Autodesk® Product Design Suite Ultimate
Autodesk® PLM 360

Wind energy without a trace

Startup firm Freiezo seeks to create high-performance, zero-landfill wind turbines from recyclable components

The software we received through the Autodesk® Clean Tech Partner Program has expedited our development efforts exponentially. It would've taken months to develop the turbine building's expensive physical prototypes. With Autodesk software, we cut the start-to-finish time to develop a working model by more than half.

—Bob Cumings
Chairman and Co-Founder
Freiezo, LLC

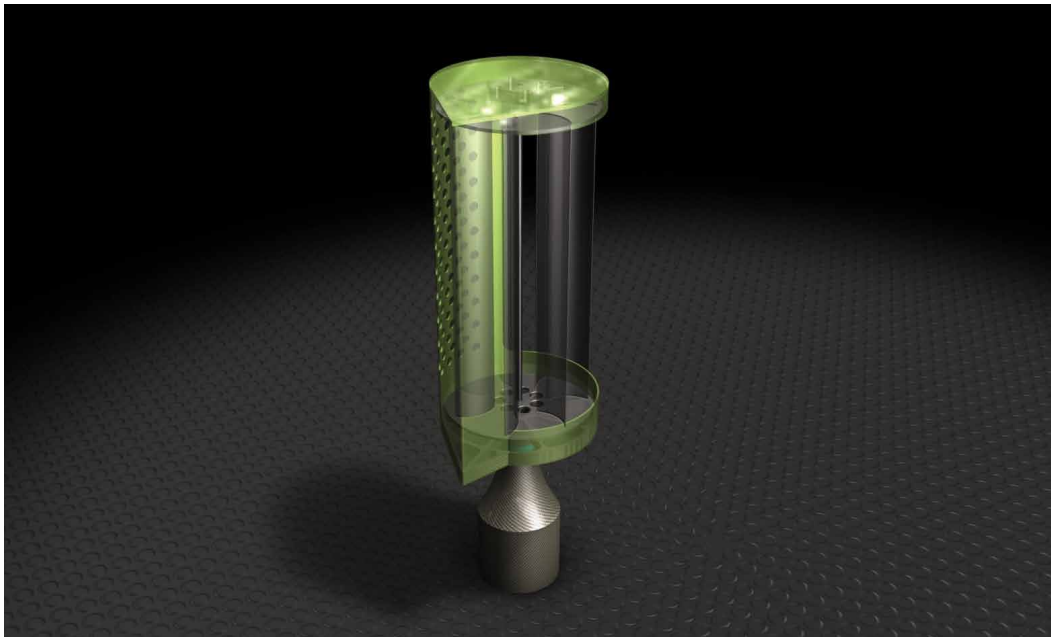

Image courtesy of Freiezo, LLC.

Project summary

Co-founded by Bob Cumings and Derrick Weisbrod, Freiezo® seeks to develop a modular, durable, and virtually silent vertical axis wind turbine (VAWT) that can efficiently convert wind energy into electricity. The company has already successfully installed and tested several working prototypes and is now actively developing the next product generation at its facilities in St. Peters, Missouri.

Cumings conceived the original design of what would ultimately become his company's residential and commercial flagship product, the Wind Joule® VAWT, while designing a new home for his family. "I wanted to cut our carbon footprint by combining solar and geothermal technologies with a modular, quiet, and high-efficiency wind turbine," says Cumings. "Unfortunately, none of the available wind technology met my needs."

Never one to back down from a challenge, Cumings applied his more than 30 years of experience as a professional inventor to the task of creating the solution.

The challenge

A deeply imaginative problem-solver, Cumings developed considerable expertise in solid modeling and computer-aided design during his long career in the aviation industry. He was also an early adopter of Autodesk® Inventor® Professional software, part of the Autodesk solution for Digital Prototyping. Within three months, Cumings used Inventor Professional to help design a digital prototype of his innovative new wind turbine. "Inventor is just where you naturally want to be when you design a machine," says Cumings.

Shortly thereafter, Cumings revealed his design ideas to longtime colleague Weisbrod, and the pair decided to found Freiezo, with Cumings serving as chair and Weisbrod as chief operating officer and co-founder. "I've always been passionate about the outdoors, conservation, and the environment," says Weisbrod. "When we started Freiezo, our goal was to create a clean tech, zero-landfill product for installation on business and residential rooftops. Essentially, we want to create wind energy without a trace."

The Autodesk Clean Tech Partner Program supports clean technology innovators with design and engineering software they can use to accelerate their development of solutions to the world's most pressing environmental challenges. For more information, visit **autodesk.com/cleantech.**

AUTODESK.

Eco Materials Adviser helped Freiezo save months of development time and secure grant funding for a feasibility study

The solution

For help designing the wind turbine, Freiezo turned to Autodesk® Product Design Suite Ultimate software—provided through the Autodesk® Clean Tech Partner Program. This suite encompasses software for 3D design, simulation, and tooling, and includes Eco Materials Adviser, an easy-to-use tool within Inventor Professional that Freiezo engineers used to evaluate the environmental impact of different materials on product design. "One of our goals is to use materials that are extremely light, extremely durable, and have minimal environmental impact," says Weisbrod.

Using traditional methods, Freiezo would have had to purchase different materials, build multiple prototypes, and test each one in order to see which met their performance, cost, and environmental requirements—a lengthy and expensive process. "Eco Materials Adviser saved us months of development time," says Weisbrod. "Being able to evaluate materials in a digital environment helped us avoid the costs, time, and waste associated with creating multiple physical prototypes." This work helped Freiezo secure a grant from the state of Missouri to conduct a feasibility study on recycled-plastics supply chains.

Using what they learned from the Digital Prototyping process, Freiezo engineers have created a small number of optimized physical prototypes. "They have been very quiet, stable, and durable," says Cumings. "In fact, a recent prototype survived a near direct tornado strike almost unscathed." Current design efforts now focus on improving power output.

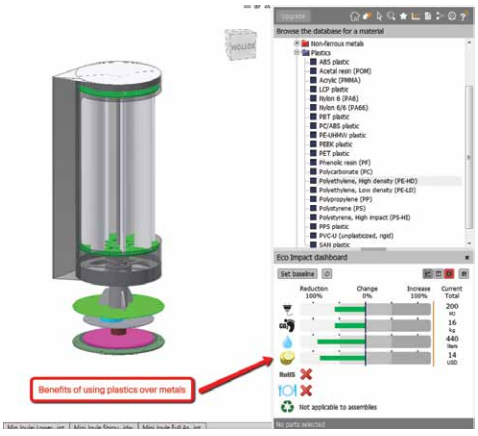

Image courtesy of Freiezo, LLC.

Through participation in the Clean Tech Partner Program, Freiezo has also begun to use Autodesk tools such as Autodesk® Vault data management software, which provides a single, online repository for file storage.

Freiezo also uses cloud-based Autodesk® PLM 360 software for product lifecycle management, with plans to implement more functionality after completing its current design validation efforts. "Before adopting Autodesk PLM 360, we were 30 days behind schedule," says Weisbrod. "Using PLM 360, we caught up in only 10 days. It helped us gain control of project management and visibility without stifling team flexibility or changing the corporate culture."

The result

"The Autodesk Clean Tech Partner Program and Autodesk Product Design Suite have been crucial to the founding and growth of Freiezo," says Weisbrod. "They have helped us develop a near-zero-landfill product containing 99 percent recyclable material."

"The software we received through the Autodesk Clean Tech Partner Program has expedited our development efforts exponentially," says Cumings. "It would've taken months to develop the turbine building's expensive physical prototypes. With Autodesk software, we cut the start-to-finish time to develop a working model by more than half."

For more information

To learn more about the Autodesk Clean Tech Partner Program, visit **autodesk.com/cleantech.**

Learn More about Autodesk Products

- Autodesk® Product Design Suite Ultimate: **autodesk.com/productdesignsuite**
- Autodesk® PLM 360: a**utodesk.com/plm360**

> Eco Materials Adviser saved us months of development time. Being able to evaluate materials in a digital environment helped us avoid the costs, time, and waste associated with creating multiple physical prototypes.
>
> **—Derrick Weisbrod**
> Chief Operating Officer and Co-Founder
> Freiezo, LLC

Image courtesy of Freiezo, LLC.

AUTODESK.