



# 2018 INNOVATORS

## » Founders of Wind Harvest International

**The Wind Harvest Co. founders** Sam Francis, George Wagner, and Bob Thomas pose at the Windstar 480 VAWT project site, Concord, California in 1985.

**It seems nothing happens fast** in the wind industry and certainly, nobody does anything significant alone. Even though the recent history of the wind industry in the U.S. earnestly begins about 2000, companies like Wind Harvest International (WHI) were working to be taken seriously more than a decade before that.

The original Wind Harvest Company was formed by a trio of friends with diverse backgrounds: George Wagner was an attorney and environmental activist, Sam Francis was a successful painter and visionary, and Bob Thomas is an aeronautical engineer and inventor. All met at and started the company after attending a seminar on Carl Jung by Dr. James Kirsch, who was also an original investor.

WHI says its mission is to offer cost-effective and durable vertical-axis wind turbines (VAWTs), develop new markets for wind energy, and integrate VAWTs into wind farms to optimize land use and energy production. Here's what each man contributed fulfilling that mission.

**Bob Thomas**, the technical brains behind WHI's core turbine design, managed to build and test over a dozen prototype VAWTs from 1976 to 2012. Thomas' approach to innovation and engineering led to a series of patents that form the core of WHI technology, including the Coupled Vortex Effect. (Three patents are described here: <https://tinyurl.com/3-patents>)

In the early 1970s, Thomas recognized the need for effective renewable-energy technology and applied his engineering experience from the aerospace industry. At the time, Thomas envisioned a wind

industry that combed government incentives, investment support, and technological innovation. As head of the California Wind Energy program in the early 1980s, he helped enact this vision and facilitate commercial-scale wind farming in California.

Thomas headed an early wind energy program for the U.S. Air Force and later worked for the California Energy Commission. Author Peter Asmus (in his book, "Reaping the Wind") calls Thomas the father of the U.S. wind industry because of Thomas' role as manager of the Commission's wind program.

Thomas also helped move Gov. Brown from supporting the large (and failed) Boeing-designed HAWTs of the late 1970s to the small turbines such as those from Kennetech, Flowind, and Jacobs. The development boom that got the U.S. and global wind industry off the ground with thousands of turbine installations may have never happened without him.

"I think Bob's greatest invention will be the Coupled Vortex Effect," said WHI's current COO Kevin Wolf. "When Dr. Ion Paraschivoiu was hired to use the data from a three-VAWT array in Palm Springs to model the effect, he said it was something neither he, engineers at Sandia National Labs, nor anyone else had considered."

French-wind-turbine company, Nenuphar, says the vortex effect will be key to floating offshore VAWTs (see <https://tinyurl.com/french-vawts>).

"This physical phenomenon can change how wind farms of the future are designed because of the vortex effect's ability to increase the wind speed of neighboring

VAWTs and how it can change surface roughness, vertical mixing, and wind speeds downwind," added Wolf.

Thomas has a BS in Aeronautical Engineering from the University of Michigan and completed graduate work for a Masters in Environmental Engineering at UC Davis. He remains active in the WHI creative design engineering for VAWTs operating in turbulent near-ground winds and has a healthy stock of innovative ideas waiting to be tested.

**George Wagner** served as President of WHI and major fundraiser over the course of 30 years. He established a large group of enthusiastic investors whose money, energy, and good will have kept the start-up company going in a challenging business climate.

Alternative energy companies were rarely given enough support to launch an effective clean energy company. Thanks, in part, to Wagner's confidence and perseverance, WHI succeeded. His efforts helped bring WHI's vertical-axis wind turbines to the wind industry. Wagner died in 2015.

**Sam Francis** was an environmentalist, visionary and internationally recognized artist. When he met Bob Thomas and George Wagner in the 1970s, Francis was fascinated with Thomas' idea of VAWTs and how they could help reduce the world's dependency on fossil fuels. He quickly encouraged the start of the Wind Harvest Company, and joined Thomas and Wagner as founders. Over the years, Francis became the company's leading investor and supporter. The company logo is an adaptation of a painting Francis created for Wind Harvest. Francis died in 1994. <sup>W</sup>