ConocoPhillips, Penn State Energy Prize for airborne wind turbines

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Adam Rein, showing off the model of the award-winning floating wind turbine. Credit: Patrick Mansell

(PhysOrg.com) -- Wind turbines that float hundreds of feet above the ground or sea and are deployable in 24 hours are the focus of the "Aerostat Platform for Rapid Deployment Airborne Wind Turbine" project that is the winner of the 2011 ConocoPhillips Energy Prize, awarded by ConocoPhillips and Penn State.

The ConocoPhillips Energy Prize recognizes new ideas and original, feasible solutions in three areas that can help improve the way the U.S. develops and uses energy: developing new energy sources, improving energy efficiency and combating climate change.

Ben Glass, CEO of Altaeros Energies, inventor of the Altaeros Airborne

Wind Turbine and Adam Rein, co-founder, Altaeros Energies are developing wind turbines that are stationary blimps, which take advantage of the more consistent and higher speed winds at altitude. These floating wind turbines can be used in remote areas where they arrive in a box and, once inflated with helium, rise into the air, tethered by a conducting cable. The turbines can supply 100 kilowatts of electrical power without using fossil fuels or producing any greenhouse gases.

While initially the company plans to sell these elevated turbines for remote uses such as military applications, emergency power and other remote installations, eventually they will form the basis of offshore, deep-water wind farms floating high above the waves.

Aerostats, like these airborne turbines, are currently used in a variety of locations and contexts and can remain in the air for up to three months without replacing helium. The rules and regulations for deploying aerostats already exist and these inflatables have a proven track record.

The first runner up was Jason Aramburu, founder and CEO of re:char and his team. Re:char manufactures small kilns to locally manufactured biochar on farms in Kenya. Biochar, manufactured from organic farm waste such as corn stover and other plant materials, is a charcoal-like material that can be made into briquettes, but can also be added to soils to improve their productivity. Selling the briquettes can earn local farmers money, but using it in the soil improves crops far more than simply selling the biochar.

The second runner up was Mark Mascal, professor of chemistry, University of California, Davis, for "Conversion of Plant Carbohydrates Into a New Generation of Biofuels and Substitutes for Petroleum Products" who uses inexpensive solvents and low temperature to convert cellulose and hemicellulose into furans, which can become the basis for

biofuels, drugs and plastics.

The five finalists included Jack C. Swearengen, emeritus professor and founding director of engineering programs, Washington State University, Vancouver, for "Carbon-Free Ammonia for Agriculture," a project that uses nitrogen from the air and hydrogen from water to create ammonia without producing carbon dioxide.

Also among the five finalists was Li Song, assistant professor, School of Aerospace and Mechanical Engineering, University of Oklahoma and Gang Wang, assistant professor, Civil and Architectural Engineering, TAMUK, who work on automated energy monitoring for commercial buildings.

Each of the five finalists received an award of $25,000 to further the development of their concept. The winner received an additional $100,000; the first and second runners-up received an additional $50,000 and $25,000, respectively

In 2010, ConocoPhillips and Penn State awarded the ConocoPhillips Energy Prize to Matthew Orosz and team STG for a solar generator that could bring electric power to remote areas around the world. The "Small Scale Solar Organic Rankine Cycle for Rural Cogeneration" provides electricity and hot water for remote, off-the-grid health clinics and schools.

More information: www.conocophillips.com/energyprize

Provided by Pennsylvania State University

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