

Current Event: University's prototype uses ocean's energy

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A perpetual-motion machine is the stuff of fantasy, but clean, renewable energy sources are within the grasp of societies that marry science, industry and economics.

For years, inventors have dreamed and schemed of tapping power from the ocean, yet nobody has come through with a practical plan. That's the hope of a Florida project that will test the waters on a way to generate electricity from Gulf Stream currents. Researchers at Florida Atlantic University in Boca Raton are developing an underwater energy farm that employs a network of turbines secured to the ocean floor. As strong currents turn the turbine props, spinning magnets create electricity and send it to a power plant along the shore.

"The concept is you have turbine blades in the flow of the ocean, much like turbines that harness the wind," said engineer Rick Driscoll, the director of the Florida Center for Excellence in Ocean Energy Technology, a research arm of the university.

"Ocean currents are much slower than the wind, but water is 700 to 800 times denser than air."

The turbines will be anywhere from five to 40 miles off the Southeast coast, where ocean currents are robust and reliable. Anchored to the bottom and suspended about 300 feet below the surface, each corrosion-resistant turbine will include a rotor 120 feet in diameter.

"Everything will be underwater except a few surface buoys," Driscoll said. "There will be inherent challenges in putting something that big in the ocean because you want it to be a long-duration thing."

The system won't produce carbon-dioxide emissions, create surface noise or be seen from shore. Because the high-torque, low-rpm rotors spin slowly, they aren't expected to hurt fish or other marine life.

If the prototype works - and clears an environmental-impact assessment - the immediate aim is to produce electricity for Florida's power grid, at the same time creating a revenue stream. In the larger picture, Driscoll said, the turbines could create electricity to make a fuel for the future - hydrogen - pumped back to an offshore loading station for ship transport to other markets.

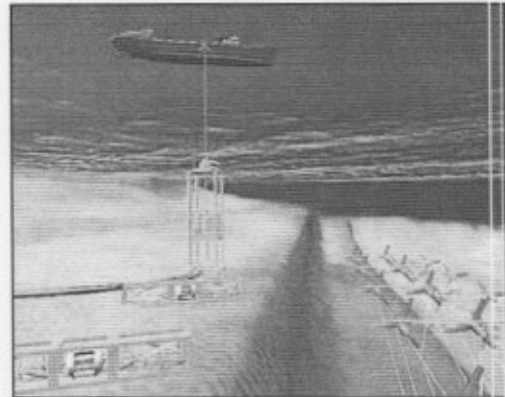
"Right now, hydrogen is produced from coal or oil, so there's a net gain in pollution," Driscoll said. "We want this to have a positive environmental impact."

Florida Atlantic will use \$5 million toward getting the project off the ground and in the water. Incentive comes from Florida's rapid growth - and a possible energy crisis. In-state energy production, currently is less than 1 percent of consumption, is forcing residents to rely heavily on imported sources.

Experts estimate a 30 percent increase in energy use in the next 10 years, with demand growing by 76 percent by 2030.

This story can be found at:

http://www.journalnow.com/servlet/Satellite?pagename=WSJ/MGArticle/WSJ_BasicArticle&c=MGArticle&c_id=1149193268806&path=!living&s=1037645509005



An underwater view shows a ship being loaded with hydrogen, the fuel that could result from the power produced.

(Illustrations courtesy of Florida Atlantic University)