

SEVERN ESTUARY,
United Kingdom

tech in sight
**Tides Turn
for Tidal**

Big tidal power projects seek backing

CAPRICIOUS AIR currents and passing clouds may thwart wind and solar power, but the tides, governed by the gravitational pull of the moon and the sun, might prove a more dependable energy source. In certain spots, the tides have already proved a good source of electricity. La Rance Tidal Power Station—a barrage on the Rance River’s estuary in Brittany, France—has converted the tides’ movements into as much as 240 megawatts of electricity since 1966. But support for new projects is less predictable: Backing has ebbed for some designs, while for others it’s just starting to flow.

—JOSEPH CALAMIA

INDIA'S GULF OF KUTCH

Atlantis Resources Corp., based in Singapore and London, is building big. Its AK-1000 tidal power turbine, the largest of its kind, weighs 1300 metric tons, has rotors with an 18-meter diameter, and stands 22.5 meters high. The giant can generate up to 1 MW of power and has two rotors per generator to collect energy from water flowing in either direction. Although that’s a mere fraction of what some barrages can produce, Atlantis CEO Timothy Cornelius says that turbines allow funders to test the waters, one generator at a time. “The big difference between a La Rance and our turbines is that you build up capacity incrementally,” he says. “It allows governments to get comfortable.... You don’t just go from 0 to 240 MW.” The company started testing the turbine at the European Marine Energy

Centre in Orkney, Scotland, this past August; it already has interested buyers. In January 2011, Atlantis announced that Narendra Modi, the chief minister of Gujarat, India, approved a partnership for a 50-MW tidal power project in the Gulf of Kutch. Cornelius expects that construction will likely begin in 2012 and finish in 2013—making the company’s turbines contenders for Asia’s first commercial-scale tidal power station.

ROOSEVELT ISLAND TIDAL ENERGY PROJECT

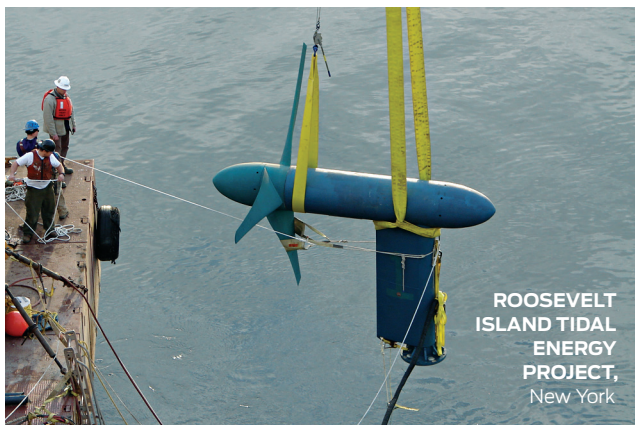
As part of its Roosevelt Island Tidal Energy Project, Verdant Power, headquartered in New York City, sank its first three-bladed turbines into the East River in 2002. From 2006 to 2008, a set of five turbines—which could passively pivot to face the tidal currents—delivered a total of 80 megawatt-hours of electricity to a supermarket and

parking garage on the city’s Roosevelt Island. By the end of 2014, Verdant Power plans to install 30 of its newest turbines on triangular frames in the river. Each can produce 35 kilowatts, for a total peak power output of around 1 MW. More power could come from placing larger, 500-kW generators in other, deeper waters like the Long Island Sound or from using the turbines to tap river currents in addition to tidal currents, says Trey Taylor, cofounder and president of the company. Verdant Power has also launched a project in Canada’s St. Lawrence River.

SEVERN ESTUARY

Stretching from the banks of Lavernock Point in Wales to the English shores of Brean Down, a 15-kilometer barrage across the Severn Estuary could meet up to 5 percent of the United Kingdom’s electricity demand, its developers at Corlan Hafren say. The barrage would make use of Severn’s 14-meter difference in water depth between low and high tides. Gates would close at high tide to trap water behind the barrage. Then, when the tides turn, the water would return at high pressure through the barrage’s turbines to generate an estimated peak power of 8 gigawatts.

A UK Department of Energy and Climate Change feasibility study, released in October 2010, dashed hopes for public funding of the barrage’s construction, questioning whether the costs of the project were too high, measured both in pounds sterling (which the report estimated at up to £34 billion) and its impacts on neighboring nature conservation sites. But Corlan Hafren hasn’t given up: Now it is looking for private investors to front what it estimates will be £23 billion for construction.



ROOSEVELT ISLAND TIDAL ENERGY PROJECT,
New York



GULF OF KUTCH, India

CLOCKWISE FROM TOP: CORLAN HAFREN; ATLANTIS RESOURCES CORP.; KRIS UNGER/VERDANT POWER