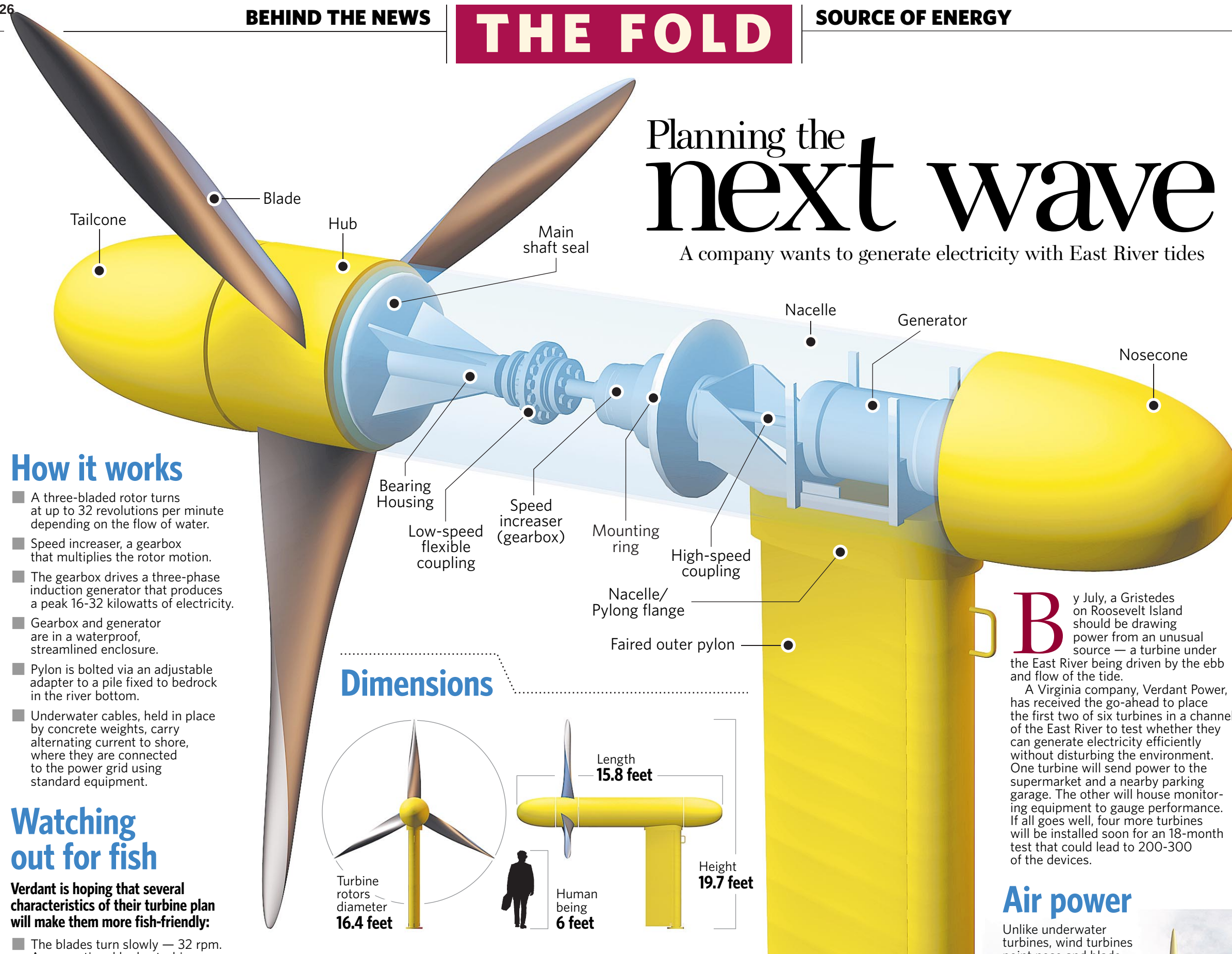
Planning the next wave

A company wants to generate electricity with East River tides



By July, a Gristedes on Roosevelt Island should be drawing power from an unusual source — a turbine under the East River being driven by the ebb and flow of the tide.

A Virginia company, Verdant Power, has received the go-ahead to place the first two of six turbines in a channel of the East River to test whether they can generate electricity efficiently without disturbing the environment. One turbine will send power to the supermarket and a nearby parking garage. The other will house monitoring equipment to gauge performance. If all goes well, four more turbines will be installed soon for an 18-month test that could lead to 200-300 of the devices.

How it works

- A three-bladed rotor turns at up to 32 revolutions per minute depending on the flow of water.
- Speed increaser, a gearbox that multiplies the rotor motion.
- The gearbox drives a three-phase induction generator that produces a peak 16-32 kilowatts of electricity.
- Gearbox and generator are in a waterproof, streamlined enclosure.
- Pylon is bolted via an adjustable adapter to a pile fixed to bedrock in the river bottom.
- Underwater cables, held in place by concrete weights, carry alternating current to shore, where they are connected to the power grid using standard equipment.

Dimensions

Watching out for fish

Verdant is hoping that several characteristics of their turbine plan will make them more fish-friendly:

- The blades turn slowly — 32 rpm. A conventional hydro-turbine turns at 600-700 rmp and is brutal on fish.
- They're spaced out. The turbines are between 40 and 100 feet apart, allowing more open space for fish to avoid them.
- They are relatively small. The pilot project takes up an area that is 77 feet wide and 217 feet long, less than an acre altogether.

Verdant is also studying fish patterns:

- **Six months before installation:** The company has been using fixed and mobile hydroacoustic transducers, and netting batches of fish as well, to determine the normal amount and kinds of fish passing through the test area.
- **For 18 months during the test:** Eighteen hydroacoustic transducers will be deployed with the test turbines to monitor fish behavior and impact.

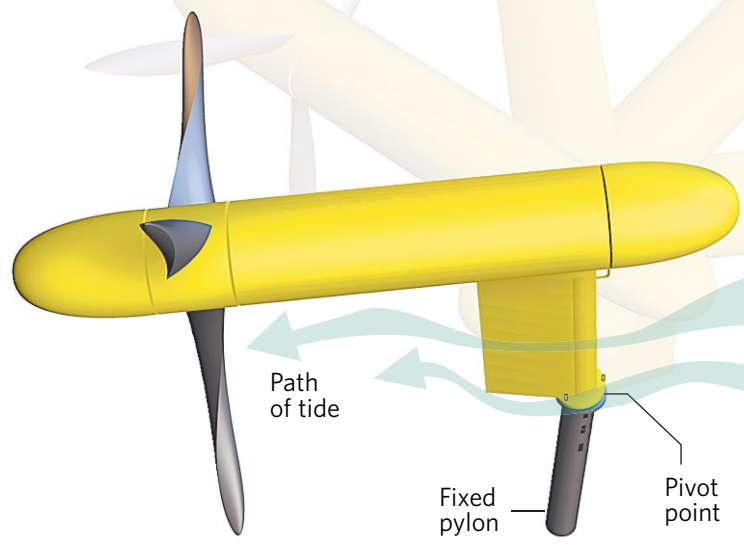
Other Studies

In addition to monitoring the effect of the turbines on fish, the company will be studying:

- Navigation and security
- Recreational resources
- Historical resources
- Water quality

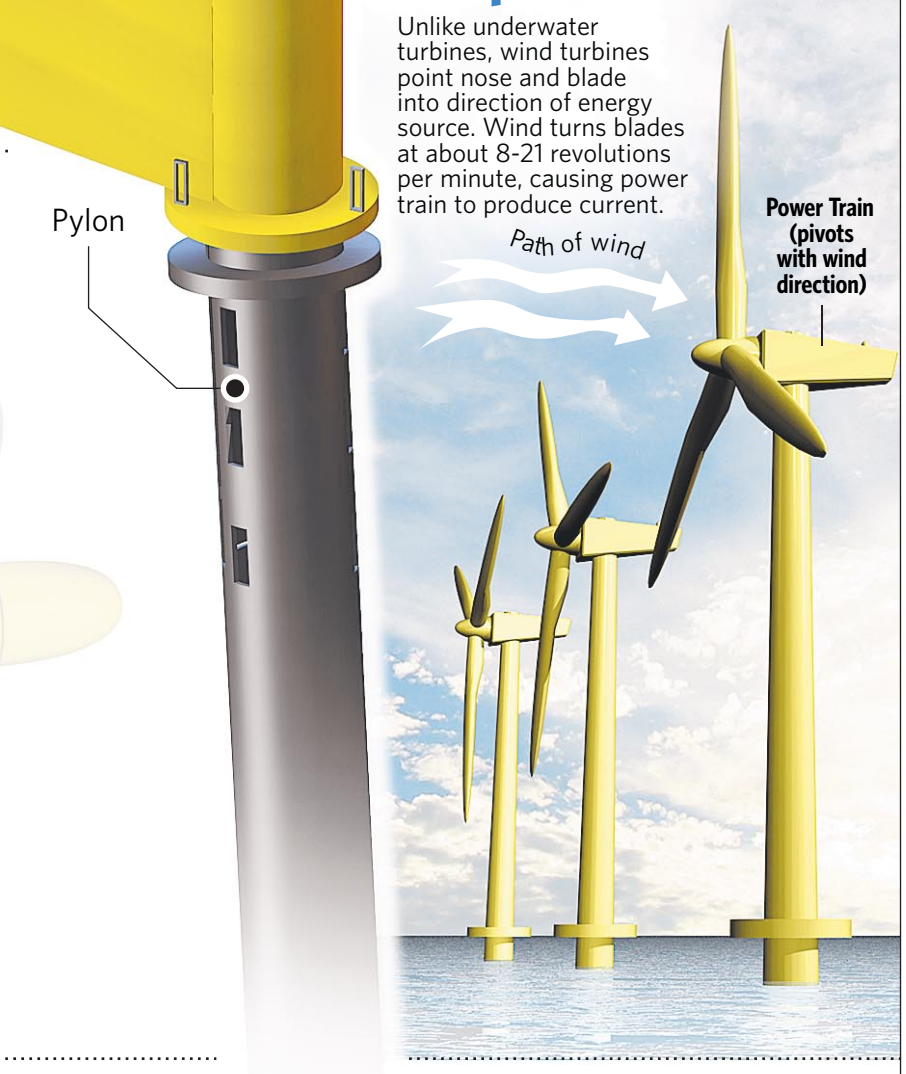
Going with the flow

Streamlined pylon pivots in the direction of the tide so power can be generated when tide is moving in or out.



Air power

Unlike underwater turbines, wind turbines point nose and blade into direction of energy source. Wind turns blades at about 8-21 revolutions per minute, causing power train to produce current.



Location

The initial six turbines will be installed just north of the Roosevelt Island Bridge, which links the island to Queens. If the project is fully built, turbines will run from the 59th Street Bridge to the northern end of the island.

NEWSDAY PHOTO / JULIA GAINES

Placement

They will be spaced two to a row, 40 feet apart east to west, with 100 feet between row (north to south).

There will be 6 feet of water under the turbine rotor at all times and 5 feet above it at the usual low-water mark.

SOURCE: VERDANT POWER LLC

VERDANT POWER

www.verdantpower.com