Developers face challenges capturing wave energy

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Although wave-generated power could meet a quarter of America's energy needs, the technology lags other renewables such as wind and solar. But the U.S. Navy has established a test site in Hawaii, where power from floating devices travels a mile through undersea cables to Oahu's power grid—the first wave-induced electricity online in the U.S.

Some things to know about wave power:

HOW DOES IT WORK?

Buoys convert wave movement to electricity. Some buoys capture the up-and-down motion of the waves, powering generators, while others capture the side-to-side motion. Industry experts say a machine that uses all the ocean's movements at once is most likely to succeed.

WHY IS WAVE POWER SO HARD TO DEVELOP?

Salt water is corrosive, and powerful storms can damage machinery, so it's challenging to design buoys that can withstand the elements. Unlike solar panels or wind turbines on roofs and hills, wave energy buoys are constantly moving and are challenging to install and repair, requiring boats and crews with oceangoing expertise.

HOW DOES U.S. WAVE ENERGY RESEARCH COMPARE?

The U.S. government and military have put about $334 million into it

over the last decade, while Europe invested more than $1 billion, according to the Marine Energy Council, a trade association. Congress is working on a bill that would provide additional wave research funding. Industry experts say wave energy could be commercially viable in the U.S. in the next five to 10 years.

CAN WAVE ENERGY DEVICES BE SEEN FROM LAND?

It depends. The two buoys deployed in Hawaii are visible from Marine Corps Base Hawaii at Kaneohe Bay, but you need binoculars to get a good look. It's likely that wave energy devices deployed by the dozen would be visible from land.

WHAT'S NEXT FOR THE HAWAII TEST SITE?

Two more companies are planning to test devices over the next two years. Each will be able to produce about 500 kilowatts of energy, which could potentially power hundreds of homes.