

## San Onofre wave farm idea churns up concerns

*An Orange County firm has federal approval to study putting thousands of generators off San Onofre. Surfers, conservationists and fishing groups worry about potential negative effects.*

**Tony Barboza, Los Angeles Times, 3-30-11**

The waves off San Onofre have for generations beckoned surfers and sport fishermen to a wild stretch of coastline in the shadow of domed nuclear reactors.

Now, an Orange County entrepreneur wants to tap the power of that legendary surf in a novel but highly controversial plan to build one of the nation's first hydrokinetic wave farms.

Federal energy regulators have given JD Products of Fountain Valley permission to begin a three-year study looking at the feasibility of installing thousands of ocean wave electricity generators a mile off San Onofre State Beach.

The firm's general manager, Chong Hun Kim, said he chose the site because it is close to transmission lines that serve the San Onofre nuclear power plant. Kim said he hopes to connect offshore generators to the power grid through underwater cables and sell power to the plant's operator, Southern California Edison.

The idea would be to connect the wave farm to San Onofre's transmission lines without going through the nuclear power plant, which has been under added scrutiny in light of Japan's massive tsunami and radiation crisis.

To surfers, conservationists and fishing groups that fiercely protect San Onofre as one of the California coast's natural treasures, Kim's idea is a half-baked proposal that has so far ignored potential impacts on wildlife, surf patterns and even training exercises at the nearby Marine Corps Base Camp Pendleton.

Environmental groups, which are broadly supportive of renewable energy projects, said putting the devices in the waters of San Onofre could harm marine life and potentially mar the view from the coastline. Surfers are worried it would dampen waves and alter seafloor terrain along a stretch of coast famed for its surf breaks. Sport-fishing groups said a wave farm could block off favored waters for sand bass, bonito and barracuda fishing.

"It seems like a silly idea," said Michael Hansen, owner of Dana Wharf Sportfishing. "It would pretty much shut down a huge area of productive fishing. If it did go in, it would bum us out."

Utilities and energy companies along the West Coast for years have sought to harness the vast potential of the Pacific Ocean to produce clean energy. But wave energy projects are largely in uncharted waters south of Point Conception, where waves aren't considered consistently powerful enough to make electricity generation worthwhile.

Several wave energy projects have been proposed off the California coast, but most have faltered.

Pacific Gas & Electric last year suspended its efforts to build a pilot wave energy project near Eureka, citing high costs and hard-to-obtain permits. Plans to build three wave farms off Sonoma County are stalled while officials look for \$1.75 million to pay for a feasibility study. San Francisco has proposed putting wave power

generators in the ocean to provide power for the city.

Wave farms have been tried in such places as Scotland and Australia. All work on the same principle: capturing the motion of ocean waves and turning it into electricity. In recent years companies have developed a vast array of devices, including hydrokinetic buoys that bob in the surf, hulking underwater turbines and huge, partly submerged "sea snakes" — tubes that use wave action to power electric generators. A collection of partially submerged cylindrical devices placed off the coast of Portugal in 2008 was heralded as the world's first wave farm.

But the idea has yet to gain much traction in the United States, where a nascent industry of mostly small start-up firms has struggled to develop and test the technology.

One of the most closely watched projects in the nation is a commercial wave park of hydrokinetic buoys proposed for off the coast of Reedsport, Ore. It has garnered the support of environmental groups like Surfrider Foundation because the firm plans to intensively monitor its effects on marine life and wave patterns.

Kim, a retired engineer in his 70s, would not discuss the details of his wave-harvesting mechanism or how the project would generate 3,186 megawatts of electricity as described in initial documents. He said he consulted experts who confirmed that wave velocity in the area was adequate. The generators would not harm marine life, he said, because they have no turbines.

An initial application with the Federal Energy Regulatory Commission said the firm would eventually mount more than 11,000 generators on the seafloor in a 2-square-mile area, at an undisclosed cost. The generators would contain buckets that capture energy from the push and pull of the surf. That energy would propel a conveyor belt that would ultimately produce the power. The federal permit issued to Kim in October gives his firm priority over the location but does not authorize construction.

Kim, scheduled to discuss the project at a public meeting Thursday, said it would be years before anything could be approved, much less built.

Adding to the obstacles is the would-be wave farm's proximity to the Trestles surf break, a sliver of coastline so treasured by wave riders that it is sometimes called the Yosemite of surfing.

Surfers and environmentalists mobilized and successfully halted a proposed toll road through southern Orange County in 2008 because it could have threatened Trestles. Advocates expect similar resistance to any development offshore.

"The challenge with Southern California is that it's such a heavily used coastline recreationally" that it is difficult to accommodate wave farms without disturbing some other use, said Chad Nelsen, Surfrider's environmental director. "We think wave energy is a good idea, but it's got to be sited in the right place and done in the right way."

Some state officials expressed hopes that testing wave devices like those proposed for San Onofre could one day lead to renewable energy sources that are compatible with the marine environment.

"If there is going to be hope for wave energy, we need to test these devices," said Laura Engeman, a project manager at the California Ocean Protection Council, which keeps track of wave energy projects along the state's coastline. "We need to see how much energy they produce and what kind of impacts they cause."