Harnessing wave energy to light up coastal communities

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Developing a sustainable society requires an all-hands-on-deck effort, one in which computer science and information technology have an important role to play. In October 2014, NSF announced $12.5 million in grants to 16 projects spanning 15 states through the Cyber-Innovation for Sustainability Science and Engineering (CyberSEES) program. The awards aim to advance the science of sustainability in tandem with advances in computing and communication technologies. The two-to-four-year grants, ranging from $100,000 to $1.2 million, bring together teams of researchers from computer science and other disciplines to develop new tools, technologies and models that advance sustainability science. One example of an area where CyberSEES has the

potential to have significant impact is in the harvesting of energy from ocean waves. Ocean waves have the potential to economically deliver more than one quarter of the nation's electricity needs, yet to date, they are a largely untapped energy resource. An interdisciplinary research team from Lehigh University was awarded a CyberSEES grant to study and optimize the operations of future wave farms, which will test the production of electricity across an array of wave energy conversion devices. Find out more in this news release. Credit: Andrew Schmidt, PublicDomainPictures.net

There's a new renewable energy player in town and it's about to make waves in the industry. Despite its massive potential as a source for renewable energy, the ocean is unlikely to contribute meaningfully to electricity supplies without dramatic, innovation-driven reductions in the cost of energy conversion.

That's where engineers Balky Nair, Rahul Shendure and Tim Mundon come in with their company, Oscilla Power. With support from the National Science Foundation (NSF), they're developing a utility-scale wave energy harvester called the Triton. It's a sturdy system with few moving parts—rugged enough to stand up to harsh seas with little need for maintenance. This technology shows promise as a means for delivering utility-scale electric power to the grid at a price that is competitive with conventional fossil or renewable technologies.

The team plans more tests with increasingly larger and more sophisticated prototypes. At full scale, each Triton system will be 30 yards wide and will power more than 650 homes.

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