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UVic-led research is bridging the knowledge gap for energy-challenged coastal communities

Even though BC’s remote, off-the-grid coastal communities rely on dirty and expensive diesel fuel to generate their electricity, there’s a strong appetite in these communities—for renewable technologies such as wind, wave and tidal. So what’s holding them back?

“There’s a knowledge gap that still has to be bridged,” says Brad Buckham, a mechanical engineer at UVic’s Institute for Integrated Energy Systems who specializes in marine energy technologies. “The communities need real data to assess how the resource will be harvested, how the technology will produce power over decades of operation, and how it will offset diesel use over that same period.”

Without that long-term assessment, he says, uncertainty dominates discussion and first-of-a-kind community-based marine energy projects fail to materialize.

Buckham is co-leading the Pacific Regional Institute for Marine Energy Discovery (PRIMED), a new project that will eliminate this uncertainty. “PRIMED is all about using data gathered in the field and advanced computer simulations to do long-term assessments and determine the full costs to the communities,” he says. As principal investigators have to accept a technology developer’s estimate of the benefits and costs of a project, without an on-site third-party to review PRIMED is that third party, says Buckham. “Trust has to be proportional to the economic commitment made by the community and the commitment made by the technology developer. PRIMED will help build that trust.”

PRIMED involves a range of academic and mature energy technology partners, notably Barkley Project Group in Nanaimo, a renewable energy developer that already works with remote communities along the coast.

“They’re our community representatives,” says Buckham. “Renewable energy integration is all about a synergy between supply and demand. Barkley is covering the demand side, PRIMED will provide the supply side and find the synergies, if there are there. Through Barkley, we’ll communicate possibilities and results to community leadership.”

PRIMED will gather extensive wind, wave and tide data from a number of existing sources, including the multi-partner West Coast Wave Initiative which Buckham also leads, and the new Canadian Pacific Robotic Underwater Observatory Facility (C-PROOF), led by UVic oceanographer Judy Kliger. The C-PROOF project involves sensors insured on autonomous underwater gliders and floats.

As the first project of its kind in Canada and the world, PRIMED will be a model for other jurisdictions, says Buckham.

“Worldwide, remote coastal communities are the break-in market for marine renewables. Our goal is to demonstrate how this ‘third party’ approach to risk mitigation should be a best practice in BC and elsewhere.”

INVENTION WILL SAVE LIVES AND REDUCE COSTS

High-tech bandage uses phone app

A ‘smart bandage’ that detects infection using a smartphone app has the potential to transform wound care, says UVic bioengineer Mohab Alibai.

He and his UVic-based research team, with collaborators from Harvard Medical School and ONC, are working with UVic Industry Partnerships to commercialize GelDerm, a patent-pending bandage that monitors pH levels at wound sites to detect the earliest signs of bacterial infection. When using GelDerm, a patient can use their smartphone to check whether infection has set in. The information can be used for self-monitoring and can be relayed remotely to a patient’s health care team for follow-up.

“The technology holds great promise in managing chronic and acute injuries caused by trauma, surgery or diabetes,” says Alibai. “This ‘all-in-one’ bandage will save lives and reduce costs.”

The bandage could be on the market within five years once industry partners have identified

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