

COVER STORY

MORE POWER TO THE PEOPLE

PROPOSED UNDERSEA CABLE WOULD ENABLE OAHU AND MAUI TO SHARE ENERGY



COURTESY HAWAII INFRASTRUCTURE PARTNERS

A submarine cable would consist of a large positive cable, a smaller neutral conductor and a much smaller fiber optic bundle.

► UNDERSEA CABLE, AT A GLANCE

Here's a look at some of the components of a proposed undersea cable that would link electrical power sources between Oahu and Maui.

THE CABLES

- The project calls for two high-voltage, direct-current undersea cables, plus land-based infrastructure on both islands.
- Each cable would be about 112 miles long and installed at a maximum depth of 650 meters (about 2,000 feet).
- Each cable would be capable of carrying 200 megawatts of energy.
- The cables likely would come ashore near Maalaea Harbor on Maui and Honolulu Harbor on Oahu.
- Alternative routes will be explored.

TIMELINE

- If approved, planning, permitting and construction are expected to occur during the next seven years.
- The system could be in service by 2020.

COST

- Between \$650 million and \$800 million.

BENEFITS

- Estimated cost savings for Maui Electric Co. and Hawaiian Electric Co. customers of \$4.8 billion to \$13 billion combined during the first 40 years of operations, representing up to nearly \$300 in annual savings for a typical residential customer.
- Improved electric system reliability for both utilities' customers by allowing electric generation resources located on both islands to support customer requirements on either island.
- Reduced consumption of imported oil by up to 1.5 million barrels each year.
- Increased renewable-energy production by 50 percent to 90 percent in 2020 on the combined Maui and Oahu system, compared to 2012 levels, while preventing the potential waste of renewable energy due to curtailments.

SOURCE: NEXTERA ENERGY HAWAII

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Oahu and Maui could share each other's power, and eventually lower residents' electrical bills while stabilizing the grid, under a plan that involves the state, Hawaii's largest utility and several undersea cable developers from the Mainland.

But the price tag is enormous – \$600 million to \$800 million by most estimates. In return, ratepayers could save a total of \$423 million over 30 years, according to the state Energy Office. And Hawaii would move closer to its clean-energy goals.

This cable project is different from the one that created headlines and controversy a few years ago. The "Big Wind" project, which is stalled indefinitely, would have transferred wind energy to Oahu from Lanai and Molokai.

The latest proposal would involve two cables – one sending energy from Oahu to Maui and other transferring clean energy from Maui to Oahu.

At least three developers say they have the expertise to lay the cable and construct the land-based infrastructure to distribute the energy.

The state Public Utilities Commission is in the midst of a review process to determine if such an undersea cable would be in the public interest. PUC Chairwoman Hermina Morita



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declined comment, noting that is an ongoing case.

The PUC has not said when it expects to make a decision. If it decides in favor of the project, it will issue a request for proposals.

Economic benefits

The three companies expected to bid on the project agree that long-term economic benefits outweigh short-term costs.

For instance, NextEra Energy estimates a cost savings for Maui Electric Co. and Hawaiian Electric Co. of about \$4.8 billion to \$13 billion over the first 40 years of operations, representing up to nearly \$300 in annual savings for a typical residential customer.

Hawaii Infrastructure Partners contends that there will be many opportunities for other businesses in addition to itself.

"There's going to be a lot of permitting activities and there are lots of resources that would have to come from the Islands," said Hugh Baker, founder and managing director of HD Baker & Co. "There's some engineering, cultural assessments, marine biology, corals, fish and whales. Lot of help will come from Hawaii."

On the construction side alone, he estimates that there will be work for hundreds of people throughout the various phases of the project. He said up to 15 people would be required to operate such a system.

David Parquet, senior vice president of Pattern



Hugh Baker



Mark Glick

Development, said nearly all businesses in Hawaii would benefit from the project. He noted that nearly all Hawaii businesses are electric customers and, for many, purchasing electricity is among their biggest expense.

"This project would benefit them by helping to lower electricity costs," he said.

HECO pointed out that lowering customer bills, reducing the state's use of oil and improving service are its top priorities and it believes that an interisland transmission system connecting Maui and Oahu could provide those benefits to its customers.

"However, it's important to determine the actual cost-effectiveness of such a system," HECO spokesman Peter Rosegg told PBN. "The best course of action is to use a request for proposals to gather information from potential developers about costs and the energy resources that could be shared between the Islands. An interisland cable would be a significant investment in our Islands' energy future, so we support going ahead with an RFP so we can gather the information needed to move this effort forward."

State believes in the cable project

Mark Glick, administrator for the state Energy Office, says the state supports an interisland transmission cable and believes an Oahu-Maui grid tie is in the public interest.

"As outlined in the State Energy Policy's second directive, connecting the islands through integrated, modernized grids is critical to meeting our energy goals," he said. "Our analysis finds an Oahu-Maui grid tie will provide economic benefits to ratepayers on both islands."

In addition to the \$423 million savings between 2020 and 2050, the project could reduce electricity rates by up to 0.6 cents per kilowatt hour and provide more consistent electricity rates due to the reduced exposure to oil pricing volatility, Glick said.

"Our analysis finds an Oahu-Maui grid tie will also provide benefits to the environment, such as reduced pollution, lower cost of environmental compliance, and the ability to retire old, inefficient petroleum-based power plants," he said. "[It] will help the state meet and exceed our mandated clean-energy goals. A grid tie will increase opportunities for high-efficiency renewable-energy development that can be operated more efficiently with less or even no curtailment."

Maui County sees benefits

Some Maui County officials believe that the cable configuration connecting the grids will most likely benefit residents of both islands.

"The biggest risk we see for an Oahu-Maui grid tie connection is that substantial amounts of distributed generation, mainly solar photovoltaics, will be added on Oahu before any cable could ever be built," said Maui County Energy Coordinator Doug McLeod. "If Oahu were to add enough renewable energy that there was significant curtailment on Oahu, then some of the economic benefits could be lost."

Noting that his office's review of the project is still preliminary, he said grid-tied systems could have such benefits as increased use of renewable energy on the island of Maui, agricultural land could be made economically productive if used for solar PV production, and a grid-tied

CONTINUED ON PAGE 14

Blue Planet Foundation CEO Jeff Mikulina, left, says an undersea cable could, for example, allow Maui to share its excess wind energy with Oahu at night.

COVER STORY

▶ THREE FIRMS HOPING TO DEVELOP THE PROJECT

NextEra Energy has acquired this property on Iwilei Road in Honolulu as a possible landing site for an undersea cable linking Oahu and Maui.

TINA YUEN



Three developers — Hawaii Infrastructure Partners, Hawaii Interisland Cable and NextEra Energy Hawaii — have publicly come out to show their respective interest in the project.

These developers share their plans and strategies as well as the benefits of undergoing something that Hawaii has never seen before.

HAWAII INFRASTRUCTURE PARTNERS

Hawaii Infrastructure Partners LLC, which is made up of three entities — Massachusetts-based Anbaric Transmission, Connecticut-based PowerBridge LLC and Kailua-Kona-based HDBaker & Co. — has been waiting for a little more than four years for a request for proposals to come out regarding a Hawaii undersea cable project.

"We would like to see a decision," Hugh Baker, founder and managing director of HDBaker & Co., told PBN. "I think that if you look at the body of information that's been filed in the case, there are a number of things that say, economically, there is a pretty good case to be made."

Baker says that from his firm's perspective, they hope the PUC will put a lot of scrutiny on the economics of the project.

"I think that's what's really important, that people buy into the financial feasibility analysis," he said. "From our perspective, we don't want to do a project that does not make sense."

Baker estimates that an undersea cable project connecting the grids on Oahu and Maui would range in cost from \$650 million to \$800 million.

Members of the development group — which is being managed by PowerBridge, which operates two other electric transmission projects on the East Coast — together or separately have other cable projects that they're pursuing, Baker said.

He noted that Hawaii Infrastructure Partners' experience in other such projects makes it a cut above the rest.

"Of the players interested in Hawaii, we're the only ones that have done two cable projects," Baker said. "There's not many developer types in the United States that have done undersea cables, so in terms of how many others are out there, maybe two or less that could be out there."

HAWAII INTERISLAND CABLE

Hawaii Interisland Cable LLC, a development group made up of California-based Pattern Energy Group and Colorado-based Bio-Logical Capital, hopes that an undersea cable project will happen, mainly because it would benefit the state's ratepayers in many ways, including lower energy costs and improved energy reliability for both Maui and Oahu.

"It would also lead to reductions in the burning of fuel oil, which would benefit Hawaii's environment," Pattern Development Senior Vice President David Parquet told PBN.

The group, which once had plans to develop Molokai's 200-megawatt portion of the so-called

Big Wind project, which was taken off the table last year after the landowner could not reach an agreement with them, was formed to participate in "Hawaii's energy future."

"We will submit a competitive proposal if the PUC issues an RFP for the project," Parquet said. "However, we also continue to look for other opportunities to help the state benefit from cost-effective renewable energy."

Hawaii Interisland Cable also touts experience as a key strength.

"Our team members have significant experience developing and constructing transmission and interconnection facilities, including the undersea Trans Bay Cable Project that traverses the environmentally sensitive San Francisco Bay," Parquet said.

NEXT ERA ENERGY

NextEra Energy, one of the top producers of wind and solar energy in North America, also is looking to develop an undersea cable project between Oahu and Maui. The company has, for the past two years, been developing plans for such a project, as well as connecting the Big Island's grid, which would pump geothermal energy into the mix.

The Florida-based firm, which formed NextGrid Hawaii for the project, estimates that such a project would cost about \$600 million to develop and build.

"We're a participant in the process," NextEra Energy spokesman Steve Stengel told PBN. "We have filed comments as part of the docket and we support the work that the PUC is doing and like others interested in this project, we look forward to the PUC's determination whether it is in the public interest."

NextEra Energy, which has done an extensive analysis on the project, says that the project would involve two cables, one for power coming in and one for power going out. Each cable would be capable of carrying 200 megawatts of energy.

NextEra Energy also says that it would finance the project itself, with a 40-year payback by the state with interest.

Additionally, the company has acquired a 25,000-square-foot parcel in Honolulu at 616 Iwilei Road, which would be the landing site on Oahu.

If an undersea cable project isn't found to be in the best interest of the public, NextEra Energy says that it is already looking at renewable-energy opportunities in Hawaii, in addition to the cable project.

"One does not depend on the other," Stengel said. "We're continuing to pursue renewable opportunities as well as the cable project."

One of NextEra Energy's main strengths it is touting is its financial resources. The publicly traded Fortune 200 company notes its year-end 2012 balance sheet included more than \$64 billion in assets and \$16 billion in shareholder equity.

CONTINUED FROM PAGE 13

cable could enable island residents to add more of this type of energy.

But benefits must be compared to costs, McLeod said, pointing out that wind farms carry higher "costs" in the area of visual impairment, while solar PV would be easier for the community to see as a net benefit.

Growing demand for undersea cables

As cable technology improves, more projects are being planned that require longer, deeper and higher-capacity cables, according to Navigant Research, a market research and clean-technology consulting firm with offices in Colorado and Washington, D.C.

A Navigant report released in November regarding installed submarine electricity cables, including ones connecting electric grids, estimated conservatively that the number of installed projects will grow from 110 in 2013 to 304 in 2023. By comparison, under a more aggressive scenario, that number could reach 453 by 2023, Navigant said.

"Only a few companies have the capability to construct and install high-voltage submarine cable, and the constricted supply chain for these highly specialized and expensive products has limited the industry's growth in the past," said Bob Lockhart, research director for Navigant Research. "The tide has changed, with market entrants from other sectors and other regions of the world beginning to step in to absorb the excess demand."

While the economic downturn of the past few years has slowed the number of installations, many governments and organizations remain committed to the types of projects that drive new high-voltage submarine cable installations, the report said.

Navigant Research predicts that the high-voltage submarine cable market will reach \$33.8 billion in cumulative revenue between 2014 and 2023.

Clean-energy advocate backs undersea cable

The Blue Planet Foundation, a Honolulu-based nonprofit that advocates for clean energy, believes that a grid-tie cable supports its mission and serves the public interest.



Jeff Mikulina

"An example of how a cable would enable cooperative operations would be if Maui were able to share its surplus of wind energy at night, while Oahu has an expanding fleet of electric vehicles that could put that energy to work," Jeff Mikulina, the foundation's CEO, wrote in a letter to the PUC. "Similarly, if a power-generation problem were to occur on Maui, then electricity could be sent there from renewable sources or fossil units on Oahu."

He also noted that crude oil is imported to and refined on Oahu, then shipped to the Neighbor Islands, making it unnecessary for them to have their own crude oil off-loading or refineries.

"Replacing imported fuels with in-state energy projects generates jobs, income and tax revenues that support local communities with funds that otherwise would have flowed out of the state," Mikulina said. "Relying on each other to share renewable resources and to control our energy costs will strengthen all parts of Hawaii's economy. This benefits all the Islands."