Can 100% renewable energy be reasonably achieved without thermal power? Unlikely

(Honolulu Star-Advertiser "Island Voices" Article, October 19, 2026)

By Clint Churchill and Ed MacNaughton

In the debate over switching Oahu's power from oil to liquefied natural gas, LNG is framed as a transition fuel to 2045, when Hawaii is assumed--required?--to reach 100% renewable energy. We question that assumption, with major implications for the LNG infrastructure timeframe.

The only plausible path to 100% renewable is solar, combining utility-scale and customer-sited. Community opposition will likely block new wind projects and perhaps renewals of existing ones. Hydrogen and biofuel are too costly and would raise ratepayer cost unacceptably.

Beyond excessive land requirements, the major problem with relying almost entirely on solar power is reliability. What will it cost to run Oahu on batteries, every night and on every overcast day?

Hawaiian Electric's "hybrid" solar farms provide only four hours of battery storage relative to peak generation, typically drawn down from 5 to 9 p.m. each evening, and recharged the next day--if it's sunny. On a cloudy day, a solar farm can't generate enough for daytime demand, let alone recharge for the night. The shortfall compounds over several overcast days.

Battery farms are a costly middleman between solar farms and ratepayers. Oahu's first battery farm, Kapolei Energy Storage (KES), cost roughly $220 million. Once KES recovers its capital cost, a rate of return, and throughput charges, HECo estimates a 20-year ratepayer cost of $500 million. But KES's 565 megawatt hours of storage provides less than 3% of Oahu's daily demand.

Thus a critical question: How many days of battery backup should be required? The March 2026 Kona Low storms, with nearly two weeks of overcast skies, sharpen this question. Assuming roughly 70% of Oahu's electricity might eventually come from solar, the Practical Policy Institute (PPIH) believes that depending on fewer than five days of battery backup would be unwise.

A key assumption is future battery cost. The KES capital cost was $389 per kWh. The PPIH calculation is based on the National Renewable Energy Laboratory's lowest-cost projection for 2035 of $147 per kWh—62% below KES's actual cost. An optimistic best-case scenario.

Based on those assumptions, the capital cost of battery backup at projected future demand is a staggering $13.5 billion (see Briefing Paper #9 at practicalpolicy.org). Doubling that over 20 years--for cost recovery, rate of return, and throughput charges--yields annual charges to ratepayers of $1.35 billion. This means a best-case addition of $0.15 per kWh for HECO ratepayers who don't generate their own power.

The inescapable conclusion: Massive battery farms for solar reliability will be cost-prohibitive. But isn't 100% renewable energy required by Act 97 of 2015? Perhaps a surprise to many, the answer is clearly no. The law contains 13 exceptions, including "inability (of utilities) to acquire sufficient cost effective renewable electrical energy."

PPIH's view is that "cost effective" should be read to include reliability. HECo's most recent utility solar farm bid, Mahi Solar, came in at $.23 per kWh. With federal and state subsidies gone, future bids will surely rise. Adding backup storage cost, the total will clearly be well above the cost of natural gas combined cycle generation.

PPIH also believes Oahu will need thermal power beyond 2045, not only as solar backup but to meet demand outright. Briefing Paper #7 projects solar will "hit the wall" at about 45% of demand (solar accounted for 25% of 2025 demand), due to land constraints and rooftop saturation--resulting in a continuing need for thermal generation for as much as 50% of demand.

Natural gas, shipped as LNG, is the only practical alternative to reduce costs, reduce CO2 emissions relative to oil, and ensure electricity at night and on cloudy days.

We should absolutely continue our best efforts toward affordable 100% renewable energy, but should these efforts fall short, the only practical pathway ahead is to have LNG infrastructure in place. We should all support the LNG initiative laid out by Gov. Green and the State Energy Office.

Clint Churchill and Ed MacNaughton represent the Practical Policy Institute of Hawaii.

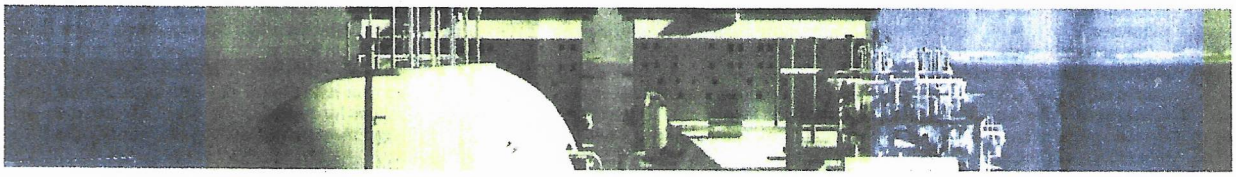
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Part of a rendering of Jera Americas' proposed LNG terminal, to sit off Kalaeloa, is shown here.

JERA AMERICAS WEBSITE

Will LNG be in isles' clean-energy future?

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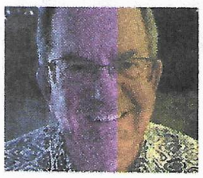
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ISLAND VOICES





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