



# west kaua'i energy project

*Developing a pumped storage hydro project on Kaua'i's west side has been in discussion for nearly a decade. Kaua'i Island Utility Cooperative (KIUC) and The AES Corporation (AES) joined forces on a groundbreaking solar PV + Battery Energy Storage and pumped storage hydro project which will be the first of its kind in the world and is a critical component of Kaua'i's renewable energy future.*



Accelerates Hawai'i's transition to 100% renewable by 2045, moving Kaua'i beyond 80% renewable generation.



Expected to generate renewable energy to meet approximately 25% of Kaua'i's energy needs.



Improves grid performance through long-duration storage capability. Capable of operating on 100% renewable energy for prolonged periods without sunlight and throughout the night.



Enhanced firefighting capabilities through availability of reservoir water resources.



Improves historic diversion structures in Koke'e to restore and increase flow in tributaries.



Provides new irrigation infrastructure, supporting water delivery and diversified agriculture on Department of Hawaiian Homelands.



Offsets approximately 425 million barrels of fossil fuel over its 50-year lifespan.



Improved access to Pu'u Lua for seasonal fishing.



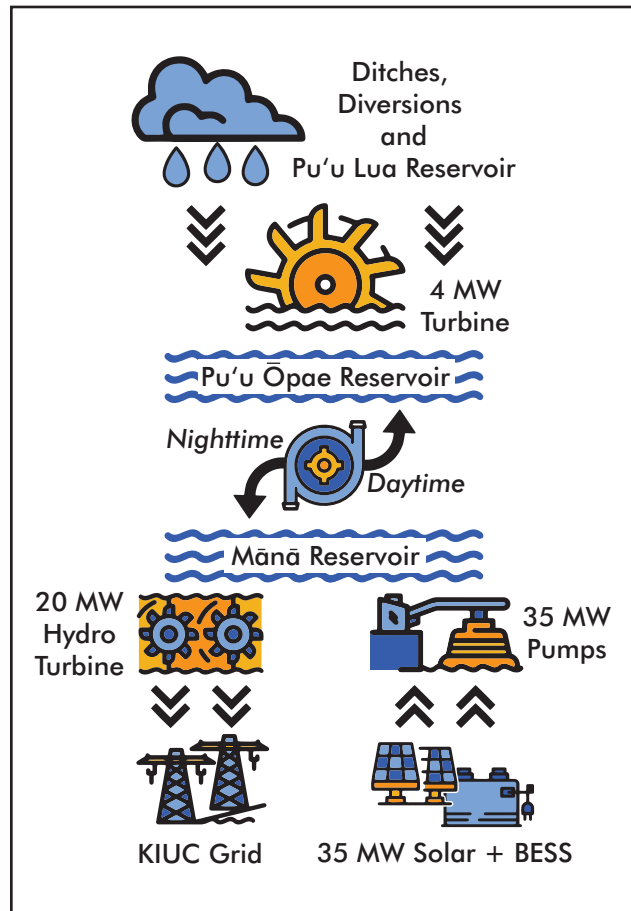
Stabilizes and lowers energy rates over time.

## WHY WKEP?

- ◆ Envisioned to be a “legacy” generation facility: expected to serve Kauaʻi’s energy needs for 100 years or more while stabilizing rates over time.
- ◆ The unique topography of the area coupled with the existing plantation ditch and reservoir infrastructure offer the opportunity to create a renewable energy generation project that is unique in the world.
- ◆ Creates economic development and agricultural opportunities for Native Hawaiians and the west side communities of Waimea and Kekaha.

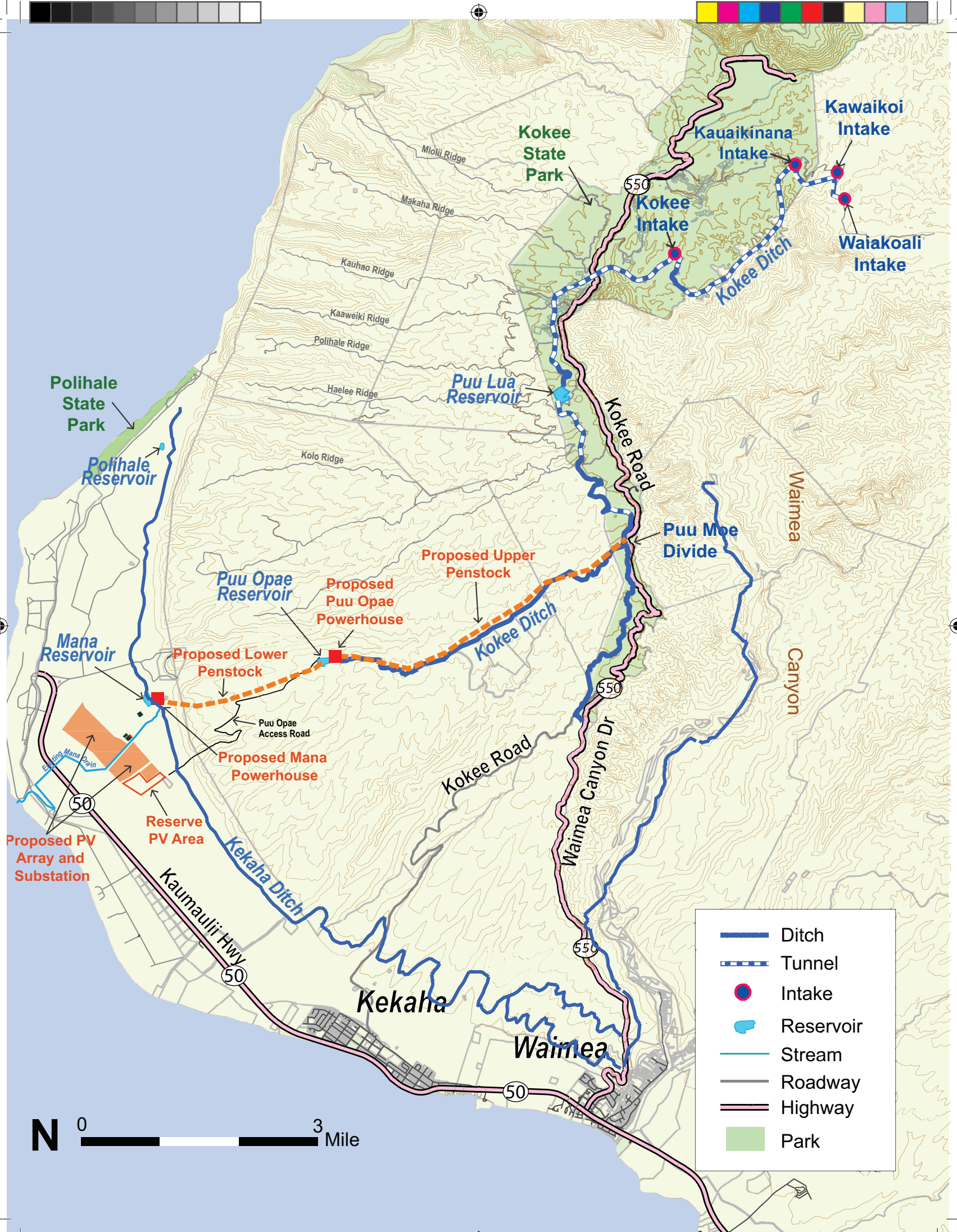
## HOW DOES IT WORK?

- ◆ Three reservoirs from Kokeʻe to Mānā will be upgraded and rehabilitated and water from streams in Kokeʻe will be delivered to Puʻu Lua reservoir, to be stored and released via a renovated ditch system and pipeline to a powerhouse at Puʻu ʻŌpae reservoir.
- ◆ A 4-megawatt (MW) hydroelectric generator at Puʻu ʻŌpae will provide flow-through generation, while the reservoir also supplies irrigation water to adjacent Department of Hawaiian Home Lands tenants for agricultural use.
- ◆ Water will then be released via an underground penstock to Mānā Reservoir. A 35 MW Solar + battery energy storage system (BESS) will provide power to pump water from Mānā back up to Puʻu ʻŌpae, effectively “charging” the system utilizing renewable energy. At night and other times as needed, water stored at Puʻu ʻŌpae will be released to produce firm, renewable power.
- ◆ A 20 MW powerhouse at the Mānā Reservoir will serve most of the power to the grid, while the 4 MW generator at Puʻu ʻŌpae adds incremental hydropower. The current design would be capable of delivering 240 megawatt hours (MWh) of stored energy daily, and allows KIUC to replace fossil-fuel generation with renewable power throughout the evening. The large storage capacity also allows KIUC to use this electricity over a period of days in times of emergency or extended periods with no sunlight.



## PROTECTION OF WATER RESOURCES

- ◆ As part of the project, KIUC will modify existing diversions so that Interim Instream Flow Standards, as prescribed by Commission on Water Resource Management through a mediation settlement, are met.
- ◆ Key parties in this mediation were KIUC, Poʻai Wai Ola/West Kauaʻi Watershed Alliance, the Agribusiness Development Corporation, the Department of Hawaiian Home Lands and the Kekaha Agriculture Association.
- ◆ The mediated settlement amended the instream flow standards for the Kokeʻe diversions, resolved disputes over water waste and addressed long term needs and uses on the Kokeʻe and Kekaha ditches.



	Ditch
	Tunnel
	Intake
	Reservoir
	Stream
	Roadway
	Highway
	Park

N 0 3 Mile

## WHAT WILL WKEP COST?

- ◆ WKEP is competitively or lower-priced than all other renewable generation sources currently in service for KIUC, and offers many additional benefits to grid operations, the environment and the community at-large.
- ◆ KIUC will purchase solar power from AES at a fixed price of \$71.60 per megawatt hour, a rate at least 34% lower than any of KIUC's currently operating utility-scale solar facilities.
- ◆ AES will provide 24 MW of firm renewable capacity, along with 240 megawatt hours of long-duration storage daily and in turn will receive roughly \$8.9 million per year via a hydropower capacity charge. In times of emergency, more than 1,300 megawatt hours of storage offered by Pu'u Lua reservoir can also be used.
- ◆ The average annual operating cost is \$150 per MWh, and is expected to save KIUC and its members between \$157 and \$172 million versus the projected cost of diesel over the 25-year term of the power purchase agreement.

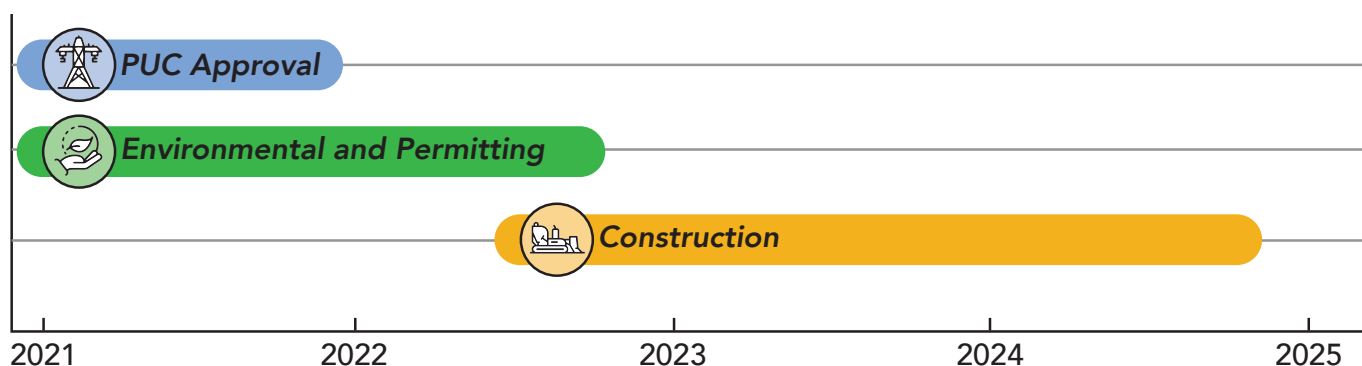
## ELECTRICITY PRODUCTION

SOURCE	OUTPUT
PV	56 MW dc, 35 MW ac
Battery	35 MW ac, 70 MWh
Lower Hydropower Plant (Mānā)	20 MW turbine generator, 35 MW pumping
Upper Hydropower Plant (Pu'u 'Ōpae)	4 MW turbine generator

## RESERVOIR/WATER STORAGE

RESERVOIR	STORAGE CAPACITY	OUTPUT
Mānā	80 MG	Can supply 35 MW of pumping for 9 hours
Pu'u 'Ōpae	100 MG	Can power 20 MW plant for 12 hours
Pu'u Lua	219 MG	Can power 4 MW plant for 166 hours and 20 MW plant for 33 hours

## PROJECT TIMELINE



## FOR MORE INFORMATION, CONTACT:



[www.aes.com](http://www.aes.com)



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rev. 03/21