Kaua'i Island Utility Cooperative

Your Touchstone Energy® Cooperative

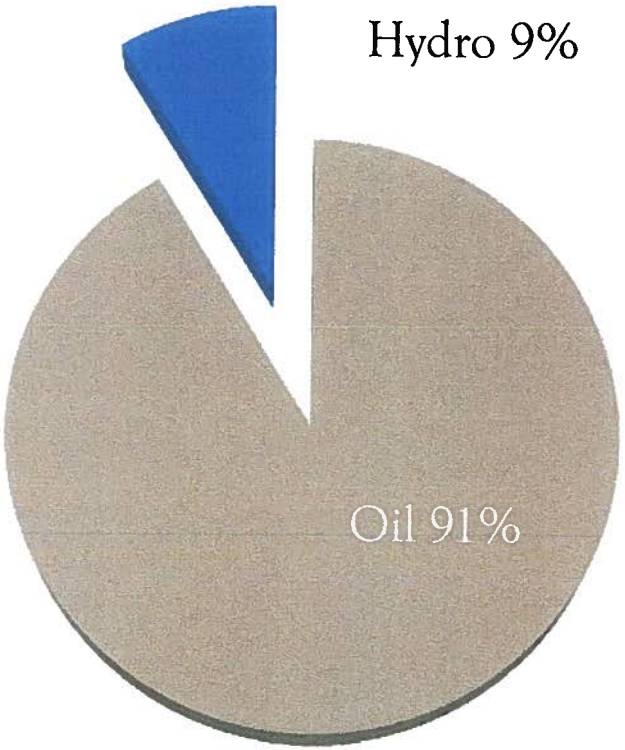
KIUC Pumped Storage

April 2015

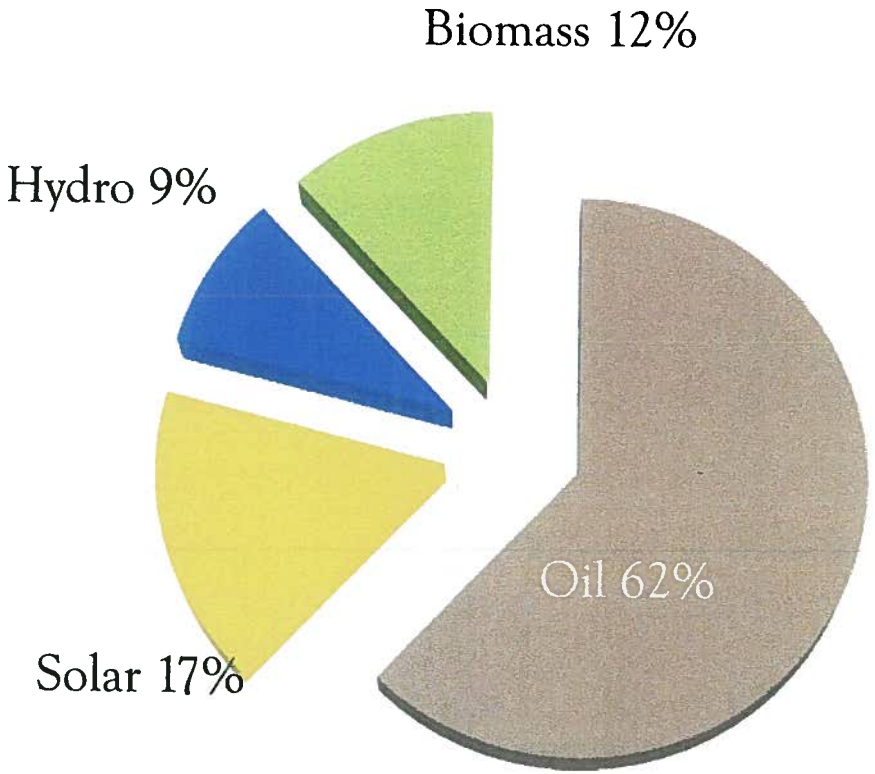
Kaua'i Island Utility Cooperative

Where Kauai Gets Its Power

Fuel Mix 2009



Fuel Mix 2015



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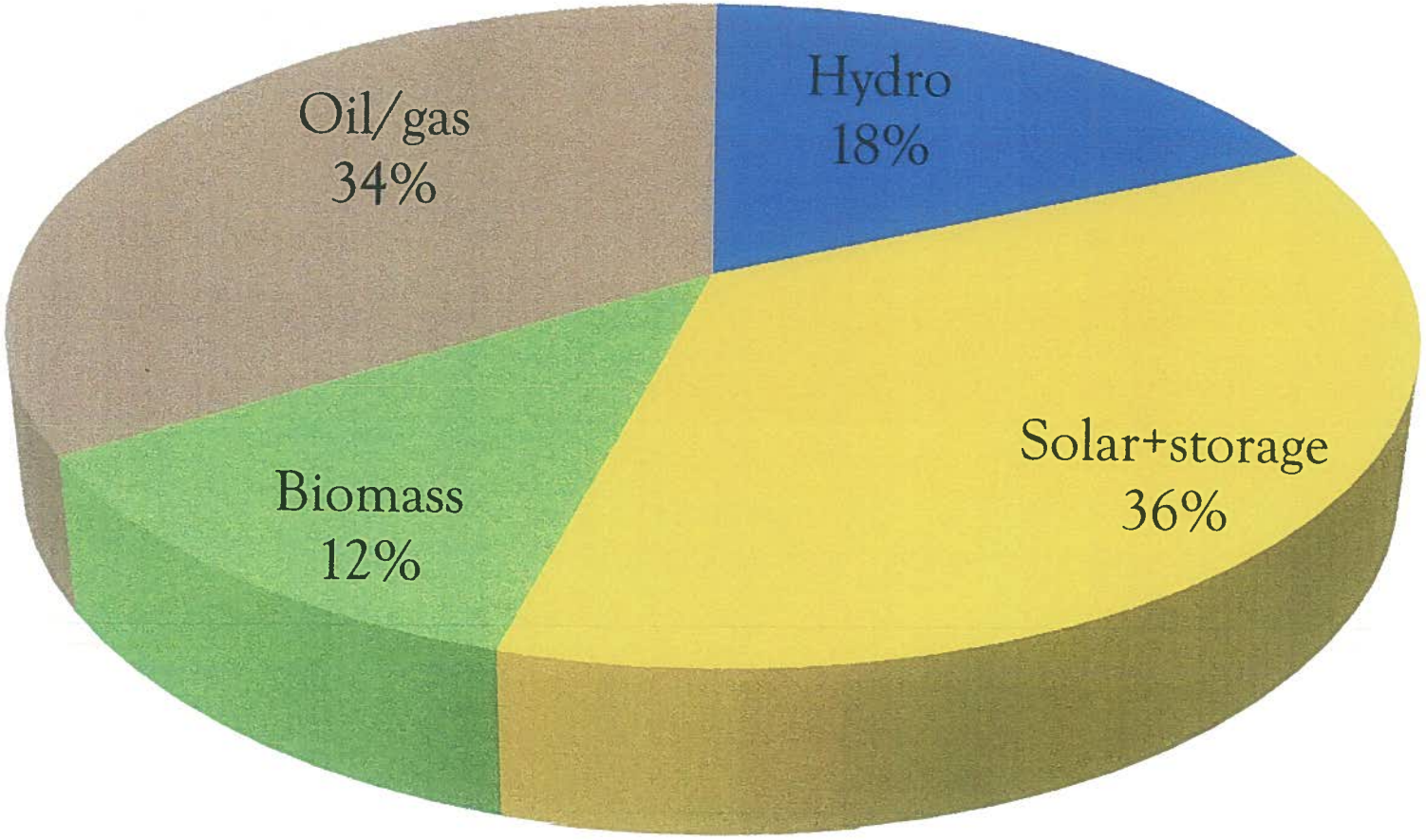
Renewable Energy Outlook for 2023



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Kauai's Solar Challenge

- 50% of Kauai's daytime demand for electricity will soon be met with solar
- Challenge is moving cheap solar power to evening peak hours
- Pumped storage provides a way to store solar energy and releasing energy when it's most needed

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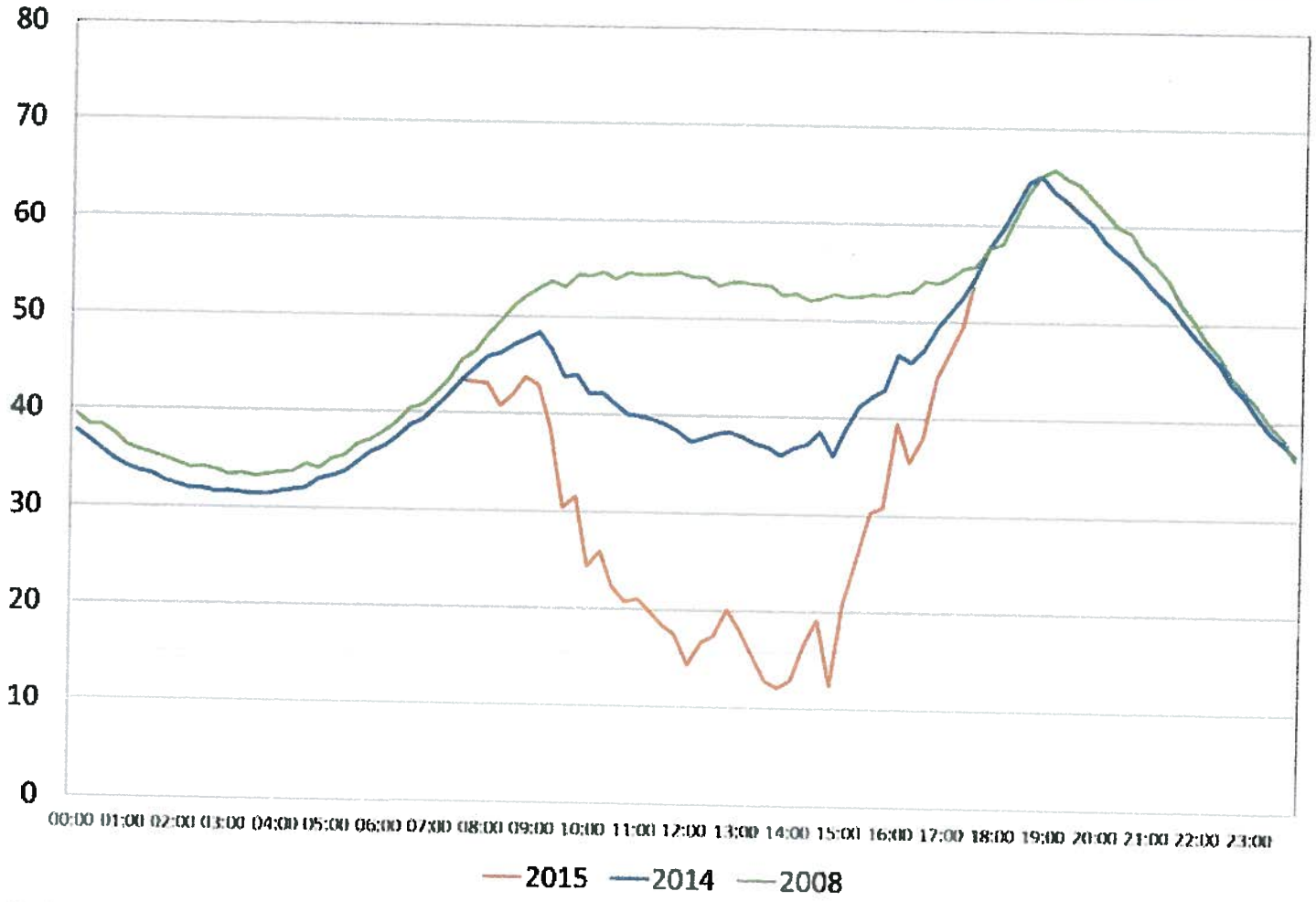
Daily Electricity Demand on Kauai



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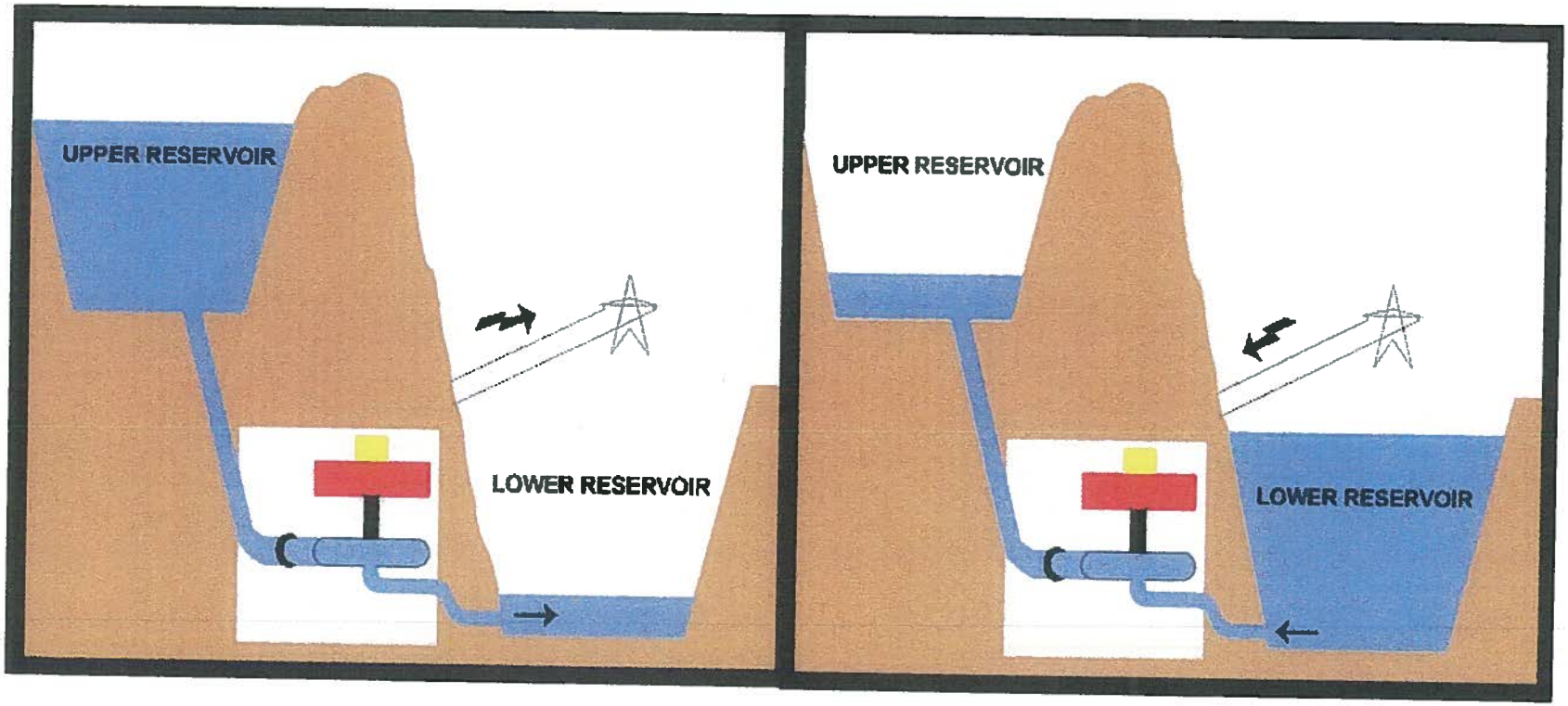
What is Pumped Storage Hydro?



Generating

Pumping

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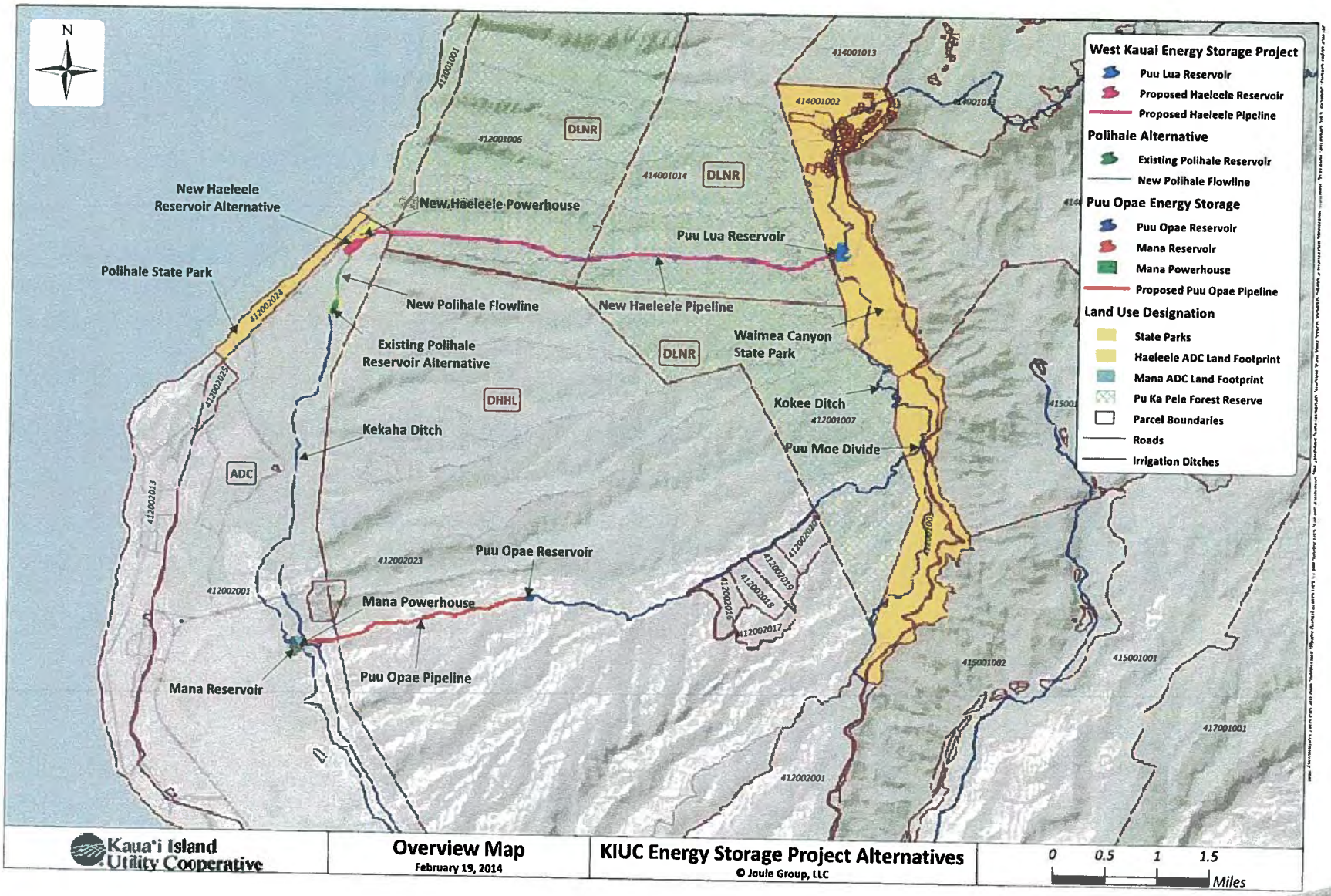
Pumped Storage – Initial Work

- Identified 5 potential sites on Kauai
- Initial cost comparison for 7 configurations
- Two lead sites
  - Puu Lua
  - Puu Opae
- Worked with KIUC staff to derive routings and cost for transmission lines and grid connections
- Developed conceptual layouts on 2 lead sites
- Conducted initial biological surveys on 2 lead sites
- Identified archaeological and culturally sensitive areas for 2 lead sites

Pumped Storage Project Overview

- 25 MW design capacity and up to 250,000 kWh of daily storage
- Closed loop system – no consumption of water
- Load shifting capability to firm solar generation
- Two project locations being considered
  - Puu Lua/Haeleele – this proposal involves rehabilitation of Puu Lua and construction of a new 30 MG reservoir
  - Puu Opae/Mana – this proposal involves rehabilitation of Puu Opae and Mana reservoirs
- Sufficient quantities of water for irrigation will be stored in the reservoir at all times
- Potential to provide pressurized irrigation
- Provides improved hunting access and recreational fishing



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Overview Map
February 19, 2014

KIUC Energy Storage Project Alternatives
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Agricultural Benefits

- Rehabilitation and long term maintenance of reservoirs
  - Public safety improvements with bringing reservoirs into compliance
  - KIUC pays for rehabilitation and maintenance of state-owned infrastructure
- Improvement and maintenance of access roads
  - Existing roadways to the project reservoirs will be improved and maintained by the project – allowing better access for others using the reservoirs and lands
- Modernizing and Improving the Kokee Irrigation System
  - Increasing storage capability for downstream irrigation users – current and future
  - Reliable pressurized irrigation delivery possible
  - Potential for decreased water losses and improved efficiency

Island & Community Benefits

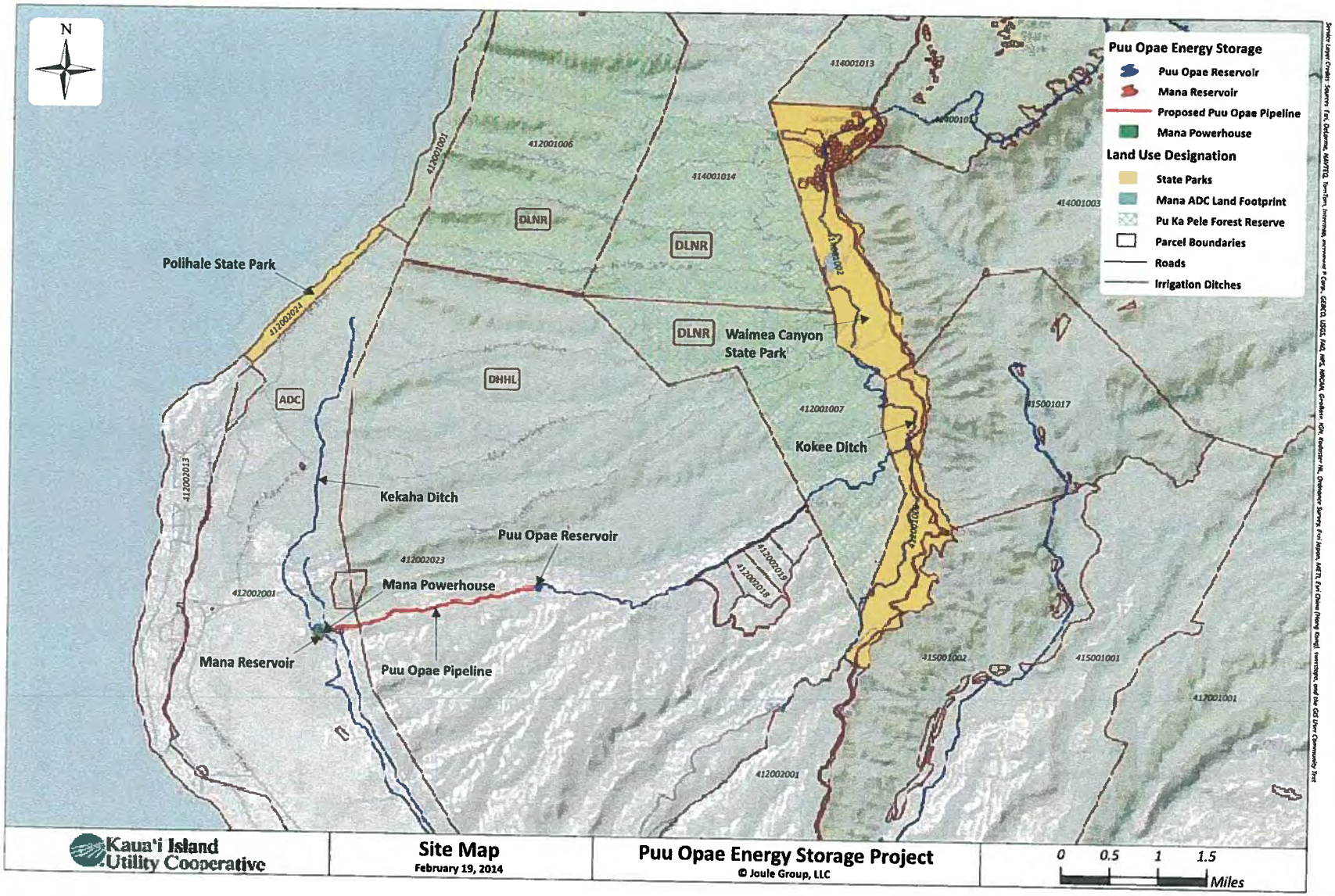
- Most cost effective form of energy storage
- Supports higher renewable penetration
  - Load shifting solar to evening peak demand
  - Evening hydro generation off-setting fossil fuel
- Long term downward pressure on rates
- Member-owned legacy project that will store power inexpensively and reliably
- Increased grid system stability and reliability
- Helps avoid curtailment of solar generation
- Provides improved access for hunting and fishing

Stakeholder Meetings

- Community meetings
  - Waimea community meeting July 2014
  - Waimea community meeting scheduled for May 2015
  - KAA Board presentation September 2014, additional follow up meetings in August
  - Meetings with Syngenta in October 2014
  - Meetings with PMRF in May & Sept 2014 and Jan 2015
  - Small group meetings in Waimea
  - Kekaha Hawaiian Homestead Association
- Agency meetings
  - DLNR administration and staff and BLNR
  - CWRM administration
  - DHHL administration and staff
  - ADC Board and staff

Current Status

- Haeleele Ridge
  - Received "Approval of Concept" by BLNR and ROE allowing KIUC permission to conduct engineering work and environmental & cultural studies
  - Obtained non-invasive ROE from ADC with amendment to conduct geotech field work
  - Initial phase of Geotech work completed
  - 20% engineering work scheduled from completion May 2015
  - Wetlands Delineation survey and report completed
- Puu Opae
  - Received non-invasive ROE from DHHL - expires May 31, 2016
  - Obtained non-invasive ROE from ADC
  - Conducted several site assessment visits
  - Photo and video documentation
  - Initial biological survey



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Puu Opae Reservoir

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Mana Reservoir

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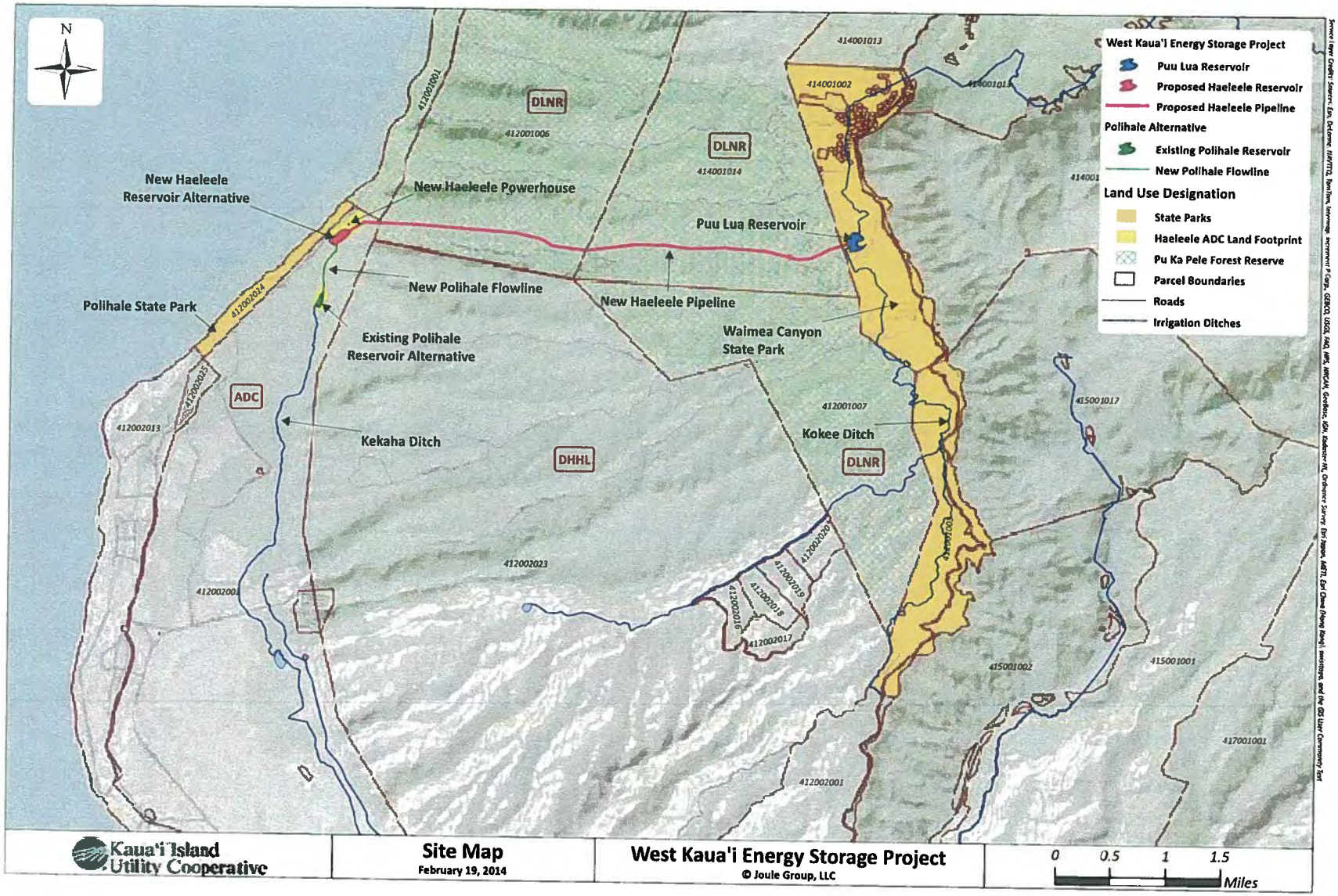

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Puu Lua Reservoir after Rehabilitation

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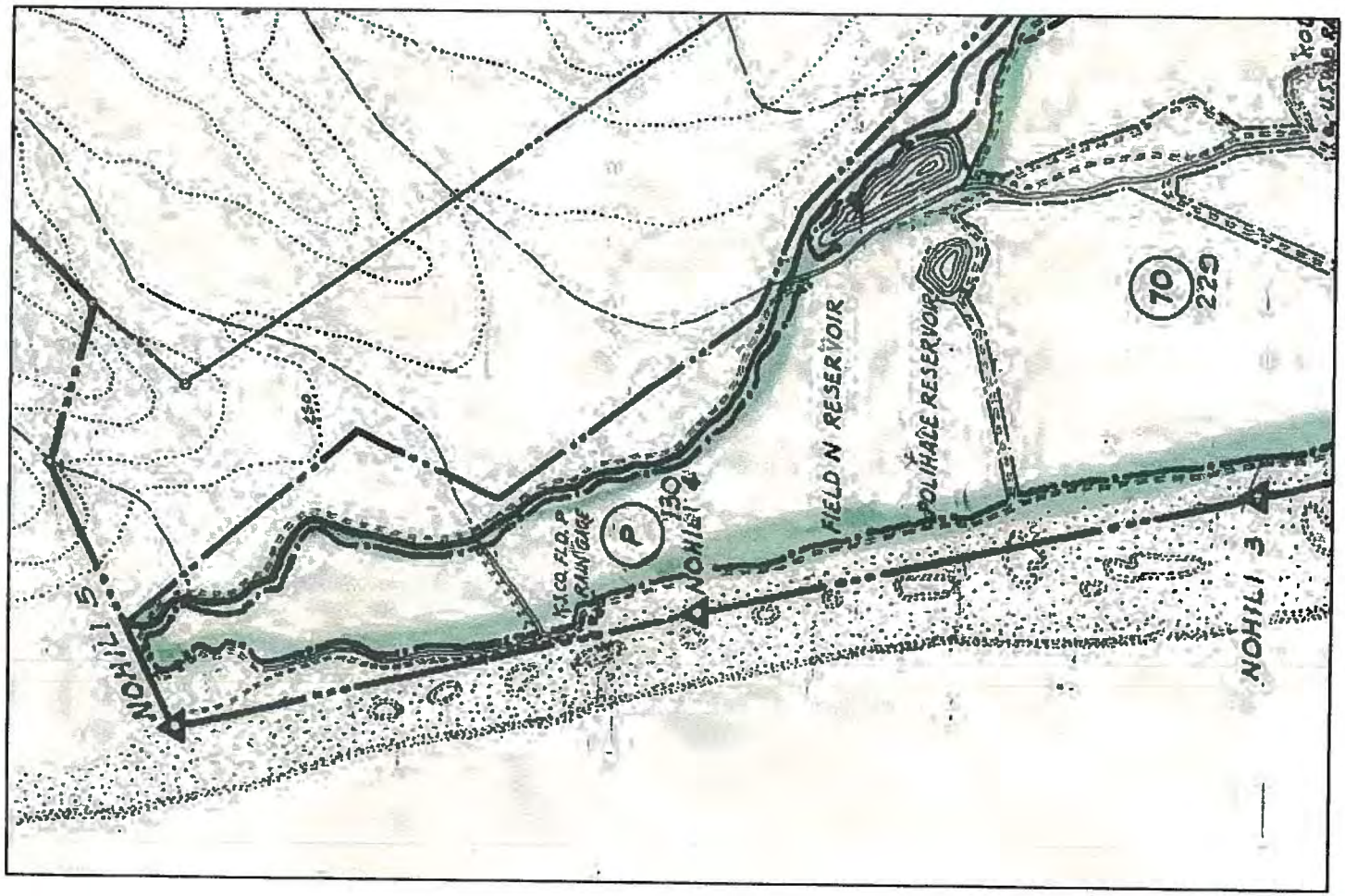
Lower Reservoir Alternatives for Haeleele Ridge

- New 30 MG Haeleele Reservoir
  - Located at the base of Haeleele Ridge
  - Approximate depth of up to 7 feet below existing grade

- Existing Field N Reservoir Rehabilitation and Expansion
  - Located at the base of Kolo Ridge approximately 3500 feet from proposed powerhouse location
  - Increase size of reservoir to 30 MG usable capacity
  - Requires construction of new flowline from new powerhouse structure to Field N

Proposed Lower Reservoir Locations



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Mahalo and Questions

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