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Lahaina Energy Partnership Task 1. Resource Assessment

NREL Task Lead: Evan Rosenlieb

These posters were produced when the laboratory operated as the National Renewable Energy Laboratory (NREL). The laboratory is now the National Laboratory of the Rockies (NLR).

Activities

Assess electricity generation technologies of interest.

- Low-impact hydropower (focus on R-1 treated wastewater)
- Distributed solar generation on rooftops and over parking lots
- Other energy and storage technologies (firm power like waste-to-energy), agrivoltaics, distributed wind, and floating solar.

Community TA Priorities

Higher Priority

- Low-Impact Hydropower
- Distributed Energy Resources
- Community Solar (aka Shared Solar or CBRE)

Lower Priority

- Waste-to-Energy
- Agrivoltaics

Pathway to Implementation

For hydropower, inform decision to request a full engineering feasibility study. For other technologies, the approach will depend on results of analysis and community response.

Key Audiences

Community members, policymakers, County of Maui departments (water supply, environmental management, etc.), and other TA task teams.

Subtask	High-Level Timeline
1.1: First-order bracketing analysis	Months 1–4
1.2: Wastewater treatment plant hydropower assessment	Months 3–8
1.3: Other low-impact hydropower assessment	Months 5–8
1.4: Rooftop and parking lot distributed solar assessment	Months 5–13
1.5: Assessment of other renewable generation opportunities	Months 5–8

Discussion Questions

- Are there examples or types of parking lots or rooftops that you would prefer to see solar PV concentrated on?
- Are there examples or types of parking lots or rooftops you would *not* like to see solar PV on?
- If a good use of R-1 wastewater is for pumped storage hydropower, at least one and possibly two new reservoirs (or large water tanks) would need to be built. Do you have ideas or concerns about where these should be located?
- What are your questions or comments about how this task relates to cross-cutting topics:
 - Workforce development and training
 - Policy and regulatory analysis
 - Funding and financing?



Lahaina Energy Partnership

Task 2. Building Modeling

NREL Task Lead: Ben Polly

Activities

- Develop a high-efficiency and solar/microgrid-ready building prototype design to benefit Lahaina in reconstruction efforts.
- Develop Lahaina building load profiles necessary for tasks 3 (Microgrid) and 4 (Distribution Grid/Undergrounding).

Community TA Priorities

Higher Priority

- Community Energy Microgrids
- Undergrounding and Other Grid Hardening
- Distributed Energy Resources

Lower Priority

- Grid Modernization, Grid-Interactive Technologies, and Demand Response

Pathway to Implementation

Provide key technical strategies and considerations for rebuilding including energy efficiency, distributed energy resources, and grid interactivity/demand response-ready building technologies.

Key Audiences

Community residents, businesses, and stakeholders/organizations affecting the energy-related affordability and resilience of reconstructed buildings.

Subtask	High-Level Timeline
2.1: Assess Lahaina building reconstruction landscape	Months 1–2
2.2: Lahaina high-efficiency and solar/microgrid-ready building prototype design	Months 3–10
2.3: Develop Lahaina building load profiles necessary for Tasks 3 and 4	Months 1–6

Discussion Questions

- For those that are rebuilding, how do new building designs differ from what existed before?
- Do you have feedback on timing of building prototype designs for residential & commercial buildings?
- To what extent are you considering building with enhanced efficiency and/or potential future solar/battery storage/backup power to improve energy affordability and/or resilience?
 - Why or why not?
 - Are you pursuing any incentives related to this?
 - What are the barriers and what would help you overcome them?
- How could the findings and deliverables of this task be most useful to you?
- What are your questions or comments about how this task relates to cross-cutting topics:
 - Workforce development and training
 - Policy and regulatory analysis
 - Funding and financing?



Lahaina Energy Partnership

Task 3. Microgrids

NREL Task Lead: Amanda Farthing and Ian Baring-Gould

Activities

Develop preliminary microgrid designs and implementation guidance for select use cases and projects.

Community TA Priorities

Higher Priority

- Community Energy Microgrids
- Distributed Energy Resources
- Community Solar (aka Shared Solar or CBRE)
- Community Ownership Models

Lower Priority

- Grid Modernization, Grid-Interactive Technologies, and Demand Response

Pathway to Implementation

Support high-level energy planning informed by costs and benefits of microgrids at varying scales; inform plans for specific microgrid projects; provide information for near-term development needs; and identify policy, regulatory, and business model challenges, considering potential alternatives.

Key Audiences

Lahaina community, developers/planners, the Hawaiian Electric Company, and the Hawai'i State Energy Office.

Subtask	High-Level Timeline
3.1: Policy and regulatory review, community mapping, and information gathering (closely connected to Task 5)	Months 1-4
3.2: High-level (bracketing) microgrid analyses	Months 2-8
3.3: Detailed microgrid analyses	Months 6-13
3.4: Implementation considerations and microgrid development TA	Months 10-17

Discussion Questions

- What results from the microgrids task would be most useful for you or any partners you work with?
- What worries you most about a 3-hour, 12-hour, and 3-day power outage?
- What does “community ownership” of energy systems mean to you?
- Are there any ongoing plans for microgrids or resilience hubs within Lahaina or elsewhere in Maui that you’re aware of?
- Would you place higher priority on microgrids powering resilience hubs/critical services or neighborhood-based microgrids? What are your considerations?
- What are your questions or comments about how this task relates to cross-cutting topics:
 - Workforce development and training
 - Policy and regulatory analysis
 - Funding and financing?



Lahaina Energy Partnership

Task 4. Distribution Grid and Undergrounding

NREL Task Lead: Lawryn Kiboma and Bryan Palmintier

Activities

Look carefully at the electric grid to provide the Lahaina community and utility stakeholders with information to make grid-informed decisions on grid hardening and microgrid placement.

Community TA Priorities

Higher Priority

- Community Energy Microgrids
- Undergrounding and Other Grid Hardening
- Distributed Energy Resources
- Community Solar (aka Shared Solar or CBRE)

Lower Priority

- Grid Modernization, Grid-Interactive Technologies, and Demand Response

Pathway to Implementation

Support grid investment decision-making in coordination with the Hawaiian Electric Company.

Key Audiences

Community and utility partners, public utility commission, and the Hawai'i State Energy Office.

Subtask	High-Level Timeline
4.1: Coordination with HECO	Months 1–17
4.2: Grid hardening and undergrounding analysis	Months 1–12
4.3: Grid baseline and planning support for reliability and affordability	Months 3–17
4.4: Grid interactions with microgrid sites and building technologies	Months 3–17

Discussion Questions

- What do you want us to know about undergrounding and grid hardening efforts in Lahaina?
- What are your concerns regarding undergrounding power lines? What grid hardening alternatives to undergrounding are in favor of?
- In what ways are you aware of HECO updating the community on wildfire-related upgrades?
- What are your questions or comments about how this task relates to cross-cutting topics:
 - Workforce development and training
 - Policy and regulatory analysis
 - Funding and financing?



Lahaina Energy Partnership Task 5. Crosscutting Technologies

NREL Task Leads: Jennifer Daw, Aaron Levine, and Bethany Speer

Subtask 5.1. Workforce Development and Job Training

NREL Task Lead: Jennifer Daw

Activities

Assess existing energy workforce development programs in Hawai'i, identify gaps and needs for Lahaina, and provide guidance and resources to support Lahaina's local workforce needs for the new energy systems.

Key Audiences

Hawai'i State Energy Office, University of Hawai'i, Hawai'i Energy, developers/planners, apprenticeship programs, and state/local workforce organizations that support energy sector recruiting and job entry.

Pathway to Implementation

Leverage results to supplement Hawai'i's energy workforce development programs and build the local workforce to own and operate energy systems.

Subtask 5.2. Policy and Regulatory Analysis

NREL Task Lead: Aaron Levine

Activities

Research existing policies and regulations associated with developing identified energy solutions, research implementation opportunities and challenges, and summarize findings.

Key Audiences

Lahaina community, developers/planners, the Hawaiian Electric Company, and the Hawai'i State Energy Office.

Pathway to Implementation

Use results to inform energy planning efforts about existing laws and regulations and identify implementation opportunities and/or challenges.

Subtask 5.3. Funding and Financing

NREL Task Lead: Bethany Speer

Activities

Build awareness and capacity to access financing and funding to support development of priority energy projects for Lahaina, with a focus on community ownership models.

Key Audiences

Lahaina community, financial institutions, local foundations, planners, developers, energy sector businesses, and other private sector representatives.

Pathway to Implementation

Leverage understanding of leading financing mechanisms, incentives, and funding programs to support development of priority energy projects.