U.S. DEPARTMENT of ENERGY | Office of Energy Efficiency and Renewable Energy

Lahaina Energy Partnership: Community Priorities and Technical Assistance Scope of Work

Presented to the Lahaina Community

By the National Renewable Energy Laboratory (NREL) and Local Partners Lāhainā Strong, Hā Sustainability, and Shake Energy Collaborative

July 24, 2025, 5:30–7:30 p.m.

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Hannah Peila
Mariane Torres Belfort Rezende
Ali Andrews
Sofia Luczak
Sébastien Selarque

Agenda

- Welcome and agenda (5 minutes)
- Project overview and timeline (5 minutes)
- Lahaina community energy priorities: presented by local partners Lāhainā Strong, Hā Sustainability, and Shake Energy Collaborative (15 minutes)
- NREL technical assistance (TA) scope of work overview: presented by NREL task leaders (five tasks, 15 minutes total)
- General Q&A (10 minutes)
- NREL TA small group discussions and Q&A (three 15-minute rotations; 45 minutes total)
- Next steps and adjourn (5 minutes)
- Optional: Talk story with NREL team and partners (15 minutes)

Project Overview

Lahaina Energy Partnership

PROJECT OVERVIEW

The U.S. Department of Energy (DOE) and NREL initiated a multiyear, community-led project for Lahaina to:

1. **Identify energy questions** related to rebuilding Lahaina.
2. **Conduct technical analysis** to support informed, community-led decision-making.

Community Role:

Local partners convene the Lahaina community to identify energy solutions of interest and inform a scope of TA.

National Lab Role:

National labs conduct analysis to assist the Lahaina community in assessing opportunities for energy planning and rebuilding.

Learn more (click or scan):

Lahaina Energy Partnership Local Partners

Lāhainā Strong

- Grassroots organization focused on resilience, recovery, and rebuilding efforts in Lahaina.
- Movement includes efforts to restore housing, infrastructure, and the local economy
- Based in Lahaina, Maui
- https://wearelahainastrong.org/.

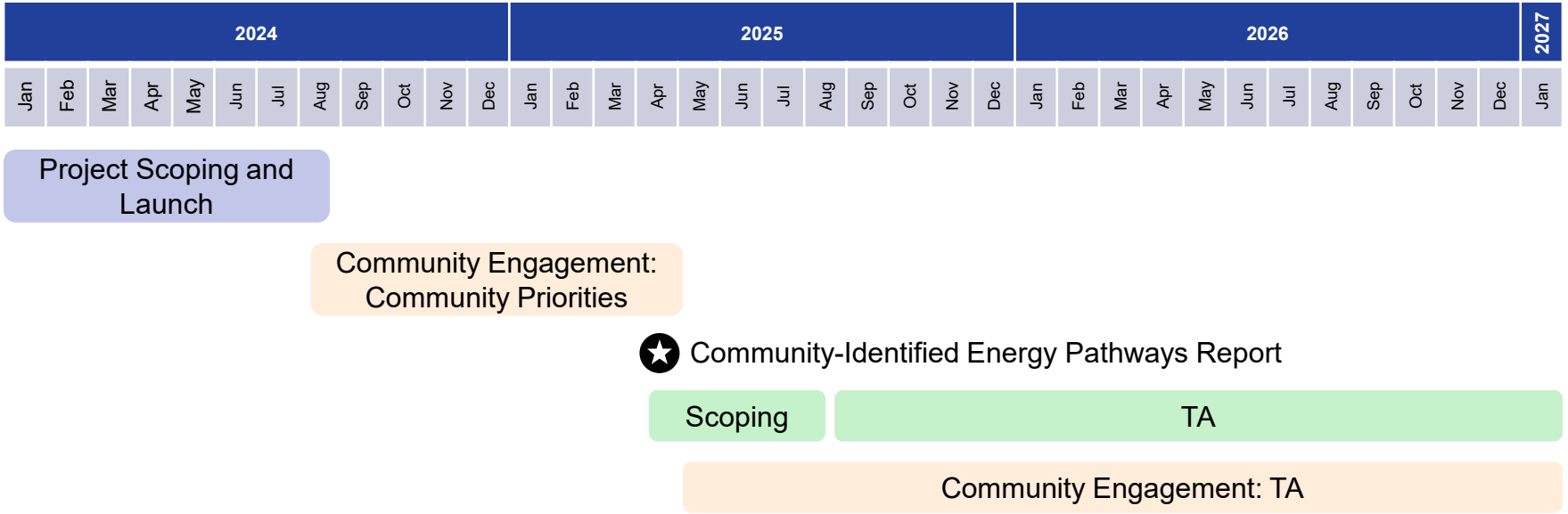
Hā Sustainability

- Sustainability consulting firm dedicated to supporting community-driven initiatives
- Relevant experience in developing impactful energy education programs and facilitating meaningful community engagement
- Headquartered on Maui
- www.hasustainability.com.

Shake Energy Collaborative

- Community-based renewable energy developer
- Relevant experience working with Molokaʻi community energy projects
- Based on Oahu
- www.shake-energy.com/.

Project Phases

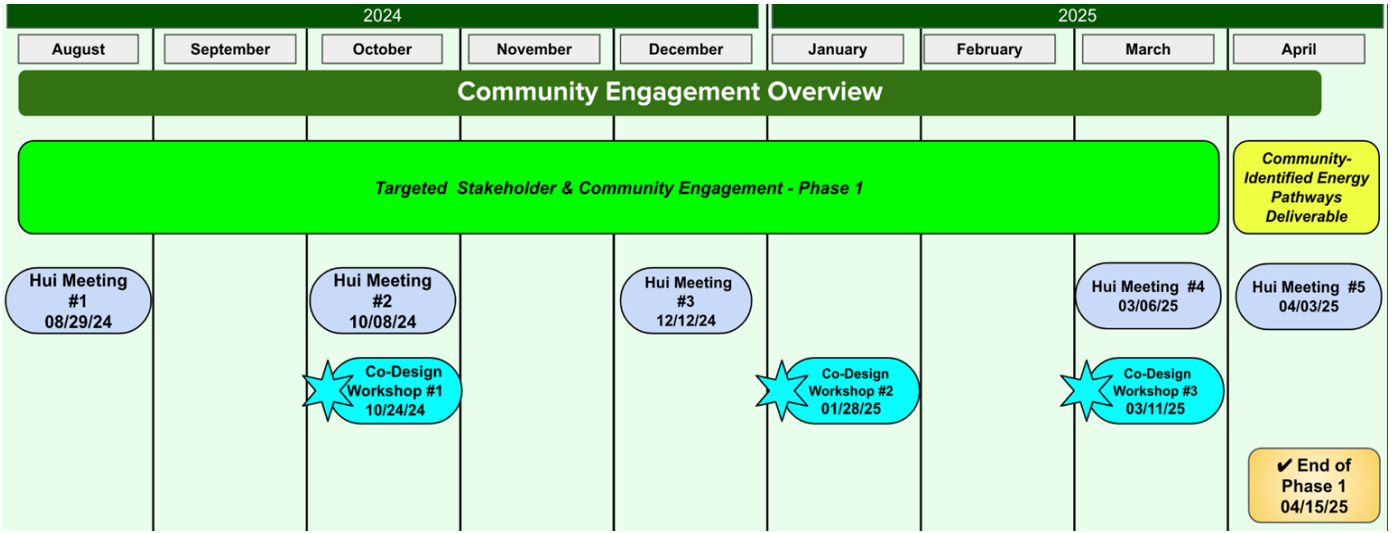


Lahaina Community Energy Priorities

Presented by Lāhainā Strong, Hā Sustainability, and Shake Energy Collaborative

Community Engagement in Phase 1

- Local partners conducted stakeholder and community engagement (phase 1) from August 2024 to April 2025.
- In March 2025, energy topic prioritization activities were conducted in-person during a Hui meeting and a community workshop, and in an online form.
- Results of the prioritization activities are presented on the following slides.



Top Five Community Energy Priorities

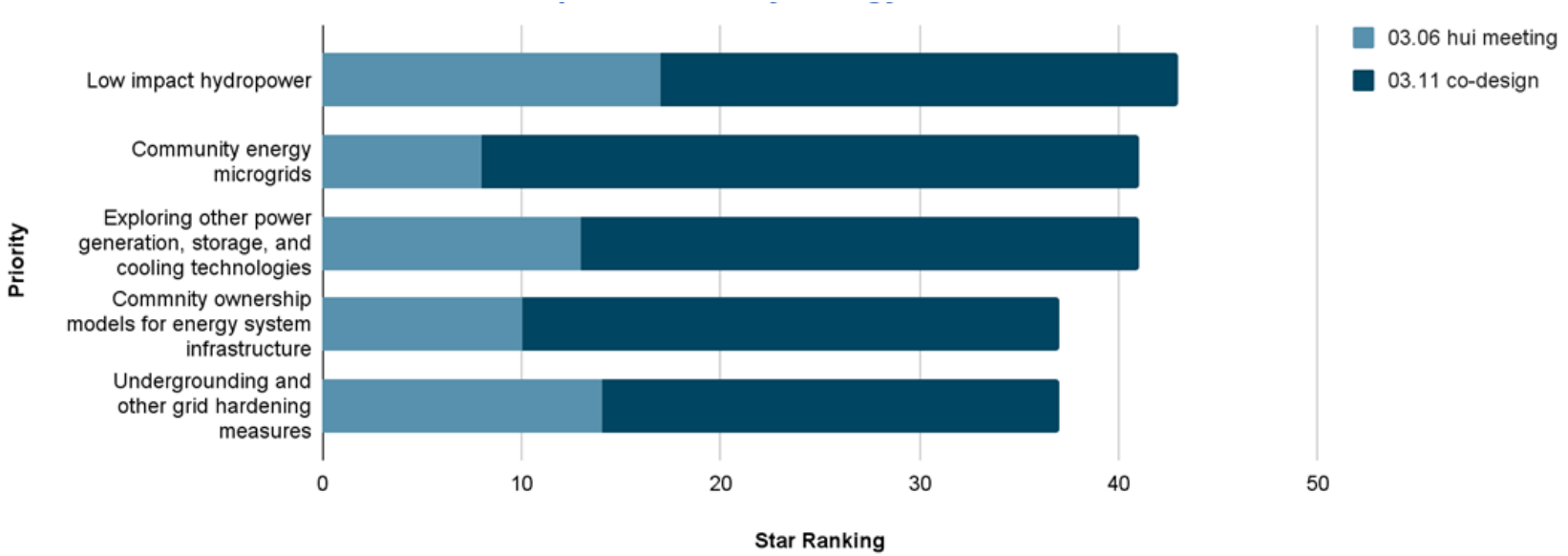


Figure from Hā Sustainability, Shake Energy Collaborative, and Lāhainā Strong

Low-Impact Hydropower Priorities from Community Meetings

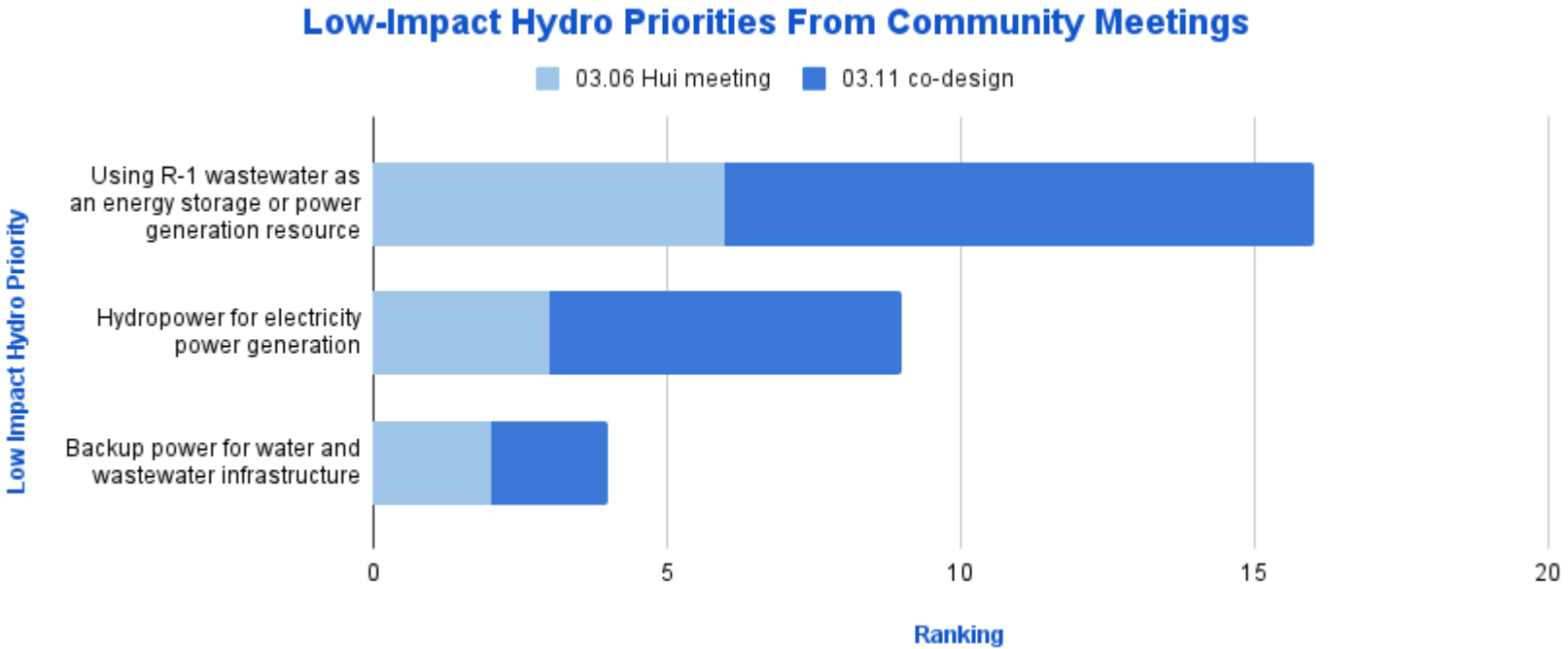


Figure from Hā Sustainability, Shake Energy Collaborative, and Lāhainā Strong

Power Generation, Storage, and Cooling Priorities from Community Meetings

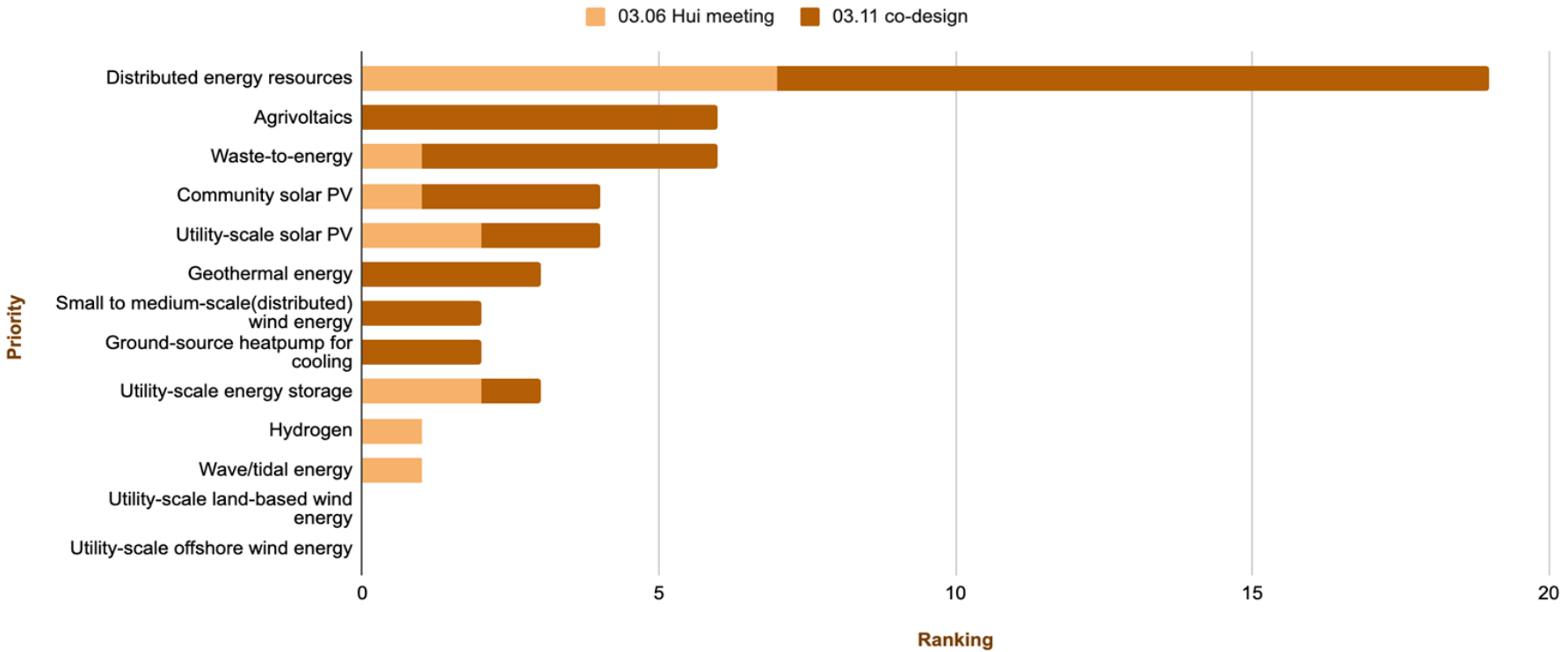


Figure from Hā Sustainability, Shake Energy Collaborative, and Lāhainā Strong

PV = photovoltaics

Undergrounding and Other Grid Hardening Measures Priorities from Community Meetings

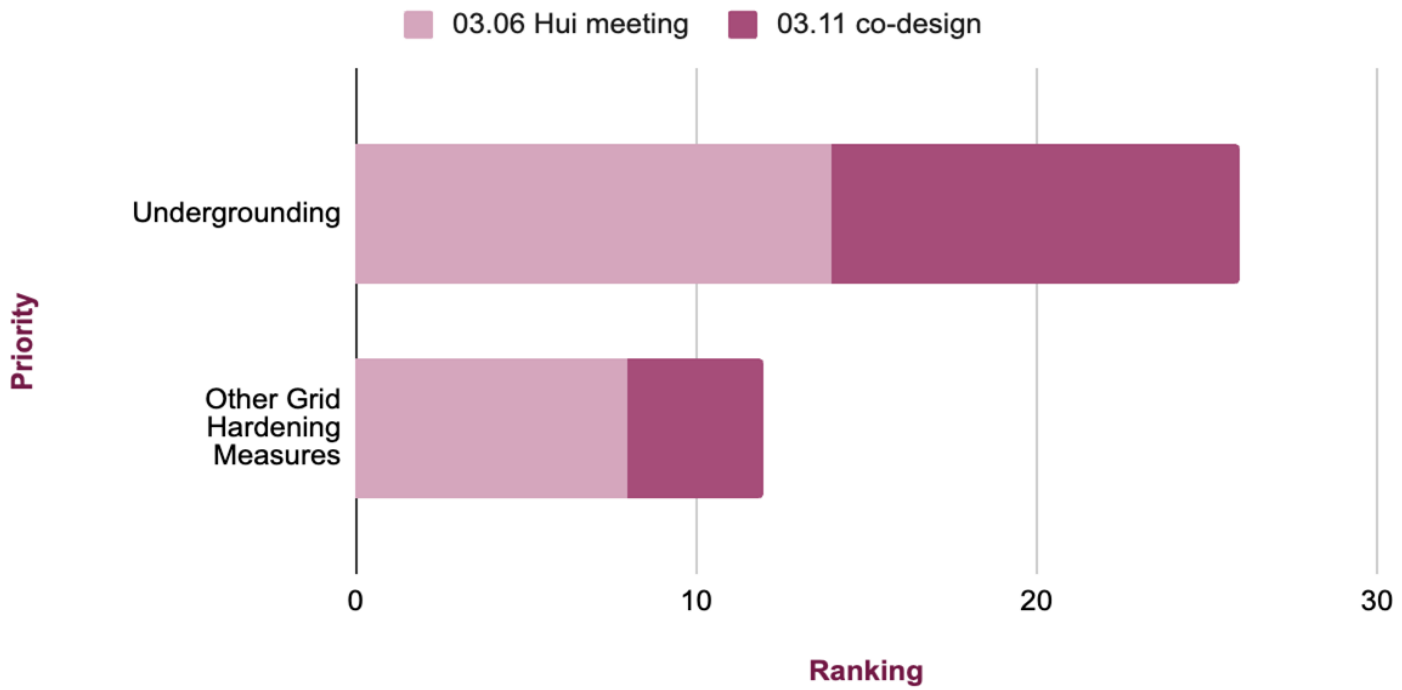


Figure from Hā Sustainability, Shake Energy Collaborative, and Lāhainā Strong

Energy Priority Trends Over Community Meetings

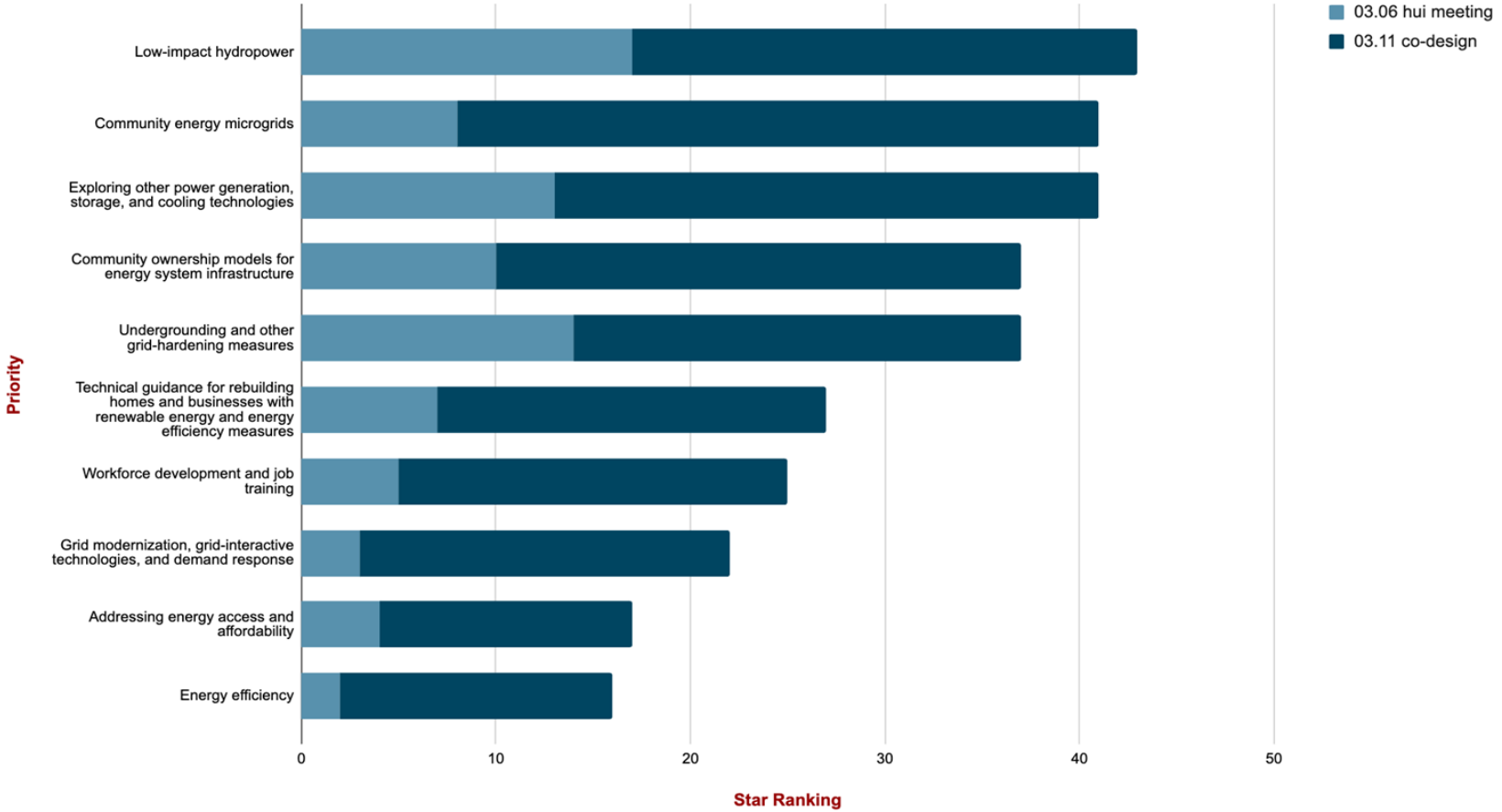


Figure from Hā Sustainability, Shake Energy Collaborative, and Lāhainā Strong

Overall Online Feedback Rankings (All Responses)

Based on total responses across all ZIP codes, the top-ranked community energy priorities were:

- **Undergrounding and other grid hardening measures:** The highest-ranked priority, reflecting strong public support for safer, more fire-resilient infrastructure.
- **Community energy microgrids:** A close second, highlighting interest in decentralized neighborhood-scale solutions.
- **Low-impact hydropower:** Participants saw value in small-scale hydropower tied to existing infrastructure.
- **Technical guidance for rebuilding with renewable energy and efficiency:** Reflects the community's desire for practical support in recovery.
- **Community ownership models:** Support for local control and keeping energy revenues in the community.

Results from Hā Sustainability, Shake Energy Collaborative, and Lāhainā Strong

Lahaina Community Higher Priorities for TA

Low-Impact Hydropower	Community Energy Microgrids	Undergrounding and Other Grid Hardening	Distributed Energy Resources	Community Solar (aka Shared Solar or CBRE)	Community Ownership Models for Energy System Infrastructure
• Assess feasibility of leveraging recycled (R-1) water distribution for community-owned energy generation and storage. • Stakeholders include Maui County, current R-1 users (hotels, resorts, and golf courses), the Hawai'i Department of Health, the U.S. Environmental Protection Agency, etc.	• Explore technical and policy options for microgrids to allow portions of Lahaina to maintain power during grid outages and potentially reduce dependence on power transmitted from other parts of Maui. • Understand the community's energy profile to inform effective planning.	• Assess costs, benefits, and best practice examples of undergrounding and other grid hardening measures to support rebuilding a more resilient electrical system in Lahaina.	• Assess rebuilding the distribution grid to accommodate high levels of rooftop solar photovoltaics (PV) and enable virtual power plants. • Assess maximum generation potential of rooftop solar if all residential and commercial roofs installed solar.	• Assess appropriate sizing for community solar projects serving Lahaina (known as community-based renewable energy [CBRE]). • Research possible sites, including brownfields.	• Develop in-depth case studies of cooperative and municipal ownership of (1) a generation project, (2) a grid-tied microgrid, and (3) the West Maui grid. • Provide technical guidance for steps or approaches the Lahaina community could take to pursue community ownership of energy infrastructure.

From Community-Identified Energy Pathways report

Lahaina Community Lower Priorities for TA

Workforce Development and Job Training	Grid Modernization, Grid-Interactive Technologies, and Demand Response	Waste-to-Energy	Agrivoltaics
• Identify jobs most in need to meet Lahaina's energy workforce needs. • Determine the training and experience needed by a local workforce to meet these needs. • Assess whether there are existing training resources available to train the required local workforce: ○ If yes, identify what they are. ○ If no, recommend how these could be developed/offered to the community to develop its local energy workforce.	• Develop recommendations for infrastructure or operation of the rebuilding of the distribution grid in Lahaina to allow for rooftop solar and possible aggregation (e.g., virtual power plants).	• Determine which waste-to-energy (WTE) technologies would be most appropriate for Lahaina. • Analyze pros and cons of various WTE technologies compared to other possible generation options, considering: ○ Environmental impacts ○ Economic factors ○ Resilience benefits.	• Conduct an analysis of agrivoltaics for Lahaina.

From Community-Identified Energy Pathways report

NREL TA Scope of Work Overview

Presented by NREL Task Leads

Approach to Addressing the *Community-Identified Energy Pathways* Report

NREL has assembled a team of experts on topics prioritized in the report.

While all content provides valuable context and insight, we paid special attention to these sections when developing this scope:

- Within Section 4. Community Engagement Results
  - Section 4.1. Lahaina's Community Energy Vision and Guiding Principles
  - Section 4.3. Recurring Energy Questions
- Section 5. Community Energy Priorities
- Section 6. Priorities for Technical Assistance.

NREL TA Scope Tasks

1. Renewable Energy Resource and Technology Assessments
2. Building Modeling for Enhanced Affordability and Resilience
3. Microgrid Planning and Modeling for Energy Resilience
4. Distribution System Undergrounding and Grid Planning/Optimization
5. Crosscutting Topics
   - 5.1 Workforce Development and Job Training
   - 5.2 Policy and Regulatory Analysis
   - 5.3 Funding and Financing Options.

Note: Resilience is inherent in all tasks and integrated throughout the scope.

COMMUNITY TA PRIORITIES

HIGHER TA PRIORITIES

- Low-Impact Hydropower
- Community Energy Microgrids
- Undergrounding and Other Grid Hardening
- Distributed Energy Resources
- Community Solar (aka Shared Solar or CBRE)
- Community Ownership Models for Energy System Infrastructure

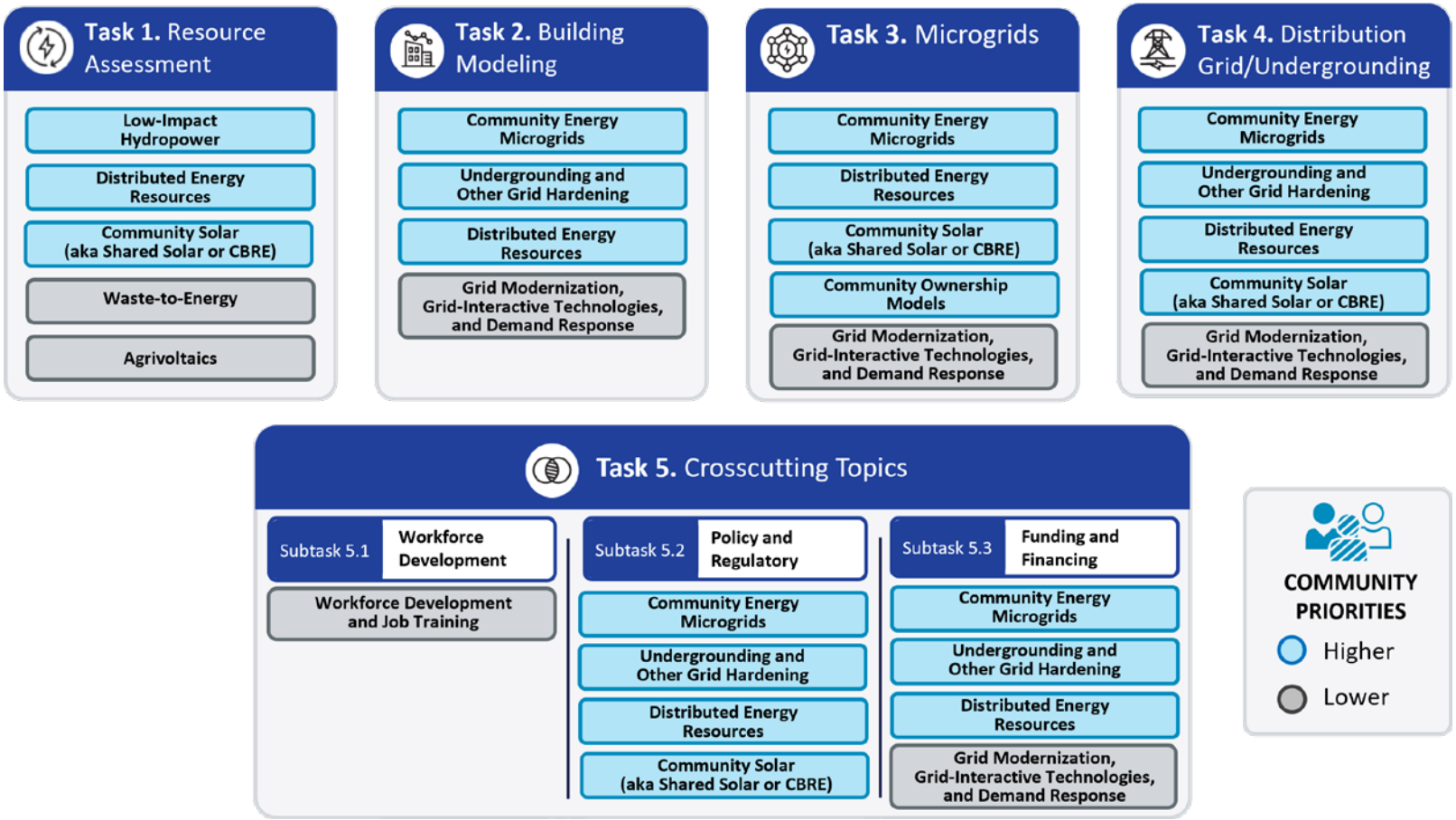
LOWER TA PRIORITIES

- Workforce Development and Job Training
- Grid Modernization, Grid-Interactive Technologies, and Demand Response
- Waste-to-Energy
- Agrivoltaics

NREL TA TASKS

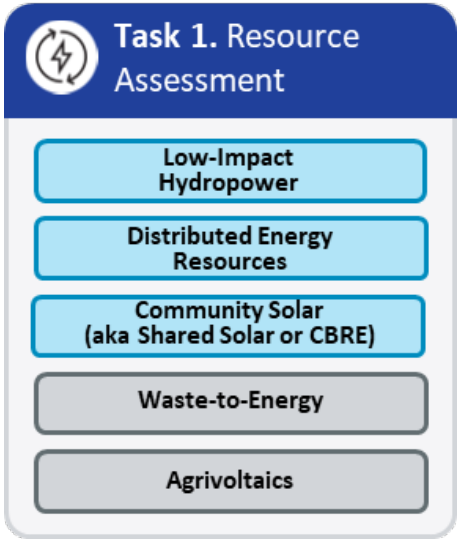
- Task 1. Resource Assessment
- Task 2. Building Modeling
- Task 3. Microgrids
- Task 4. Distribution Grid/ Undergrounding
- Task 5. Crosscutting Topics
  - Subtask 5.1 Workforce Development
  - Subtask 5.2 Policy and Regulatory
  - Subtask 5.3 Funding and Financing

Mapping Community TA Priorities to NREL TA Tasks



Task 1. Resource Assessment – Overview

NREL Task Lead:
Evan Rosenlieb



Activities:

Assess electricity generation technologies of interest.

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

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

Pathway to implementation:

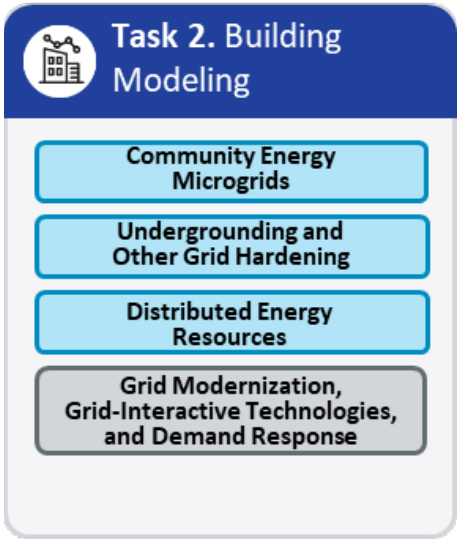
- For hydropower, inform decision to request a full engineering feasibility study.
- For other technologies, the approach will depend on results of analysis and community response (e.g., results of other tasks may help show where potential parking lot PV could be sited).

Task 1. Resource Assessment – Subtasks and Timeline

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

Task 2. Building Modeling – Overview

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).

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

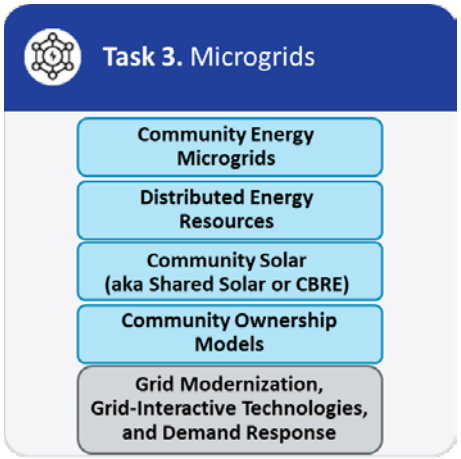
Pathway to implementation: Provide key technical strategies and considerations for rebuilding including energy efficiency, distributed energy resources, and grid interactivity/demand response-ready building technologies.

Task 2. Building Modeling – Subtasks and Timeline

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

Task 3. Microgrids – Overview

NREL Task Leads:
Amanda Farthing
Ian Baring-Gould



Activities: Develop preliminary microgrid designs and implementation considerations for select use cases and projects.

Key audiences: Lahaina community, developers/planners, Hawaiian Electric Company (HECO), and the Hawai‘i State Energy Office (HSEO).

Pathway to implementation:

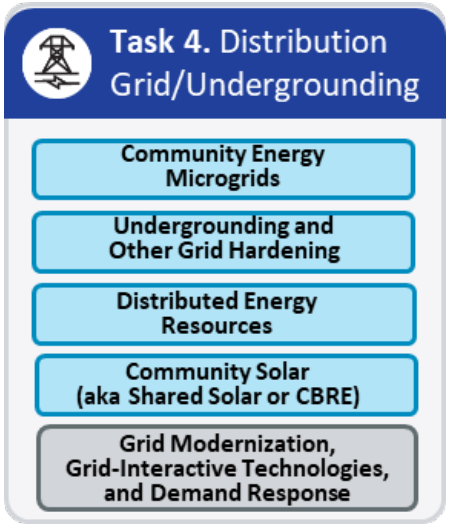
- High-level energy planning informed by costs and benefits of microgrids at varying scales.
- Inform plans for specific microgrid projects (pursuing funding/financing, developing requests for proposals).
- Provide information to support near-term development needs.
- Identify policy, regulatory, and business model challenges and consider potential alternatives.

Task 3. Microgrids – Subtasks and Timeline

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

Task 4. Distribution Grid/Undergrounding – Overview

NREL Task Leads:
Lawryn Kiboma
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.

Key audiences: Community and utility partners (HECO), public utility commission, and HSEO.

Pathway to implementation: Support grid investment decision-making in coordination with HECO.

Task 4. Distribution Grid/Undergrounding – Subtasks and Timeline

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

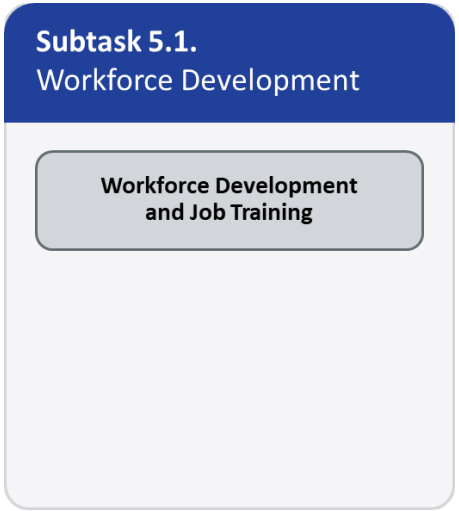
Task 5. Crosscutting Topics

Provide **crosscutting insights** to strengthen and align with Tasks 1–4:

- **Subtask 5.1. Workforce Development and Job Training**
- **Subtask 5.2. Policy and Regulatory Analysis**
- **Subtask 5.3. Funding and Financing.**

Subtask 5.1. Workforce Development and Job Training – Overview

NREL Task Lead:
Jennifer Daw



Activities:

- Assess existing energy workforce development programs in Hawai‘i.
- Identify gaps and local education, training, and partnership needs for Lahaina.
- Provide guidance and resources to support Lahaina’s local workforce needs for the new energy systems.

Key audiences: HSEO, University of Hawai‘i, Hawai‘i Energy, developers/planners, apprenticeship programs, and state/local workforce organizations that support energy sector recruiting and job entry.

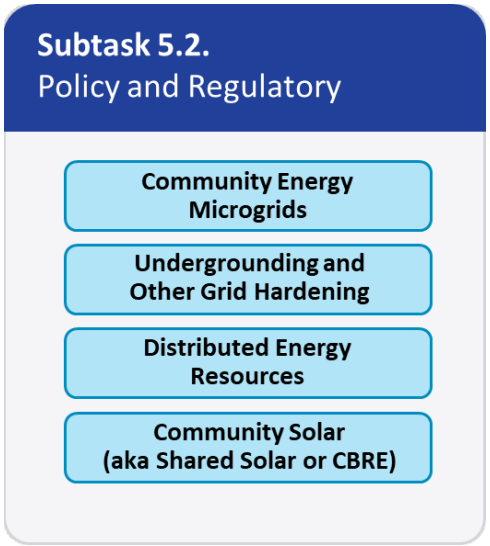
Pathway to implementation: Leverage results to supplement Hawai‘i's energy workforce development programs and build the local workforce to own and operate energy systems.

Subtask 5.1. Workforce Development and Job Training – Subtasks and Timeline

Subtask	High-Level Timeline
5.1.1: Energy workforce development gaps assessment	Months 1–4
5.1.2: Workforce development guidance	Months 2–6

Subtask 5.2. Policy and Regulatory Analysis – Overview

NREL Task Lead:
Aaron Levine



Activities:

- Research existing policies and regulations (federal, state, local, utility) associated with developing identified energy solutions (e.g., rooftop and community solar, low-impact hydropower, microgrids, community ownership models).
- Research implementation opportunities and challenges for identified energy solutions.
- Summarize findings in a final memo.

Key audiences: Lahaina community, developers/planners, HECO, and HSEO.

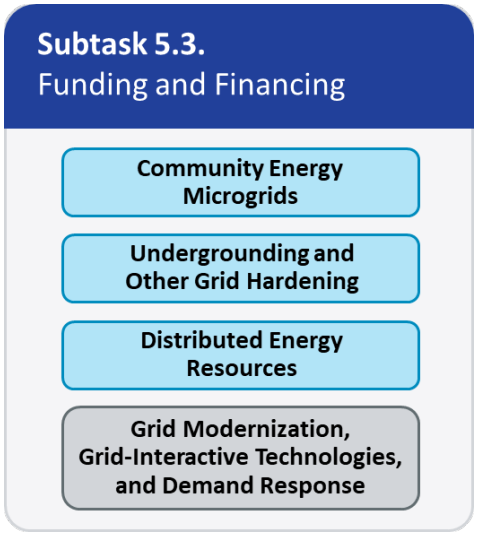
Pathway to implementation: Use results to inform energy planning efforts with existing laws and regulations and identify implementation opportunities and/or challenges.

Subtask 5.2. Policy and Regulatory – Subtasks and Timeline

Subtask	High-Level Timeline
5.2.1: Literature and policy review	Months 1–6
5.2.2: Implementation analysis	Months 6–15

Subtask 5.3. Funding and Financing – Overview

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.

Subtask 5.3. Funding and Financing – Subtasks and Timeline

Subtask	High-Level Timeline
5.3.1: Baseline assessment	Months 1–8
5.3.2: Virtual peer exchanges	Months 1–14
5.3.3: Funding and financing toolkit	Months 8–14

General Q&A and Discussion

Small Group Discussions

Objectives

- Learn more about each task.
- Ask your questions.
- Answer questions from NREL.

Instructions

- Four tables:
  - One table each for Tasks 1–4.
  - Discuss Task 5 subtasks (workforce, policy, funding) at each table in relation to other tasks.
- Three rotations of 15 minutes each (45 minutes total).
- An NREL task lead and a local partner will facilitate each table and take notes.
- Go to tables of tasks you are most interested in/want to know more about.
- Answer questions verbally or in writing.

Next Steps

- NREL and partners present and discuss community priorities and TA scope during stakeholder briefings and community meetings (June to July 2025).
  - Incorporate additional feedback (July 2025).
- NREL begins TA work (August 2025).
- NREL and partners engage with community and stakeholders with requests for information and to present interim results and products (ongoing).

Mahalo!

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