ENERGY TRANSITIONS INITIATIVE
U.S. Department of Energy

Partnership Project

Energy Resilience Planning For Remote, Island, And Islanded Communities

Presented by Tessa Greco
Program Manager, ETIPP
National Renewable Energy Laboratory

January 26, 2021

Webinar Logistics

- This webinar is being recorded
- Attendees are muted
- Please submit your questions using the Chat feature
- Questions will be answered during Q&A at end

Agenda

- ETIPP Overview
- Partners & Expertise
- Technical Assistance Overview & Examples
- Project Timeline & Application Process
- Q&A

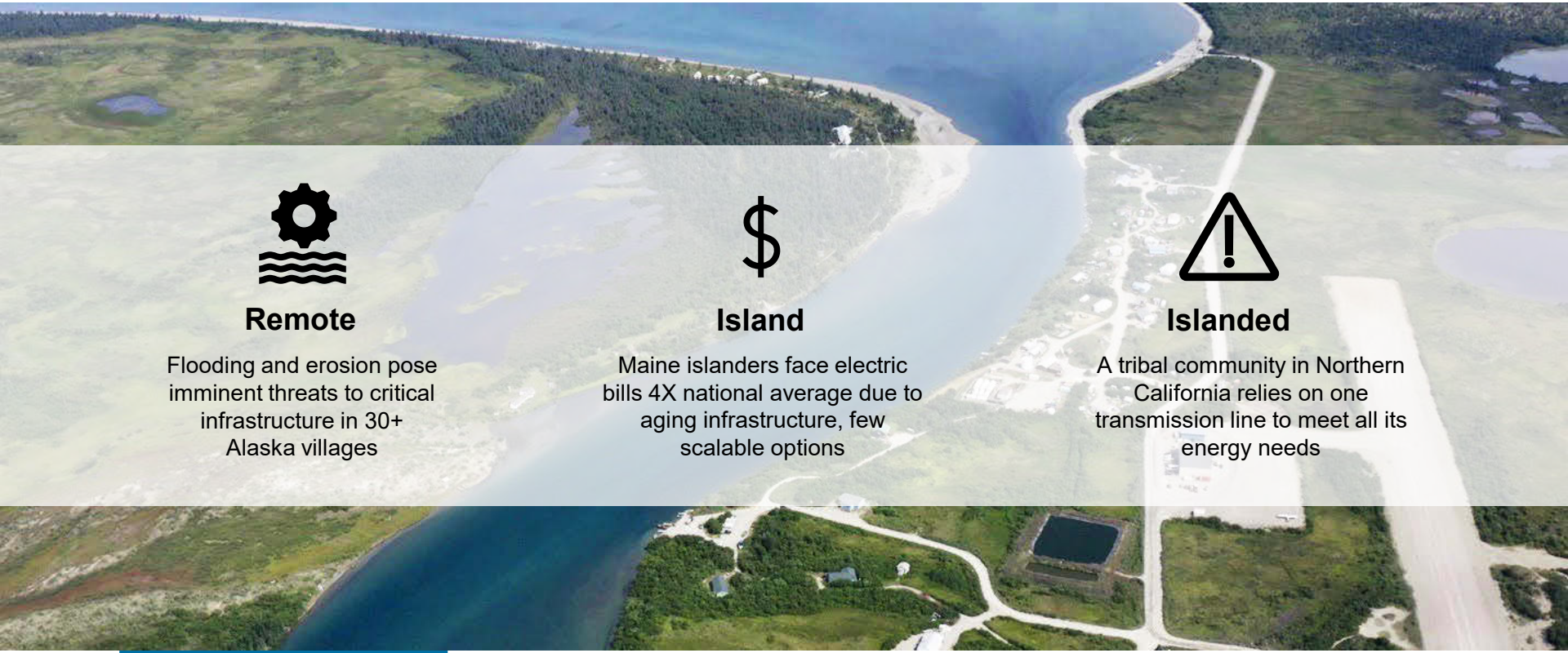
ETIPP Overview

Vulnerable Communities, Unique Challenges

Because of their geographic isolation, **remote, island, and islanded communities face unique energy and infrastructure challenges**.

Overcoming these challenges and reducing risk requires **ramping up resilience**—often with limited resources and capacity.

Energy & Infrastructure Challenges



Remote

Flooding and erosion pose imminent threats to critical infrastructure in 30+ Alaska villages

Island

Maine islanders face electric bills 4X national average due to aging infrastructure, few scalable options

Islanded

A tribal community in Northern California relies on one transmission line to meet all its energy needs

Energy Transitions Initiative Partnership Project (ETIPP)

Holistic, **community-driven** approach to advance energy transitions

Comprehensive, technology-neutral **technical assistance prioritizes community challenges, values, and goals**.

Empowering communities to transform their energy systems

Proven resilience framework fosters high-impact, replicable community energy transitions.

Community priorities

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Partnership

Deep energy-sector experience +
Specialized local expertise

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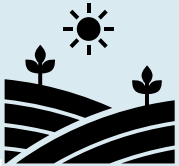


Resilient energy systems

LEARNINGS

ETIPP connects communities with energy experts to advance development of **resilient energy systems**.

Partners & Expertise

Leveraging Experience & Expertise

Communities (8-12)
Unique challenges, values, goals

Regional Partners (5)
Local, trusted, community-based

- **Stakeholder engagement and outreach**
- Translate technical content
- Share learnings, support use-case development

National Labs (4)
Deep energy-sector experience, expertise

- **Technology-neutral technical assistance**
- Identify and advance strategic, tailored solutions
- Address challenges, build capacity, and accelerate sharing of best practices and innovations

U.S. DOE Offices (4)
Funding, support, expertise

Support energy assessment, planning, and operations to achieve energy-resilient communities

U.S. DEPARTMENT OF ENERGY | Office of ENERGY EFFICIENCY & RENEWABLE ENERGY
OFFICE OF STRATEGIC PROGRAMS
SOLAR ENERGY TECHNOLOGIES OFFICE
WATER POWER TECHNOLOGIES OFFICE

U.S. DEPARTMENT OF ENERGY
Office of Electricity

U.S. Department of Energy

	U.S. DEPARTMENT OF ENERGY | Office of ENERGY EFFICIENCY & RENEWABLE ENERGY OFFICE OF STRATEGIC PROGRAMS	U.S. DEPARTMENT OF ENERGY | Office of ENERGY EFFICIENCY & RENEWABLE ENERGY SOLAR ENERGY TECHNOLOGIES OFFICE	U.S. DEPARTMENT OF ENERGY | Office of ENERGY EFFICIENCY & RENEWABLE ENERGY WATER POWER TECHNOLOGIES OFFICE
INCREASE USE OF EERE TECHNOLOGIES	ETI and National Labs have **catalyzed technical support, collaborative research,** and **direct support** so **communities can effectively and sustainably use EERE technologies** without ongoing federal support.	ETI's holistic approach allows **SETO to build tools and capabilities for better integrating solar** into state and local initiatives **Solar energy technology maturity is uniquely suited** to ETIPP communities	Deep assessment of needs and **opportunities to be met by marine energy;** develop **specific, targeted system designs** More thorough assessment of **marine energy as part of resource mix**
CROSS-OFFICE COLLABORATION	ETIPP represents growth for **ETI to expand its tools, partners, and program** to **support more communities**, and **provides strong linkages across EERE**	**Coordinate and execute a cross-office strategy** ETI-developed tools, resources and information have served as models for a **broader set of stakeholders** and helped **identify leading-edge issues and needs** for energy system innovation	**Ocean-centric view of marine energy innovation in close partnership with U.S. DOE offices**, other federal agencies, and diverse industries and sectors **Invest in National Lab assets for broader community impact**
GROWTH AND LEARNING	**Leverage and enhance ETI tools** as part of this effort, including **Engage**, the **Islands Playbook**, and the **ETI Energy Scenario Tool**. Develop additional **use cases** and a **network of shared learnings and resources to expand knowledge and access** for a broader set of communities	**Gain insights into early systems integration and remote grid markets**—relevant to microgrid and hybrid systems **Testing, evaluation and implementation** of solutions to address reliability, affordability and resilience can **yield unexpected insights**.	**Refine WPTO tools, models, and data** to include **marine energy in resilience strategies and planning** **Understand marine energy resources at higher resolution** and expand to **new places** Develop **core theories around marine-dependent communities** and how to **consider technology innovation** **De-risk tidal and in-stream devices deployment at scale** by better understanding their use for resilience

National Laboratories

Lawrence Berkeley National Laboratory (LBNL)

National Renewable Energy Laboratory (NREL)

Pacific Northwest National Laboratory (PNNL)

Sandia National Laboratories (SNL)

National Lab Role

- Provide technology-neutral technical assistance
- Identify and advance strategic, tailored solutions
- Address energy challenges, build capacity, and accelerate sharing of best practices and innovations

Regional Partners

Alaska Center for Energy and Power (ACEP) *Fairbanks, AK*

Coastal Studies Institute (ECU-CSI) *Outer Banks, NC*

Hawaii Natural Energy Institute (HNEI) *Honolulu, HI*

Island Institute *Rockland, ME*

Renewable Energy Alaska Project (REAP) *Anchorage, AK*

Regional Partner Role

- Lead stakeholder engagement and outreach
- Translate technical content; provide community support through work plan development
- Share lessons learned and provide input to develop use cases for specific communities

Communities

8-12 Communities Selected
For First Cohort ~ Spring 2021

Each Community is paired with:

- A Regional Partner, based on geographic location, and

ACEP Alaska Center for Energy and Power · Coastal Studies Institute A Multi-Institutional Research Partnership · HNEI Hawai'i Natural Energy Institute University of Hawai'i at Mānoa · ISLAND INSTITUTE · REAP

- National Lab staff, based on technical needs identified in the workplan.

BERKELEY LAB · NREL Transforming ENERGY · Pacific Northwest National Laboratory · Sandia National Laboratories

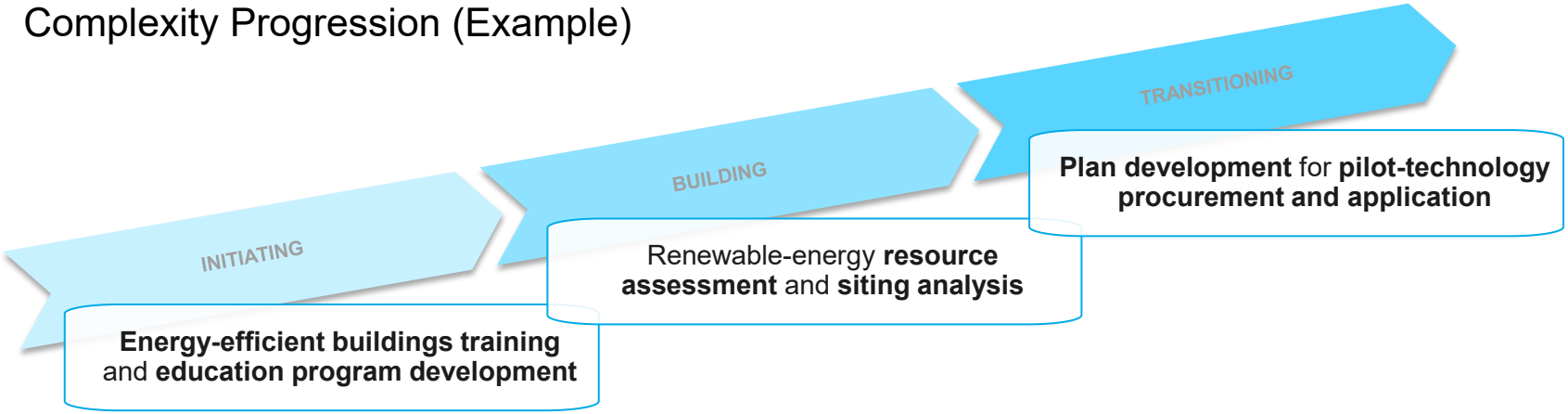
Community Role

- Identify energy resilience challenges and potential needs
- Commit to the exploration of implementing plans developed through ETIPP
- Convene relevant community decision-makers and influencers
- Work alongside regional partners and lab technical experts to address energy challenges

Technical Assistance Overview & Examples

ETIPP Technical Assistance

Complexity Progression (Example)



ETIPP's programmatic goal is to **support energy resilience planning and execution** in remote, island, and islanded communities with unreliable and expensive energy systems and supplies.

Initiating: Capacity Development

INITIATING

Solar PV O&M Training for Tribal Members

Challenge: Technical staff for tribes needed advanced training for solar PV system O&M

TA: NREL and GRID Alternatives developed and provided a weeklong workshop for technical staff of five Indian tribes on solar PV O&M. The workshop included classroom learning and hands-on experience.

Workshop participants get hands-on experience performing preventative and corrective maintenance on a rooftop system in Aurora, Colorado. *Photo by Devonie McCamey, NREL.*

Building: Resource Characterization

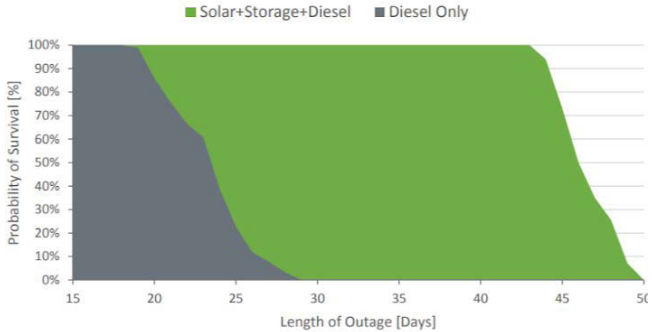
BUILDING

Coastal NC Resilient Energy System

Challenge: Assessment of PV procurement for diesel hybrid systems

TA: NREL used the REopt tool to:

- Evaluate the techno-economic potential of adding solar & storage at 4 facilities, and
- Compare the probability of surviving outages with:
  - A diesel generator & fixed fuel supply, or
  - A generator augmented with a PV & battery system.



	Diesel-only	PV-Battery-Diesel Hybrid
PV size	–	33 kW
Battery size	–	5 kWh
Inverter size	–	10 kW
Generator size	40 kW	40 kW
Available fuel	200 gallons	200 gallons

Resilience Scenario Results for Radio Tower

Transitioning: Pilot Technology

TRANSITIONING

Long-term Energy Planning & Preparation for Pilot Technology Deployment

Challenge: Assess and refine long-term energy strategy of Igiugig, Alaska

Objectives: 1) Deploy an operational river hydrokinetic turbine, and 2) Integrate renewable energy sources to achieve very high percent renewables (>70%)

TA: NREL worked with community leaders, academia, utilities, and industry partners to:

- Analyze the available resource for Igiugig, and
- Build scenarios to understand which long-term energy mix would provide energy self-sufficiency.

Imagery ©2019 DigitalGlobe, Map data ©2019 Google

ETIPP at Scale

Transition a wide breadth of energy systems for local and national impact

Create investment-ready, multi-stakeholder action **blueprints**

Unlock data and local expertise-driven **insights**

Convene local partners and national investors

Applicable across diverse geographies, regions, and types of communities; varied energy resilience challenges; holistic framework.

ENERGY TRANSITIONS INITIATIVE
PARTNERSHIP PROJECT

Project Timeline & Application Process

Project Timeline

You are here

Establish Partnership

Select Regional Partners for community support.

Oct. 2020

Select Communities

Competitive call for Communities seeking technical assistance via ETIPP.

Application deadline:
Feb. 15, 2021

Select 8–12 Communities to develop an energy resilience work plan.

Feb.–March 2021

Technical Assistance and Support

Connect each Community with National Lab technical lead.

Work plan development: March–May 2021

Technical Assistance execution: June 2021–December 2022

Technical assistance executed over a 12- to 18-month period.

LEARNINGS

Knowledge-Sharing Network

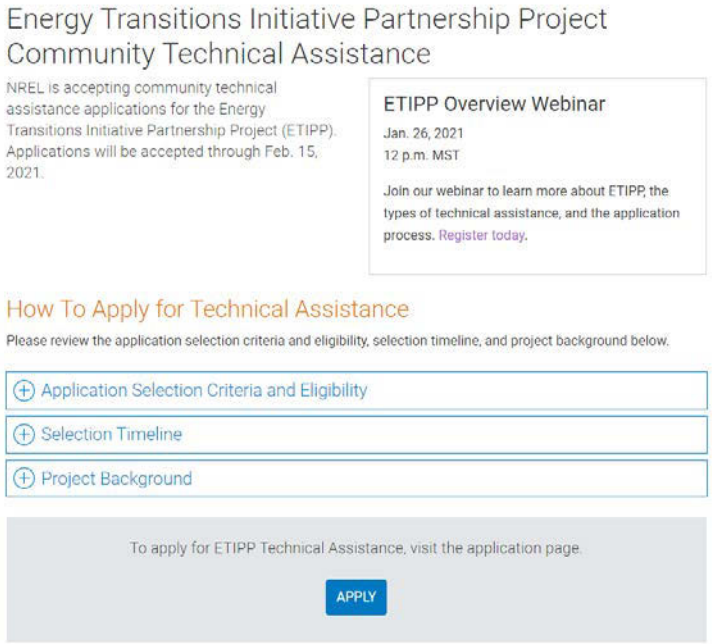
Communities, Regional Partners, and National Labs contribute to a knowledge-sharing network, resulting in lessons learned and use cases for future use.

Knowledge-Sharing Network: Technical Assistance period

Fall 2021: Target release for second cohort of community TA.

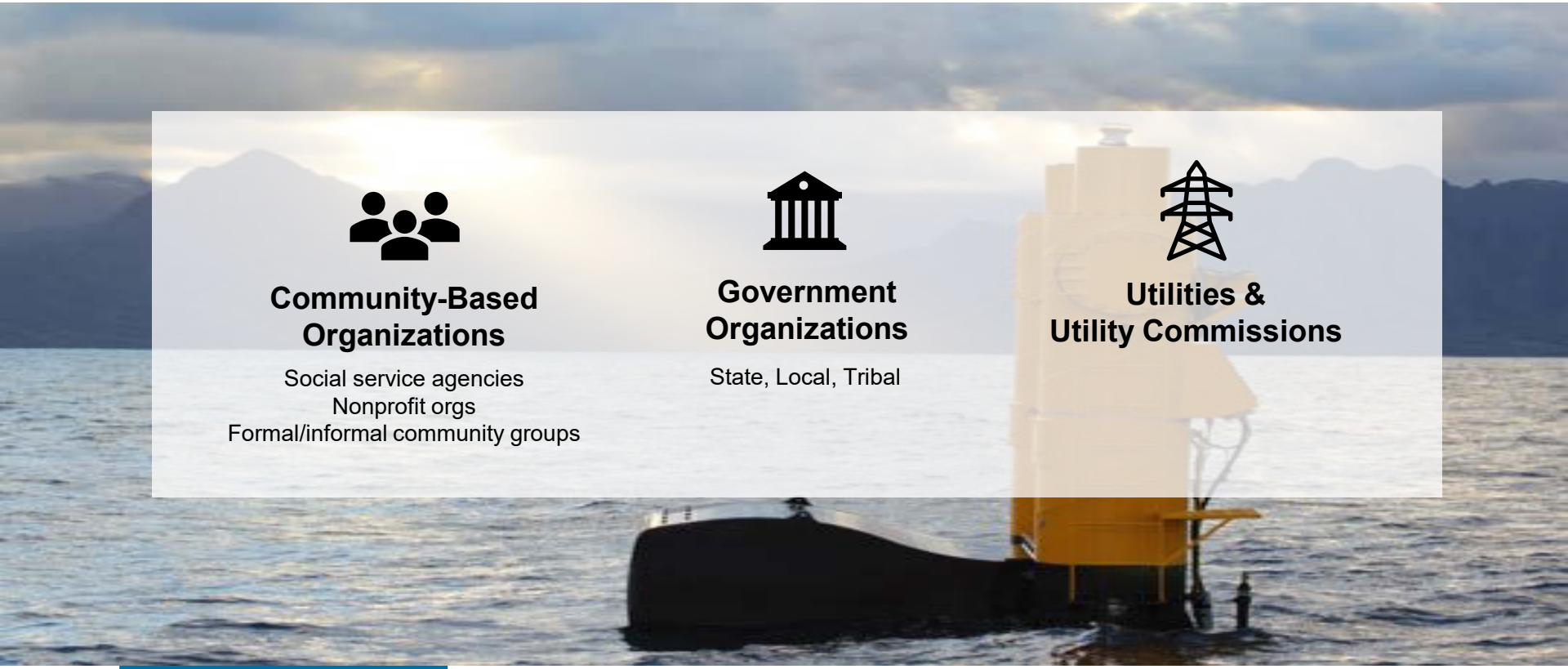
Application Process

- Visit **https://bit.ly/3n00YLX** to find all ETIPP-related info and blue **Apply** button
- Review selection criteria and eligibility:
  - ❑ Impact on your energy resilience objectives
  - ❑ Support from your leaders/decisionmakers
  - ❑ Likelihood of project completion
  - ❑ Alignment with ETIPP goal
- Apply by **February 15, 2021**
- Final selections announced in **March – April 2021**



The ETIPP TA page is found at: *www.nrel.gov/state-local-tribal/etipp-technical-assistance.html*

Determine Eligibility: Who Can Apply?



Community-Based Organizations

Social service agencies
Nonprofit orgs
Formal/informal community groups

Government Organizations

State, Local, Tribal

Utilities & Utility Commissions

Questions on Applying?

Questions about the project or process: ETIPP@nrel.gov

For questions related to your region or community, contact the regional partner in your area:

Alaska Regional Partners

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Northeast Regional Partner

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Southeast Regional Partner

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Thank you!

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