NREL Overview for Tribal Communities

Martha Symko-Davies
Lab Program Manager, Accelerating Clean Energy at Scale

NREL at-a-Glance

2,926
Workforce, including
219 postdoctoral researchers
60 graduate students
81 undergraduate students

World-class
facilities, renowned technology experts

More than 900
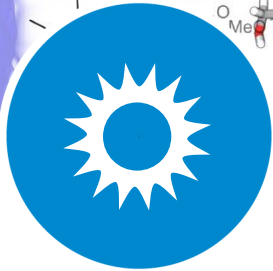**Partnerships**
with industry, academia, and government
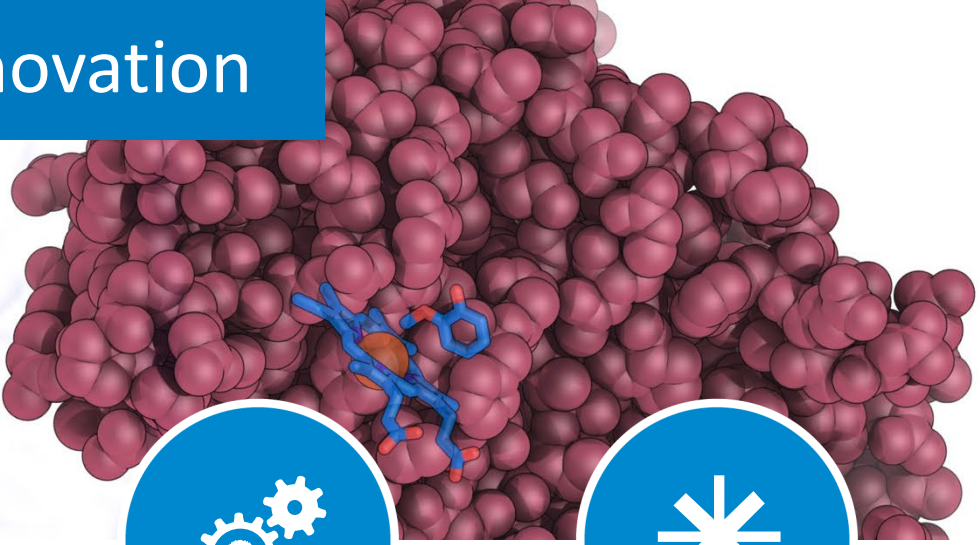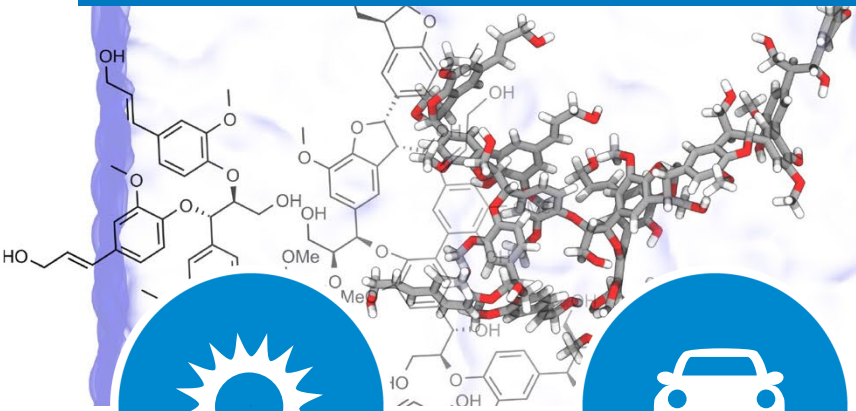
Campus
operates as a living laboratory

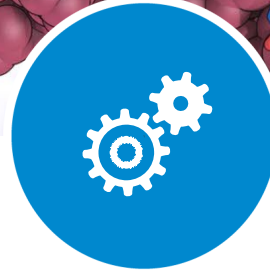# NREL Science Drives Innovation

Renewable Power
Solar

Wind

Water

Geothermal

Sustainable Transportation
Bioenergy

Vehicle Technologies

Hydrogen

Energy Efficiency
Buildings

Advanced Manufacturing

Government Energy Management
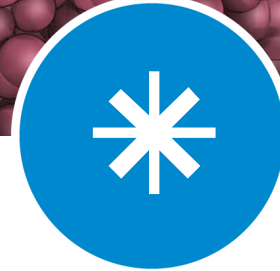
Energy Systems Integration
Grid Integration

Hybrid Systems

Security and Resilience

Applying the collective power of the national lab and its partners to support tribes in reaching their goals

STAKEHOLDER ENGAGEMENT AND DECISION SUPPORT

Map and assess actionable pathways for achieving clean energy goals, with continuous community input

CUSTOMIZED MODELING AND ANALYSIS

Apply customized tools to provide decision-supportive analysis on critical policy and technology decisions

SIMULATION, EMULATION, AND VALIDATION

De-risk large-scale deployments through realistic simulations/ emulations on the ARIES platform

LOCAL CAPACITY BUILDING AND TRAINING

Support training and institutional capacity building on clean energy, equity, policies, smart buildings, electric transportation

PEER-TO-PEER LEARNING WITH OTHER COMMUNITIES

Work through national coalitions to leverage lessons learned from other cities and share best practices

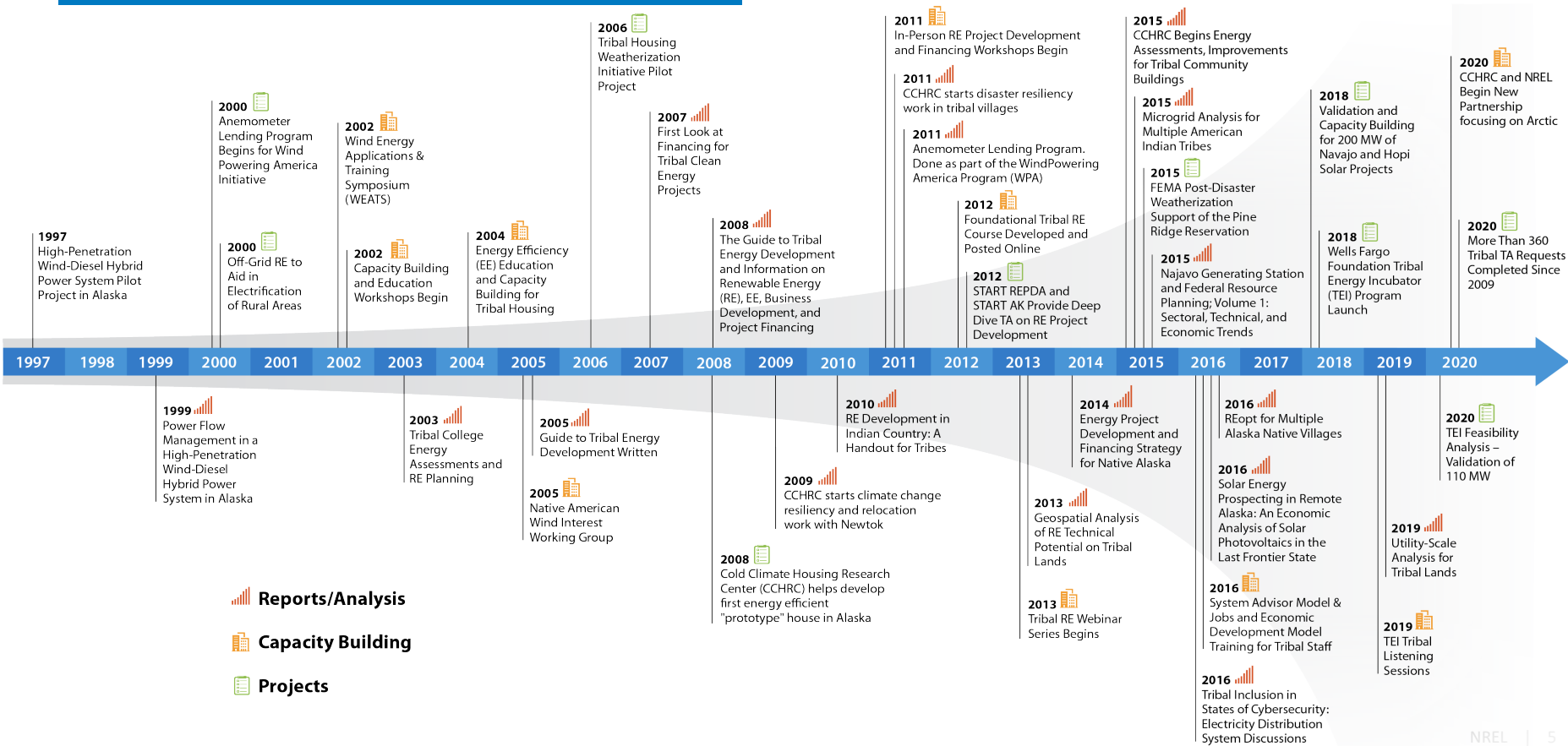# NREL Tribal Programs at a Glance

1997
High-Penetration Wind-Diesel Hybrid Power System Pilot Project in Alaska

1999
Power Flow Management in a High-Penetration Wind-Diesel Hybrid Power System in Alaska

2000
Anemometer Lending Program Begins for Wind Powering America Initiative

2000
Off-Grid RE to Aid in Electrification of Rural Areas

2002
Wind Energy Applications & Training Symposium (WEATS)

2002
Capacity Building and Education Workshops Begin

2003
Tribal College Energy Assessments and RE Planning

2004
Energy Efficiency (EE) Education and Capacity Building for Tribal Housing

2005
Guide to Tribal Energy Development Written

2005
Native American Wind Interest Working Group

2006
Tribal Housing Weatherization Initiative Pilot Project

2007
First Look at Financing for Tribal Clean Energy Projects

2008
The Guide to Tribal Energy Development and Information on Renewable Energy (RE), EE, Business Development, and Project Financing

2008
Cold Climate Housing Research Center (CCHRC) helps develop first energy efficient "prototype" house in Alaska

2009
CCHRC starts climate change resiliency and relocation work with Newtok

2010
RE Development in Indian Country: A Handout for Tribes

2011
In-Person RE Project Development and Financing Workshops Begin

2011
CCHRC starts disaster resiliency work in tribal villages

2011
Anemometer Lending Program. Done as part of the WindPowering America Program (WPA)

2012
Foundational Tribal RE Course Developed and Posted Online

2012
START REPDA and START AK Provide Deep Dive TA on RE Project Development

2013
Geospatial Analysis of RE Technical Potential on Tribal Lands

2013
Tribal RE Webinar Series Begins

2014
Energy Project Development and Financing Strategy for Native Alaska

2015
CCHRC Begins Energy Assessments, Improvements for Tribal Community Buildings

2015
Microgrid Analysis for Multiple American Indian Tribes

2015
FEMA Post-Disaster Weatherization Support of the Pine Ridge Reservation

2015
Najavo Generating Station and Federal Resource Planning; Volume 1: Sectoral, Technical, and Economic Trends

2016
REopt for Multiple Alaska Native Villages

2016
Solar Energy Prospecting in Remote Alaska: An Economic Analysis of Solar Photovoltaics in the Last Frontier State

2016
System Advisor Model & Jobs and Economic Development Model Training for Tribal Staff

2016
Tribal Inclusion in States of Cybersecurity: Electricity Distribution System Discussions

2018
Validation and Capacity Building for 200 MW of Navajo and Hopi Solar Projects

2018
Wells Fargo Foundation Tribal Energy Incubator (TEI) Program Launch

2019
Utility-Scale Analysis for Tribal Lands

2019
TEI Tribal Listening Sessions

2020
CCHRC and NREL Begin New Partnership focusing on Arctic

2020
More Than 360 Tribal TA Requests Completed Since 2009

2020
TEI Feasibility Analysis – Validation of 110 MW

1997 | 1998 | 1999 | 2000 | 2001 | 2002 | 2003 | 2004 | 2005 | 2006 | 2007 | 2008 | 2009 | 2010 | 2011 | 2012 | 2013 | 2014 | 2015 | 2016 | 2017 | 2018 | 2019 | 2020

Reports/Analysis

Capacity Building

Projects

NREL's Approach to Working with Tribes

Community context → Community goals and questions → Our tools, analysis, and expertise → Options for Energy Future

Tribal and regional partners, community-based organizations
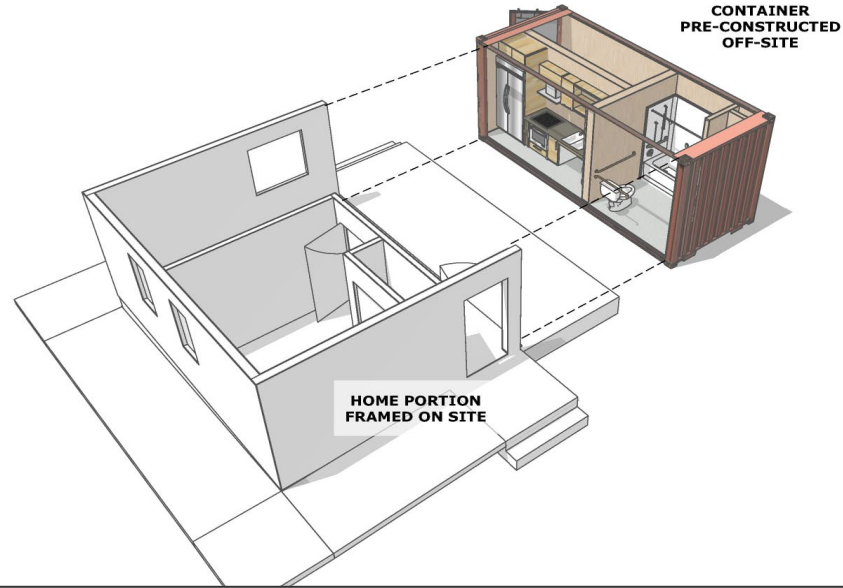
Co-Designed Solutions

NREL researchers work with communities to co-develop solutions to energy challenges. These solutions prioritize community context, local ingenuity, and community goals

CONTAINER PRE-CONSTRUCTED OFF-SITE

HOME PORTION FRAMED ON SITE

Project Highlight: Unalakleet Elder and ADA Housing

Community Challenges:

- Lack of affordable, ADA accessible housing units to allow elders to age in place
- Lack of local jobs
- Extreme climate with high energy costs

Solution: Semi-containerized housing installing HVAC, plumbing, and electrical equipment in a shipping container while providing detailed plans for framing an efficient house around the container

Results: an efficient, ADA home built significantly below average cost that keeps jobs in the community

Bridging National Investment with Community Goals

Stakeholder engagement

Community interests and potential impacts + industrial partners + investors + energy-sector expertise and experience

Analytic insights, models, tools, and data sets

Actual + modeled granular data

Scalable from building to state-wide and regional potential

Solutions, technologies, and integration

Research matches complexity of the modern energy system for integration and development of groundbreaking new energy technologies

Action plans and implementation

Coordination of tech design, develop, demonstrate, and deploy equity informed technology portfolios

Community-driven national impact

High-impact, replicable transitions rapidly scalable to any geographic region or type of community

Questions?

THANK YOU!

Martha Symko-Davies

Lab Program Manager: Accelerating Clean Energy at Scale