DOE OFFICE OF INDIAN ENERGY

DOE Alaska Native Village Energy Development Workshop: Office of Indian Energy Overview

Anchorage, Alaska, April 29, 2014



U.S. DEPARTMENT OF ENERGY | Office of Indian Energy

Office of Indian Energy Goals

- Promote Indian tribal energy development, efficiency and use
- Reduce or stabilize energy costs
- Enhance and strengthen Indian tribal energy and economic infrastructure relating to natural resource development and electrification
- Bring electrical power and service to Indian land and the homes of tribal members

Energy Policy Act of 2005, Title V, Sec. 502

Alaska Native Entities Served

- Federally recognized tribes
- ISDEAA tribes:
  - Tribal consortiums
  - ANC with 638 contracts/SD compacts
- For projects on Indian lands:
  - Lands conveyed to ANC through ANCSA

Key Alaska Energy Challenges

- Cost to build, lack of scale
- Funding and financing
- Renewable resources stranded
- Regional Grid / Micro grid design and renewable energy integration
- Disaggregate village/regional approach to energy development
- Education, capacity building, and sustainability at the village level
- Utility sustainability and economics
- Transition from diesel energy economy

DOE Office of Indian Energy

- Alaska START Program
- On-Demand Technical Assistance (joint with TEP)
- Education and Capacity-Building
- Microgrid / Renewable Integration Support
- US National Arctic Strategy Implementation Plan

Alaska START Program

- Key Goals/Objectives
  - Identify and develop community capacity building
    - Energy planning
    - Community education
    - Energy champion(s)
    - Technical skills-building
  - Lower cost/use of energy
    - Replace diesel with renewables
    - Micro-grid/renewable integration
    - Energy efficiency/weatherization
  - Identify funding/financing mechanisms for energy projects
  - Identify and develop on-going sustainability and support mechanisms
    - Inter-tribal organizations
    - Non-profits
    - ANCs
- Round III application – Sept. 2014

Technical Assistance

- 40 hours free technical assistance
- Focused on:
  - Strategic energy planning
  - Project development and finance
  - Technology assessment and review

Education and Capacity Building

- **Project development and finance workshops**
  - Community scale project development and finance July 2014 (Portland, OR) and August 2014 (Minneapolis, MN)
  - Commercial scale project development and finance, July 2014, Golden, CO
  - Alaska regional workshop - TBD
- **Tribal leader forums** -
  - Finance and Investment Forum May 14, 2014 San Diego, CA.
  - Waste to energy forum June 23, 2014 Washington, D.C.
- **Webinars** - The FY 2014 series focuses on topics and issues related to facility- and community-scale renewable tribal energy projects. Monthly, last Wednesday of the month.
- **On-line training curriculum**
  - **Foundational Courses:** basic information on renewable energy technologies, strategic energy planning, and electrical grid basics.
  - **Development and Finance:** The presentations provide an overview of developing and financing clean energy projects on tribal lands, including key concepts and decision points.

FY 2014 Financial Assistance

- Expect to fund up to $6.5 million
- Community-scale renewable energy
- Facility-scale renewable energy and energy efficiency

Alaska Opportunities for FY 2014

- Inter-tribal organizations/ANC capacity building
- Coordinated technical assistance – Denali Commission, Tribal Energy Program, AEA, AHFC
- Regional capacity building workshops
- Continued funding for renewable energy and energy efficiency deployment

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Why Complete a Renewable Energy Project?

Reduce use of diesel and heating oil

Jobs/Workforce Development

Cost savings/stabilization

Energy reliability / security

Economic development

Environmental sustainability

Climate change mitigation, adaptation, resiliency

Community Based Energy Planning

- Begin with a plan:
  - Roadmap for project and program development
  - Promotes continuity
  - Encourages buy-in from tribal leadership and community members
  - Provides touchstone for future project evaluation and development
- DOE Alaska Native Village Community Energy Development Guidebook

Energy Planning Model

Nine Step Process:

- Step 1: Identify and convene stakeholders
- Step 2: Establish a leadership team
- Step 3: Develop a common energy vision
- Step 4: Develop a community energy baseline
- Step 5: Develop energy goals
- Step 6: Identify and evaluate program and project resource options
- Step 7: Find and secure funding sources
- Step 8: Compile the Plan
- Step 9: Measure and evaluate

Energy Plan Element – Energy Baseline

- Energy Baseline Questions:
  - demand/load – peak, average, profile?
  - What is cost to produce power-fuel/non-fuel?
  - What is cost to install alternative energy – wind, hydro, biomass – per unit (kWh, BTU)?
  - What is average use by sector – residential, business, government?
  - Future loads?

Energy Plan Element – Community Goals/Metrics

- Specific metrics to determine if meeting objectives, achieving results
- Examples:
  - Reduce cost to install wind by ____%
  - Reduce cost to produce power by ____% or reduce to _____/kWh
  - Reduce use of power by ____%
  - Reduce total cost of power by ____%
  - Increase energy jobs by ___%
  - Develop new energy businesses
  - Train and develop____ community members.

Energy Plan – Project Identification and Prioritization

- Projects should be on the list that achieve the plan's goals and objectives.
- When you have multiple energy resources/technology options, several methodologies can help to prioritize projects. Typical methods include:
  - Levelized cost of energy (LCOE)
    - Allows comparison between different technologies, with different installed costs, operating costs, and lifespans
  - Total life cycle costs analysis (LCA)
    - Accounts for all the costs – including indirect costs – to build and operate a project
- Additional non-technology projects can include:
  - Adopt green building codes
  - Form operations and maintenance business
  - Adopt energy efficiency and renewable energy incentive programs

Prioritization Examples

Project	Power/ Heat	Size	Goal	LCOE	Installed Cost	Funding
Ground-mount solar	Power	200kW	Reduce cost to produce	.25/kWh	$7/W $1.4 M	DOE, AEA, USDA, ANC
Biomass CHP	Heat / Power	50kW	Reduce cost to produce heat and power	.35/kWh	$10/W $500k	DOE, AEA, USDA
Wind	Power	300 kW	Reduce cost to produce	.45/kWh	$23/W $6.9M	ANC, AEA, DOE

Other Energy Projects: Energy Business Opportunities

- Energy project development and ownership
- Energy services company – energy efficiency, renewable energy, energy conservation
- Energy products - biomass, waste resources
- Local manufacturing/assembly of systems
  - Bulk purchasing
  - Pre-positioning

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DOE Alaska Native Village Energy Development Workshop : Alternative and Innovative Financing

Anchorage, Alaska, April 30, 2014



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Common Ways to Finance Renewable Energy

Government Sponsored

- Grants
- Loans
- Tax Exempt Bonds
  - CREBS
  - QECB (AK $7,100,000)
- Renewable Energy Credits
- Tax benefits
  - Tax credits
  - Depreciation benefits

Private Financing

- Equity
  - Equity from project owner
- Debt
  - Banks
  - ESCOs - Energy savings performance contracting
- Tax equity
  - Upfront equity, in exchange for tax credits and other benefits, primarily from US banks and insurance companies (and Google)

Federal Energy Programs

- DOE
  - Tribal Energy Grant Program
  - Innovative Technology Loan Guarantee
- DOI – Office of Indian Energy and Economic Development
  - DEMD Grants and Technical Assistance
  - Loan Guarantee
- USDA – Rural Development
  - RUS Loan Guarantee Program
  - REAP Grant/Loan Program
  - Woody Biomass Program
  - RBOG Grant/Loan Program
- EPA
  - Clean Diesel Grant Program
- Commerce
  - EDA
  - MBDA
- Treasury
  - New Clean Renewable Energy Bonds (CREB) - $1.4B est. reallocation
  - Qualified Energy Conservation Bonds (QECB) – AK $7,100,000
  - New Market Tax Credits
- DHS/FEMA
  - Climate change, disaster mitigation

Leasing/PPA Models

- Renewable energy company installs, owns, operates, and maintains energy system – receives 30% tax credit
- RE company has PPA with host to sell power from system
- Host leases system and buys power from RE company at price < utility retail price
- Lease to purchase terms available to buy system at end of lease

Bulk Purchasing

- Aggregate demand for energy systems: individuals, companies, government entities
- Reduced pricing from vendors – scale
- Simplified purchasing process
- Examples:
  - Los Angeles, Portland, San Francisco
  - San Jose in partnership with SJFCU for low cost loans

Green Bonds

- Finance tool for green projects: projects and activities that promote climate and other environmentally sustainable purposes
  - Renewable energy
  - Energy efficiency
  - Sustainable waste management
  - Clean transportation
- Nascent market for institutional investors who have climate considerations in their investment objectives
  - Currently led by international organizations (WB, IMF)
  - Some states beginning to look at (MA and HI have issued some green bonds)

Additional Information & Resources

Financing Opportunities For Alaska Native Villages

Innovations in Voluntary Renewable Energy Procurement, NREL Report #TP-6A20-54991 (Sept. 2012)

Federal Financing Facilities

Federal Loan Programs for Indian Country

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