

DOE OFFICE OF INDIAN ENERGY

# Key Concepts

Narrowing project options, selection, ownership through pros and cons



U.S. DEPARTMENT OF  
**ENERGY**

Office of  
Indian Energy

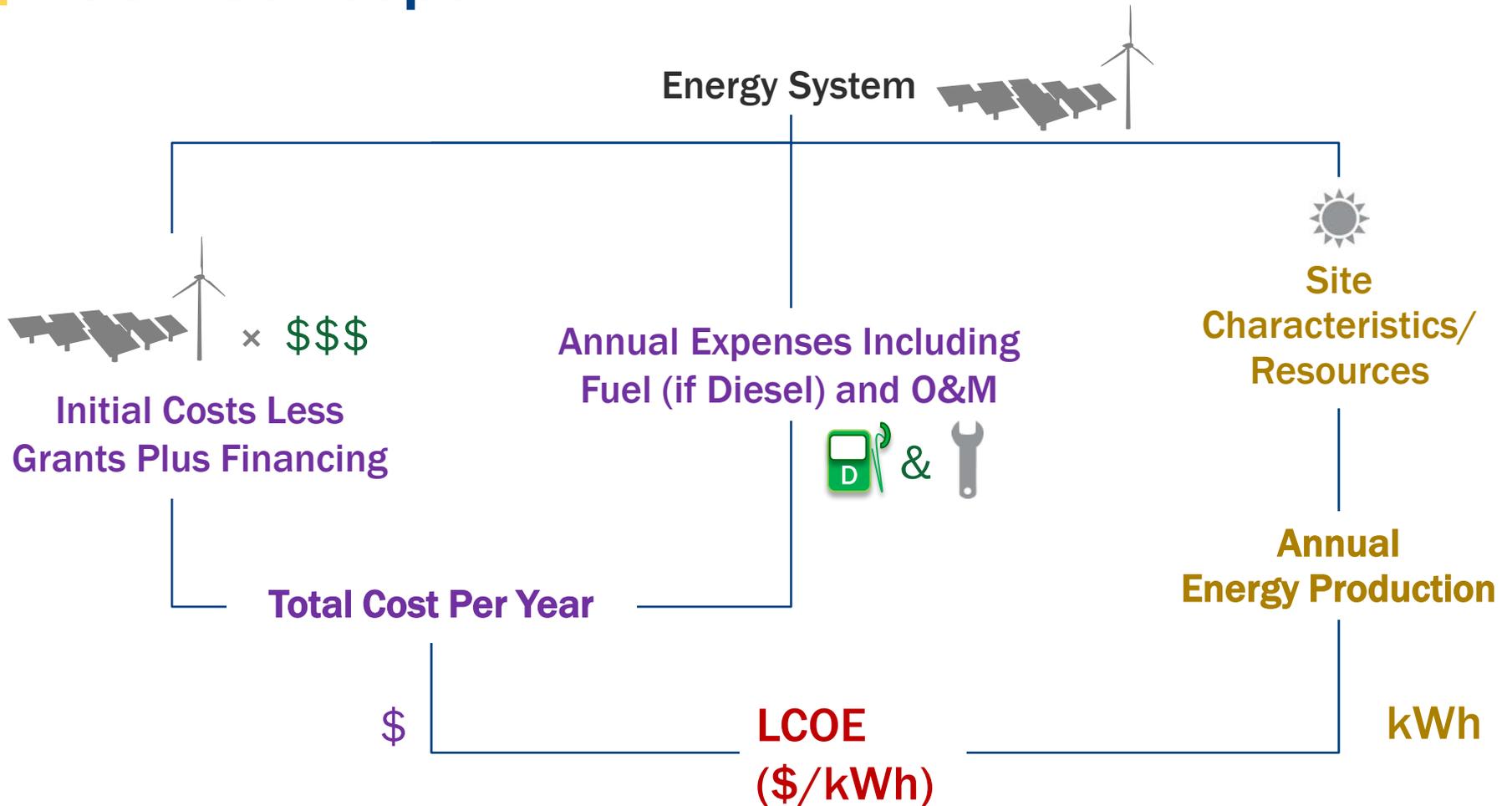
A photograph of three wind turbines on a mountain peak. The turbines are white with three blades each. The mountain is covered in green grass, and a thick layer of white mist or fog surrounds the base of the turbines and the mountain. The sky is a clear, light blue. The overall scene is serene and represents renewable energy.

# LEVELIZED COST OF ENERGY

# Key Concept: Levelized Cost of Energy (LCOE)

- Measures *lifetime costs* divided by energy production, captured in \$/MWh or ¢/kWh
- Calculates *present value* of the total cost of
  - Building
  - Operating a power plant over an assumed lifetime
- Allows the comparison of different technologies (e.g., wind, solar, natural gas) of
  - Unequal life spans
  - Project size
  - Different capital cost
  - Risk, return, and capacities

# LCOE Concept

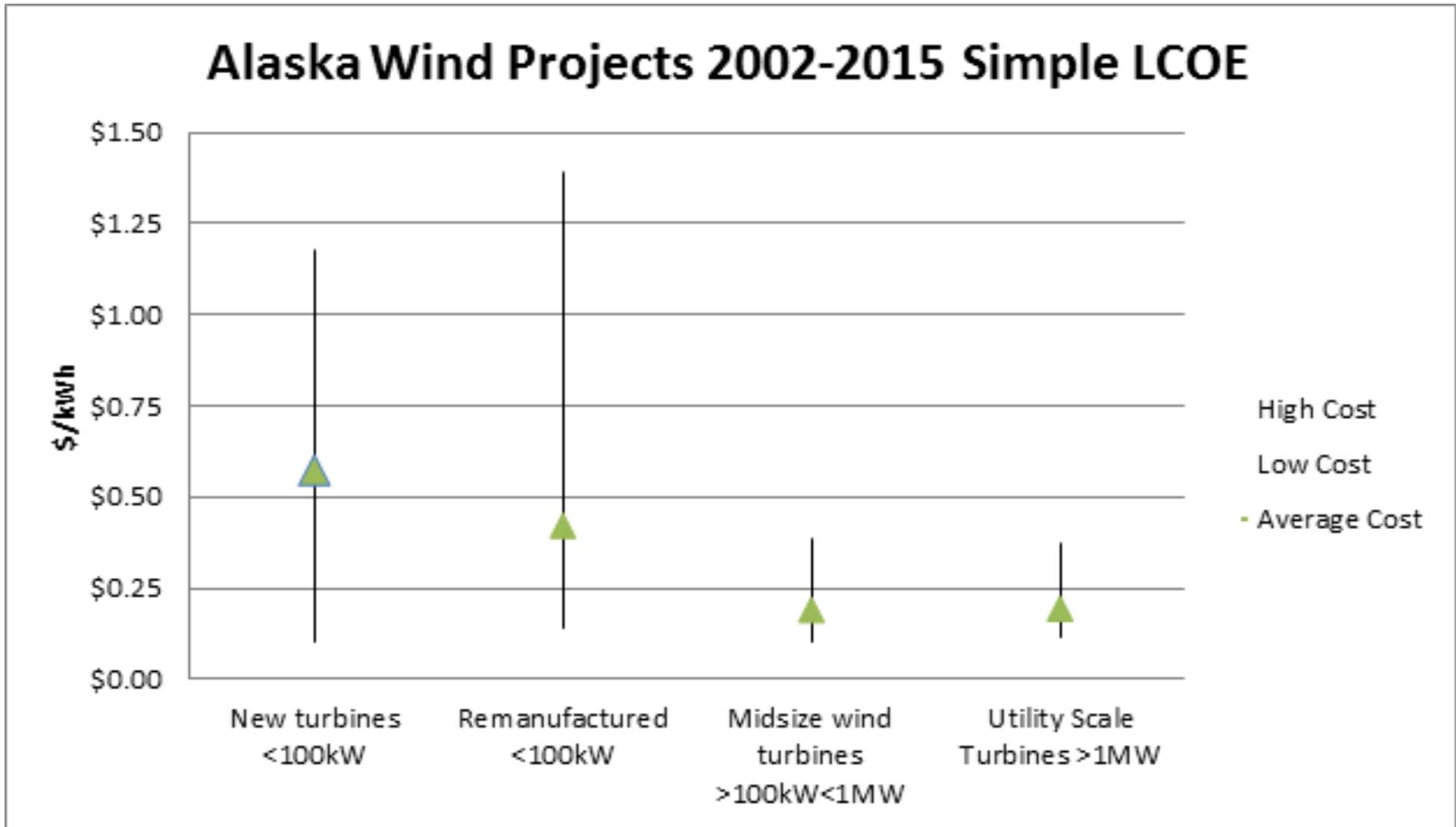


Adapted from European Wind Energy Association, "Economics of Wind Energy,"

[http://www.ewea.org/fileadmin/ewea\\_documents/documents/00\\_POLICY\\_document/Economics\\_of\\_Wind\\_Energy\\_March\\_2009\\_.pdf](http://www.ewea.org/fileadmin/ewea_documents/documents/00_POLICY_document/Economics_of_Wind_Energy_March_2009_.pdf)

# LCOE for Wind Energy in Alaska

A wide range of estimated wind LCOE for a variety of wind turbine types utilized In Alaska:



# Cost of Energy Analysis

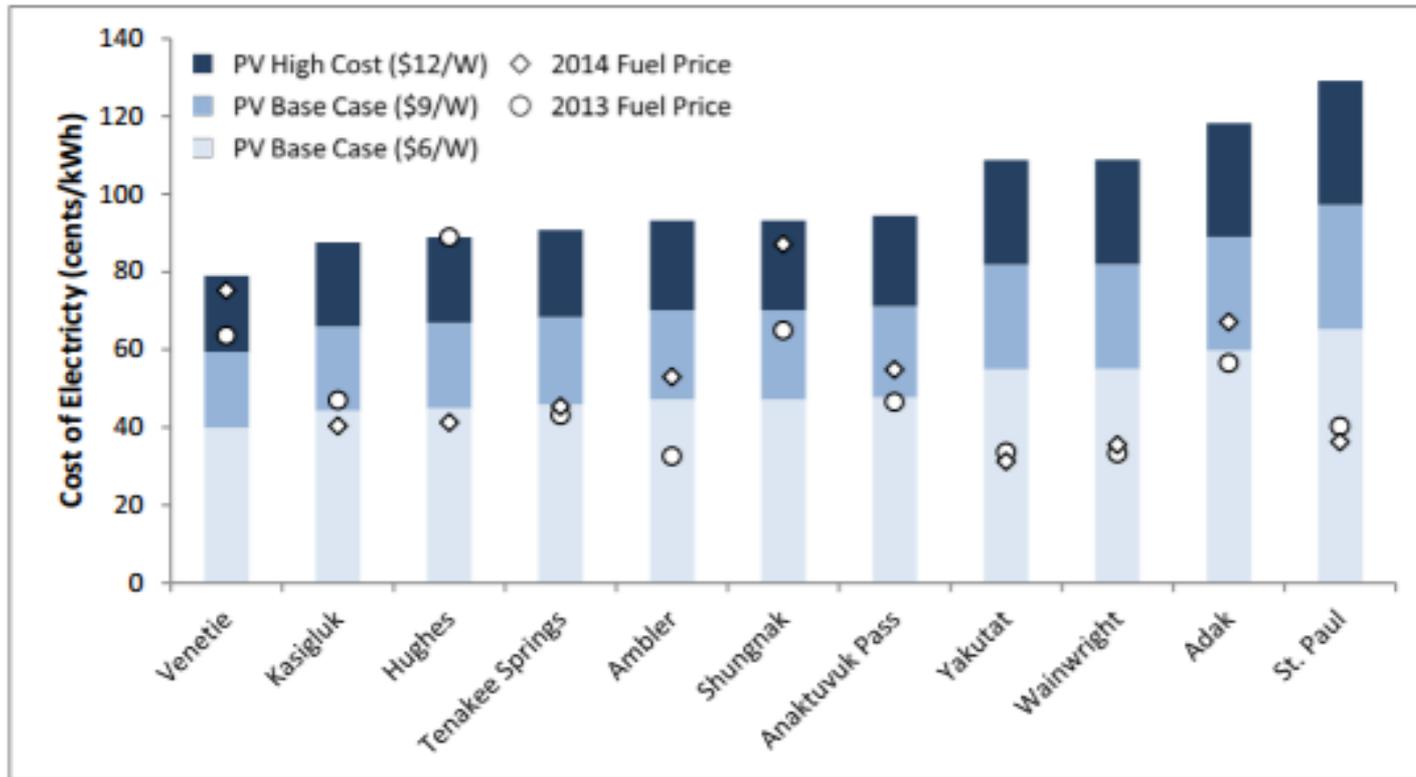


Figure 13. Cost of electricity comparison between solar PV and diesel generation

A photograph of three wind turbines standing on a mountain ridge. The turbines are partially obscured by a thick layer of white mist or fog that fills the valley and clings to the slopes. The sky above is a clear, bright blue. The overall scene is serene and emphasizes clean energy in a natural setting.

# TRIBAL ROLES



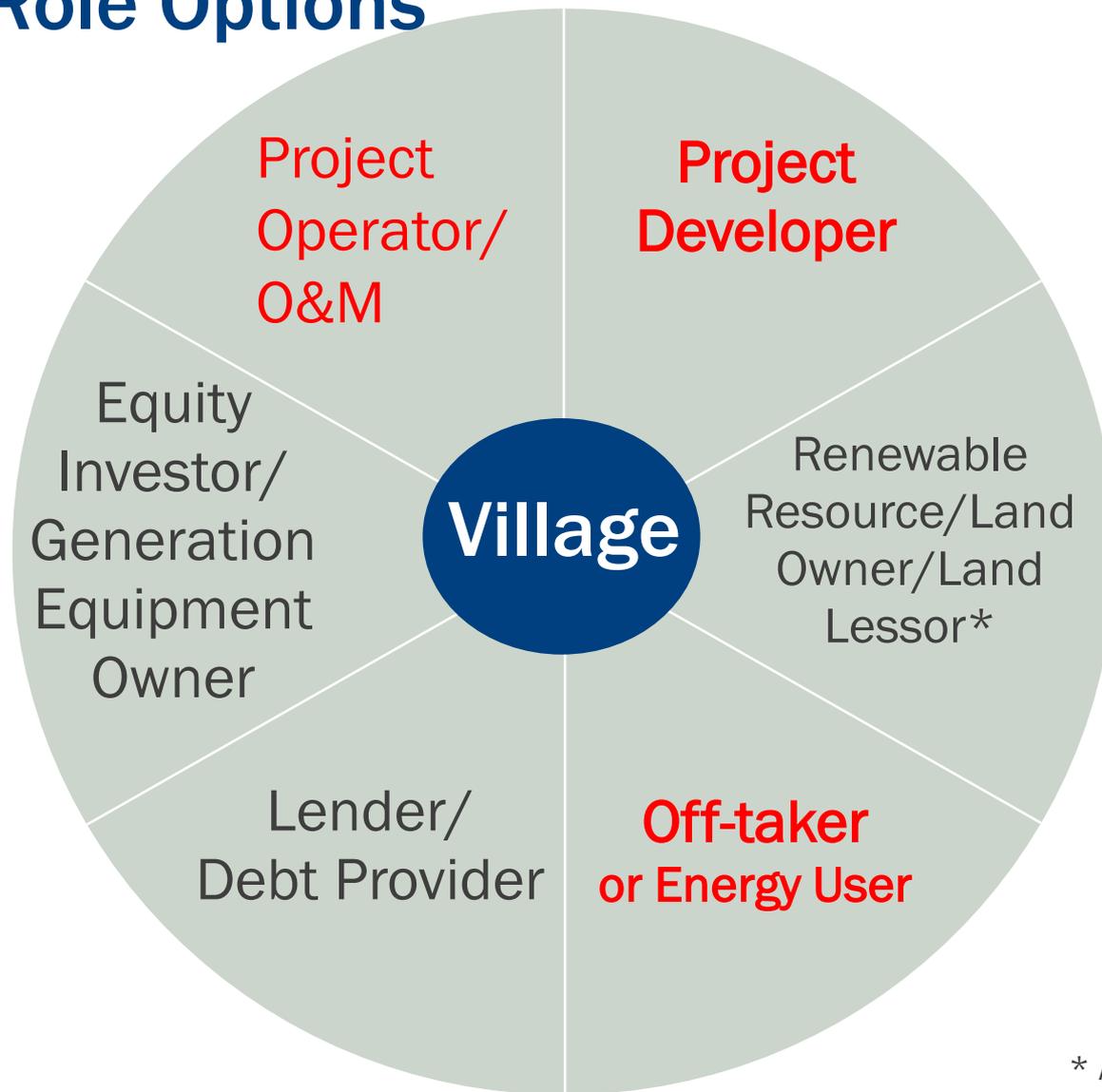
# Potential Team Members

- **Village Members**
  - Leadership, staff, community members
  - Attorneys, engineers, professionals
- **Developer**
  - Business managers, engineers, permitting specialists, investors, banks, attorneys, accountants, power marketers, procurement specialists, communications, public relations, government relations, corporate finance, project finance, construction managers, O&M specialists, asset managers, etc.
- **Utility**
  - Engineers, attorneys, planning specialists, operations specialists, regulatory specialists, finance, accounting, public relations, communications, systems operators, construction and field personnel, maintenance and emergency operations, etc.
- **Government**
  - Village government, federal, state, local entities, regulating bodies (public utilities commission), Bureau of Indian Affairs, DOE, Federal Energy Regulatory Commission, etc.

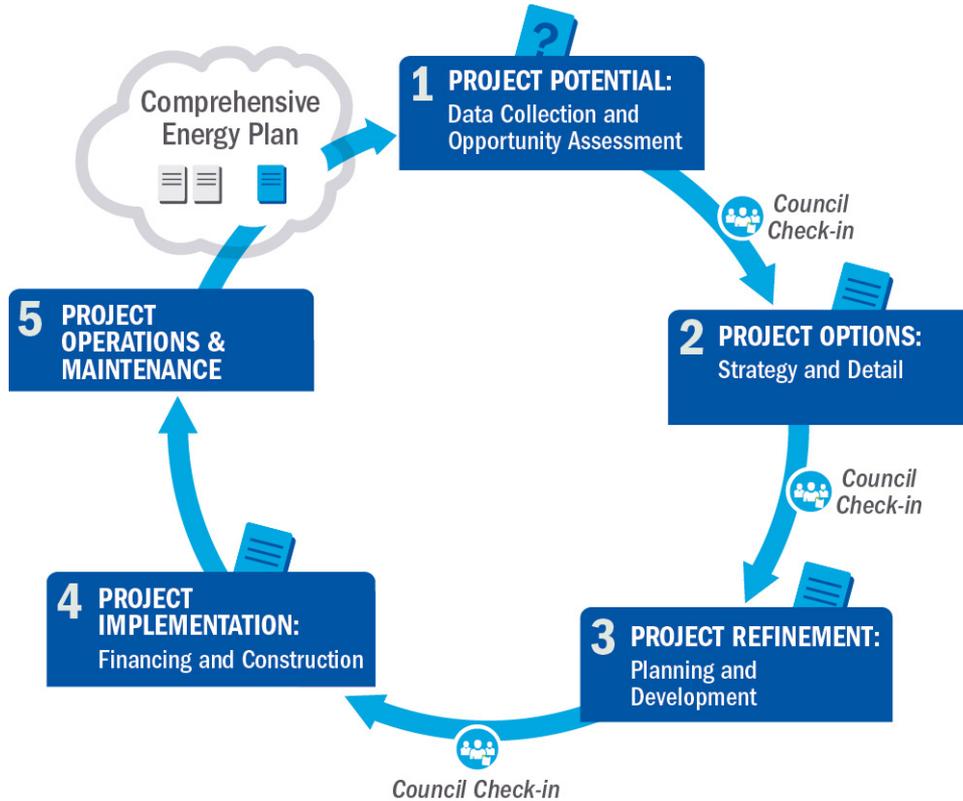
# The Role of the Project Champion



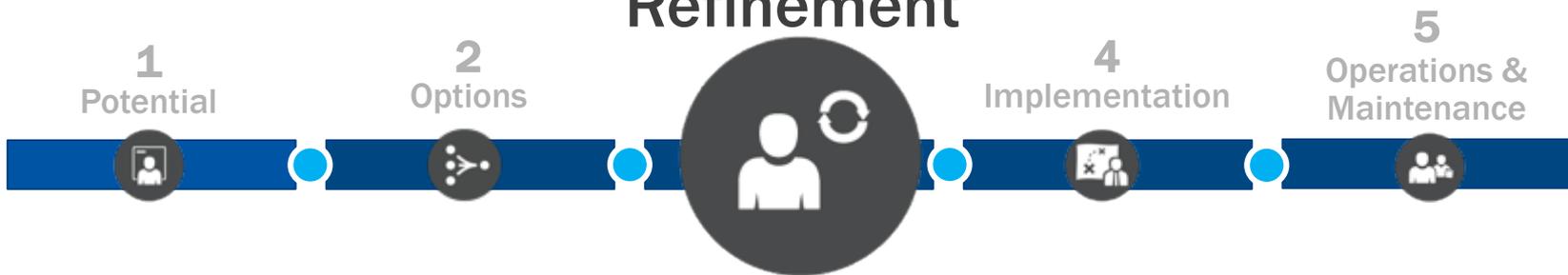
# Village Role Options



\* Also called Tribal Host



# 3 Refinement



The image shows three wind turbines on a mountain peak. The turbines are positioned across the top of the frame. The lower portion of the image is obscured by a thick layer of white mist or clouds. A large, semi-transparent blue rectangular box is overlaid on the bottom half of the image, containing the word "INTERCONNECTION" in white, bold, uppercase letters.

# INTERCONNECTION



# What is Interconnection?

“The technical rules and procedures allowing customers to ‘plug in’ to the grid.”

Source: *Solar Energy Industry Association*. Issues and Policies: Net Metering, accessed Aug 11, 2013. <http://www.seia.org/policy/distributed-solar/net-metering>



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## What is Interconnection? (cont.)

- Agreement required to connect your facility- or community-scale system to the grid
- Distribution-level interconnection is largely the domain of state policy
  - Rules and regulations are highly variable between states
- Involve your utility *early* and *often* in the project development process
  - Many utilities have their interconnection procedures and the necessary contacts posted on their website

# Common Interconnection Elements

- Application
- Designated interconnection utility representative
- Generator size thresholds
  - Different tracks for generators of certain sizes
  - Fast-track procedure for systems smaller than a certain size (generally ~2 MW)
  - Technical screens, feasibility studies, etc., for larger, more complex systems
- Timelines for each step
- Standard agreement between utility and customer

A photograph of three wind turbines standing on a mountain peak. The turbines are partially obscured by a thick layer of white fog or mist that fills the valley and surrounds the base of the mountain. The sky above is a clear, bright blue. The overall scene is serene and emphasizes renewable energy in a natural setting.

# INTERCONNECTION AND NET METERING

# What is Net Metering?

“Net metering allows residential and commercial customers who generate their own electricity from [eligible technologies] to feed electricity they do not use back into the grid” for utility credit.

Source: Solar Energy Industry Association. *Issues and Policies: Net Metering*, accessed Aug 11, 2013. <http://www.seia.org/policy/distributed-solar/net-metering>



# ■ Interconnection & Net Metering

- Required Agreements
- General Process for Interconnection
- How to Find Utility Rules on Interconnection
- Common Missteps and Caveats

# Net Metering Variations

- Net metering works best for
  - Home owners (not renters)
  - Single dwellings (not multi-unit homes/businesses)
  - Customers located in same utility territory
  - Distributed generation (DG) located in the same utility territory
- Variations on net metering allow for broader participation
  - Group billing
  - Virtual net metering
  - Joint ownership

# Virtual Net Metering

- Similar to group billing
  - Multiple participants receive net metering credits from a single renewable system
  - Offsets load at multiple retail electric accounts
  - Must be within a utility's service territory
- As with traditional net metering, credits appear on each individual customer's bill, instead of on a group bill
- Sometimes, the DG system is not required to be behind the customer's meter
- Examples: Colorado, Delaware, Massachusetts, and California

# Group Billing

- Allows multiple participants to receive net metering credits from a single renewable energy facility
  - Great for multi-family homes or multi-tenant business buildings
  - Utility's rules must allow for group billing
- Utility plays an active role
  - Produces group bill for all energy consumption and charges
  - Output from net metered system is credited against group bill
  - Remaining costs are allocated according to participant agreement
- Requires
  - Customer representative as utility contact to do administrative work
  - Creditworthy customer representative
- Example: Vermont

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# PROCUREMENT



# Procurement Process

## Facility- and Community-Scale Projects



- Potential Project Partners to Procure
  - Consider the General Services Administration (GSA) as a resource for procurement:  
<http://www.gsa.gov/portal/category/20998>
  - Project developer
  - Engineering, procurement, and construction (EPC) contractor
  - Environmental permits contractor
    - May apply to some community projects, but not to others

# Outline of the RFP Process

## 1. Develop RFP

- Timeline: 1 month to 1 year (depends on project scale and site complexity)
- Who creates the RFP: project leader, contract officer/lawyer, site manager(s), energy manager and technology expert. RFP writers will receive input from utility, tribal leaders, and stakeholders
- RFP content

## 2. Issue RFP

Tribal, federal, and industry networks

## 3. Administer the RFP

- Proposal meeting(s)
- Site tour(s) – can be concurrent with proposal meeting
- Q&A process – ensure all developers get same information

## 4. Evaluate Criteria

- Should be a clear process with well defined criteria
- Evaluation panel recommended to consist of an odd number of members (typically 3 to 7)

## 5. Award Contract

- Four approaches

# Develop RFP

## Key Elements of the RFP

- **Type of procurement**
  - Purchase
  - Power Purchase Agreement (PPA)
  - ESCO
- **Technical specification (scope of work)**
- **Criteria for evaluating proposals: 3–5 of most important project aspects**
  - Proposed project solution that meets specified criteria
  - System performance guarantee
  - Developer experience, track record, and customer satisfaction
  - Developer financial health/longevity
  - Maintenance plan
  - Reasonable timelines
  - Other

# Develop RFP (continued)

## Key Elements of the RFP

- **Description of RFP administration process**
  - Typically 2–5 months
  - Key dates: proposal meeting(s), sites visit(s), proposal due date
  - Description of how questions will be handled and answered
- **Defining responsible parties**
  - Who is responsible for permits
  - Who is responsible for interconnection agreements
  - Who is responsible for applying for incentives
- **Any preferences on parties allowed to submit proposals**
  - Small business
  - Minority-owned
  - Other
- **Land use agreements**
  - Address site access and land use issues as relevant to ownership model

# RFP Evaluation Criteria

## Two Typical Approaches

- Best value:
  - Typically 3–5 criteria with weighting based on importance
  - Score proposal on each criteria
  - Somewhat subjective and can lead to contentious, time-consuming evaluations but good method to capture best value
- Low price, technically acceptable
  - Proposals initially stripped of pricing/cost information
  - First evaluation determines proposals that meet technical hurdle
  - Technically acceptable proposal with lowest cost gets award
  - More transparent process but may not capture best value

A photograph of three wind turbines on a mountain ridge. The turbines are silhouetted against a bright, hazy sky. The foreground is a green, grassy slope partially obscured by a thick layer of white fog or mist. The overall scene is serene and emphasizes renewable energy.

# BUSINESS STRUCTURES AND BONDS

# Business Structure Options for Tribes

- Tribal government entities
  - Unincorporated instrumentalities
  - Political subdivisions
- Section 17 corporations
- Tribally chartered corporations
- State law entities
  - State law corporations
  - Limited liability companies (LLCs)
- Joint venture



NREL Photo #07958

# Business Structure: Tribal Government Entities

## Option 1: Unincorporated Instrumentalities

### Advantages

- Easy to form
- Management is centralized
- Not subject to federal income tax
- Same privileges and immunities as tribal government

### Disadvantages

- Politics and business are not separated
- Assets and liabilities of the enterprise not separated from governmental assets
- May preclude equity ownership by outside investors

## Option 2: Political Subdivisions

### Advantages

- Exempt from federal income tax
- Retain sovereign immunity
- May issue tax-exempt bonds
- Ability to form a corporate board

### Disadvantages

- Timely and costly to form the entity
- Not as much flexibility as corporations and LLCs
- May deter certain business partners

Source: Office of Indian Energy & Economic Development 2008

# Business Structure: Section 17 Corporations

Tribes can form corporations under Section 17 of the Indian Reorganization Act of 1934

## Advantages

- Same privileges and immunity as the tribal government, including tribal sovereign immunity
- Separates the assets and liability of the corporation from tribal asset
- Not subject to federal income tax

## Disadvantages

- Lengthy timeline to obtain a corporate charter
- Corporation must be wholly owned by a Tribe
- Example of Section 17 Corp: S&K Technologies, Inc.
  - Environmental restoration
  - Stream channel reconstruction
  - Native plant re-vegetation
  - Civil construction



Tour of the Ponnequin Wind Farm. Photo by NREL 09827

# Business Structure: Tribally Chartered Corporations

- Formed by tribal ordinance or tribal corporation code
- Must select a name and draft articles of incorporation
- Best utilized to operate on reservation as an arm of the tribal government
- Example: Ho-Chunk, Inc.
  - Information technology
  - Construction
  - Government contracting



Rooftop PV installation on the Forest County Potawatomi Tribe administration building.  
Photo from Forest County Potawatomi Tribe, NREL 20107

# Business Structure: State Law Entities

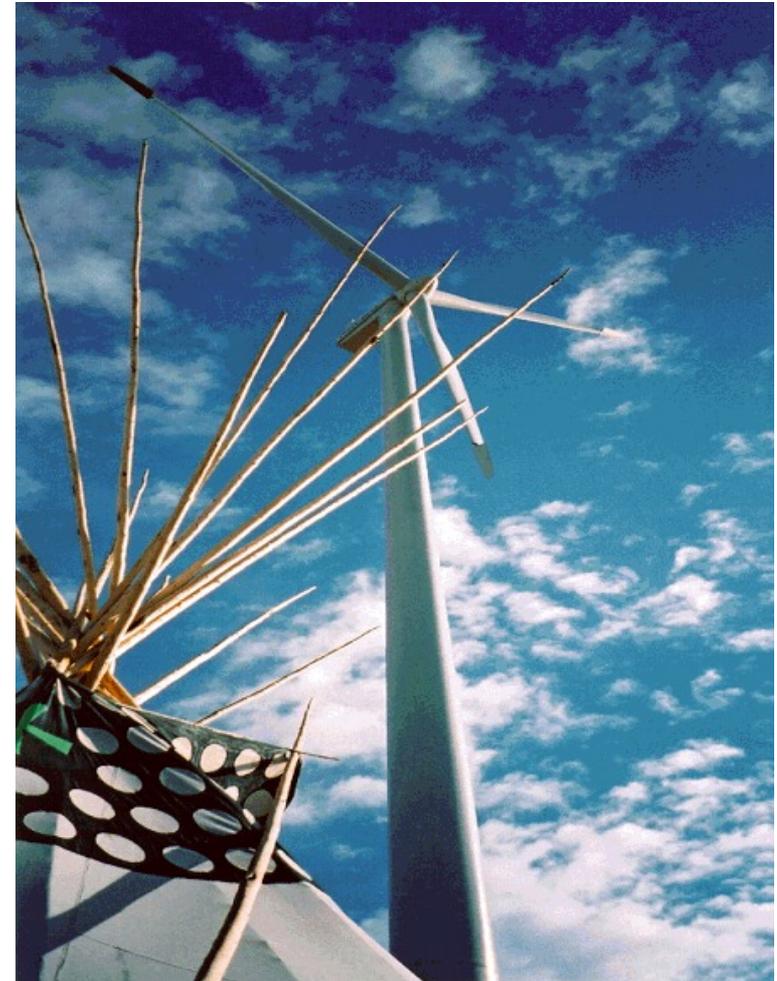
## State Law Corporations and LLCs

### Advantages

- Quick and easy to organize
- Familiar to lenders and potential business partners
- Can be used to acquire or merge with an existing state-law entity

### Disadvantages

- Subject to federal income tax
- May not issue tax-exempt debt



Weather Dancer 1 wind project in Alberta, Canada. Photo from Piikuni Utilities Corporation, NREL 13792

# Business Structure: Joint Venture – LLCs or Limited Partnerships

## Advantages

- Acquire energy project development expertise
- Secure project financing
- Enjoy benefits of federal incentives (e.g., tax credits)

## Disadvantages

- Likely loss of sovereign immunity for the joint venture entity
- Inability to qualify for certain kinds of financing



7.1 kilowatts of residential solar PV

NREL Photo #18691

# Bonds: Clean Renewable Energy Bonds (CREBs)

- CREBs
  - Apply to the IRS for an allocation
  - Federal tax credit to bond owner in lieu of interest payment from bond issuer
  - May be more attractive than tax-exempt municipal bonds
    - Issuer only pays back bond principal (for most part)
- Total allocation of \$1.2 B
  - Up to 62.5% for public sector projects (rest: coops)
  - Round 1: 401 of 610 public sector PV projects
  - Round 2: \$262MM for public-sector PV projects
  - Additional rounds possible

## Bonds: CREBs cont.

### Challenges

- Not truly equivalent to interest-free bond
  - Assumes bond issuer is equiv. to AA corporate
  - Public entities with weaker credit must either:
    - Make supplemental interest payments, or
    - Sell the bond at a discount
- Transaction costs are high
  - Allocations made from smallest to largest projects
  - Solution: MA bundled 12 projects (1 MW)
- First principal payment due in December of the year the CREB is issued

# Bonds: 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 (World Bank, International Monetary Fund)
  - Some states beginning to look at these instruments (MA has issued some green bonds)