DOE OFFICE OF INDIAN ENERGY

The Five-Step Development Process

Step 3: Project Refinement

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


Comprehensive Energy Plan
1 PROJECT POTENTIAL: Data Collection and Opportunity Assessment
Council Check-in
2 PROJECT OPTIONS: Strategy and Detail
Council Check-in
3 PROJECT REFINEMENT: Planning and Development
Council Check-in
4 PROJECT IMPLEMENTATION: Financing and Construction
5 PROJECT OPERATIONS AND MAINTENANCE
Project Development and Financing Strategy


3
Refinement
1
Potential
2
Options
4
Implementation
5
Operations & Maintenance

FUNDING AND FINANCING OPTIONS

Project Ownership

Financing structure is highly dependent on size of the project and the capital available for a given project:

- Tribe owns the project (cash purchase or debt)
- Tribe hosts the project and buys the electricity (power purchase agreement)
- Tribe partners with private sector and co-owns the project (uncertainties about receipt of tax benefits)

Financing Options and Sources of Capital

- Cash on hand (e.g., reserves, trust, cash flow from other activities)
- Grants from third parties
- Renewable energy incentives (e.g., Single-family Affordable Solar Homes Program [SASH])
- Monetizing green attributes (e.g., renewable energy certificates [RECs])
- Debt
- Energy savings performance contracts (ESPCs) and utility energy savings contracts (UESCs)
- Tax equity investors seeking tax incentives

Project Scale

Facility: single-building system

Primary goals: offset building energy use, costs
Development timeline: 1 month to 1 year

10 kilowatts (kW) @ $3.50/Watt (W)
$35,000

NC Solar Center, NREL 09373

Community: multiple buildings/campus

Primary goals: Offset community energy costs, promote energy self-sufficiency
Development timeline: 6 months to 2 years

100 kW @ $2.75/W
$275,000

1,000 kW @ $2.25/W
$2,250,000

Orange County Convention Center, NREL 18077

Tucson Electric Power, NREL 13327

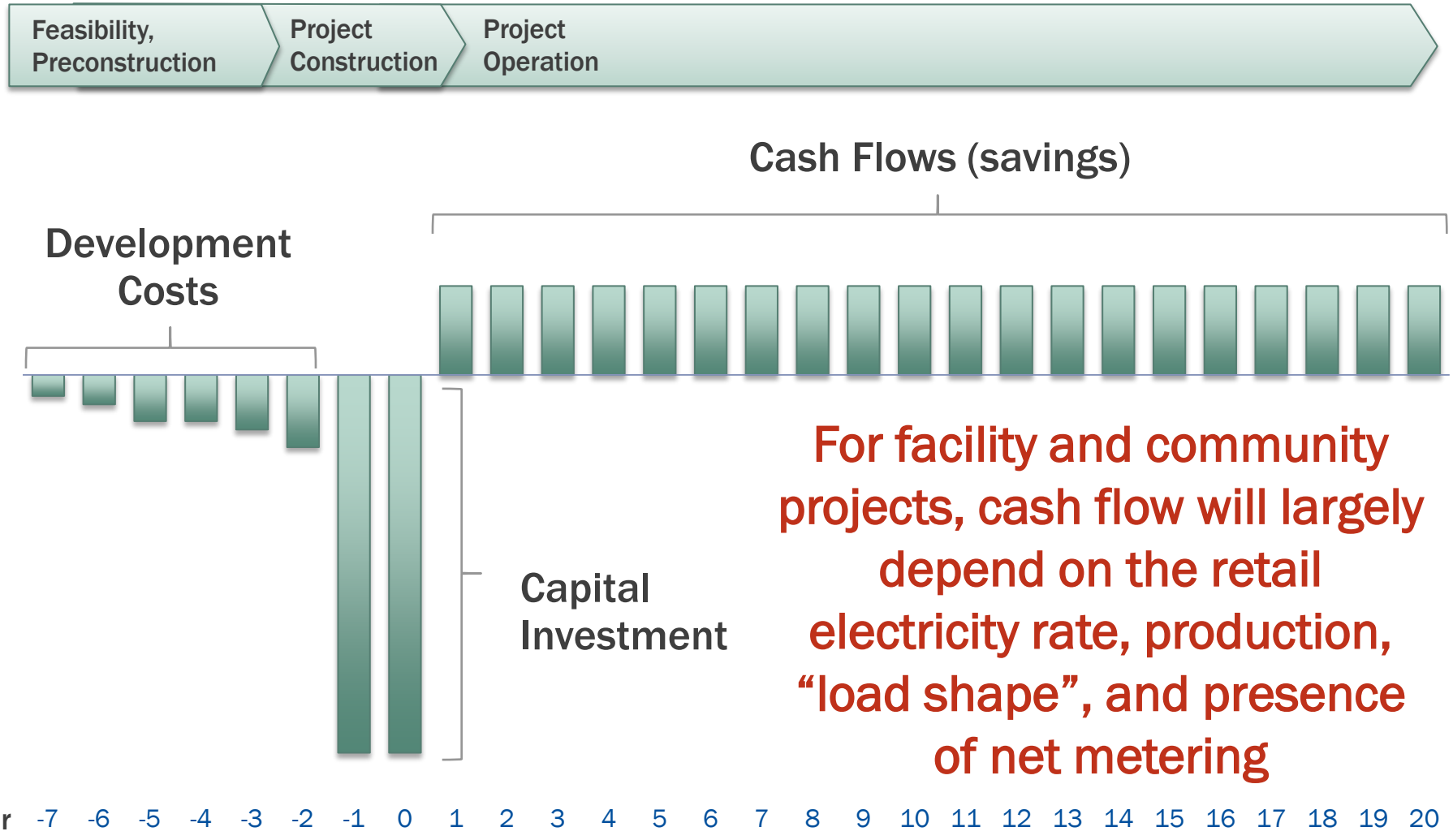
Paying for the Project

Three Major Costs to Develop a Project

- **Feasibility** – this is the project potential analysis
- **Preconstruction** – permitting, environmental
- **Construction** – engineering, procurement of equipment, and actual construction of plant

42-kW PV panels installed on Grand Ronde Tribal Housing Authority carport. Combination of tribal funds and state incentives.
Photo from GRTHA, NREL 31797

Costs and Cash Flows Example (hypothetical, without tax credits)



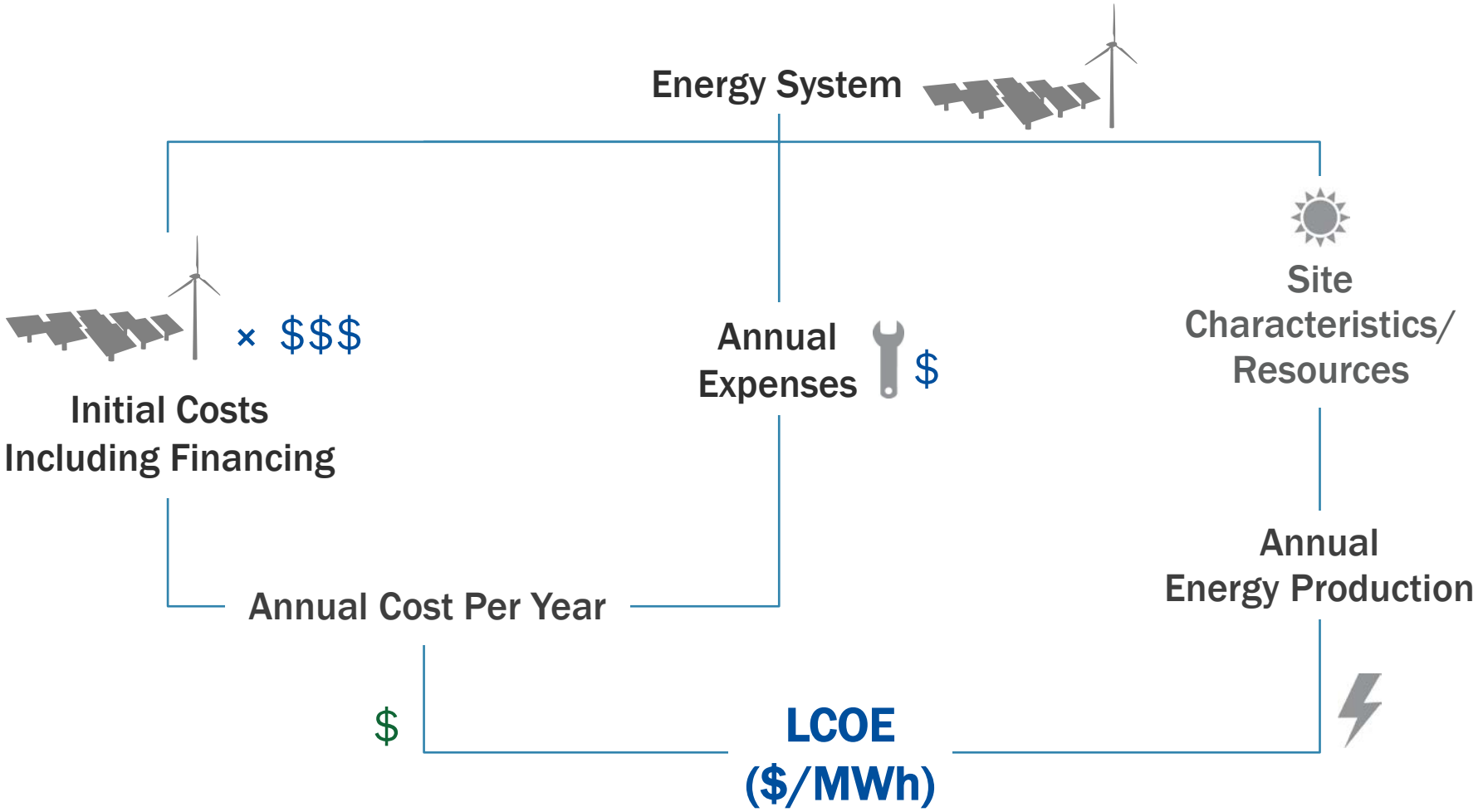
LEVELIZED COST OF ENERGY

Levelized Cost of Energy (LCOE)

- Measures lifetime costs divided by energy production, captured in $/megawatt-hour (MWh) or ¢/kilowatt hour (kWh)
- Calculates present value of the total cost of: a) building and b) 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

Critical to making an informed decision to proceed with development of a facility or community energy project.

Simplified 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

Using LCOE

Calculating and comparing LCOE can:

- Measure value across the longer term, showing probable life-cycle costs
- Highlight opportunities for tribes to develop different scales of projects (facility, community, or commercial)
- Inform decisions to pursue projects on an economic basis, compared to utility rates

Most renewable energy projects have zero fuel costs (with biomass being the possible exception)

HYPOTHETICAL PROJECTS

Net Metering

- Contract with utility that compensates generators for electricity fed onto the grid (i.e., not consumed onsite)
- Compensation is most commonly at the retail rate (although this is under dispute in many states)
- Can be a critical component to realizing return on investment for facility and community projects

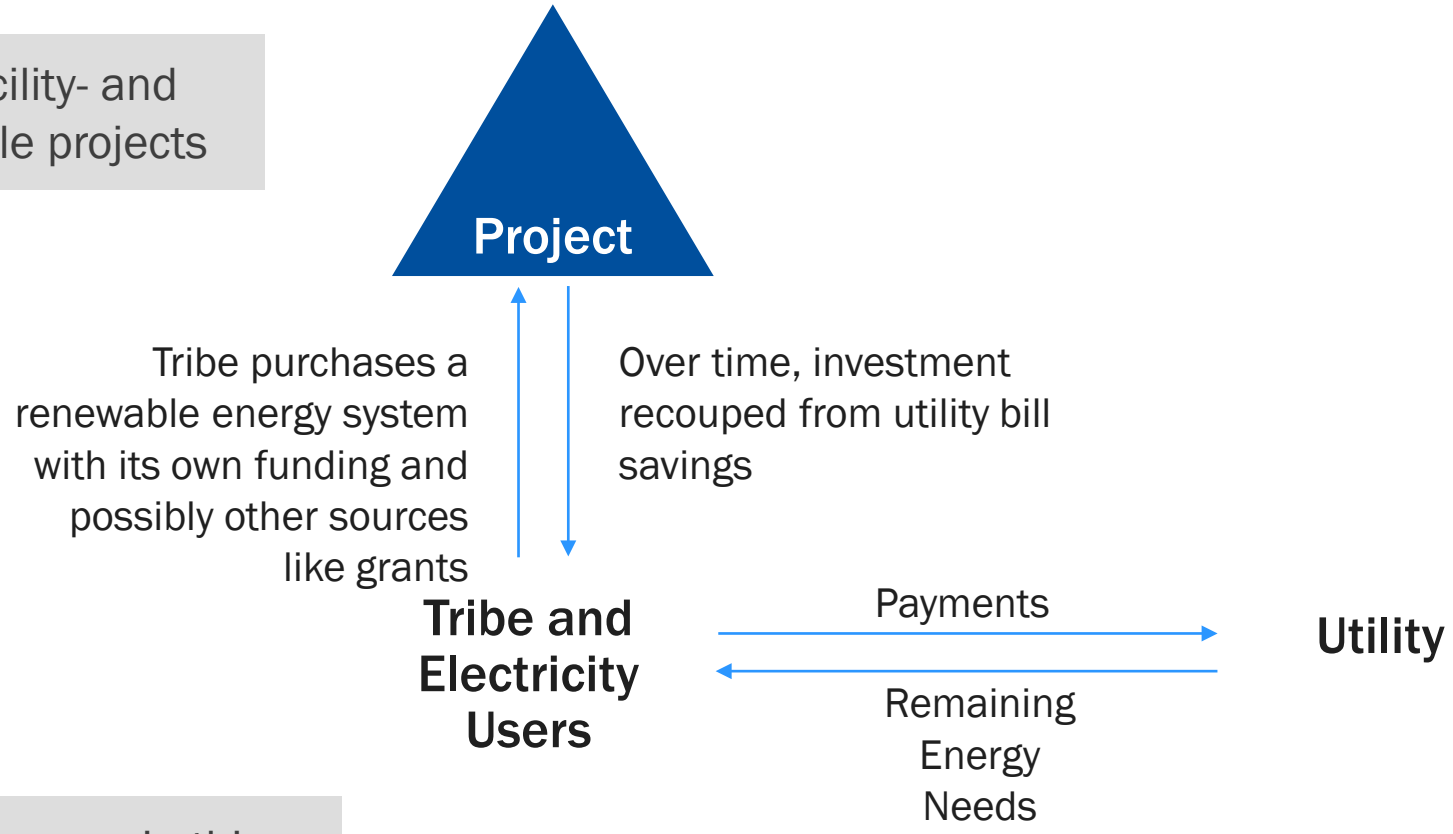
Paying for It: Small Scale

10 kW @ $3.50/W
$35,000

- Tribal Funds
- Grants
- Incentives
- RECs

Direct Ownership Structure

Primarily for facility- and community-scale projects



The tribe is the owner in this structure and self-generates its electricity

Hypothetical Solar Project: Direct Ownership

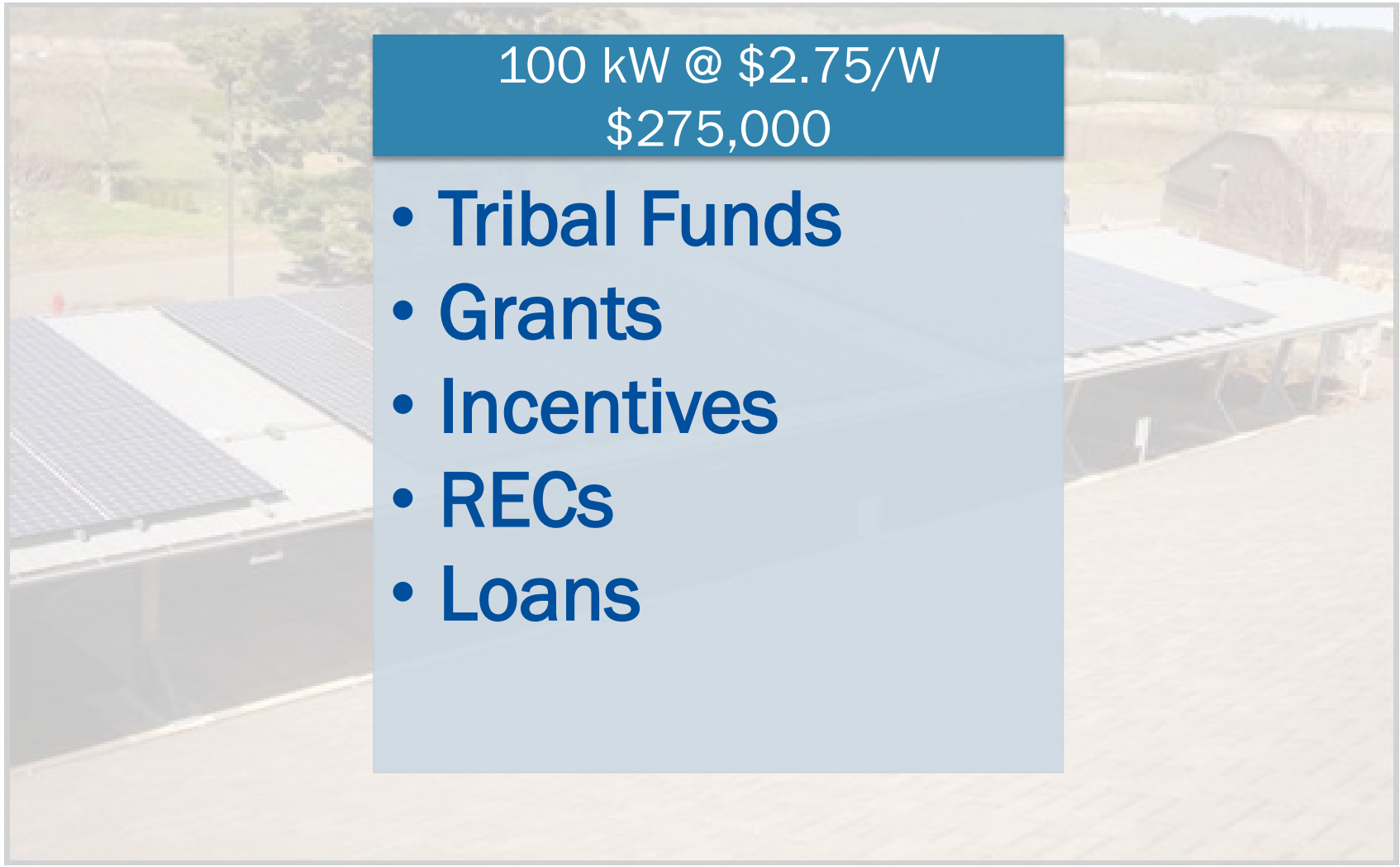
- 10 kW
- Installation on rooftop of small administrative building, Southern California
- Offset Southern California Edison (SCE) GS-1 Rate (assume 1% annual increase)
- $35,000 capital cost
- Cash purchase
- No incentives, no REC sales

30-Year Analysis	
Metric	**Value**
Annual energy	16,741 kWh
Capacity factor	19.10%
LCOE	15.16 ¢/kWh
Electricity cost without system	$12,492
Electricity cost with system	$9,690
Net savings with system	$2,802
Payback period	11.6 years

Below average retail rate?

Acceptable timeframe?

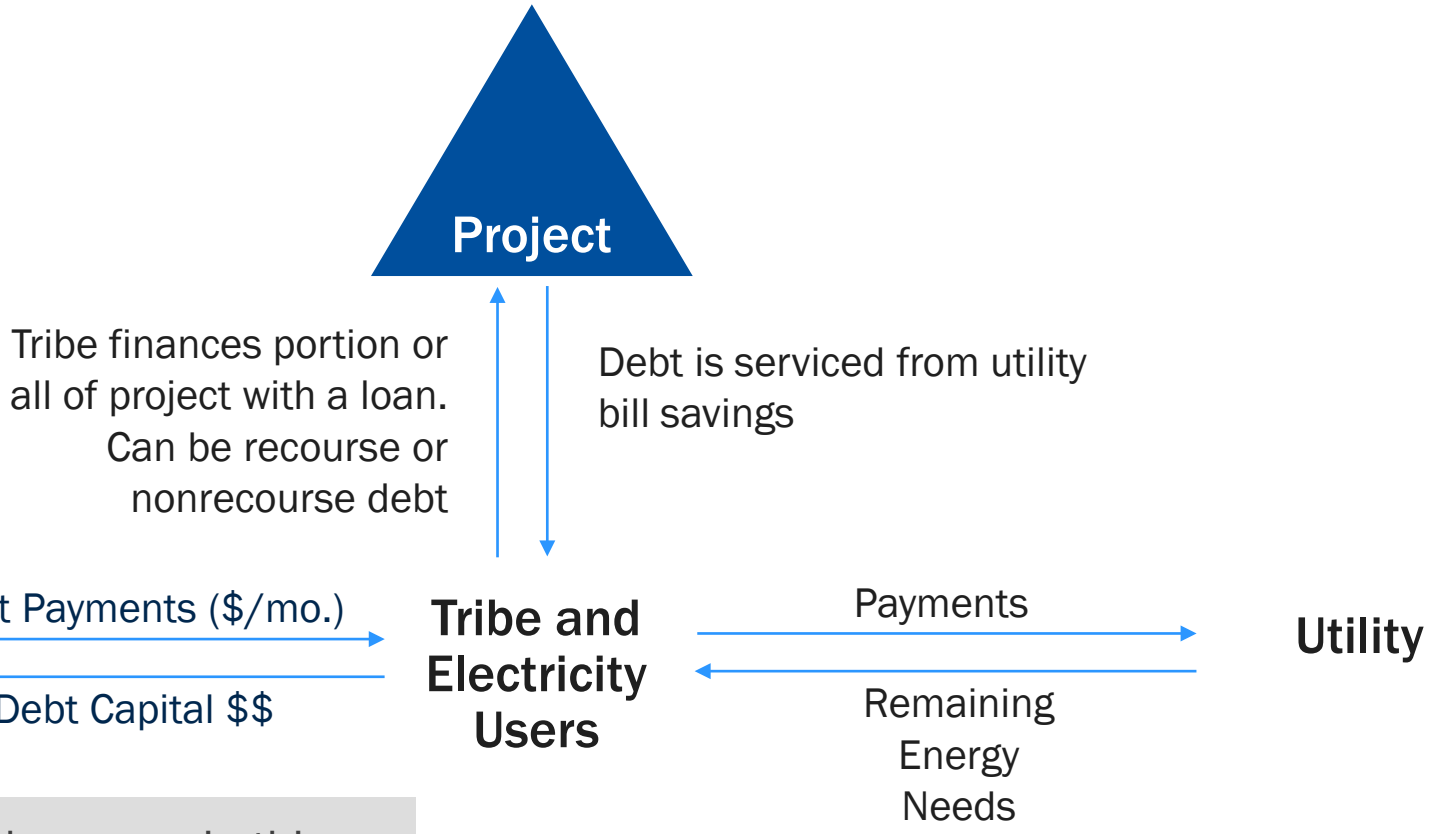
Paying for It: Mid Scale



100 kW @ $2.75/W
$275,000

- Tribal Funds
- Grants
- Incentives
- RECs
- Loans

Ownership with Debt



The tribe is still the owner in this structure and self-generates its electricity. Cash flows/savings go partially or entirely to debt service

Potential Sources of Debt/Loans

- Tribal Economic Development Bonds (TEDB)
- Commercial bank loans
  - Credit enhancements (e.g., loan guarantees)
- Other Tax Credit Bonds (Qualified Energy Conservation Bond [QECB]/Clean Renewable Energy Bond [CREB])
- Other

Hypothetical Solar Project: Loan Finance

- 100 kW
- Ground-mount installation serving an office complex, Southern California
- Offset SCE GS-2 Rate (assume average 17% demand charge offset annually)
- $275,000 capital cost, 100% debt financed
- 20-year loan, 6% interest rate
- No incentives, no REC sales

30-Year Analysis	
Metric	**Value**
Annual energy	16,741 kWh
Capacity factor	19.10%
LCOE	15.48 ¢/kWh
Electricity cost without system	$92,724
Electricity cost with system	$74,184
Net savings with system	$18,540
Payback period	14.2 years

Below average retail rate?

Acceptable timeframe?

Paying for It: Large Scale

1 MW @ $2.25/W
$2,250,000

- Tribal Funds
- Grants
- Incentives
- RECs
- Loans
- Tax Credits?

Primary Federal Tax Credits and Incentives

	Production Tax Credit (PTC)	Investment Tax Credit (ITC)	Accelerated Depreciation
Value	Tax credit of 2.3¢/kWh	Tax credit of 30% of project costs	Depreciation of eligible costs according to an annual schedule
Primary Technology	Wind	Solar	Can be taken with either PTC or ITC
Basis	Energy produced over 10-year period	Eligible project cost. Credit taken at the time the project is placed in service	Qualifying project cost. If used with ITC, basis is reduced by half of the credit (i.e., 85% of qualifying costs)
Expiration/ Phasedown	Currently available. Phasedown from 2016–2019	Currently available. Phasedown from 2020–2021	MACRS*: None Bonus: phasedown 2018–2019 Tribal Lands: Placed in service by December 2016

*Modified Accelerated Cost Recovery System

Issues w/ Tax Credits

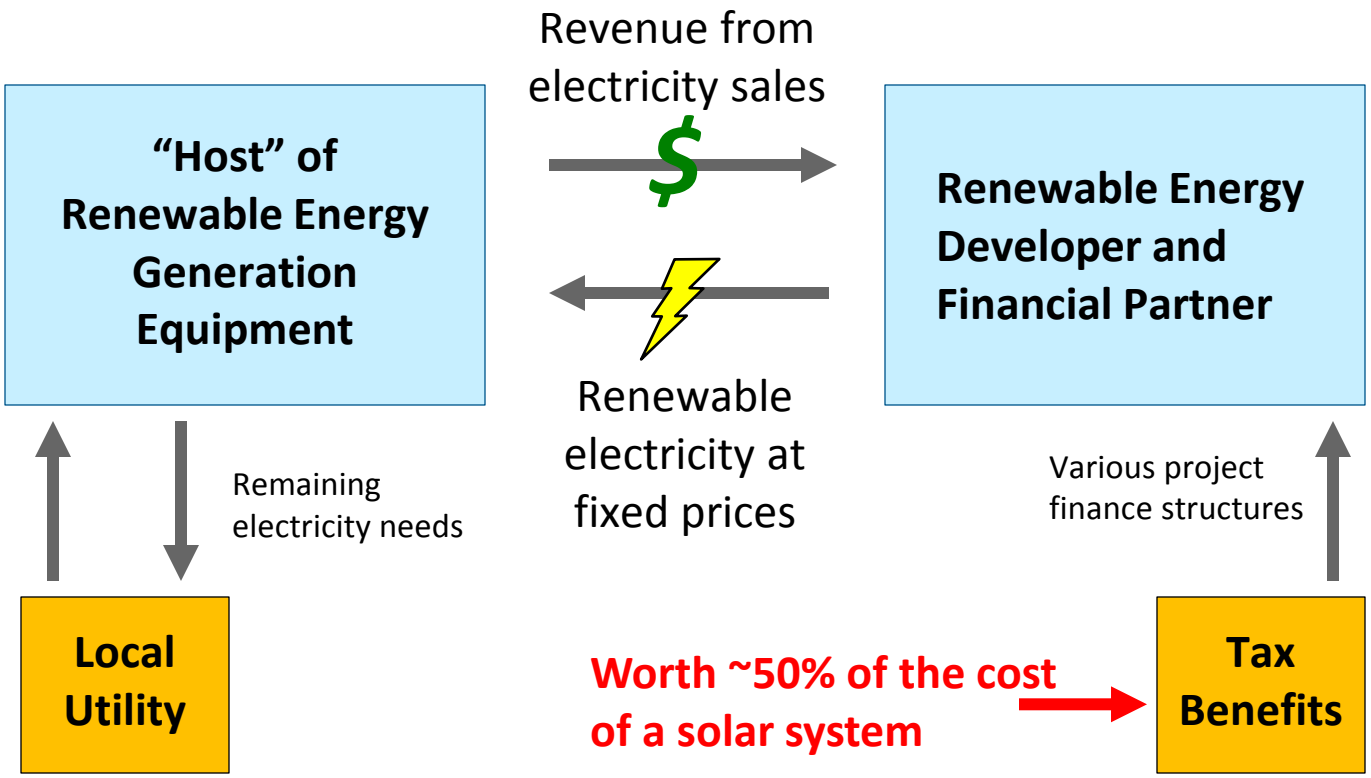
- Tribes cannot directly use tax benefits because they have no federal tax liability
  - Project still may be able to benefit (i.e., reduced cost of energy)
- "Tax exempt" entities cannot partner with, or be party to, a lease with a taxable entity on a project that receives tax benefits ("Pickle Rules")
  - IRS has stated that tribes are not "tax exempt" (though still explicitly prohibited from receiving accelerated depreciation benefits as per Section 168 of Internal Revenue Code)

Solutions

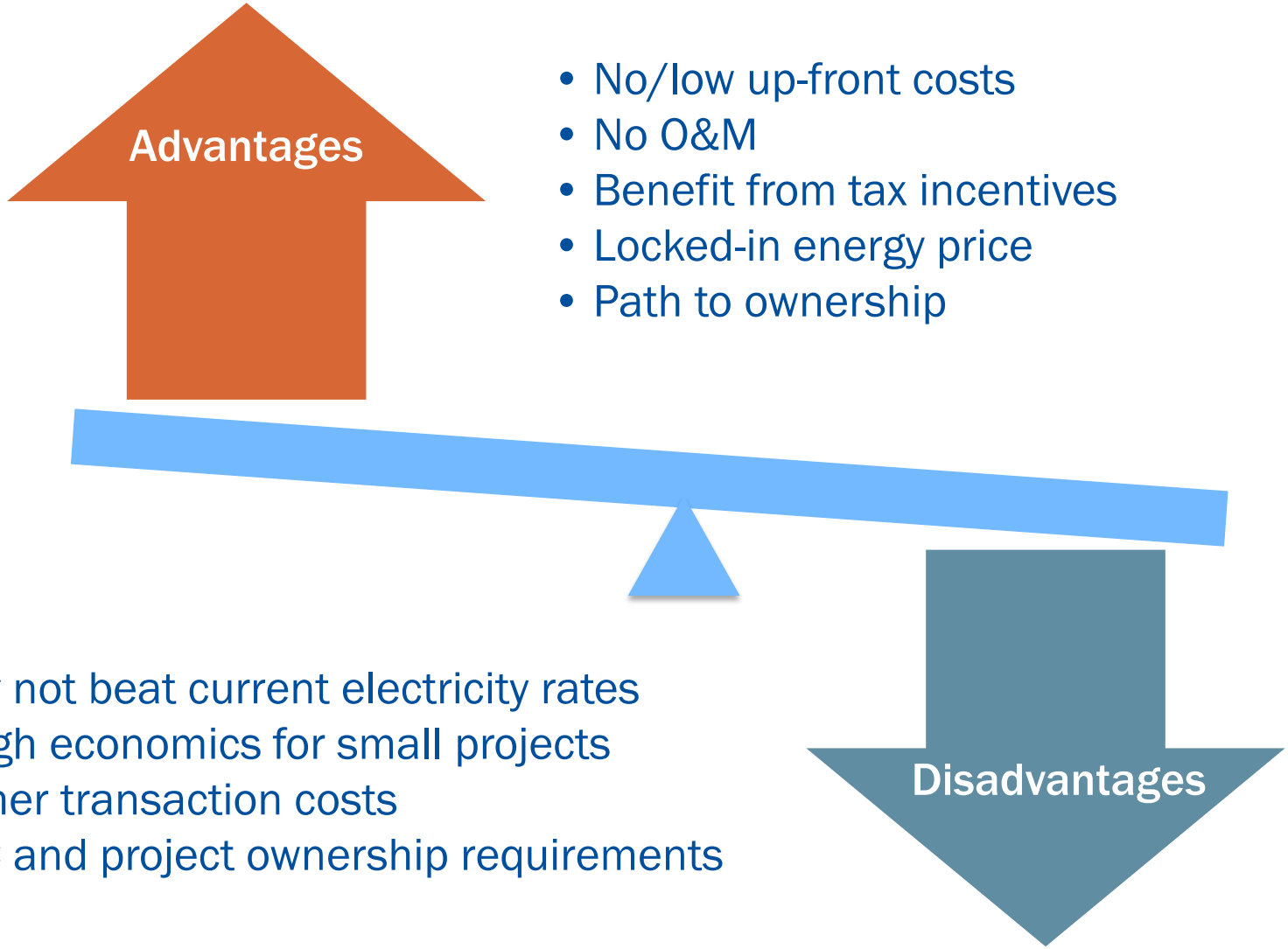
- Power purchase agreement (PPA)
- Use of “blocker corporations” (i.e., taxable entity such as an LLC) to partner or be party to a lease with a taxable entity
- 2013 Private Letter Ruling – tribes are not “tax-exempt” entities (more on that in a minute…)
- New market tax credits (NMTCs)

Third-Party PPA

The customer agrees to **host** the system and **purchase** the electricity



PPA Considerations to Weigh



- No/low up-front costs
- No O&M
- Benefit from tax incentives
- Locked-in energy price
- Path to ownership

- May not beat current electricity rates
- Tough economics for small projects
- Higher transaction costs
- REC and project ownership requirements

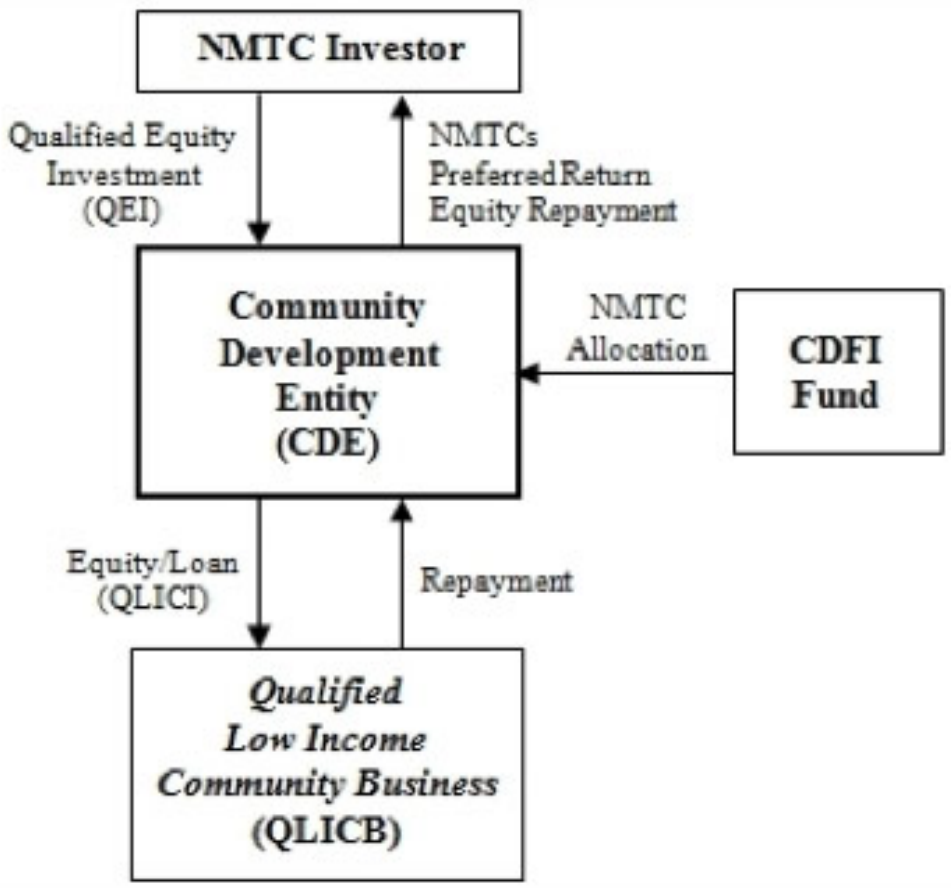
March 8, 2013 IRS Private Letter Ruling – 111532-11

"Based on your representation that the Renewable Energy Assets qualify as energy property under § 48 and our conclusion that an Indian tribal government is neither a governmental unit described in § 50(b)(4) nor an organization exempt from tax imposed by Chapter 1 for purposes of § 50, we conclude that Tribe may elect to pass investment credits associated with the Renewable Energy Assets to Lessee under § 50(d)(5)."

http://www.irs.gov/pub/irs-wd/1310001.pdf

(A private letter ruling, is a written statement issued to a *specific* taxpayer that interprets and applies tax laws to that taxpayer's represented set of facts. A private letter ruling may *not* be relied on as precedent by other taxpayers or by IRS personnel.)

New Market Tax Credits



- **39% tax break**
  - 5% in first 3 years
  - 6% in last 4 years
  - Net value: 20% due to financing complexity, number of parties
- **CDE can shop credits to investors**
  - Renewable energy project must be aligned with CDE mission
  - CDEs take time to establish
- **Examples**
  - 1-MW PV City of Denver's buildings[1]
  - 1.65-MW PV in Salt Lake City[2]

1. http://www.nrel.gov/docs/fy10osti/49056.pdf
2. http://nationaldevelopmentcouncil.org/blog/?p=2242

Hypothetical Solar Project: PPA vs. Tribe Ownership

- 1 MW
- Ground-mount installation in Southern California
- $2,250,000 capital cost
- No REC sales

PPA
Developer-owned, tax equity monetizes ITC and MACRS. Tribe can purchase project after tax benefits fully vest

Year 1 PPA Price: 15.17¢/kWh

vs.

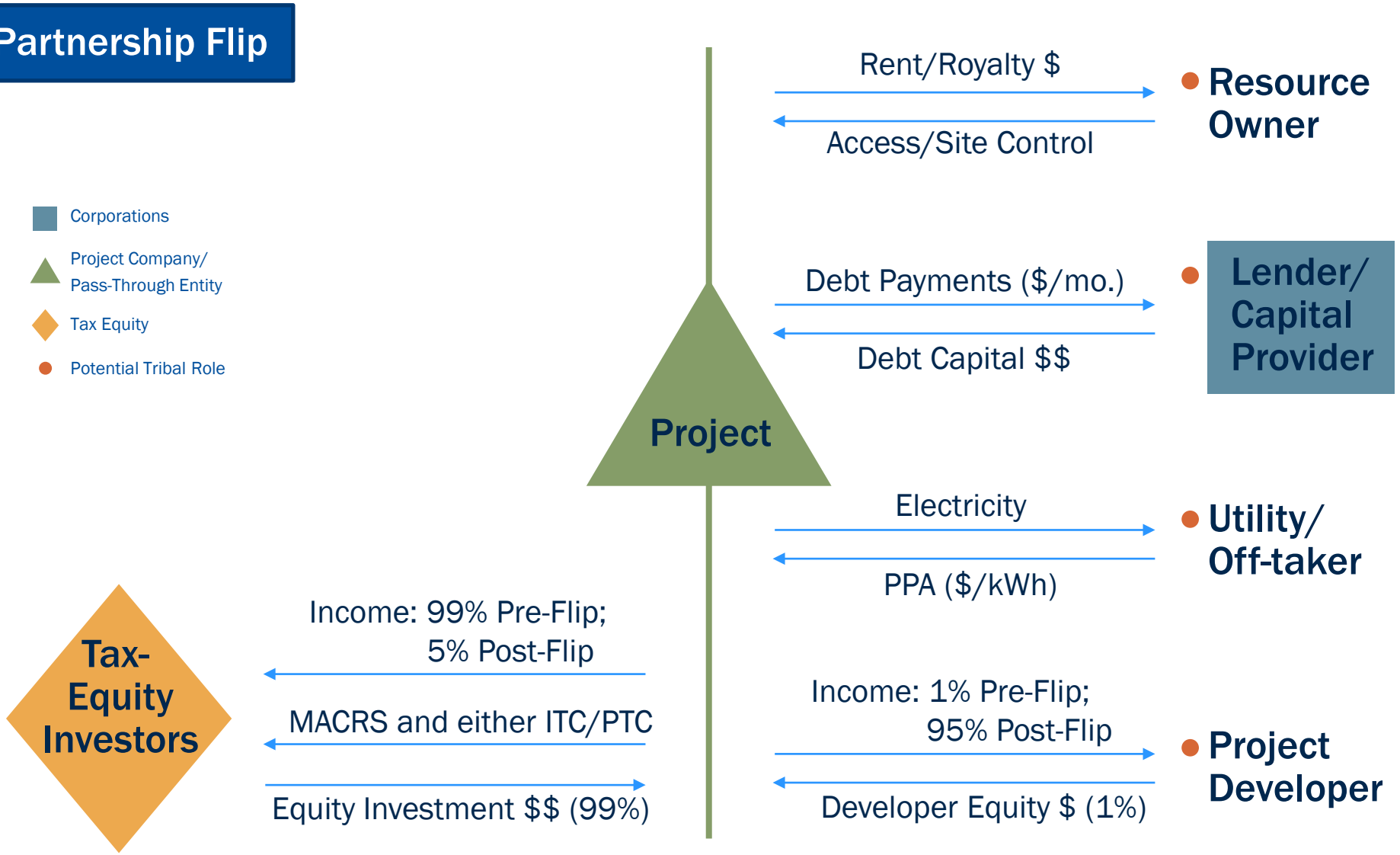
Tribe-Owned
100% debt-financed (20-year term, 6.5% interest), no tax benefits

LCOE: 16.04¢/kWh

Tribe-Owned
50% debt-financed (20 year term, 6.5% interest), 50% equity (6% internal rate of return) no tax benefits

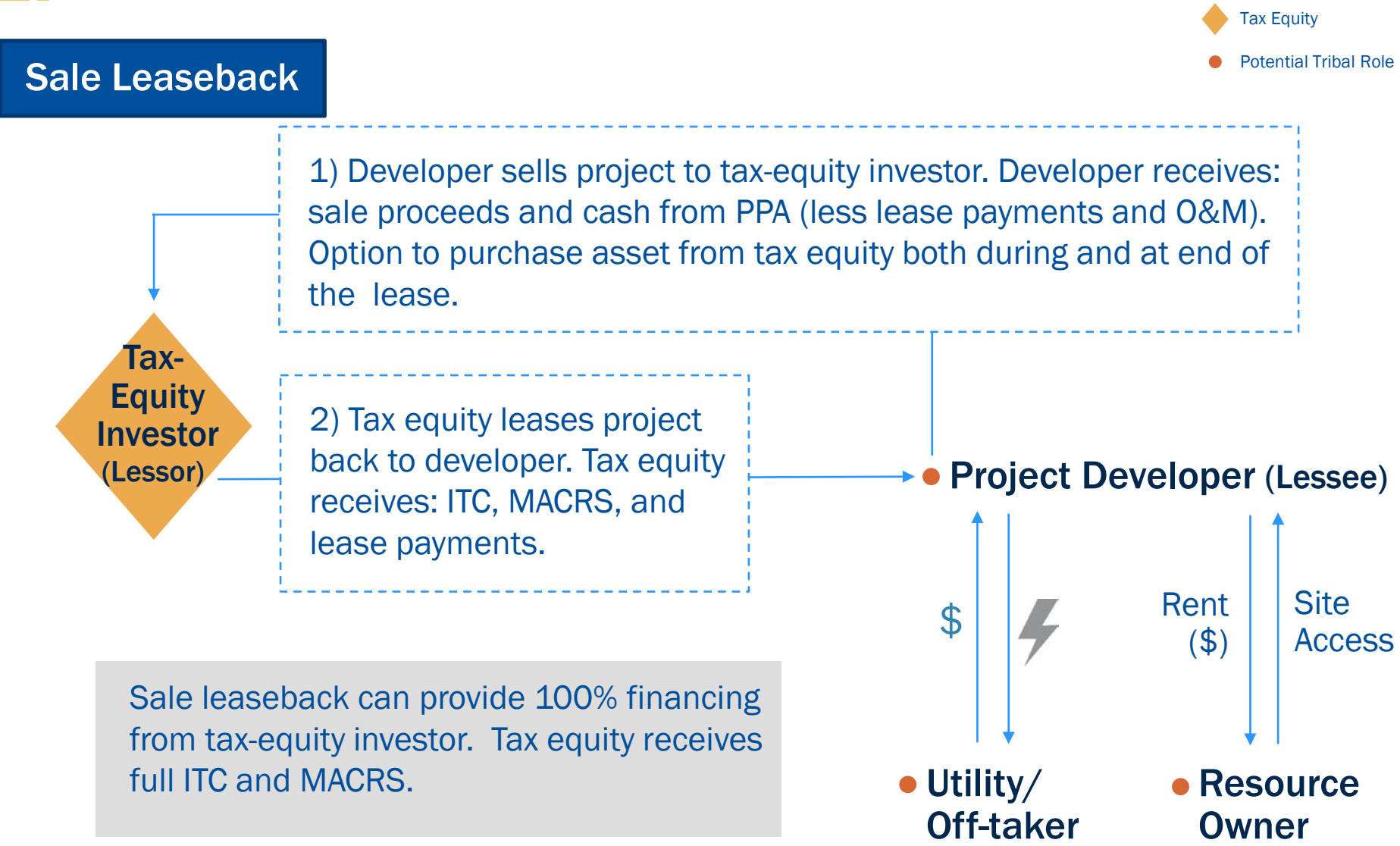
LCOE: 17.32¢/kWh

Partnership Flip



Source: Graphs adapted from "Renewable Energy Project Finance in the U.S.: An Overview and Midterm Outlook" (Mintz Levin Green Paper, 2010)

Sale Leaseback Structure



On-Request Technical Assistance

Apply for up to 40 hours of in-depth technical assistance to:

- Address a specific challenge
- Fulfill a need that is essential to a current project's successful implementation

Two categories of technical assistance:

1. **Strategic Energy Planning**—an on-site workshop that walks tribal leaders and staff through a nine-step planning process
2. **Project Development Support**—Expert guidance and analysis that helps address specific project barriers. Examples include:
   - Third-party independent reviews of transmission studies, financing structures, lease agreements, project reports
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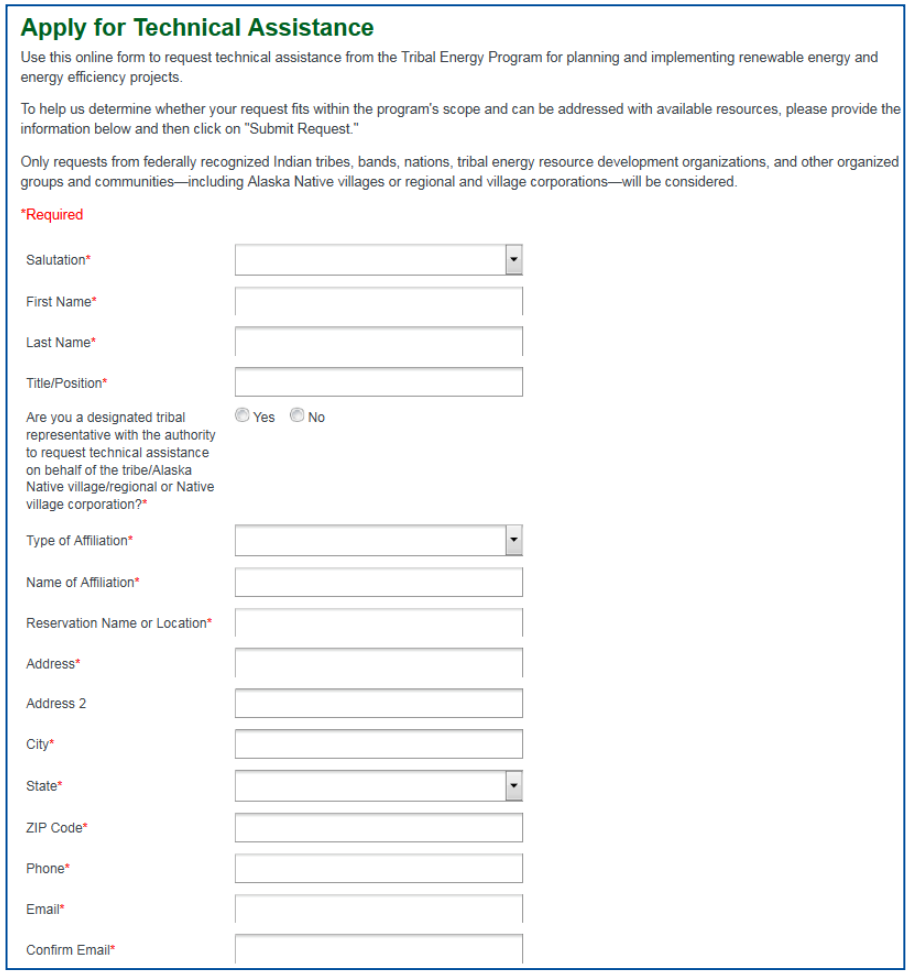
   - Economic evaluations
   - System design reviews



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Name of Affiliation*

Reservation Name or Location*

Address*

Address 2

City*

State*

ZIP Code*

Phone*

Email*

Confirm Email*

Learn more and apply online:
energy.gov/indianenergy/technical-assistance


PROCUREMENT

Procurement Process for Facility- and Community-Scale Projects

Potential Project Partners to Procure

- Consider 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

Request for Proposals (RFP) Process Outline

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
  - PPA
  - ESPCs
  - Other finance structure
- 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 cont.

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 Technical Specifications

Define Scope of Work

- What is the project scale
- Type of renewable energy technology
- Site information:
  - Location
  - Interconnection requirements as known
  - Applicable codes and standards
  - Roof structure, soils, other (as applicable and available)
  - Site prep: fencing, roads, grading limitations, etc.
  - Installation requirements: min/max heights of equipment, vegetation mitigation, design standards for structural/electrical
- Equipment minimum standards and warranties
- Expected minimum performance (recommended) or capacity
- Strategy for training maintenance and operations staff
- Commissioning plan

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

RFP Award Contract

Choose One of These Four Typical Approaches:

1. Award based on proposal: awarded solely on merits of proposal
2. Award with discussion: awarded on proposal but contingent on clarifying discussions
3. Award with discussion and negotiation: awarded on proposal but contingent on further negotiation
4. Award with best proposal:
   - Best proposals are short-listed
   - Short-listed proposals asked for best final proposal revision
   - Award based on final proposal revision

Summary: Project Procurement and Implementation

- Procurement strategy will vary depending on the project scale and financing solution selected
- Increasingly more complex for larger projects
- Post procurement issues are critical as these are very long term assets and relationships
- Save time and money by considering GSA pricing

Project Risk: Community- and Facility-Scale

Phases	Risks	Risk Assessment Post Step 3	✓
Development	• Poor or no renewable energy resource assessment	Low; site picked	✓
	• Not identifying all possible costs	Low; detailed model	✓
	• Incorrect estimation of long-term "community" energy use (energy efficiency first)	Low; final projection	✓
	• Utility rules and ability to offset use with centralized production	Reduced	✓
Site	• Structural (e.g. rooftop solar, wind loading, soil conditions)	Assumed low; assessed	✓
	• Installation safety (e.g., wind tower, hazard for adjacent sites)	EPC assumes risk	✓
	• Site control for safety/security purposes	Low; site secure	✓
Permitting	• Tribe-adopted codes and permitting requirements	Low; complete	✓
	• Utility interconnection requirements	Low; complete	✓
Finance	• Capital availability	Low; PPA complete	✓
	• Incentive availability risk	Low; risk on developer	✓
Construction/ Completion	• EPC difficulties	Low; allocate to EPC or developer	
	• Cost overruns		
	• Schedule		
Operating	• Output shortfall from expected	Assumed low, mitigable or allocatable	
	• Technology O&M		

*NOTE: Underlining signifies that the risk assessment outcome changes during the step at hand.

Sources: Adapted from Holland & Hart, RE Project Development & Finance & Infocast, Advanced RE Project Finance & Analysis

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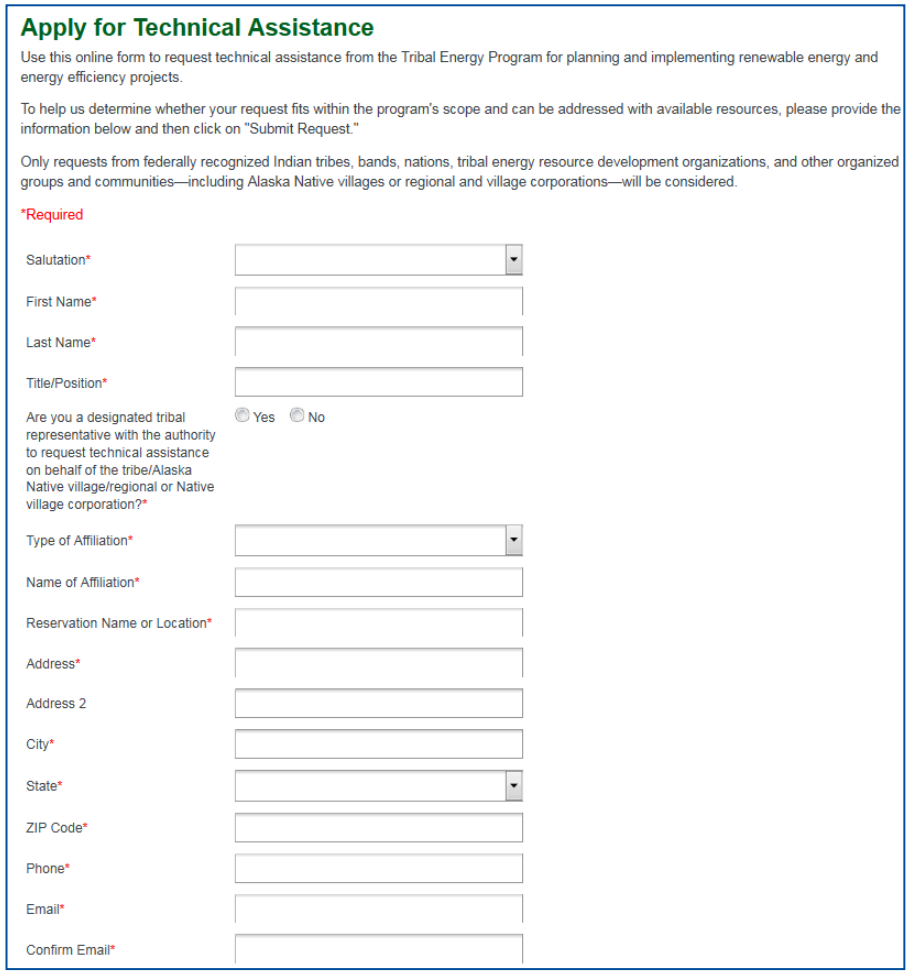

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Email*

Confirm Email*

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Tribal Case in Point: Refine the Project

Campo Band of the Kumeyaay Nation, CA

- **Challenges**
  - Requested technical assistance in reviewing developer-generated plans for a wind farm on its reservation
  - With an existing wind farm already on-site and some experience with wind development, Campo was interested in potential ownership options in the proposed new project and sought assistance with evaluating them
- **DOE Technical Assistance**
  - Validated data collected through anemometer testing
  - Provided tribal leadership with background information on partnerships and ownership options
  - Briefed tribal leaders and staff on various project ownership configurations

"The Tribe was pleased with the sale-leaseback ownership option and determined that it was a more realistic path to ownership for them."

—Colton Heaps, NREL

Activity

- RFP Ranking

Types of GSA Support

- Global Supply
- Multiple Award Schedule Contracts
- Airline CityPairs Program
- Travel Program
- Excess Personal Property*
- Vehicle Leasing* and Acquisition
- SmartPay2 Purchase Card Program

*Not available to tribes or Tribal Designated Housing Entities using Native American Housing Assistance and Self Determination Act of 1996 authority/funding

GSA Multiple Award Schedules

- GSA establishes long-term, government-wide contracts with commercial firms to provide access to millions of commercial products and services at volume-discount pricing
- Why use them?
  - Competition requirements have been met
  - Indian preference still applies
  - Best-value determination required
- Compliant with environmental requirements
- Discounts negotiated for you