WAPA Tribal Energy Series
Pulling it All Together

Amy Hollander
Strategic Energy Planning
The 5 Step Planning Process
LCOE
Finance for Tribal Energy Projects

DOE Office of Indian Energy Policy and Programs
DOE Office of Energy Efficiency and Renewable Energy
Tribal Energy Program
Western Area Power Administration
Strategic Energy Planning & The 5-Step Project Development & Finance Process

DOE Office of Indian Energy Policy and Programs
DOE Office of Energy Efficiency and Renewable Energy Tribal Energy Program
Western Area Power Administration
Strategic Energy Planning

• Definition
• Stakeholder Inclusivity
• Leadership Team
• The Strategic Plan
  – Convene Stakeholders
  – Form Leadership Team
  – Develop Energy Vision
  – Assess Energy Needs and Resources
  – Develop Specific Goals
  – Prioritize Projects and Programs
  – Identify Financing Options
  – Compile Energy Plan
  – Measurement and Verification (M&V) and Plan Alterations
Strategic Energy Planning: First Steps

Stakeholders

- Tribal Members
- Tribal Council
- Tribal Government
- Tribal Utilities
- Tribal Enterprise Leaders
- Large Energy Users
- Local Utilities

Key Success Component:
Identify and select an energy “champion” to shepherd the process
Leadership Team

Not just people with the “right” idea, but those committed to the long-term task with personal and political influence

✔️ Include

- Individuals with authority to direct resources
- Individuals with a passion for the “destination”
- Individuals with influence in the community and administrative abilities to keep the project alive
- Individuals with the technical ability
- Individuals who can “tell the story”

❌ Avoid

- Exclusively political appointees
- Exclusively technical staff
- Exclusively implementers
Develop an Energy Vision

Common objectives, such as:

- Increase and ensure energy reliability
- Minimize environmental impacts
- Diversify energy supply
- Use local, renewable resources
- Strengthen, support economic development
- Build workforce/jobs
- Ensure energy affordability
- Generate revenue for Tribe
- Energy security/self-sufficiency
- Off-grid electrification
- Save money (offset energy costs)
- Keep money in Tribe
- Stabilize energy costs for Tribe and tribal members
- Deliver energy to rural areas
Strategic Energy Planning: Priorities & Decisions

- Assess Energy Needs
- Develop Specific Goals
- Prioritize Projects & Programs
- Identify Financing Options
- Examine Levelized Cost of Energy & Total Resource Cost

Analyse Energy Usage Data and Available Renewable Resources

Reduce Energy Costs by ___% in 5 years

\( $$ \)
Strategic Energy Planning: Energy Plan

1. Compile Energy Plan
2. M&V and Plan Alterations

DOE-IE Foundational Strategic Energy Planning
Energy Plan: Components

Include

• Vision
• Objectives
• Goals
• Baseline
• Barriers

Include

• Program Description
  – Demand side
  – Generation
• Recommendations & data
• Adoption by Tribal Council

Photo by NREL #19794
Energy Plan: M&V and Plan Alterations

- M&V
- Evaluate
- Fine tune
The Five Step Project Development and Financing Process

- Project Steps Defined using a wheel graphic
  - Potential
  - Options
  - Refinement
  - Implementation
  - Operations & Management

- Energy Plan and Council Check-in at every step
### Summary of Action Steps

<table>
<thead>
<tr>
<th>Step</th>
<th>Description</th>
</tr>
</thead>
<tbody>
<tr>
<td>1</td>
<td><strong>Potential</strong>&lt;br&gt;Data Collection and Opportunity Assessment&lt;br&gt;Step 1: Gather all relevant data in order to make first pass at potential project, understand Tribal role options</td>
</tr>
<tr>
<td>2</td>
<td><strong>Options</strong>&lt;br&gt;Options and Strategies&lt;br&gt;Step 2: Estimate value to Tribe, consider ownership approach, begin to identify off-takers, partners, vendors, begin planning permitting and site use</td>
</tr>
<tr>
<td>3</td>
<td><strong>Refinement</strong>&lt;br&gt;Planning and Development&lt;br&gt;Step 3: Finalize economic assumptions and tribal roles, finalize permitting, interconnection, transmission and off-take agreements, and determine financial partnerships, ownership structure</td>
</tr>
<tr>
<td>4</td>
<td><strong>Implementation</strong>&lt;br&gt;Financing and Construction&lt;br&gt;Step 4: Finalize agreements (including vendor contracting); financial close and construction; project commissioning, begin operation&lt;br&gt;Celebrate!</td>
</tr>
<tr>
<td>5</td>
<td><strong>Operations &amp; Maintenance</strong>&lt;br&gt;Maintenance plan implementation (conduct or ensure ongoing O&amp;M, R&amp;R)</td>
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</tbody>
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**DOE-IE Foundational Strategic Energy Planning**

**Office of Indian Energy**
Project Finance

Direct Ownership
Power Purchase Agreements
ESPCs
New Market Tax Credits
Levelized Cost of Energy (LCOE)

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

• Measures lifetime costs divided by energy production, captured in $/MWh or ¢/kWh

• Calculates present value of the total cost of BUILDING and 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
Levelized Cost Of Energy (LCOE)

Lifetime or Levelized Costs of Renewables

Levelized cost of energy $\$/kWh

Technology

- Wind, Onshore
- Wind, Offshore
- Solar Photovoltaic
- Concentrating Solar Power
- Geothermal
- Hydropower
- Biopower

Value:

- Wind, Onshore: $0.10
- Wind, Offshore: $0.15
- Solar Photovoltaic: $0.50
- Concentrating Solar Power: $0.30
- Geothermal: $0.15
- Hydropower: $0.05
- Biopower: $0.10
<table>
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<tr>
<th>Financing Type</th>
<th>Benefits</th>
<th>Challenges</th>
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<td>• Tribe funds it</td>
<td>• No Tax Incentives</td>
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<td>Must have capital</td>
<td>• Initial investment in the project is recouped through lower electricity bills</td>
<td>• Must take on O&amp;M Responsibilities</td>
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<tr>
<td>Power Purchase Agreements (PPA)</td>
<td>• No Capital or O&amp;M</td>
<td>• Tough economics for small projects but no lower electricity rates.</td>
</tr>
<tr>
<td>Tribe is the host and buys energy from the system built by a tax investor.</td>
<td>• Will Benefit from Tax Incentives</td>
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</tr>
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<td>• Locked in Energy Price</td>
<td></td>
</tr>
<tr>
<td></td>
<td>• Path to Ownership</td>
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<tr>
<td>Energy Savings Performance Contracting (ESPCs)</td>
<td>• No up front Costs</td>
<td>• Tribe pays their energy savings to ESCO financial partner.</td>
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<td>For Energy Efficiency Upgrades—a good first step.</td>
<td>• ESCO pays for energy upgrades</td>
<td>• Mainly used for energy efficiency.</td>
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<td>CDEs take time and planning to set up.</td>
<td>• High return on tax breaks (Net 20%) = affordable renewables.</td>
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## Direct Ownership

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<td>• Maximum reduction in electricity bills</td>
<td>• Need the resources to pay for the project</td>
</tr>
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<td>• Lower finance costs (or none depending on source)</td>
<td>• Don’t benefit from available tax incentives given tax-exempt status</td>
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<tr>
<td>• Full control over a project: design, operations, and risks</td>
<td>• Responsibilities of ownership (operations &amp; maintenance)</td>
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<tr>
<td>• Own renewable energy credits (RECs) and can choose to retain or monetize</td>
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<td>• Might be only option for small projects</td>
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The Tribe is the host in this structure and agrees to buy electricity generated by the renewable energy system.

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**Third Party Power Purchase Agreement (PPA)**

- **Utility**
  - $ Energy

- **Tribe:** Host and Purchase

- **Project**
  - Fixed price Electricity (PPA)
  - Site Access, $ Purchase Output

- **Lender**
  - Lends $ to the Project

- **Developer**
  - Cash flow
  - Equity Investment

- **Tax-Equity Investor**
  - Tax benefits
  - Equity Investment

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Corporations
Project Company/Pass-Through Entity
Tax Equity
Tribal Role

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PPA Considerations to Weigh

Disadvantages
- May not be lower than current electricity rates
- Tough economics for small projects
- Higher transaction costs
- Renewable energy credit (REC) and project ownership requirements

Advantages
- No/low up-front costs
- No O&M
- Benefit from tax incentives
- Locked-in energy price
- Path to ownership
Energy Savings Performance Contracting (ESPCs)

An ESPC is a **no up-front cost** contracting mechanism between a site customer and an energy service company (ESCO). Energy conservation measures and on-site generation are financed and implemented by an ESCO, which is **repaid through energy savings**. This would be done as a PPA, in conjunction with energy efficiency, to bring costs down.

Over 90 DOE-Qualified ESCOs, including:

- Ameresco
- McKinstry
- Chevron
- Siemens
- Honeywell
- Tetra Tech
- Johnson Controls
- Trane

For full DOE Listing: [http://www1.eere.energy.gov/femp/financing/espocs_qualifiedescos.html](http://www1.eere.energy.gov/femp/financing/espocs_qualifiedescos.html)
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 market credits to investors
  – Renewable energy project must be aligned with CDE mission
  – CDEs take time to establish

• Renewable examples
  – 1 MW PV City of Denver's buildings\(^1\)
  – 1.65 MW PV in Salt Lake City\(^2\)

Sources:
\(^1\) [http://www.nrel.gov/docs/fy10osti/49056.pdf](http://www.nrel.gov/docs/fy10osti/49056.pdf)
\(^2\) [http://nationaldevelopmentcouncil.org/blog/?p=2242](http://nationaldevelopmentcouncil.org/blog/?p=2242)
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## Useful Resources

### Resource
- U.S. Department of Energy Office of Indian Energy Resource Library
  [http://energy.gov/indianenergy/resources/energy-resource-library](http://energy.gov/indianenergy/resources/energy-resource-library)
- Native Capital Investment, Inc.
  [http://www.nativecapital.com/community.html](http://www.nativecapital.com/community.html)
- Assessing Energy Resources:

### Technology

### Policy