DOE OFFICE OF INDIAN ENERGY

The Five-Step Process for Tribal Energy Project Development

Liz Doris, State, Local, and Tribal Laboratory Program Manager
National Renewable Energy Laboratory



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

Why Complete a Renewable Energy Project?

Economic

- Jobs
- Income
- Cost savings
- Cost stabilization
- Industry exposure
- Economic sovereignty

Social

- Energy reliability (diversification)
- Energy independence
- Quality of life
- Community and stakeholder participation
- Educational Benefits

Environment

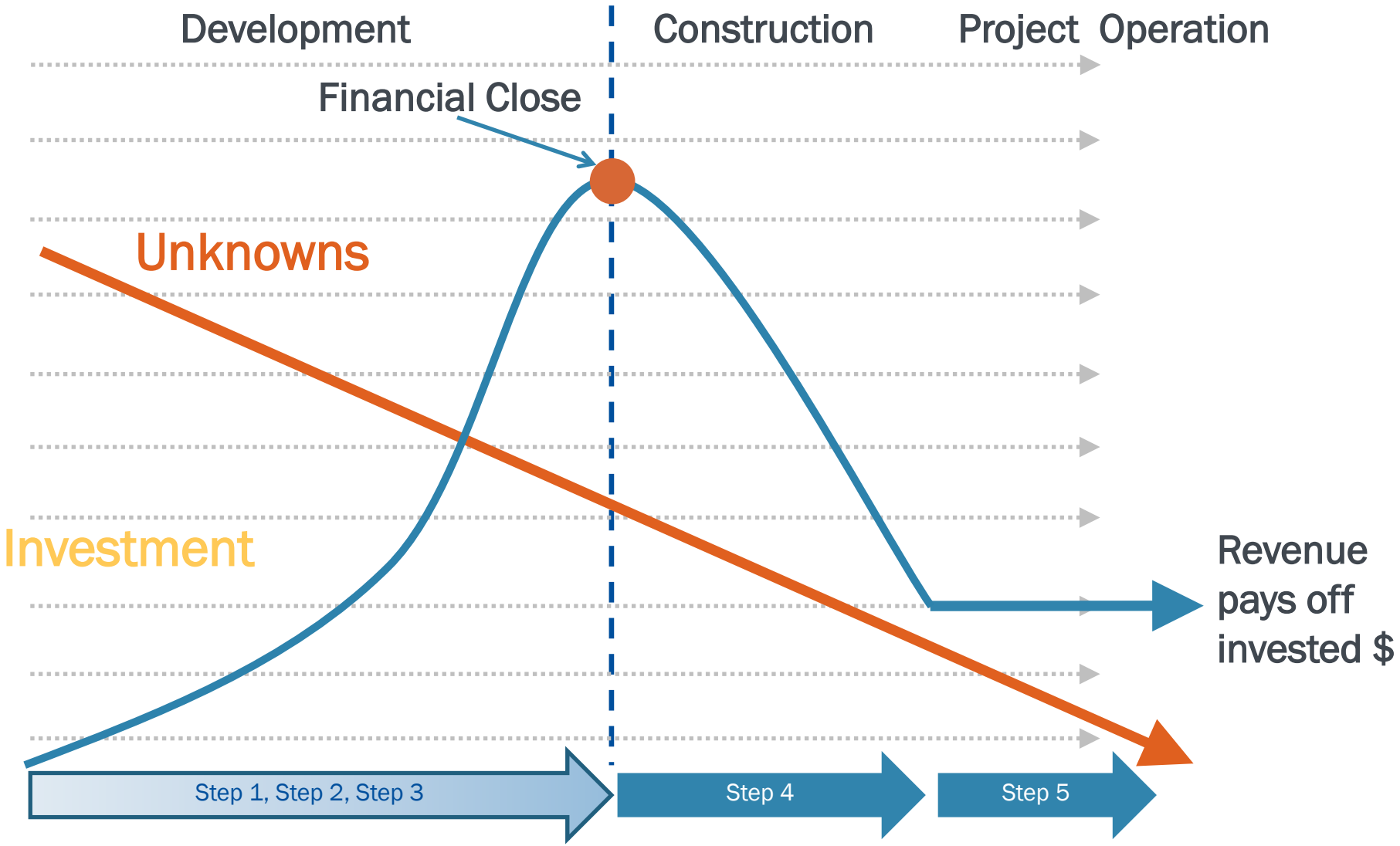
- Air quality
- Avoided Emissions
- Climate change
  - Mitigation
  - Adaptation
  - Resiliency
- Demonstrated Environmental Leadership

Benefits vary based on the type and scale of projects

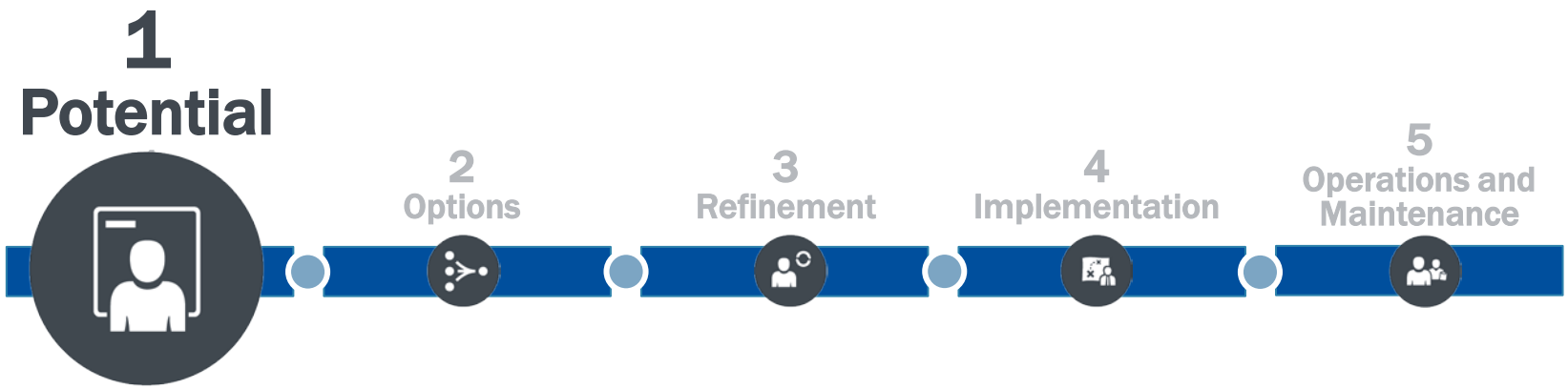
Project Development Process: What Is It?

- Framework based on **experience**
- Focuses on key **decision points**
- Shows that project development is **iterative**
- Emphasizes that delaying or deciding against a project that does not meet current **goals** is a viable outcome and option

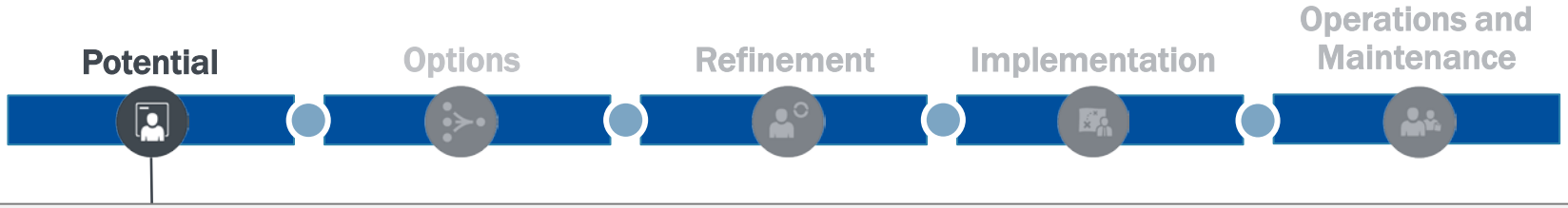
Project Uncertainty/Capital at Risk




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


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

Step 1: Site, Scale, Resource, and Community Market Potential



Purpose: Determine whether basic elements for a successful project are in place

Tasks:

1. Identify possible **sites** for project locations
2. Determine the **energy load/demand** for these sites using past electric bills for these facilities
3. Confirm renewable energy **resource**
4. Review tribal facility electric cost data, regulations, and transmission and interconnection requirements
5. Evaluate community market potential for renewable sales. **Your community is the marketplace/energy –user.**
6. Assemble or communicate with the right team—those in positions or with knowledge to facilitate, approve, and champion the project

Terminology: Project Scale

Facility: single-building system

Primary goals: offset building energy use, costs

Development timeline: 1 month to 1 year

NC Solar Center, NREL 09373

Community: multiple buildings/campus

Primary goals: Offset community energy costs, promote energy self-sufficiency

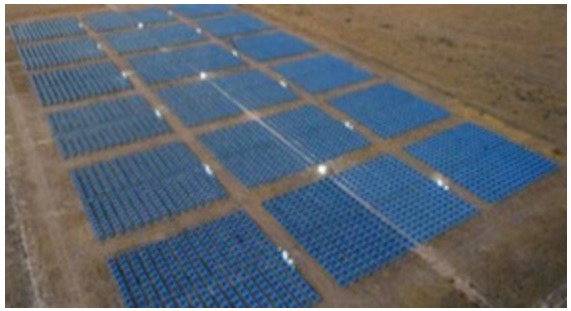
Development timeline: 6 months to 2 years

Orange County Convention Center, NREL 18077

Commercial: stand-alone project

Primary goals: sale *of power generation, financial benefits*

Development timeline: 3 to 5 years



Tucson Electric Power, NREL 13327

Determining Project Scale

Facility-Scale

- Available, tribe-controlled, appropriate location and ownership options
- Lower capital investment and overall risk
- Opportunity to gain experience with renewables before doing a larger-scale project
- Increased self-sufficiency; offset utility electricity costs
- Cost certainty
- Visual impact
- Reduced environmental impact
- Diversification of energy supply with local, renewable sources

Community-Scale

- Available, tribe-controlled, appropriate location and ownership
- Greater impact on community (good or bad)
- Offset community electricity costs (primary use is on-site)
- Minimized environmental impact
- Diversification of energy supply with local, renewable sources
- Reduced energy off-taker complexities
- Smaller capital requirements
- Job development (construction and maintenance)
- Self-sufficiency

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.

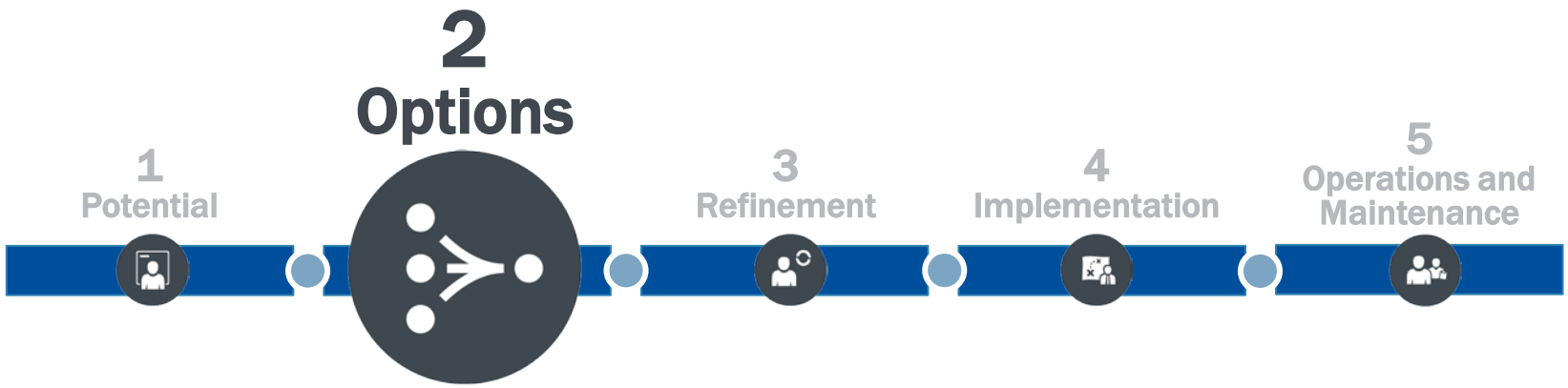
Using LCOE

Calculating and comparing LCOE can:

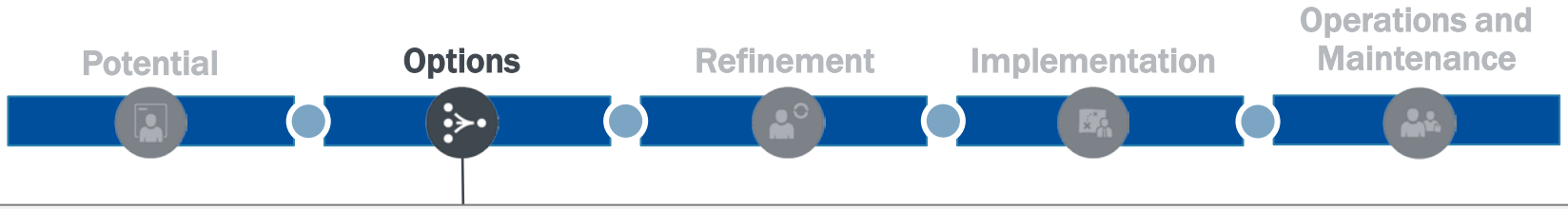
- Measure value across the longer term, showing probable life-cycle costs
- Highlight opportunities for tribes to develop different scales of projects (facility, community, or commercial)
- Inform decisions to pursue projects on an economic basis, compared to utility rates

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


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


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

Step 2: Roles, Business Structures, & Regulatory Considerations



Purpose: Determine ownership structure and permitting considerations if any.
(Note: It is likely that internal tribal permitting is required if developed on tribal lands; however, state and federal permitting may be required if the tribe is dealing with fee or trust land outside the tribal land holdings.)

Tasks:

1. Understand tribal role(s) and risk allocations/business structure
2. Identify permitting needs and site use considerations
3. Identify interconnection rules and net-metering options with the local utility

Outputs:

1. Clarify tribal roles
2. Decide on business structure
3. Understand the permit needs and process
4. Understand interconnection and net-metering options

Project Roles and Definitions

Title	Role
Project Company	Legal entity that owns the project, also called special purpose entity
Resource/Land Owner	Legal and/or beneficial owner of land and natural resources
Sponsor/Developer	Organizes all of the other parties and typically controls project development and makes an equity investment in the company or other entity that owns the project
EPC Contractor	Construction contractor provides design, engineering, and construction of the project
Operator	Provides the day-to-day O&M of the project
Feedstock Supplier	Provides the supply of feedstock (i.e., energy, raw materials) to the project (e.g., for a power plant, the feedstock supplier will supply fuel)
Product Off-taker	Generally enters into a long-term agreement with the project company for the purchase of all the energy
Lender	A single financial institution or a group of financial institutions that provides a loan to the project company to develop and construct the project and that takes a security interest in all of the project assets
Tribal Host	Primary sovereign of project site

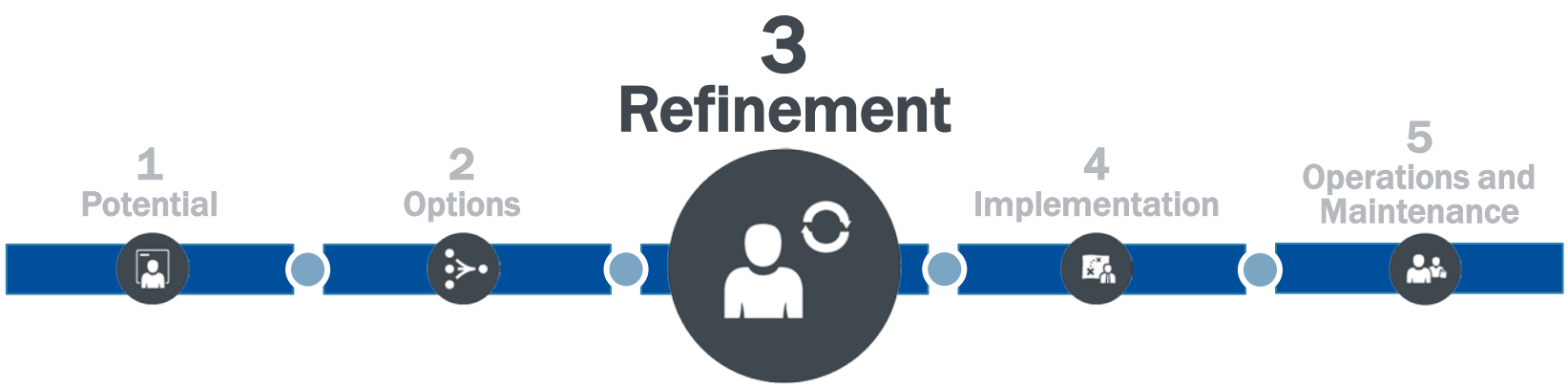
Tribal Role Options - Descriptions

Role	Opportunity	Constraints	Comments
Resource/ Land Owner	Land rent/royalty, taxes. Low risk, known reward, consistent income.	• Limited project control. Must provide site access.	Limited upside potential, limited risk
Off-taker/ Energy User	Tribe purchases or uses all power on-site. Could include an "on-site" provider; security.	• Limited investment, economic development for on-site projects	Must have demand to use power; still requires utility interconnection agreement (if on the grid). Med. risk.
Project Operator/ O&M	Control and self-determination of project; potential for profits (and losses) is minimal	• Investors require experience • Only consider as a new business (multiple projects in a portfolio) • Tribes investing money may not want this high risk/return investment	• High risk, complex • Tribes may be best served by outsourcing • A project pipeline/portfolio mitigates some risks
Lender/ Debt Provider	Participate financially in project (e.g., cash or New Market Tax Credit (NMTC)) with lower risk	• Requires ready capital • May be cost-prohibitive to document and manage a single debt transaction (multiple more cost-effective)	• Med. risk, more complex • Requires lending knowledge • Option for Tribes with limited lands, lots of $
Equity Investor/ Gen. Owner	Provide cash or NMTC for project development. Less capital than commercial-scale.	• Higher risk than debt lending. Requires ready capital, or unique source of capital that provides market advantage (like NMTC).	• High risk, more complex • Competes with other investments • Option for Tribes with limited lands, lots of $
Project Developer	Self-determination of project; potential for profits (and losses) is highest. Tribes with $ don't need investors.	• Investors require experience • Only consider as a new business (do multiple projects for diverse portfolio) • Tribes investing money may not want this high risk/return investment	• High risk, complex • Tribes may be best served by outsourcing • A project pipeline/portfolio mitigates some risks

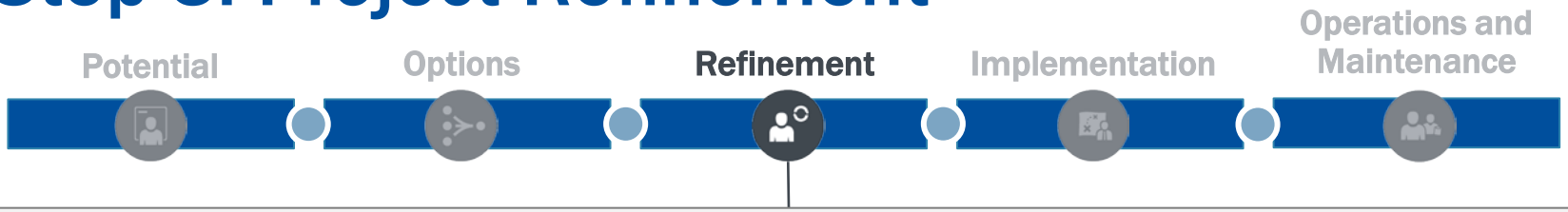
Key Concept: Tax Equity Partnerships

- Tribe can benefit from tax equity incentives without being taxable
- Tax equity can lower capital costs for a qualifying project significantly (40%-50%)
- Tribe benefits by either reduced electricity costs from the renewable project, or offering a more competitive price for energy or renewable energy attributes (commonly referred to as “RECs”) from the project
- Tribes can partner with third-party tax investors and/or developers to gain this advantage


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 and Maintenance

Step 3: Project Refinement



Purpose: Validate decisions and finalize project structure

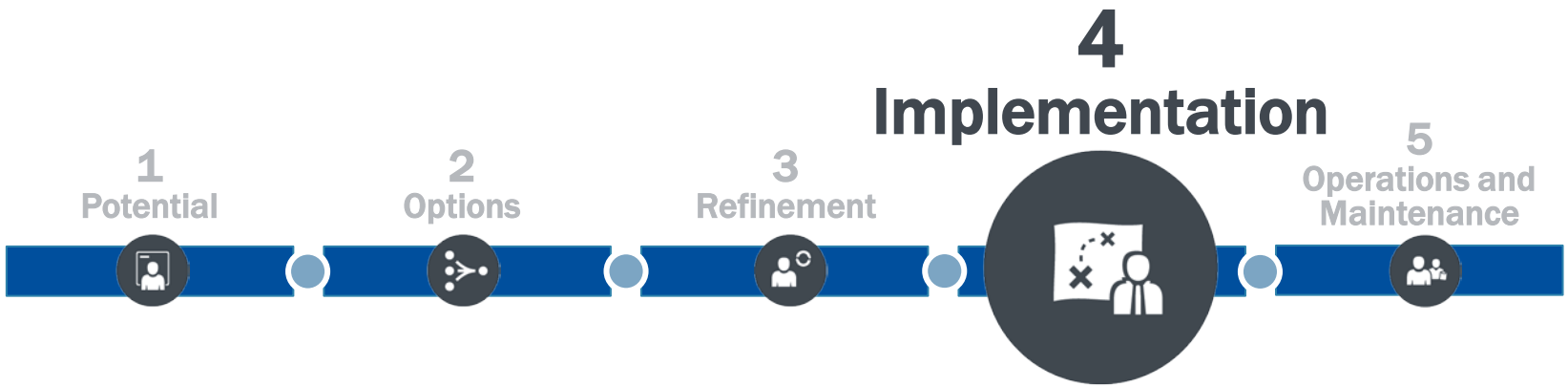
Tasks:

1. Finalize ownership structure and project team identification
2. Finalize permitting, including environmental reviews, net metering, and interconnection
3. Finalize technology, financing, and development costs

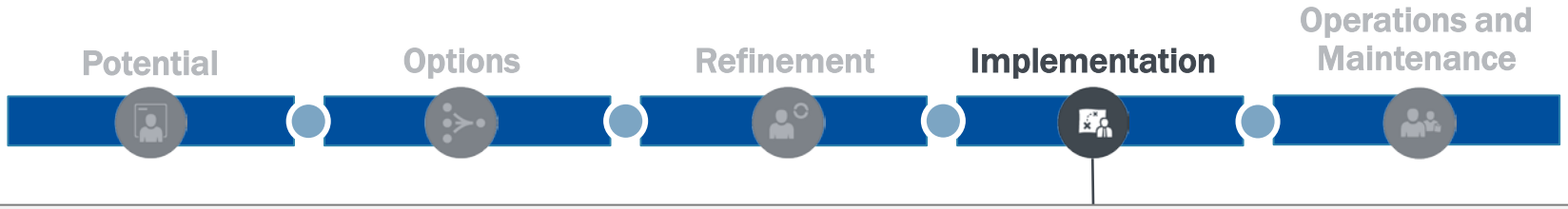
Outputs:

1. Proposed financing/commitments and organization structure
2. Detailed economic models
3. Vendors selected
4. Completed environmental reviews and finalized permits
5. Net-metering and interconnection agreement
6. Transmission finalized, if necessary


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


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

Step 4: Implementation



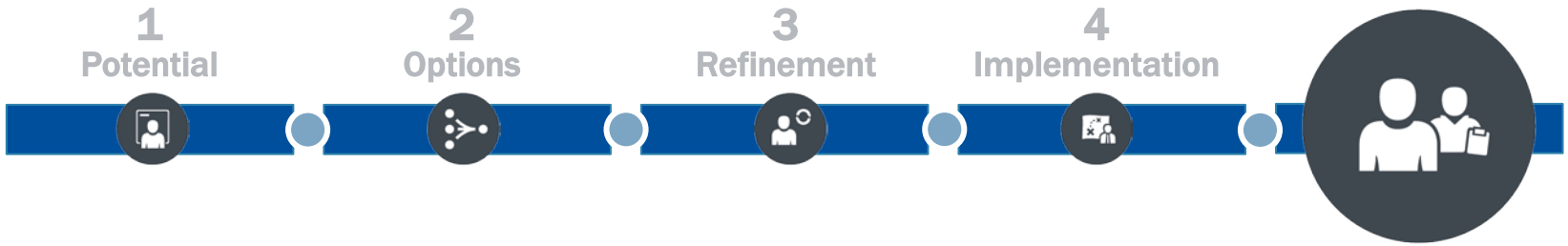
Purpose: Contract for and ***build*** the project

Tasks:

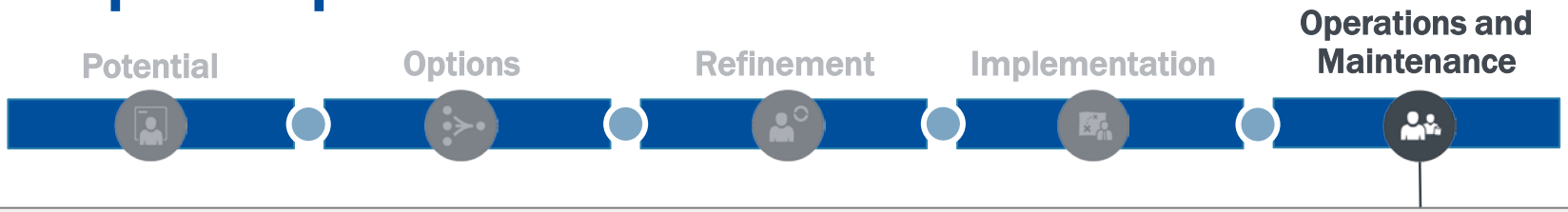
- Finalize pre-construction activities including project agreements—financial, contractual, and interconnection
- Start construction and equipment installation
- Interconnect project to the grid
- Start project commissioning leading to facility/community project operation

Output: Completed project (operation)

5 Operations and Maintenance



Step 5: Operations & Maintenance



Purpose: Conduct or ensure ongoing operations and maintenance (O&M), including repair and replacement (R&R)*

Task:

- O&M agreements
- Warranties
- Monitoring system
- System performance
- Production guarantees
- Buyout options

Outputs:

- Ensure responsible party carries out O&M/R&R*
- Measuring and tracking success
- Correlate with business plan and strategic energy plan
- Contract compliance
- Reporting of generation
- Met or exceeded energy and financial performance

**Especially if owner – role of highest O&M risk*

Photo by Warren Getz, NREL 00180

Revisit Energy Plan

- Check back in with planning document—update as necessary
- Identify next potential project from plan

Summary of Actions by Step

Step 1: Gather all relevant data in order to make first pass at potential project; understand tribal role options

Step 2: Estimate value to Tribe; begin to identify offtakers, partners, vendors

Step 3: Finalize economic assumptions and roles, interconnection and offtake agreements, partnerships, ownership structure

Step 4: Financial close and construction, vendor contracting completion, project commercially delivered

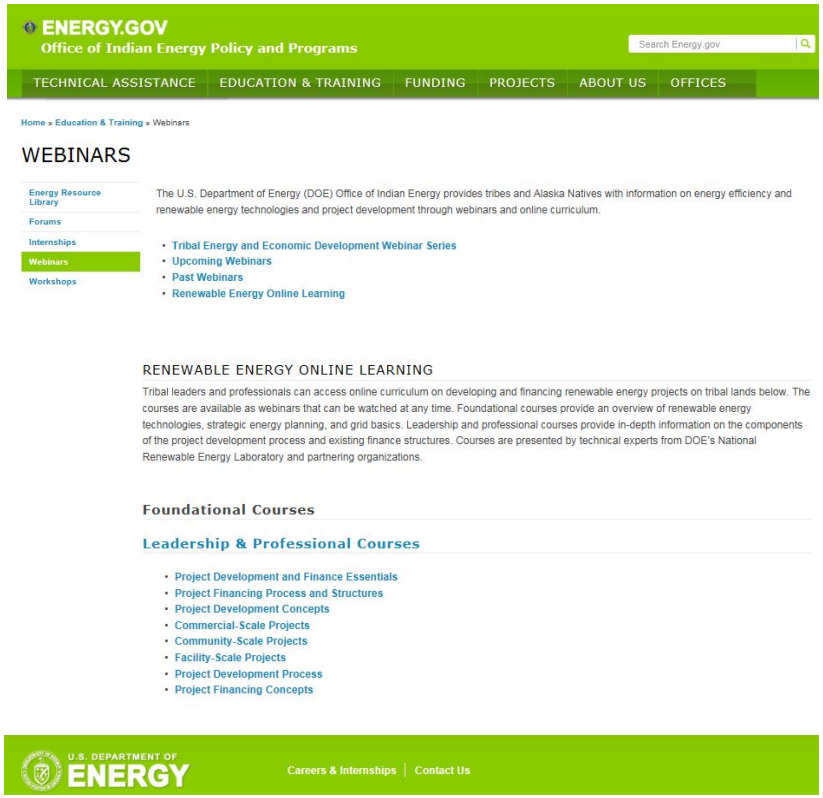
Step 5: Maintenance plan implementation

Celebrate!

Resources: On-Demand Curriculum

Access free courses anytime

- **Foundational Courses**
  Overview of specific renewable energy technologies, strategic energy planning, and grid basics
- **Leadership & Professional Courses**
  In-depth information on the components of the project development process and existing financing structures



energy.gov/indianenergy/webinars#curriculum

Thank you!

Liz Doris
National Renewable Energy Laboratory
Email: Elizabeth.doris@nrel.gov