

DOE OFFICE OF INDIAN ENERGY

# The Five-Step Process Framework for Project Development and Key Concepts



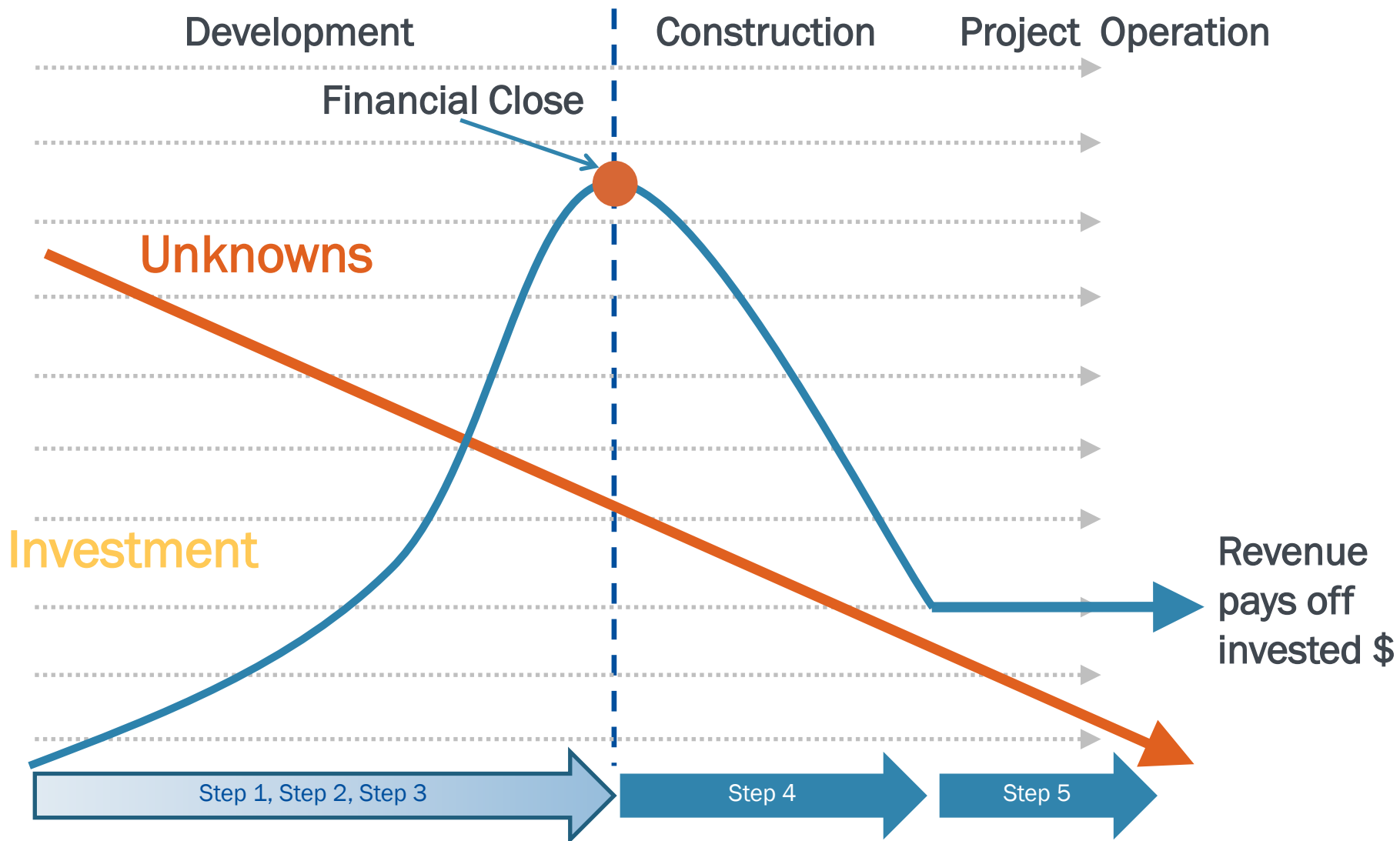
U.S. DEPARTMENT OF  
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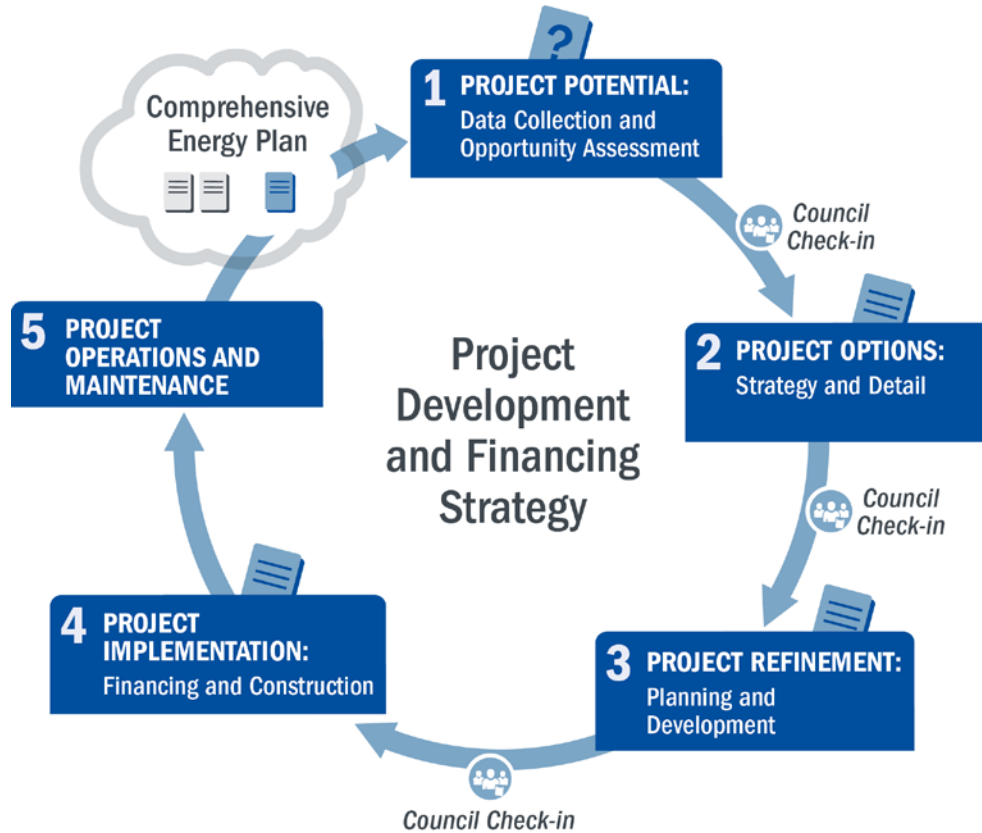
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Indian Energy

# Project Development Process: What Is It?

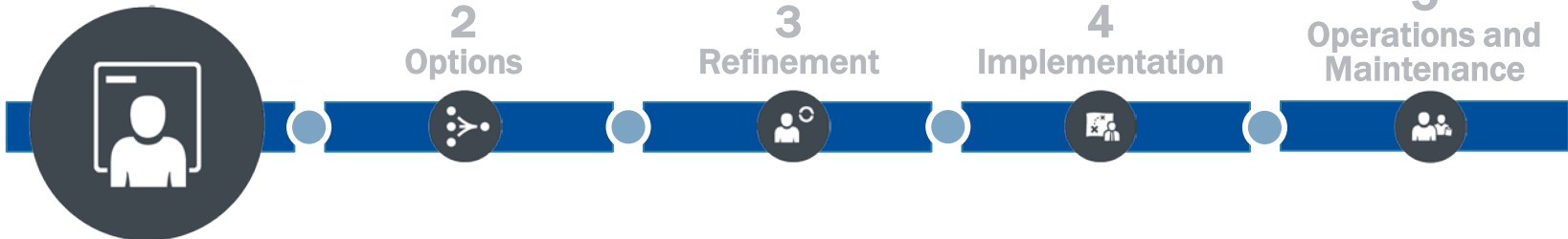
- Framework based on **experience**
- Focuses on key **decision points**
- Shows that project development is **iterative**
- Emphasizes that delaying or deciding against a project that does not meet current **goals** is a viable outcome and option

# Project Uncertainty/Capitol at Risk





# 1 Potential



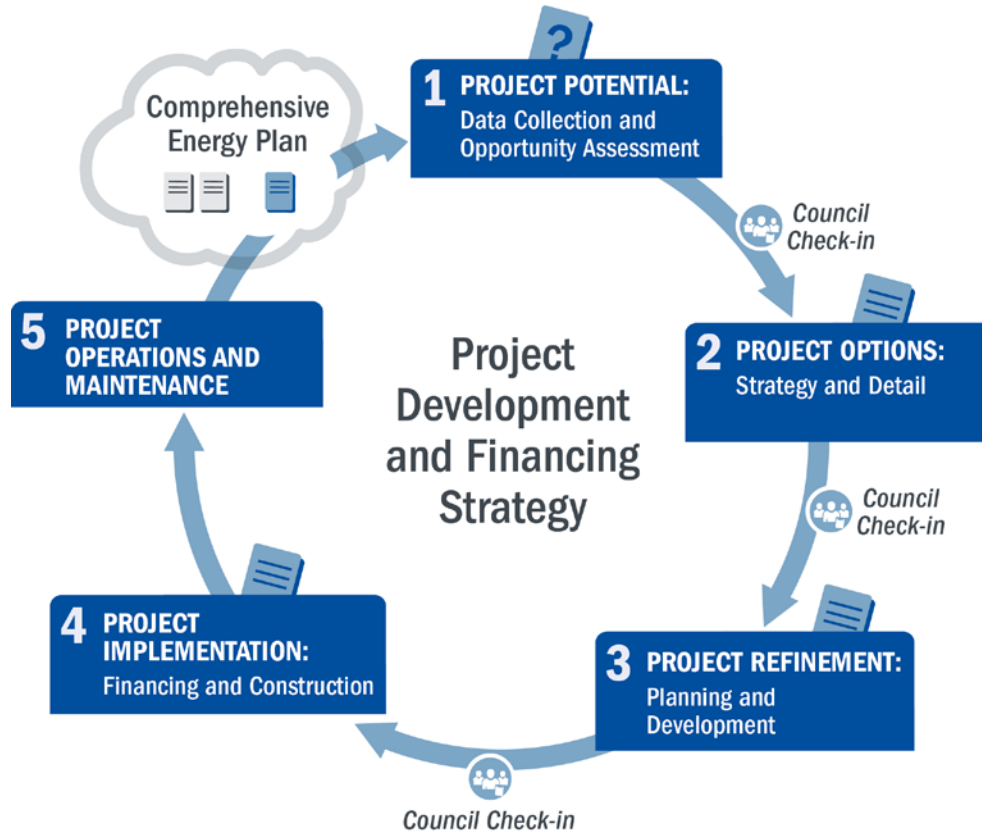
# Step 1: Site, Scale, Resource, and Community Market Potential



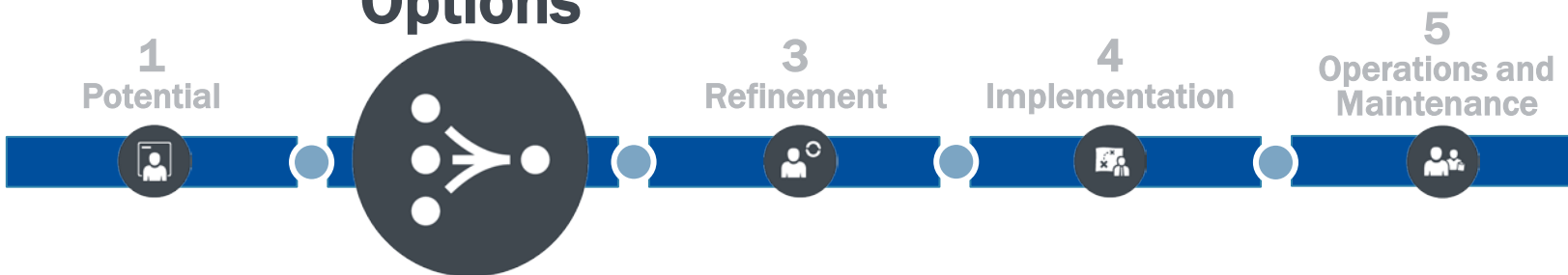
**Purpose:** Determine whether basic elements for a successful project are in place

## 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



## 2 Options



## Step 2: Roles, Business Structures, & Regulatory Considerations



**Purpose:** Determine ownership structure and permitting considerations if any.

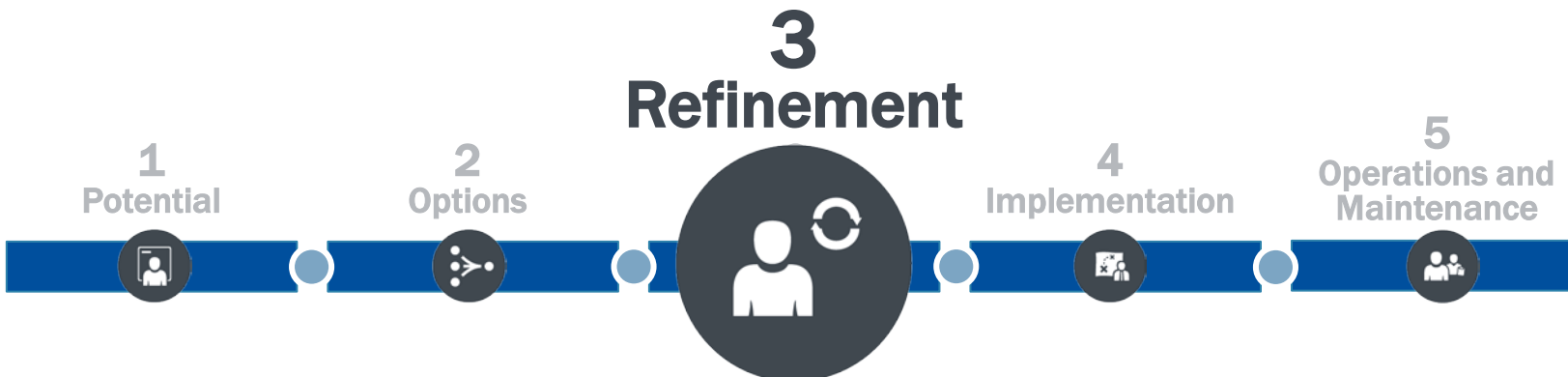
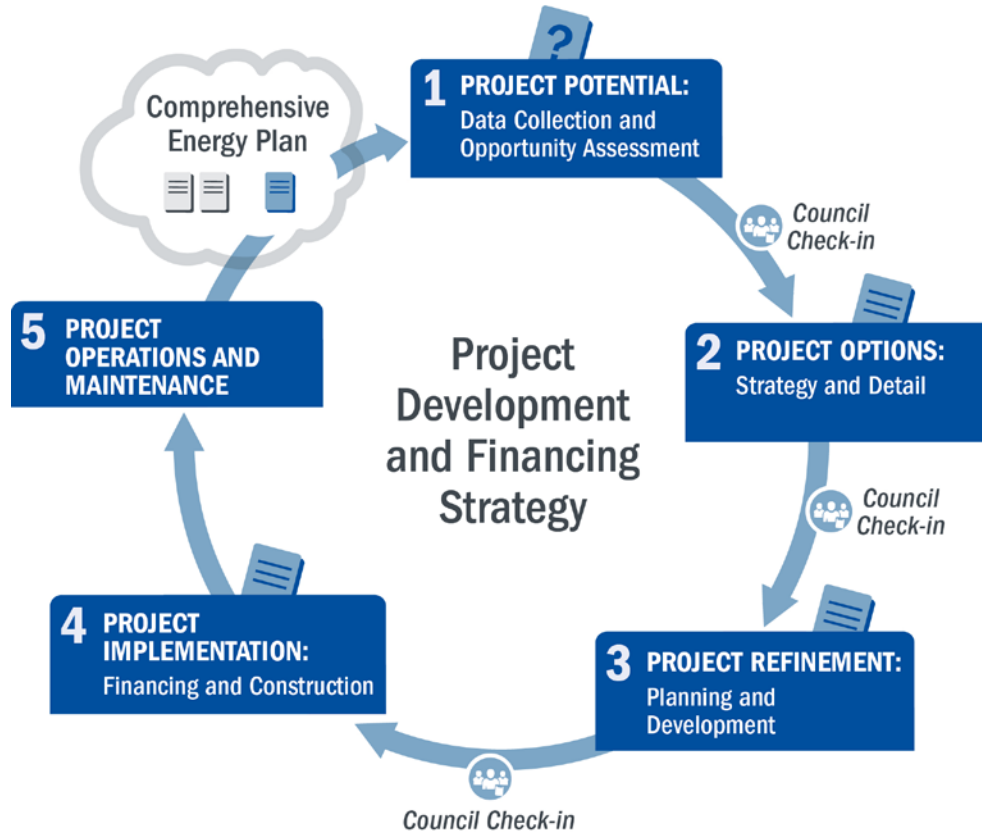
*(Note: It is likely that internal tribal permitting is required if developed on tribal lands, however, state and federal permitting may be required if the Tribe is dealing with fee or trust land outside the tribal land holdings.)*

### 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





# Step 3: Project Refinement



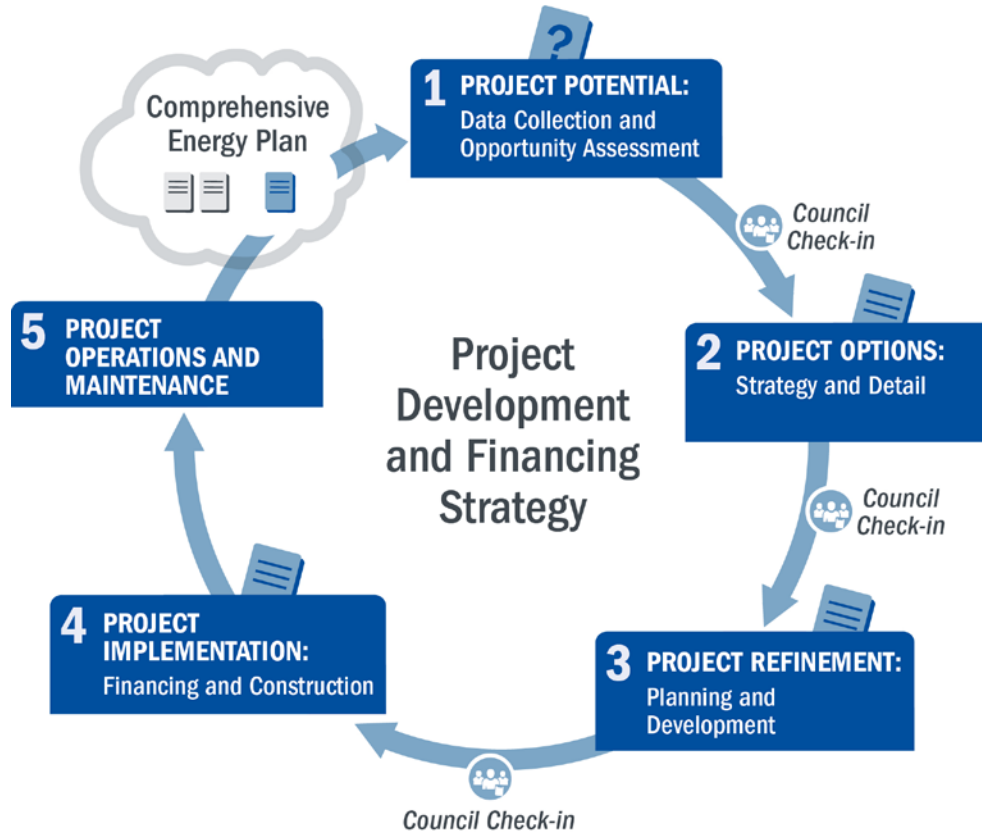
**Purpose:** Validate decisions and finalize project structure

## Tasks:

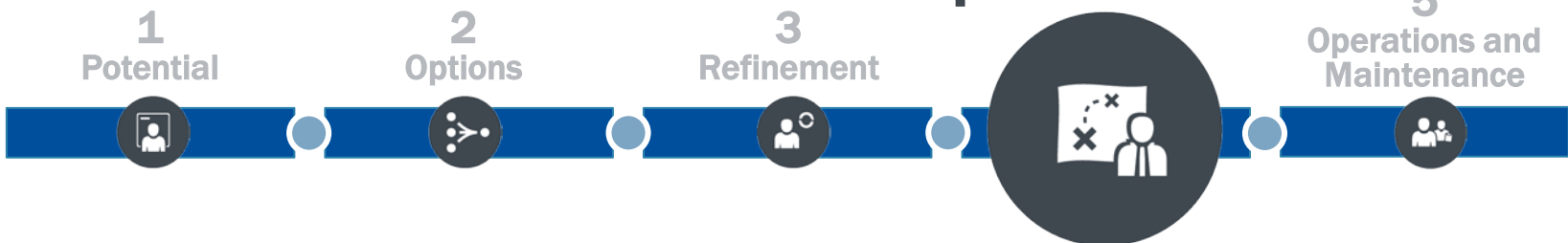
1. Finalize ownership structure and project team identification
2. Finalize permitting, including environmental reviews, net metering, and interconnection
3. Finalize technology, financing, and development costs

## 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



# 4 Implementation



# Step 4: Implementation

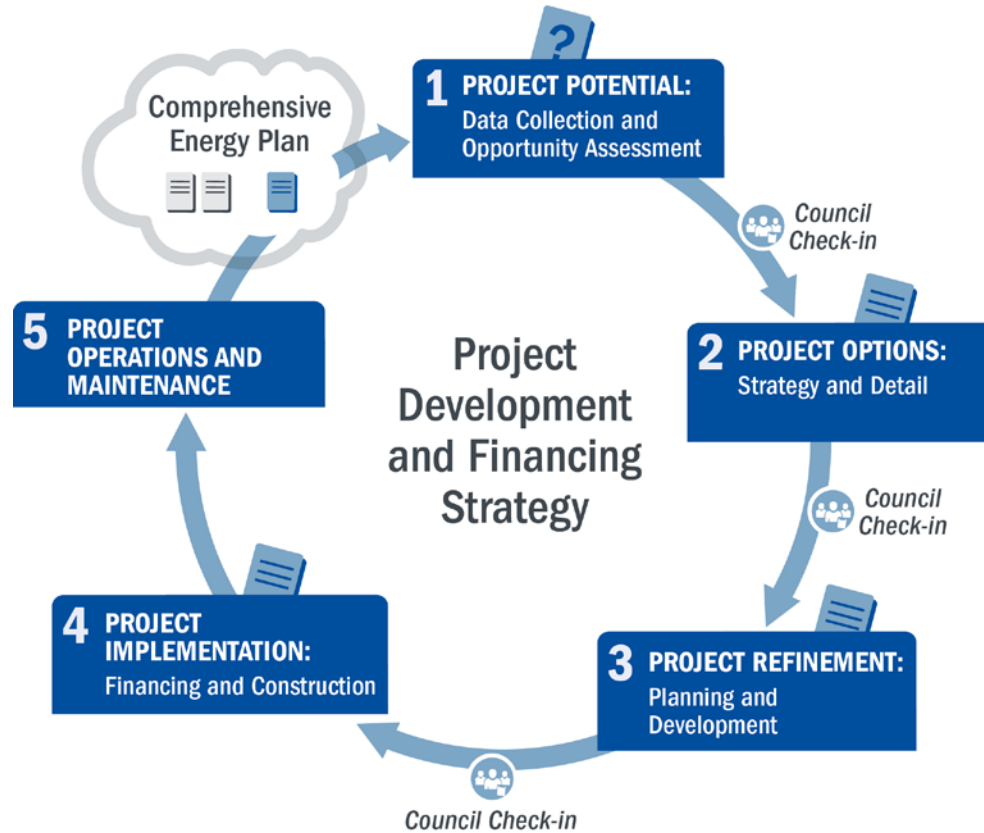


**Purpose:** Contract for and *build* the project

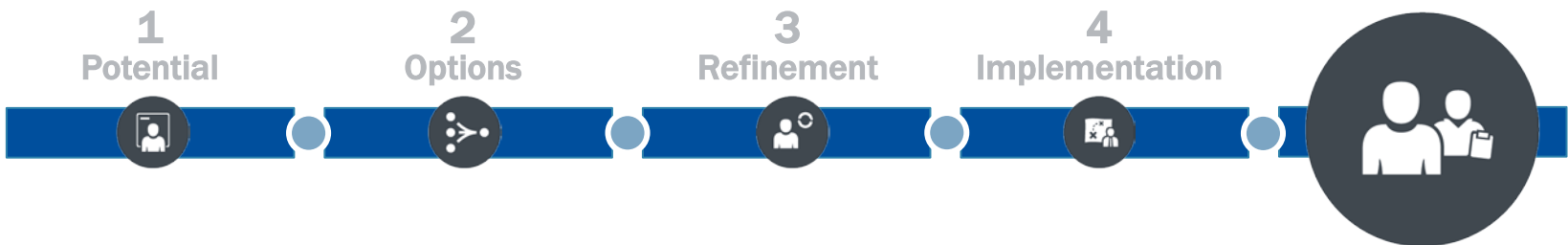
## Tasks:

- 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

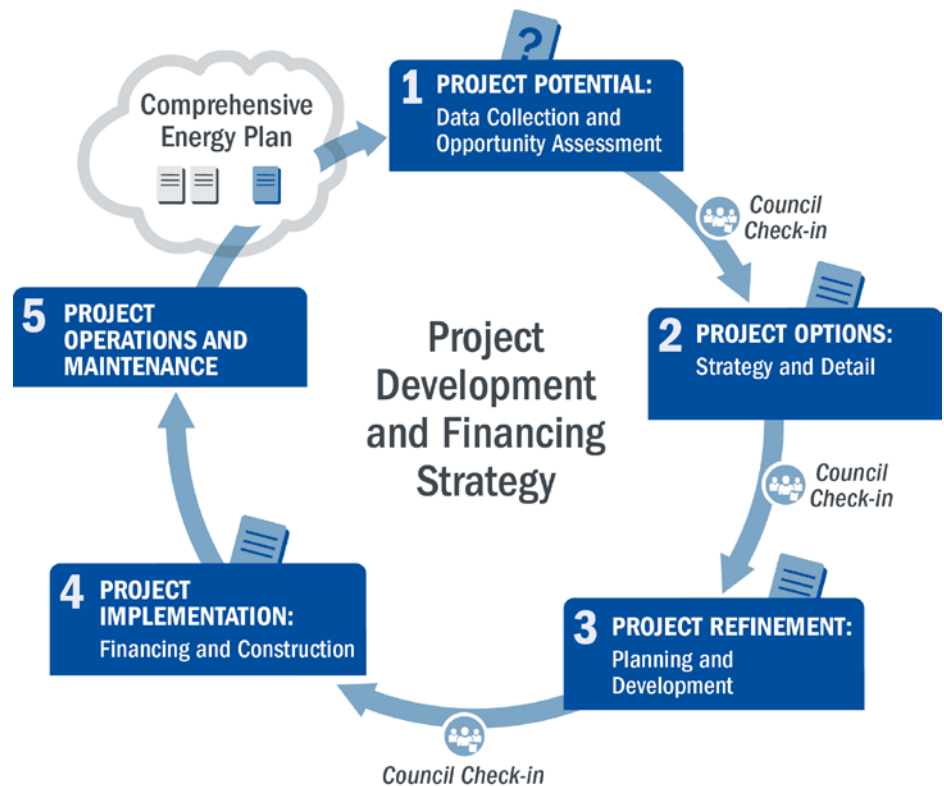
*\*Especially if owner – role of highest O&M risk*



Photo by Warren Getz, NREL 00180

# Revisit Energy Plan

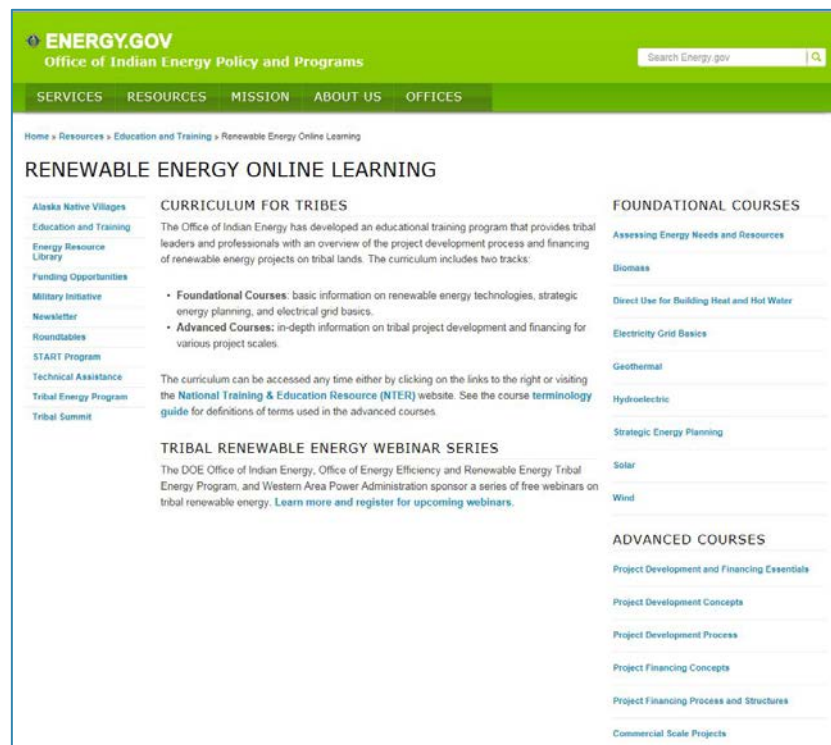
- Check back in with planning document—update as necessary
- Identify next potential project from plan



# 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



The screenshot displays the 'RENEWABLE ENERGY ONLINE LEARNING' page on the ENERGY.GOV website. The page is titled 'CURRICULUM FOR TRIBES' and provides an overview of the educational training program. It includes a search bar at the top right and a navigation menu with options like SERVICES, RESOURCES, MISSION, ABOUT US, and OFFICES. The main content area is divided into three columns: a left sidebar with links to various resources, a central text area describing the curriculum tracks, and a right sidebar listing course categories. The curriculum is divided into two tracks: Foundational Courses and Advanced Courses. The Foundational Courses include: Assessing Energy Needs and Resources, Biomass, Direct Use for Building Heat and Hot Water, Electricity Grid Basics, Geothermal, Hydroelectric, Strategic Energy Planning, Solar, and Wind. The Advanced Courses include: Project Development and Financing Essentials, Project Development Concepts, Project Development Process, Project Financing Concepts, Project Financing Process and Structures, and Commercial Scale Projects. The page also mentions a 'TRIBAL RENEWABLE ENERGY WEBINAR SERIES' and provides information on how to access the curriculum.

[energy.gov/indianenergy/curriculum](https://energy.gov/indianenergy/curriculum)

# Key Concepts

- Levelized Cost of Energy - SAM
- Sources of Capital
- Role of Tax Credits for Renewable Energy Development

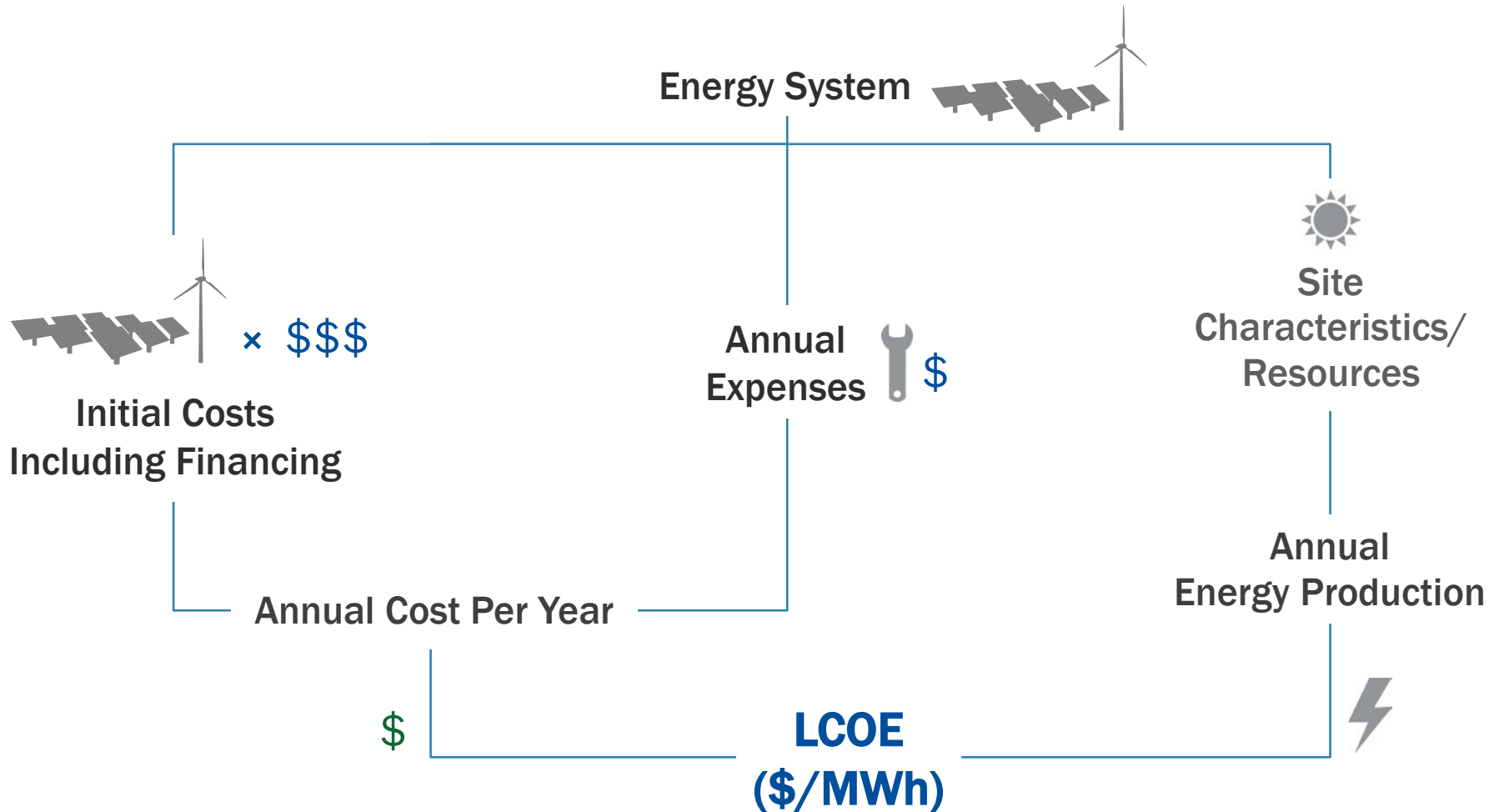


# Levelized Cost of Energy (LCOE)

- 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](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)