

DOE OFFICE OF INDIAN ENERGY

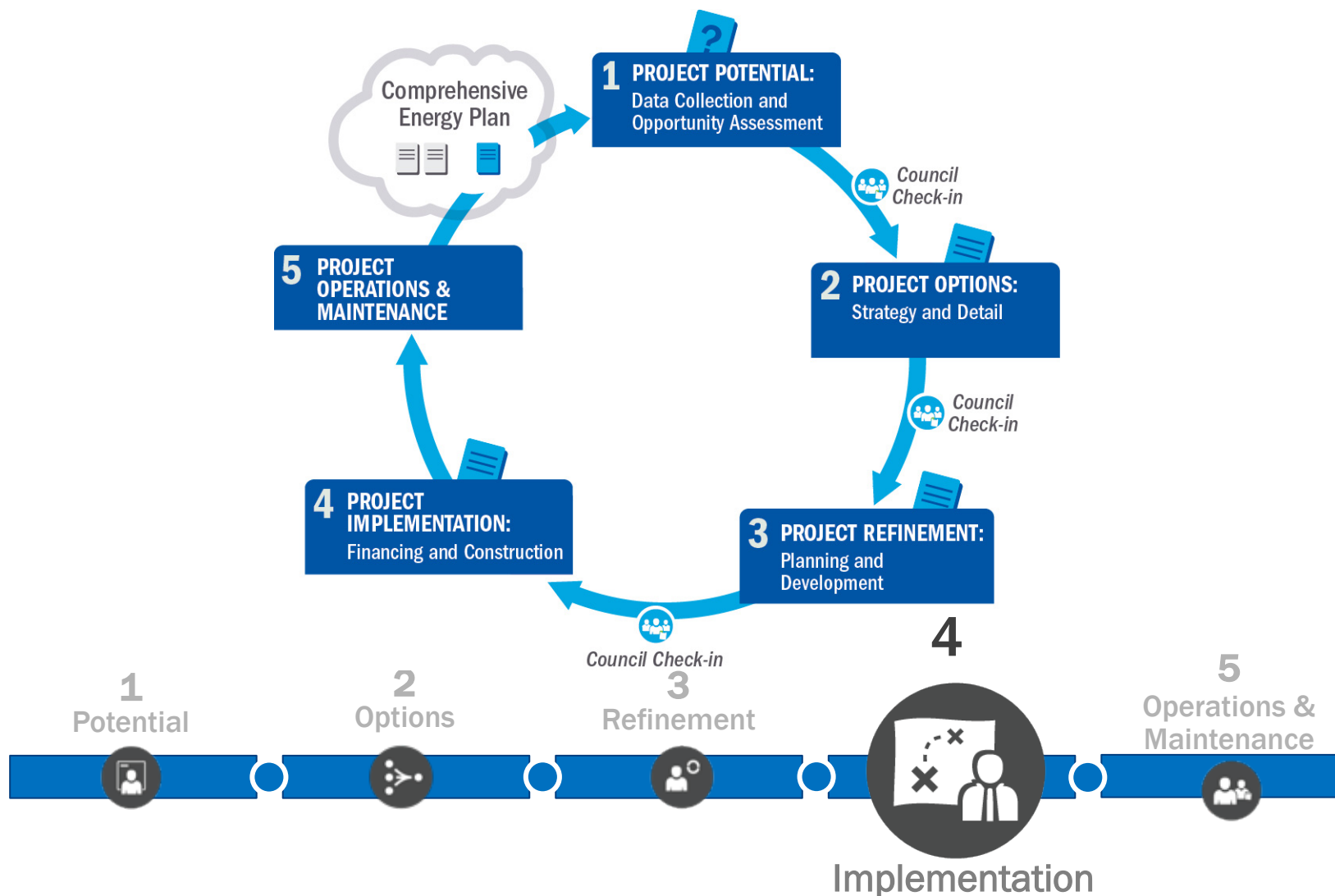
Step 4: Project Implementation



U.S. DEPARTMENT OF
ENERGY

Office of
Indian Energy

Project Implementation



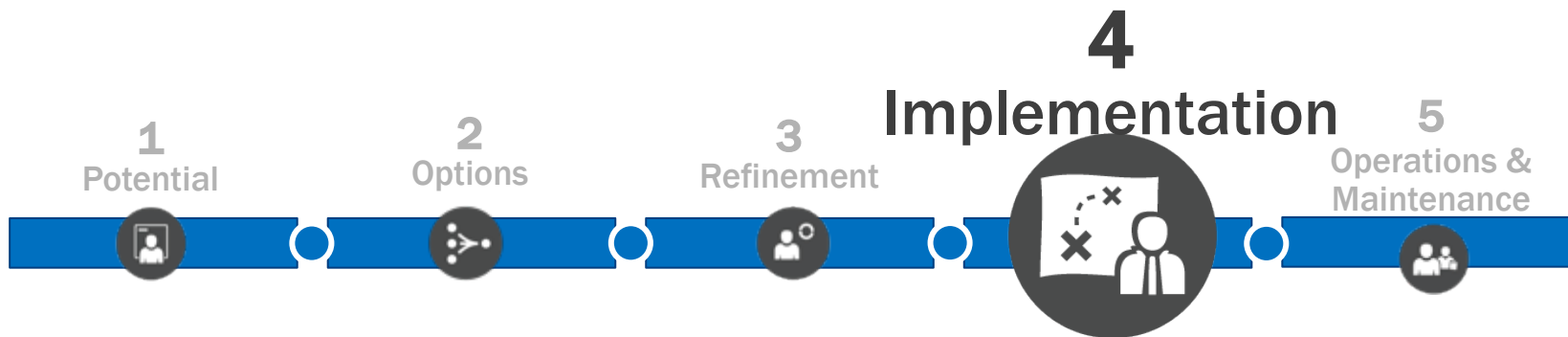
Step 4: Implementation

Purpose: Realize physical construction of project

Tasks:

- Finalize preconstruction tasks
- Realize construction and equipment installation
- Realize interconnection
- Realize project commissioning

Output: Completed project (operation)



Step 4: Implementation

1. Pre-construction
 - Project kickoff
 - Design and construction documents, plans/schedules, submittals
2. Construction of project
 - Contract oversight/quality control
 - Change control
3. Commissioning
 - Testing and verification
 - Interconnection verification (utility)

Variable effort relative to project scale

Pre-construction

- Checklists for schedules and each activity based on contract and project documents
- Kickoff meeting
- Utility interconnection process and agreement
- Design (often in stages) and design approvals
- Other possible plans:
 - Utility
 - Construction
 - Management
 - QC
 - Commissioning
 - Environmental Protection
 - Security

Construction of Project

- Project developer orders equipment and begins construction or installation
- Construction manager coordinates work of various trades
- Close coordination with tenants if site is an occupied building
- Frequent communication among all parties to minimize possible issues



Small Wind and Solar on Facility
NREL Photo #19430

Interconnection and Commissioning

- Project interconnected according to utility interconnection agreement and utility process
- Plan may be standardized by developer and technology and may be refined per individual system design
- Witnessing and/or third party independent commissioning may be stipulated
- Commissioning
 - Physical inspection
 - Testing
 - Whole-system performance testing

Commissioning



Step 4: Hypothetical – Outputs Implementation

- ✓ Completed and operating project
- ✓ New ownership organization completed (if needed)

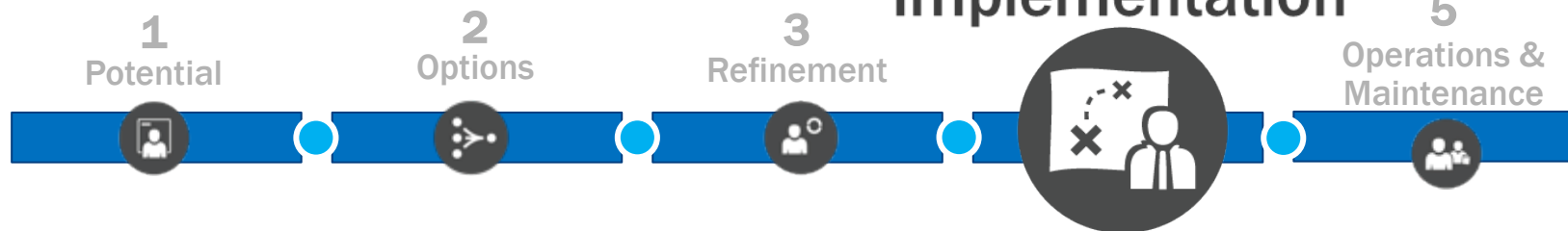
Project Implementation Success

- Project generating electricity
- Project developed within budget



4

Implementation



Project Risk – Post Step 4

	Risks	Risk Assessment Post Step 4
Development	<ul style="list-style-type: none"> • Poor or no renewable energy resource assessment • Not identifying all possible costs • Unrealistic estimation of all costs • Incorrect estimation of long-term “community” energy use • Utility rules and ability to offset use with centralized production; interconnection risk 	<p>Low; site picked ✓</p> <p>Low; detailed model ✓</p> <p>Low; detailed model ✓</p> <p>Low; final projection ✓</p> <p><u>None; executed</u> ✓</p>
Site	<ul style="list-style-type: none"> • Structural (e.g. rooftop solar, wind loading, soil conditions) • Installation safety (e.g., wind tower, hazard for adjacent sites) • Site control for safety/security purposes 	<p><u>None; addressed</u> ✓</p> <p><u>None; addressed</u> ✓</p> <p>Low; site secure ✓</p>
Permitting	<ul style="list-style-type: none"> • Tribe-adopted codes and permitting requirements • Utility interconnection requirements 	<p>Low; complete ✓</p> <p><u>None; complete</u> ✓</p>
Finance	<ul style="list-style-type: none"> • Capital availability • Incentive availability risk 	<p>None; finalized ✓</p> <p>None ; finalized ✓</p>
Construction/ Completion	<ul style="list-style-type: none"> • EPC difficulties • Cost overruns • Schedule 	<p><u>None; contracted</u> ✓</p> <p><u>None; construction complete</u> ✓</p>
Operating	<ul style="list-style-type: none"> • Output shortfall from expected • Technology O&M 	<p>Assumed low, mitigable or allocatable</p>



OPERATIONS AND MAINTENANCE



Project Implementation O & M

- Set up maintenance schedules and contracts
- Schedule the final blower door on residential energy efficiency
- Schedule final inspections based on completion dates