GMI Biogas Project Development Toolkit

Biogas Subcommittee Meeting
Madison, WI
October 28, 2019

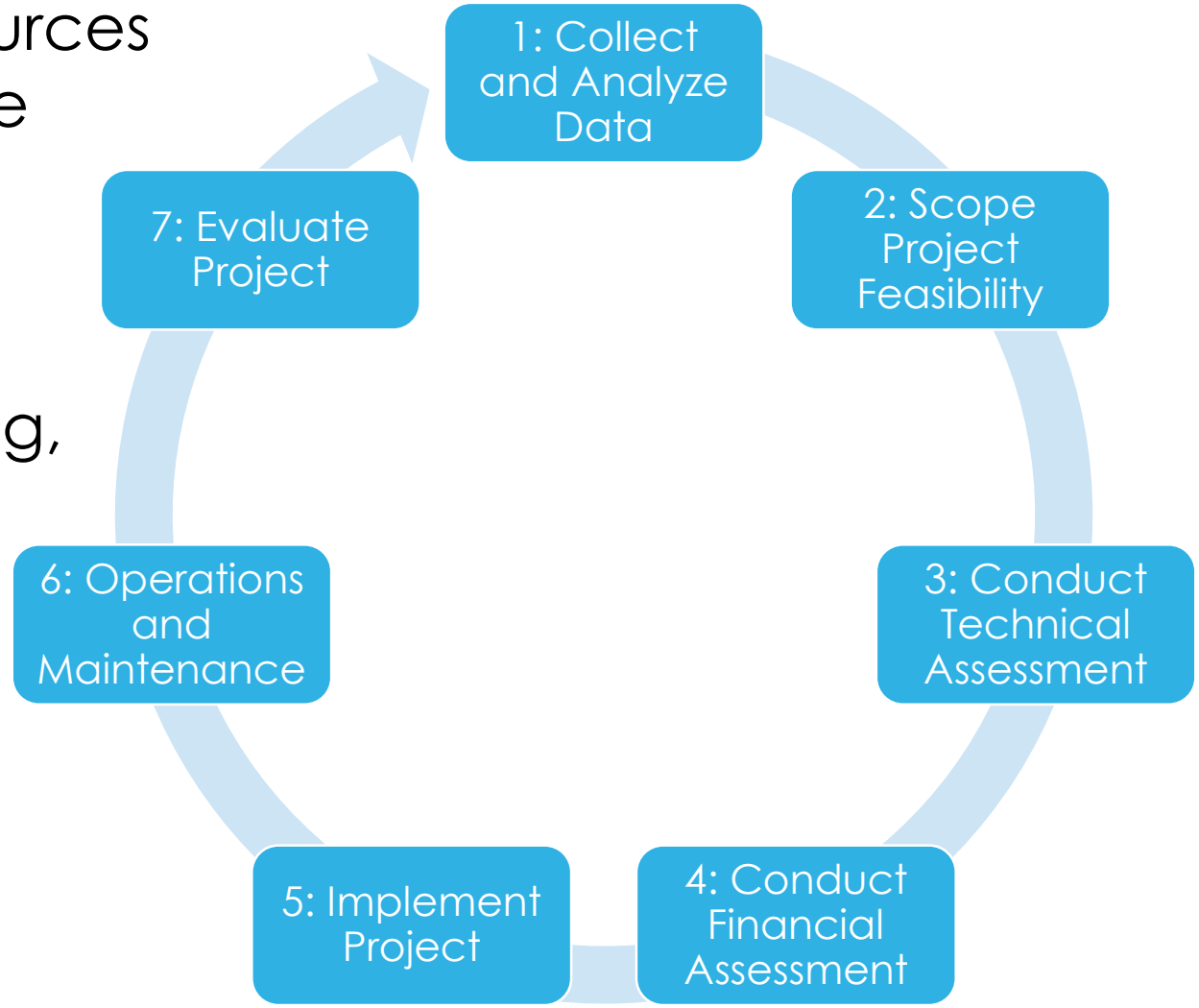
Global Methane Initiative

Presentation Overview

- Overview of the Biogas Toolkit
- Using the Toolkit to Support National & Subnational Goals
- Biogas Toolkit Steps and select tool descriptions
- Engaging Subcommittee and Project Network to Develop and Pilot

GMI Biogas Toolkit

- A toolkit with over 25 tools and resources that GMI has developed to facilitate biogas project development
- The Biogas Toolkit will serve as a roadmap for planning, implementing, and quantifying economic and environmental impacts of biogas projects
- Audience: Policymakers, financial institutions, project developers



Using the Biogas Toolkit to Support Policy Goals

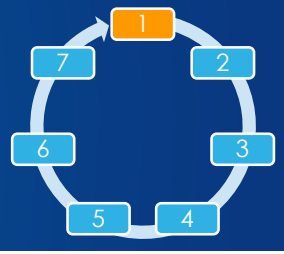
- Supplying stakeholders with a single platform will facilitate successful implementation of biogas projects and work towards achieving National and Subnational goals

- The Toolkit can also support Sustainable Development Goals (SDGs) on affordable and clean energy, and clean water and sanitation

Countries that mention biogas in their NDCs

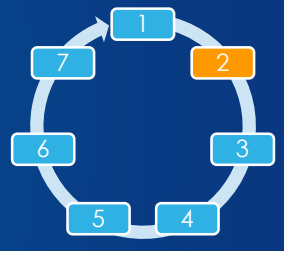
Source: WRI's Climate Watch NDC Search

Step 1: Collect and Analyze Data



- Goal: Determine resource potential
- Developers should collect data on:
  - The amount and type of feedstock available
  - Project sizing requirements
  - Technical specifications and standards
  - Other necessary project design components
- Example tools & resources:
  - CCAC Waste Initiative City Assessment Tool
  - AD Project Data Collection Form
  - Resource Assessments and Market Opportunity Reports

Step 2: Scope Project Feasibility

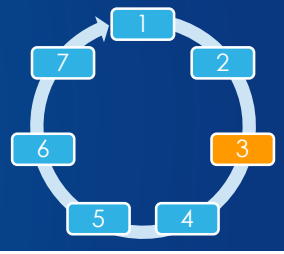


- Goal: Conduct initial project scoping to determine if detailed assessments are needed
- Questions to consider:
  - *Technical.* What is the project type, location, market potential, and waste source?
  - *Financial.* What are the financial resources or incentives?
  - *Regulatory*. What are the permitting and environmental requirements?
- Example tools & resources:
  - Solid Waste Emissions Estimation Tool
  - OrganEcs – Cost Estimating Tool for Managing Source-Separated Organic Waste
  - Anaerobic Digester Project Screening Tool

Anaerobic Digestion Project Screening Tool

- Excel-based screening tool
- Limited inputs required
- Outputs
  - Biogas and digestate generation
  - Best potential end uses for biogas
  - Expected emissions avoided
  - Optimal feedstock mix

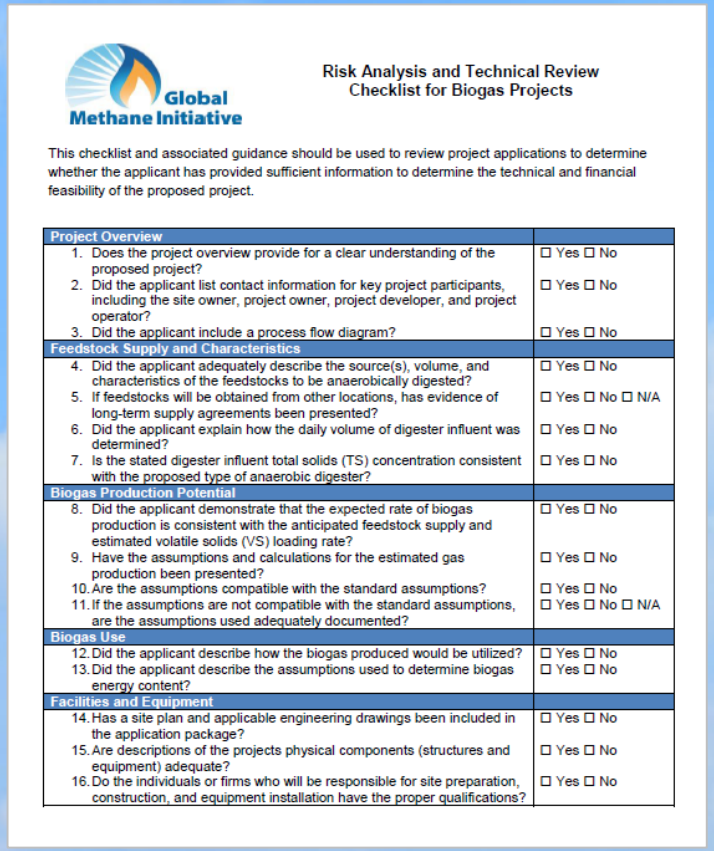
Step 3: Conduct Technical Assessment



- Goal: Conduct a detailed project-specific technical assessment to understand project design, construction, and operation
- Detailed technical assessments consider:
  - Site-specific engineering design
  - Equipment selection
  - Biogas production potential
- Example tools & resources:
  - Biogas Project Development Checklist
  - Biogas Wastewater Assessment Technology Tool

Biogas Project Development Checklist

- A checklist with questions to ensure availability of information to evaluate the technical and financial feasibility of the proposed project
- Includes guidance for each question with information on standard assumptions



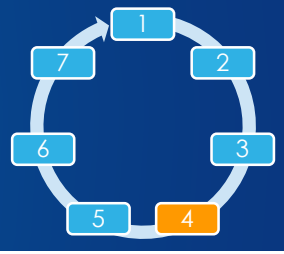
Global Methane Initiative

Risk Analysis and Technical Review Checklist for Biogas Projects

This checklist and associated guidance should be used to review project applications to determine whether the applicant has provided sufficient information to determine the technical and financial feasibility of the proposed project.

Project Overview	
1. Does the project overview provide for a clear understanding of the proposed project?	☐ Yes ☐ No
2. Did the applicant list contact information for key project participants, including the site owner, project owner, project developer, and project operator?	☐ Yes ☐ No
3. Did the applicant include a process flow diagram?	☐ Yes ☐ No
Feedstock Supply and Characteristics	
4. Did the applicant adequately describe the source(s), volume, and characteristics of the feedstocks to be anaerobically digested?	☐ Yes ☐ No
5. If feedstocks will be obtained from other locations, has evidence of long-term supply agreements been presented?	☐ Yes ☐ No ☐ N/A
6. Did the applicant explain how the daily volume of digester influent was determined?	☐ Yes ☐ No
7. Is the stated digester influent total solids (TS) concentration consistent with the proposed type of anaerobic digester?	☐ Yes ☐ No
Biogas Production Potential	
8. Did the applicant demonstrate that the expected rate of biogas production is consistent with the anticipated feedstock supply and estimated volatile solids (VS) loading rate?	☐ Yes ☐ No
9. Have the assumptions and calculations for the estimated gas production been presented?	☐ Yes ☐ No
10. Are the assumptions compatible with the standard assumptions?	☐ Yes ☐ No
11. If the assumptions are not compatible with the standard assumptions, are the assumptions used adequately documented?	☐ Yes ☐ No ☐ N/A
Biogas Use	
12. Did the applicant describe how the biogas produced would be utilized?	☐ Yes ☐ No
13. Did the applicant describe the assumptions used to determine biogas energy content?	☐ Yes ☐ No
Facilities and Equipment	
14. Has a site plan and applicable engineering drawings been included in the application package?	☐ Yes ☐ No
15. Are descriptions of the projects physical components (structures and equipment) adequate?	☐ Yes ☐ No
16. Do the individuals or firms who will be responsible for site preparation, construction, and equipment installation have the proper qualifications?	☐ Yes ☐ No

Step 4: Conduct Financial Assessment



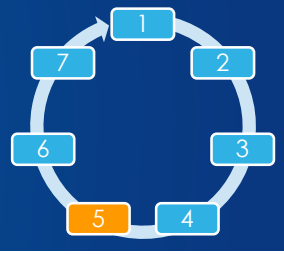
- Goal: Determine financial feasibility and funding mechanisms
- Financial considerations include:
  - How will construction be funded?
  - How will feedstocks be purchased?
  - How and to whom will products be sold?
- Example Tools & Resources:
  - Financial Readiness Questionnaire
  - Biogas Project Development Checklist

Financing Readiness Evaluation

- Evaluation questions to help cities think about whether they are ready to seek financing for a project
- Raises awareness of challenges and potential pitfalls in several areas
- Helps city identify gaps or areas of potential risks
- Cities can use the evaluation develop a plan for improving their readiness for financing

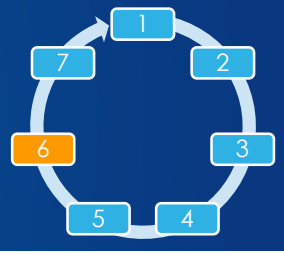
- Political environment
- Regulatory environment
- Legal frameworks
- Revenue streams
- Financial and technical expertise
- Bidding

Step 5: Implement Project



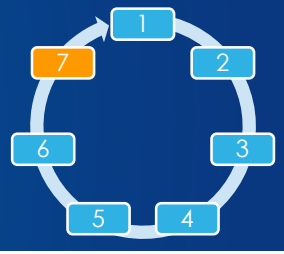
- Goal: Begin construction and project commissioning
- All project agreements should be in finalized in this stage
- Example tools and resources:
  - Best Practices Guide for Monitoring, Reporting, and Verification
  - Landfill Gas Energy Project Best Practices Guide

Step 6: Operations and Maintenance



- Goal: Successfully operate and maintain project
- Involves training staff, monitoring operations, safety assessments, repairing or replacing malfunctioning equipment
- Example tools and resources:
  - Best Practices Guide for Monitoring, Reporting, and Verification
  - Landfill Gas Energy Project Best Practices Guide
  - Biogas Project Development Checklist

Step 7: Evaluate Project



- Goal: Ensure the project is operating optimally; collect data to inform future projects
- This step involves the continuous process of collecting and analyzing data on project performance, and evaluating and improving performance when possible
- This step feeds into the first step (Collect and Analyze Data) for future projects

Using the Toolkit to Support Biogas Development

- GMI seeks to engage with stakeholders to help users implement the toolkit
- Could include training or developing additional guidance
- Through this engagement process GMI expects to identify gaps in the toolkit and develop new tools and resources to fill those gaps

Filling Gaps in the Biogas Toolkit

- Initial Framework based on where existing tools fit in project development cycle.
- In 2018, GMI hosted a workshop in New Delhi to bring together stakeholders to facilitate information sharing between U.S. EPA and India for conducting reviews of biogas project funding applications.
- GMI Interested in expanding cooperation to other sectors and partners through the Biogas Subcommittee to provide feedback, pilot existing tools and/or develop additional tools where needed.