

TERMS OF REFERENCE

IRENA Project Navigator

Technical Concept Guidelines for Biogas Projects

Secretariat of the International Renewable Energy Agency (IRENA)
IRENA Innovation and Technology Centre (IITC)

I. STATEMENT OF PURPOSE

The IRENA Project Navigator is an online platform providing comprehensive, easily accessible, and practical information, tools and guidance to assist in the development of bankable renewable energy projects. It provides critical information, analysis and best practices covering the complete project lifecycle of multiple renewable energy technologies through a project lifecycle process structured in several distinct phases designed to support the progressive development of renewable energy projects.

The objective of the work outlined in these terms of reference is to expand the IRENA Project Navigator's bioenergy coverage with biogas production through anaerobic digestion. The output of the work shall be used by IRENA, as the basis for the Project Navigator's Technical Concept Guidelines for Biogas Projects and includes drafting a set of guidelines covering technical, organizational, environmental, economical & financial aspects that need to be taken into account when developing a biogas project, while ensuring the sustainable use of bioenergy resources. The typical audience groups come from diverse backgrounds and may have a non-expert knowledge of technical content (e.g. project developers, financiers, governments and academia).

II. BACKGROUND

The International Renewable Energy Agency (IRENA) is an inter-governmental organisation, mandated by member states around the world to promote the widespread and increased adoption, and sustainable use of all forms of renewable energy. In accordance with its Statute, IRENA's objective is to "promote the widespread and increased adoption and the sustainable use of all forms of renewable energy". This concerns all forms of energy produced from renewable sources in a sustainable manner. These forms include bioenergy, geothermal energy, hydropower, ocean, solar, on and off-shore wind power.

Despite a rise in installed generation capacity worldwide, the deployment of renewable energy can at times be challenging if projects do not meet certain standards to obtain the necessary financial support. Added to this, there is a perception of high technology risk, cumbersome administrative procedures, insufficient transparency in the project cycle, as well as limited access to institutional and commercial financing instruments.

In this context, IRENA has developed Project Navigator - an online platform (www.irena.org/navigator) providing comprehensive, easily accessible, and practical information, tools and guidance to assist in the development of bankable renewable energy projects.

An important part of the Project Navigator, and the subject of this document, are the Technical Concept Guidelines, which are meant to cover specific aspects that need to be taken into consideration for the successful development of a renewable energy project (e.g. technical, organizational, environmental, economical & financial aspects) while considering the financial consequences of the choices involved in the process. The guidelines follow a project development process defined in the IRENA Project Navigator (Figure 1).



Figure 1. Project development process as suggested by the IRENA Project Navigator.

III. TECHNICAL SCOPE

The IRENA Project Navigator introduces a project lifecycle process structured in several distinct phases designed to support the progressive development of renewable energy projects. The learning section features easy-to-access knowledge materials for each renewable energy technology featuring practical tools, real-life case studies and industry best practices. Renewable Energy Technical Concept Guidelines provides critical information, analysis and best practices covering the complete project lifecycle of multiple renewable energy technologies. The platform already provides Technical Concept Guidelines for several types of RET projects, such as onshore wind, solar PV, small-hydro, geothermal power, mini-grids and woody biomass.

The Technical Concept Guidelines for Solid Biofuels from Woody Biomass¹ launched in early 2017 were the Project Navigator's first incursion into the field of bioenergy. The objective of this work is to expand the Navigator's coverage in bioenergy, to include biogas production through anaerobic digestion. These guidelines can provide project developers with the knowledge of practical details like site selection, sustainably securing feedstock and selecting the appropriate technology for different end-uses and applications.

Given the large diversity of anaerobic digestion projects, the document should present the different feedstock options used for this type of projects. However, the scope of the guidelines should focus mainly on projects using feedstocks such as kitchen waste and agricultural, animal farming, and food processing residues. Energy crops (i.e. crops grown specifically for use as feedstock) should also be covered, assuming they have economic potential and do not require a change in land-use. The document should explain how to identify and characterize suitable feedstock sources, assess the market potential, and dimension the project accordingly.

In terms of end-uses, the document should cover power generation, heating (incl. cooking), cogeneration and transport applications. Additionally the document should also cover the by-products of anaerobic digestion and their impact in the economics of a project.

The document should be centred specifically on the process of developing small- to medium-scale anaerobic digestion/co-digestion plants suitable for the end-uses described above. Therefore, end-use applications should be covered only to the necessary extent. Developers should know the end-use alternatives they have since some alternatives might have specific requirements for the biomass they use and because developers should understand that demand of the biogas is the main driver of the project. The methodology presented should be flexible and also allow for the clustering of small-scale household size projects, which are a key option for developing countries.

The scope of the technical concept guidelines will be further discussed and refined with the contractor at the kick-off meeting to ensure effective work and the achievement of the expected milestones.

¹ IRENA (2017), IRENA Project Navigator – Technical Concept Guidelines for Solid Biofuels from Woody Biomass, International Renewable Energy Agency, Abu Dhabi.

IV. SCOPE OF WORK

The work will consist of the following three activities:

- 1) **Drafting a document featuring a set of guidelines** addressing technical, organizational, environmental, economic and financial aspects involved in the development of a biogas project, including feedstock options, technology selection, logistics, supply chain, and bankability requirements:

The technical guidelines should provide developers with the necessary information for them to make technically, environmentally, commercially and financially sound decisions. They should show project developers how to plan for the development of the required plant, taking into account external influences, such as legislation or contracts. Readers should be able to choose the most adequate approach based on the project's particularities and make the most out of their investment, while keeping sustainability as the cornerstone of the project. Therefore, financial and commercial comparisons of different options from the developer's perspective should be included. The overall objective of the guidelines is to help make project proposals as attractive as possible for financiers.

The structure of the document should include an executive summary and an introduction followed by the nine step project development process proposed by the Project Navigator. It should cover the different technological options and considerations for storage, pre-treatment and transformation of feedstock, plant design elements and end-use applications. It should also take into account the necessary standards and environmental requirements.

The structure of the technical concept guidelines will be further discussed and refined with the contractor at the kick-off meeting to ensure effective work and the achievement of the expected milestones.

Previous work on technical guidelines can be accessed at <http://navigator.irena.org>

- 2) **Preparing a case study** which showcases the development process of biogas project.

The case study should follow the project development process described in the main document, and exemplify the application of the tools and principles the document addresses. The case study will be attached to the main document as an annex.

- 3) **Creating a practical Toolkit** and a **Project Evaluation Model** which developers can use throughout the project development process.

The Toolkit shall be composed of at least 8 tools and a financial project evaluation model which are meant to complement the guidelines. The tools can vary in nature and could be delivered in the form of calculation tools, checklists, assessment matrices, and templates among others. The final composition of the toolkit will be further discussed and refined with the contractor after the contract is awarded. The Project Evaluation Model, should provide its users the means to evaluate the operational and financial performance of the project by analysing the project's cash flows against technical inputs with appropriate sensitivity analysis. All tools should be delivered with an appropriate documentation explaining its construct. Examples can

be found on the Project Navigator website, however these should be used only as a reference.

V. DELIVERABLES AND TIMELINES

The consultant is expected to provide the required deliverables according to the timeline specified in the table below:

Deliverable	Indicative Description	Latest Completion date after Notice to Proceed (NTP)
D1. First draft D1.1 Kick-off meeting and inception document D1.2 First draft document	<p>The inception document corresponds to the summary of the structure of the main document with adequate description for each subsections.</p> <p>The First Draft document corresponds to the document integrating all comments from the inception document.</p>	NTP n°1 + 6 weeks
D2. Intermediate draft D2.1 Intermediate draft document D2.2 Draft toolkit D2.3 Draft project evaluation model	The intermediate draft corresponds to the document integrating the required improvements mentioned in point b) of the quality compliance requirements mentioned in Section VI	NTP n°2 + 7 weeks
D3. Final Draft D3.1 Final draft document D3.2 Final draft toolkit D3.3 Final draft project evaluation model D3.4 Close-out meeting	The final draft refers to the documents delivered by the contractor after incorporating the required improvements mentioned in point d) of the quality compliance requirements mentioned in Section VI	NTP n°3 + 2 weeks

Note: These estimated figures do not include waiting times. The actual duration of the quality control process may vary depending on review process.

- Total duration is expected to be approximately 4 to 6 months and should be reflected in the resource allocation of the proposal.
- The consultant shall provide a copy of the electronic source files for maps, figures or photographs in parallel to the deliverables. The files must be of sufficiently high resolution for printing. No graphic may be reproduced from an external source without clear copyright permission.
- The recommended concept and timeframe are open to different offers and proposals as long as the objectives are achieved.

VI. PERFORMANCE CRITERIA

During the assignment, the consultant is expected to provide the required deliverables covering the scope of work presented in section IV & V of these Terms of Reference.

The consultant will be required to regularly discuss and report progress by video or telephone conference with the project team at the IRENA Innovation and Technology Centre (ITC). This will typically be on a weekly or bi-weekly basis.

In addition, two online meetings, corresponding to a kick-off workshop and a closing meeting, should be budgeted:

- **Kick-off meeting:** The objective of the one-day kick-off workshop is to introduce the team, assign roles and responsibilities, present the base elements of the project and clarify the scope of work. The contractor shall bring a draft content outline of the document's structure and an overview of each chapter's content, which will be a starting point for the discussion. The output of the kick-off workshop will be an *inception document*. The objective of the inception document is to set out the consultant's approach to the required work and describe their proposed methodology. In the case of the main document, the inception document shall include a proposed structure and an explanation of how each chapter will be filled. The inception document will be shared internally to gather early feedback for the first draft of the document and other deliverables.
- **Closing meeting:** The objective of this meeting is for the contractor to present the completed work to the senior management, and agree on any additional resolutions required.

All deliverables should be delivered in excellent English and requiring little to no linguistic editing. Furthermore, no graphic may be reproduced from an external source without clear copyright permission. Documents that do not meet these standards will be returned to the commissioned writer or partner entity with a request for revision. IRENA reserves the right to withhold payment to a commissioned writer or partner entity until any such revision is satisfactorily undertaken.

Finally, the document should have the adequate tone and language for a non-expert audience, it should not only be informative, it should also be instructional. In this sense, it is crucial that the content is presented sequentially and that it is easy to track and follow. The writer should use of graphics and tables abundantly, including pictures of real projects exemplifying good and bad practices. No graphic may be reproduced from an external source without clear copyright permission.

Quality compliance requirements

After the first draft of the document is submitted by the consultant, the document will go through IRENA's standard quality control process:

- a) IRENA's internal and cross-divisional review, followed by a new version by the contractor incorporating the required improvements;
- b) External peer-review, legal review by IRENA's legal department and technical review by IRENA's dedicated technical reviewer followed by a new version by the contractor (Intermediate draft) incorporating the required improvements;
- c) Editorial review by IRENA's Publications Office, followed by a new version by the contractor incorporating the required improvements;
- d) Final approval by division director, followed, if necessary, by a new version by the contractor (Final draft) incorporating the required improvements.

IRENA/OECD style requirements

Documents, working papers or other documents prepared for IRENA must conform to IRENA/OECD style requirements. These requirements are outlined in IRENA's style guide (IRENA Publications: A Short Guide – PDF attached) and further elaborated in successive editions of the OECD Style Guide. All IRENA publications must strive for clarity and accuracy, consistent with building an evidence-based narrative in line with the mandate to promote renewable energy worldwide. Crucial style details include English-UK spelling, Harvard-style source citations, and full explanation of abbreviations or acronyms. IRENA provides a template Microsoft Word document (attached) for the drafting of documents and papers in a suitable format for IRENA-branded publications. Texts that do not meet IRENA's stipulated style requirements will be returned to the commissioned writer or partner entity with a request for revision. IRENA reserves the right to withhold payment to a commissioned writer or partner entity until any such revision is satisfactorily undertaken.

Anti-plagiarism compliance requirements

Plagiarism will not be tolerated whatsoever in IRENA publications. Any document, working paper or other document prepared for IRENA must constitute original work, in which all sources for information or data receive complete and accurate attribution. Passages taken from prior publications or other works must either be presented as direct quotations (marked "...") or paraphrased, with the source clearly stated in a Harvard-style citation in either case.

IRENA uses plagiarism-detection software to review all draft publications. Passages found to resemble existing publications too closely may require rewriting and more explicit source citation. Passages copied from prior publications (by IRENA or other publishers) cannot be accepted as original work and may be returned to the commissioned writer or partner entity for further revision. IRENA reserves the right to withhold payment to a commissioned writer or partner entity until any such revision is satisfactorily undertaken. Plagiarism, including either copy-and-paste text production or failure to cite sources, may result in rejection of the draft with no financial obligation on the part of IRENA.

VII. EVALUATION CRITERIA

For the evaluation of the proposals, please provide detailed costs per man-month and the estimated timeframe. In order to select best option in terms of value for money, the evaluation of the proposal will be based on:

Summary of Proposal Evaluation		Weighting
1.	Technical Evaluation	70%
2.	Commercial/Financial Evaluation	30%
TOTAL SCORE		100%

Technical Evaluation:

Technical Evaluation Criteria	Weighting (%)
<p>Proposed approach and work plan</p> <p>(a) Understanding of the task, its scope and its objectives, as described in the Terms of Reference;</p> <p>(b) Identification of the critical elements of both the task and the topic to be covered;</p> <p>(c) Proposed approach and implementation strategy for the required work, providing a realistic work plan with clear milestones;</p> <p>(d) Elaboration of a clear and concise technical proposal for this RFP, demonstrating extensive knowledge, experience and ability to carry out critical analysis and provide sound advice on technology matters for project developers, policy-makers and investors using a clear, structured and complete methodology.</p>	<p>20%</p> <p>5%</p> <p>5%</p> <p>5%</p> <p>5%</p>
<p>Proposed Content Outline</p> <p>Providing a clear overview of the suggested topics to be covered and the way in which they will be addressed. The proposal's structure should be consistent with the structure of IRENA Project Navigator technical concept guidelines (accessible at http://navigator.irena.org). This content outline will be the basis for the kick-off meeting and will serve as input for the inception document, if the proposal is selected.</p>	<p>35%</p>
<p>Experience in biogas projects</p> <p>Provide 2 references of work in the field of development and financing of biogas projects not older than 7 years.</p>	<p>10%</p>

<p>Team quality</p> <p>(a) Composition, qualifications and experience of the experts who will be directly involved in the project in various capacities – For each team member (at least 1 senior consultant and 1 junior consultant), provide CV and samples of relevant work undertaken.</p> <p>(b) Minimum qualifications:</p> <ul style="list-style-type: none"> ○ Senior consultant – 5 years professional experience in project management and in the development and financing of bioenergy projects including biogas technology. ○ Junior consultant – 2 years professional experience in the development and financing of bioenergy projects including biogas technology. <p>(c) Indicate management and implementation plan.</p>	<p>35%</p>
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