REQUEST FOR PROPOSALS (RFP)
RFP/2024/008 – Amendment 1

For the provision of a cutting-edge AI-powered solution to streamline the data collection, enhancement, and proposal processes for the IRENA REmap tool.

International Renewable Energy Agency
Abu Dhabi, UAE

The International Renewable Energy Agency (IRENA) does not charge a fee at any stage of the procurement process (e.g. vendor registration, bid submission or any other stage). In the event that you have any reason to suspect that any activity purporting to be made on behalf of IRENA may be fraudulent, please contact procurement@irena.org.

15 August 2024

Section 1: Letter of Invitation

Abu Dhabi, United Arab Emirates
05/09/2024

Dear Madam or Sir,

The International Renewable Energy Agency (IRENA) hereby invites you to submit a Proposal to this Request for Proposal (RFP) for the provision of a cutting-edge AI-powered solution to streamline the data collection, enhancement, and proposal processes for the IRENA REmap tool.

1. This RFP includes the following documents:

   Section 1 – This Letter of Invitation
   Section 2 – Instructions to Proposers, including the Data Sheet
   Section 3 – Terms of Reference, including technical evaluation criteria
   Section 4 – General Terms and Conditions for Professional Services
   Section 5 – Form of Contract
   Section 6 – Proposal Submission Form
   Section 7 – Documents Establishing the Eligibility and Qualifications of the Proposer
   Section 8 – Technical Proposal Form
   Section 9 – Financial Proposal Form
   Section 10 – Form for Performance Security – Not Applicable
   Section 11 – Form of Bank Guarantee for Advance Payment – Not Applicable

2. Your offer comprising a Technical and Financial Proposal, in separate files(pdf.), should be submitted in accordance with the Data Sheet.

3. You are kindly requested to submit an acknowledgment letter to IRENA via the following email address: procurement@irena.org.

4. The letter should be received by IRENA no later than 30 August 2024 at 23:59 Hours Gulf Standard Time. The same letter should advise whether your company intends to submit a Proposal. If your company decides not to submit a proposal, we would appreciate it if you would kindly indicate the reason for our records.

5. Should you need further clarification, kindly communicate with the contact person indicated in the attached Data Sheet as the focal point for queries relating to this RFP.

We look forward to receiving your Proposal and thank you in advance for your interest in IRENA procurement opportunities.

Yours sincerely,

Amel ElTayeb

Acting Chief Procurement Officer
Amel ElTayeb

Section 2: Instruction to Proposers

Definitions of Terms

a) *"Contract"* refers to the agreement that will be signed by and between the IRENA and the successful Proposer and all the attached documents thereto, including the General Terms and Conditions for Professional Services (GTC) and the Appendices.

b) "*Country"* refers to the country in which the Services are to be performed as indicated in the Data Sheet.

c) *"Data Sheet"* refers to such part of the Instructions to Proposers used to reflect conditions of the tendering process that are specific for the requirements of the RFP.

d) *"Day"* refers to calendar day.

e) *"Instructions to Proposers"* (Section 2 of the RFP) refers to the complete set of documents which provides Proposers with all information needed and procedures to be followed in the course of preparing their Proposals.

f) *"LOI"* (Section 1 of the RFP) refers to the Letter of Invitation being sent by IRENA to the Proposers.

g) *"Material Deviation"* refers to any content or characteristic of the Proposal that is significantly different from an important aspect or requirement of the RFP, substantially alters the scope and quality of the requirements, limits the rights of IRENA and/or the obligations of the Proposer, or compromises the competitive position of other Proposers or otherwise adversely impacts the fairness and principles of the procurement process.

h) *"Proposal"* refers to the Proposer's response to the RFP, including the Proposal Submission Form, Technical and Financial Proposal and all other documentation attached thereto as required by the RFP.

i) *"Proposer"* refers to any legal entity that may submit, or has submitted, a Proposal for the provision of Services requested by IRENA through this RFP.

j) *"RFP"* refers to the Request for Proposals consisting of instructions and references prepared by IRENA for the purposes of selecting the best service provider to perform the Services described in the Terms of Reference.

k) *"Services"* refers to the entire scope of tasks and deliverables requested by IRENA under the RFP.

l) "*Supplemental Information to the RFP"* refers to a written communication issued by IRENA to prospective Proposers containing clarifications, responses to queries received from prospective Proposers, or changes to be made to the RFP, before the deadline for the submission of Proposals.

m) *"Terms of Reference"* or *"TOR"* refers to the document included in this RFP as Section 3 which describes the objectives, scope of services, activities, tasks to be performed, responsibilities of the Proposer, expected results and deliverables and other data pertinent to the performance of the range of duties and services expected of the successful Proposer.

A. GENERAL

1. IRENA hereby solicits Proposals in response to this RFP. Proposers must strictly adhere to all the requirements of this RFP. No changes, substitutions or other alterations to the provisions stipulated in this RFP may be made or assumed unless approved in writing by IRENA in the form of Supplemental Information to the RFP. However, whilst fully complying with the RFP requirements, Proposers are encouraged to provide any suggestions and solutions that may achieve a more cost-effective and value-for-money approach to fulfilling the requirements of this RFP.

2. Submission of a Proposal shall be deemed to constitute an acknowledgement by the Proposer that all obligations stipulated in this RFP shall be met and that, unless specified otherwise, the Proposer has read, understood and agreed to all the instructions provided in this RFP.

3. Any Proposal submitted will be regarded as an offer by the Proposer and shall not constitute or imply the acceptance of any Proposal by IRENA. This RFP does not commit IRENA to award a contract. The Proposal submitted by the successful Proposer will be the basis for negotiations which may lead to conclusion of a Contract with the successful Proposer.

4. IRENA implements a policy of zero tolerance on proscribed practices, including fraud, corruption, collusion, and unethical practices. IRENA is committed to preventing, identifying and addressing all acts of fraud and corrupt practices against IRENA as well as third parties involved in IRENA's activities.

5. Proposers shall not be in any position of conflict of interest arising from their current or future work with respect to IRENA. All Proposers found to have a conflict of interest shall be disqualified. Without limitation on the generality of the above, Proposers shall be considered to have a conflict of interest if they:

    5.1 are or have been associated in the past, with a firm or any of its affiliates which have been engaged with IRENA to provide services for the preparation of the design, specifications, Terms of Reference and other documents to be used for the procurement of the Services;

    5.2 were involved in the preparation and/or design of the programme/project related to the Services;

    5.3 have owners, officers, directors, controlling shareholders, or key personnel who are related to IRENA personnel involved in procurement functions; or

    5.4 are found to be in conflict for any other reason, as may be established by and at the discretion of IRENA.

6. Proposers shall disclose in their Proposal their knowledge of any other circumstances that could potentially lead to actual or perceived conflict of interest, collusion or unfair competition practices. Failure of such disclosure may result in the rejection of the proposal or proposals affected by the non-disclosure.

7. More than one Proposal from any company, either in its own name or as part of a joint venture, consortium or partnership, shall not be considered. If any Proposer submits or participates in more than one Proposal in response to this RFP, all such Proposals shall be disqualified and rejected. If IRENA has reasons to believe that collusion exists between Proposers, all such Proposers shall be disqualified.

B. CONTENTS OF PROPOSAL

8. Sections of Proposal

Proposers are required to complete, sign and submit in the number of copies indicated in the **Data Sheet** (DS no. 18) the following documents:

8.1 Proposal Submission Form (see Section 6 of this RFP);

8.2 Documents Establishing the Eligibility and Qualifications of the Proposer (see Section 5 and the Data Sheet (DS no. 23) of this RFP);

8.3 Technical Proposal Form (see Section 8 of this RFP);

8.4 Financial Proposal Form (see Section 9 of this RFP); and

8.5 Any attachments and/or appendices to the Proposal, including those specified in the Data Sheet (DS no. 24).

9. Clarification of Request for Proposals

Proposers may request a clarification of any of the RFP documents no later than the deadline for the submission of requests for clarification indicated in the **Data Sheet** (DS no. 16). Any request for clarification must be sent in writing to the IRENA email address indicated in the **Data Sheet** (DS no. 17). IRENA will respond in writing by electronic means and will send written response (including an explanation of the query but without identifying the source of inquiry) to all Proposers who have provided confirmation of their intention to submit a Proposal.

IRENA shall endeavour to provide such responses to clarifications in an expeditious manner, but any delay in such response shall not cause an obligation on the part of IRENA to extend the submission date of the Proposals, unless IRENA deems that such an extension is justified and necessary.

10. Amendment of Request for Proposals

At any time prior to the deadline for submission of Proposals, IRENA may for any reason, such as in response to a clarification requested by a Proposer, make changes to the RFP in the form of a Supplemental Information to the RFP. All Proposers who have provided confirmation of their intention to submit a Proposal will be notified in writing of all amendments to the RFP.

In order to afford prospective Proposers reasonable time to consider the amendments in preparing their Proposals, IRENA may, at its discretion, extend the deadline for submission of Proposals, if the nature of the amendment to the RFP justifies such extension.

C. PREPARATION OF PROPOSALS

11. Cost of Proposal

The Proposer shall bear any and all costs related to the preparation and/or submission of the Proposal, regardless of whether its Proposal is selected or not. IRENA shall in no case be responsible or liable for those costs, regardless of the conduct or outcome of the process.

12. **Language of Proposal**

The Proposal, as well as all related correspondence exchanged by the Proposer and IRENA, shall be written in the English language, unless a language other than English has been specified in the **Data Sheet** (DS no. 4). Any printed literature furnished by the Proposer written in a language other than the language specified in the **Data Sheet** (DS no. 4) must be accompanied by a translation into the language specified in the **Data Sheet** (DS no. 4). For the purposes of interpretation of the Proposal and in the event of any discrepancy or inconsistency in meaning, the version translated into the language specified in the **Data Sheet** (DS no. 4) shall prevail.

13. **Proposal Submission Form**

Proposers shall submit their Proposals using the Proposal Submission Form furnished in Section 6 of the RFP.

14. **Technical Proposal Format and Content**

Unless otherwise stated in the **Data Sheet (**DS no. 24), the Proposer shall structure the Technical Proposal in the format provided in Section 8 and in accordance with the following:

14.1 Expertise of Firm/Organisation – this section shall provide details regarding the management structure of the Proposer, organisational capability/resources, the experience of the Proposer, the list of projects/contracts (both completed and ongoing, both domestic and international) which are related or similar in nature to the requirements of the RFP, and proof of financial stability and adequacy of resources to complete the Services (see Clause 15 of this Section 2 for further details).

14.2 Proposed Methodology, Approach and Implementation Plan – this section should demonstrate the Proposer's response to the Terms of Reference by: identifying the specific components proposed, how the requirements shall be addressed, as specified, point by point; providing a detailed description of the essential performance characteristics proposed; identifying the works/portions of the work that will be subcontracted; and demonstrating how the proposed methodology meets or exceeds the specifications, while ensuring appropriateness of the approach to the local conditions and the rest of the project operating environment. This methodology must be laid out in an implementation timetable that is within the duration of the Contract as specified in the Terms of Reference.

14.3 Management Structure and Key Personnel – This section should include the comprehensive curriculum vitae (CVs) of key personnel that will be assigned to support the implementation of the proposed methodology, clearly defining the roles and responsibilities vis-à-vis the proposed methodology. CVs should establish competence and demonstrate qualifications in areas relevant to the TOR.

In complying with this sub-section 14, the Proposer assures and confirms to IRENA that the personnel being nominated are available to implement the Services within the duration of the Contract indicated in the Terms of Reference. If, at any time prior to award of the Contract, any of the key personnel listed in the Technical Proposal become unavailable, except for unavoidable reasons such as death, medical incapacity or delay in the implementation of the Services through no fault of the Proposer, IRENA reserves the right to consider the Proposal non-responsive. Any substitution of personnel arising from

unavoidable reasons shall be made only with IRENA's approval of the justification for the substitution and with IRENA's approval of the replacement, who shall be of either equal or superior credentials to the one being replaced and which shall not involve any additional cost to IRENA.

The Technical Proposal shall not include any financial information. A Technical Proposal containing any form of financial information that could lead to the determination of the price offer may be declared non-compliant.

15. **Financial Proposals**

The Financial Proposal shall be prepared using the attached standard form provided in Section 9. It shall list all major cost components associated with the services, and the detailed breakdown of such costs. All outputs and activities described in the Technical Proposal must be priced separately on a one-to-one correspondence. Any output and activities described in the Technical Proposal but not priced in the Financial Proposal, shall be assumed to be included in the prices of other activities or items, as well as in the final total price.

16. **Currencies of Proposals**

All prices from Proposers shall be quoted in the preferred currency indicated in the **Data Sheet** (DS no. 15).

16.1 Should the Proposer submit a Financial Proposal in a currency that is different from the preferred currency specified in the Data Sheet (DS no. 15), IRENA will convert the currency quoted in the Proposal to the preferred currency in accordance with the prevailing United Nations operational rate of exchange on the deadline for submission of Proposals; and

16.2 In the event that the Proposal that is found to be the most responsive to the RFP requirements is quoted in a currency different from the preferred currency indicated in the Data Sheet (DS no. 15), IRENA reserves the right to award the Contract in the preferred currency specified in the Data Sheet (DS no. 15) using the conversion method specified in sub-section 16.1 above.

17. **Documents Establishing the Eligibility and Qualifications of the Proposer**

The Proposer shall furnish evidence of its status as an eligible and qualified vendor, using the forms provided in Section 7 of this RFP, with such eligibility and qualifications to be documented to IRENA's satisfaction. This evidence shall include, and must demonstrate, the following:

17.1 That, in the case of a Proposer offering to supply goods under the Contract which the Proposer did not manufacture or otherwise produce, the Proposer has been duly authorised by the goods' manufacturer or producer to supply the goods in the country of final destination; and

17.2 That the Proposer has the financial, technical, and production capability necessary to perform the Contract.

18. **Joint Venture, Consortium or Association**

If the Proposer is a group of legal entities that will form or have formed a joint venture, consortium, or association at the time of the submission of the Proposal, all of the members of the joint venture/consortium/association shall submit, along with the Proposal, a duly notarised agreement

confirming that they have designated one member to act as the lead entity duly vested with the authority to bind the members of the joint venture/consortium/association jointly and severally, and that if their Proposal is selected, the Contract shall be negotiated and entered into between IRENA and the designated lead entity who shall be acting for and on behalf of all the members of the joint venture/consortium/association.

After the Proposal has been submitted to IRENA, neither the lead entity nor the composition or constitution of the joint venture/consortium/association shall be altered without the prior consent of IRENA.

The organisation of the joint venture/consortium/association must clearly define the role of each of its component/member entities in the course of performing the Services.

Where a joint venture/consortium/association is presenting its track record and experience in a similar undertaking as those required in the TOR, it should present such information in the following manner:

- Those that were undertaken together by the joint venture/consortium/association; and
- Those that were undertaken by the individual members of the joint venture/consortium/association expected to be involved in the performance of the Services.

Previous contracts completed by individual experts working privately but who are permanently or were temporarily associated with the joint venture/consortium/association or any of its members cannot be claimed as the experience of the joint venture/consortium/association or those of any of its members, but should only be claimed by the individual experts themselves in their presentation of their credentials.

19. **Alternative Proposals**

Unless otherwise specified in the **Data Sheet** (DS no. 6), alternative proposals shall not be considered. Where alternative proposals are allowed in the **Data Sheet** (DS no. 6), IRENA reserves the right to award a Contract based on an alternative proposal when the conditions for its acceptance are met.

20. **Period of Validity**

Proposals shall remain valid for the period specified in the **Data Sheet (**DS no. 8**)**, commencing on the deadline for submission also indicated in the **Data Sheet** (DS no. 20). A Proposal valid for a shorter period shall be immediately disqualified and rejected by IRENA.

In exceptional circumstances, prior to the expiration of the proposal validity period, IRENA may request Proposers to extend the period of validity of their Proposals. The request and the responses shall be made in writing, and shall be considered integral to the Proposal.

D. SUBMISSION AND OPENING OF PROPOSALS

21. **Submission and Opening of Proposals**

21.1 The Technical Proposal and the Financial Proposal files must be separate and each of them must be submitted individually and clearly marked as either “TECHNICAL PROPOSAL” or “FINANCIAL PROPOSAL”, as appropriate.

21.2 The Proposer shall assume the responsibility for the misplacement or premature opening of Proposals due to improper labelling.

21.3 Proposers must always submit their Proposals by email.

21.4 Proposers must be aware that the mere act of submission of a Proposal, in and of itself, implies that the Proposer accepts the General Terms and Conditions for Professional Services in full as attached hereto as Section 4.

22. **Deadline for Submission of Proposals and Late Proposals**

22.1 Proposals must be received by IRENA at the email address and no later than the date and time specified in the Data Sheet (DS nos. 19 and 20).

22.2 IRENA shall not consider any Proposal that arrives after the deadline for submission of Proposals. Any Proposal or modification of a Proposal that is received by IRENA after the deadline for submission of Proposals shall be declared late, rejected, and returned unopened to the Proposer.

23. **Withdrawal, Substitution, and Modification of Proposals**

23.1 Proposers are expected to have sole responsibility for taking steps to carefully examine in detail the full consistency of their Proposals to the requirements of the RFP, keeping in mind that material deficiencies in providing information requested by IRENA or a lack of clarity in the description of services to be provided may result in the rejection of the Proposal. IRENA shall not assume any responsibility regarding erroneous interpretations or conclusions made by the Proposer in understanding the RFP.

23.2 A Proposer may withdraw, substitute or modify its Proposal after it has been submitted by sending a written notice in accordance with Clause 21.1 of this Section 2, duly signed by an authorised representative, and shall include a copy of the authorisation (or a Power of Attorney). The corresponding substitution or modification of the Proposal must accompany the written notice. All notices must be received by IRENA prior to the deadline for submission of Proposals and submitted in accordance with Clause 21.1 of Section 2 (except that withdrawal notices do not require copies). The respective envelopes shall be clearly marked "WITHDRAWAL," "SUBSTITUTION," or "MODIFICATION".

23.3 Proposals requested to be withdrawn shall be returned unopened to the Proposers.

23.4 No Proposal may be withdrawn, substituted, or modified in the interval between the deadline for submission of Proposals and the expiration of the period of proposal validity specified by the Proposer on the Proposal Submission Form or any extension thereof.

24. **Proposal Opening**

24.1 IRENA will open the Proposals in the presence of an ad-hoc committee of at least two (2) members formed by IRENA.

24.2 The Proposers' names, withdrawals, substitutions and modifications, the condition of the labels of the files, the presence or absence of required documents, and such other details as IRENA may

consider appropriate will be announced at the opening. No Proposal shall be rejected at the opening stage, except for late submission, for which the Proposal shall be returned unopened to the Proposer.

25. **Confidentiality**

25.1 Information relating to the examination, evaluation, and comparison of Proposals and recommendation of contract award shall not be disclosed to Proposers or any other persons not officially concerned with such process, even after publication of the contract award.

25.2 Any effort by a Proposer to influence IRENA in the examination, evaluation and comparison of the Proposals or contract award decisions may, at IRENA's decision, result in the rejection of its Proposal.

25.3 In the event that a Proposer is unsuccessful, the Proposer may seek a meeting with IRENA for a debriefing. Such debriefing shall be limited to discussing the strengths and weaknesses of the Proposal of said Proposer in order to assist the Proposer in improving future proposals to IRENA. The content of other Proposals, their evaluation and how they compare to the Proposer's Proposals shall not be discussed.

26. **Clarification of Proposals**

To assist in the examination, evaluation and comparison of Proposals, IRENA may, at its discretion, ask any Proposer for a clarification of its Proposal.

IRENA's request for clarification and the response shall be in writing. Notwithstanding the written communication, no change in the prices or substance of the Proposal shall be sought, offered, or permitted, except to provide clarification, and confirm the correction of any arithmetic errors discovered by IRENA in the evaluation of the Proposals, in accordance with Clause 30 of this Section 2.

Any unsolicited clarification submitted by a Proposer in respect to its Proposal, which is not a response to a request by IRENA, shall not be considered during the review and evaluation of the Proposals.

E. EVALUATION AND COMPARISON OF PROPOSALS

27. **Preliminary Examination of Proposals**

27.1 IRENA shall examine the Proposals to determine whether they are complete, whether the documents have been properly signed, and whether the Proposals are generally in order. IRENA reserves the right to reject any Proposal after preliminary examination of the Proposal, if IRENA finds a reason for such rejection, including but not limited to the discovery of significant or material deviation, conflict of interest or fraud, among others.

27.2 IRENA shall reject the Proposal of any Proposer found to appear in a United Nations Security Council sanctions list or such ineligibility lists as may be established or recognised by IRENA in accordance with its applicable rules, policies and procedures.

28. **Evaluation of Proposals**

28.1 IRENA shall examine the Proposal to confirm that the IRENA General Terms and Conditions for Professional Services and any Special Conditions of the RFP have been accepted by the Proposer without any deviation or reservation.

28.2 In the first stage, the evaluation committee shall review and evaluate the Technical Proposals on the basis of their responsiveness to the Terms of Reference and other requirements in the RFP, applying the evaluation criteria, sub-criteria, and point system specified in the Data Sheet (DS no. 26). Each responsive Proposal will be given a technical score. A Proposal shall be rendered non-responsive at this stage if it does not substantially respond to the RFP, and particularly the Terms of Reference, or if it fails to achieve the minimum technical score indicated in the Terms of Reference. No changes shall be made by IRENA to the criteria, sub-criteria and point system indicated in the Data Sheet (DS no. 26) after all Proposals have been received.

28.3 In the second stage, only the Financial Proposal of those Proposers that achieve the minimum technical score will be opened for evaluation. The Financial Proposals corresponding to Technical Proposals that did not meet the minimum passing technical score shall be returned to the relevant Proposers unopened. The overall evaluation score will be based either on a combination of the technical and financial scores, or on the lowest evaluated financial proposal of the technically qualified Proposers. The evaluation method that applies for this RFP shall be as indicated in the Data Sheet (DS no. 22).

28.4 IRENA reserves the right to undertake a post-qualification exercise aimed at determining to its satisfaction the accuracy, authenticity and validity of information provided by the Proposer through verification and reference checking, among other means that it deems appropriate, at any stage within the selection process.

28.5 When the Data Sheet (DS no. 22) specifies that the evaluation method to be used shall be the combined scoring method, the formula for evaluating the Proposals shall be as follows:

$$\mathbf{p = y\,(x/z)}$$

where:

p = weighted percentage points for the Financial Proposal being evaluated
y = maximum weighted percentage number of points for the Financial Proposal, as indicated in the **Data Sheet** (DS no. 22)
x = price of the lowest priced Proposal
z = price of the Proposal being evaluated based on a combination of the technical and financial scores

29. Responsiveness of Proposal

29.1 IRENA's determination of a Proposal's responsiveness is to be based on the contents of the Proposal itself.

29.2 A substantially responsive Proposal is one that conforms to all the terms, conditions, and specifications of the RFP without material deviation, reservation, or omission.

29.3 If a Proposal is not substantially responsive, it shall be rejected by IRENA and may not subsequently be made responsive by the Proposer by correction of the material deviation, reservation, or omission.

30. **Nonconformities, Errors and Omissions**

30.1 Provided that a Proposal is substantially responsive, IRENA may waive any non-conformities or omissions in the Proposal that do not constitute a material deviation.

30.2 Provided that a Proposal is substantially responsive, IRENA may request the Proposer to submit the necessary information or documentation, within a reasonable period of time, to rectify nonmaterial nonconformities or omissions in the Proposal related to documentation requirements. Failure of the Proposer to comply with the request may result in the rejection of its Proposal.

30.3 Provided that the Proposal is substantially responsive, IRENA shall correct arithmetical errors on the following basis:

30.3.1 If there is a discrepancy between the unit price and the line item total that is obtained by multiplying the unit price by the quantity, the unit price shall prevail and the line item total shall be corrected, unless in the opinion of IRENA there is an obvious misplacement of the decimal point in the unit price, in which case the line item total as quoted shall govern and the unit price shall be corrected;

30.3.2 If there is an error in a total corresponding to the addition or subtraction of subtotals, the subtotals shall prevail and the total shall be corrected; and

30.3.3 If there is a discrepancy between words and figures, the amount in words shall prevail, unless the amount expressed in words is related to an arithmetic error, in which case the amount in figures shall prevail subject to the above.

30.4 If the Proposer does not accept the correction of errors made by IRENA, its Proposal shall be rejected.

F. AWARD OF CONTRACT

31. **Right to Accept, Reject, or Render Non-Responsive Any or All Proposals**

IRENA reserves the right to accept or reject any Proposal, to render any or all Proposals as non-responsive, and to annul the solicitation process and reject all Proposals at any time prior to award of Contract, without thereby incurring any liability to the affected Proposer(s), or any obligation to inform the affected Proposer(s) of the grounds for IRENA's action. Furthermore, IRENA shall not be obliged to award the Contract to the Proposer that submitted the lowest priced Proposal.

32. **Award Criteria**

Prior to the expiration of Proposal validity, IRENA shall award the Contract to the qualified Proposer with the highest score based on the evaluation method indicated in the **Data Sheet** (DS no. 22).

33. **Contract Signature**

Within fifteen (15) days from the date of receipt of the Contract negotiated between IRENA and the successful Proposer, the successful Proposer shall sign and date the Contract and return it to IRENA.

34. **Performance Security**

34.1 A performance security, if required, shall be provided in the amount and form and by the deadline indicated in the Data Sheet (DS nos. 9 and 10), as applicable.

34.2 Failure of the successful Proposer to comply with the requirement of RFP Clause 33 or RFP Clause 35 shall constitute sufficient grounds for the annulment of the award and forfeiture of the performance security if any, on which event IRENA may award the Contract to the Proposer with the second highest rated Proposal, or call for new Proposals.

35. **Right to Vary Requirements at the Time of Award**

At the time of award of Contract, IRENA reserves the right to vary the quantity of services and/or goods, by up to a maximum ten per cent (10%) of the total offer, without any change in the unit price or other terms and conditions.

36. **Bank Guarantee for Advance Payment**

Except when the interests of IRENA so require, it is IRENA's policy to make no advance payment(s) on contracts. In the event that the Proposer requires an advance payment and if such request is duly accepted by IRENA, and the said advance payment exceeds 20% of the total proposal price or the amount of $30,000, IRENA shall require the Proposer to submit a bank guarantee in the same amount as the advance payment and in the form provided in Section 11.

37. **Proposer's Conference**

When appropriate, a pre-proposal conference will be conducted at the date, time and location specified in the **Data Sheet** (DS no. 7). All Proposers are encouraged to attend. Non-attendance, however, shall not result in disqualification of an interested Proposer. Minutes of the Proposers' conference will be either posted on the IRENA website or disseminated to the individual firms that have registered or expressed interest in the RFP, whether or not they attended the conference. No statement made during the conference shall modify the terms and conditions of the RFP unless such statement is issued as an amendment in the form of a Supplemental Information to the RFP.

38. **Vendor Protest**

The IRENA vendor protest procedure provides an opportunity for appeal to those persons or firms not awarded a purchase order or contract through a competitive procurement process. This procedure is not available to Proposers whose Proposals were rejected. In the event that you believe you have not received fair treatment, the following email provides further details regarding IRENA vendor protest procedures: awardreview@irena.org.

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Instructions to Proposers

DATA SHEET

The following data for the services to be procured shall complement, supplement, or amend the provisions in the Instruction to Proposers. In the case of a conflict between the Instruction to Proposers and the Data Sheet, the provisions in the Data Sheet shall prevail**.**

DS no.	Data	Specific Instructions
1.	Reference number:	RFP-2024-008
2.	Title of Services/Work:	For the provision of a cutting-edge AI-powered solution to streamline the data collection, enhancement, and proposal processes for the IRENA REmap tool.
3.	Country:	IRENA Office Bonn, Germany
4.	Language of the Proposal:	English only
5.	Conditions for submitting Proposals for parts or sub-parts of the TOR	☐ Allowed ☒ Not allowed
6.	Conditions for submitting alternative Proposals	☒ Shall not be considered ☐ Shall be considered
7.	A pre-proposal conference will be held:	☒ No ☐ Yes
8.	Period of Proposal validity commencing on the deadline of submission of Proposals	☒ 90 days ☐ 120 days
9.	Performance security	☐ Required ☒ Not required
10.	Acceptable forms of performance security	☐ Bank guarantee ☐ Manager's cheque/cashier's cheque/certified cheque

		☐ Others ☒ Not applicable
11.	Validity of performance security	Not Applicable
12.	Proposal prices shall be subjected to taxation	☒ Yes, please submit Proposal prices inclusive of all applicable taxes ☐ No, please submit Proposal prices exclusive of all taxes
13.	Advanced payment upon signing of contract	☐ Allowed up to a maximum of ____% of the contract price ☒ Not allowed
14.	Liquidated damages	☐ Will not be imposed ☒ Will be imposed under the following conditions: In accordance with: RFP Section 4: General Terms and Conditions for Professional Services, Clause 23. Liquidated damages for delay After which IRENA may terminate the Contract.
15.	Preferred currency of Proposal and method for currency conversion	USD
16.	Deadline for submitting requests for clarifications/questions	Date: 16 September 2024 Time: 23:59 hours Abu Dhabi Time (Gulf Standard Time Zone)
17.	Contact Details for submitting clarifications/questions	Focal Person in IRENA: Arslan Ahmad Address: IRENA Procurement Office E-mail address dedicated for this purpose: procurement@irena.org cc aahmad@irena.org

18.	No. of copies of Proposal that must be submitted	Original: 1 copy of each Technical and Financial offer to be sent via email
19.	Proposal submission address	Bids must be submitted electronically only to bids@irena.org.
20.	Deadline of submission of Proposals	Date: 30 September 2024 Time: 23:59 hours Abu Dhabi Time (Gulf Standard Time Zone)
21.	Date, time and venue for opening of Proposals	Date: 01 October 2024 Time: 09:00 Hours Abu Dhabi Time (Gulf Standard Time Zone) Venue: IRENA HQ, Procurement Office
22.	Evaluation method to be used in selecting the most responsive Proposal	☐ Lowest financial offer of technically qualified Proposals. The minimum passing technical score for Technical Proposals shall be *[insert]*. ☒ Combined scoring method, using the 70%-30% distribution for Technical and Financial Proposals, respectively. The passing score for technical evaluation is 70%. ☐ Combined scoring method, using the 60%-40% distribution for Technical and Financial Proposals, respectively. ☐ Combined scoring method, using the 50%-50% distribution for Technical and Financial Proposals, respectively.
23.	Required documents that must be submitted to establish qualification of Proposers (In "Certified True Copy" form only)	☒ Company profile, which should not exceed forty (40) pages, including CVs of all personnel that shall be performing the Services, projects implemented, and details relevant to the Services being procured. ☒ Valid certificate of registration of the business, including Articles of Incorporation or equivalent document if Proposer is not a corporation.

		☒ Quality certificate (e.g., ISO, etc.) and/or other similar certificates, accreditations, awards and citations received by the Proposer, if any. ☒ Project implementation plan
24.	Other information related to the RFP	Not applicable
25.	Expected date for commencement of Contract	Subject to the contract award date
26.	Criteria for the evaluation of Proposals	As specified in the TOR

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Section 3: Terms of Reference (TOR)

For the provision of a cutting-edge AI-powered solution to streamline the data collection, enhancement, and proposal processes for the IRENA REmap tool.

International Renewable Energy Agency (IRENA)
IITC, Bonn Office

BACKGROUND

The International Renewable Energy Agency (IRENA) is an inter-governmental organization, 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 offshore wind power.

The IRENA Innovation and Technology Centre (IITC) is responsible for the provision of the means for an accelerated renewable energy technology uptake, considering national conditions of resource endowment, social and economic frameworks. In accordance with the IRENA Statute, activities in this field include analysis of renewable energy technology policies; dissemination of information and increased awareness; technologies and equipment overview and assessment of success- failure factors; improved pertinent knowledge and technology transfer, and joint RD&D and provision of information about the development and deployment of national and international technical standards in relation to renewable energy.

The IRENA Innovation and Technology Centre (IITC) focused on supporting the energy transition of countries by providing tools, data, and analytics to empower decision-makers in implementing energy policies and technologies. With a diverse set of tools, models, and databases at its disposal, the IITC plays a crucial role in analyzing and modeling energy systems. The IRENA is committed to facilitating the energy transition globally by empowering decision-makers with the necessary tools and data. This last one being a vital input for the development of energy plans, roadmaps and analyses.

IITC developed a REmap tool that is used to produce IRENA's renewables energy roadmaps at the country, regional and global levels. The roadmaps encompass the whole energy system, including end-use sectors (transport, buildings, industry, and other consumption), transformation centers (power plants, heat plants, hydrogen production, bioenergy, etc.) and primary supply. Each of these sectors is further subdivided into subsectors, modes and services, technologies, and carriers. This creates a rich description of the energy system and allows for granular modelling of different options in terms of energy demand and supply.

This, however, requires that a large amount of input data should be collected and inputted in the tool. For the different sectors and subsectors, that data might include levels of activity, equipment stock, specific energy consumption, energy efficiency, usage factors, technology mixes, carriers mixes, energy imports and exports, material use, population, GDP, and many other technical and economic factors. The relevant data must be collected for both historical values and any available information for future projections published by countries and/or regions. The datasets are pivotal to run comprehensive and robust renewable energy roadmaps to inform countries on their potential to scale up renewables. The roadmap focuses on renewable power technologies including heating, cooling, transport, and buildings.

Gathering this data requires a significant number of resources to identify data sources, assess data quality, extract the data from the source, transform the data to fit input table formats, and input transformed data into the REmap tool. In many cases there are remaining important data gaps which require further analysis so that complete data can be inputted in the tool. To do that, estimates are often made based on historical trends and forecasts and using proxy values from neighboring or similar countries and regions.

Ideally, all data should always be kept up to date, which means the data collection effort needs to be repeated on a regular (annual or bi-annual) basis; maintaining a record of the previous years' data, to identify and track significant deviations.

OBJECTIVES

IITC aims to procure a cutting-edge AI-powered solution to streamline the data collection, enhancement, and proposal processes for the IRENA REmap tool. The primary objectives include:

- Automating the search and identification of pertinent data from diverse sources, while maintaining the information on the data sources, definitions and context
- Provide the data source and identify instances of multiple sources for a given parameter, enabling users to evaluate and select the most relevant and reliable source.
- Employing advanced information extraction techniques to extract relevant data from unstructured data sources.
- Employing imputation methods to address missing values within the dataset wherever feasible.
- Processing, restructuring, and transforming datasets to conform to the input requirements of the IRENA REmap tool, ensuring compatibility and optimal utilization, while maintaining the trackability and transparency of the data processing.
- Implementing evaluation metrics and performance assessment methodologies to ensure the accuracy, efficiency, and reliability of the AI-driven data mining process.

This initiative is designed to minimize the manual effort and time required for data gathering and enhancement, while ensuring the utmost accuracy and dependability of the resultant datasets and analytical insights. By achieving these objectives, analysts can redirect their focus towards offering valuable advice to policymakers and interpreting the outcomes derived from the REmap tool.

The proposed focus of this pilot project is data collection for energy modelling in the buildings end-use sector. The buildings sector is subdivided into two subsectors: residential and non-residential (commercial, public, etc.) buildings. Each of those is further subdivided into energy services: cooking, lighting, water heating, space heating, space cooling, appliances (residential buildings only), electrification and other consumption. Energy demand is determined for each of these services in each of the subsectors, in a total of 15 modules of energy demand. The data needed to model these energy services includes, but is not limited to, the following: population, number of households, floor area, access to energy services, hours and days of use, specific energy consumption, equipment stock, technology and carrier mixes. A detailed description of the energy modelling equations and all data input needs is presented in Annex 1.

The geographical scope of this pilot project is global, with a strong focus on the G20 countries. The unit of analysis is the country. So ideally the solution developed should gather data at the country level with global coverage and strong focus on G20 countries for this pilot phase.

SCOPE OF WORK

- Data Search and Identification

  Develop AI algorithms to search and identify relevant data points from various sources such as online databases (including databases paid for by IRENA), reports, and other relevant (public) documents; as well as indicate how many times the sourced has been cited or any other metric to assess Prior to the commencement of the project, IRENA (and the vendor) will define the quality of the various data sources (e.g., the official statistics from country statistics office to be prioritized over gray publications), so that the data search can prioritize the type of data sources with higher quality.

- Data Collection and Completion

Develop AI algorithms to construct the dataset by collecting and preprocessing the identified data points and completing missing data where possible, using techniques such as data imputation and prediction.

In parallel, the algorithm should generate the corresponding "metadata", in a database format including but not limited to sources, date of publication, date of access of the information, units, name of website/entity of the source, links/URL, and other parameter, to facilitate further collection, tracking and transparency of the analysis done using the data.

- Data Set Processing and Transformation

Develop AI algorithms that process and transform the data so that it can be used as inputs for the IRENA REmap tool, based on the collected and completed data. The tool should allow users to customize and filter data sources at each stage of data processing.

- Insights Generation

Develop AI algorithms to analyze the proposed data sets and draw insights to analysts using the tool.

The selected company must adhere to stringent data privacy and security standards, ensuring compliance with relevant regulations and implementing measures for data anonymization, encryption, and secure handling. Prioritizing ethical AI principles, including fairness, transparency, and accountability, and addressing potential biases in data and algorithms.

The solution should be scalable and flexible to accommodate future growth and seamlessly integrated with existing tools, such as the IRENA REmap tool. Since the proposed solution would be a bespoke solution, the ownership of bespoke solution will rest with IRENA. The vendor must handover source code and project documentation of software to IRENA.

The selected vendor must utilize Microsoft Azure AI services for the development and deployment of the AI solution. The solution should leverage Azure's scalability, security, and compliance features to ensure the efficient and secure processing of data. Integration with other Azure services within our organization's ecosystem, such as Azure Storage and Azure SQL Database, is required for seamless data exchange and workflow automation. The vendor should also consider cost management principles to ensure the AI solution remains cost-effective and aligns with budgetary constraints.

DELIVERABLES

- An AI-powered solution capable of searching, identifying, collecting, completing, and transforming datasets for the IRENA REmap tool.
- A user-friendly interface for end-users to easily access and understand the insights generated by the AI solution.
- Comprehensive training and ongoing support for end-users post-deployment for a reasonable period of time during the initiation implementation phase, ensuring proficiency in utilizing the solution to its full potential and maximizing its impact on decision-making processes; including but not limited to virtual and on-site sessions and reference videos.

ESTIMATED COMPLETION DATES OF DELIVERABLES

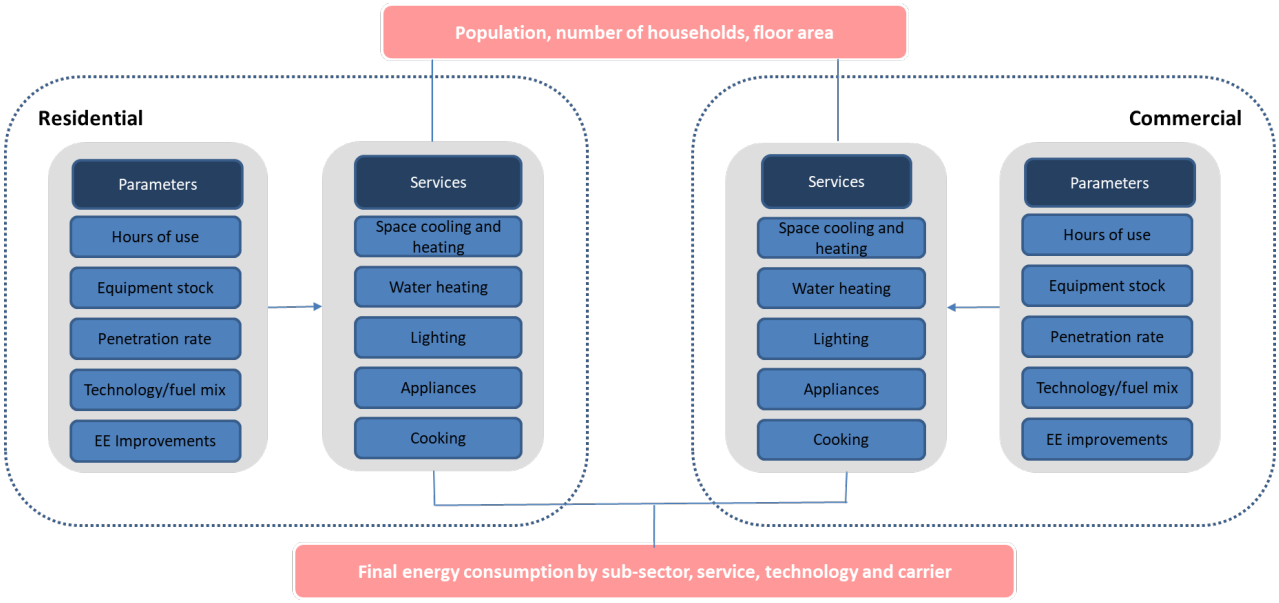
The contractor is to propose a timeline and schedule for the development of this solution. The timeline should include client testing, validation throughout the development process, training, and support to users for at least a 6-month period after deployment.

Annex 1 – Detailed description of the buildings energy model and data requirements

The buildings sector is subdivided in two subsectors:

- Residential buildings
- Commercial buildings (more properly non-residential buildings).

The figure below describes the organization of the buildings sector.



Each of the subsectors, residential and commercial, are further subdivided into services, including:

- Cooking
- Lighting
- Water heating
- Space cooling
- Space heating
- Appliances
- Electrification (solar PV, smart meters, home battery systems, etc.)

Generally speaking, energy consumption is driven by population, number of households and floor area. These are the main activity drivers in the buildings sector. The general approach to energy modelling is to use technical fators such as hours of use, nameplate capacities, penetration of services, technology mixes and the activity levels to estimate energy demand and corresponding emissions and investment needs. In the following sections, each module is described in more detail.

1.1.1. RESIDENTIAL APPLIANCES

Appliances account for energy consumption in all sorts of household equipment excluding those explicitly covered in other services, such as light bulbs (covered in lighting), air conditioners (covered in space cooling), boilers and heaters (covered in space heating and water heating) and cookstoves (covered in cooking). So this module is related to electricity consumption in equipment such as:

technology	carrier
refrigerator_conventional	electricity
refrigerator_efficient	electricity
tv	electricity
washing_machine	electricity
dishwasher	electricity
exhauster	electricity
iron	electricity

Commercial buildings do not have an "appliances" module.
The core energy equation is as follows:

energy_carrier (PJ)
*energy_carrier = activity * penetration_service * specific_useful_energy * share_technology * * 1 / stock_efficiency * blending_ratio * 1 / (10 ** 15)*

activity (person or house)
Activity levels are calculated and depend on the appliance in question. They can either be population or the stock of households:
TV, refrigerator: *activity = population*
Other appliances: *activity = stock{buildings;residential;-;-;house;-}*

Both the stock of houses and the population are inputs to the analysis. Although the stock of houses may be alternatively computed as:
stock{buildings;residential;-;-;house;-} = population / household_size

household_size (person/house)
The household_size is an input and represents the average number of people per household in a given country.

penetration_service (ratio)
The penetration of service reflects the access to the given service, in this case each appliance. It is an input to the analysis and can often be obtained from household surveys. For instance, a typical household survey would indicate what share of households in a country have a washing machine at home. This would then be the penetration of service for washing machines.

specific_useful_energy (various units, see below)
The specific useful energy is calculated from other input variables and depends on the appliance. The name is misleading as this variable does not represent an energy metric, but rather a usage metric. Generally speaking it gives a sense of how much a given appliance is used. The name is kept as such though to be consistency with other modules in the buildings sector.
These are the different equations used to compute specific_useful_energy (usage factors) for different groups of appliances:
TV, exhauster: *specific_useful_energy = units_per_dwelling * hours_per_day * days_per_year * 3600 (hour/year)*
Refrigerator: *specific_useful_energy = units_per_dwelling * 3600 * 1000 (units)*
Wasghing machine, dishwasher: *specific_useful_energy = cycles_per_person_year * 3600 * 1000 (cycle/person/year)*
Iron: *specific_useful_energy = cycles_per_person_year * hours_per_cycle * 3600 (hour/year)*

units_per_dwelling (unit/house)
This is an input and refers to the number of units of the appliance on average for households in the country. Generally speaking it should be 1, however TVs might be an exception in wealthier countries, with units per dwelling exceeding 1 on average.

hours_per_day (hour/day)
Hours per day is an input that represents the number of hours the appliance is used on average for a typical household in the country. For instance, this could be number of hours that the TV is on average for a day.

days_per_year (day/year)
Similar to hours per day, days per year is an input and represents the number of days the appliance is used on average over a year.

cycles_per_person_year (cycle/person/year)
This is an input. The usage of appliances like dishwashers and washing machines is modelled in terms of the number of cycles per person on average over a year. For instance, a washing machine could be used on average once a week for a single person, which would result in a cycles_per_person_year equal to 1 cycle/week * 54 weeks/year = 54 cycles/year.

hours_per_cycle (hour/cycle)
Other appliances such as the iron also relies on the hours_per_cycle on top of the cycles_per_person_year. This is an input.

share_technology (ratio)
This is an input that represents the share of different technology options if an appliance offers different options. In general, appliances are modelled as a single technology, which means this input should be equal to 1, for any given appliance. However, if the analysis includes two or more technology options for a given appliance then this input should reflect the shares of each technology option in the mix. For instance, if the analysis wants to include different types of refrigerators (from less efficient to super efficient) different "technology" should be included for the appliance "refrigerator" and the share_technology should reflect the shares of each technology in the mix. This means the sum of the share_technology for a given apliance must be equal to 1.

stock_efficiency (various units, see below)
This is calculated as part of the stock turnover model. It represents the energy performance of the stock and is affected by all units (old and new) in the stock. See section on the stock turnover model for more details. The main input affecting this variable if the stock_efficiency_new, which is an input that represents the energy performance of new units entering the stock every year for a given appliance. See section on the stock turnover model for more details.
The stock_efficiency_new is different for each appliance, as described below:

TV, exhauster, iron:	*stock_efficiency_new = 1 / nameplate_new (1/W)*
Refrigerator:	*stock_efficiency_new = 1 / label_kWh_per_year_new (1/kWh/year)*
Washing machine, dishwasher:	*stock_efficiency_new = 1 / label_kWh_per_cycle_new (1/kWh/cycle)*

namepate_new (W)
This is an input and represents the nameplate electrical capacity of a typical new appliance entering the stock every year. You must pick an average that is representative of the new units that enter the stock every year. For instance, for a TV this could be 200 W.

label_kWh_per_year_new (kWh/year)
This is an input that represents the electricity consumption over a year for a refrigerator under typical use. This is often found in the energy efficiency labels of refrigerators, but it can also be found from technical literature. You must pick an average that is representative of the new units that enter the stock every year.

label_kWh_per_cycle_new (kWh/cycle)
This is an input and represents the electricity consumption of washing machines and dishwashers in a typical cycle. The energy efficiency lable of the appliance or its technical specifications ofetn inform this number. You must pick an average that is representative of the new units that enter the stock every year.

stock (unit)
The stock is computed as part of the stock turnover model. See section on the stock turnover model for more details. The equation used to compute stock is the same for all appliances:
*stock = stock{buildings;residential;-;-;house;-} * penetration_service * share_technology * * units_per_dwelling*

1.1.2. RESIDENTIAL/COMMERCIAL COOKING

Cooking accounts for all energy consumption related to domestic cooking, and usually includes the following technologies and carriers:

technology	carrier
stove_oven	biomass_traditional
stove_oven	biomass_charcoal
stove_oven	biomass_solid
stove_oven	biogas
stove_oven	natural_gas
stove_oven	lpg
stove_oven_conventional	electricity
stove_oven_efficient	electricity

In principle, the use of other electric appliances for cooking such as kettles, steamers, electric ovens, microwave ovens, etc. should also be included here if relevant. However that may unnecessarily increase the complexity of the analysis, and these other cooking methods could be all lumped together under electric stoves/ovens.
The energy model for both residential and commercial cooking is very similar. In the description, we present the residential buildings model and then, if any difference exists in the case of commercial buildings, they will be highlighted.
The core energy equation is as follows:

energy_carrier (PJ)
energy_carrier = activity * penetration_service * specific_useful_energy * share_technology * * 1 / stock_efficiency * blending_ratio / (10 ** 15)

This is the same for commercial buildings.

activity (person)
The activity is equal to the population in case of cooking. It is assumed that population is the main driver of energy demand for home cooking. The population is an input to the analysis.
activity = population

This is the same for commercial buildings.

penetration_service (ratio)
The penetration of service reflects the access to the given service, in this case cooking.
For residential buildings, we would typically assume that all households do some cooking at home, which means this input should just be set to 1.
For commercial buildings the penetration reflects the share of the population that eat outside regularly. It could in principle be assumed to be 1, as in residential cooking.

specific_useful_energy (J-useful/year)
The specific useful energy is calculated from other input variables. It represents the amount of useful energy per capita used for cooking over a year. This is the formula used (where 365 is the numbers of days in a year):
specific_useful_energy = meals_day_person * 365 * specific_useful_energy_per_meal

This is the same for commercial buildings.

meals_day_person (meal/day/person)
For residential buildings, this is an input that represents, on average, the number of meals cooked at home for one person in a day.
For commercial buildings, this is an input that represents, on average, the number of meals eaten out, say in restaurants, hotels, etc., (not cooked at home) for one person in a day.
This input is usually a number between 1 and 4. This can be used to reflect different cooking habits where more urbanized or wealthier countries might have less frequent home cooking (and more frequent eating-out), as opposed to more rural or poorer countries, where home cooking tends to be more frequent.

specific_useful_energy_per_meal (J-useful/meal)
This is an input and represents, on average, the amount of useful energy needed to cook one meal for one person. This can be highly variable depending on the type of meal that is being cooked, but should be well constrained. Reasonable guesses can be made based on previous REmap analysis (consult the values used in different projects). This can be used to reflect different cooking habits where more urbanized or wealthier countries might have less useful energy because cooking involves pre-cooked food (such as forzen food), as opposed to more rural or less wealthy countries, where home cooking tends to happen more from scratch.
This is the same for commercial buildings.

share_technology (ratio)
This is an input that represents the shares of different technology options in providing the service cooking. This means that the sum of the share_technology for each of the stove/oven technologies used in the analysis must be equal to 1.
This is the same for commercial buildings.

stock_efficiency (ratio)
This is calculated as part of the stock turnover model. It represents the energy performance of the stock and is affected by all units (old and new) in the stock. See section on the stock turnover model for more details.
The main input affecting this variable if the stock_efficiency_new, which is an input that represents the energy performance of new units entering the stock every year for a given appliance. See section on the stock turnover model for more details. The stock_efficiency_new is an input value:
stock_efficiency_new = cooking_efficiency_new
This is the same for commercial buildings.

cooking_efficiency_new (ratio)
This is an input that represents the energy consumption of a cookstove/oven that enters the stock every year. This is often found in the energy efficiency labels, but it can also be found from technical literature. You must pick an average that is representative of the new units that enter the stock every year.
This is the same for commercial buildings.

stock (unit)
The stock is computed as part of the stock turnover model. See section on the stock turnover model for more details.
For residential cooking, the equation used is the following:
stock = stock{buildings;residential;-;-;house;-} * penetration_service * share_technology * units_per_dwelling

For commercial cooking, the equation used is the following:
stock = stock{buildings;commercial;-;-;building;-} * share_with_kitchen * share_technology * units_per_building

stock{buildings;residential;-;-;house;-} (house)
In the case of residential buildings, the stock of houses can either be an input or it can be alternatively calculated using the following formula:
stock{buildings;residential;-;-;house;-} = population / household_size
In the case of commercial buildings, this is an input.

household_size (person/house)
The household_size is an input and represents the average number of people per household in a given country.
This is not applicable to commercial buildings.

units_per_dwelling (unit/house)
This is an input and refers to the number of cookstoves/ovens on average for households in the country. Generally speaking it should be 1.
For commercial buildings the same idea applies, just the name changes from “dwelling” to “building”.

share_with_kitchen (ratio)
This is an input and it is only applicable to commercial buildings. It represents the share of commercial buildings that have kitchens/cooking (e.g., restaurants, hotels, etc.).

1.1.3. RESIDENTIAL/COMMERCIAL LIGHTING

Lighting accounts for all energy consumption related to buildings lighting, and usually includes the following technologies and carriers:

technology	carrier
incandescent	electricity
fluorescent	electricity
halogen	electricity
led	electricity
lamp	kerosene

The energy model for both residential and commercial buildings is very similar. In the description, we present the residential buildings model and then, if any difference exists in the case of commercial buildings, they will be highlighted.
The core energy equation is as follows:

energy_carrier (PJ)

```
energy_carrier = activity * penetration_service * specific_useful_energy * share_technology *
* 1 / stock_efficiency * blending_ratio / ( 10 ** 15 )
```

This is the same for commercial buildings. However, in some old versions of commercial lighting there may be an extra multiplication by 3,600 in this equation that in newer versions has been moved to the variable specific_useful_energy so that all is consistent with residential buildings. The final result is the same.

activity (m^2)

The activity is calculated based on the floor area and the efective area, as below:

```
activity = floor_area * effective_m2
```

This is the same for commercial buildings.

floor_area (m^2)

In the case of residential buildings, the floor area can either be an input or it can be calculated. It represents to total built floor area of residential buildings in the country in a given year.

```
floor_area = population * floor_area_per_capita
```

In the case of commercial buildings the floor area is an input. There is no alternative method to calculate floor area from other inputs.

floor_area_per_capita (m^2/person)

This is an input and reflects the average floor area per capita in the country. When floor area is not available, this can be used as an alternative to project floor area from population. In this case, the floor area per capita can be obtained from a historical datapoint, or estimated based on other countries with similar socioeconomic conditions. In any case, this should be a well constrained variable.
This is not applicable to commercial buildings.

effective_m2 (m^2)

The effective area is an input and represents the share of the total floor area that is actually lit, on average. Usually lighting does not cover the total floor area at any given time. Only parts of it are actually lit at any given time.
This is the same for commercial buildings.

penetration_service (ratio)

The penetration of service reflects the access to the given service, in this case lighting. Typically we would assume that all households have access to lighting, whether it is electric lighting or other forms like kerosene lamps. This means this input would usually be set to 1.
This is the same for commercial buildings.

specific_useful_energy (lumen.second/m^2/year)

The specific useful energy is calculated from other input variables. It represents the amount of useful energy per m2 used for lighting over a year. This is the formula used (where 3600 is the conversion factor from hour to second):

specific_useful_energy = lumen_per_m2 * hours_per_year * 3600

This is the same for commercial buildings. Although in some old versions for commercial buildings the factor 3,600 appears in the energy_carrier equation. The final result is the same.

lumen_per_m2 (lumen/m^2)
This is an input and represents the amount of lighting measured in lumens needed to light a m^2. There are engineering standards that can be used to estimate this value and an average number should be taken that is representative of different lighting in a typical household.
This is the same for commercial buildings.

hours_per_year (hour/year)
Hours per year is an input that represents the number of hours that lighting is used on average for a typical household in the country over a year. For instance, this could accommodate lighting demand differences in countries located in different latitudes due to the duration of the day.
This is the same for commercial buildings. Although you might a different name like hours_yr.

share_technology (ratio)
This is an input that represents the shares of different technology options in providing the service lighting. This means that the sum of the share_technology for each of the lightbulb/lamp technologies used in the analysis must be equal to 1.
This is the same for commercial buildings.

stock_efficiency (lumen/W)
This is calculated as part of the stock turnover model. It represents the energy performance of the stock and is affected by all units (old and new) in the stock. See section on the stock turnover model for more details.
The main input affecting this variable is the stock_efficiency_new, which is an input that represents the energy performance of new lightbulbs/lamps entering the stock every year measured in lumen/W. See section on the stock turnover model for more details. The stock_efficiency_new is an input value:
stock_efficiency_new = lumen_per_watt_new

This is the same for commercial buildings.

stock (unit)
The stock is computed as part of the stock turnover model. See section on the stock turnover model for more details.
In the case of residential buildings, the equation used to compute stock is the following:
stock = stock{buildings;residential;-;-;house;-} * penetration_service * share_technology * units_per_dwelling

In the case of commercial buildings, the equation is very similar, but instead of units/dwelling, units/m2 is used:
stock = floor_area{buildings;commercial;-;-;building;-} * penetration_service * share_technology * units_per_m2

stock{buildings;residential;-;-;house;-} (house)
In the case of residential buildings, the stock of houses can either be an input or it can be alternatively calculated using the following formula:
stock{buildings;residential;-;-;house;-} = population / household_size

In the case of commercial buildings, this is not used, as the floor_area is used instead of number of buildings.

household_size (person/house)
The household_size is an input and represents the average number of people per household in a given country.
This is not applicable to commercial buildings.

units_per_dwelling (unit/house)
This is an input and refers to the number of lightbulbs/lamps on average for households in the country. It can be guessed from typical size of the household, number of rooms. It should be a well constrained input value.
This is not applicable to commercial buildings.

units_per_m2 (unit/m^2)
This is an input and refers to the number of lightbulbs per m2 on average for commercial buildings in the country.
This is not applicable to residential buildings.

1.1.4. RESIDENTIAL/COMMERCIAL SPACE COOLING

This accounts for all energy consumption related to space cooling in buildings, and usually includes the following technologies and carriers:

technology	carrier
air_conditioner_conventional	electricity
air_conditioner_efficient	electricity
heat_pump	electricity
district_cooling	district_cooling

The energy model for both residential and commercial buildings is very similar. In the description, we present the residential buildings model and then, if any difference exists in the case of commercial buildings, they will be highlighted.
The core energy equation is as follows:

energy_carrier (PJ)
energy_carrier = activity * penetration_service * specific_useful_energy{building} * share_technology *
* 1 / stock_efficiency{air_conditioner} * blending_ratio / (10 ** 15)

This is the same for commercial buildings.

activity (m^2)
The activity is calculated based on the floor area, by type of building, and the efective area, as below:
activity = floor_area_type * effective_m2

This is the same for commercial buildings.

effective_m2 (m^2)
The effective area is an input and represents the share of the total floor area that is actually cooled, on average. Usually space cooling does not cover the total floor area at any given time. Only parts of it are actually cooled at any given time.
This is the same for commercial buildings.

floor_area_type (m^2)
This is calculated from the total floor area and the share of building types:
floor_area_type = floor_area{buildings;residential;-;-;house;-} * share_building_type

This is the same for commercial buildings.

share_building_type (ratio)
This is an input that represents the shares of different types of buildings in the building stock. Usually we model only two types of buildings, conventional and efficient. This is used to differentiate between the energy efficiency of the building envelope.
This is the same for commercial buildings.

floor_area (m2)
For residential buildings, the floor area can either be an input or it can be calculted. It represents to total built floor area of residential buildings in the country in a given year.
floor_area = population * floor_area_per_capita

In the case of commercial buildings the floor area is an input. There is no alternative method to calculate floor area from other inputs.

floor_area_per_capita (m^2/person)
This is an input and reflects the average floor area per capita in the country. When floor area is not available, this can be used as an alternative to project floor area from population. In this case, the floor area per capita can be obtained from a historical datapoint, or estimated based on other countries with similar socioeconomic conditions. In any case, this should be a well constrained variable.
This is not applicable to commercial buildings.

penetration_service (ratio)
The penetration of service reflects the access to the given service, in this case space cooling. This can be obtained from household surveys, otherwise technical literature might bring estimates. In the absence of data, this might be an indication that penetration of space coolingi is low.
This is the same for commercial buildings.

specific_useful_energy (J/m^2)
The specific useful energy is calculated from other input variables. It is calculated only for the building, not the air conditioner. It represents the amount of useful energy per m2 used for space cooling over a year. It depends on the bulding type, where more energy efficient buildings will have a lower specific_useful_energy. The constant 1055 converts from BTU to J.
specific_useful_energy = stock_efficiency * 1055 * days_per_year * hours_per_day

This is the same for commercial buildings.

days_per_year (day/year)
This is an input and represents, on average, the number of days in a year that space cooling is used.

This is the same for commercial buildings.

hours_per_day (hour/day)
This is an input and represents, on average, the number of hours in a day that space cooling is used.
This is the same for commercial buildings.

stock_efficiency (buildings: BTU/h/m^2; air conditioner: BTU/h/W)
This is calculated as part of the stock turnover model. It represents the energy performance of the stock and is affected by all units (old and new) in the stock. See section on the stock turnover model for more details. This is calculated both for buildings and air conditioners. The main input affecting this variable is the stock_efficiency_new, which is an input that represents the energy performance of new units entering the stock every year for a given building type or air conditioner (as applicable). See section on the stock turnover model for more details. The stock_efficiency_new is an input value:

Building:	stock_efficiency_new = btu_per_hour_m2_new
Air conditioner:	stock_efficiency_new = EER_new * (1055 / 3600)

This is the same for commercial buildings.

btu_per_hour_m2_new (BTU/h/m^2)
For buildings, the stock_efficiency_new is the useful power consumption measured as BTU/h per m2 for space cooling. This is measured in useful energy (not carrier energy) and should dependent only on the building, not the air conditioner. It measures the energy performance of the building.
This is the same for commercial buildings.

EER_new (BTU/h/W)
For air conditioners, the stock_efficiency_new is the ratio between the useful power output of the air conditioner in BTU/h per W of input electricity. This is a measure of the performance of the air conditioner and is usually found in energy efficiency labels and technical specification of the equipment. It should dependent only on the equipment, not the building. For district_cooling use 1.
This is the same for commercial buildings.

share_technology (ratio)
This is an input that represents the shares of different technology options in providing the service space cooling. This means that the sum of the share_technology for each of the technologies used in the analysis must be equal to 1.
This is the same for commercial buildings.

stock (units)
The stock is computed as part of the stock turnover model. See section on the stock turnover model for more details. The equations used to compute stock are the following:

Building:	stock = stock{buildings;residential;-;-;house;-} * share_building_type
Air conditioner:	stock = stock{buildings;residential;-;-;house;-} * share_building_type * penetration_service * share_technology * units_per_dwelling

This is the same for commercial buildings.

In the case of residential buildings, the stock of houses can be either an input or it can be estimated from population and household size:
stock = population / household_size

In the case of commercial buildings, the stock of buildings is an input.

household_size (person/house)
The household_size is an input and represents the average number of people per household in a given country.
This is not applicable to commercial buildings.

units_per_dwelling (unit/house)
This is an input and refers to the number of air conditioners on average for households in the country. It can be guessed from typical size of the household, number of rooms. It should be a well constrained input value.
For commercial buildings the same idea applies, just the name changes from "dwelling" to "building".

1.1.5. RESIDENTIAL/COMMERCIAL SPACE HEATING

This accounts for all energy consumption related to residential space heating and usually includes the following technologies and carriers:

technology	carrier
boiler	coal
boiler	fuel_oil
boiler	natural_gas
boiler	lpg
boiler	biomass_solid
boiler	biogas
solar_thermal	solar_thermal
heat_pump	electricity
electric_heater	electricity
district_heating	district_heating

It is important to highlight that there is some overlap between water heating and space heating as far as heating technologies are concerned. Usually the same boiler is used for both space and water heating. This should be properly taken into account when considering units_per_dwelling and typical unit size (for investment purposes) and avoid double-counting of heating equipment.
The energy model for both residential and commercial buildings is very similar. In the description, we present the residential buildings model and then, if any difference exists in the case of commercial buildings, they will be highlighted.
The core energy equation is as follows:

energy_carrier (PJ)
```
energy_carrier = activity * penetration_service * specific_useful_energy * share_technology *
* 1 / stock_efficiency * blending_ratio / ( 10 ** 15 )
```

This is the same for commercial buildings.

activity (m^2)
The activity is calculated based on the floor area, by type of building, and the efective area, as below:
```
activity = floor_area_type * effective_m2
```

This is the same for commercial buildings.

effective_m2 (m^2)
The effective area is an input and represents the share of the total floor area that is actually heated, on average. Usually space heating does not cover the total floor area at any given time. Only parts of it are actually heated at any given time.
This is the same for commercial buildings.

floor_area_type (m^2)
This is calculated from the total floor area and the share of building types:
floor_area_type = floor_area{buildings;residential;-;-;house;-} * share_building_type

This is the same for commercial buildings.

share_building_type (ratio)
This is an input that represents the shares of different types of buildings in the building stock. Usually we model only two types of buildings, conventional and efficient. This is used to differentiate between the energy efficiency of the building envelope.
This is the same for commercial buildings.

floor_area (m^2)
For residential buildings, the floor area can either be an input or it can be calculted. It represents to total built floor area of residential buildings in the country in a given year.
floor_area = population * floor_area_per_capita

In the case of commercial buildings the floor area is an input. There is no alternative method to calculate floor area from other inputs.

floor_area_per_capita (m^2/person)
This is an input and reflects the average floor area per capita in the country. When floor area is not available, this can be used as an alternative to project floor area from population. In this case, the floor area per capita can be obtained from a historical datapoint, or estimated based on other countries with similar socioeconomic conditions. In any case, this should be a well constrained variable.
This is not applicable to commercial buildings.

penetration_service (ratio)
The penetration of service reflects the access to the given service, in this case space heating. This can be obtained from household surveys, otherwise technical literature might bring estimates. In the absence of data, this might be an indication that penetration of space heating is low.
This is the same for commercial buildings.

specific_useful_energy (J/m^2)
The specific useful energy is calculated from other input variables. It is calculated only for the building, not the heaters/boilers. It represents the amount of useful energy per m2 used for space heating over a year. It depends on the bulding type, where more energy efficient buildings will have a lower specific_useful_energy. The constant 1055 converts from BTU to J.
specific_useful_energy = stock_efficiency * 1055 * days_per_year * hours_per_day

This is the same for commercial buildings.

days_per_year (day/year)
This is an input and represents, on average, the number of days in a year that space cooling is used.
This is the same for commercial buildings.

hours_per_day (hour/day)
This is an input and represents, on average, the number of hours in a day that space cooling is used.
This is the same for commercial buildings.

stock_efficiency (buildings: BTU/h/m^2; boilers/heaters/heat pumps: ratio)
This is calculated as part of the stock turnover model. It represents the energy performance of the stock and is affected by all units (old and new) in the stock. See section on the stock turnover model for more details. This is calculated both for buildings and boilers/heaters. The main input affecting this variable is the stock_efficiency_new, which is an input that represents the energy performance of new units entering the stock every year for a given building type or boiler/heater (as applicable). See section on the stock turnover model for more details. The stock_efficiency_new is an input value:

Building:	stock_efficiency_new = btu_per_hour_m2_new
Air conditioner:	stock_efficiency_new = space_heat_efficiency_new

This is the same for commercial buildings.

btu_per_hour_m2_new (BTU/h/m^2)
For buildings, the stock_efficiency_new is the useful power consumption measured as BTU/h per m2 for space heating. This is measured in useful energy (not carrier energy) and should dependent only on the building, not the boiler/heater technology. It measures the energy performance of the building.
This is the same for commercial buildings.

space_heat_efficiency_new (ratio)
This is the typical energy efficiency of the equipment, that is the ratio between the output and input energy of the equipment. This is a measure of the energy performance of the heating equipment (boiler, heater, heat pump). It is usually found in energy efficiency labels and technical specification of the equipment. It should dependent only on the equipment, not the building. For district_heating use 1.
This is the same for commercial buildings.

share_technology (ratio)
This is an input that represents the shares of different technology options in providing the service space heating. This means that the sum of the share_technology for each of the technologies used in the analysis must be equal to 1.
This is the same for commercial buildings.

stock (units)
The stock is computed as part of the stock turnover model. See section on the stock turnover model for more details. The equations used to compute stock are the following:

Building:	stock = stock{buildings;residential;-;-;house;-} * share_building_type
Heating equipment:	stock = stock{buildings;residential;-;-;house;-} * share_building_type * penetration_service * share_technology * units_per_dwelling

This is the same for commercial buildings.

In the case of residential buildings, the stock of houses can be either an input or it can be estimated from population and household size:

```
stock = population / household_size
```

In the case of commercial buildings, the stock of buildings is an input.

household_size (person/house)
The household_size is an input and represents the average number of people per household in a given country.
This is not applicable to commercial buildings.

units_per_dwelling (unit/house)
This is an input and refers to the number of heating equipment on average for households in the country. It can be guessed from typical size of the household, number of rooms. It should be a well constrained input value.
For commercial buildings the same idea applies, just the name changes from "dwelling" to "building".

1.1.6. RESIDENTIAL/COMMERCIAL WATER HEATING

This accounts for all energy consumption related to water heating in buildings and usually includes the following technologies and carriers:

technology	carrier
boiler	coal
boiler	fuel_oil
boiler	natural_gas
boiler	lpg
boiler	biomass_solid
boiler	biogas
solar_thermal	solar_thermal
heat_pump	electricity
electric_heater	electricity
district_heating	district_heating

It is important to highlight that there is some overlap between water heating and space heating as far as heating technologies are concerned. Usually the same boiler is used for both space and water heating. This should be properly taken into account when considering units_per_dwelling and typical unit size (for investment purposes) and avoid double-counting of heating equipment.
The energy model for both residential and commercial buildings is very similar. In the description, we present the residential buildings model and then, if any difference exists in the case of commercial buildings, they will be highlighted.
The core energy equation is as follows:

energy_carrier (PJ)

```
energy_carrier = activity * penetration_service * specific_useful_energy * share_technology * 1 / stock_efficiency * blending_ratio / ( 10 ** 15 )
```

This is the same for commercial buildings.

activity (person)
The activity is equal to the population. It is assumed that population is the main driver of energy demand for water heating. The population is an input to the analysis.
activity = population

This is the same for commercial buildings.

penetration_service (ratio)
The penetration of service reflects the access to the given service, in this water heating. This can be obtained from household surveys, otherwise technical literature might bring estimates. In the absence of data, this might be an indication that penetration of water heating is low.
This is the same for commercial buildings.

specific_useful_energy (J/person/year)
The specific useful energy is calculated from other input variables. It represents the amount of useful energy per person needed for water heating over a year. It is assumed 1 cal/g/oC to heat water. The factor 418/100 converts units from cal to J.
specific_useful_energy = liter_per_person_day * days_per_year * (Tout - Tin) * (418 / 100) * 1000

This is the same for commercial buildings.

liter_per_person_day (L/person/day)
This is an input and represents the amount of water heated, per person, per day. It is an average value for the country.
This is the same for commercial buildings.

days_per_year (day/year)
This is an input and represents, on average, the number of days in a year that water heating is used.
This is the same for commercial buildings.

Tout and Tin (ºC)
These are inputs and represent respectivelly the output and input temperatures of water. These are used to differentiate colder climates from warmer climates in useful energy demand. Typically Tout is 60ºC whereas Tin will vary with the climate.
This is the same for commercial buildings.

stock_efficiency (ratio)
This is calculated as part of the stock turnover model. It represents the energy performance of the stock and is affected by all units (old and new) in the stock. See section on the stock turnover model for more details. The main input affecting this variable is the stock_efficiency_new, which is an input that represents the energy performance of new units entering the stock every year for a given water heating equipment. See section on the stock turnover model for more details. The stock_efficiency_new is an input value:
stock_efficiency_new = water_heat_efficiency_new
This is the same for commercial buildings.

water_heat_efficiency_new (ratio)
This is the typical energy efficiency of the equipment, that is the ratio between the output and input energy of the equipment. This is a measure of the energy performance of the water heating equipment (boiler, heater,

heat pump). It is usually found in energy efficiency labels and technical specification of the equipment. It should dependent only on the equipment, not the building. For district_heating use 1.
This is the same for commercial buildings.

share_technology (ratio)
This is an input that represents the shares of different technology options in providing the service water heating. This means that the sum of the share_technology for each of the technologies used in the analysis must be equal to 1.
This is the same for commercial buildings.

stock (units)
The stock is computed as part of the stock turnover model. See section on the stock turnover model for more details. The equation to compute stock is the following:
stock = stock{buildings;residential;-;-;house;-} * penetration_service * share_technology * units_per_dwelling
This is the same for commercial buildings.

units_per_dwelling (unit/house)
This is an input and refers to the number of heating equipment on average for households in the country. It can be guessed from typical size of the household, number of rooms. It should be a well constrained input value.
For commercial buildings the same idea applies, just the name changes from "dwelling" to "building".

1.1.7. RESIDENTIAL/COMMERCIAL OTHER CONSUMPTION

This accounts for all remaining energy consumption related to residential buildings not covered in the previous services. The approach is to accoutn for carrier demand directly without trying to explain which specific service or technology is involved. The following carriers are included:

technology	carrier
-	biofuel
-	biomass_solid
-	coal
-	district_heating
-	electricity
-	natural_gas
-	oil_products
-	solar_thermal
-	geothermal

Since there is no equipment involved, there is no stock turnover.
The energy model for both residential and commercial buildings is very similar. In the description, we present the residential buildings model and then, if any difference exists in the case of commercial buildings, they will be highlighted.
The core energy equation is as follows:

energy_carrier (PJ)
energy_carrier = activity * specific_useful_energy * blending_ratio / (10 ** 15)

This is the same for commercial buildings.

activity (residential: house; commercial: m^2)
For residential buildings, the activity is equal to the number of houses. It is assumed that the number of houses is the main driver of energy demand for other consumption, althoug an apporach based on population would also make sense.
activity = stock{buildings;residential;-;-;house;-}

For commercial buildings the activity is the floor area.
activity = floor_area{buildings;commercial;-;-;building;-}

floor_area (m^2)
This only applies to commercial buildings. The floor area is an input. It represents to total built floor area of commercial buildings in the country in a given year.

stock (house)
This only pplies to residential buildings. It is computed as part of the stock turnover model. See section on the stock turnover model for more details. The housing stock can be either an input or it can be estimated from population and household size:
stock = population / household_size

household_size (person/house)
This only pplies to residential buildings. The household_size is an input and represents the average number of people per household in a given country.

specific_useful_energy (MJ/house/year)
For residential buildings, the specific useful energy is an input and represents the specific consumption of each energy carrier per house over a year.
specific_useful_energy = specific_consumption_per_house * (10 ** 6)

For commercial buildings, the idea is similar but per m^2.
specific_useful_energy = specific_consumption_per_m2 * (10 ** 6)

The word "useful" in the name specific_useful_energy is misleading because this variable does not represent useful energy, but simply the actual energy carrier consumption. The name is kept so, though, to ensure naming consistency with other services.

1.1.8. RESIDENTIAL/COMMERCIAL ELECTRIFICATION

This accounts for other aspects of residential and commercial buildings that are relevant to the energy transition, generally related to electrification technologies. These include solar PV rooftop, home battery systems, smart meters and smart home systems. The energy models for residential and commercial buildings are very similar. The differences, when they exist, are highlighted below.

a. Solar PV rooftop

This accounts for electricity generation from solar PV rooftop modules. The generation is included as part of transformation centers. The electricity generation is estimated as:

energy_carrier (PJ)
energy_carrier = stock * 8760 * capacity_factor * (3600 / 1000000)

This is the same for commercial buildings.

stock (GW)

The stock of solar PV rooftop is simply measured by the installed capacity:

stock = capacity_installed

This is the same for commercial buildings.

capacity_installed (GW)

This is calculated as below, based on the typical installed capacity per building, penetration of service and the number of buildings:

capacity_installed = stock{buildings;residential;-;-;house;-} * penetration_service * capacity_installed_per_building / 1000000

This is the same for commercial buildings.

stock (house, building)

For residential buildings, the housing stock can be either an input or it can be estimated from population and household size:

stock = population / household_size

For commercial buildings this is an input.

household_size (person/house)

The household_size is an input and represents the average number of people per household in a given country.

This is not applicable to commercial buildings.

penetration_service (ratio)

The penetration of service reflects the access to the given service, in this solar PV rooftop. This can be obtained from household surveys, otherwise technical literature might bring estimates. In the absence of data, this might be an indication that penetration of water heating is low.

This is the same for commercial buildings.

capacity_installed_per_building (GW/house)

This is an input and represents the typical installed capacity of solar PV rooftop, in GW, for a building.

This is the same for commercial buildings.

capacity_factor (ratio)

This is an input and represents the annual average capacity factor of solar PV rooftop in the country.

This is the same for commercial buildings.

b. Battery, smart meter, smart home system

The only purpose of these is to account for the related investment needs. There is no energy accouting involved.
This is the same for commercial buildings.

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1. **TECHNICAL EVALUTION CRITERIA**

Technical Evaluation Criteria **The criteria and score weights are indicative, could be changed as needed in accordance with the Project requirements.*	**Weighting (%)**
(a) Understanding of the task, its scope and its deliverables, as described in the Terms of Reference. The proposal should address these requirements and explain how the solution will meet IRENA's project needs.	20%
(b) Proposed approach and implementation plan for the required work, providing a realistic work plan with clear milestones. The bidder must provide CVs of key personnel assigned to the project demonstrating the team's capabilities.	25%
(c) Experience and knowledge of the EU AI Act. and measures undertaken to adhere to this act. The bidder must provide information on the efforts made to comply with the EU AI act.	15%
(d) Providing at least 2 references of work demonstrating expertise in AI business application project in the energy sector.	15%
(e) Providing at least 1 reference of work demonstrating experience in AI data mining.	15%
(f) At least 05 years of experience in the AI industry	10%

For the evaluation of the proposals, kindly submit a financial and technical proposal. The financial proposal should be itemized per milestone (if applicable) and service (for example development of tool, training). In order to select the best option in terms of value for money, the evaluation of the proposal shall be based on:

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

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Section 4: General Terms and Conditions for Professional Services

1. DEFINITIONS

In these General Terms and Conditions for Professional Services (hereinafter referred to as "General Terms and Conditions") the following definitions shall apply:

"Agency" means the International Renewable Energy Agency.

"Contract" means the written agreement relating to the provision of Services entered into by the Agency and the Contractor and includes these General Terms and Conditions.

"Contractor" means the legal entity named in the Contract and with whom the Contract has been entered, or its successors.

"Parties" means the Contractor and the Agency collectively, and "Party" means either one of them.

"Services" means any service provided, or to be provided, to the Agency by the Contractor (or any of the Contractor's sub-contractors) pursuant to or in connection with the Contract.

2. LEGAL STATUS

The Contractor shall be considered as having the legal status of an independent contractor vis-à-vis the Agency. Neither the Contractor, and any subcontractor, nor any of their personnel shall be considered to be employees or agents of the Agency.

3. PAYMENT TERMS

(a) The Agency shall, unless otherwise specified in the Contract, make payment within 30 days of receipt of the Contractor's invoice which is issued only upon the Agency's acceptance of the work specified in the Contract.

(b) The prices shown in the Contract cannot be increased except by express written agreement by the Agency. The Agency will not pay any charge for late payment unless expressly agreed to in writing.

4. CONTRACTOR'S RESPONSIBILITY FOR EMPLOYEES AND ASSIGNMENT OF PERSONNEL

(a) The Contractor shall supervise and be responsible for the professional and technical competence of its employees and shall select, for work under the Contract, reliable individuals who will perform effectively in the implementation of the Contract, respect the local customs and conform to a high standard of moral and ethical conduct.

(b) The Contractor shall not replace or withdraw any personnel referred to in the Contract for the performance of the Services without the prior written approval of the Agency or unless requested by the Agency. The Agency shall not unreasonably refuse or delay approval of any such withdrawal or replacement.

(c) Prior to assignment, replacement or withdrawal of personnel for the performance of the Services, the Contractor shall submit to the Agency for its consideration, the curriculum vitae or detailed justification to permit evaluation by the Agency of the impact which such assignment, replacement or withdrawal would have on the Services.

(d) In the event of replacement or withdrawal of personnel, all costs and additional expenses resulting from the replacement, for whatever reasons, of any of the Contractor's personnel shall be for the account of the Contractor. Such replacement or withdrawal shall not be considered as termination in part or in whole of the Contract.

5. SOURCE OF INSTRUCTIONS

The Contractor shall neither seek nor accept instructions from any authority external to the Agency in connection with the performance of its obligations under the Contract. The Contractor shall refrain from any action which may adversely affect the Agency and shall fulfil its commitments with the fullest regard to the interests of the Agency.

6. OFFICIALS NOT TO BENEFIT

The Contractor warrants that it has not and shall not offer any direct or indirect benefit arising from or related to the Contract or the award thereof to any official or employee of the Agency. The Contractor acknowledges and agrees that any breach of this Article is a breach of an essential term of the Contract.

7. ASSIGNMENT AND INSOLVENCY

(a) The Contractor shall not assign, transfer, pledge or make other disposition of the Contract

or any part thereof, or any of the Contractor's rights, claims or obligations under the Contract except with the prior written consent of the Agency.
(b) Should the Contractor become insolvent, adjudged bankrupt, or should control of the Contractor change by virtue of insolvency, the Agency may, without prejudice to any other rights or remedies, immediately terminate the Contract by giving the Contractor written notice of termination.

8. SUBCONTRACTING
In the event the Contractor requires the services of one or more subcontractors, the Contractor shall obtain the prior written approval of the Agency for all such subcontractor(s). The Agency's approval of a subcontractor shall not relieve the Contractor of any of its obligations under the Contract, and the terms of any subcontract shall be subject to and in conformity with the provisions of the Contract.

9. INDEMNIFICATION
The Contractor shall indemnify, hold and save harmless and defend at its own expense the Agency, its officers, agents, servants and employees from and against all suits, claims, demands and liability of any nature or kind, including cost and expenses arising out of acts or omissions of the Contractor or its employees or subcontractors in the performance of the Contract. This requirement shall extend, inter alia, to claims or liabilities in the nature of workers' compensation, product liability and to liabilities pertaining to intellectual property rights. The obligations under this clause do not lapse upon termination of the Contract.

10. INSURANCE AND LIABILITIES TO THIRD PARTIES
(a) The Contractor shall provide and thereafter maintain all appropriate workers compensation insurance, or its equivalent, with respect to its employees to cover claims for personal injury, bodily injury or death arising from or in connection with the implementation of the Contract.
(b) The Contractor shall provide and thereafter maintain insurance against all risk in respect of its property and any equipment used for the execution of the Contract.
(c) The Contractor shall also provide and thereafter maintain liability insurance in an adequate amount to cover third party claims for death, bodily injury, loss of and damage to property arising from or in connection with the implementation of the Contract or from the operation of any vehicles, boats, airplanes and other equipment owned or leased by the Contractor or its agents, servants, employees or subcontractors performing work or services in connection with the Contract.
(d) Except for insurance mentioned in paragraph (a), the insurance policies under this clause shall:
(i) Name the Agency as additional beneficiary (additional insured);
(ii) Include a waiver of subrogation of the Contractor's rights to the insurance carrier against the Agency;
(iii) Provide that the Agency shall receive thirty (30) days written notice from the insurers prior to any cancellation or change of coverage.
(e) The Contractor shall, upon request, provide the Agency with satisfactory evidence of the insurance required under this Article.
(f) The Contractor acknowledges and agrees that neither the requirement for taking out and maintaining insurance as set forth in the Contract nor the amount of any such insurance, including, but not limited to, any deductible or retention relating thereto, shall in any way be construed as limiting the Contractor's liability arising under or relating to the Contract.

11. ENCUMBRANCES/LIENS
The Contractor shall not cause or permit any lien, attachment or other encumbrance by any person to be placed on file in any public office or on file with the Agency against any monies due or to become due for any Services provided under the Contract, or by reason of any other claim or demand against the Contractor.

12. TITLE TO EQUIPMENT
Title to any equipment and supplies that may be furnished by the Agency shall rest with the Agency and any such equipment shall be returned to the Agency at the conclusion of the Contract or when no longer needed. Such equipment, when

returned shall be in the same condition as when delivered to the Contractor, subject to normal wear and tear, and the Contractor shall be liable to compensate the Agency for any damage or degradation of the equipment that is beyond normal wear and tear.

13. OBSERVANCE OF THE LAW

The Contractor shall comply with all laws, ordinances, rules and regulations bearing upon the performance of its obligations under the terms of the Contract.

14. COPYRIGHT, PATENTS AND OTHER PROPRIETARY RIGHTS

(a) Except as otherwise expressly provided in the Contract, the Agency shall be entitled to all intellectual property and other property rights, including but not limited to copyrights, patents and trademarks, with regard to products, documents or other materials which bear a direct relation to or are produced, prepared or collected in consequence or in the course of the execution of the Contract. At the request of the Agency, the Contractor shall take all necessary steps, prepare and process all necessary documents and assist in securing such proprietary rights and transferring them to the Agency in compliance with the requirements of the applicable law.

(b) To the extent that any such intellectual property or other proprietary rights consist of any intellectual property or other proprietary rights of the Contractor: (i) that pre-existed the performance by the Contractor of its obligations under the Contract, or (ii) that the Contractor may develop or acquire, or may have developed or acquired, independently of the performance of its obligations under the Contract, the Agency does not and shall not claim any ownership interest thereto, and the Contractor grants to the Agency a non-exclusive, perpetual and irrevocable license to use such intellectual property or other proprietary right.

15. CONFIDENTIALITY

(a) All technical, financial or other documentation and data the Contractor compiled for or received from the Agency under the Contract shall be treated as confidential and shall be delivered only to the Agency's authorised officials on completion of the work or services or as requested by the Agency.

(b) The Contractor may not communicate at any time to any other person, Government or authority external to the Agency, any information known to it by reason of its association with the Agency which has not been made public except with the authorisation of the Agency, nor shall the Contractor at any time use such information to private advantage. These obligations do not lapse upon termination of the Contract.

16. USE OF NAME, EMBLEM, OR OFFICIAL SEAL OF THE AGENCY

The Contractor shall not advertise or otherwise make public for purposes of commercial advantage that it is a Contractor of the Agency, nor shall the Contractor, in any manner whatsoever, use the name, emblem or official seal of the Agency or any abbreviation of the name of the Agency in connection with its business or otherwise, without the prior written approval by the Agency. These obligations do not lapse upon termination of the Contract.

17. FORCE MAJEURE

(a) *Force majeure* as used herein shall mean any unforeseeable and irresistible act of nature, any act of war (whether declared or not), invasion, revolution, insurrection, terrorism, or any other acts of a similar nature or force, provided that such acts arise from causes beyond the control and without the fault or negligence of the Contractor.

(b) In the event of or as soon as possible after the occurrence of any cause constituting *force majeure*, the Contractor shall give notice and full particulars in writing to the Agency of such occurrence if the Contractor is thereby rendered unable, wholly or in part, to perform its obligations and meet its responsibilities under the Contract. The Contractor shall also notify the Agency of any other changes in conditions or the occurrence of any event which interferes or threatens to interfere with the Contractor's performance under the Contract. Upon receipt of the notice required under this Article, the Agency shall take such action as, in its sole discretion, it considers to be appropriate or necessary in the circumstances, including the granting to the Contractor of a reasonable extension of time in

which to perform its obligations under the Contract.
(c) If the Contractor is rendered permanently unable, wholly or in part, by reason of force majeure to perform its obligations and meet its responsibilities under the Contract, the Agency shall have the right to terminate the Contract on the same terms and conditions as are provided for in Article 19 ("Termination") of these General Terms and Conditions, except that the period of notice may be seven (7) days instead of thirty (30) days.

18. AMENDMENT
Except as otherwise expressly provided in the Contract, the provisions of the Contract and the annexes thereto may be amended or supplemented only by means of a written agreement signed by all of the Parties or their authorised representatives.

19. TERMINATION
(a) The Agency may terminate the Contract in whole or in part, and at any time, upon thirty (30) days' notice of termination to the Contractor. The initiation of arbitral proceedings in accordance with Article 20 ("Settlement of Disputes") of these General Terms and Conditions, shall not be deemed a termination of the Contract.
(b) The Agency may terminate forthwith the Contract at any time should the funding for the Agency be curtailed or terminated, in which case the Contractor shall be reimbursed by the Agency for all reasonable costs incurred by the Contractor prior to receipt of the notice of termination.
(c) In the event of termination by the Agency, no payment shall be due from the Agency to the Contractor except for work and services satisfactorily performed and accepted by the Agency in accordance with the express terms of the Contract.
(d) Should the Contractor be adjudicated bankrupt, or be liquidated or become insolvent, or should the Contractor make an assignment for the benefit of its creditors, or should a Receiver be appointed on account of the insolvency of the Contractor, the Agency may, without prejudice to any other right or remedy it may have under the Contract terminate the Contract forthwith. The Contractor shall immediately inform the Agency of the occurrence of any of the above events.

20. SETTLEMENT OF DISPUTES
(a) **Amicable Settlement**: The Parties shall use their best efforts to settle amicably any dispute, controversy or claim arising out of this Contract or the breach, termination or invalidity thereof. Where the Parties wish to seek such an amicable settlement through conciliation, the conciliation shall take place in accordance with the Conciliation Rules then obtaining of the United Nations Commission on International Trade Law ("UNCITRAL"), or according to such other procedure as may be agreed between the Parties.
(b) **Arbitration:** Any dispute, controversy, or claim between the Parties arising out of the Contract or the breach, termination, or invalidity thereof, unless settled amicably under Article 20(a) above ("Amicable Settlement"), within sixty (60) days after receipt by one Party of the other Party's written request for such amicable settlement, shall be referred by either Party to arbitration in accordance with the UNCITRAL Arbitration Rules then obtaining. The decisions of the arbitral tribunal shall be based on general principles of international commercial law. The arbitral tribunal shall be empowered to order the return or destruction of goods or any property, whether tangible or intangible, or of any confidential information provided under the Contract, order the termination of the Contract, or order that any other protective measures be taken with respect to the goods, services or any other property, whether tangible or intangible, or of any confidential information provided under the Contract, as appropriate, all in accordance with the authority of the arbitral tribunal pursuant to Article 26 ("Interim measures") and Article 34 ("Form and effect of the award") of the UNCITRAL Arbitration Rules. The arbitral tribunal shall have no authority to award punitive damages, nor to award interest in excess of the London Inter-Bank Offered Rate ("LIBOR") then prevailing, and any such interest shall be simple interest only. The Parties shall be bound by any arbitration award rendered as a result of such arbitration as the final adjudication of any such dispute, controversy or claim.

21. PRIVILEGES AND IMMUNITIES
Nothing in or relating to the Contract shall be deemed a waiver, express or implied, of any of the privileges and immunities of the Agency.

22. ANTI-FRAUD AND ANTI-CORRUPTION
1. The Contractor acknowledges and agrees that IRENA has zero tolerance for Fraudulent, Corrupt and/or Collusive Practices (as such terms are defined below).
2. In particular, and without limitation, the Contractor represents and warrants to IRENA that it has not, and it shall not, at any time: (a) perform any act or omit to perform any act, including any misrepresentation, in order to knowingly mislead, or attempt to mislead, IRENA and/or any other party to obtain a financial or other benefit or to avoid any obligation ("Fraudulent Practice"); (b) offer, give, receive or solicit, directly or indirectly, or attempt to offer, give, receive or solicit, directly or indirectly, anything of value to improperly influence the actions of IRENA and/or any other party ("Corrupt Practice"); nor (c) enter into any arrangements with any other party or parties that are designed to achieve an improper purpose, including but not limited to improperly influencing the actions of IRENA and/or any other party or engaging in price fixing ("Collusive Practice", and together with Fraudulent Practices and Corrupt Practices, "Prohibited Practices").
3. The Contractor shall communicate the IRENA Anti-Fraud and Anti-Corruption practices to its officers, employees, contractors, subcontractors and agents and shall take all reasonable measures to ensure that such persons do not engage in Prohibited Practices.
4. The Contractor shall immediately disclose to IRENA any actual, apparent, potential or attempted Prohibited Practice that the Contractor becomes aware of. To that end, the Contractor shall fully cooperate, and shall take all reasonable steps to ensure that its officers, employees, contractors, subcontractors and agents fully cooperate, with any investigation of Prohibited Practices by IRENA, including by complying with all reasonable requests from IRENA to gain access to and inspect any records, documents and other relevant information.
5. (a) The Contractor expressly acknowledges and agrees that any breach of this clause by the Contractor or by any of its officers, employees, contractors, subcontractors or agents, constitutes a material breach of this Agreement, which entitles IRENA to immediately terminate this Agreement without incurring any liability to the Contractor.

23. LIQUIDATED DAMAGES FOR DELAY
If the Contractor fails to perform any of the services within the time period specified in the Contract, IRENA may, without prejudice to any other rights and remedies, withhold and deduct from the total price stipulated in this Contract an amount of 0.10% of the price of such unperformed services for each calendar day of delay until actual completion up to maximum deduction of 10% of the contract price. Once the maximum limit is reached, IRENA reserves the right to cancel the contract in the event of default or significant delay by the Contractor for delay in unperformed services beyond the stipulated date.

24. CHILD LABOUR
The Contractor represents and warrants that it is not engaged in any practice inconsistent with the rights set forth in the Convention on the Rights of the Child, including Article 32 thereof, which, inter alia, requires that a child shall be protected from performing any work that is likely to be hazardous or to interfere with the child's education, or to be harmful to the child's health or physical mental, spiritual, moral or social development. Any breach of this representation and warranty shall entitle IRENA to terminate this Contract immediately upon notice to the Contractor, at no cost to IRENA.

25. MINES
The Contractor represents and warrants that it is not actively and directly engaged in patent activities, development, assembly, production, trade or manufacture of mines or in such activities in respect of components primarily utilized in the manufacture of Mines. The term "Mines" means those devices defined in Article 2, Paragraphs 1, 4 and 5 of Protocol II annexed to the Convention on Prohibitions and Restrictions on the Use of Certain Conventional Weapons Which May Be Deemed to Be Excessively Injurious or to Have

Indiscriminate Effects of 1980. Any breach of this representation and warranty shall entitle IRENA to terminate this Contract immediately upon notice to the Contractor, without any liability for termination charges or any other liability of any kind of IRENA.

Section 5: Form of Contract[1]

Contract

between

the International Renewable Energy Agency (IRENA)

and

[INSERT NAME OF THE CONTRACTOR]

for the provision of

[INSERT DESIGNATION OF THE SERVICES]

Solicitation: **[INSERT RFP REFERENCE NUMBER]**
Contract No.: **[INSERT NUMBER OF CONTRACT]**

[1] *Drafting note: Please replace this with the LTA template if applicable to the RFP.*

This Contract, dated as of the Effective Date, is entered into by and between the International Renewable Energy Agency, having its headquarters located in Masdar City, P.O. Box 236, Abu Dhabi, United Arab Emirates (hereinafter "IRENA"), and **[INSERT NAME OF THE CONTRACTOR]**, duly incorporated under the laws of **[INSERT NAME OF THE COUNTRY]** and having its principal office located at **[INSERT ADDRESS OF THE CONTRACTOR]** (hereinafter the "Contractor").

WHEREAS the Contractor desires to provide IRENA, and IRENA desires to obtain from the Contractor, the Services described in this Contract on the terms and conditions set forth in this Contract;

WHEREAS the offer of the Contractor dated **[INSERT DATE]**, submitted in response to the IRENA **[INSERT REFERENCE TO THE SOLICITATION DOCUMENT: Request for Proposal/Invitation to Bid No…, dated …]**, was accepted by IRENA;

NOW, THEREFORE, IRENA and the Contractor (hereinafter collectively the "Parties" and individually a "Party") hereby agree as follows:

Article 1: Contract Documents

1.1 This document and the documents listed in Article 1.2 below ("Contract Documents") constitute the entire agreement by and between the Parties with regard to the subject hereof and supersedes all prior representations, contracts and proposals, whether written or oral, by and between the Parties on this subject.

1.2 The Contractor and IRENA agree to be bound by the provisions contained in the following documents, which are complementary of one another but in case of ambiguities, discrepancies or inconsistencies between or among them shall take precedence in the following order:

a) This document;

b) The IRENA General Terms and Conditions for Professional Services, attached hereto as Annex 1. The provisions of such Annex shall control the interpretation of this Contract and in no way shall be deemed to have been derogated by the contents of this document and any other Annexes, unless otherwise expressly stated;

c) The Terms of Reference **[INSERT REFERENCE AND DATE AS APPLICABLE]**, attached hereto as Annex 2; and

d) The Contractor's technical proposal **[INSERT REFERENCE AND DATE AS APPLICABLE]**, not attached hereto but known to and in the possession of both Parties and incorporated herein by reference.

Article 2: Definitions

2.1 In this Contract, terms shall have the same meanings as respectively assigned to them in the IRENA General Terms and Conditions for Professional Services and the Terms of Reference, annexed to this Contract.

2.2 In addition, the following terms shall have the meanings hereby assigned to them for the purposes of this Contract:

a) "Acceptance" means certification by IRENA that a particular Service or Deliverable has been provided and that the Service or Deliverable satisfies the applicable Acceptance Criteria. Deliverables accepted pursuant to the foregoing certification shall be considered "Accepted".

b) "Acceptance Criteria" means the criteria used by IRENA to evaluate Acceptance for each Service or Deliverable separately and as integrated with any previously Accepted Service or Deliverable as provided herein. The term "Acceptance Criteria" shall be deemed to include that each Service or Deliverable shall meet the applicable specifications related to such Service or Deliverable, as set forth in this Contract including the Terms of Reference and, as applicable, the Contractor's technical proposal, and operates in accordance with such other specific criteria as may be developed and recorded in writing by the Parties in the implementation of this Contract.

c) "Completion Date" means, for any Deliverable or task, the date set forth in this Contract and, as applicable, the Implementation Schedule, on or before which such Deliverable or task must be completed and/or delivered to IRENA.

d) "Contract" means the Contract Documents and any amendments as may be made thereto in accordance with Article 18 of the IRENA General Terms and Conditions for Professional Services.

e) "Contract Documents" has the meaning set forth in Article 1.

f) "Contractor" has the meaning set forth in the introductory paragraph of this Contract or its successors, subject to recognition by IRENA. If the Contractor wishes IRENA to recognize a successor in interest to this Contract or a name change, the Contractor shall notify IRENA in writing accordingly. The Contractor shall be the only interface for all matters pertaining to execution of the Services under this Contract.

g) "Deliverables" means any and all items to be developed and delivered by the Contractor to IRENA under this Contract including as described in the Terms of Reference and, as applicable, the Contractor's technical proposal.

h) "Effective Date" has the meaning set forth in Article 11.

i) "Implementation Schedule" means the schedule which identifies the various tasks and responsibilities of the Parties as set forth in the Terms of Reference.

j) "Personnel" means any personnel, employee, official, agent, servant, representative and sub-contractor (or any of the sub-contractor's personnel, employee, official, agent, servant and representative) of the Contractor.

k) "Services" means the work to be performed by the Contractor under this Contract including as described in the Terms of Reference and the Contractor's technical proposal, and any incidental services, functions or responsibilities not specifically described in this Contract, but which are required for and are related to the proper performance of the Services.

Article 3: Obligations of the Contractor

3.1 The Contractor shall perform and complete the Services with the necessary diligence and efficiency and in accordance with the highest industry and professional standards, under the terms mutually agreed in this Contract.

3.2 The Contractor shall perform the Services in accordance with the Implementation Schedule and submit the Deliverables to IRENA according to the following schedule:

No.	**Deliverable Description** *(Procurement to ensure that the deliverable description mirrors the terms of the Terms of Reference contained in Annex 2. If the deliverables are sufficiently described in the Terms of Reference, it may be sufficient to indicate "Progress Report as specified in Annex 2", "Final Report as specified in Annex 2", etc.)*	**Completion Date**
1		
2		
3		

3.3 The Contractor shall provide the services of qualified English-speaking Personnel as specified and in accordance with the Contractor's technical proposal. Any replacement by the Contractor of the Personnel specified in its technical proposal shall be made in accordance with Article 4 of the IRENA General Terms and Conditions for Professional Services.

3.4 Without limiting and further to Article 4 of the IRENA General Terms and Conditions for Professional Services, the Contractor shall be fully responsible and liable for all work and services performed by its Personnel, and for its Personnel's compliance with the terms and conditions of this Contract.

3.5 The Contractor shall be responsible, at its own costs, for obtaining all licenses, permits and authorisations from governmental or other authorities, legally required for the performance of the Services under this Contract.

3.6 The Contractor represents and warrants the accuracy of any information or data provided to IRENA for the purpose of entering into this Contract.

3.7 The Contractor represents and warrants that any Service performed under this Contract shall be its own work. In the performance of the Services, the Contractor shall not infringe any third party intellectual property or other proprietary right nor shall it violate any third party rights of privacy. The Contractor shall obtain all necessary permissions for and appropriately acknowledge in the Deliverables any use of any intellectual property or other proprietary rights that pre-existed the performance of the Contract.

3.8 In the event of a breach of Article 3.7 above, including in case of plagiarism, IRENA, in its sole discretion and without prejudice to any of IRENA's other rights and remedies under this Contract or otherwise, exercise any or all of the following:

3.8.1 Reduce any payments owed to the Contractor for the Deliverables at a rate proportionate to the breach, with such rate to be determined by IRENA in its sole discretion;

3.8.2 If the breach is identified after acceptance of the Deliverable by IRENA, require the return to IRENA of any payments made to the Contractor for the Deliverable at a rate proportionate to the breach, with such rate to be determined by IRENA in its sole discretion;

3.8.3 Terminate the Contract forthwith and without limitation to Article 19(c) of the IRENA General Terms and Conditions for Professional Services.

Article 4: Price and Payment

4.1 In consideration of the complete and satisfactory performance by the Contractor of all of the Services under this Contract, IRENA shall pay the Contractor a total fixed price of **[INSERT CURRENCY & AMOUNT IN FIGURES AND WORDS]** (hereinafter referred to as "the Contract Price").

4.2 The Contract Price is inclusive of all costs, expenses, charges or fees that the Contractor may incur in connection with the performance of its obligations hereunder, including management, remuneration, and travel costs of Contractor's Personnel, and all taxes, duties, levies, fees and other charges of any nature imposed by any authority or entity. [*If travel costs are not included in the Contract Price, include:* The Contract Price however excludes travel expenses. Any travel by the Contractor that may be required under this Contract must be authorised by IRENA in advance and undertaken in accordance with IRENA's travel policy.]

4.3 The Contract Price shall remain firm and fixed during the term of this Contract. It shall not be subject to any adjustment or revision because of price or currency fluctuations or the actual costs incurred by the Contractor in the performance of the Services under the Contract. The Contractor shall not do any work, provide any material or equipment or perform any service which may result in any charge to IRENA over and above the Contract without a formal written amendment to this Contract.

4.4 IRENA shall effect payments to the Contractor within thirty (30) days after receipt of the Contractor's invoices and acceptance by IRENA of the Services and Deliverables represented by the invoices, unless IRENA disputes the invoice or a portion thereof. Invoices shall be submitted only upon achievement of the corresponding milestones and for the following amounts:

No.	**Milestone**	**Amount (in USD/AED/EUR/GBP)** *[select as applicable from the RFP]*
1	Acceptance of deliverable 1	**[INSERT AMOUNT]**
2	Acceptance of deliverable 2	**[INSERT AMOUNT]**
3	*(Procurement to fill and adjust as required)*	**[INSERT AMOUNT]**

4.5 The Contractor shall submit an original copy of its invoices by mail for all Services supplied under the Contract and in accordance with the payment milestones specified above to the following address:

International Renewable Energy Agency
IRENA Headquarters, Masdar City
P.O. Box 236, Abu Dhabi
United Arab Emirates
Tel.: +971-2-417-9000
Attention: **[INSERT NAME OF PROJECT MANAGER]**

4.6 Invoices shall indicate the Contract reference number, the milestones achieved and corresponding amount payable, and specify the details of the bank account to which payment is to be made.

4.7 Payments effected by IRENA to the Contractor shall not be deemed to relieve the Contractor of its obligations under this Contract. [*If advance payment is agreed with the Contractor, add:* nor shall it be deemed as acceptance by IRENA of the Contractor's performance of the Services and the Deliverables.]

4.8 The Contractor acknowledges and agrees that IRENA may withhold payment in respect of any invoice in the event that, in the opinion of IRENA following review and evaluation of the Services and Deliverables in accordance with Article 7, the Contractor has not performed in accordance with the terms of this Contract.

4.9 If IRENA disputes any invoice or a portion thereof, IRENA shall notify the Contractor accordingly. IRENA and the Contractor shall consult in good faith to promptly resolve outstanding issues with respect to any disputed invoice. Once a dispute regarding an invoice or a portion thereof has been resolved, IRENA shall pay the Contractor the relevant amount within thirty (30) days after the final resolution of such dispute.

Article 5: Temporary Suspension of the Services

5.1 IRENA may, at any time, temporarily suspend, in whole or in part, the Services being performed by the Contractor under this Contract by giving thirty (30) days' advance notice in writing to the Contractor. The Services so suspended shall be resumed by the Contractor on the basis of a revised Implementation Schedule and on terms and conditions to be mutually agreed upon between the Parties.

Article 6: Delays; Extension of Time for Performance

6.1 The Contractor acknowledges and agrees that all time limits contained in this Contract and timely performance in completing the Services are of essence in respect of the performance of the Services.

6.2 In the event the Contractor anticipates a delay in the performance of the Services and delivery of the Deliverables, the Contractor shall immediately notify IRENA in writing of the extent of such delay and the overall impact such delay may have on completing the Services in accordance with the terms of this Contract. In such event, IRENA may, in its sole discretion, extend the Completion Dates and adjust the Implementation Schedule accordingly. The Contractor shall use its best efforts to ensure that any delay in the delivery of a Deliverable shall not result in the delay of any Deliverable to be subsequently delivered to IRENA under this Contract.

6.3 In the event a delay in the performance of the Services and delivery of the Deliverables by the Contractor is caused by the acts or omissions of IRENA, its personnel or other contractors, the Completion Dates shall be extended. Such extension of time shall be the sole remedy of the Contractor and the Contractor shall not be entitled to additional payments or compensation for damage resulting from any such delay, including, but not limited to, damage resulting from overheads or loss of productivity.

Article 7: Review and Evaluation; Improper Performance

7.1 IRENA may review and evaluate the Services performed and Deliverables provided under this Contract at any time during or after the performance of the Services and delivery of the Deliverables.

7.2 All Deliverables shall meet the Acceptance Criteria and the terms of this Contract before such Deliverable can be accepted by IRENA.

7.3 If any Service performed or Deliverable delivered by the Contractor does not conform to the Acceptance Criteria or to the terms of this Contract, without prejudice to any of IRENA's other rights and remedies under this Contract or otherwise, IRENA may, in its sole discretion, exercise the following:

(a) If IRENA determines that the improper performance or the breach of the terms of this Contract can be remedied by way of re-performance or other corrective measures by the Contractor, IRENA requests the Contractor to take, and the Contractor shall take, at no additional cost or expense to IRENA, the measures necessary to re-perform or to take appropriate actions to remedy the improperly performed Services or the breach within such period as IRENA may specify following consultation with the Contractor.

(b) IRENA accepts the Deliverable with its deficiencies and reaches agreement with the Contractor on an equitable reduction to the Contract Price to reflect the improper performance of the Services and the uncorrected deficiencies in the Deliverables.

(c) If the Contractor does not take corrective measures or if IRENA reasonably determines that the Contractor is unable to remedy the improper performance or breach in a satisfactory and timely manner, or if IRENA, in its sole discretion, determines that the improper performance or breach cannot be remedied by re-performance or other corrective measures by the Contractor, IRENA may terminate the Contract in accordance with Article 19 of the IRENA General Terms and Conditions for Professional Services.

Article 8: Notices; IRENA Focal Point

8.1 Except as otherwise specified in this Contract, all notices and other communications between the Parties required or contemplated under this Contract shall be in writing and shall be delivered either by: (i) personal delivery; (ii) postage prepaid, return receipt requested, certified mail; (iii) confirmed email, transmitted to the Party for which such notice or communication is intended at the addresses specified below or at such other address as may be specified by the Parties:

For IRENA:

Chief Procurement Officer
International Renewable Energy Agency
IRENA Headquarters, Masdar City
P.O. Box 236, Abu Dhabi
United Arab Emirates
Tel.: +971-2-417-9000
Email: procurement@irena.org

For the Contractor:

[INSERT CONTACT DETAILS]

8.2 Without prejudice to the above, IRENA shall designate a member of its personnel to serve, as from the Effective Date of this Contract, as the primary IRENA representative under this Contract for all actions bearing upon the performance of the Services. IRENA shall promptly notify the Contractor of such designation. The IRENA Focal Point will have overall responsibility for ensuring that the Services are carried out in accordance with this Contract and shall respond promptly to requests by the Contractor relating to the performance of the Services.

Article 9: Special Conditions *(This Article should be included only if, in its offer, the Contractor has expressly requested an amendment to the IRENA General Terms and Conditions)*

Option 1
(Delete all text in italics in this Article 9 after selecting this option)

9.1 Article [INSERT NUMBER] of the IRENA General Terms and Conditions for Professional Services in Annex 1 shall be amended to read:

"[INSERT NEW TEXT]"

9.2 Article [INSERT NUMBER] of the IRENA General Terms and Conditions for Professional Services in Annex 1 shall be deleted in its entirety.

Option 2
(Delete all text in italics in this Article 9 after selecting this option)

9.1 Not applicable.

Article 10: Severability; No Waiver

10.1 If any provision of this Contract shall be held to be invalid, illegal or unenforceable (in whole or in part), the validity, legality and enforceability of the remaining provisions of this Contract shall not in any way be affected or impaired thereby.

10.2 Failure by a Party to enforce a right shall not be deemed to be a waiver of that right unless otherwise expressly provided in this Contract.

Article 11: Effective Date and Term

11.1 The Contract shall enter into force on the last date of its signature by both Parties ("the Effective Date") and it shall remain in force until the Parties fulfil all of their obligations hereunder.

IN WITNESS WHEREOF, the duly authorised representatives of the Parties have signed this Contract on the date(s) set forth below.

For IRENA:

Signature _____
Name: _____
Title: _____
Date: _____

For [INSERT NAME OF THE CONTRACTOR]:

Signature _____
Name: _____
Title: _____
Date: _____

Section 6: Proposal Submission Form[2]

This form must be returned along with the submission signed and stamped by an authorised person.

To: IRENA, Chief Procurement Officer
[Insert IRENA address as indicated in the Data Sheet]

Dear Sir/Madam:

We, the undersigned, hereby offer to provide professional services as described in your Request for Proposal dated [date] and our Proposal. We are hereby submitting our Proposal, which includes the Technical Proposal and Financial Proposal sealed under separate sealed envelopes.

We hereby declare that:

a) All the information and statements made in this Proposal are true and we accept that any misrepresentation may lead to our disqualification.

b) We are currently not on any United Nations sanctions list;

c) We have no outstanding bankruptcy proceedings or pending litigation or legal action that could impair our operation as a going concern;

d) We do not employ or otherwise engage, nor anticipate employing or engaging during the performance of the services required under the RFP any person who is or was recently employed by IRENA.

We confirm that we have read, understood and hereby accept the Terms of Reference describing the duties and responsibilities required of us in this RFP and the General Terms and Conditions for Professional Services of IRENA.

We agree to abide by this Proposal for [insert Proposal validity period as indicated in the Data Sheet] days.

[2] No deletion or modification may be made to this form. Any such deletion or modification may lead to the rejection of the Proposal.

We fully understand and recognise that IRENA is not bound to accept this Proposal, that we shall bear all costs associated with its preparation and submission, and that IRENA will in no case be responsible or liable for those costs, regardless of the conduct or outcome of the evaluation.

Yours sincerely,

Authorised Signature [*In full and initials*]:_____

Name and Title of Signatory:_____

Name of Firm:_____

Contact Details:_____

[Please mark this with your corporate seal, if available.]

Section 7: Documents Establishing the Eligibility and Qualifications of the Proposer

Proposer Information Form[3]

Date: *[insert date (as day, month and year] of Proposal Submission*]
RFP no.: *[insert number]*

Page _____of _____ pages

1. Proposer's legal name: *[insert Proposer's legal name]*		
2. In case of Joint Venture (JV), legal name of each party: *[insert legal name of each party in JV]*		
3. Actual or intended Country/ies of registration/operation: *[insert actual or intended Country of registration]*		
4. Year of registration: *[insert Proposer's year of registration]*		
5. Countries of operation:	6. No. of staff in each Country:	7. Years of operation in each Country:
8. Legal address/es in Country/ies of registration/operation: *[insert Proposer's legal address in country of registration]*		
9. Value and description of top three (3) biggest contracts for the past five (5) years:		
10. Latest credit rating (if any):		
10. Brief description of litigation history (disputes, arbitration, claims, etc.), indicating current status and outcomes, if already resolved:		
12. Proposer's authorised representative information Name: *[insert authorised representative's name]* Address: *[insert authorised representative's name]* Telephone/Fax numbers: *[insert authorised representative's name]* Email address: *[insert authorised representative's name]*		
13. Attached are copies of original documents of: ☐ All eligibility document requirements listed in the Data Sheet ☐ If Joint Venture/Consortium – copy of the Memorandum of Understanding/Agreement or Letter of Intent to form a JV/Consortium, or Registration of JV/Consortium, if registered ☐ If case of Government corporation or Government-owned/controlled entity, documents establishing legal and financial autonomy and compliance with commercial law.		

[3] The Proposer shall fill in this Form in accordance with the instructions. Apart from providing additional information, no alterations to its format shall be permitted and no substitutions shall be accepted.

Joint Venture Partner Information Form (if registered)[4]

Date: *[insert date (as day, month and year) of Proposal Submission*]
RFP No.: *[insert number]*

Page _____ of_ _____ pages

1. Proposer's legal name: *[insert Proposer's legal name]*		
2. JV's party legal name: *[insert JV's Party legal name]*		
3. JV's party Country of registration: *[insert JV's Party country of registration]*		
4. Year of registration: *[insert Party's year of registration]*		
5. Countries of operation:	6. No. of staff in each Country:	7.Years of operation in each Country:
8. Legal address/es in Country/ies of registration/operation: *[insert Party's legal address in country of registration]*		
9. Value and description of top three (3) biggest contracts for the past five (5) years:		
10. Latest credit rating (if any):		
1. Brief description of litigation history (disputes, arbitration, claims, etc.), indicating current status and outcomes, if already resolved:		
13. JV's party authorised representative information Name: *[insert name of JV's party authorised representative]* Address: *[insert address of JV's party authorised representative]* Telephone/fax numbers: *[insert telephone/fax numbers of JV's Party authorised representative]* Email Address: *[insert email address of JV's Party authorised representative]*		
14. Attached are copies of original documents of: *[check the box(es) of the attached original documents]* ☐ All eligibility document requirements listed in the Data Sheet ☐ Articles of Incorporation or Registration of firm named in 2.		

[4] *The Proposer shall fill in this Form in accordance with the instructions. Apart from providing additional information, no alterations to its format shall be permitted and no substitutions shall be accepted.*

☐ In case of government-owned entity, documents establishing legal and financial autonomy and compliance with commercial law.

Section 8: Technical Proposal Form

TECHNICAL PROPOSAL

[INSERT TITLE OF THE SERVICES]

Note: Technical Proposals not submitted in this format may be rejected. The financial proposal should be included in a separate envelope.

Name of Proposing organization / firm:	
Country of registration:	
Name of contact person for this Proposal:	
Address:	
Phone / Fax:	
Email:	

SECTION 1: EXPERTISE OF FIRM/ ORGANISATION

This section should fully explain the Proposer's resources in terms of personnel and facilities necessary for the performance of this requirement. All contents of this section may be modified or expanded depending on the evaluation criteria stated in the RFP.

1.1 Brief description of Proposer as an entity: Provide a brief description of the organisation / firm submitting the Proposal, its legal mandates/authorised business activities, the year and country of incorporation, types of activities undertaken, and approximate annual budget, etc. Include reference to reputation, or any history of litigation and arbitration in which the organisation/firm has been involved that could adversely affect or impact the performance of services, indicating the status/result of such litigation/arbitration.

1.2. Financial capacity: Provide the latest Audited Financial Statement (Income Statement and Balance Sheet) duly certified by a Public Accountant, and with authentication of receipt by the relevant government's Internal Revenue Authority. Include any indication of credit rating, industry rating, etc.

1.3. Track record and experiences: Provide the following information regarding corporate experience within the last five (5) years which are related or relevant to those required for this Contract.

Name of project	Client	Contract value	Period of activity	Types of activities undertaken	Status or date completed	References contact details (name, phone, email)

SECTION 2 - APPROACH AND IMPLEMENTATION PLAN

This section should demonstrate the Proposer's responsiveness to the TOR by identifying the specific components proposed, addressing the requirements, as specified, point by point; providing a detailed description of the essential performance characteristics proposed; and demonstrating how the proposed methodology meets or exceeds the requirements.

2.1. Approach to the Service/Work required: Please provide a detailed description of the methodology for how the organisation/firm will achieve the Terms of Reference of the Project, keeping in mind the appropriateness to local conditions and project environment.

2.2. Technical quality assurance review mechanisms: The methodology shall also include details of the Proposer's internal technical and quality assurance review mechanisms.

2.3. Implementation timelines: The Proposer shall submit a Gantt chart or Project schedule indicating the detailed sequence of activities that will be undertaken and their corresponding timing.

2.4. Subcontracting: Explain whether any work would be subcontracted, to whom, how much percentage of the work, the rationale for such, and the roles of the proposed sub-contractors. Special attention should be given to providing a clear picture of the role of each entity and how everyone will function as a team.

2.5. Risks/mitigation measures: Please describe the potential risks for the implementation of this Project that may impact achievement and timely completion of expected results as well as their quality. Describe measures that will be put in place to mitigate these risks.

2.6. Reporting and monitoring: If required in the TOR, please provide a brief description of the mechanisms proposed for this project for reporting to IRENA and partners, including a reporting schedule.

2.7. Anti-corruption strategy: Define the anti-corruption strategy that will be applied in this project to prevent the misuse of funds. Describe the financial controls that will be put in place.

2.8. Partnerships: Explain any partnerships with local, international or other organisations that are planned for the implementation of the Project. Special attention should be given to providing a clear picture of the role of each entity and how everyone will function as a team. Letters of commitment from partners and an indication of whether some or all have successfully worked together on other previous projects is encouraged.

2.9. Statement of full disclosure: This is intended to disclose any potential conflict in accordance with the definition of "conflict" under Clause 5 of Section 2 of the RFP, if any.

2.10. Other: Any other comments or information regarding the Project approach and methodology that will be adopted.

SECTION 3: PERSONNEL

3.1 Management structure: Describe the overall management approach toward planning and implementing this activity. Include an organisation chart for the management of the Project describing the relationship of key positions and designations.

3.2 Staff time allocation: Provide a spreadsheet to show the activities of each staff member and the time allocated for his/her involvement. *(Note: This spreadsheet is crucial and no substitution of personnel will be tolerated once the contract has been awarded except in extreme circumstances. Any substation shall be made only with IRENA's approval of the justification for the substitution and with IRENA's approval of the replacement, who shall be of either equal or superior credentials to the one being replaced and which shall not involve any additional cost to IRENA. No increase in costs will be considered as a result of any substitution.)*

3.3 Qualifications of key personnel: Provide the CVs for key personnel (team leader, managerial and general staff) that will be provided to support the implementation of this project. CVs should demonstrate qualifications in areas relevant to the Scope of Services. Please use the format below:

Name:		
Position for this Contract:		
Nationality:		
Contact information:		
Countries of work experience:		
Language skills:		
Educational and other qualifications:		
Summary of experience: *Highlight experience in the region and on similar projects.*		
Relevant experience (from most recent):		
Period: From – To	**Name of activity/project/ funding organisation, if applicable:**	**Job title and activities undertaken/description of actual role performed:**
e.g. June 2004-January 2005		
Etc.		
Etc.		
Reference no.1 (minimum of 3):	*Name* *Designation* *Organisation* *Contact Information – Address; Phone; Email; etc.*	
Reference no.2	*Name* *Designation* *Organisation* *Contact Information – Address; Phone; Email; etc.*	
Reference no.3	*Name* *Designation* *Organisation* *Contact Information – Address; Phone; Email; etc.*	
Declaration: I confirm my intention to serve in the stated position and present availability to serve for the term of the proposed contract. I also understand that any wilful misstatement described above may lead to		

my disqualification, before or during my engagement.

_____

_____

Signature of the Nominated Team Leader/Member Date Signed

Section 9: Financial Proposal Form

The Proposer is required to submit the Financial Proposal in a separate file from the rest of the RFP response as indicated in Clause 21 of the Instructions to Proposers.

The Financial Proposal must provide a detailed cost breakdown. The format shown on the following pages is suggested for use as a guide in preparing the Financial Proposal. The format includes specific expenditures, which may or may not be required or applicable but are indicated to serve as examples.

A. **Cost breakdown per Deliverables**

Description of deliverable	Total cost (USD)
Deliverable 1: An AI-powered solution capable of searching, identifying, collecting, completing, and transforming datasets for the IRENA REmap tool.	
Deliverable 2: A user-friendly interface for end-users to easily access and understand the insights generated by the AI solution.	
Deliverable 3: Comprehensive training and ongoing support for end-users post-deployment for a reasonable period of time (atleast 6 months) during the initiation implementation phase, ensuring proficiency in utilizing the solution to its full potential and maximizing its impact on decision-making processes; including but not limited to virtual and on-site sessions and reference videos.	
Grand total in USD	

Please fill in the above structure as the Financial Proposal. No other format will be accepted. Please ensure a breakdown of total individual deliverables is provided. Kindly also provide breakdown of the rates per day per resource for reference.

Name of bidder/firm:.....

Address: .....

Signature of authorised person:.....

Stamp of bidder:

Section 10: Form for Performance Security[5]

This must be finalised using the official letterhead of the issuing bank. Except for indicated fields, no changes may be made to this template.

To: IRENA
[*Insert contact information as provided in Data Sheet*]

WHEREAS [*name and address of Contractor*] (hereinafter called "the Contractor") has undertaken, in pursuance of Contract No. [*insert Contract number*] dated [*insert Contract date*], to execute Services (hereinafter called "the Contract"):

AND WHEREAS it has been stipulated by you in the said Contract that the Contractor shall furnish you with a Bank Guarantee by a recognised bank for the sum specified therein as security for compliance with his obligations in accordance with the Contract:

AND WHEREAS we have agreed to give the Contractor such a Bank Guarantee:

NOW THEREFORE we hereby affirm that we are the Guarantor and responsible to you, on behalf of the Contractor, up to a total of [*amount of guarantee*] [*in words and numbers*], such sum being payable in the types and proportions of currencies in which the Contract Price is payable, and we undertake to pay you, upon your first written demand and without cavil or argument, any sum or sums within the limits of *[amount of guarantee as aforesaid*] without your needing to prove or to show grounds or reasons for your demand for the sum specified therein.

This guarantee shall be valid until a date 30 days from the date of issue by IRENA of a certificate of satisfactory performance and full completion of services by the Contractor.

SIGNATURE AND SEAL OF THE GUARANTOR BANK

Date: .....

Name of Bank: .....

Address: .....

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[5] If the RFP requires the submission of a performance security, which shall be made a condition to the signing and effectivity of the Contract, the performance security that the Proposer's bank will issue shall use the contents of this template

Section 11: Form of Bank Guarantee for Advance Payment

This must be finalised using the official letterhead of the issuing bank. Except for indicated fields, no changes may be made to this template.

Note: All italicized text is for indicative purposes only to assist in preparing this Form and shall be deleted from the final product.

_____ *[Bank's name, and address of issuing branch or office]*
Beneficiary: _____ *[Name and address of IRENA as provided in Data Sheet]*
Date: _____
Advance Payment Guarantee No.: _____

We have been informed that *[name of company]* (hereinafter called "the Contractor") has entered into Contract No. *[reference number of the Contract]* dated *[insert date]* with you, for the provision of *[brief description of Services]* (hereinafter called "the Contract").

Furthermore, we understand that, according to the conditions of the Contract, an advance payment in the sum of *[amount in words]* (*[amount in figures]*) is to be made against an advance payment guarantee.

At the request of the Contractor, we, *[name of Bank]*, hereby irrevocably undertake to pay you any sum or sums not exceeding in total an amount of *[amount in words]* (*[amount in figures]*)[6] upon receipt by us of your first demand in writing accompanied by a written statement stating that the Contractor is in breach of its obligation under the Contract because the Contractor has used the advance payment for purposes other than toward providing the Services under the Contract.

It is a condition for any claim and payment under this guarantee to be made that the advance payment referred to above must have been received by the Contractor on its account number _____ at *[name and address of Bank]*.

The maximum amount of this guarantee shall be progressively reduced by the amount of the advance payment repaid by the Contractor as indicated in copies of certified monthly statements which shall be presented to us. This guarantee shall expire, at the latest, upon our receipt of the monthly payment certificate indicating that the Consultants have made full repayment of the amount of the advance payment. Consequently, any demand for payment under this guarantee must be received by us at this office on or before that date.

This guarantee is subject to the Uniform Rules for Demand Guarantees, ICC Publication No. 458.

_____
[signature(s)]

[6] The Guarantor Bank shall insert an amount representing the amount of the advance payment and denominated in the currency of the advance payment as specified in the Contract.