

Development of the National Standards for Battery Energy Storage System (BESS) (Vietnam)



Terms of Reference | 21 June 2023

Battery Energy Storage System (BESS) is a crucial technology in the renewable energy sector as it can provide several benefits in terms of capacity, charge and discharge rate, energy density, safety, and cost-effectiveness. Currently, the absence of national standards for BESS in Vietnam's renewable energy industry is hindering their investment and growth, as well as the penetration rate of renewable energy in the power system.

This project is a collaboration between ETP and the Directorate for Standards, Metrology and Quality (STAMEQ) under the Ministry of Science and Technology (MOST). It will establish the Vietnamese National Standards (TCVN) system for BESS which offers a framework to categorise and evaluate BESS products, services, and their environmental and socio-economic impacts. The TCVN for BESS will enable state authorities to manage their integration into renewable energy projects securely and effectively. The project will contribute to ensuring a dependable and sustainable energy system, supporting the Power Development Plan VIII, and assisting Vietnam in meeting its net-zero commitment.

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I. Introduction

1. The Southeast Asia Energy Transition Partnership (ETP) brings together governments and philanthropies to work with partner countries in the region. ETP supports the transition towards modern energy systems that can simultaneously ensure economic growth, energy security, and environmental sustainability. To contribute to the achievement of the UN's Sustainable Development Goals (SDGs) and the Paris Climate Agreement objectives, ETP works in Southeast Asia, with a focus on three priority countries, namely Indonesia, the Philippines, and Vietnam. ETP's strategy is built around four inter-related pillars of strategic engagement that are squarely aligned to address the barriers to energy transition. These are (i) policy alignment with climate commitments, (ii) de-risking energy efficiency and renewable energy investments, (iii) extending smart grids, and (iv) expanding knowledge and awareness building.

II. Summary

2. The Technical Assistance program is an initiative of ETP in collaboration with the Directorate for Standards, Metrology, and Quality under the Ministry of Science and Technology (STAMEQ). It aims to develop a complete set of Vietnamese National Standards (TCVN) for the battery energy storage system (BESS). Currently, Vietnam lacks national BESS standards, which limit investment in renewable energy (RE) and impede its growth. Therefore, developing these standards will enable state authorities to effectively manage the integration of BESS into renewable energy (RE) projects and ensure a reliable and sustainable energy system, thus contributing to the Power Development Plan VIII and achieving Vietnam's net-zero commitment.

III. Project Details

A. Rationale

3. In Vietnam, the substantial growth in solar capacity during 2019-20 has had significant impacts on power system operations, creating challenges such as meeting variable renewable energy demand and constructing responsive transmission lines within tight timeframes and budgets. The oversupply has also posed a significant threat to the security of the national grid, resulting in wasteful curtailment of solar projects¹. It is crucial to mitigate this issue, since under the Just Energy Transition Partnership (JETP) agreement, Vietnam commits to accelerating the adoption of renewable energy and reaching a minimum of 47 percent of electricity generation by 2030².
4. Battery energy storage systems (BESS) can mitigate this issue as it can store excess energy generated by RE sources such as solar or wind farms and enhance their stability and efficiency. By aiding in load levelling and grid support, BESS can assist in balancing electricity demand fluctuations throughout the day, and mitigate congestion on the grid. The deployment of BESS

¹ Dan, N. L. 2022. Vietnam's Renewable Energy Policies and Opportunities for the Private Sector. Clean Edge Asia Project. The National Bureau of Asian Research.

² Barnes, M. 2022. Unpacked: Vietnam's US\$15.5 Billion JETP Agreement. Vietnam Briefing from Dezan Shira and Associates.

can also help to reduce the need for expensive distribution upgrades or emergency generators by offering backup power during outages or extreme weather events.

5. However, the lack of national standards for BESS in the field of renewable energy in Vietnam is hindering their investment, endorsement, and appraisal, and impeding the growth and penetration rate of RE in the power system. As BESS is a novel technology in Vietnam with no established national standards or regulations, the creation of a Vietnamese National Standards (TCVN) system for BESS based on international standards such as the International Electrotechnical Commission (IEC) standards³ and following the [government's procedures \(Annex 1\)](#) will offer a framework to categorise and assess BESS products, services, as well as their associated environmental and socio-economic effects, with the aim of enhancing their efficiency and quality in Vietnam's production, application, and usage. This TVCN for BESSs will serve as a reliable platform to enable state authorities to effectively and securely manage the integration of BESS into RE projects in Vietnam.

B. Impact

6. The support from ETP will offer clear guidance to the primary beneficiaries such as the Directorate for Standards, Metrology and Quality (STAMEQ), Ministry of Science and Technology (MOST), Ministry of Industry and Trade (MOIT), and the Ministry of Natural Resources and Environment (MONRE) on the integration of BESS in Vietnam. This guidance will include recommendations on the legal framework and institutional mechanisms needed to establish national standards for BESS. The establishment of robust national standards can play a crucial role in the transition to a more reliable, sustainable, and efficient energy system. This project will contribute to ETP's strategic outcome 2 on de-risking of energy efficiency and renewable energy investments.

C. Objectives and Outcome and Outputs

7. The objective of this project is to support the Government of Vietnam in establishing a comprehensive collection of TCVN pertaining to BESS-related operations within Vietnam.
8. The outcome of the project is that the TCVN for BESS will serve as a platform in order to safeguard effectively and reliably management of the state authorities on the study, integration of BESS into RE projects in Vietnam. When the TCVN set for BESS is promulgated, it shall increase the deployment of renewable energy in Vietnam as outlined in the Power Development Plan VIII (PDP8) and contribute to achieving the net-zero commitment.
9. The primary outputs of this project are:
 - i. A comprehensive study and develop draft TCVN for BESS;

³ The International Electrotechnical Commission (IEC) is an international standards organisation that operates as a non-profit and non-governmental entity. Its main focus is the development and dissemination of International Standards for "electrotechnology," which encompasses all electrical, electronic, and related technologies.

- ii. Development of TCVNs in close consultation with STAMEQ based on at least two consultation workshops held in two regions of Vietnam by the consultant;
- iii. Organisations of seminars and consultation meetings;
- iv. Two trips to international labs and collaboration with them to evaluate the feasibility of the TCVNs;
- v. Promulgation of the TCVNs with support from MOST; and
- vi. Set of recommendations to scale up BESS in Vietnam.

D. Sustainability and Gender Mainstreaming

10. The Project is committed to the promotion, enhancement and development of gender sensitivity of its implementation activities. For cause-oriented groups, the Project shall be inclusive of the invited stakeholders during the consultation, more particularly women's groups. The Project shall also ensure gender balance among the officials designated into the inter-departmental committee. Emphasis shall be given to policy measures that shall not discriminate or alienate any personalities and groups based on gender.

IV. Project Deliverables

- 11. In line with the outputs and outcomes expected from this project (see Project Background), this section provides additional information on specific deliverables and activities required.
- 12. Table 1 outlines the key deliverables and associated activities which are expected in this project. Additional details about each deliverable follow Table 1. Table 1 briefly outlines the activities which are expected in the project.

Table 1. Key activities and desired outputs

#	Deliverables	Activities	Target Delivery and Payment Dates
1	Inception Report	Mobilisation and Inception report	Month 1
2	A comprehensive study report for the development of the TCVN	Conduct a study and propose step-wise for the development of the TCVN	Month 1
3	Draft National Standards (TVCN) for BESS according to the list agreed with STAMEQ	Develop the National Standards (TVCN) for BESS (the proposed list and detailed descriptions of each TCVN are provided in the Annex) in a close consultation with STAMEQ	Month 6

#	Deliverables	Activities	Target Delivery and Payment Dates
4	Workshop organization* and post-workshop reports <i>(one week after each event)</i>	Organise two hybrid, half-day consultation workshops in two regions in Vietnam (preferably Hanoi and Ho Chi Minh City) to consult and collect feedbacks/ contributions on the draft TCVNs	Month 8
5	Trips to international labs* in countries with strong experience in management of BESS and Reports including lessons learnt and recommendations for TCVNs in Vietnam	Conduct two 5-day trips to international labs in countries (one in Asia and one in Europe) with strong experience in management of BESS for 10 representatives from MOST and MOIT	Month 7
6	Reports on testing principles, practicality of TCVNs, and categorisation of mandatory and optional standards	During the two trips conducted in task 5, the consultant and/or representatives from MOST and MOIT collaborate with labs to develop testing principles of TCVNs on BESS, evaluate the practicality of TCVNs on BESS, and decide mandatory standards that impact social and environmental safety, along with optional standards	Month 11
7	Final version of the Vietnamese National Standards TCVNs for BESS according to the comments and feedbacks from different stakeholders and in a close consultation with STAMEQ submitted to the Appraisal Council	The consultant finalises the final version of TCVNs on BESS and submits it to the Appraisal Council in a close consultation with STAMEQ	Month 13

#	Deliverables	Activities	Target Delivery and Payment Dates
8	A full dossier of TCVNs on BESS to submit to MOST for promulgation	The consultant will prepare a full dossier of TCVNs on BESS based on suggestions of the Appraisal Council and submit to the MOST for promulgation.	Month 14
9	Final workshop organization* and post-workshop report	<p>The Consultant organises the final stakeholder workshop. It should be hybrid and happen for half a day, with a minimum of 75 participants. Gender consideration needs to be taken into consideration in the workshop. Minimum % of women participants is 40%.</p> <p>All key stakeholders related to the topic, particularly governmental entities, should be engaged. The consultant is required to submit a final workshop report outlining the background, purpose, outcome, etc. of the report.</p>	Month 14
10	Grand Final Report	Grand final report should include key findings of previous reports and explanation of the national standards (e.g., applicability, certification, impacts).	Month 15

*: All logistic costs associated with workshops and international trips will be reimbursable based on actual costs.

Deliverable 1: Inception Report

13. The consultant prepares a detailed work plan and mobilises the necessary resources. As a deliverable, the consultant develops and submits a detailed inception report detailing the plan, ensuring the expectations of ETP are aligned with the understanding of the project from the consultant.
14. The inception report should contain, as a minimum:
 - a. Introduction and project background
 - b. Scope of Services

- c. Methodology and Workplan, including approach, methodology and project gantt chart
- d. A detailed approach as to how each deliverable will be met and what each submission will contain
- e. Results of the audience/ stakeholder mapping and analysis and communication/ outreach plans
- f. A donor coordination strategy
- g. Project management inclusive of organisational chart detailing key personnel, their roles and responsibilities, as well as their locations (strong in country team and project management is expected)
- h. Risks, mitigations and assumptions
- i. Monitoring and Evaluation Framework, presented in the form of the ETP Results Based Monitoring Framework (RBMF)

Table 2. The Minimum Requirements of the Communications Plan

The consultant is responsible for drafting a detailed communications plan which will be embedded in the Inception Report. The minimum requirements for the communications materials are as follows:

Item	Communications materials	Number
1	Social media posts (liaising with ETP)	5
2	Press releases	1 per public workshop/ event. The consultant is required to submit the press release together with the proposal for workshop for ETP's approval so that communication could be rolled out smoothly.
3	Newspapers The Consultant is required to connect with at least five relevant news agencies. The news will be based on press release prepared (item 2)	5 per public workshop/ event
4	Online presentations of project progress and highlights work status to the ETP Secretariat and/or ETP Funders Steering Committees	4 (1 hour maximum/ each)

Deliverable 2: A comprehensive study report for the development of the TCVN

- 15. This requires in-depth research and analysis of the current state of BESS in Vietnam, including the regulatory environment, industry standards, and technical requirements. The proposed approach should be systematic and logical, providing a clear roadmap for the development of the TCVN, taking into consideration factors such as safety, reliability, efficiency, and compatibility.

Deliverable 3: Draft National Standards (TCVN) for BESS according to the [list](#) agreed with STAMEQ

16. The development process of TCNVs for BESS requires close consultation with STAMEQ to ensure that the standards align with the national regulatory framework and technical requirements. This task requires collaboration with experts and stakeholders from the BESS industry, research institutions, and government agencies to ensure the standards are comprehensive and inclusive of all relevant aspects of BESS deployment, such as safety, reliability, and efficiency. The proposed TCNVs should be developed in a systematic and logical manner, taking into account the current state of BESS technology and international best practices.

Deliverable 4: Workshop organization and post-workshop reports

17. The purpose of the hybrid, half-day workshops is to engage with a wide range of stakeholders, including industry representatives, researchers, government officials, and other relevant parties to solicit their opinions, suggestions, and feedback on the draft standards. The events should be well-organised, structured, and include presentations on the draft TCNVs and their rationale, followed by facilitated discussions and Q&A sessions. The minimum number of participants for each of the hybrid, half-day workshop is 50. The number of consultation workshops is 02. Each should be organised in different regions in Vietnam, preferably in Hanoi and Ho Chi Minh City. The Consultant is required to engage with journalists to promulgate the project. The consultant should include the ceiling cost for logistic matters. The cost will be reimbursable per actual cost.
18. The feedback and contributions collected should be documented and analysed to identify key issues, concerns, and areas for improvement in the draft standards. The results of the consultation process should be used to refine and improve the draft TCNVs to ensure that they are comprehensive, inclusive, and effective in promoting the safe and effective deployment of BESS in Vietnam.

Deliverable 5: Trips to international labs in countries with strong experience in management of BESS and reports including lessons learnt and recommendations for TCNVs in Vietnam

19. The consultant is required to conduct two 5-day trips to international labs in two countries (one in Asia and one in Europe) with strong experience in management of BESS for 10 representatives from MOIT and MOST. The purpose of the trips is to gain insights into the best practices and approaches for managing BESS and to identify potential strategies and lessons learned that can be applied in the Vietnamese context. The study-tour should include visits to BESS facilities, meetings with industry representatives, and discussions with relevant government agencies and experts.
20. The sites selected for the study-tour should have a robust and successful track record in the deployment and management of BESS and be similar in context to Vietnam. The study-tour should be well-planned, structured, and include a clear set of objectives and expected outcomes. The Consultant needs to detail logistic considerations, including 10 roundtrips economic class flight tickets, accomodations, per diem, and so on. Potential agenda of the trips

should also be provided. The actual agenda and logistics details will be confirmed later during the implementation and needs to obtain approval from ETP and STAMEQ. The details provided here are for the standard of evaluation. The consultant should include the ceiling cost for potential logistic matters i.e. the roundtrip flights (economy class), accommodations, and per diem. The cost will be reimbursable per actual cost.

21. The Consultant is required to submit a report. The report should include the insights and lessons learned from the trips and an analysis to identify potential strategies and best practices that can be applied in Vietnam.

Deliverable 6: Reports on testing principles, practicality of TCVNs, and categorisation of mandatory and optional standards

22. The consultant team must collaborate with labs to evaluate the practical applicability of TCVNs on BESS and decide mandatory standards that impact social and environmental safety, along with optional standards. The purpose of this task is to test and verify the effectiveness and practicality of the TCVNs in real-world scenarios and identify potential areas for improvement. During the trips to two international labs, there needs to be discussion with relevant experts on the practical applicability of TCVNs on BESS, which standards should be mandatory and which should be optional, and the testing principles for BESS. The insights should be documented and analysed to identify areas for improvement and potential modifications to the TCVNs.

Deliverable 7: Final version of the Vietnamese National Standards TCVNs for BESS according to the comments and feedbacks from different stakeholders and in a close consultation with STAMEQ submitted to the Appraisal Council

23. In this task, the Consultant finalises the TCVNs and prepares them for submission to the Appraisal Council in close consultation with STAMEQ. The TCVNs should be aligned with international best practices and be appropriate for the Vietnamese context.

Deliverable 8: A full dossier of TCVNs on BESS to submit to MOST for promulgation

24. Based on suggestions and recommendations of the Appraisal Council, the Consultant modifies the dossier and submits it to MOST for promulgation.

Deliverable 9: Final workshop organization and post-workshop report

25. The consultant will organize the final stakeholder workshop to communicate the key points of the standards which are finalised based on comments of the appraisal council and promulgated by the MOST. The workshop is also to guide the relevant public and private sector stakeholders how to apply the standards and how the manufacturing and import activities will be monitored accordingly. The consultant should include the ceiling cost for logistic matters. The cost will be reimbursable per actual cost.
26. Gender consideration needs to be taken into consideration in the workshop. Minimum % of women participants is 40%. All key stakeholders related to the topic, particularly governmental

entities, should be engaged. Journalists should be invited also to promulgate the findings of the workshop. The minimum number of participants is 75. The workshop should be hybrid and happen for half a day. The workshop will be held in Hanoi.

27. The consultant will also write a post-workshop report that contains information as follows:

- i. Description of the workshop (e.g., background, objective, organisation)
- ii. Workshop agenda and participant components
- iii. Workshop proceedings (e.g., summary of presentations, key points raised, important insights, significant outcomes or decisions)
- iv. Gender considerations
- v. Stakeholder engagement
- vi. Monitoring and implementation
- vii. Media and communication
- viii. Conclusion and next steps
- ix. Annexes (supporting materials such as slides of the presentations, workshop handouts, participant list, list of comments, etc.)

Deliverable 10: Grand final report

28. The Grand final report should include all key findings of previous reports and explanation of the national standards (e.g., applicability, certification, impacts). The report needs to provide a comprehensive overview of the project, its objectives, methodologies, findings, and recommendations. The report must include at least the following components:

- i. Executive Summary
- ii. Methodology
- iii. Regulatory and policy framework/ steps to develop the national standards
- iv. Technical standards development, with rationale behind each standard clearly outlined
- v. Environmental and social considerations
- vi. Stakeholder engagement
- vii. Implementation strategies
- viii. Conclusion and recommendations for the expansion of BESS
- ix. Appendices

Other key information:

- A public facing, publishable Executive Summary (approximately 2 pages) in professional English must be submitted with each deliverable.
- A public facing, catchy powerpoint presentation highlighting key information must be submitted with each deliverable.
- All project deliverables and presentations must be submitted in English and the local language.
- All deliverables are subject to review by ETP, and beneficiary entity(ies) where applicable, before approval. If there are comments and suggestions, the deliverables need to be revised accordingly before payment is released.
- A plan of consultation meetings with relevant stakeholders, particularly the beneficiary and relevant government entities, should be provided and ETP team might participate in them.

- The consultant is required to update the results and achievements of the project in accordance with the agreed project level Results-Based Monitoring Framework, as per the approved template. All results, where applicable, must be gender disaggregated
- The consultant is required to organize and execute all aspects of the workshops and visits to international labs, including organization and logistics.
- All costs associated with workshops and visits to international labs are reimbursable based on actual costs.
- The consultant must consider and highlight specific gender considerations in their proposal.
- The consultant must be available to attend 1 in person workshop with the ETP secretariat in the region. The costs for this will be covered outside the financial scope of this proposal.
- The consultant, or an active organization within the applying consortium, must have in country presence.

V. Timeline for the Project

29. The project will require 15 months from 2023 to 2024. The actual project timeline will be presented by the consultant and agreed upon in the Inception Report. The timeline of the Project is shown in the TOR for the consultant’s services.

Table 3. Proposed timeline of the project’s deliverables

DELIVERABLES	1	2	3	4	5	6	7	8	9	10	11	12	13	14	15
1. Inception Report															
2. A comprehensive study report for the development of the TCVN															
3. Draft National Standards (TVCN) for BESS according to the list agreed with STAMEQ															
4. Workshop organization and post-workshop reports (one week after each event)															
5. Trips to international labs in countries with strong experience in management of BESS; and Reports including lessons learnt and recommendations for TCVNs in Vietnam															
6. Reports on testing principles, practicality of TCVNs, and															

Investors	Direct	The National Standard Framework will ensure BESS integration into RE projects effectively and reliably. As ETP's support provides the enterprises with comprehensive understanding of the standards' impacts and implications as well as supports the government of Vietnam to develop BESS, the RE investors shall benefit from a quick and effective energy transition while maintaining their competitiveness.
Government of Vietnam	Indirect	ETP's support to the ministries and private sector shall contribute to the Government's efforts to achieve climate change targets in the Paris Agreement and to realise the net-zero emission by 2050 commitment.

31. A [donor mapping](#) (Annex 3) was conducted to prevent duplication of efforts between ETP and other development partners in the same areas, as well as to identify areas where ETP could provide support for energy transition that had not yet been addressed

VII. Results Based Monitoring Framework and Risks

A. Results Based Monitoring Framework

32. The Results of the Project are monitored through the following Framework in Table 2. All reports will update the achievement of the indicators.
33. The results are reported with additional supporting information and evidence where applicable and necessary.

Table 5. Results-based monitoring framework

Project Name: Development of the National Standards for Battery Energy Storage System (BESS)

IMPACT

- Increase the share of renewable energy (RE) in the total final energy consumption (TFEC).

OUTCOME

Strategic Outcome 1. Policy Alignment with Climate Commitments
 Strategic Outcome 3. Sustainable Resilient Infrastructure - Smart Grids-

OUTPUT

1.1 National RE and EE policies, regulations, standards, and energy plans reflect a clear commitment to Energy Transition agenda and integrated into sectoral plans to contribute to the achievement of Paris Agreement

3.1 National energy strategy and sectoral plans involve evidence-based planning for an improved national-smart-grid system along with related infrastructure and innovative technologies

INDICATOR	TARGET
IN 1.1-03 - No. of RE and EE policies, laws, regulations, and/or technical standards developed/ revised and presented to/by the government entities	IN 1.1-03 - Creation of a set of TCVNs for BESS
IN 3.1-02 - No. of technical design, demo, modelling projects supported for smart infrastructure	IN 3.1-02 - The national standards will guide the technical development and design of BESS projects so that they are safe, efficient, and environmentally responsible.

ACTIVITIES

- A detailed work plan for the development of the national standards in accordance with the government's procedures
- Develop the national standards for BESS in consultation with STAMEQ
- Two national hybrid-mode consultation workshops to collect feedbacks/ contributions on the national standards
- Evaluate the practical applicability of national standards on BESS with experts from two international labs with a strong experience in these technologies
- A full dossier of national standards on BESS based on suggestions of the Appraisal Council and submit it to the MOST for promulgation

B. Risks and Mitigation Measures

34. The ETP team and the STAMEQ had discussions on the technical assistance activities and confirmed that there is no risk of overlapping with activities implemented by other donors in Vietnam. On the other hand, during the project design and development stage, ETP and STAMEQ will work closely to ensure that the project addresses the needs of STAMEQ and in line with the Government's regulations. The two teams will jointly provide proper justifications to any questions coming from the relevant authorities, which secure the timely approval of the project.

VIII. Qualification and Experience of the Service Provider

A. General requirements

35. The consultant's project team should demonstrate the capacity to execute the works and should include all essential roles filled with personnel with relevant experience. CVs and relevant proofs of the key personnel proposed should be used to verify this information.
36. The company or expert of the company should have **a minimum of 5 years of continuous experience** in delivering similar projects in the past with a track-record of success. What is considered as relevant experience are the following:
- Developing and implementing ministerial-level standards or ministerial-level legal documents in Vietnam
 - Conducting projects with investigation and document collection works with the participation of international organisations and experts.
 - Technical and/ or legal review of BESS equipment, production, operation and management.
 - Organising successful national, international workshops/seminars and national stakeholder consultations.
37. To be considered qualified for the tender, the bidder should have at least 1 experience among the relevant experiences listed in Paragraph 36.
38. Offeror must provide a minimum of two (2) customer references from which similar services have been successfully provided, within any of the last 5 years.

B. Requirements for the Consultant team leader

39. The lead individual should have the following qualification:

Education:

- Master's Degree or higher education in Energy, Economics, Development Policies, Social Sciences, Environmental Sciences or related fields to Quality/Standards Management is required.

- Minimum bachelor's degree with knowledge in engineering in either Electronic or Electrical, Renewable Energy or other relevant fields.

Work Experience

- At least 10 years of experience in the field of scientific research and standards development process.
- At least 5 years of experience in developing National standards related to Renewable energies, such as Solar energy, wind energy, inverters or related fields.
- Experiences for similar assignments.
- Experience in working with development projects, government agencies.
- Computer literacy in Microsoft packages (MS Word, MS Excel, MS Access, MS Power Point) is required.

C. Requirements for the project team

40. The project team members should have the following qualification:

- Extensive experience in energy management, technical, engineering, electrical, mechanical equipment, and other related fields
- Strong knowledge and experience of Renewable Energy such as solar energy, wind energy, inverter, energy storage system, battery and standards or related fields.
- Experience in dealing procedures for development of standards and regulations
- Knowledge and experience in laboratory testing relating to Electronic/ Electrical energy storage systems.
- Knowledgeable with quality assurance procedures including but not limited to TCVN, QCVN standards
- Proven work experience with MOST and/or other governmental authorities and industrial sectors is a preference

41. Considering the importance of close coordination with stakeholders in Vietnam, it is expected that the team proposed consists of consultant(s) who understands the local context in climate change, energy efficiency and energy transition in Vietnam.

42. The bidder should also assign a Contract Manager who would liaise on the non-technical part of the contract implementation, including coordination, liaising with key counterparts, liaising with UNOPS on submission of invoice and payment-related documents.

VIII. Evaluation Criteria

A. Eligibility and Formal Criteria

43. The criteria contained in the table below will be evaluated on Pass/Fail basis and checked during Preliminary Examination of the proposals:

Criteria	Documents to establish compliance with the criteria
1. Offeror is eligible as defined in Instructions to Offerors, Article 4	<ul style="list-style-type: none"> • Form A: Joint Venture Partner Information Form, all documents as required in the Form, in the event that the Proposal is submitted by a Joint Venture. • Form B: Proposal Submission Form
2. Completeness of the Proposal. All documents and technical documentation requested in Instructions to Offerors Article 10 have been provided and are complete	<ul style="list-style-type: none"> • All documentation as requested under Instructions to Offerors Article 10, Documents Comprising the Proposals
3. Offeror accepts UNOPS General Conditions of Contract as specified in Section IV	<ul style="list-style-type: none"> • Form B: Proposal Submission Form

B. Qualification Criteria

44. The criteria contained in table below will be evaluated on Pass/Fail basis and checked during Qualification Evaluation of the proposals.

Criteria	Documents to establish compliance with the criteria
1. The company should have a minimum of 5+ years of continuous experience in delivering similar projects in the past with a track-record of success.	<ul style="list-style-type: none"> • Certification of incorporation of the Offeror • Form F: Performance Statement Form
2. Offeror must provide a minimum of two (2) customer references from which similar services have been successfully provided, within any of the last 5 years	<ul style="list-style-type: none"> • Form F: Performance Statement Form

C. Technical Criteria

45. Technical evaluation will be carried out to bids that pass the eligibility, formal and the qualification criteria, with requirements as follows:

- The maximum number of points that a bidder may obtain for the Technical proposal is 80. To be technically compliant, Bidders must obtain a minimum of 56 points

- Minimum pass score: 70% of maximum 80 points = 56 points

Technical proposal points allocation:

Section number/description		Points Obtainable
1	Offeror's qualification, capacity and expertise	25
2	Proposed Methodology, Approach and Implementation Plan	30
3	Key Personnel proposed and Sustainability Criteria	25
Total Technical Proposal Points		80

Section 1: Offeror's qualification, capacity and expertise

Section 1: Offeror's qualification, capacity and expertise		Points	Sub-points
1.1	Brief description of the organization, including the year and country of incorporation, and types of activities undertaken, including relevance of specialized knowledge and experience on similar engagements done in the past. (Max 4 pages written text plus 1 Matrix)	20	
	Experience in projects of comparable size, type, complexity and technical specialty		10
	Experience in providing similar services, especially in Vietnam and demonstration of good network and experience in engaging with diversified stakeholders and organizing trainings for industries in Vietnam		5
	Understanding of local context, and partnering up with a Vietnamese entity to provide for the strategic consultation, translations; as well as the communications expertise		5
1.2	General organizational capability which is likely to affect implementation: management structure, and project management controls. (Max 4 pages written text)	5	
	1. Management structure, management controls, and extent to which any part would be subcontracted		3
	2. Financial Capacity/financial stability: Bidder should have minimum annual turnover of 300,000 USD in any of the past 2 years Liquidity / quick ratio should be minimum 1, in any of the past 2 years . In case of a joint venture, annual turnover is calculated based on the total annual turnover of the JV members. In case of a joint-venture, at least one		2

	of the JV members should have 1 liquidity/quick ratio in any of the past 2 years.		
Total points for section		25	

Section 2: Proposed Methodology, Approach and Implementation Plan

Section 2: Proposed Methodology, Approach and Implementation Plan		Points	Sub-points
2.1	Description of the Offeror's approach and methodology for meeting or exceeding the requirements of the Terms of Reference	20	
	1. Description of the offeror's approach to conduct and achieve deliverable 1 to 5		10
	2. Description of the offeror's approach to conduct and achieve deliverable 6 to 10		10
2.2	Quality Assurance	5	
	A plan outlining how the bidder intends to ensure oversight and quality assurance throughout the assignment. Quality Assurance plan should include discussion on risk-assessment and its mitigation plan		5
2.3	Implementation Timeline	5	
	Bidder submits a detailed implementation timeline which includes detailed activities to be undertaken during this assignment, and is completed with gantt chart		5
Total points of the section		30	

Section 3 Key personnel proposed and Sustainability Criteria

Number	Description	Sub-points	Points (Total)
3.1 Qualifications of key personnel proposed	a) Project lead	4	20
	b) Engineering expert	2	
	d) Energy expert	2	
	e) Energy storage system expert	3	
	f) Standard expert	3	
	g) Conformity/ certification expert	3	
	h) Quality management system expert	3	
3.2	The bidder shall provide a response that demonstrates its commitment to support and mainstream gender equality and social inclusion through its operations and project implementation activities.	5	5
Total points for section			25

Scoring Matrix for Key Personnel:

Title	Minimum Qualification	Preferred experience	Max Points
Project Lead	<p>Master's Degree or higher education in Energy, Economics, Development Policies, Social Sciences, Environmental Sciences or related fields to Quality/Standards Management.</p> <p>Knowledge of the energy and standard in Vietnam is desired;</p> <p>Computer literacy in Microsoft packages (MS Word, MS Excel, MS Access, MS Power Point) is required.</p>	<p>Minimum 10 year of experience in development of standards and regulations</p>	4
Energy storage system expert	<p>Master's degree or higher in Energy, Economics, Engineering, Power, Environmental Sciences or related fields</p> <p>Two years of similar experience with a Bachelor Degree is considered equivalent.</p>	<p>10 years of experience in laboratory testing relating to Electronic/ Electrical, energy storage systems.</p> <p>Experience related to Renewable Energy such as Solar Energy, Wind Energy, Inverter or related fields.</p> <p>Knowledge of electrical and mechanical equipment manufacturing process</p> <p>Experience in procedures for development of standards and regulations preferred</p>	2
Energy expert	<p>Master's degree in Energy, Economics, Development Policies, Social Sciences, Environmental Sciences or related fields.</p> <p>Additional two years of similar experience with a Bachelor Degree is considered equivalent.</p>	<p>At least 10 years of experience working on Energy.</p> <p>Experience related to Renewable Energy such as Solar Energy, Wind Energy, Inverter or related fields.</p> <p>Knowledge of electrical and mechanical equipment manufacturing process preferred</p> <p>Experience in procedures for development of standards and regulations preferred</p>	2
Engineering expert	<p>Master's degree or higher in Engineering,</p>	<p>At least 10 years of experience working on engineering.</p>	3

	<p>Energy, Environmental Sciences or related fields</p> <p>Additional two years of similar experience with a Bachelor Degree is considered equivalent.</p>	<p>Experience related to Renewable Energy such as Solar Energy, Wind Energy, Inverter or related fields</p> <p>Knowledge of electrical and mechanical equipment manufacturing processes.</p> <p>Experience in procedures for development of standards and regulations is desirable</p>	
Standard Expert	<p>Master's Degree or higher education in Energy, Economics, Development Policies, Social Sciences, Environmental Sciences or related fields to Quality/Standards Management.</p> <p>Additional two years of similar experience with a Bachelor Degree is considered equivalent.</p>	<p>At least 10 years of experience on standards and regulations, including TCVNs, QCVNs, and international standards</p> <p>Knowledge of mechanical equipment and energy process preferred</p> <p>Strong knowledge of and experience in procedures for development of standards and regulations in Vietnam</p>	3
Conformity/certification expert	<p>Master degree in Electronic or Electrical System or related fields.</p> <p>Additional two years of similar experience with a Bachelor Degree is considered equivalent.</p>	<p>At least 5 years of experience working on conformity and certification in Vietnam</p> <p>Knowledge of laboratory testing relating to Electronic/ Electrical, Renewable Energy or other relevant fields</p> <p>Strong knowledge of international certification process and at least 5 years of experience with international certification process</p> <p>Strong knowledge of and proven experience with certification process in Vietnam</p>	3
Quality management system expert	<p>Master degree in Energy, Economics, Development Policies, Social Sciences, Environmental Sciences, or related fields.</p> <p>Additional two years of similar experience with a Bachelor Degree is considered equivalent.</p>	<p>At least 5 years of experience working on quality management system, particularly for Electronic/ Electrical, Renewable Energy or other relevant fields</p> <p>Knowledge of quality assurance procedures including but not limited to ISO 9001, ISO 50001, ... and at least 5 years of working with the procedures</p>	3

		Proven experience in setting up the quality management system for Vietnam	
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D. Financial Criteria (20 maximum points)

- 46. The financial part of those proposals that are found to be technically compliant will be evaluated as follows.
- 47. The maximum number of points that a bidder may obtain for the Financial Proposal is 20. The maximum number of points will be allocated to the lowest evaluated price bid. All other prices will receive points in reverse proportion according to the following formula:
- 48. Points for the Financial Proposal of a bid being evaluated =

$$\frac{[\text{Maximum number of points for the Financial Proposal}] \times \{\text{Lowest price}\}}{[\text{Price of proposal being evaluated}]}$$

- 49. Financial proposals will be evaluated following completion of the technical evaluation. The bidder with the lowest evaluated cost will be awarded (20) points. Financial proposals from other bidders will receive prorated points based on the relationship of the bidder's prices to that of the lowest evaluated cost.

E. Formula for computing points: Example

Points = (A/B) Financial Points
Bidder A's price is the lowest at \$20.00. Bidder A receives 20 points
Bidder B's price is \$40.00. Bidder B receives (\$20.00/\$40.00) X 20 points = 10 points

- 50. The total score obtained in both Technical and Financial proposals will be the final score for the proposal, with 80% allocated to the Technical proposal and 20% to the Financial proposal. The proposal obtaining the overall highest score will be considered as the winning proposal. This proposal will be considered to be the most responsive to the needs of UNOPS in terms of value for money.
- 51. The selection of the preferred bidder will be based on a cumulative analysis, analysing all relevant costs, risks and benefits of each proposal throughout the whole life cycle of the services and in the context of the project as a whole. The lowest priced proposal will not necessarily be accepted.

Annex 1. Background Information

Nationals Standards for Battery Energy Storage System (BESS)

1. The Technical Assistance program is an initiative of ETP in collaboration with the Directorate for Standards, Metrology, and Quality under the Ministry of Science and Technology (STAMEQ). It aims to develop a complete set of Vietnamese National Standards (TCVN) for the battery energy storage system (BESS). Currently, Vietnam lacks national BESS standards, which limit investment in renewable energy (RE) and impede its growth. Therefore, developing these standards will enable state authorities to effectively manage the integration of BESS into renewable energy (RE) projects and ensure a reliable and sustainable energy system, thus contributing to the Power Development Plan VIII and achieving Vietnam's net-zero commitment.
11. The development of electricity from RE sources to remove carbon in the energy system in order to realise the goal of Net zero (reducing emissions to zero) is the trend of the energy sector worldwide. However, the increase in the proportion of RE in the electricity sources has caused many problems for the stable operation of the power system. Stemming from this fact, many countries around the world have combined the process of increasing the proportion of RE sources with investment in an energy storage system (ESS). The energy storage system will contribute to reducing the maximum capacity of the power system during peak hours and reducing the grid overload situation, thereby improving the economic efficiency of the power system.
12. In many countries around the world, the battery energy storage system (BESS) has become an essential technology in demand management, RE, and smart grid. Along with other technological applications, BESS technology is also being developed to contribute to promoting economical and efficient use of energy. BESS become more and more important as the grid develops into a smarter system to receive electricity produced from RE sources.
13. In Vietnam, currently the total installed capacity of RE sources (including wind and solar power) as of October 31, 2021 reaches 20,462 MW, equivalent to 27.2% of the capacity of the whole system. The proportion of RE capacity has increased rapidly over the past three years thanks to the feed-in tariffs (FIT) for the development of solar and wind power. Although capacity from RE accounts for 27%, the electricity generation of this source contributes only about 10.9% of the whole system (see Table 1). Part of the reason for this low electricity generation from RE is that wind and solar power plants, after being put into operation, have to curtail the electricity generation due to overloading of the transmission grid.

Table 1: Statistics on capacity and electricity of the national power system in 2021

Power source	Capacity (MW)	Electricity generation (million MWh)

Hydropower	21,364 (28.4%)	74,873 (29.4%)
Coal fired	23,437 (31.2%)	120,548 (47.4%)
Gas fired + oil fired	9,025 (12.0%)	2,905 (11.4%)
Imported	897 (0.9%)	2,215 (0.9%)
RE	20,462 (27.2%)	27,815 (10.9%)
Total	75,185	254,509

Source: National Load Dispatch Center - A0 (updated to 11/2021)

14. BESS provides a cost-effective way to store excess energy generated by renewable sources like wind and solar farms. Therefore, the need to invest, develop and put into operation of a BESS is significantly urgent to increase stably and efficiently the contribution from RE and solar power in particular to the national electricity generation. In order to have a reliable renewable energy source, the quality of BESS must be assessed and maintained. Around the world, BESSs are evaluated according to international standards such as IEC standards. These standards specify performance specifications, test methods, performance evaluation planning of BESSs or grid-integrated types, relevant environmental aspects, etc.
15. Currently, Vietnam does not have yet any national standards (TCVNs) for BESS in the field of renewable energy. Lacking national standards on BESS causes the delay in developing, endorsing and appraising of BESS investment and implementation activities. It in turn will reduce the growth and the penetration rate of RE in the power system. Therefore, it is imperative that TCVNs for BESS are formulated.
- TCVN stands for Vietnam standard phrases, used as a prefix notation for the national standards of Vietnam. There are now thousands of TCVN including basic standards, terminology standards, standard technical requirements, test methods and standards in fields such as mechanical engineering, metallurgy, transportation, construction, chemical, oil and gas, minerals, agriculture, food, consumer goods, environmental, safety, electrical, electronics, information technology, etc.
1. The national standards shall be created/ approved through the government's procedures⁴, including the following steps:
 - Step 1: Submission of proposal for the development of the national standards

⁴ The procedures in Vietnamese published on Vietnam Standards Quality and Institute can be found in this link: <https://vsqi.gov.vn/standards-development-process-a36>

- Step 2: Approval of the standard development project and its development schedule
 - Step 3: Technical development of the draft standards, including data collection and analysis, translation of relevant international standards, drafting the international standards and technical preamble, testing prototypes and/ or products available in the market, site surveys to local factories or countries where the products are produced, internal technical consultations and finalisation of the draft.
 - Step 4: Consultation workshops with experts, manufacturers, and relevant stakeholders, finalisation of the draft standards
 - Step 5: Appraisal: the draft standards shall be appraised by the National Appraisal Committee
 - Step 6: Announcement of the national standards
 - Step 7: Publication of the national standards
16. The Ministry of Science and Technology (MOST) is responsible for establishment and implementation of all National Standards (TCVN). The Directorate for Standards, Metrology and Quality (STAMEQ) is in charge of development and appraisal of draft national standards (TCVN), including those for BESS.
17. Given the fact that BESS is a new technology to Vietnam and lacking national standards and regulations, the development of TCVN system on BESS will provide national standards to classify and evaluate BESS products, services, related environmental and socio-economic impacts in order to improve the quality and efficiency of BESS application, production and usage in Vietnam. The National Standard System for BESSs will serve as a platform in order to safeguard effectively and reliably management of the state authorities on the study, integration of BESS into RE projects in Vietnam.
18. The Ministry of Industry and Trade (MOIT) or Department of Industry and Trade (DOIT) are the main governmental interlocutors involved in the RE development process, depending on the size of the project. These branches of the government coordinate the appraisal of different stages of RE project development. The Electricity Regulatory Authority of Vietnam (ERAV) oversees the development of the power sector, including planning and regulation of electricity tariffs. Vietnam Electricity (EVN), the national and vertically integrated utility, operates the power system. Its different subsidiaries are engaged during the different development phases for integration of the RE into the national grid.
19. The Ministry of Natural Resources and Environment (MONRE), and its provincial branches (DONRE), are in charge of approving environmental impact assessments and action plans. Besides, the RE project owner/ investor must also address the Department of Fire Prevention and Fighting to ensure compliance with national safety standards.
20. The ETP's support shall provide the key beneficiaries, including MOST, MOIT, and MONRE a clear vision of the BESS integration in Vietnam, recommending a legal framework and institutional mechanism to develop national standards for BESS. A firm national standard system shall provide a suitable framework for sustainably and reliably integrating BESS into RE projects in Vietnam.

Annex 2. Proposed List of TCVNs for BESS

No	TCVN	Description
1	Electrical energy storage (EES) systems - Part 1: Vocabulary	This part defines terms applicable to electrical energy storage (EES) systems including terms necessary for the definition of unit parameters, test methods, planning, installation, safety and environmental issues.
2	Electrical energy storage (EES) systems - Part 2-1: Unit parameters and testing methods - General specification	This part deals with EES system performance defining: <ul style="list-style-type: none"> - unit parameters, - testing methods.
3	Electrical energy storage (EES) systems - Part 2-2: Unit parameters and testing methods - Application and performance testing	This part defines testing methods and duty cycles to validate the EES system's technical specification
4	Electrical energy storage (EES) systems - Part 2-200: Unit parameters and testing methods - Case study of electrical energy storage (EES) systems located in EV charging station with PV	This part presents a case study of electrical energy storage (EES) systems located in electric vehicle (EV) charging stations with photovoltaic (PV) power generation (PV-EES-EV charging stations) This document includes the following elements: <ul style="list-style-type: none"> - overview of general PV-EES-EV charging stations; - operational analysis of EES systems in typical project cases; - summary and recommendation of EES systems' operation modes.
5	Electrical energy storage (EES) systems - Part 3-1: Planning and performance assessment of electrical energy storage systems - General specification	This document considers <ul style="list-style-type: none"> - necessary functions and capabilities of EES systems - test items and performance assessment methods for EES systems - requirements for monitoring and acquisition of EES system operating parameters - exchange of system information and control capabilities required

6	Electrical Energy Storage (EES) Systems - Part 3-2: Planning and performance assessment of electrical energy storage systems - Additional requirements for power intensive and renewable energy sources integration related applications	This part provides the requirements for power intensive and for renewable energy sources integration related applications of EES systems, including grid integration, performance indicators, sizing and planning, operation and control, monitoring and maintenance.
7	Electrical Energy Storage (EES) Systems - Part 3-3: Planning and performance assessment of electrical energy storage systems - Additional requirements for energy intensive and backup power applications	This part defines the requirements, considerations, and use cases for the application of EES systems for energy intensive applications, islanded operation, and backup power supply.
8	Electrical energy storage (EES) systems - Part 4-1: Guidance on environmental issues - General specification	This part is a Technical Specification, describes environmental issues associated with electrical energy storage systems (EES systems), and presents guidelines to address the environmental impacts to and from EES systems including the impacts to humans due to chronic exposure associated with the mentioned environmental impacts.
9	Electric Energy Storage Systems - Part 4-2- Assessment of the environmental impact of battery failure in an electrochemical based storage system	This part defines the requirements and structure for the evaluation and reporting of the impact on the environment, from a failure of the electrochemical core of the battery energy storage system (BESS), i.e. the cell, battery, or cell stack due to internal and exogenous causes. This failure may result in a negative impact to the environment in which the BESS exists.
10	Electrical energy storage(EES) systems - Part 4-3: The protection requirements of BESS according to the environmental conditions and location types	This part focuses on the protection requirements of BESS according to the environmental conditions and location types.
11	Electrical energy storage (EES) systems- Part 4-4: Standard on environmental issues battery-based energy storage systems (BESS) with reused batteries – requirements	This part provides environmental requirements for BESS using reused batteries in various installations and aspects of life cycles.

12	Electrical energy storage (EES) systems - Part 5-1: Safety considerations for grid-integrated EES systems - General specification	<p>This part includes a Technical Specification, specifies safety considerations (e.g. hazards identification, risk assessment, risk mitigation) applicable to EES systems integrated with the electrical grid.</p> <p>This document provides criteria to foster the safe application and use of electric energy storage systems of any type or size intended for grid-integrated applications</p>
13	Electrical energy storage (EES) systems - Part 5-2: Safety requirements for grid-integrated EES systems - Electrochemical-based systems	<p>This part primarily describes safety aspects for people and, where appropriate, safety matters related to the surroundings and living beings for grid-connected energy storage systems where an electrochemical storage subsystem is used.</p>
14	Electrical energy storage (EES) systems Part 5-3: Safety requirements for electrochemical based EES systems considering initially non-anticipated modifications - partial replacement, changing application, relocation and loading reused battery	<p>This part includes the requirements to achieve safe modifications of the BESS. Such undergoing unplanned modifications can involve one or more of the following:</p> <ul style="list-style-type: none"> - Energy storage capacity adjustments - Changes of the chemistry, design or manufacturer of batteries - Subsystem component substitutions - Changes of mode of operation - Changes of installation site - Installation of reused or repurposed batteries
15	Electrical energy storage (ESS) systems - Part 5-4 - Safety test methods and procedures for grid integrated EES systems - Lithium ion battery-based systems	<p>This part provides test methods and procedures to address safety concerns for grid integrated EES systems - Lithium ion battery-based systems</p>

Annex 3. Donor Mapping

Battery Energy Storage System in Vietnam

Table 1 shows a list of projects related to the battery energy storage system (BESS) that were implemented by development partners in Vietnam. The list is not exhaustive, but provides examples of ongoing and completed projects on the topic. All of the projects focussed on assessing the feasibility of battery energy storage systems (BESS) in Vietnam. Therefore, this technical assistance of ETP can further support the efforts to scale up BESS deployment by developing national standards.

Table 1. Relevant programmes/ projects on BESS

Organization Name	Topic and Detailed Activity	Timeline	Output
ADB	In the Southeast Asia Energy Sector Development, Investment Planning, and Capacity Building Facility project, which there is a focus on battery storage system. Particularly, the project aims to provide technical assistance facility encompassing a range of activities, including policy guidance, sector analysis, capacity building, and project implementation support to leverage the expertise of technical specialists in clean energy technologies, such as battery storage systems.	September 2018 - December 2021	The support provided includes technical and advisory assistance, as well as capacity development and implementation support.

ADB and the Global Energy Alliance for People and Planet (GEAPP) Fund	<p>On March 30, EVN, ADB, and GEAPP have agreed to extend their discussions and collaborative efforts in implementing several BESS-related initiatives. Specifically, there will be a focus on developing an investment plan for the BESS project, as well as exchanging information regarding technical infrastructure development needs in the near future.</p>	<p>Not provided</p>	<p>Technical support and investment plan for BESS</p>
USAID	<p>The USAID Vietnam Urban Energy Security project collaborates with the Government of Vietnam (GVN) at the national, provincial, and city levels to enhance clean energy-related legislation, attract investments, and promote the use of innovative energy solutions. One aspect of the project is to demonstrate the potential of the Battery Energy Storage System (BESS) as an innovative energy solution to support Vietnam in the commercial and industry sector.</p>	<p>August 2021, for a maximum period of up to six months.</p>	<p>The consortium and the project will document and share the lessons learned, challenges faced, and achievements made through a case study, installation manual, webinars/workshops, and exchange visits with relevant stakeholders.</p>
Danish Energy Agency	<p>Under the Vietnam-Denmark Energy Partnership Programme 2021-2025 (DEPP3), the Technology Catalogues were produced and contain data for energy technologies. One of the catalogues focusses on energy storage technologies, which include lithium-ion batteries and vanadium redox flow batteries.</p>	<p>2021 - 2025</p>	<p>Catalogues of technology data related to energy technologies. These catalogs provide information on the technology, economics, and environmental aspects of various energy installations and are utilised by the agency for energy projections.</p>
US Consulate General, HCM City	<p>In collaboration with the U.S. Consulate General in Ho Chi Minh City, AMI Energy Khanh Hoa will initiate a pilot project for a utility-scale Battery Energy Storage System (BESS) in Vietnam. This initiative aims to showcase the potential of BESS technology in reducing power losses and facilitating the integration of renewable energy sources into Vietnam's power system.</p>	<p>Not provided</p>	<p>Demonstration of the potential of BESS in reducing power losses in Vietnam and recommendations on how Vietnam can integrate better renewable energy in its power system.</p>
U.S. Trade and Development Agency	<p>Vietnam Electricity (EVN), the state-owned power company of Vietnam, was granted funding by the U.S. Trade and</p>	<p>Not provided</p>	<p>A report showing the potential of energy storage technologies, such as</p>

	<p>Development Agency to explore the practicality of implementing cutting-edge energy storage technologies in Vietnam.</p>		<p>battery energy storage systems and flywheels, in mitigating power shortages and reducing losses, while also promoting a higher capacity for renewable energy generation across the nation.</p>
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