

Enhancing Hydro Energy Storage Viability

De-risking pump storage hydro project development Philippines



Terms of Reference | Nov 22, 2023

This technical assistance project will provide support to the Department Of Energy (DOE) in developing de-risking mechanisms for pump storage hydro (PSH) project development. **There are two work packages being tendered as part of the overall initiative Enhancing Hydro Energy Storage Viability. The implementing partners of these two work packages are expected to collaborate, where applicable, to deliver the expected project outputs. This Terms of Reference (TOR) document refers to Work Package 1 covering non-coastal, non-salinated PSH projects as stand-alone energy storage system.** The project aims to address the upfront risks to PSH project development so that it can be utilised as the long-term, viable energy storage solution for the grid to facilitate variable renewable energy (VRE) integration. The de-risking components in this project include the initial siting of potential PSH sites, developing environmental, social impacts, grid connectivity assessment framework for PSH project development, and conducting a market assessment study for power generated from PSH. Related capacity building for policymakers, as well as stakeholder engagement activities, will also be carried out. Enabling PSH as the energy storage for a grid with VRE uptake will address grid-connection issues associated with it such as RE curtailment and load shifting, frequency problems, black start, and capacity firming.

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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 works through four interrelated Strategic Objectives. These are (i) policy alignment with climate commitments, (ii) de-risking energy efficiency and renewable energy investments, (iii) extending smart grids, and (iv) knowledge, awareness, and capacity building.

II. Summary

- 2 ETP, in collaboration with the Philippines Department of Energy (DOE), will implement two distinct but interrelated projects (referred to as Work Package) on pump storage hydro (PSH) development as a stand-alone energy storage system (ESS). The first project covers non-coastal, non-salinated PSH project development while the second would assess seawater energy storage's viability. The relevant capacity-building and information dissemination activities will be designed and implemented to aid in the sustainability of the project outputs towards achieving its intended outcomes. The expected Project timeline is 18 months.
- 3 **Work Package 1: De-risking non-coastal, non-salinated pump storage hydro project development as a stand-alone energy storage system.** Enhancing hydro energy storage viability through Work Package 1 is being tackled for the role of PSH as an ESS that would effectively facilitate variable renewable (VRE) integration into the power grid while maintaining system reliability and security. This will be addressed by assisting the DOE in identifying the potential PSH sites and by developing de-risking mechanisms to address the upfront challenges to PSH project development as a stand-alone ESS. This technical assistance (TA) has three project components based on the major outputs and will be implemented for 18 months. The related capacity-building activities and knowledge-raising events will also be designed and implemented.
 - i. **Component 1: Determine Potential PSH Sites.** The Consultants shall use reliable and industry-accepted databases and software application/s to geolocate and characterise the potential sites for PSH projects. These sites shall be ranked/ prioritized based on the parameters defined together with the DOE.
 - ii. **Component 2: Conduct a Market Assessment Study.** Another upfront challenge to PSH project development is its economic unattractiveness where the associated business model is characterized by long-term remuneration schemes, low prices for flexibility services, and uncertainty over electricity prices and market conditions. To address this, the market assessment study will provide recommendations and options for market mechanisms of PSH power supply.

- iii. **Component 3: Develop PSH Project Development Framework.** The associated environmental and social impacts of PSH project development and implementation can potentially have high negative consequences, and in effect takes a very long time for impact assessments to be completed. This in turn reduces its attractiveness for RE project developers and/or investors. Moreover, PSH as an energy storage solution should have grid connectivity already considered otherwise, it adds up to the lengthy and risky project development process. As such, Component 3 will focus on developing a recommended project development framework that would set the environmental and social impact standards, and grid connectivity considerations. This will entail in-depth stakeholder engagement activities.

III. Project Details

A. Rationale

- 4 The Philippines has set renewable energy (RE) targets of 35% by 2040 and 50% by 2050 in the power generation mix. While these overarching targets provide a strong case for RE adoption, its integration into the power grid remains a challenge. Specifically, VRE makes it difficult for its intermittent supply to provide a secure and stable power supply.
- 5 These grid integration issues could be addressed by a reliable energy storage system (ESS) such as pump storage hydro (PSH). According to the International Renewable Energy Agency, PSH is a viable long-term energy storage solution for grid systems with high VRE capacity.¹ Moreover, as its operations make up close to 94% of the global energy storage capacity, it has been proven that PSH addresses grid-connection issues from variable power generation such as RE curtailment and load shifting, frequency problems, black start, and capacity firming.² As such, PSH has a significant role as large-scale energy storage to facilitate large fractions of VRE integration while maintaining system reliability and security.
- 6 However, PSH project development is restricted by an unattractive business case and slow deployment. The economic attractiveness of PSH is weakened by long-term remuneration because of uncertainties over electricity prices and market conditions within this timeframe, the associated environmental and social impact assessments are lengthy and costly, grid integration has no set connection points, and the current regulatory framework perceives impounding with high environmental risks. As such, there is a need to reduce the risks associated with PSH project development to maximise its potential.
- 7 The concept of ESS has already been recognized by the Department of Energy (DOE) as an emerging technology that will help improve the electric power industry dominated by

¹ IRENA (2020), *Innovation landscape brief: Innovative operation of pumped hydropower storage*, International Renewable Energy Agency, Abu Dhabi.

² International Hydropower Association. (2022). *Pumped hydro*.
<https://www.hydropower.org/factsheets/pumped-storage>

renewable energy. As such, it has released Department Circular (DC) 2023-04-0008, which prescribes the policy for energy storage systems (ESS) to ensure the power sector's quality, reliability, security, sustainability, and affordability while supporting the accelerated deployment of renewable energy. Moreover, the Philippine Electricity Market Corporation is preparing for the market integration of battery storage and other ESS into the electricity market.³

- 8 The 2022 Marine RE Stocktake Report,⁴ developed through ETP's support in its response to a request from the DOE to the Rapid Response Facility, presents PSH technology and seawater-based energy storage as suitable solutions to achieving the clean energy targets and national renewable energy program of the Philippines.
- 9 To address the issues presented above and build upon its BESS Report and Marine RE Stocktake, ETP is providing support to the Philippines DOE in its request to support enhancing the viability of PSH in the country.

B. Impact

- 10 It is envisioned that this technical assistance will result in greenhouse gas (GHG) emissions avoidance and/or reduction from fossil fuel replaced by renewable energy power generation and green jobs in low-carbon industries added.

C. Outcomes, and Outputs

- 11 The main objective of this technical assistance is to develop de-risking mechanisms that would enhance the viability of pumped hydro storage projects.
- 12 The outcomes of this project are:
 - i. Increased investments in RE projects, contributing to the projected net capacity addition of 20 GW ⁵ from PHS between 2026 and 2030 in the Asia Pacific region
 - ii. De-risked mechanisms for the environmental and social impacts of and business case for PSH developed to allow for its sustainable development and enhance its viability

³ PEMC. (2023). *Downloads: Upgrading Design and Implementation of Energy Battery Storage Market Mechanism of the Philippines Electricity Market Mechanism*.
<https://www.wesm.ph/library/downloads/view-download/documents/renewable-energy-market/bess-final-report>

⁴ ETP. (2023). *Marine Renewable Energy in the Philippines: Sustainable Energy from Ocean Spaces and Resources*.
<https://www.energytransitionpartnership.org/resource/marine-renewable-energy-in-the-philippines-sustainable-energy-from-ocean-spaces-and-resources/>

⁵ IEA. (July 2021). *Hydropower Special Market Report: Analysis and forecast to 2030*.
https://iea.blob.core.windows.net/assets/4d2d4365-08c6-4171-9ea2-8549fabd1c8d/HydropowerSpecialMarketReport_corr.pdf

- iii. Enhanced capacity of policymakers to develop and implement PSH energy projects and increased awareness of sustainable alternatives to energy storage systems, thus allowing for quicker and greater uptake of VRE

13 The primary outputs of this project are:

- a. Preliminary list of potential PSH sites
- b. Prioritisation tool for PSH project development
- c. Market assessment report
- d. PSH project development framework
- e. Final completion report
- f. 4 Capacity building workshops for energy policymakers and regulators
- g. Minimum 6 technical working groups
- h. 1 Knowledge and information dissemination event

D. Sustainability, Gender Equality, and Social Inclusion Mainstreaming

14 ETP is committed to promoting and supporting gender equality and social inclusion (GESI) through its project implementation. Groups that will be impacted by the project activities shall be identified. The Project shall be inclusive of the invited stakeholders during the consultation and seek a balanced representation of women and other identified groups in project activities. The implementing partner should identify the implications, outputs, and contributions to gender equality and social inclusion in the project activities. This task shall be accomplished through a clear methodology and approach which must be identified as part of the inception report.

IV. Project Deliverables

- 15 In line with the outputs and outcomes expected from this project (see Project Details), this section provides additional information on specific deliverables required to accomplish the above project outputs.
- 16 Table 1 outlines the key deliverables that are expected in this project. Additional details on associated activities for each deliverable are provided below under Table 1.

Table 1. Key deliverables

| No | Deliverables | Target delivery |
|----|---|---|
| 1 | Inception Report | Month 1 after contract signing |
| 2 | Preliminary list of potential PSH sites and Capacity Building* | Month 6 after contract signing |
| 3 | Prioritisation Tool and Capacity Building Session* | Month 10 after contract signing |
| 4 | Market Assessment Report and Capacity Building Session* | Month 16 after contract signing |
| 5 | PSH Project Development Framework and Capacity Building Session* | Month 17 after contract signing |
| 6 | Final Completion Report and Information Dissemination Event | Month 18 after contract signing |
| 7 | Minimum 6 Project Technical Working Group (TWG)* | Months 2, 6, 10, 13, 16, 17 |
| 8 | Contract Monitoring Monthly Progress Report: In addition to the listed deliverables, the consultant will need to provide monthly progress reports as per the provided template which will be shared during the project kick-off stage. Failure to submit this report may result in the payments being withheld. | Monthly |
| 9 | Non-personnel reimbursable costs: Some of the above deliverables (*) contain logistic organisations of technical working groups and capacity-building workshops. The consultant is required to propose in their financial proposal a ceiling cost to organise and execute all aspects of the workshops, including organisation and logistics. | As per the deliverables' milestone deadlines. |

17 Deliverable 1: Inception Report The Consultant shall prepare the project Inception Report based on the agreed timeline of implementation and methodology. As a deliverable, the inception report ensures that project expectations are aligned with the understanding of the Consultant. It shall contain, as a minimum:

- i. Introduction and project background

- ii. Scope of Services
- iii. Methodology and Workplan, with details on the approach and project Gantt chart. The approach shall detail how each deliverable will be met and what each submission will contain including an Annotated Outline for the main deliverables
- iv. Stakeholder Analysis, which includes an audience mapping, analysis, and communication/ outreach plan
- v. Gender equality and social inclusion, which details how the project implementation will account for gender equality and social inclusion, as well as incorporating it in the PSH Project Development Framework that will be proposed
- vi. A donor coordination strategy, explaining how project outputs will leverage and complement ongoing and planned projects from other development partners
- vii. Project management inclusive of organizational chart detailing key personnel, their roles and responsibilities, as well as their locations (strong in-country team and project management is required), and project quality assurance
- viii. Risks, mitigations, and assumptions
- ix. Monitoring and Evaluation Framework, presented in the form of the ETP Results Based Monitoring Framework (RBMF)
- x. Communications Plan, identifying the suitable media channels for communicating the project and the rationale for choosing them as described in Table 2.

Table 2: Minimum Requirements in the Communications Plan⁶

| No. | Communications materials | Quantity, minimum |
|-----|--|---|
| 1 | Social media posts (liaising with ETP) | At least 4, spread throughout the duration of the project linked to various key milestone events |
| 2 | Press release, upon agreement with the DOE or News article | 1 per public workshop/ event |
| 3 | Stakeholder Engagement Plan for Components 2 and 3 | 1 plan (internal document) |
| 4 | Online presentation of project progress and highlights to the ETP Secretariat and/or ETP Funders | 1 (1-hour maximum) |
| 5 | Maintain/develop a database of photographs/ videos/ vox pops from events/ activities | 4 high-quality images per workshop/event Minimum 2 high-quality short raw video footage (2-3 mins) per |

⁶ The consultant is required to draft and execute a detailed communications plan. The costs to deliver the communication materials will be disbursed against the actual expenses. Apart from the personnel costs to deliver the deliverables, bidders are required to provide financial proposal for these communication-related costs under the non-personnel costs.

| No. | Communications materials | Quantity, minimum |
|-----|--------------------------|---|
| | | workshop/event (ideally, key speeches and/or highlights reel) |

Component 1: Determine Potential PSH Sites

- 18 **Deliverable 2: Preliminary list of potential PSH sites and Capacity Building** The second deliverable covers the siting of the potential stand-alone PSH sites and conduct of related capacity building. Any changes to the project's implementation such as but not limited to project timeline, team composition, strategy, and risk assessment shall be reported to ETP for proper documentation.
- 19 The Consultant shall identify the potential sites for stand-alone PSH in non-coastal, non-salinated water systems using Geographic Information System (GIS)-based siting. The Consultant shall explain its approach in developing the model to use, the GIS algorithm to employ, and the classifications of PSH sites, where applicable. The expected inputs to the modelling include but are not limited to publicly available but reliable digital elevation models and protected area datasets. The software that is available and ready for use by the DOE-REMB is QGIS and ArcGIS (9.1 basic), and the Consultant shall ensure that the data submitted are usable by the DOE. At this stage, the potential PSH sites will be reported with the following parameters:
- i. Project location (province and municipality)
 - ii. Location of primary structures i.e. upper and lower reservoirs, dam, powerhouse
 - iii. Geographic coordinates (preferably using PRS92 coordinate system⁷)
 - iv. Preliminary geological conditions
 - v. General scheme of development e.g. trace of the waterways, extent of the reservoirs, etc.
 - vi. Design discharge
 - vii. Potential Capacity
 - viii. Stored energy
 - ix. Head
 - x. Upper Reservoir
 - i. watershed
 - ii. area
 - iii. storage (in cubic meters)
 1. live
 2. dead
 - xi. Dam (upper and lower)

⁷ Philippine Reference System of 1992

- i. crest elevation (in meters above sea level)
 - ii. height
 - iii. length
 - iv. volume
- xii. Lower Reservoir
 - i. area (in square kilometers)
 - ii. storage (in cubic meters)
 - 1. live
 - 2. dead
- xiii. Water to dam rock volume ratio
- xiv. Penstock
 - i. Horizontal distance (in kilometers)
 - ii. Length (meters)
 - iii. Slope
- xv. Tailrace
 - i. Length (meters)
 - ii. Horizontal distance
- xvi. Access roads (kilometers)
- xvii. Distance to nearest substation(s)
- xviii. Preliminary social and environmental concerns

20 In the preliminary identification of potential PSH sites (stand-alone ESS), the Consultant should also provide classification on how to best approach/ consider the potential PSH sites i.e. open-loop, closed-loop, storage capacity.

21 The Consultant shall develop and deliver a capacity-building session for the DOE-REMB on the methodology used in the siting of the preliminary stand-alone PSH sites. The Consultant shall explain its approach in developing the model used and the GIS algorithm employed. The objective is to ensure that DOE-REMB is familiarised with the methodology and is able to conduct subsequent updating of the database. The Consultant shall arrange the half-day workshop either in the DOE Office or in a conducive venue within Metro Manila for 30 government participants.

22 For all capacity-building workshops⁸ and events, the Consultant is expected to:

⁸ Under Deliverables 2, 3, 4, and 5, the associated costs for logistic organisation of the half-day capacity building workshops will be reimbursed against the actual expenses. The bidder is expected to propose a ceiling budget to deliver capacity building workshops in a venue within Metro Manila. The financial proposal for this task should be budgeted separately from the personnel lump sum costs. The bidder should include in the non-personnel costs all associated costs to organise the event including, venue, organisation, and other travel and logistics expected.

- i. handle all tasks related to the workshop including organising the logistics, inviting participants and speakers, booking the venue, and executing the actual workshop
- ii. shall implement gender equality and social inclusivity
- iii. submit a Post-workshop Report 10 working days after the completion of the capacity building with the following details:
 - i. Description of the workshop (e.g., background, objective, organisation)
 - ii. Workshop agenda
 - iii. List of participants with gender-disaggregated data
 - iv. Workshop proceedings (e.g., summary of presentations, key points raised, important insights, significant outcomes or decisions)
 - v. Gender considerations and social inclusion
 - vi. Conclusion and next steps
 - vii. Annexes (supporting materials such as slides of the presentations, workshop handouts, participant list, list of comments, etc.)

23 For this deliverable, there are two expected outputs to be submitted:

- i. GIS-map of the potential PSH sites with the applicable data (layers) specified in item 19, with DOE as the end-user
- ii. Post-workshop report

24 **Deliverable 3: Prioritisation Tool for PSH Development and Capacity Building:** The third deliverable covers the prioritisation/ranking of potential stand-alone PSH sites and the conduct of related capacity building. Any changes to the project's implementation such as, but not limited to project timeline, team composition, strategy, and risk assessment shall be reported to ETP for proper documentation.

25 Using the list of potential PSH sites determined in Deliverable 2, the Consultant shall conduct a prioritisation/ranking of the potential PSH sites and develop the corresponding Prioritisation Tool, which will then be turned over to DOE-REMB. The prioritisation/ranking shall be in consideration of the following factors: project economic feasibility, areas of the grid where there is an urgent need for grid stability and reliability,⁹ proximity to transmission connection, environmental considerations i.e. environmentally-protected areas, restricted areas/ no-go zones with overlapping existing hydropower service contracts (HSC), dams, and irrigation canals, and social constraints i.e. areas with Certificate of Ancestral Domain Title (CADT). The Consultant shall guide the prioritisation/ranking process and will work closely with DOE-REMB to define the criteria.

26 The Consultant shall develop and deliver a capacity-building session on the prioritisation of PSH sites. The objective is to ensure that DOE-REMB is familiarised with and understands the prioritisation process to enable them to conduct related information dissemination activities

⁹ ETP will share relevant reports on the battery energy storage systems (BESS) and smart grid for the transmission network

and to implement the succeeding updating of the list using the Prioritisation Tool developed. The Consultant shall arrange the workshop either in the DOE Office or in a conducive venue within Metro Manila for 30 government participants.¹⁰

27 For this deliverable, there are three outputs expected to be submitted:

- i. A Prioritisation Tool that can be used by, and modified by DOE in the future, with DOE as the end-user
- ii. An internal report for the DOE that explains the priority PSH sites for development with relevant information and data.
- iii. Post-workshop report

28 During this time, the Consultant must already plan and prepare for the stakeholder engagement activities needed in developing the PSH Project Development Framework and reviewing the existing service contracts.

Component 2: Conduct Market Assessment Study

29 **Deliverable 4: Market Assessment Study Report and Capacity Building:** The fourth deliverable covers the market assessment of PSH as a stand-alone ESS through desk research and analysis, stakeholder engagement activities, review of existing hydropower service contracts, and simulations, where applicable. The conduct of related capacity building shall also be delivered. Any changes to the project's implementation such as, but not limited to project timeline, team composition, strategy, and risk assessment shall be reported to ETP for proper documentation.

30 The market assessment is carried out to enhance the business case/ economic (un)attractiveness of PSH projects. Currently, this is characterised by a lack of long-term remuneration schemes, low prices for flexibility services, and uncertainty over electricity prices and market conditions. The Consultant will analyse the business case of PSH as a stand-alone ESS that can serve as both generator and load services within the current Philippines context and then provide recommendations for economic viability. The current ESS Policy Framework (DC2023-04-0008) stipulates that ESS shall register when providing any of the following: ancillary service, energy supply through bilateral contracts, or participating in the electricity spot market, VRE management (as generation company), auxiliary load management of gencos, deferment of transmission and distribution facility upgrades, power quality management in the transmission and distribution side, and demand side management. The Consultant should also

¹⁰ Under Deliverables 2, 3, 4, and 5, the associated costs for logistic organization of the capacity building workshops will be reimbursed against the actual expenses. The bidder is expected to propose a ceiling budget to deliver capacity building workshops in a venue within Metro Manila. The financial proposal for this task should be budgeted separately from the personnel lump sum costs. The bidder should include in the non-personnel costs all associated costs to organize the event including, venue, organization, and other travel and logistics expected.

examine Sections 8.0 and 9.0, which provide for the market registration and participation of ESS and incentives respectively, and factor in their effects on the economic feasibility of stand-alone PSH. The Consultant could also consider analysing operation strategies to maximise profits from energy arbitrage in competitive electricity markets and providing inertial response and ancillary services such as frequency control. The Consultant is expected to present the results of the market assessment study to DOE-REMB and project TWG.

- 31 The Consultant will also review existing hydro service contracts as part of the market assessment study and project development framework. The rationale is that these project developers may have insights into the realities of hydropower project development. Currently, there are 18 active and 10 outstanding hydro service contracts (equivalent to 7,800 MW). The project developers' issues and inconveniences should be well synthesised in the project outputs, but most especially for the Market Assessment Report and Project Development Framework.
- 32 The Consultant shall develop and deliver at least one session for government energy regulators to report the results of the market assessment study and discuss the methodology employed. The objective is to ensure that DOE-REMB understands the appropriate market mechanism for PSH power supply. The Consultant shall arrange the workshop either in the DOE Office or in a conducive venue within Metro Manila for 30 government participants.¹¹
- 33 For this deliverable, there are two expected outputs:
 - i. Publishable quality Market Assessment Report on Stand-alone PSH Projects for submission to DOE and ETP
 - ii. Post-workshop report

Component 3: Develop PSH Project Development Framework

- 34 **Deliverable 5: PSH Project Development Framework and Capacity Building:** The fifth deliverable covers developing a framework on environment assessment, social evaluation, and grid-connectivity of PSH projects captured in a Project Development Framework, which would serve as a de-risking mechanism for PSH project development. The Framework should also be based on stakeholder engagement activities on site and should be subjected to a capacity-building activity. Any changes to the project's implementation such as, but not limited to project timeline, team composition, strategy, and risk assessment shall be reported to ETP for proper documentation.

¹¹ Under Deliverables 2, 3, 4, and 5, the associated costs for logistic organisation of the half-day capacity building workshops will be reimbursed against the actual expenses. The bidder is expected to propose a ceiling budget to deliver capacity building workshops in a venue within Metro Manila. The financial proposal for this task should be budgeted separately from the personnel lump sum costs. The bidder should include in the non-personnel costs all associated costs to organise the event including, venue, organisation, and other travel and logistics expected.

- 35 The PSH Project Development Framework aims to address the slow deployment of PSH facilities as a result of the lengthy, costly, and risky environmental and social impact assessments, as well as from the regulatory implication/s associated with the permitting process. While Section 6 on Permits and licences and Section 13 on Disposal and recycling of the ESS Policy Framework (DC2023-04-0008) identified the requirement to comply with existing regulations for environmental assessments, there is still no clear principles or framework that enables regulators to review and approve PSH projects. Moreover, grid connectivity considerations must be accounted for in the Framework as it is envisioned that PSH is the ESS for a grid system that will incorporate VRE capacity. The Consultant shall develop appropriate de-risking mechanism/s, which may be in the form of sustainability standards and/or framework that PSH project developers can refer to, to lessen the project risks from environmental and social impact assessments, permitting process, and grid connectivity. To strengthen the output, the Consultant must consider site visits and conduct stakeholder engagement activities, preferably in the priority PSH sites identified in Deliverable 3.
- 36 The Consultant shall develop and deliver at least one session to the DOE-REMB discussing the PSH project development framework. The objective is to ensure that DOE-REMB and relevant government agencies are familiarised with and understand the framework for future information dissemination activities. The Consultant shall arrange the workshop either in the DOE Office or in a conducive venue within Metro Manila for 30 government participants.¹²
- 37 For this deliverable, there are two expected outputs to be submitted:
- i. Publishable quality report of the PSH Project Development Framework for submission to DOE and ETP
 - ii. Post-workshop report
- 38 **Deliverable 6: Final Completion Report with the Workshop Reports and Information Dissemination Activity:** The Final Completion Report covers the accomplished project activities and the conduct of the information dissemination activity for the general public. It should also be able to clearly discuss the project accomplishments, including the lessons learned and recommendations as ways forward. Annexed to this completion report are all relevant and remaining documentation of the project. The Final Completion Report is for submission to the ETP.
- 39 The Consultant shall conceptualise, organise, and deliver an information dissemination activity as part of awareness raising effort for project developers and/or the general public, upon

¹² Under Deliverables 2, 3, 4, and 5, the associated costs for logistic organisation of the half-day capacity building workshops will be reimbursed against the actual expenses. The bidder is expected to propose a ceiling budget to deliver capacity building workshops in a venue within Metro Manila. The financial proposal for this task should be budgeted separately from the personnel lump sum costs. The bidder should include in the non-personnel costs all associated costs to organise the event including, venue, organisation, and other travel and logistics expected.

discussion with DOE-REMB, on the key provisions of the PSH Project Development Framework. The objective is to inform the general public, specifically RE project developers, on the environmental and social standards for PSH project development. The Consultant shall organise a full-day hybrid awareness raising event, where it will be held in an appropriate venue in Metro Manila. The number of in-person participants should be minimum 50 participants.¹³

- i. For this deliverable, the expected output is Final Completion Report, with the Post-workshop Report of the Information Dissemination Activity incorporated in the annex.

40 Deliverable 7: Minimum 6 Project Technical Working Group (TWG)*: A project technical working shall be established to provide guidance and recommendations on the delivery of the project activities and outputs. This also ensures that the project is implemented in a consultative manner. The Consultant will assist the DOE Renewable Energy Management Bureau (REMB) in establishing and convening the project's TWG and shall act as its Secretariat. The TWG members shall be identified and agreed upon with DOE-REMB, but the Consultant could recommend members whose roles will be important in steering the project. As the TWG Secretariat, the Consultant is responsible for the conduct of meetings, documenting minutes, and coordinating with the TWG members. The Consultants will also collate and maintain all relevant documents, presentations, and other materials resulting from the TWG meetings. Ownership of the materials must be transferred to DOE-REMB at the end of the technical assistance. The Consultant should consider holding at least six TWG meetings to be held in available DOE conference rooms or a venue near the DOE Office in Taguig City. The required minimum number of in-person participants in the TWG meetings is 35 pax per TWG.¹⁴

41 Contract Monitoring Monthly Progress Report: In addition to the listed deliverables, the consultant is required to submit monthly progress reports as per the provided template. Failure to submit this report may result in the payments being withheld. Progress Report that includes a concise narrative of the activities completed and next steps. The progress report must also document the capacity building activities covering the time period.

¹³ Under Deliverables 6, the associated costs for logistical organisation of the information dissemination activity will be reimbursed against the actual expenses. The financial proposal must include non-personnel costs expected to be incurred to execute these workshops, separate from the personnel lumpsum costs required to deliver the deliverable. The bidder should include in the non-personnel costs all associated costs to organise the event including, venue, organisation, and other travel and logistics expected.

¹⁴ Under Deliverable 7, the associated costs for logistic organisation of the technical working groups will be reimbursed against the actual expenses. The bidder is expected to propose a ceiling budget to deliver this separately from the personnel lump sum costs. The bidder should include in the non-personnel costs all associated costs to organise the event including, venue, organisation, and other travel and logistics expected.

42 The monthly progress report is internal-facing between the consultant and the ETP team. The monthly progress report must include the following standard items:

- i. Updated Gantt Chart
- ii. Updated Results Based Monitoring Framework (RBMF) in a provided template
- iii. Risks and mitigations
- iv. Minutes of TWG meetings, if relevant
- v. Upcoming workshop agenda

Other key information:

- A public-facing, publishable Executive Summary (maximum 3 pages) in professional English must be developed and submitted for the Market Assessment Report and PSH Project Development Framework. However, these external-facing documents shall only be published after the completion of all project activities and on ETP website, and other channels approved by the DOE.
- When applicable, a Powerpoint presentation highlighting key information must be submitted with each deliverable.
- All project deliverables and presentations must be submitted in English.
- 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.
- The timeline of implementation that is defined in this Terms of Reference could be adjusted by the Consultant. However, the methodology and project work plan should justify the proposed timeline based on actual successful engagements and/ or related experiences and shall adhere to submitting the defined project deliverables.
- The Consultant is required to update the results and achievements of the project in accordance with the agreed project level Results-Based Monitoring Framework (RBMF), as per the approved template. All results, where applicable, must be gender disaggregated.
- The consultant is required to organise and execute all aspects of workshops, including organisation and logistics.
- The consultant must consider and highlight specific gender considerations in their proposal.
- The consultant must be available to attend one 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 organisation within the applying consortium, shall have an in-country, local partner fully operating in the Philippines through the project timeline. The international experts should be present in person for at least 30% of the contract duration.

V. Timeline for Project

- 43 The project will require 18 months. The actual project timeline will be presented by the consultant and agreed upon in the Inception Report.

Table 3. Proposed timeline of the project's deliverables

| No. | Deliverables | Proposed implementation timeline | % of payment |
|-----|---|--|--|
| 1 | Inception Report | Month 1 | 10 |
| 2 | Preliminary list of potential PSH sites and Capacity Building* | Months 2 to 6 | 20 |
| 3 | Prioritisation Tool and Capacity Building* | Months 7 to 10 | 20 |
| 4 | Market Assessment Study Report and Capacity Building* | Months 10 to 16 | 20 |
| 5 | PSH Project Development Framework and Capacity Building* | Months 10 to 17 | 20 |
| 6 | Final Completion Report and Information Dissemination Activity | Month 18 | 10 |
| 7 | Contract Monitoring Monthly Progress Report: In addition to the listed deliverables, the consultant will need to provide monthly progress reports as per the provided template. Failure to submit this report may result in the payments being withheld. | Monthly | N/a |
| 8 | Non-personnel reimbursable costs: Some of the above deliverables (*) contain logistical organisations of technical working group meetings and capacity building workshops. The consultant is required to propose in their financial proposal a ceiling cost to organise and execute all aspects of the workshops, including organisation and logistics. | As per the deliverables' milestone deadlines | Budget to be proposed based on the requirements on the logistic organisations that are listed in the TOR's section IV. Project Activities and Expected Deliverables. |

VI. Key Beneficiaries

- 44 The key beneficiaries of this project are provided in Table 4.

Table 4. List of beneficiaries of this project

| Beneficiary | Benefit | Explanation |
|---|----------|--|
| DOE-REMB | Direct | The lead government agency in the regulation of PSH project development, through appropriate policy issuances. |
| Department of Environment and Natural Resources | Direct | The lead government agency in ensuring that environmental protection in RE project development are well-accounted for. They must also be consulted, informed, and capacitated on the PSH Project Development Framework. |
| National Commission on Indigenous Peoples | Indirect | The lead government agency in ensuring that the interests and well-being of the Indigenous Cultural Communities/Indigenous Peoples are protected and promoted with due regard to their beliefs, customs, traditions, and institutions in RE project development. They must also be consulted, informed, and capacitated on the potential PSH sites and PSH Project Development Framework, considering that some potential PSH sites are within their ancestral domain. |
| Philippine Electricity Market Corporation | Indirect | The governing body to the electricity spot market of the Philippines to ensure the supply of power, efficiency, market operations, and competition. PEMC could further enhance its rules and regulations for BESS using the results of the Market Assessment study. |
| Affected Local government offices | Indirect | The local-level government unit ensures that projects within their jurisdiction undergo their review and approval process. They must also be consulted, informed, and capacitated on the potential of PSH in their area and of the PSH Project Development Framework. |

- 45 A donor mapping was conducted to prevent duplication of efforts between ETP and other development partners in the same areas and identify areas where ETP could provide support for energy transition that had not yet been addressed. See Annex 1.
- 46 The contractor is expected to identify and engage with other relevant stakeholders as part of this project. Simultaneously, the ETP will provide project updates to JICA by sharing the DOE-approved outputs in anticipation of the next phase of this work.

VII. Results Based Monitoring Framework and Risks

A. Results Based Monitoring Framework

- 47 The Results of the Project are monitored through the following Framework in Table 5. All reports will update the achievement of the indicators.

Table 5. Results Based Monitoring Framework Outline

| Indicators | Targets |
|---|---|
| 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 | 1 set of Framework for PSH Project Development (accounting for grid connection and environmental and social impacts assessment) |
| IN 2.2-01 - No. of new and existing, national and international, financing options / instruments de-risked and opened for private and blended financing | <ul style="list-style-type: none"> • 1 Market Assessment Study for Pump Storage Hydro Projects • 1 set of Preliminary potential sites for pump storage hydro projects • 1 Prioritisation Tool for ranking PSH Projects |
| IN 4.1-02 - No. of trainings, knowledge sharing events, and/or awareness workshops organised at national and regional levels building institutional capacity and knowledge networks | At least 5 knowledge-raising workshops for policy makers / regulators and awareness-raising events |

- 48 The results are reported with additional supporting information and evidence where applicable and necessary.

VIII. Qualification and experience of the service provider and evaluation criteria

A. Qualification and Experience of the Service Provider

- 49 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. CV's of the personnel proposed should be used to verify this information.
- 50 The following are the **minimum positions** that should be included on the team. Bidders should make an assessment of the additional positions needed (if any) to complete the assignment as per Terms of Reference:
- Team Lead
 - Industry Expert/ Hydropower Engineer

- iii. GIS Specialist
- iv. Environmental Management Expert
- v. Social Development Specialist
- vi. Policy Expert
- vii. Power Grid Expert
- viii. Energy Market Expert

- 51 Considering the importance of close coordination with stakeholders in the Philippines, it is expected that the team proposed consists of consultant(s) who understands the local context in the Philippines.
- 52 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.

B. Evaluation Criteria

Eligibility and Formal Criteria

- 53 The criteria contained in the table below will be evaluated on a **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. In case of JV, all JV members should fulfill this requirement | <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 required Questionnaires (if any), Returnable Bidding Forms, and other documentation requested under the Document Checklist section 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: Contract Forms | <ul style="list-style-type: none"> Form B: Proposal Submission Form |

Qualification Criteria

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

| Criteria | Documents to establish compliance with the criteria |
|---|---|
| <p>1. The company should have a minimum of five years of continuous experience in delivering similar projects in the past with a track record of success.</p> <p>In case of JV, at least one of the JV members should fulfil this criteria</p> | <ul style="list-style-type: none"> • Certification of incorporation of the Offeror • Form F: Performance Statement Form |
| <p>2. Offeror must provide a minimum of two (2) customer references from which similar services have been successfully provided, within any of the last FIVE years.</p> <p>In case of JV, the customer references of JV members can be combined</p> | <ul style="list-style-type: none"> • Form F: Performance Statement Form |

Technical Criteria

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

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

56 Technical proposal points allocation

| Section number/description | | Points Obtainable |
|---------------------------------|---|-------------------|
| 1. | Offeror's qualification, capacity, and expertise | 20 |
| 2. | Proposed Methodology, Approach, and Implementation Plan | 32 |
| 3. | Key Personnel proposed and Sustainability Criteria | 28 |
| 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 organisation, including the year and country of incorporation, and types of activities undertaken, including relevance of specialised knowledge and experience on similar engagements done in the past. Bidders partnering up with a local entity to provide for the strategic consultation, translations; as well as the communications expertise is considered a valuable asset. | 15 | |
| | 1. Experience in projects of comparable size, type, complexity and technical specialty | | 5 |
| | 2. Experience in providing similar services in the region, especially in the Philippines | | 5 |
| | 3. Understanding of local context, and partnering up with a Philippines-based entity to provide for the strategic consultation and, 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 25 300,000 USD in any of the past 2 years. <i>In case of a joint venture, annual turnover is calculated based on the total annual turnover of the JV members.</i> | | 1 |
| | 3. Bidder should have liquidity /quick ratio should be minimum 1, in any of the past 2 years. | | 1 |

| Section 1: Offeror's qualification, capacity and expertise | | Points | Sub-points |
|--|---|--------|------------|
| | In case of a joint-venture, at least one of the JV members should have 1 liquidity/quick ratio in any of the past 2 years | | |
| Total points for section | | 20 | |

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 including risk(s) and mitigation measure(s), and methodology for meeting or exceeding the requirements of the Terms of Reference | 22 | |
| | 1. Description of the offeror's approach to identification of data sources, scenarios, issues for the deep-dive in the analysis | | 4 |
| | 2. Description of the offeror's approach to assessment, siting, and prioritisation of potential PSH sites | | 5 |
| | 3. Description of the offeror's approach to the market assessment study | | 5 |
| | 4. Description of the offeror's approach to the assessments for the PSH project development framework | | 5 |
| | 5. Description of the offeror's approach to providing guidance to the government policymakers | | 3 |
| 2.2 | Quality Assurance Plan | 5 | |
| | 1. 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 | |

| Section 2: Proposed Methodology, Approach and Implementation Plan | | Points | Sub-points |
|---|--|--------|------------|
| | 1. 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 for section | | 32 | |

Section 3: Key personnel proposed and Sustainability Criteria

| Section 3: Key personnel proposed and Sustainability Criteria | | Points | sub-points |
|---|---|--------|------------|
| 3.1 | Qualifications of key personnel proposed aligned with the Terms of Reference | 25 | |
| | <p><u>Team Lead</u></p> <p>Education: A Master's Degree in Management, Engineering, Energy, Economics, Political Sciences, Development or related fields is required. An additional 10 years of similar experience with a Bachelor's Degree is considered equivalent.</p> <p>Experience:</p> <ul style="list-style-type: none"> • A minimum of 10 years of relevant experience in similar role, with minimum 2 years of leadership experience is required • Professional experience in project management of similar scale in Southeast Asia is required • Professional experience in renewable energy project development is required • Knowledge of the Philippines energy landscape, climate change, environmental management, and social development are desired | | 3.5 |
| | <p><u>Industry Expert/ Hydropower Engineer</u></p> <p>Education: A Bachelor's Degree in Engineering, Environment Management, Physical Sciences, or related field is required.</p> <p>Experience:</p> <ul style="list-style-type: none"> • A minimum of 5 years of relevant experience in a similar role is required • Professional experience in pump storage hydropower project design and development is required | | 3.5 |

| Section 3: Key personnel proposed and Sustainability Criteria | | Points | sub-points |
|---|---|--------|------------|
| | <ul style="list-style-type: none"> • Knowledge of the Philippines energy landscape is preferred • Knowledge of climate change, environmental management, and social development are desired | | |
| | <p><u>GIS Specialist</u></p> <p>Education: A Bachelor's Degree in Engineering, Physics, Physical Sciences, Environment Management, or related field is required.</p> <p>Experience:</p> <ul style="list-style-type: none"> • A minimum of 5 years of relevant experience in the same role is required • Professional experience in environmental and climate change projects on the application of geospatial data analysis and management is required • Professional experience with GIS software suite/or other comparable tools and common extensions is required • Knowledge of the Philippines energy landscape, climate change, environmental management, and social development are desired | | 3 |
| | <p><u>Environmental Management Expert</u></p> <p>Education: A Master's Degree in Environment Management, Engineering, Physical Sciences, or related field is required. An additional 8 years of similar experience with a Bachelor's Degree is considered equivalent.</p> <p>Experience:</p> <ul style="list-style-type: none"> • A minimum of 8 years of relevant experience in similar role is required • Professional experience in environmental impact assessments is required • Knowledge of the Philippines' environmental laws, energy landscape, climate change, and social development is desired | | 3 |
| | <p><u>Social Development Specialist</u></p> <p>Education: A Master's Degree in Social Sciences, Development Management, Environment Management, or related field is required. An additional 8 years of similar experience with a Bachelor's Degree is considered equivalent.</p> <p>Experience:</p> | | 3 |

| Section 3: Key personnel proposed and Sustainability Criteria | | Points | sub-points |
|---|---|--------|------------|
| | <ul style="list-style-type: none"> • A minimum of 8 years of relevant experience in similar role is required • Professional experience in social development and stakeholder engagements is required • Knowledge of Philippine policies, energy landscape, climate change, and environmental management are desired | | |
| | <p><u>Policy Expert</u></p> <p>Education: A Bachelor's Degree in Legal Management, Environment Management, Development, or related field is required.</p> <p>Experience:</p> <ul style="list-style-type: none"> • A minimum of 5 years of relevant experience in similar role is required • Professional experience in policy analysis and development is required • Knowledge of the Philippines' energy landscape, environmental laws, climate change, and social development are desired | | 3 |
| | <p><u>Power Grid Expert</u></p> <p>Education: A Bachelor's Degree in Engineering or related field is required.</p> <p>Experience:</p> <ul style="list-style-type: none"> • A minimum of 8 years of relevant experience in similar role is required • Professional experience in asset management and grid analysis is required • Knowledge of the Philippines' energy landscape, esp. of the CRE zones is desired | | 3 |
| | <p><u>Energy Market Expert</u></p> <p>Education: A Master's Degree in Finance, Business, Economics, Engineering, Energy or related field is required. An additional 5 years of similar experience with a Bachelor's Degree is considered equivalent.</p> <p>Experience:</p> <ul style="list-style-type: none"> • A minimum of 6 years of relevant experience in similar role is required • Knowledge of the Philippines' power structure and energy market is required | | 3 |

| Section 3: Key personnel proposed and Sustainability Criteria | | Points | sub-points |
|---|---|-----------|------------|
| | <ul style="list-style-type: none"> Professional experience in business development and project financing is desired | | |
| 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. | 3 | |
| Total points for section | | 28 | |

Annex 1. Donour map

| Name of Organization | Topic and Detailed Activity |
|--|--|
| Japan International Cooperation Agency (JICA) | Estimated start date is March 2024 JICA and the Department of Energy are currently developing a program to advance pump storage hydro (PSH) project development in the Philippines. The tentative scope of work includes conducting a pre-feasibility assessment/s of viable PSH sites, updating the Department of Energy's hydro software previously given by JICA, and developing a PSH Roadmap. ETP had initial discussions with JICA and DOE, and has agreed that both development partners could leverage each others' work - JICA will use the outputs of ETP's work, particularly from work package 1 for them to conduct the pre-feasibility assessments and develop the PSH Roadmap. |
| United Nations Development Programme (UNDP) | Development for Renewable Energy Application Mainstreaming and Market Sustainability Project (DREAMS) is being implemented by the DOE-REMB, in partnership with UNDP and the Global Environment Facility to promote and facilitate commercialization of RE markets through removing barriers and increasing RE investments. From 2017 to 2023, the project will deliver a resource assessment of micro hydro facilities in Region 6, install at least 18 RE facilities in off-grid areas, and assist local governments in formulating their RE Development Plans. |
| ClimeCapital Southeast Asia Clean Energy Facility (SEACEF) | SEACEF is an ETP-aligned program whose support is geared towards private sector companies. SEACEF provides catalytic capital and development support to early-stage clean energy projects and businesses in a market-responsive manner. ETP's beneficiaries are government entities while SEACEF beneficiaries are private sector organisations, and we complement each others' work to accelerate the clean energy transition. Currently, SEACEF has in their pipeline to support hydro project developers, and the results of this technical assistance will ensure that the market is ready for SEACEF-backed hydro project developers. |