Specifications:

Engineering, Procurement and Construction (EPC) of a Battery Energy Storage System (BESS) at Igoumenitsa Port

1. Budget:

981,250.00€ (ex. VAT)

Project is funded 400,000.00€ from Government's "Greece 2.0 Recovery and Resilience Plan" and 581,250.00€ from I.P.A. S.A. (2027 Budget).

2. Introduction:

At the Igoumenitsa Port Authority a Photovoltaic Plant of "Zero Feed In" type, with a total power of 1,499.99kW is installed and it is currently in normal operation. To improve the utilization of the existing photovoltaic (PV) plant, the installation of a Battery Energy Storage System (BESS) is proposed. The BESS will store surplus solar generation for use during periods of higher demand or reduced PV output, helping to increase self-consumption of renewable energy, reduce peak electricity demand, and improve the overall flexibility and efficiency of the Port's energy system. Its design and operation will be coordinated with the existing PV plants and the Port's electrical network, considering applicable operational requirements, including the zero-feed-in policy where relevant.

3. Existing Installation Description:

The Port's main power supply from the public grid is a separate MV line from HEDNO with a MV metering cubicle. This MV line is connected to the 1st MV internal substation: "Phase A".

The Port internally, has four (4) interconnected MV private substations: "Phase A", "Phase B", "T2-Kiosk" and "Phase C", by using the existing MV private underground network.

The 1st PV plant (Terminal 1: 805kW & South Gate: 460kW) is connected to the LV side of the "Phase A" substation, and by design cannot feed the other substations,

via the existing MV network, since is set to “Zero Feed In” in respect with the public grid (HEDNO).

The 2nd PV plant (North Gate: 230kW) is connected to the LV side of the “Phase B” substation, and by design cannot feed the other substations, via the existing MV network, since is set to “Zero Feed In” in respect with the internal MV network.

As a result, 40% of the Port’s total loads are not connected to the PV plants and future BESS installations options are significantly restricted due to interconnection limitations.

4. System Operation Requirements:

The proposed *BESS / Technical Solution*:

1. Must feed with PV power and Battery power simultaneously all the existing interconnected four (4) MV private substations of the Port: Phase A, Phase B, T2-Kiosk, Phase C, by using the existing MV private network.
2. Must specify the necessary modifications to the existing photovoltaic installations so that they can feed the Port's common MV network, free from the existing operational limitations.
3. Must ensure “Zero Feed In” operation in respect with the public grid (HEDNO).

5. BESS Nominal Specifications:

1. Total capacity 3,655 kWh
2. Number of energy batteries: 17 units
3. Annual energy discharged by BESS: 817,276 kWh
4. Annual Photovoltaic System (PV) Production: 2,005,031 kWh
5. Self-consumption by PV and BESS: 1,553,692 kWh

6. Scope of Work:

Under an EPC contract, a single contractor assumes full, end-to-end responsibility for the entire project lifecycle. A single contract (Lump Sum Turnkey / LSTK contract) with an EPC contractor who delivers the facility fully working and ready to operate ("turnkey").

• **Engineering. The contractor handles the conceptual and detailed design of the facility. This includes electrical and mechanical design and structural planning, technical specifications, feasibility analysis, and regulatory compliance reviews.**

• **Procurement. The contractor sources and purchases all necessary machinery, specialized equipment, raw materials, and technology. They also manage vendor selection, logistics, quality assurance, and delivery timelines.**

• **Construction. The contractor executes all on-site work, including civil works, site preparation, physical erection, and equipment installation. This phase ends with testing, inspection, commissioning, and final handover to the owner.**

EPC Contractor shall undertake the following activities:

- Issue all the construction permits as required by regulations.
- Assess the existing medium-voltage (MV) electrical network, including the installed photovoltaic (PV) systems operating under a zero-feed-in policy, to identify the requirements and constraints for battery energy storage system (BESS) integration.
- Define the BESS operating philosophy and energy management strategy, taking into account PV self-consumption maximization, peak demand reduction, and compliance with the zero-feed-in policy.
- Develop the electrical design, including MV connection arrangements, single-line diagrams, power conversion systems, transformers, switchgear, protection, metering, and auxiliary power supplies.
- Define the functional requirements and technical specifications of the Power Management System (PMS), including battery dispatch control, coordination with existing PV installations, MV network monitoring, power import/export control, and communication with existing SCADA systems, where applicable.
- Design the required civil and building works, including site preparation, foundations, equipment platforms, battery container or enclosure installation, and any necessary modifications to existing infrastructure.

• Develop the overall system architecture and equipment layout, including preliminary cable routing and interfaces with the existing MV network and PV installations.

• Prepare the technical specifications, performance requirements, detail design, and minimum functional requirements for the MV equipment and all associated electromechanical and civil works.

• Prepare the technical specifications and detail design for the corresponding Fire Safety / Fire Suppression installations.

• Comply with the "System Operation Requirements".

• Proceed with the construction works.

• Supply and installation of the equipment.

• Testing, Commissioning and Performance Tests.

• Issue the activation / electrification certifications as required by HEDNO regulations.

7. IPA provided documentation:

The following documentation, provided by I.P.A. S.A., is for indicative purposes only. The Contractor is required to conduct a site visit to the Port's facilities to inspect and verify the accuracy of said documentation.

- Technical drawings and specifications (where available) of the port's electric grid.
- Technical drawings and specifications of the existing PV parks.

8. Design Deliverables:

The deliverable shall comprise a technical report, which includes review and revisions prior to the submission of the Final Report and include:

- Detailed description of the installed equipment
- Technical Specifications of the equipment
- Description and technical requirements of the EMS components and operation
- Single Line Diagrams
- Building Layouts drawings

- Cable routing drawings
- NET diagram for EMS and communications
- Construction details

9. Independent Engineer – Construction Procedure:

According to the Concession Agreement (Law 5048/2023), Major Works are constructed on the basis of designs for the relevant Works approved by the Independent Engineer (Designs), are supervised by the Independent Engineer (IE). The procedure is the following:

1. Contractor submits the Detail Design (Drawings and Documentation) to I.P.A.'s Department of Works for review. Re-submit according to I.P.A.'s instructions as needed.
2. I.P.A. submits the Detailed Design to IE for approval. Re-submit according to IE's instructions as needed.
3. Upon approval, IE issues the Design Approval Certificate.
4. Contractor issues all the construction permits as required by regulations.
5. Contractor submits the Construction Works Time Schedule.
6. Construction works start.
7. During the construction period of Major Works, the Independent Engineer shall supervise those construction works. IE monitor, review and approve the construction timetable, inspect the Major Works and ensure compliance of the construction work, materials, workmanship and the quality of the Major Works. Monitor the application of the approved environmental terms. Check that the progress of Major Works complies with the construction works program. Ensure that the contractors for Major Works establish and maintain an effective quality assurance procedure for the Major Works and report on its operation. Assist in all aspects of completion testing and taking over of the Major Works.
8. Construction works complete.
9. I.P.A. invites IE for Inspection. Within twenty (20) days of receipt of such notice, the Independent Engineer shall commence its inspection.
10. After Inspection, the Independent Engineer is able to confirm that the relevant Major Works are substantially complete in all material respects in accordance with the relevant approved Designs, the Standards and Specifications and all other requirements of this Agreement and that are ready for operation, the Independent Engineer shall issue a substantial

completion certificate (the Substantial Completion Certificate) to confirm so, within a deadline of thirty (30) days of conclusion of the inspection.

11. The observance of minor defects that are of a temporary nature, are minor in scope and importance and (either individually or in conjunction with each other) would not materially impair the safety or functionality of the Major Works or the ability of IPA and/or users of the Port of Igoumenitsa to use the resulting facilities on a commercial scale (the Snagging Items). If the Independent Engineer identifies any Snagging Items, together with issuing the Substantial Completion Certificate, the Independent Engineer shall compile a list of Snagging Items (the Punch List).
12. The Independent Engineer shall deliver a copy of the Substantial Completion Certificate and (if applicable) the Punch List to IPA and the Responsible Agency. If within the above thirty-days deadline from conclusion of the inspection, the Independent Engineer has neither issued the Substantial Completion Certificate and (as the case may be) the Punch List, nor informed IPA in writing of its decision to not issue the Substantial Completion Certificate, the Major Works shall be deemed provisionally accepted by the Independent Engineer.
13. Contractor shall ensure that any Snagging Items or other defects, deficiencies or shortcomings in respect of any Major Works identified in the Punch List are fully cured as soon as possible and, in each case, within ninety (90) days of the date of issuance of the corresponding Substantial Completion Certificate.
14. The Independent Engineer shall issue a final completion certificate (a Completion Certificate) in respect of any Major Works for which the Independent Engineer has issued a Substantial Completion Certificate.

10. Terms & Conditions:

- The outcome of the tender shall be approved by the Board of Directors of I.P.A. S.A.
- I.P.A. S.A. has submitted a request for an extension of the 'Greece 2.0 Recovery and Resilience Plan' funding program up to and including 30 June 2027. The tender shall be cancelled in the event that the aforementioned request is rejected.
- Bidder evaluation using a weighted scoring model: 70% Financial Offer and 30% Technical Quality (10% Design, 10% Experience in similar projects, 10% Delivery Timeline).

- Payment Terms: 20% Pre-payment, 40% upon construction / installations completion, 40% upon official plant activation and operation (including HEDNO certification and Substantial Completion Certificate).
- Performance Letter of Guarantee 5% of Contract's value, 24 months duration.

11. Attached Drawings:

- Port layout "MV LV Networks" pdf file.
- "PV - LV - MV Diagram" pdf file.