

Local Hydropower Engineer – full-time 12 months
Terms of Reference (TOR)
Individual Consultant

1. Background

The Zletovica Hydrosystem (HS Zletovica) is a multipurpose water infrastructure system in the northeastern and eastern parts of North Macedonia, principally within the municipalities of Probištip and Kratovo. It was developed to harness the water and hydropower potential of the Zletovska River for drinking-water supply, irrigation, and electricity generation, benefiting Kratovo, Probištip, Zletovo, Štip, Karbinci, Sveti Nikole, and Lozovo and a combined population of approximately 100,000.

The Zletovica Hydrosystem has been conceived as a phased development:

- Phase I (Completed): Construction of the Kneževo Dam and Reservoir, access roads, and regional transmission mains for drinking water supply. This phase is fully operational.
- Phase II (Planned): Modernization and expansion of irrigation services over approximately 4,500 hectares of agricultural land in the municipalities of Probištip (3,606 ha) and Kratovo (957 ha), including the construction and rehabilitation of primary and secondary irrigation infrastructure, conveyance pipelines, pumping stations, and distribution networks.
- Phase III (Planned): Development of hydropower generation capacity of approximately 9–9.5 MW (around 45.5–48 GWh per year) through the construction of small hydropower plants integrated into the existing water system.

The Government of North Macedonia (GNM) is preparing a World Bank-financed investment operation, Zletovica Productivity through Irrigation and Renewable Energy, to support Phases II and III of the hydrosystem. A US\$2.0 million Grant Facility for Project Preparation (GFPP), closing on December 30, 2027, will finance priority preparation activities, including updates to technical and hydraulic studies, dam safety documentation, transboundary-water analyses, and environmental and social instruments consistent with the World Bank Environmental and Social Framework (ESF).

The GNM will implement the GFPP through the existing Project Implementation Unit (PIU) for the Agriculture Modernization Project (AMP), housed within the Ministry of Agriculture, Forestry and Water Economy (MAFWE), in close coordination with the Public Enterprise for Water Management Activities HS “Zletovica”–Probištip (PE HS Zletovica). The PIU will be responsible for overall grant implementation, including fiduciary, procurement, and environmental and social coordination. PE HS Zletovica will provide technical leadership, data, access to facilities, and institutional support. Under this arrangement, a Senior Hydropower Engineer will be engaged full-time to support preparation of the proposed hydropower investments and, subject to project approval and availability of financing, their early implementation.

2. Objective of the Assignment

The objective of the assignment is to provide PE HS Zletovica and the PIU with senior technical advice and engineering oversight for the preparation and early implementation of the Phase III hydropower investments, while ensuring their integration with Phase II irrigation investments and the existing multipurpose system. The Engineer will help ensure that proposed investments are technically sound, economically and financially justified, safe, climate-resilient, construction-ready, operable and maintainable, compliant with applicable national requirements, and aligned with World Bank technical, procurement, environmental, and social requirements.

3. Scope of Work and Responsibilities

The Senior Hydropower Engineer will be embedded in the PE HS Zletovica technical team and will coordinate closely with its Director, the PIU, relevant ministries and agencies, energy-sector institutions, specialized consultants engaged under the GFPP, and the World Bank team. The Engineer will provide independent, documented technical advice and promptly identify issues that may affect technical quality, safety, cost, schedule, permitting, procurement, or implementation readiness. Responsibilities will include the following:

- Support hydropower-related procurement and, when formally appointed, participate in evaluation committees by providing technical input on expressions of interest, proposals, bids, equipment offers, clarifications, and consultant or contractor submissions, in accordance with applicable procurement procedures.
- Review and provide documented recommendations on hydropower feasibility, optimization, hydrological and energy-yield analyses, surveys and investigations, detailed engineering designs, technical specifications, drawings, bills of quantities, cost estimates, implementation schedules, and civil works and equipment bidding documents.
- Confirm that design packages are internally consistent, constructible, appropriately coordinated across disciplines, and sufficiently complete for permitting, procurement, and construction, including clear design criteria, interfaces, quality requirements, hold points, testing requirements, and acceptance criteria.
- Guide optimization of the hydropower schemes, including plant location and layout, installed capacity, design discharge and head, firm and average energy, turbine-generator selection, waterways, powerhouse arrangements, auxiliary systems, and integration with the multipurpose water system.
- Review electro-mechanical and electrical systems, including turbines, generators, transformers, switchgear, protection and control, metering, automation, telecommunications, supervisory control and data acquisition (SCADA), grid interconnection, and factory and site testing and commissioning arrangements.
- Coordinate hydropower development with irrigation and drinking-water demands, reservoir operations, environmental flows, dam safety, sediment management, drought and flood conditions, and future operation and maintenance requirements.
- Provide technical input to environmental and social instruments and ensure that designs and contract documents address relevant environmental, social, occupational and community health and safety, biodiversity, water-use, labor, and cumulative-impact requirements.
- Support compliance with applicable national laws, technical standards, licenses, approvals, grid-connection requirements, and construction and operational permitting processes; maintain a register of required technical approvals and their status.
- Review consultant, supervision engineer, supplier, and contractor outputs; monitor technical progress; participate in site inspections and technical meetings; and support design approvals, construction, quality assurance, testing, commissioning, handover, and defect correction.
- Provide technical inputs to project appraisal and implementation planning, including investment justification, risk assessment, implementation arrangements, procurement packaging, construction sequencing, readiness criteria, operation and maintenance arrangements, economic and financial analysis, and expected employment contributions.

- Prepare concise technical reports and decision notes; support institutional capacity building and knowledge transfer; participate in World Bank missions and technical meetings; and track agreed actions within the Engineer's area of responsibility.

4. Deliverables

- **Inception report and work plan**, submitted within 15 calendar days of commencement, confirming the assignment methodology, document-review plan, priority issues, coordination arrangements, deliverable schedule, and initial risk and approvals register.
- **Technical review memoranda**, submitted within the period agreed for each package, presenting consolidated comments, their significance, recommended actions, and a clear conclusion on whether the submission is acceptable, acceptable subject to revisions, or requires resubmission.
- **Monthly progress reports**, summarizing activities completed, key findings and decisions, progress against the work plan, procurement and permitting status, principal risks, outstanding actions, and priorities for the following month.
- **Site-visit and technical-meeting notes**, normally submitted within five working days of each visit or meeting, recording observations, decisions, responsible parties, and agreed deadlines.
- **Procurement and implementation inputs**, including technical evaluation inputs, responses to clarifications, design and contract interface notes, inspection and test-plan comments, commissioning and grid-connection inputs, and handover and completion reviews, as requested.
- **Final assignment report**, submitted at the end of the contract, summarizing work performed, status of the hydropower investments, unresolved technical and institutional issues, lessons learned, and prioritized recommendations for subsequent implementation.

All deliverables shall be submitted in English and Macedonian in editable electronic format, with supporting calculations, review matrices, and source files where applicable. Drafts will be reviewed by PE HS Zletovica and the PIU. The Consultant shall address consolidated comments and submit revised versions within the timeframe agreed for each deliverable.

5. Qualification and Experience Requirements

- Advanced university degree in hydropower, hydraulic, civil, mechanical, or electrical engineering, or another directly relevant engineering discipline. A bachelor's degree in one of these fields combined with substantial additional relevant experience may be accepted.
- At least 10 years of relevant professional experience in the planning, design, construction, rehabilitation, commissioning, and/or operation of hydropower facilities.
- Demonstrated experience with small or medium hydropower schemes, including hydraulic optimization, energy-yield assessment, waterways and hydraulic structures, turbine-generator equipment, electrical systems, and balance-of-plant facilities.
- Demonstrated experience reviewing feasibility studies, detailed designs, technical specifications, bills of quantities, cost estimates, and bidding documents for hydropower works and equipment.
- Practical experience with grid interconnection, protection and control, SCADA, equipment testing, commissioning, construction supervision, and contract implementation.
- Experience integrating hydropower into multipurpose water systems involving irrigation, water supply, reservoir operations, environmental flows, or dam safety is highly desirable.

- Experience with World Bank-financed or other international financial institution projects, including procurement and environmental and social requirements, is an advantage.
- Proven ability to coordinate multidisciplinary teams and communicate technical findings clearly to engineering, management, and nontechnical audiences.
- Professional proficiency in written and spoken Macedonian and English.

6. Reporting and Duration

- The Senior Hydropower Engineer will report technically to the Director of PE HS Zletovica, who will provide day-to-day technical direction and review the Consultant's outputs. The PIU Coordinator/Project Director will serve as the contract-management focal point and provide administrative oversight and coordination on procurement, fiduciary, environmental, and social matters. Instructions that may affect the scope, schedule, or contract terms shall be issued through the PIU in accordance with the contract.
- The assignment is expected to be full-time during the GFPP-funded preparation period. Any continuation into project implementation will be subject to satisfactory performance, project approval, financing availability, and a contract extension or new contract, as applicable.

7. Duty Station

- The duty station will be the offices of PE HS Zletovica in Probištip. The assignment will require regular travel to project sites and, as needed, to Skopje or other locations for coordination meetings, inspections, testing, and commissioning activities.