

**ANNEX II: TERMS OF REFERENCE – TECHNICAL
SPECIFICATIONS**

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1. BACKGROUND INFORMATION

The Cyprus Energy Regulatory Authority (CERA) calls for Tenders for the provision of ***Consultancy services for establishing guidelines on the deployment of Blockchain technology in the electricity market in the Republic of Cyprus.***

1.1 General background

CERA was established by Law N.122 (I) 2003 according to European Directive 99/92/EEC, *that has been replaced by (N.130(I)/2021)*. It is the National Independent Energy Regulatory Authority of the Republic and is legally distinct and functionally independent of any other public or private entity. Its mandate is to regulate and supervise the Cyprus Energy Market.

According to the Law of Regulating the Electricity Market N.130(I)/2021 (the Law), CERA has the following objectives, powers and responsibilities:

- It acts as the Dispute Resolution Authority.
- It is a single point of contact for informing consumers.
- Promotes Renewable Energy Sources.
- Encourages and facilitates genuine competition in the Electricity Market, avoiding adverse discrimination and aiming ultimately at reduced prices.
- Protects the interests of the final consumers.
- Promotes the development of an economically viable and efficient Electricity Market.
- Ensures adequacy in electricity supply for the satisfaction of all reasonable needs and demands for electricity.
- Safeguards the Continuity, Quality, Reliability and Security of electricity supply.
- Encourages the efficient use and generation of electricity.
- Issues, controls, enforces, amends and recalls Licences or grants Exemptions from a Licence.
- Ensures that Licensees operate efficiently and are in a position to finance the business activities for which the Licence has been issued.
- Determines, publishes and imposes quality standards with which Licensees have to comply.
- Regulates tariffs, charges and other terms and conditions to be applied by Licensees, for any services provided according to the terms of their Licences.
- Promotes the development of regional markets within the Community so that they operate competitively and properly in order to achieve security of supply.
- Promotes the elimination of restrictions in the electricity trade among Member States, including developing appropriate cross-border transmission capacities to meet demand and enhance the integration of national markets.
- Ensures that the Rules governing the operation of electricity networks and the electricity market (Transmission and Distribution Rules and the Electricity Market Rules) are prepared and approved in accordance with the Law.

- Sets the rules or the procedures under which complaints are examined which relate to services offered by the Licensees including, when it considers it appropriate, the carrying out of investigations and the taking of decisions for such complaints.
- Carries out investigations, either following the submission of a complaint or initiated by CERA ex officio.
- Imposes administrative fines in the event of violation of laws or regulations.
- Ensures the implementation of the provisions of Regulation (EU) no 1227/2011.
- Promotes Research and Development in the field.
- Prepares and implements long-term planning regarding capacity for generation, transmission and distribution on a long-term basis, in order to meet the demand for electricity in the system and to secure supplies to customers and includes security of supply, energy efficiency / demand-side management and achievement of environmental objectives and targets for energy from renewable sources.

During the execution of its duties and exercising its authorities and jurisdictions, CERA can:

- Take decisions in accordance with the provisions of the Law and the Regulations issued thereunder.
- Take regulatory decisions to determine how it will regulate the electricity market and which licensees will be bound by such a regulatory decision.
- To issue Regulations on the basis of the Law.

1.2 Tender specific background

The energy sector in Cyprus is undergoing fundamental transformations concerning its structure and organisation, its institutional framework and the diversification of its energy mix. To open up the market to new participants, CERA has proposed the Net-Pool model as being the most appropriate trading arrangement approach for the Cyprus electricity market (Regulatory Decision 01/2015: «The new electricity market arrangements in Cyprus»). Primary Energy Balance is achieved by Participants contracting for delivery of Energy for expected Consumer offtakes through Bilateral Over the Counter (OTC) Contracts and buying or selling through the Day-Ahead Market. Such Energy transactions are for delivery of defined amounts of Energy within each Settlement Period. The proposed design is supplemented with a) an Integrated Scheduling Process along with a real time Balancing Mechanism which provide the TSO with the ability to procure and activate balancing services and b) a settlement process. Regulatory Decision 01/2015 can be downloaded from CERA's website (https://www.cera.org.cy/Templates/00001/data/nomothesia/ethniki/hlektrismos/rythmistikes_apofaseis/2015_01%20en.pdf)

Specifically, bilateral physical forward contracts are notified and corresponding schedules are nominated to the Market Operator by OTC market gate closure on the day ahead. Suppliers and generators provide bid curves to a Day Ahead Market on a half hourly basis. Suppliers submit orders based on individually forecast demand. Orders in the Day Ahead Market should correspond to quantities not already covered by bilateral contracts. The Day Ahead Market is centrally managed by a

Market Operator. The Market Operator runs a process of matching bid curves to optimize dispatch of residual volumes at the day ahead. Contracts resulting from the Day Ahead market are between market participants and the Market Operator at the Day Ahead Market Clearing Price. An Integrated Scheduling Process with a real time Balancing Mechanism and later a continuous intra-day trading platform will be organized to further support market operations.

This high-level design will be implemented by the Transmission System Operator (TSO) which is also the Market Operator (MO), in respect to the Trading and Settlement Rules (TSR). These rules: a) enable the Market Operator and the TSO to fulfil their obligations under the Law; b) regulate the means by which Participants may trade Energy; c) allow the calculation and settlement of payments in respect of Energy, Balancing Energy and Ancillary Services; d) specify the way in which settlement and billing shall be carried out; and e) deliver the Electricity Trading Rules as envisaged in the Law.

The detailed TSR version 2.0.0 have been drafted by the Market Operator and approved by CERA in May 2017. The TSO then issued a tender for the implementation of the Market Management System (MMS) in order to be able to implement the provisions of TSR v2.0.0. MMS is an information system which includes the Forward Market, Day-Ahead Market and Balancing Market Bidding Submission Systems, the Load Forecasting / Reserve Requirements Forecasting Mechanism, the Day-Ahead Market Clearing System, the Markets Settlement System, the Imbalances Clearing and Settlement System, the Debit and Credit of the Electricity Market Clearing Accounts System, the Participant Communication System, and the databases required for the operation of all of the above, also including the Participants Registry, the Generating Unit Registry, the RES Unit Registry, the Small Conventional Unit Registry, the BSP Registry, the Oftake Registry, and the Transmission and Distribution Loss Factor Tables. The tender was rewarded in April of 2020 and the TSR version 2.0.0 are expected to enter into force by the end of 2022. After the approval of TSR version 2.0.0, CERA approved TSR version 2.1.0 which incorporates demand response and TSR version 2.2.0 which incorporates in-front-of-the-meter storage participation, but will enter into force after the beginning of the market when changes are made to the MMS to support these changes. All versions of the TSR can be found on TSOs website (<https://tsoc.org.cy/electricity-market/electricity-market-rules/>). TSR v 2.0.0 is also available in English as an unofficial translation.

At the same time, the DSO is in the process of initiating the roll out of the Advanced Metering Infrastructure (AMI) with 400.000 smart meters (installation will be completed the latest by the end of 2025) together with a better control of the distribution system (Supervisory Control and Data Acquisition/Advanced Distribution Management System - SCADA/ADMS). All the above systems are a prerequisite for the gradual removal of barriers of entry for new electricity market participants and technologies (active customers, citizen energy communities, aggregators, demand response).

In addition to the above, electricity interconnection is being assessed through a project of common interest (PCI) called “EuroAsia Interconnector” and through a regional project called “EuroAfrica Interconnector”. The implementation of these interconnections will provide the infrastructure which is required so that the energy isolation would be lifted and at the same time Cyprus would become a hub for electricity transmission to and from Europe and to and from Israel and Egypt. Besides, these projects would allow higher penetration of RES into the energy system.

Further to this review and considering:

- the challenging tasks related to the fact that Cyprus power system is growing to become more active, decentralised, and complex, with an increasing number of actors and possible actions;

- the need for advanced communication and data exchanges between different parts of the power network;
- the potential of blockchain technologies to improve the efficiency of current energy practices and processes, to provide innovation in P2P energy trading and decentralized generation, to improve energy security in terms of cybersecurity, but also act as a supporting technology that could improve security of supply, and finally promote sustainability by facilitating renewable generation and low carbon solutions; and
- CERA's role as a Consultant to the Minister of Energy, Commerce and Industry on energy related matters,

The Cyprus Energy Regulatory Authority has been reviewing worldwide developments on blockchain technology and its use in the electricity market, along with discussions around the establishment of a suitable legal and regulatory framework to support such technology. To that end, CERA decided to procure for Consultancy services for the establishment of guidelines on the deployment of specific blockchain technology **that would deliver value** in the electricity market in the RoC.

2. OBJECTIVE, PURPOSE AND EXPECTED RESULTS

2.1 Overall objective

The overall objective of the consultancy services to be undertaken by the Contractor is the establishment of guidelines that would elaborate on the required actions and measures that would enable the deployment of ***Blockchain technology that would deliver value in the electricity market*** in the Republic of Cyprus. In particular, the Guidelines should specify suggestions, **related with CERA's tasks and responsibilities**, regarding the required amendments on the law, policy, legal and regulatory framework which will support such deployment.

2.2 Expected results

The expected results should be in the form of a report (Deliverable), comprising of the activities indicated in paragraph 4.1.

3. ASSUMPTIONS AND RISKS

3.1 Assumptions the implementation of the Contract

In order to implement the Contract, the Project Team should collectively have experience and knowledge on power systems, blockchain technologies, European energy legal framework and European regulatory framework. In addition to the above, the Contractor shall be aware and take into account the characteristics of the Cypriot energy system (i.e. small size, isolated system, high dependance on fossil fuels, developments concerning electricity interconnections, the new Net Pool electricity market arrangements etc).

3.2 Risks

The major risk associated with the above-mentioned assumptions is for the Contractor not to understand the characteristics of the Cypriot energy system, thus providing general guidelines that

could not benefit the RoC in establishing relevant National Strategies and proper legal and regulatory framework **or** providing guidelines that could not be applied in the RoC **or** providing guidelines that are not related to CERA's activities.

4. CONTRACT SCOPE

4.1 Activity breakdown

The scope of the contract is the provision of **Consultancy Services for establishing guidelines on the deployment of Blockchain technology in the electricity market in the Republic of Cyprus**. As mentioned in paragraph 2.2, the expected result comprises of **one deliverable (Deliverable)** in the form of a Report, which upon final approval by the Contracting Entity is expected to be presented by the Project Team to the Contracting Authority through a video conference.

In more detail, the abovementioned Report should include at least the following activities:

- Analysis of the available blockchain technologies that are applicable and can create value in the electricity market for Cyprus.
- Identify the methodology and strategies followed by other countries using blockchain in the electricity market.
- Identify potential technical, regulatory and other challenges posed by blockchain in the Cyprus electricity market.
- Provide specific guidelines on the required amendments on the law, policy, legal and regulatory framework, from CERA's perspective, which will support the **deployment of Blockchain technology in the electricity market in Cyprus**, considering the current European policy, legal and regulatory blockchain framework, the expected modifications in relevant EC Directives and Regulations and the ongoing ACER/CEER relevant publicly available documents. It is specified that it is not expected for the Contractor to review the whole Cypriot legal and regulatory framework but to provide its view on the potential amendments that would support such deployment in the electricity market of Cyprus.
- Provide guidelines on the required amendments on national Electricity market rules and Transmission and Distribution Rules.

The **timeframe** for the implementation of the Contract Scope is indicated below:

No.	DESCRIPTION	TIMEFRAME
1	Kick-off meeting - conference call	Fourteen (14) days from the signing of the contract
2	The Contractor will submit minutes of the kick-off meeting for approval by the Contracting Authority	Five (5) days from the kick off meeting
3	The Contractor will send in writing any questions regarding	Thirty (30) days from the signing of the Contract

	the Contract	
4	The Contracting Authority will send in writing clarifications and answers to any questions of the Contractor	Forty-five (45) days from the signing of the Contract
5	The Contractor shall submit the first draft of the Deliverable	Sixty- five (65) days from the signing of the Contract
6	The Contracting Authority shall provide feedback on the first draft of the Deliverable	Eighty (80) days from the signing of the Contract
7	The contractor will make any necessary corrections as per CERA's comments and submit the final draft of the Deliverable	Ninety-five (95) days from the signing of the Contract
8	The Contracting Authority shall provide feedback on the final draft of the Deliverable	One hundred and ten (110) days from the signing of the Contract
9	The Contractor will make any necessary corrections as per Contracting Authority's comments and submit the final deliverable (the Deliverable)	One hundred and twenty-five (125) days from the signing of the Contract
10	The Contracting Authority shall inform the Contractor of its decision to approve the Deliverable.	One hundred and forty (140) days from the signing of the Contract
11	Video conference presentation of the final Deliverable, by the Key Experts of the Contractor's Project Team to the Contracting Authority	One hundred and fifty (150) days from the signing of the Contract

The reports will be submitted electronically in .pdf and MS Word (.doc , .docx) formats

4.2 Project Management

4.2.1 Organisational structure

Organisational structure of the Contracting Authority

The Contracting Authority will appoint a Project Manager for the supervision and coordination of the overall progress in the implementation of the Contract Scope and of the relevant activities, sets priorities, provides guidance, and evaluates and approves the results (deliverables and reports).

The Contracting Authority shall provide the personnel necessary to manage and resolve issues related to the management of the Contract.

The Project Manager, shall be responsible for overall coordination of the implementation of the Contract Scope and for submission of all official contract documents for approval. The Project Manager shall be the contact person for all communications with the Manager to be appointed by the Contractor.

Organisational structure of the Contractor

The Contractor shall be responsible for the performance of all phases of the Contract Scope, until final acceptance by the Contracting Authority. As such, the Contractor shall appoint a Project Team, with at least two (2) Key Experts having the minimum qualifications indicated in paragraph 6.4 of Part A of the Tender Documents. Thus the Project Team should include:

Key Expert 1/ Project Manager

Key Expert 2

Tenderers may also include in the Project Team other experts, if they deem that necessary for the successful implementation of the Contract Scope. The cost of supporting personnel must be considered when defining the financial offer or the fee rates for the experts (according to the Contract type).

The **Project Manager** shall be available throughout the implementation of the Contract Scope. The Contractor's Project Manager shall be the Key Expert 1 and shall be supported by the Contractor's Project Team.

The duties of the Contractor's Project Manager shall be as follows:

- Definition of the work plan and of the critical points, so as to ensure the quality of the services provided and the timely implementation of the individual Contract Scope activities.
- Overall responsibility for delivery of the results of the Contract (Deliverable).
- Coordination of the participation and responsibilities of the Key Experts who will perform the Contract Scope.
- Maintaining close and ongoing cooperation with the Contracting Authority and provision to it of information updates on the implementation progress, the work carried out and the solutions or alternatives adopted.
- It is noted that all communication should be addressed at **regulator.cy@cera.org.cy**.

The Contractor shall bear all costs in connection with the implementation of the Contract Scope. More in particular, the Contractor shall bear the accommodation, subsistence and travel costs for the Project Team members. The Contractor shall ensure sufficient resources for translation, interpretation, printing etc., as required by the Contract Scope activities in each case.

4.2.2 Facilities to be provided by the Contracting Authority

The Contracting Authority will provide the Contractor information regarding the new electricity market arrangements, the Cypriot electricity generation and transmission system that would be required for the execution of the Contract. The Contracting Authority is not obliged to provide any confidential information related to the above issues.

5. LOCATION AND DURATION OF CONTRACT SCOPE IMPLEMENTATION

5.1 Location of Contract Scope Implementation

Completion of the scope of the work will take place at the premises of the Contractor. Meetings with the Contracting Authority will be held on a virtual basis. The Contractor should arrange a virtual meeting to present the final deliverable to the Contracting Authority.

5.2 Duration of Contract Scope implementation

The period of implementation of the Contract Scope shall be **one hundred and fifty (150) days** from the signing of the Contract.

6. REQUIREMENTS

6.1 Office accommodation

As per the provisions of paragraph 5.1 the Contract will be executed at the Contractor's premises.

6.2 Facilities to be provided by the Contractor

The Contractor should ensure that Project Team is adequately supported and equipped. In particular, he should ensure that there is sufficient administrative, secretarial and interpreting (if required) provision to enable the Project's Team Members to concentrate on their primary responsibilities. The Contractor must also transfer funds as necessary to support its activities under the Contract and to ensure that its employees are paid regularly and in a timely manner.

7. REPORTS

7.1 Reporting requirements

The Contractor should submit a draft Deliverable Report, a final draft Deliverable Report and the Deliverable as indicated in paragraph 4.1 of this Annex.

The Contractor shall submit Ad-hoc Reports whenever it deems that it should inform the Contracting Authority of significant issues or when it is requested to submit an opinion on special issues related to the Contract Scope.

7.2 Submission and approval of Reports

The Reports of the above paragraph should be submitted electronically, to the Contracting Authority, for the attention of the Project Manager.