European Commission
Joint Research Centre
Directorate for Energy, Transport and Climate
Energy Security, Distribution and Markets Unit

ANNEX I TO CONTRACT TBC

NL-Petten: Detailed Level Market Design of the Hellenic Balancing Market, and respective Market Code. Detailed Level Design of operational procedures of TSO for market coupling and interconnection congestion management. High-level IT Functional Design Specifications for the Balancing Market and Interconnection Congestion Management – Lot 2

– Tender Specification – Part 2 - (Terms of Reference) –

1. CONTEXT

The Directorate for Energy, Transport and Climate (Directorate C) is one of the seven Directorates of the Joint Research Centre (JRC) of the European Commission. The Directorate C is based in Petten (the Netherlands), Seville (Spain) and Ispra (Italy), and has a multidisciplinary team of more than 300 scientific, technical and support staff. The mission of the JRC-C is to provide support to Community polices and technology innovation to ensure sustainable, safe, secure and efficient energy production, distribution, and use, and to foster sustainable and efficient transport in Europe.

The Energy Security, Distribution and Markets Unit of the JRC-C is carrying out quantitative techno-economic analysis to evaluate energy security, as well as working on issues relevant to ensuring the uninterrupted physical availability of energy products on the market at an affordable price for all consumers. The Unit assesses how different policy options help shape an energy system resilient to shocks and adverse trends whilst satisfying society's energy needs. In this context, the Unit has an active role on investigating implementation issues of the EU Internal Energy Market.

JRC is currently providing support to SRSS on the necessary regulatory reforms by the Hellenic Republic in order the electricity market of the latter to comply with the EU Target Model. In the context of this activity JRC is tasked to provide the following:

- The drafting of the Detailed Level Market Design for the Balancing Market as well as the respective Market Code. In addition, the detailed design of the operational procedures by the TSO regarding market coupling and interconnection congestion management is of interest.

- The drafting of the high-level IT functional design specifications for the Balancing Market and Interconnection Congestion Management.

In this respect JRC is interested in acquiring support on the implementation of the above tasks. The work will be conducted in close cooperation with SRSS and the responsible Hellenic Authorities (the Hellenic Regulatory Authority for Energy – RAE, and the Transmission System Operator – ADMIE).

1.1. Background

According to the provisions of the Hellenic Law 4336/2015, the Hellenic State has to implement significant energy reforms, including the adaption of the Hellenic electricity market to the EU Target Model by the end of 2017. Consequently, the Hellenic Parliament voted recently the "Target Model law for the Hellenic State" (Law 4425/2016) which provides the general framework for the implementation of the Target Model in the Hellenic wholesale market.

The Hellenic authorities envisage the creation of a Forward Market with forward contracts on electricity, both Over-The-Counter (OTC) and centrally-traded (organized Forward Market), a reformed, energy only Day Ahead Market, an Intra-day Market and a Balancing Market

which are fundamental aspects of the EU Target Model. Compliance with the Target Model will also require the Hellenic TSO to implement a series of operational procedures relating to Market Coupling in the Day-Ahead and the Intraday Markets.

It is noted that apart from Law 4425/2016, and the Guidelines of the Hellenic Regulatory Authority for Energy (RAE), the Hellenic Authorities have already conducted an extensive consultation on the High-Level Design of the above markets, with a main characteristic being the adoption of a Central Dispatch System. The above sources, along with all related EU and Hellenic legislative provisions will form the basis for the Detailed Level Design of the Hellenic Electricity Market, and the compilation of the respective Market Codes as well as the necessary changes and additions to the Operational Code of TSO and the high-level IT functional design specifications. All not-publically available sources will be provided by JRC to the Contractor under a Confidentiality Agreement. It is noted that some of these sources may be available only in Greek.

2. PURPOSE AND OBJECTIVES

The primary driver for the work is to support the reform of the Hellenic Electricity Market in order the latter to comply with the EU Target Model. In this respect, the work aims to the prescription of the Detailed Level Design of the Balancing Market, and the compilation of the respective Market Code, as well as the Detailed Level design of the necessary TSO operational procedures for market coupling, the compilation of the respective chapters and amendments in the Operational Code and the high-level IT functional design specifications.

Given the specific details of the Hellenic Electricity Market, and System, the developed Detailed Level Designs, Market and final Operational Codes and high-level IT specifications should fully comply with the EU Target Model, and particularly with the EU Regulation 2015/1222 (CACM), the EU Regulation 2016/1719 (Forward Capacity Allocation), as well as the, awaiting validation by the EU Parliament and Council, Guideline on System Operations and the draft Network Code on Electricity Balancing. Initiatives with Regional significance as well as other regulatory interventions by the Hellenic Authorities and developments in the Hellenic Market should also be taken into account. In this respect, close cooperation between the Contractor, JRC, SRSS, RAE and ADMIE is expected.

3. DESCRIPTION OF THE TASKS TO BE COMPLETED UNDER THIS TENDER

Task 1. Balancing Market

Task 1.1 – Detailed Level Design of the Balancing Market

The Detailed Level Design of the Balancing Market will cover the Integrated Scheduling Process, the real-time Balancing Energy Market, and the Imbalance Settlement. It will include, but not limited to, the rules for Market Participation, description of traded products, time gates, Market Time Units, operational procedures, the clearing algorithms, dimensioning rules for Reserve Capacity provision, interfaces between the overall Balancing Market, Day-Ahead Market and Intraday Market, pricing rules, calculation of uninstructed imbalances, monitoring procedures, the participation fee structure, non-compliance penalties, invoicing and the interfaces with the clearing and settlement entity. Specific provisions on the

participation of Renewable Energy Sources and Demand Response, and their balance responsibility should also be included.

The final outcome of Task 1.1 will be a reasoned Report on the Detailed Level Design of the Balancing Market. Potential necessary amendments and additions to the TSO Operational Code required for the operation of the Balancing Market will also be identified and analysed.

Task 1.2 – Market Code of the Balancing Market and amendments of TSO Operational Code

This task entails the compilation of the Market Code of the Balancing Market based on the respective Detailed Level Design. The Code will include all the necessary details required for the proper, transparent and efficient participation in the Balancing Market, and the set of rules of its operation and penalties for non-compliance. The Balancing Market Code will also include, but not limited to, the definitions of market participants, their registration and participation process, the type and timing of transaction orders, the market participants' rights and obligations, further details on the Transmission System Operator's responsibilities, the cooperation framework between the Transmission System Operator and other parties, regarding data exchange requirements and interfaces, the rules and procedures regarding the clearing and settlement of transactions, details of the necessary accounts for managing transactions, transparency requirements, the Transmission System Operator's priority re-dispatching procedure for various plants, the settlement of disputes between the Participants and the Operator.

In addition, this task entails the compilation of the necessary clauses, and amendments of existing clauses of TSO's Operational Code necessary for the operation of the Balancing Market.

Task 2. Operational procedures

Task 2.1 – Detailed Level Design of the TSO operational procedures for market coupling

The Detailed Level Design of the TSO operational procedures for market coupling will include, but not limited to, Interconnection Congestion Management, procedures related to the Forward Capacity Allocation Market, the Nomination interfaces between the Forward Capacity Allocation Market (for interconnections) and the Day-Ahead Market, TSO activities related to pre and post coupling procedures for Day-Ahead and Intraday Market.

The final outcome of Task 2.1 will be a reasoned Report on the Detailed Level Design of the TSO operational procedures necessary for market coupling.

Task 2.2 – Amendments of TSO's Operational Code for market coupling

This task entails the compilation of a new Chapter in TSO's Operational Code on Interconnection Congestion Management.

In addition, this task entails the compilation of all other necessary clauses, and amendments of existing clauses, of TSO's Operational Code necessary for defining the operations for Day Ahead and Intraday market coupling.

Task 3 – High-level IT functional design specifications

This task entails the compilation of a high-level report on the IT functional design specifications for the Integrated Scheduling Process (ISP), the Balancing Energy and Capacity provision, the Balancing Market and Imbalances calculations and clearing and settlement and the Interconnection Congestion Management, pointing out which functions should be implemented and how the different elements/features should interact, based on the detailed level market design and the market codes. The report will include, but not limited to, the high-level IT functional / technical specifications and background information of the above, concerning their timing, the procured products, the provisions for the submission of Offers and Declarations by the Participants, the required data, the clearing process and results and the settlement of penalties (non-compliance charges).

4. DELIVERABLES

The contractor shall deliver the following documents:

i. A Report on the Detailed Level Design of the Balancing Market and necessary amendments of TSO's Operational Code for its implementation.

ii. The Market Code of the Balancing Market.

iii. A Report on the Detailed Level Design of the TSO operational procedures for market coupling

iv. A Report on the revision of TSO's Operational Code, with explicit reference to it per chapter and clause. The Report will be consisted of the new chapters, clauses and amendments required for the operation of the Balancing Market, the Interconnection Congestion Management, Forward Capacity allocation, and pre and post coupling procedures for Day-Ahead and Intraday Market market coupling.

v. A high-level Report on the IT functional design specifications for the Integrated Scheduling Process (ISP), the Balancing Energy and Capacity provision, the Balancing Market and Imbalances calculations and clearing and settlement and the Interconnection Congestion Management

All documents shall be in English.

Interim drafts of the above Reports and Code will be delivered at the latest two (2) months after the signature of the Contract. JRC-Directorate C, Energy Security, Distribution and Markets Unit (JRC-C.3) shall have fifteen (15) days from the reception of the interim drafts to make observations and/or suggest modifications. The Contractor shall have twenty-one (21) days in which to submit additional information and complete the Reports and Code according to the observations made by the JRC-C.3. The submitted final drafts will be reviewed by JRC-C.3 inside seven (7) days upon which the Contractor will have fifteen (15) days to deliver the final Reports and Code.

The production and delivery stage shall not exceed overall four (4) months from the contract´s entry into force and shall follow the milestones table below.

Deliverable	Deadline
Interim Report on the Detailed Level Design of the Balancing Market	Week 7
Interim Market Code of the Balancing Market	Week 7
Interim Report on the Detailed Level Design of the TSO operational procedures for market coupling	Week 7
Interim Report on the revision of TSO's Operational Code	Week 7
Interim Report on the High-level IT functional design specifications	Week 7
Final Draft Report on the Detailed Level Design of the Balancing Market	Week 12
Final Draft Market Code of the Balancing Market	Week 12
Final Draft Report on the Detailed Level Design of the TSO operational procedures for market coupling	Week 12
Final Draft Report on the revision of TSO's Operational Code	Week 12
Final Draft Report on the High-level IT functional design specifications	Week 12
Final Report on the Detailed Level Design of the Balancing Market	Week 15
Final Market Code of the Balancing Market	Week 15
Final Report on the Detailed Level Design of the TSO operational procedures for market coupling	Week 15
Final Report on the revision of TSO's Operational Code	Week 15
Final Report on the High-level IT functional design specifications	Week 15

5. OTHER CONDITIONS

All delivered documents will be in English.

The contracting authority has included a template in annex of these technical specifications, which shall be used by the tenderer in all its reports as to conform to the corporate visual identity of the European Commission. Any major deviations are subject to prior approval from JRC-C.

The final study reports of all tasks shall include:

- an abstract of no more than 200 words and an executive summary of maximum 6 pages;

- the following standard disclaimer:

“The information and views set out in this study/database/model are those of the author(s) and do not necessarily reflect the official opinion of the Commission. The Commission does not guarantee the accuracy of the data included in this study. Neither the Commission nor any person acting on the Commission’s behalf may be held responsible for the use which may be made of the information contained therein.”

- specific identifiers which shall be incorporated on the cover page provided by the Contracting Authority.

This disclaimer shall be accompanied by the following sentence "*Reproduction is authorised provided the source is acknowledged*". However, before displaying the above mentioned sentence either of the following conditions must be fulfilled:

- no third-party textual or artistic material is included in the publication without the copyright holder's prior consent to further dissemination and reuse by other third parties;

or

- an additional notice specifies that the reproduction of the third-party textual or artistic material included in the study is prohibited.

The contractor shall provide an executive summary in English and with the aforementioned standard disclaimer and possible specific identifiers. The executive summary of maximum 6 pages, shall provide information on the (i) purpose / motivation / problem statement, (ii) methodology / procedure / approach, (iii) results / findings and (iv) conclusion / implications / recommendations of the study.

Meetings

The study will be followed by Energy Security, Distribution and Markets Unit (JRC internal working group) with the participation of the Contractor. Conference calls are organised by JRC-C.3 with the contractor and possibly SRSS and Greek stakeholders every two weeks. At the latest one week after each telephone call, the contractor shall provide meeting minutes, to be approved by JRC within one week.

In addition to the telephone conferences, the following two-day meetings are planned between JRC and the contractor in Greece, with possible participation of other project stakeholders:

When	Physical Meeting
Week 1	Meeting 1 – Kick-off
Week 10	Meeting 2 – Presentation of Interim Reports and Code and discussion on comments
Week 14	Meeting 3 – Presentation of Final Drafts of Reports and Code and discussion on comments

The physical presence of the Contractor in those meetings is required.

Place of performance

The tasks will be performed on the Contractor's premises with the exception of the meetings.

6. REPORTING

The reports and any other document shall de written in English language and shall be submitted in electronic format via e-mail using both Microsoft Word 2010© for Windows format and in Adobe Portable Document Format© (PDF). A copy of the final deliverables shall be provided on electronic format.

7. DURATION

The maximum duration of the tasks shall not exceed 4 calendar months as from the moment the contract has entered into force.

8. LANGUAGE

The language of all deliverables, meetings, presentations and exchanges will be English. If necessary, the references and sources can be given in the original language, followed immediately by a translation given in English between parentheses.

It is expected that the written text in the deliverables is of a high standard language, ideas are expressed in clear and logically structured way. The text of all deliverables will be strictly assessed according to these criteria in the review process.

9. PRICING CONDITIONS

One total fixed price including all costs related to the performance of the contract shall be provided in the tender. This total fixed price is to include all costs related to performance of the tasks as described in the contract. All physical meetings shall be held in Greece.

10. OWNERSHIP OF THE DELIVERABLES

It is under the Contractor's responsibility to obtain the necessary rights and ensure that all sources utilized for producing the deliverables of the present service's contract may be used by the Commission with unlimited access. All costs incurred in the licensing of the necessary property rights shall be included in the price of the tender.