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ΤΕΥΧΟΣ 6
TECHNICAL REQUIREMENTS



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Technical assistance for the integration of the European Connection Network Codes (CNCs) in the regulatory framework governing the Greek Electricity Transmission System

The subject of this procurement includes auditing and consulting services for the implementation of European Connection Network Codes (CNCs) by the Independent Power Transmission Operator (IPTO/ADMIE), the Greek TSO.

1. Background – Necessity of the specified services

Network codes are a set of rules drafted by ENTSO-E, with guidance from the Agency for the Cooperation of Energy Regulators (ACER), to facilitate the harmonization, integration and efficiency of the European electricity market. Each network code is an integral part of the drive towards completion of the internal energy market, and achieving the European Union's 20-20-20 energy objectives. The European Connection Network Codes (CNCs) have been developed in accordance with Regulation (EU) 714/2009 and are cornerstones to fulfill the third energy package. The CNCs were submitted for approval and voted in the EU parliament, forming thus new EU Regulations. As such, they prevail over national laws (e.g. national Grid Codes) and their implementation is obligatory for Member States.

The CNCs are analyzed in the following EU regulations:

- Regulation (EU) 2016/631 of 14 April 2016 establishing a network code on Requirements for grid connection of Generators ("**Requirements for Generators**" - **RfG**), entered into force on 17 May 2016
- Regulation (EU) 2016/1388 of 17 August 2016 establishing a network code on Demand Connection ("**Demand Connection Code**" - **DCC**), entered into force on 7 September 2016
- Regulation (EU) 2016/1447 of 26 August 2016 establishing a network code on requirements for grid connection of high voltage direct current systems and direct current-connected power park modules ("**High Voltage Direct Current Connections - HVDC**"), entered into force on 29 September 2016

Each CNC introduces "requirements of general application" that define the minimal technical and operational requirements that every new generator (EU 2016/631-RfG), every new transmission connected demand facility / distribution facility / distribution system / closed distribution system (EU 2016/1388-DCC) and every new HVDC system / DC-connected power park module connected to transmission and distribution systems with a nominal



voltage above 110kV (EU 2016/1447- HVDC) should comply, after entering into force of the relevant Regulation.

According Article 7 of the (EU) 2016/631 (RfG), Article 6 of the (EU) 2016/1388 (DCC) and Article 5 of the 2016/1447 (HVDC) Regulations, the TSOs and the Regulatory Authorities are the entities granted powers for the implementation of the Regulations.

The TSOs should define draft proposals for the requirements of general application and submit them to the Regulatory Authority for approval. These requirements should be based on the principles of non-discrimination and transparency as well as on the principle of optimization between the highest overall efficiency and lowest total cost for all involved parties. While drafting these proposals, TSO should consult with relevant DSOs/RSOs, taking into account of potential impacts on their system, and also taking into consideration agreed European standards and technical specifications. Public consultations with all stakeholders are necessary to ensure transparency and non-discrimination.

Requirements of general application, also referred as “mandatory requirements”, are further analyzed as “exhaustive” and “non-exhaustive”. The mandatory and exhaustive requirements are precisely determined in the Regulations (i.e. the technical content and/or the relevant parameters are given). On the other hand, recognizing the fact that each network system has its own characteristics (e.g. RES penetration), lots of the mandatory requirements (referred as “mandatory non-exhaustive”) are not defined in the Regulations but are left to be implemented on a national base.

The determination of the “mandatory non-exhaustive” requirements (in terms of parameters and/or methodologies), is the major task for the TSO.

Moreover, a process for derogating from each Regulation rules is foreseen, to take into account local circumstances where exceptionally (e.g. compliance with some Regulation rules could jeopardize the stability of a local network or the safe operation of a power-generating module or the alignment with the rules could result in disproportionate costs and lead to the loss of those efficiency benefits).

Subject to approval by the Regulatory Authority, system operators are allowed to propose derogations for certain classes of power-generating modules (PGMs), distribution systems (DS), closed distribution systems (CDS) and demand facilities (DF), HVDC links and DC connected PPMs.

The determination of sound and transparent criteria for granting derogations is another task for the TSO.

CNC Regulations foresee appropriate and proportionate operational notifications and compliance and monitoring testing procedures so that system operators can ensure compliance and operational security.

Alignment of the existing procedures operational notifications and compliance and monitoring testing with CNCs requirements is another task for the TSO.

All three CNC Regulations foresee a transition period of three years before they come into full effect. The TSO shall submit a proposal for requirements of general application, or the methodology used to calculate or establish them, for approval by the Regulatory Authority within two years after entry into force of each Regulation, i.e.:

- By 17 May 2018, for the Regulation (EU) 2016/631 (RfG)
- By 7 September 2018, for the Regulation (EU) 2016/1388 (DCC)



- By 29 September 2018, for the Regulation (EU) 2016/1447 (HVDC)

The Independent Power Transmission Operator (IPTO/ADMIE) has the role of Transmission System Operator (TSO) for the Hellenic Electricity Transmission System. IPTO/ADMIE is responsible for system operation, maintenance and development of the transmission system. Also, manages electricity flows on the system, taking into account exchanges with other interconnected systems and is responsible for preparing day-ahead forecasts of the load and the RES electricity production as well as the optimization of the day-ahead schedule.

The Hellenic Electricity Distribution Network Operator S.A. (HEDNO/DEDDIE) has the role of Distribution System Operator (DSO) and is responsible for the operation, maintenance and development of the electricity distribution network in Greece. This includes the non-interconnected electricity networks and the electricity generation facilities on the Greek islands. HEDNO/DEDDIE manages the access of electricity consumers as well as RES electricity producers to the distribution network. It is worth mentioning that the vast majority of RES installations in Greece apart from wind power plants are connected to the distribution network.

The alignment of the existing Grid Code is a task of IPTO/ADMIE and is further complicated due to the following reasons:

- The existing Greek Grid Code has deficiencies and numerous gaps with regard CNCs requirements. Actually, there are very few requirements for RES installations while there are rare references to the transmission connected distribution networks/demand facilities/closed distribution systems. There are no requirements for HVDC links and DC connected offshore power parks.
- The Distribution Network Code was quite recently introduced by the DSO but also has lots of deficiencies and gaps with regard CNC Regulations
- Operational notification, testing and compliance monitoring procedures are not clearly in line with CNCs requirements
- The proper evaluation of requirements of general application is hardened by the fact that there are links and overlaps between CNC Regulations as well as other than CNCs Regulations, e.g. (EU) 2017/1485 of 2 August 2017 establishing a guideline on electricity transmission system operation (SOGL) and Regulation (EU) 2017/2195 of 23 November 2017 “establishing a guideline on electricity balancing” (GLEB)
- The Implementation of the CNC Regulations carried out by IPTO/ADMIE requires proper preparation of the national legislative framework for the correct and timely adoption of the CNCs. In the national application or implementation of the CNCs, a process of alignment will be required to ensure coordination or incorporation into existing national grid codes, as appropriate, and to avoid parallel or conflicting requirements. Moreover, proper derogations criteria, operation notification procedures, compliance and monitoring mechanisms aligned to the CNCs requirements must be established.

2. Objectives

The objective of this procurement is to ensure the following services:

- Assistance and cooperation in developing three (3) technical guidelines documents, one for each CNC Regulation, defining the mandatory requirements (parameters or



methodologies) for the incorporation of RfG, DCC and HVDC Regulations into the Greek Grid Code

- Technical Assistance (oral or written) during the public consultations of the above documents
- Revision of the above technical guidelines documents in order to reassure the completeness, the correctness and the validity of the requirements that are determined on a national basis (i.e. non-exhaustive requirements) and avoid overlapping parameters defined in the three different CNCs and possibly in other than CNC Regulations
- Elaboration of detailed proposals for granting derogations from each CNC Requirement; preparation of relevant draft documents for public consultations; technical assistance during the consultations; revision of the proposals and submission of final derogation procedures dedicated to IPTO/ADMIE and HEDNO/DEDDIE for implementation
- Elaboration of detailed proposals on Operational Notification Procedures in line with each CNC requirement; preparation of relevant draft documents for public consultations; technical assistance during the consultations; revision of the proposals and submission of final Operational Notification Procedures dedicated to IPTO/ADMIE and HEDNO/DEDDIE for implementation
- Elaboration of detailed proposals on Compliance and Monitoring Mechanisms, in line with each CNC requirement; preparation of relevant draft documents for public consultations; technical assistance during the consultations; revision of the proposals and submission of final Compliance and Monitoring Mechanisms dedicated to IPTO/ADMIE and HEDNO/DEDDIE for implementation

3. Methodology and required tasks

The project shall be executed in close cooperation with IPTO/ADMIE experts in Athens. IPTO/ADMIE will support the facilitation of meetings and discussions with the Greek competent bodies (e.g. IPTO/ADMIE, HEDNO/DEDDIE, RAE and the Ministry of Environment and Energy). The project shall start with a joint meeting in Athens. For this meeting the contractor shall prepare a presentation of the proposed methodology for each CNC, a detailed project design and a time frame.

The project will be implemented in three stages (one for each CNC Regulation), each stage is further analyzed in separate phases as described in the next paragraphs.

3.1 Technical assistance for the implementation of the Regulation (EU) 2016/631 “Requirements for Generators” (RfG)

The contract of the specified services includes at minimum the following tasks and subtasks:

Phase 1-RfG, Evaluation of the Current Status

1. Evaluation of the existing grid code technical requirements for generators connected to the Greek Transmission and Distribution network, with regard Regulation (EU) 2016/631



2. Evaluation of the existing derogation procedures for generators
3. Evaluation of the existing operational notification procedure for generators
4. Evaluation of the existing compliance and monitoring mechanism for generators
5. Development of a document on the “Evaluation of the existing Greek transmission system code and distribution network code requirements, with regard Regulation (EU) 2016/631”, (**Deliverable RfG-1**)

Phase 2-RfG, Elaboration of the “requirements of general application”, preparation of Technical Documents and proposals for Public Consultations

Prior to any consultation separate technical documents and/or proposals on specific requirements will be prepared by the contractor, as described below.

1. Analysis and evaluation of a set of exhaustive and non-exhaustive parameters of the Regulation (EU) 2016/631, preliminarily adopted by ADMIE, to meet the specific requirements of the Greek system
2. Ad hoc advise on specific topics of the Regulation (EU) 2016/631 where the specification of methodologies, commonly agreed and adopted by all the stakeholders, are needed
3. Technical support and ad-hoc advices for the preparation of an introductory workshop on RfG, organized by IPTO/ADMIE, addressing to PGM manufacturers and major market participants (Public Power Corporation, Hellenic Association of Independent Power Producers as well as the associations of WF and PV developers)
4. Development of a document “Technical guideline for the incorporation of Regulation (EU) 2016/631 into the Greek transmission system code and the Greek distribution network code”, where a full set of exhaustive and non-exhaustive parameters will be provided, (**Deliverable RfG-2**)
5. Development of a document “Proposals for the development of derogation criteria and procedures for generators, in line with the Regulation (EU) 2016/631”, where specific procedures dedicated to IPTO/ADMIE and HEDNO/DEDDIE will be delivered, (**Deliverable RfG-3**)
6. Development of a document “Proposals for the development of operational notification procedures for generators into the Greek transmission system code and the Greek distribution network code, in line with the Regulation (EU) 2016/631”, where specific procedures dedicated to IPTO/ADMIE and HEDNO/DEDDIE (according to the Title III, Chapter 1 of the Regulation (EU) 2016/631) will be delivered, (**Deliverable RfG-4**)
7. Development of a document “Proposals for the development of compliance and monitoring mechanisms for generators into the Greek transmission system code and the Greek distribution network code, in line with the Regulation (EU) 2016/631”, where specific procedures dedicated to IPTO/ADMIE and HEDNO/DEDDIE (according to the Title IV of the Regulation (EU) 2016/631) will be delivered, (**Deliverable RfG-5**)
8. Presentation of the deliverables RfG-2 to RfG-5 to the Greek competent bodies (e.g. IPTO/ADMIE, HEDNO/DEDDIE, RAE and the Ministry of Environment and Energy)
9. Technical support and ad-hoc advises during separate public consultations on parameter selection, derogation criteria, operational notification, compliance and monitoring mechanism (items 3 to 6 above), organized by IPTO/ADMIE. Each of the deliverables RfG-2 to RfG-5 above will correspond to a separate public consultation; more than one consultations may run in parallel time frames



Phase 3-RfG, Implementation of the Regulation (EU) 2016/631

The outcome of the public consultations as well as the comments from stakeholders will be incorporated by the contractor in the finalization of documents of Phase 2-RfG, resulting to the respective documents, as described below.

1. Incorporation of the conclusion of public consultations on the set of exhaustive and non-exhaustive parameters in a technical document “Incorporation of Regulation (EU) 2016/631 into the Greek transmission system code and the Greek distribution network code”, (**Deliverable RfG-6**)
2. Development of a document “Derogation criteria for generators with regard the Regulation (EU) 2016/631”, where specific procedures dedicated to IPTO/ADMIE and HEDNO/DEDDIE will be delivered, (**Deliverable RfG-7**)
3. Development of all necessary technical documents and all relevant templates regarding the “Establishment of an operational notification procedure for the requirements for generators into the Greek Transmission System code and the Greek distribution network code”, (**Deliverable RfG-8**)
4. Development of all necessary technical documents and all relevant templates regarding the “Establishment of a compliance and monitoring mechanism for the requirements for generators into the Greek Transmission System code and the Greek distribution network code”, (**Deliverable RfG-9**)

3.1.1 Evaluation of current Grid code status with regard the Regulation (EU) 2016/631

At the beginning of the task, the contractor is foreseen to perform a detailed gap analysis between the requirements for generators that are included in the approved versions of the Greek network codes (i.e. the transmission system code and the distribution network code) and the requirements of the Regulation (EU) 2016/631. The contractor will then proceed with elaborating concrete proposals for the alignment of the Greek Grid codes with the provisions of the RfG, (**Deliverable RfG-1**)

3.1.2 Development of technical guideline defining the requirements for the incorporation of Regulation (EU) 2016/631 to the Greek transmission system code

The technical guidelines document will be developed by the contractor in close collaboration with IPTO/ADMIE, considering ENTSOe recommendations as introduced in the National Implementation Guidance Documents (IGDs) for the connection network codes.

It is noted that IPTO/ADMIE has already defined the maximum capacity thresholds for types B, C and D power-generating modules in accordance with Article 5 of the Regulation (EU) 2016/631, as follows:

- Type A: PGMs with a connection point below 110 kV and maximum capacity above 0.8 kW and at or below 1 MW
- Type B: PGMs with a connection point below 110 kV and maximum capacity above 1 MW and at or below 15 MW
- Type C: PGMs with a connection point below 110 kV and maximum capacity above 15 MW and at or below 75 MW



- Type D: PGMs with a connection point at or above 110 kV or maximum capacity above 75 MW

Targeted discussions with the responsible units within IPTO/ADMIE and HEDNO/DEDDIE shall be organized by the contractor. Further technical information required for the execution of this task shall be made available by IPTO/ADMIE and HEDNO/DEDDIE to the extent possible and collected by the contractor from publicly available information sources (e.g. legal texts, grid codes, and websites of IPTO/ADMIE and HEDNO/DEDDIE).

During the drafting, the contractor shall:

- offer expert opinion, analysis and advice in terms of oral consultation
- evaluate compliance of the non-exhaustive parameters selected by IPTO/ADMIE to the typical international practice
- provide ad hoc advices for the specification of the methodologies for the evaluation of mandatory requirements, where required by the Regulation (EU) 2016/631
- propose solutions for potential equivocal situations in the process of selecting parameters, applying the best international practice
- provide help in the interpretation of ambiguous requirements or requirements that may overlap within CNCs other ENTSOe Codes (e.g. SOGL's load/frequency control, information exchanges etc.) or that are contradictory to the current practices adopted in the connection of generators to the Greek Transmission System

The contractor shall also provide a detailed documentation of the methodology that was used for arriving at the recommendations, including detailed descriptions of assumptions, calculations and results according the international practice. The contractor should also define and recommend additional actions (with a proposed timeline) that would be required on the level of the network operators in view of the necessary adjustments of the Greek network codes.

Prior to the public consultation, IPTO/ADMIE shall organize at least one an introductory workshop on RfG focusing on the set of exhaustive and non-exhaustive parameters preliminarily adopted by ADMIE and addressing to PGM manufacturers and major market participants (Public Power Corporation, Hellenic Association of Independent Power Producers as well as the associations of WF and PV developers). Specific ad hoc advise is also required for the preparation of this workshop.

The results of the above-described analysis as well as the detailed recommendations shall be documented in the form of a draft report on "Technical guideline for the incorporation of Regulation (EU) 2016/631 into the Greek transmission system code and the Greek distribution network code", (**Deliverable RfG-2**).

3.1.3 Revision of the developed technical guideline in order to reassure the completeness and the correctness of the requirements that are determined on a national basis

In the process of evaluation of the technical guideline prepared, the contractor, after considering the public consultation results, shall:

- remedy possible errors and give proposals aimed at quality improvements
- ensure quality of the technical document based on identification, analysis and handling of potential noticed risks during the mapping of RfG specifications, as well as proposal of necessary corrective measures for risk reduction or elimination



- propose modifications of the non-exhaustive parameters defined by IPTO/ADMIE
- notify IPTO/ADMIE representatives if significant deviations from the typical international practice relevant for that field are noticed by the contractor and propose appropriate corrective measures.

The results of the above-described analysis as well as the detailed recommendations shall be documented in the form of a final report on the “Incorporation of Regulation (EU) 2016/631 into the Greek transmission system code and the Greek distribution network code”, **(Deliverable RfG-6)**.

3.1.4 Establishment of derogation criteria with regard the Regulation (EU) 2016/631

Subject to approval by the Regulatory Authority, system operators are allowed to propose derogations for certain classes of power-generating modules (PGMs).

The contractor, in close coordination with IPTO/ADMIE and HEDNO/DEDDIE, shall assess the necessity and possible benefits of foreseeing any derogations from the Regulation (EU) 2016/631 in line with Title V of the Regulation.

On the basis of the above analysis and in close coordination with IPTO/ADMIE and HEDNO/DEDDIE, the contractor shall evaluate the existing derogation procedures and propose sound and transparent criteria for granting derogations for public consultation, **(Deliverable RfG-3)**.

Considering the outcome of the public consultation, the contractor shall develop a document with “Derogation criteria for generators with regard the Regulation (EU) 2016/631”, where specific procedures dedicated to IPTO/ADMIE and HEDNO/DEDDIE will be delivered, **(Deliverable RfG-7)**.

3.1.5 Establishment of an Operational Notification Procedure in line with the provisions of Title IV of the Regulation (EU) 2016/631

The Regulation (EU) 2016/631 significantly differentiates the Operation Notification Procedure according to the category of significance (type A, B, C or D) as well as the technology (synchronous, PPM (Power Park Module) or offshore PPM) of any new PGM (Power-Generating Module).

With regard IPTO/ADMIE, based on the current procedure, different application forms are foreseen to be prepared by the power-generating facility owners, depending on the kind of the PGM. This constitutes a deviation from the Regulation (EU) 2016/631, where all PGMs should be treated uniformly and IPTO/ADMIE should elaborate on providing a uniform list/document with the necessary information, common for all kinds of PGMs, independent of the primary energy source.

It is not clear what is the current Operational Notification Procedure followed by HEDNO/DEDDIE (types A, B and C PGMs). It is suggested that a common template is released by HEDNO/DEDDIE and IPTO/ADMIE, so that the whole process is facilitated and simplified.

According the Regulation (EU) 2016/631, for type A PGMs a submission of a simple installation document is foreseen. The contractor shall prepare a proposal on this installation document, considering existing experiences and best practices of other ENTSOe members.



With regard B, C and D PGMs, the Regulation (EU) 2016/631 requires that the relevant operator shall introduce the power-generating module document (PGMD), which shall be provided by the power-generating facility owner and shall include an itemized Statement of Compliance to the requirements of the Grid Code. The format of the PGMD and the information to be given therein shall be specified by IPTO/ADMIE.

IPTO/ADMIE shall have the right to request that the power-generating facility owner includes the following in the PGMD:

- evidence of an agreement on the protection and control settings relevant to the connection point
- itemized statement of compliance
- detailed technical data of the power-generating module with relevance to the grid connection as specified by the relevant system operator
- equipment certificates issued by an authorized certifier in respect of power-generating modules, where these are relied upon as part of the evidence of compliance
- studies demonstrating the expected steady-state and dynamic performance as required by the RfG (for type D PGMs)
- details of intended compliance tests in accordance (for type D PGMs)

With regard type D PGMs, the TSO is entitled to issue three different Operational Notifications, during the various stages of PGM commitment: Energisation Operational Notification (EON), Interim Operational Notification (ION) and Final Operational Notification (FON). The contractor shall present a clear and sound energisation procedure for type D PGMs, based on existing experiences and best practices of other ENTSOe members, in line with possibly overlapping procedures and requirements foreseen in other NC Regulations.

The work to be performed for the adaptation of the Operational Notification Procedure of IPTO/ADMIE to the Regulation (EU) 2016/631 requirements includes at least the following main steps:

- A. Review of the current Operational and Notification Procedure for generators followed by IPTO/ADMIE and HEDNO/DEDDIE
- B. Compilation and release of a single uniform application form for all kinds of PGMs with all the required information/parameters
- C. Prepare a document “Proposals for the development of operational notification procedures for generators into the Greek transmission system code and the Greek distribution network code, in line with the Regulation (EU) 2016/631“, with the necessary conditions for the Operational Notification Procedures that IPTO/ADMIE and HEDNO/DEDDIE shall follow, **(Deliverable RfG-4)**
- D. Considering the outcome of a public consultation, the contractor shall prepare a technical document and a full set of all relevant templates regarding the “Establishment of an operational notification procedure for the requirements for generators into the Greek Transmission System code and the Greek distribution network code” **(Deliverable RfG-8)**

A complete list of templates for the documents described in the previous paragraphs will (namely) contain at least the following:

- Technical Guideline for testing requirements for the PGMs and PPMs **(Deliverable RfG-8.1)**
- Uniform application form for all kinds of PGMs with all the required information/parameters **(Deliverable RfG-8.2)**



- Document with the necessary conditions for the assessment of Grid Compliance, to be used by the power facility owners / Authorized Certifiers (**Deliverable RfG-8.3**)
- Technical Guideline for the necessary simulation models and grid studies required to be submitted (**Deliverable RfG-8.4**)
- Power-generating module document ('PGMD'), for type C and D PGMs (**Deliverable RfG-8.5**)
- Compliance Test Reports and Simulation Studies, for type C and D PGMs (**Deliverable RfG-8.6**)
- Technical Guideline for Energisation Operational Notification (EON) for type D PGMs (**Deliverable RfG-8.7**)
- Technical Guideline for Interim Operational Notification (ION) for type D PGMs (**Deliverable RfG-8.8**)
- Technical Guideline for Final Operational Notification (FON) for type D PGMs (**Deliverable RfG-8.9**)

3.1.6 Establishment of a compliance mechanism in line with the provisions of Title IV of the Regulation (EU) 2016/631

The Regulation (EU) 2016/631 includes provisions on compliance testing and compliance simulation which aim at demonstrating that the requirements of the Regulation are fulfilled. Generally, grid code compliance verification has a double objective: on the one hand, owners of power-generating modules are responsible for demonstrating compliance with the grid code to the relevant network operator. On the other hand, network operators have to assess compliance in order to ensure that the new generator does not adversely affect the secure operation of the power system.

The compliance mechanism differentiates according the category of significance (type A, B, C or D) as well as the technology (synchronous, PPM or offshore PPM) of any new PGM.

The contractor is required to provide IPTO/ADMIE with a detailed proposal related to the establishment of a compliance mechanism for each PGM type and/or technology, in line with the provisions under Title IV of Regulation (EU) 2016/631.

The proposal of the contractor for the compliance mechanism shall take into consideration existing experiences and best practices of other ENTSOe members related to mechanisms for ensuring the compliance of generators with grid code requirements. When drafting these proposals, the contractor shall elaborate on how the compliance mechanism could possibly be integrated into the existing licensing procedures for generators in Greece.

The proposal shall differentiate between the connection of generators to the transmission and to the distribution network and will define roles and responsibilities as well as the related procedures of the respective network operators, power-generating facility owner / Authorized Certifiers.

The contractor shall also provide estimations of the expected costs of this compliance mechanism both for the generators as well as for the network operators.

The work to be performed for the establishment of a compliance mechanism includes at least the following main steps:

- A. Review of the current Compliance Mechanism followed by IPTO/ADMIE and HEDNO/DEDDIE



- B. Establish clear and concrete testing requirements for the PGMs and PPMs based on the state of the art procedures worldwide and considering any particularities of the Greek Power System
- C. Compile guidelines for the necessary simulation models and grid studies required to be submitted by PGM owner
- D. Prepare a document on a “Proposal for the development of compliance mechanisms in line with the Regulation (EU) 2016/631” with the necessary conditions for the assessment of Grid Compliance, **(Deliverable RfG-5)**
- E. Considering the outcome of a public consultation, the contractor shall prepare a technical document and full set of all relevant templates regarding the “Establishment of a compliance monitoring mechanism for the requirements for generators within the Greek Transmission System code”, **(Deliverable RfG-9)**

3.2 Technical assistance for the implementation of the Regulation (EU) 2016/1388 “Demand Connection Code” (DCC)

The contract of the specified services includes at minimum the following tasks and subtasks:

Phase 1-DCC, Evaluation of the Current Status

- 1. Evaluation of the existing technical requirements for demand facilities, distribution systems and closed distribution systems connected to the Greek Transmission and distribution network, with regard the Regulation (EU) 2016/1388
- 2. Evaluation of the existing derogation procedures for Demand Connection
- 3. Evaluation of the existing operational notification procedure for Demand Connection
- 4. Evaluation of the existing compliance mechanism for Demand Connection
- 5. Development of a document on the “Evaluation of the existing Greek transmission system and distribution network code requirements, with regard Regulation (EU) 2016/1388”, **(Deliverable DCC-1)**

Phase 2-DCC, Elaboration of the “requirements of general application”, preparation of Technical Documents and proposals for Public Consultations

Prior to any consultation separate technical documents and/or proposals on specific requirements will be prepared by the contractor, as described below.

- 1. Analysis of options and recommendations for the adaptation of the Greek Grid Code to the Regulation (EU) 2016/1388, including the necessary specifications and/or parameters to be applied
- 2. Provision of ad hoc advice on topics of the Regulation (EU) 2016/1388 where the specification of methodologies, commonly agreed and adopted by all the stakeholders, are needed
- 3. Review and presentation of methodologies for the adoption of rules for demand facilities or closed distribution systems offering Demand Response (DR) services, taking into account the impact of these services on the Transmission System operation



4. Development of a document “Technical guideline for the incorporation of Regulation (EU) 2016/1388 into the Greek transmission system code and the Greek distribution network code”, where a full set of exhaustive and non-exhaustive parameters will be provided, (**Deliverable DCC-2**)
5. Development of a document “Proposals of derogation criteria and procedures in line with the Regulation (EU) 2016/1388”, where specific procedures dedicated to IPTO/ADMIE and HEDNO/DEDDIE will be delivered (Title V, Chapter 2 of Regulation (EU) 2016/1388), (**Deliverable DCC-3**)
6. Development of a document “Proposals for the development of operational notification procedures for demand connection and distribution networks, in line with the Regulation (EU) 2016/1388”, where specific procedures dedicated to IPTO/ADMIE and HEDNO/DEDDIE (according to the Titles II and III of the Regulation (EU) 2016/631) will be delivered, (**Deliverable DCC-4**)
7. Development of a document “Proposals for the development of compliance mechanisms for demand connection and distribution networks in line with the Regulation (EU) 2016/1388”, where specific procedures dedicated to IPTO/ADMIE and HEDNO/DEDDIE (according to the Title IV of the Regulation (EU) 2016/1388) will be delivered, (**Deliverable DCC-5**)
8. Presentation of the deliverables DCC-2 to DCC-5 to the Greek competent bodies (e.g. IPTO/ADMIE, HEDNO/DEDDIE, RAE and the Ministry of Environment and Energy)
9. Technical support and ad-hoc advises during separate public consultations on parameter selection, derogation criteria, operational notification and compliance mechanism (items 4 to 7 above), organized by IPTO/ADMIE. Each of the deliverables DCC-2 to DCC-5 above will correspond to a separate public consultation; more than one consultations may run in parallel time frames

Phase 3-DCC, Implementation of Regulation (EU) 2016/1388

The outcome of the public consultations as well as the comments from stakeholders will be incorporated by the contractor in the finalization of documents of Phase 2-DCC, resulting to the respective documents, as described below.

1. Incorporation of the conclusion of public consultations on the set of exhaustive and non-exhaustive parameters in a technical document “Incorporation of Regulation (EU) 2016/1388 into the Greek transmission system code and the Greek distribution network code”, (**Deliverable DCC-6**)
2. Development of a document “Derogation criteria with regard the Regulation (EU) 2016/1388”, where specific procedures dedicated to IPTO/ADMIE and HEDNO/DEDDIE will be delivered, (**Deliverable DCC-7**)
3. Development of all necessary technical documents and all relevant templates regarding the “Establishment of an operational notification procedure for demand connection and distribution networks, into the Greek Transmission System code and the Greek distribution network code”, (**Deliverable DCC-8**)
4. Development of all necessary technical documents and all relevant templates regarding the “Establishment of a compliance monitoring mechanism for demand facilities and distribution networks into the Greek Transmission System code and the Greek distribution network code”, (**Deliverable DCC-9**)



3.2.1 Evaluation of current Grid code status with regard the Regulation (EU) 2016/1388

At the beginning of the task, the contractor is foreseen to perform a detailed gap analysis between the requirements for Demand Connection included in the approved versions of the Greek network codes (i.e. the transmission system code and the distribution network code) and the requirements of the Regulation (EU) 2016/1388. The contractor will then proceed with elaborating concrete proposals for the alignment of the Greek Grid codes with the provisions of the Regulation, (**Deliverable DCC-1**)

3.2.2 Development of technical guideline defining the requirements for the incorporation of Regulation (EU) 2016/1388 to the Greek transmission system code

The technical guidelines document will be developed by the contractor in close collaboration with IPTO/ADMIE, considering ENTSOe recommendations as introduced in the National Implementation Guidance Documents (IGDs) for the connection network codes.

Targeted discussions with the responsible units within IPTO/ADMIE and HEDNO/DEDDIE shall be organized by the contractor. Further technical information required for the execution of this task shall be made available by IPTO/ADMIE and HEDNO/DEDDIE to the extent possible and collected by the contractor from publicly available information sources (e.g. legal texts, grid codes, and websites of IPTO/ADMIE and HEDNO/DEDDIE).

It is underlined that HEDNO/DEDDIE has not elaborated a demand response (DR) plan so far. On the other hand, Regulation (EU) 2016/1388 puts forward a set of non-mandatory connection rules for Demand Response (DR) as it is acknowledged as a main contributor to more effective markets and to system security with a high penetration of fluctuating generation. Compliance to those requirements implicates additional analysis and evaluation, as well as adoption of specific methodologies.

During the drafting of the above documents, the contractor shall:

- analyze different options for the implementation of the non-exhaustive requirements of the Regulation (EU) 2016/1388 in Greece, including the necessary specifications and/or parameters to be applied. For this purpose, specific characteristics of the Greek transmission and distribution system should be identified
- offer expert opinion, analysis and advice in terms of oral or written consultation
- provide ad hoc advices for the specification of the methodologies, where required by the Regulation (EU) 2016/1388, for the evaluation of mandatory requirements
- provide ad hoc advices and specification of the methodologies for the evaluation of non-mandatory requirements of DR services
- propose solutions for potential equivocal situations in the process of selecting parameters, applying the best international practice
- provide help in the interpretation of ambiguous requirements or requirements that may overlap with other ENTSOe Codes or that are contradictory to the current practices adopted in the Demand Connection to the Greek Transmission System

The contractor shall also provide a detailed documentation of the methodology that was used for arriving at the recommendations, including detailed descriptions of assumptions,



calculations and results according the international practice. The contractor should also define and recommend additional actions (with a proposed timeline) that would be required on the level of the network operators in view of the necessary adjustments of the Greek network codes.

Since Regulation (EU) 2016/1388 is closely linked to the Regulation (EU) 2016/631, there will be a number of similarities in the provisions to be applied, such as for the frequency, protection, voltage, power quality, and active and reactive power requirements. For this reason, the contractor will assess the degree to which the recommendations concerning the inclusion of requirements for generators in the Greek network codes could and should also apply to demand facilities, distribution facilities, distribution systems and demand units.

The results of the above-described analysis as well as the detailed recommendations shall be documented in the form of a draft report on “Technical guideline for the incorporation of Regulation (EU) 2016/1388 into the Greek transmission system code and the Greek distribution network code”, (**Deliverable DCC-2**).

3.2.3 Revision of the developed technical guideline in order to reassure the completeness and the correctness of the requirements that are determined on a national basis

In the process of evaluation of the technical guideline, the contractor, after considering the public consultation comments, shall:

- remedy possible errors and give proposals aimed at quality improvements
- ensure quality of the technical document based on identification, analysis and handling of potential noticed risks during the mapping of DCC specifications, as well as proposal of necessary corrective measures for risk reduction or elimination
- propose modifications of the defined non-exhaustive parameters
- notify IPTO/ADMIE and HEDNO/DEDDIE representatives if significant deviations from the typical international practice relevant for that field are noticed by the contractor and propose appropriate corrective measures.

The results of the above-described analysis as well as the detailed recommendations shall be documented in the form of a final report on “Incorporation of Regulation (EU) 2016/1388 into the Greek transmission system code and the Greek distribution network code”, (**Deliverable DCC-6**).

3.2.4 Establishment of derogation criteria with regard the Regulation (EU) 2016/1388

Subject to approval by the Regulatory Authority, system operators are allowed to propose derogations for certain classes of transmission connected demand facilities / distribution facilities / distribution systems / closed distribution systems.

The contractor shall assess, in close coordination with IPTO/ADMIE and HEDNO/DEDDIE, the necessity and possible benefits of foreseeing any derogations from the Regulation (EU) 2016/1388 in line with Title V Chapter 2 of the Regulation. On this basis and in close coordination with the IPTO/ADMIE and HEDNO/DEDDIE, the contractor shall elaborate reasoned recommendations and eligible and transparent criteria.

The contractor shall evaluate the existing derogation procedures and propose for public consultation sound and transparent criteria for granting derogations in the form of a



document “Proposals for the development of derogation criteria and procedures in line with the Regulation (EU) 2016/1388”, where specific procedures dedicated to IPTO/ADMIE and HEDNO/DEDDIE will be delivered, (**Deliverable DCC-3**).

Considering the outcome of a public consultation, the contractor shall develop a document with “Derogation criteria with regard the Regulation (EU) 2016/1388”, where specific procedures dedicated to IPTO/ADMIE and HEDNO/DEDDIE will be delivered, (**Deliverable DCC-7**).

3.2.5 Establishment of an Operational Notification Procedure in line with the provisions of Title II and Title III of the Regulation (EU) 2016/1388

The work to be performed for the adaptation of the Operational Notification Procedure of IPTO/ADMIE to the Regulation (EU) 2016/1388 requirements includes at least the following main steps:

- A. Review of the current Operational and Notification Procedure for Demand Connection followed by IPTO/ADMIE and HEDNO/DEDDIE
- B. Prepare a document “Proposals for the development of operational notification procedures for demand connection and distribution networks, in line with the Regulation (EU) 2016/1388”, where specific procedures dedicated to IPTO/ADMIE and HEDNO/DEDDIE (according to the Titles II and III of the Regulation (EU) 2016/631) will be delivered, (**Deliverable DCC-4**)
- C. Considering the outcome of the public consultation, the contractor shall prepare a technical document and a full set of all relevant templates regarding the “Establishment of an operational notification procedure for demand connection and distribution networks, into the Greek Transmission System code and the Greek distribution network code” (**Deliverable DCC-8**)

It is noted that the current Operational Notification Procedure followed by IPTO/ADMIE is elementary while it is not clear what procedures are followed by HEDNO/ DEDDIE.

The Operational Notification Procedure should differentiate between new transmission-connected demand facilities, transmission-connected distribution facilities and new transmission-connected distribution systems as described in Regulation (EU) 2016/1388.

Separate guidelines for each stage of the Operational Notification (EON, ION and FON) should be delivered.

3.2.6 Establishment of a compliance mechanism in line with the provisions of Title IV of the Regulation (EU) 2016/1388

The contractor is required to provide IPTO/ADMIE and HEDNO/DEDDIE with detailed proposals related to the establishment of a compliance mechanism, in line with the provisions under Title IV of the Regulation (EU) 2016/1388. The contractor is expected to define the structure and methodology for this compliance mechanism, including a definition of roles and responsibilities as well as the related procedures.

The contractor shall elaborate proposals on how this compliance mechanism could possibly be integrated into the existing procedures in Greece. These proposals shall differentiate between transmission connected demand facilities / distribution facilities / distribution



systems / closed distribution systems as well as between the responsibilities of the respective network operators.

The contractor shall also provide estimations of the expected costs of this compliance mechanism both for the facility owners as well as for the network operators.

The proposal of the contractor for the compliance mechanism shall take into consideration existing experiences and best practices of other EU member states related to mechanisms for ensuring the compliance of Demand Connection with grid code requirements.

The work to be performed for the adaptation of the Operational Notification Procedure of IPTO/ADMIE to the Regulation (EU) 2016/1447 requirements includes at least the following main steps:

- A. Establish clear and concrete testing requirements for the transmission connected demand facilities / distribution facilities / distribution systems / closed distribution systems based on the state of the art procedures worldwide and considering any particularities of the Greek Power System
- B. Compile guidelines for the necessary simulation models and grid studies required to be submitted by the transmission connected demand facilities / distribution facilities / distribution systems / closed distribution systems owner
- C. Prepare a document “Proposals for the development of compliance mechanisms for demand connection and distribution networks in line with the Regulation (EU) 2016/1388”, where specific procedures dedicated to IPTO/ADMIE and HEDNO/DEDDIE (according to the Title IV of the Regulation (EU) 2016/1388) will be delivered, (**Deliverable DCC-5**)
- D. Considering the outcome of a public consultation, the contractor shall prepare a technical document and a full set of all relevant templates regarding the “Establishment of a compliance monitoring mechanism for demand facilities and distribution networks into the Greek Transmission System code and the Greek distribution network code”, (**Deliverable DCC-9**)

It is noted that so far there are elementary testing requirements followed by IPTO/ADMIE and HEDNO/DEDDIE for the Demand Connection.

The compliance and monitoring mechanism, should differentiate transmission connected demand facilities / distribution facilities / distribution systems / closed distribution systems, as described in Title IV of the Regulation (EU) 2016/1388.

3.3 Technical assistance for the implementation of the Regulation (EU) 2016/1447 “High Voltage Direct Current Connections and DC connected PPMs” (HVDC)

The contract of the specified services includes at minimum the following tasks and subtasks:

Phase 1-HVDC, Elaboration of the “requirements of general application”, preparation of Technical Documents and proposals for Public Consultations



Prior to any consultation separate technical documents and/or proposals on specific requirements will be prepared by the contractor, as described below.

1. Recommendations for the adaptation of the Greek Grid Code to the Regulation (EU) 2016/1447 for HVDC systems (according Title II of the Regulation) and DC-connected PPMs (according Title III of the Regulation), including the necessary specifications and/or parameters to be applied
2. Ad hoc advise on specific topics of the Regulation (EU) 2016/1447 where the specification of methodologies commonly agreed and adopted by all the stakeholders are needed
3. Development of a document “Technical guideline for the incorporation of the Regulation (EU) 2016/1447 into the Greek transmission system code”, where a full set of exhaustive and non-exhaustive parameters will be provided, (**Deliverable HVDC-1**)
4. Development of a document “Proposals of derogation criteria and procedures in line with the Regulation (EU) 2016/1447”, where specific procedures dedicated to IPTO/ADMIE will be delivered according the Title VII of Regulation (EU) 2016/1447, (**Deliverable HVDC-2**)
5. Development of a document “Proposals for the development of operational notification procedures for HVDC systems and DC connected power parks in line with the Regulation (EU) 2016/1447”, where specific procedures (according to Title V, Chapter 1 “Connection of new HVDC systems” and Title V, Chapter 2 “Connection of new DC-connected power park modules” of the Regulation) dedicated to IPTO/ADMIE will be delivered, (**Deliverable HVDC-3**)
6. Development of a document “Proposals for the development of compliance mechanisms for HVDC systems and DC connected PPMs, in line with the Regulation (EU) 2016/1447”, where specific procedures (according to Title VI of the Regulation) dedicated to IPTO/ADMIE will be delivered, (**Deliverable HVDC-4**)
7. Presentation of the deliverables HVDC-1 to HVDC-4 to the Greek competent bodies (e.g. IPTO/ADMIE, HEDNO/DEDDIE, RAE and the Ministry of Environment and Energy)
8. Technical support and ad-hoc advises during separate public consultations on parameter selection, derogation criteria, operational notification and compliance mechanism (items 3 to 6 above), organized by IPTO/ADMIE. Each of the deliverables HVDC-1 to HVDC-4 above will correspond to a separate public consultation; more than one consultations may run in parallel time frames.

Phase 2-HVDC, Implementation of Regulation (EU) 2016/1447

The outcome of the public consultations as well as the comments from stakeholders will be incorporated by the contractor in the finalization of documents of Phase 1-HVDC, resulting to the respective documents, as described below.

1. Incorporation of the conclusion of public consultations on the set of exhaustive and non-exhaustive parameters in a technical document “Incorporation of the Regulation (EU) 2016/1447 into the Greek transmission system code”, (**Deliverable HVDC-5**)
2. Development of a document “Derogation criteria with regard the Regulation (EU) 2016/1447”, where specific procedures dedicated to IPTO/ADMIE will be delivered, (**Deliverable HVDC-6**)



3. Development of all necessary technical documents and all relevant templates regarding the “Establishment of an operational notification procedure for the HVDC systems and DC connected PPMs into the Greek Transmission System code”
(Deliverable HVDC-7)
4. Development of all necessary technical documents and all relevant templates regarding the “Establishment of an compliance and monitoring mechanism for the HVDC systems and DC connected PPMs into the Greek Transmission System code”
(Deliverable HVDC-8)

3.3.1 Development of technical guideline defining the requirements for the incorporation of Regulation (EU) 2016/1447 to the Greek transmission system code

The technical guidelines (document) will be developed by the contractor in close collaboration with IPTO/ADMIE, considering ENTSOe recommendations as introduced in the Implementation Guidance Documents (IGDs) for the connection network codes.

Targeted discussions with the responsible units within IPTO/ADMIE shall be organized by the contractor. Further technical information required for the execution of this task shall be made available by IPTO/ADMIE to the extent possible and collected by the contractor from publicly available information sources (e.g. legal texts, grid codes, and websites of IPTO).

During the drafting of the above documents, the contractor shall

- provide an option for the implementation of the non-exhaustive requirements of the Regulation (EU) 2016/1447 in Greece, including the necessary specifications and/or parameters to be applied. For this purpose, specific characteristics of the Greek transmission system should be identified
- offer expert opinion, analysis and advice in terms of oral or written consultation
- provide ad hoc advices for the specification of the methodologies, where required by the Regulation (EU) 2016/1447, for the evaluation of mandatory requirements
- propose solutions for potential equivocal situations in the process of selecting parameters, applying the best international practice
- provide help in the interpretation of ambiguous requirements or requirements that may overlap with other ENTSOe Codes or that are contradictory to the current practices adopted in the Greek Transmission System

The contractor shall also provide a detailed documentation of the methodology that was used for arriving at the recommendations, including detailed descriptions of assumptions, calculations and results according the international practice. The contractor should also define and recommend additional actions (with a proposed timeline) that would be required on the level of the network operators in view of the necessary adjustments of the Greek network codes.

Since Regulation (EU) 2016/1447 is closely linked to the Regulation (EU) 2016/631, there will be a number of similarities in the provisions to be applied, such as for the frequency, protection, voltage, power quality, and active and reactive power requirements. For this reason, the contractor will assess the degree to which the recommendations concerning the inclusion of requirements for generators in the Greek network codes could and should also apply to HVDC systems and DC-connected PPMs.



The results of the above-described analysis as well as the detailed recommendations shall be documented in the form of a report on “Technical guideline for the incorporation of the Regulation (EU) 2016/1447 into the Greek transmission system code”, (**Deliverable HVDC-1**).

3.3.2 Revision of the technical guideline developed in order to reassure the completeness and the correctness of the requirements that are determined on a national basis

In the process of evaluation of the technical guideline prepared by IPTO/ADMIE, the contractor, after considering the public consultation comments, shall:

- remedy possible errors and give proposals aimed at quality improvements
- ensure quality of the technical document based on identification, analysis and handling of potential noticed risks during the mapping of HVDC specifications, as well as proposal of necessary corrective measures for risk reduction or elimination
- propose modifications of the defined non-exhaustive parameters
- notify IPTO/ADMIE representatives if significant deviations from the typical international practice relevant for that field are noticed by the contractor and propose appropriate corrective measures.

The results of the above-described analysis as well as the detailed recommendations shall be documented in the form of a final report on “Incorporation of the Regulation (EU) 2016/1447 into the Greek transmission system code”, (**Deliverable HVDC-5**).

3.3.3 Establishment of derogation criteria with regard the Regulation (EU) 2016/1447

Subject to approval by the Regulatory Authority, system operators are allowed to propose derogations for specific HVDC systems as well as DC-connected PPMs.

The contractor shall assess, in close coordination with the IPTO/ADMIE, the necessity and possible benefits of foreseeing any derogations from the Regulation (EU) 2016/1447 in line with Title VII of the Regulation. On the basis of the above analysis, the contractor shall propose for public consultation sound and transparent criteria for granting derogations in the form of a document “Proposals of derogation criteria and procedures in line with the Regulation (EU) 2016/1447”, where specific procedures in line with the Title VII of Regulation (EU) 2016/1447 dedicated to IPTO/ADMIE will be delivered, (**Deliverable HVDC-2**).

Considering the outcome of a public consultation, the contractor shall develop a document with “Derogation criteria with regard the Regulation (EU) 2016/1447”, where specific procedures dedicated to IPTO/ADMIE will be delivered, (**Deliverable HVDC-6**).

3.3.4 Establishment of an Operational Notification Procedure in line with the provisions of Title V of the Regulation (EU) 2016/1447

The work to be performed for the adaptation of the Operational Notification Procedure of IPTO/ADMIE to the Regulation (EU) 2016/1447 requirements includes at least the following main steps:

- A. Prepare a document “Proposals for the development of operational notification procedures for HVDC systems and DC connected power parks in line with the



Regulation (EU) 2016/1447”, with the necessary conditions for the Operational Notification Procedures that IPTO/ADMIE shall follow, **(Deliverable HVDC-3)**

- B. Considering the outcome of a public consultation, the contractor shall prepare a technical document and a full set of all relevant templates regarding the “Establishment of an operational notification procedure for HVDC systems and DC connected PPMs into the Greek Transmission System code”, **(Deliverable HVDC-7)**

It is noted that there is no Operational Notification Procedure followed by IPTO/ADMIE so far for HVDC systems, while no DC-connected PPMs exist in the Greek Transmission System.

The Operational Notification Procedure should differentiate between HVDC systems and DC-connected PPMs, as described in Title V Chapter 1 “Connection of new HVDC systems” and Chapter 2 “Connection of new DC-connected power park modules”, of the Regulation (EU) 2016/1447.

Separate guidelines for each stage of the Operational Notification (EON, ION and FON) should be delivered.

3.3.5 Establishment of a compliance mechanism in line with the provisions of Title VI of the Regulation (EU) 2016/1447

The contractor is required to provide IPTO with detailed proposals related to the establishment of a compliance mechanism, in line with the provisions under Title VI of the Regulation (EU) 2016/1447. The contractor is expected to define the structure and methodology for this compliance mechanism, including a definition of roles and responsibilities as well as the related procedures. These proposals shall differentiate between HVDC systems and DC-connected PPMs. The contractor shall also provide estimations of the expected costs of this compliance mechanism both for the HVDC system and DC-connected PPMs owners as well as for the TSO.

The proposal of the contractor for the compliance mechanism shall take into consideration existing experiences and best practices of other EU member states related to mechanisms for ensuring the compliance of HVDC systems and DC-connected PPMs with grid code requirements.

The work to be performed for the adaptation of the Operational Notification Procedure of IPTO/ADMIE to the Regulation (EU) 2016/1447 requirements includes at least the following main steps:

- A. Establish clear and concrete testing requirements for the HVDC systems and DC-connected PPMs based on the state of the art procedures worldwide and considering any particularities of the Greek Power System
- B. Compile guidelines for the necessary simulation models and grid studies required to be submitted by the HVDC system or DC-connected PPM owner
- C. Prepare a document “Proposals for the development of compliance and monitoring mechanisms in line with the Regulation (EU) 2016/1447”, with the necessary conditions for the assessment of Grid Compliance that IPTO/ADMIE shall follow, **(Deliverable HVDC-4)**
- D. Considering the outcome of a public consultation, the contractor shall prepare a technical document and a full set of all relevant templates regarding the “Establishment of a compliance and monitoring mechanism for HVDC systems and DC connected PPMs into the Greek Transmission System code”, **(Deliverable HVDC-8)**



It is noted that there are no testing requirements followed by IPTO/ADMIE so far for HVDC systems, while no DC-connected PPMs exist in the Greek Transmission System. The compliance and monitoring mechanism should differentiate between HVDC systems and DC-connected PPMs, as described in Title VI of the Regulation (EU) 2016/1447.

4. Deliverables

After completion of each particular project phase, the contractor shall be responsible of submitting the deliverables in the following tables.

The deliverables will be delivered in electronic format and in English language.

Stage 1: Technical assistance for the implementation of the Regulation (EU) 2016/631 “Requirements for Generators” (RfG)		
Phase 1-RfG Evaluation of the Current Status	Phase 2-RfG Elaboration of the requirements of general application	Phase 3-RfG Implementation of the Regulation (EU) 2016/631
Deliverable RfG-1: “Evaluation of the existing Greek transmission system code and distribution network code requirements, with regard Regulation (EU) 2016/631”	Deliverable RfG-2: “Technical guideline for the incorporation of Regulation (EU) 2016/631 into the Greek transmission system code and the Greek distribution network code” Deliverable RfG-3: “Proposals for the development of derogation criteria and procedures for generators, in line with the Regulation (EU) 2016/631” Deliverable RfG-4: “Proposals for the development of operational notification procedures for generators into the Greek transmission system code and the Greek distribution network code, in line with the Regulation (EU) 2016/631” Deliverable RfG-5: “Proposals for the development of compliance	Deliverable RfG-6: “Incorporation of Regulation (EU) 2016/631 into the Greek transmission system code and the Greek distribution network code” Deliverable RfG-7: “Derogation criteria for generators with regard the Regulation (EU) 2016/631” Deliverable RfG-8: Establishment of an operational notification procedure for the requirements for generators into the Greek Transmission System code and the Greek distribution network code” Deliverable RfG-9: “Establishment of a compliance monitoring mechanism for the requirements for generators into the Greek Transmission System code and the Greek distribution network code”



	mechanisms for generators into the Greek transmission system code and the Greek distribution network code, in line with the Regulation (EU) 2016/631”	
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Stage 2: Technical assistance for the implementation of the Regulation (EU) 2016/1388 “Demand Connection Code” (DCC)

Phase 1-DCC Evaluation of the Current Status	Phase 2- DCC Elaboration of the requirements of general application	Phase 3- DCC Implementation of the Regulation (EU) 2016/1388
Deliverable DCC-1: “Evaluation of the existing Greek transmission system and distribution network code requirements, with regard Regulation (EU) 2016/1388”	Deliverable DCC-2: “Technical guideline for the incorporation of Regulation (EU) 2016/1388 into the Greek transmission system code and the Greek distribution network code” Deliverable DCC-3: “Proposals for the development of derogation criteria and procedures in line with the Regulation (EU) 2016/1388” Deliverable DCC-4: Proposals for the development of operational notification procedures for demand connection and distribution networks, in line with the Regulation (EU) 2016/1388” Deliverable DCC-5: “Proposals for the development of compliance mechanisms for demand connection and distribution networks in line with the Regulation (EU) 2016/1388”	Deliverable DCC-6: “Incorporation of Regulation (EU) 2016/1388 into the Greek transmission system code and the Greek distribution network code” Deliverable DCC-7: Derogation criteria with regard the Regulation (EU) 2016/1388” Deliverable DCC-8: “Establishment of an operational notification procedure for demand connection and distribution networks, into the Greek Transmission System code and the Greek distribution network code” Deliverable DCC-9: “Establishment of a compliance monitoring mechanism for demand facilities and distribution networks into the Greek Transmission System code and the Greek distribution network code”

Stage 3: Technical assistance for the implementation of the Regulation (EU) 2016/1447 “High Voltage Direct Current Connections and DC connected PPMs” (HVDC)

Phase 1-HVDC Elaboration of the requirements of general	Phase 2-HVDC Implementation of Regulation (EU)
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application	2016/1447
Deliverable HVDC-1: “Technical guideline for the incorporation of the Regulation (EU) 2016/1447 into the Greek transmission system code” Deliverable HVDC-2: “Proposals of derogation criteria and procedures in line with the Regulation (EU) 2016/1447” Deliverable HVDC-3: “Proposals for the development of operational notification procedures for HVDC systems and DC connected power parks in line with the Regulation (EU) 2016/1447” Deliverable HVDC-4: “Proposals for the development of compliance mechanisms for HVDC systems and DC connected PPMs, in line with the Regulation (EU) 2016/1447”	Deliverable HVDC-5: “Incorporation of the Regulation (EU) 2016/1447 into the Greek transmission system code” Deliverable HVDC-6: “Derogation criteria with regard the Regulation (EU) 2016/1447” Deliverable HVDC-7: “Establishment of an operational notification procedure for the HVDC systems and DC connected PPMs into the Greek Transmission System code” Deliverable HVDC-8: “Establishment of a compliance and monitoring mechanism for the HVDC systems and DC connected PPMs into the Greek Transmission System code”

The contract shall be executed in close cooperation with the IPTO/ADMIE project experts in Athens. IPTO/ADMIE, will support the facilitation of meetings and discussions with the Greek competent bodies (e.g. IPTO/ADMIE, HEDNO/DEDDIE, RAE and the Ministry of Environment and Energy).

In implementing the service the contractor shall be bound to:

- actively participate with IPTO/ADMIE project management team in all planned activities
- actively cooperate with team leaders and key beneficiaries on all current project activities
- timely notify the project management team in writing about noticed risks and proposals for their elimination

The project shall start with a joint meeting in Athens. For this meeting the contractor shall prepare a presentation of the proposed methodology for each CNC, a detailed project design and a time frame.

Separate physical meetings in Athens will take place at the end of the execution period of Phase-2 of RfG, Phase-2 of DCC as well as at the end of Phase-1 of HVDC (i.e. after the evaluation of stakeholders' comments and public consultations outcome and before the submission of the final documents per each CNC). In the meanwhile, regular follow up teleconferences between the contractor and IPTO/ADMIE members will take place to assess the progress status of each deliverable and validate the progress of the whole project.

In case of certain doubts about the approach of the contractor or certain delay in the project process, IPTO/ADMIE may call for additional physical meetings.



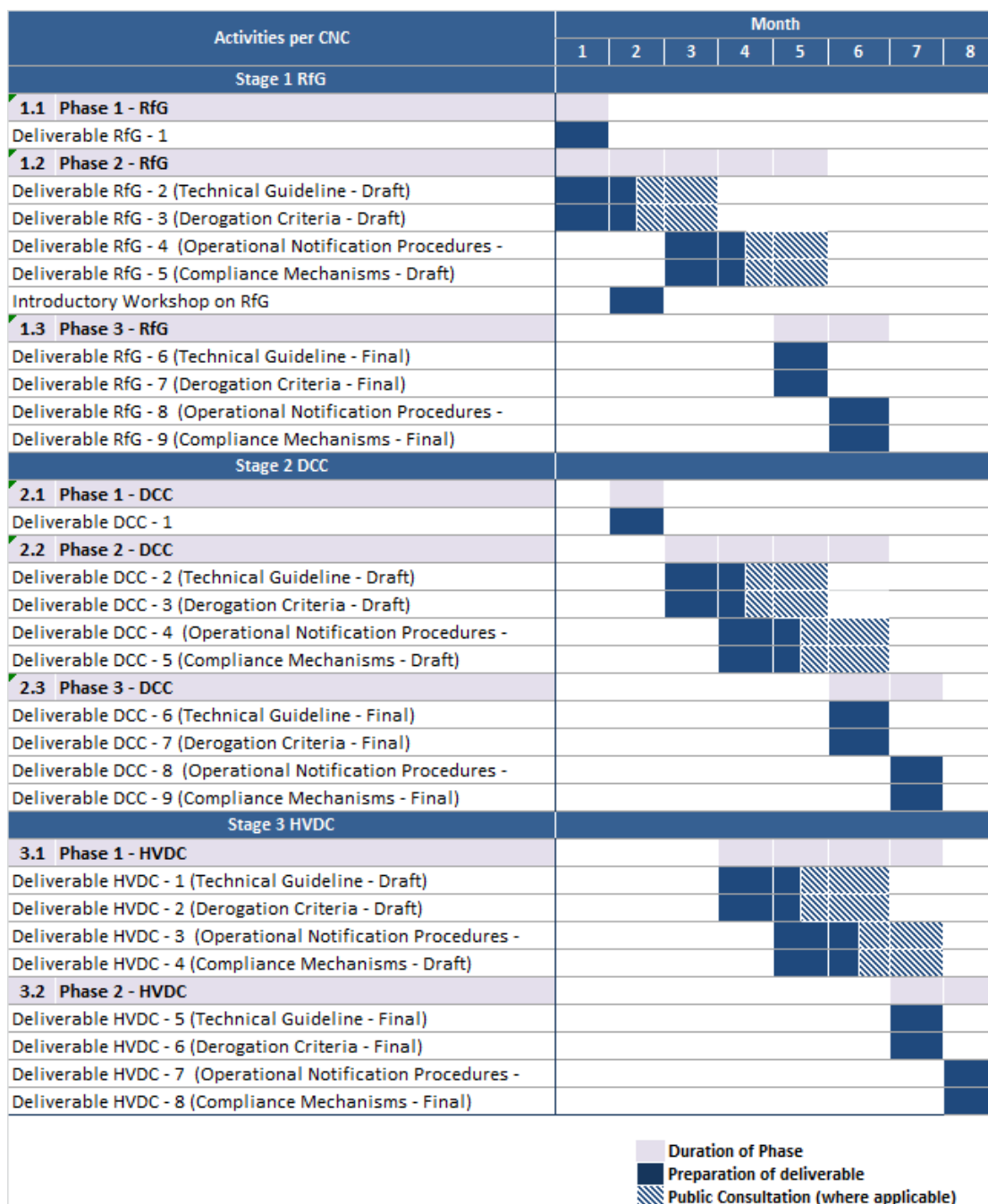
At the end of the project, the final documents as well as a summary presentation of the work will be presented at a closing meeting at the IPTO/ADMIE offices.

The validation and expression of acceptance on the part of IPTO/ADMIE of the results obtained is essential, in order to satisfactorily complete the contract.

5. Time Schedule

The whole project shall be finalized over a period of 8 months starting from the signature of the contract.

An estimated time schedule for the implementation of the project is given in the form of a Gantt Chart below.



6. Technical and financial offer

Details with regard the tender process, offer submission as well as the process of bidding evaluation, project awarding, the contracting plan and payment schedule is described in the relative tender dossiers (in Greek).