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REFORM OF THE CAPACITY REMUNERATION MECHANISM IN GREECE

Traditionally, the Capacity Remuneration Mechanism (CRM) in Greece performs two operations: it rewards power capacity availability and it aims at tackling market failures of the electricity market; however, the Greek Regulatory Authority for Energy (RAE) underlines the need for a change of direction, i.e. the need for a reformed CRM that provides the means to ensure resource adequacy and System reliability, i.e. a need of a permanent nature, and to eliminate the existing market failures arising from the structure and the degree of concentration both in the wholesale and the retail Greek energy market, i.e. a need of a transitional nature.

On 29.7.2014, the Greek Regulatory Authority for Energy (RAE) put forward a consultation on its first proposal for the reform of the Capacity Remuneration Mechanism (CRM) in Greece.

The foundations of this proposal can be found on (a) the Communication from the Commission entitled "Delivering the internal electricity market and making the most of public intervention"[1] and the accompanying working document entitled "Incorporating demand side flexibility, in particular demand response, in electricity markets"[2], as well as (b) the "Guidelines on State aid for environmental protection and energy 2014-2020"[3].

Besides, pursuant to the rationale of a previous RAE decision (No 338/2013)[4], the reform of the existing CRM was deemed as necessary for ensuring capacity availability and security of supply; it highlighted that the existing CRM shall be reassessed in line with the principle of proportionality and shall be adjusted to the market rules and conditions while taking into account the potential financial returns of each unit arising from its participation in Daily Energy Scheduling (DES).

The increased share of intermittent (i.e. variably operating) Renewable Energy Sources (RES) in the energy mix, leads to the assumption that generation adequacy is not only about capacity margin. As the output of these resources is variable and not fully predictable, flexibility is required. Moreover, under Directive No 2009/28/EC on the promotion of the use of energy from renewable sources, Greece committed itself that by year 2020, 18% of the final energy consumption will be produced from RES. Also, by Law No 3851/2010 this percentage was increased to 20%. Therefore, generation adequacy (the availability of sufficient resources capacity when needed, including activation of demand switching) and flexibility (the ability to adapt production or consumption to the System needs within a given timeframe) constitute the two cornerstones of a reliable power System.

The initial structure of the proposed CRM

The design of the CRM which was proposed by the RAE, consisted of four pillars, which respond to four different

needs of the System, i.e. capacity availability, flexibility, strategic reserve and demand side response, each triggering the application of a different remuneration mechanism. The 1st pillar (capacity availability) ensures the availability of sufficient dispatchable plants in Greece to meet demand at peak times. The corresponding remuneration mechanism remunerates true capacity availability of dispatchable plants using a unit capacity payment approach. The 2nd pillar (flexibility) aims at supporting plant capacity which provides flexibility to the System. Flexibility is defined as fast increase (ramp-up) or decrease (ramp-down) of committed capacity by a plant so as to meet the load requirements of the System over the time scale of one hour or more. The respective remuneration mechanism remunerates capability of dispatchable plants to perform ramping at rates beyond a certain threshold, using a mixed System which combines a fixed payment and a variable payment component. The 3rd pillar (strategic reserve) aims at addressing security of supply threats at times of extreme events. The respective remuneration mechanism provides for the conclusion of contracts with plants remaining in cold reserve for strategic reserve purposes, following a procurement procedure. The 4th pillar (demand side response) aims at the creation of a separate mechanism which could allow consumers to provide interruptible load services to the Transmission System Operator (TSO) in order to reduce electricity consumption at times of high demand. The respective remuneration mechanism remunerates energy demand reduction at System marginal price levels or at prices determined after a tender for a limited collection of times of high demand.

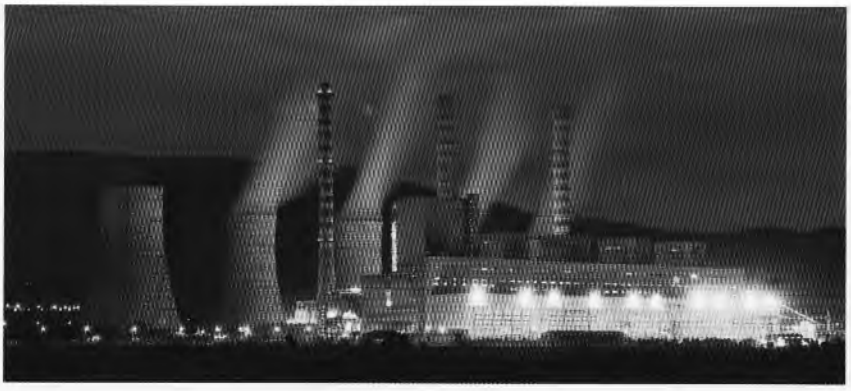
The final proposal of RAE

Following its first consultation, the RAE launched its final consultation on 7.1.2015 under the title "Final proposal of RAE for the reform of the Capacity Remuneration Mechanism in the Interconnected System-Development of the Flexibility Remuneration Mechanism", after having considered the comments of market participants on its first proposal and the Electricity Generation Adequacy Study Report for the Greek Interconnected System for years 2015-2024, which was conducted on behalf of ADMIE.

As already addressed above, the RAE introduces the new concept of flexibility for the efficiency of resources, which is related to ramp-up and ramp-down power and is required in order to maintain reliability standards due to the intermittent production from renewable energy injected to the grid.

Consequently, the RAE's final proposal refers to the establishment of two mechanisms: a new permanent mechanism which shall operate on the basis of auctions for the purchase of the necessary flexibility services for the System, and a transitory mechanism to operate during the first 10 months of 2015 for the remuneration of flexibility (FRM). This final proposal is focused solely on one element of the initially proposed mechanism, namely the flexibility pillar. The main characteristics of the FRM can be summarized as follows:

(a) Introduction and use of the



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concepts of "flexibility service" and "availability for flexible delivery"
The term "flexibility service" is denoting the rapid increase (ramp-up) and decrease (ramp-down) of dispatched power of a power plant, so as to cover the load, following the dispatch instruction of the TSO over a period of several hours. The term "availability for flexible delivery" denotes the ability of a unit to follow a rapid operation cycle in response to a greater than the predetermined threshold. This threshold corresponds to the measured rate of output variation in MW/min, within a short timeframe of three hours.

(b) The establishment of a permanent mechanism for the remuneration of the units for having the capacity required to offer the flexibility service
The fixed remuneration which will be provided for the flexibility service shall create the necessary incentive for the availability of the units to provide the aforementioned service. In the case of the permanent mechanism, this fixed remuneration shall be defined as the clearing price of the yearly auction which shall be carried out for the provision of the flexibility service.

(c) The introduction of eligibility criteria
The proposal sets a number of eligibility criteria, which shall be based on technical parameters, irrespective of the power plant technology. In particular, apart from existing units, new power plants are eligible to participate in the FRM. The prerequisite is the application of a remote control system allowing the TSO to control the output. They shall also have the ability to alter their output with a change rate of at least 8 MW/min and the ability to respond for at least three consecutive hours.

(d) Total cost and allocation
The calculation of the total cost required for meeting the needs for flexibility during 2015 in the context of the transitory mechanism, is based on the needs of the System as these were assessed in the abovementioned Study of ADMIE and the total available capacity of the units that participate in the mechanism. It will take into account technical and economic data that mirror the expected increased operation and maintenance cost of these units due to the requirement for adjusting their output levels. In particular, three parameters shall be taken into account for the calculation of the total operation and maintenance cost that is required for the provision of flexibility services. These are the following:
(i) The annual operation and maintenance cost for the smooth cyclical operation of a CCGT plant, so as to respond to predefined and clearly determined technical characteristics for the provision of flexibility services. This cost amounts to 21.000€/MW per year.
(ii) The additional operation and maintenance cost of a CCGT plant that corresponds to the increased requirements for cyclical operation required for flexibility services. This cost includes, among other parameters, the additional maintenance which is required for the turbine system and electricity equipment due to the increased

number of ramp-up and ramp-down of the unit, as well as the increased own consumption which this intensive cycle entails, and totally amounts to approximately 16.300€/MW per year.
(iii) The additional annual cost for the supply and transportation of natural gas, which corresponds to the required availability of gas as fuel of the respective units, in order to respond to the output variations they are required to perform, as well as the possible unpredicted allocation instructions of the TSO for the provision of flexibility services. This cost, which is estimated to amount to approximately 9.100€/MW per year, includes the cost of balancing gas and potential penalties for declination from scheduled production profile, the additional cost of transportation, as well as the cost for a potential application of take-or-pay clauses.

On the basis of the above, the proposed remuneration for the provision of the flexibility service amounts to 45.000€/MW per year and the total available capacity of the units which are eligible to participate in the FRM amounts to approximately 5.000 MW. Therefore, the budget for the FRM is estimated to approach €225 million Euros (45.000€/MWx5.000MW). The cost for the ten month-period of the application of the FRM amounts to €187 million Euros. With regards to the allocation of the aforementioned cost, the payments to the power plant producers shall be fully recovered by the TSO through charges imposed to the Load Representatives, which shall be proportionate to the requirement for capacity availability, as it is determined during the critical periods of the Transmission System.

The Hellenic Association of Independent Power Producers participated in the consultation process and underlined that the proposed method for the calculation of the remuneration underestimates the value of the service provided, as it is determined by a cost-oriented method and not on the basis of the opportunity cost which its provision entails.
The Association also considered the shifting of availability away from the design of the market as a negative development, in particular, because the Greek market was among the innovative ones at EU level as to the adoption of market capacity mechanisms. With regards to the comments of the PPC, it admitted that the proposed transitory mechanism is a step in the right direction given that it finally leads to the significant reduction of the total cost of the Electricity System. The PPC also came up to the following conclusions:

a) The Electricity System has sufficient flexibility to cover its needs at least until 2024,

b) The hydroelectric power plants are the most flexible units of the System and in fact provide the largest part of the necessary flexibility, irrespective of the hydrological circumstances. The lignite plants, although less flexible, also provide a significant part of the necessary flexibility at least at the same percentage as the natural gas plants, and

c) The calculation method of the reasonable remuneration as well as the cost basis of the eligible units are unclear and raise a number of questions about their economic justification.

1 C (2013) 7243 final.

2 SWD (2013) 442 final.

3 2014/C 200/01.

4 "Amendments to the provisions of the Code on the Operation of the Greek Electricity Transmission System (Official Government Gazette No 103/31-1-2012) and the Code on Electricity Transactions (Official Government Gazette No B' 103/31-1-2012)" of RAE

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