

UNOFFICIAL TRANSLATION FROM GREEK

To:

Regulatory Authority for Energy

Mr. Chairman, N. Vassilakos

SUBJECT: Public Consultation regarding the Methodology for the Calculation of the Variable Cost of Hydroelectric Units

Athens, 15/01/2015

Dear Mr. Chairman,

In relation to the revised methodology for the calculation of the Variable Cost for Hydroelectric Units based on the Article 44, paragraph 5 of the Electricity Market Code, which was submitted for consultation by the participants, as well as regarding the results of the additional tests for the implementation of the respective methodology by the Operator of the Electricity Market, we submit to you the following remarks:

A. On the need to adopt a system which will define the Maximum Daily Declared and Injected Energy by Hydroelectric Stations

In order to secure the smooth operation of the electricity market with a simultaneous development of the conditions enabling healthy competition and prevention of phenomena related to the abuse of dominant market power, apart from the revision of the methodology referring to the calculation of the variable cost of the hydroelectric units, it is absolutely necessary to fully implement the measure of the maximum quantity of energy that can be offered to the Day-Ahead Scheduling by hydroelectric units.

In this framework, it is suggested that the maximum daily quantity of hydroelectric production of each unit, **which will be defined with specific and justified methodology**, taken into consideration historic data, the current and the foreseen level of the water reserves, as well as the inflows of each reservoir on a daily basis, is declared and published on the day before the Dispatching Day. This quantity should be binding versus the

quantity offered and injected daily from each hydroelectric unit and no overflows should be allowed, apart from the cases set by the provisions of article 55, paragraph 5 of the Electricity Market Code.

Moreover, the implementation of a Maximum Daily Energy Injection by Hydroelectric Units was included in a proposal by RAE from March 2008, since it is well known that hydroelectric units cannot offer the total amount of ca. 3.000MW of their installed capacity throughout the largest part of the year. The daily declaration of water availability is not in most cases in accordance with the actual production ability and it is thus distorting systematically the wholesale market. As explicitly noted by RAE in the analysis of the respective Public Consultation of 03/04/2008: *“it is a fact that the use of hydroelectric power plants can take place in a way that can affect and significantly distort the Day-Ahead Scheduling, especially since hydroelectric power plants are controlled only by the incumbent”*. Afterwards, a relevant proposal by DESMIE (I-121989/21.09.2010), was submitted, suggesting among others the development of a methodology for the calculation of the quantity of energy and capacity, which can be declared as available by Hydroelectric Power Plants each day. The relevant provision for the implementation of a Maximum Daily Energy Injection by Hydroelectric Units, following a respective opinion by RAE to the Ministry (349/27.09.2010), was finally incorporated in the System Management Code and Electricity Market Code, with the Ministerial Decision of 09/28/2010.

Until today, three years later and despite the relevant provisions of the System Management Code (article 13, paragraph. 10), the implementation of a Maximum Daily Energy Injection by Hydroelectric Units is not enforced, as a result of the lack of a methodology defining the maximum quantity of energy and capacity that can be declared as available to the Day-Ahead Scheduling and dispatched towards injection.

As it can be easily understood, the systematic offer of the total capacity of the Hydroelectric Units as available, creates a virtual zone of 1.500-2.500 MW, which finally though is not dispatched for production by the Hydroelectric Units when requested, but instead it is substituted by other units that have submitted higher offers in order to produce the exact same amount of energy, which the hydroelectric units declared they can offer in the process of the Day-Ahead Scheduling. Such a practice on behalf of the hydroelectric units, results in the creation of a virtual sealing in the System Marginal Price and the Deviation Marginal Price by the offering price of this zone, excluding the

disclosing of the offering price of the dispatched units and thus the disclosing of the real value of energy during those hours.

Concluding, and given our experience from the latest revisions of the System Management Code and Electricity Market Code, we kindly ask for the coordination between the actions undertaken by the Operator of the Electricity Market and the Independent Transmission Operator, under the auspices of the Regulatory Authority for Energy, in order to effectively and without any further delay implement the final provision of the respective methodology.

B. Regarding the basic principles of the proposed revised methodology for the calculation of the Variable Cost of Hydroelectric Units

We consider that the majority of the proposed revisions of the methodology are towards the right direction and have taken into account the justified opinions of the participants in the respective Public Consultation of January 2014. More specifically, in relation to the targets for the proposed revisions:

(a) Security of Reservoirs

The definition of Security Reserves R_{sec} as well as the announcement of the relevant values that they receive from each reservoir separately, must take place once and immediately by the owner of the Hydroelectric Power Plants, submitting in parallel and data justifying the proposal/adoption of these values. Relevant provisions by the Operator of the Electricity Market and the Independent Transmission Operator with regards to the revisions of the System Management Code and the Electricity Market Code, are viewed as rational. In any case, possible improvements in the Electricity Transactions Information Management System for the inclusion of additional characteristics beyond the already recorded based on the Article 262 of the System Management Code, should take place as soon as possible by the pertinent organizations, taken into consideration our experience from relevant changes in the past.

With regards to taking into account historic data for the statistical calculation of measurements such as R_{ref} , R_{min} , R_{max} , it is adopted by the proposed process the exemption of the historic sample of the maximum daily decade level, but on the other hand it is suggested to maintain the minimum daily decade level, a proposal which we totally oppose. On this issue, **we would like to underline that both the first and the latter**

should be excluded from the historic sample. Otherwise the historic sample will lack information regarding the frequency of dry/wet years. Consequently, with the exemption of these values, the definition and the use of an actually representative ‘sample’ which would lead to the preservation of the energy reservoirs of the Hydroelectric Units in adequate levels, will be feasible. Otherwise the exemption of only the extremely wet years that may have occurred during the last decade will affect permanently the way we calculate the reference values R_{ref} , used for the ‘within the limits’ implementation of the mechanism and moreover the threshold values for the Variable Cost of the Hydroelectric Units, offering inadequate financial signals for the value of the replacement of the reserves.

(b) Reflection of the thermal production replacement cost

We view that the suggested interventions are in accordance with our proposals during the previous consultation and therefore we expect their incorporation in the final text of the respective methodology.

C. Specific points of the Public Consultation

(1) For the revised approach regarding the calculation of the fuel replacement component.

We agree with the proposed methodology.

(2) For the water reserves component and especially the values of the regulatory parameters VC_{max} , TOL , k_1 , k_2 . It is noted that the pair $K_1=K_2=3$ constitutes the optimal approach, introducing symmetrical management of the increases and decreases of the reserves beyond the reference zone.

The values of these parameters as indicated by the tests results are considered as rational. Possible changes towards the direction of an optimum implementation of the methodology (hence the achievement of reserves security and adequate pricing of the Variable Cost of Hydroelectric Power Plants) are deemed as needed with the appropriate justification and Regulatory approval.

(3) For the revised approach regarding the management of stations with considerably similar inflows.

We agree with the proposed methodology.

(4) For the definition of values R_{max} , R_{min} , R_{ref} , through the historic sample of the decade, with the exemption of the maximum reservoir level constituting the suggested approach for the management of extreme prices.

This point is covered by our positions, as developed previously. (par. A(a))

(5) For the proposed revisions of the System Management Code which describe the special circumstances under which the methodology is activated.

The non-implementation of the methodology for the calculation of the Variable Cost of the Hydroelectric Stations should take place in extremely special cases and based on data related to the reserves and not the outlook of the manager/owner of the Power Plants. In any case the target for the security of reservoirs can be achieved also in real time in order to cover special circumstances. In this way arbitrary actions on behalf of PPC, which historically uses hydroelectric units in order to absorb the capacity deficit of lignite stations, distorting competition, causing technically low levels of the Marginal System Price and excluding the independent producers, can be limited.

Additionally, the results deriving from the implementation of the methodology should be observed carefully both by the Operator of the Electricity Market as well as by RAE and whichever parameters are deemed appropriate should be revised, in order to limit practices on behalf of PPC that would hinder competition.

(6) The proposed revisions in the Electricity Market Code and in its Manual regarding the Administrative Defined Minimum Price for Offers of Energy by Hydroelectric Units which submit Priced Pumping Load Declarations.

We view that the relevant proposals cover the respective remarks which we submitted in the previous public consultation. Additionally, the submission of Priced Injection Offers for the produced energy quantities deriving from pumping (which is still now done with zero price, a practice demonstrating the existence of water reserve surplus), **should be replaced**, with the minimum price of the substituted thermal production, as this is formed by market data.

(7) For the separate but relevant aforementioned issue regarding the actual discovery of the non linearity, in relation to the available capacity of the hydroelectric units and the creation of a pertinent Methodology.

The available capacity of the hydroelectric power plants, apart from possible technical failures/malfunctions that may occur, is linked to the height of the water falling, as this justified in the respective bibliography and is also mentioned in the text of the respective consultation. This ability is framed within the entrance/exit curves of each hydroelectric power plant, which define for separate water falling heights the relation between the consumption of water (in m³/sec) and the produced energy (in MWh). The level of the reserves of each reservoir, apart from the short-term value of these reserves, defines also the special consumption of water by each hydroelectric station, as well as its maximum capacity. **Practically this demonstrates the inability of the hydroelectric power plants with intense daily water level fluctuation to maintain at the same level of reliability their maximum availability for energy production and reserves provision. Moreover, the hydraulic dependence of the lower level reserves from the outflows of the higher level reserves, impacts the level of their reserves and thus their availability.** In times of hydraulic drought, the increase of outflows (in m³/sec) in order to achieve higher levels of availability – even for main reservoirs – leads to the over-exploitation of the reserves and their further decrease. Evidently, during the scheduling of reserves management for each hydraulic dependent hydroelectric power plant, its owner can know the foreseen fluctuation of the reservoirs' levels and thus the availability of the units and the provision of reserves by each station. **We believe that the availability of the hydroelectric power plants should be 'foreseen' during the drafting of its operation schedule in whatever level this may belong.** We also believe it is reasonable that this availability is maximized during the outflow/scheduling hours of the produced energy due to mandatory injections. **During the remaining hours in the hydraulic dependent hydroelectric stations with hydraulic interdependence, the owner must – taking into consideration a relevant methodology – submit respective declarations of unavailability, in order to demonstrate subsequently in this manner the lack of water.**

D. Regarding the final price which is formed as the threshold for the offers by Hydroelectric Power Plants

As Hydroelectric Power Plants due to the scarcity of the fuel are dispatched in the operation scheduling during peak hours (apart from mandatory water) and thus they form the market price, the Regulatory Authority for Energy must calculate and incorporate in the respective threshold price one part of the cost (in addition to the discussed methodology), reflecting the part of the investments in hydroelectric stations that has not been depreciated. If this is not implemented and the owner of each hydroelectric power plant submits offers on the threshold of the prices alone, then it is evident that these units do not cover their full costs by their operation alone, but their operation is rather based upon the market power of their owner.

E. Regarding the time elapsed since the previous public consultation

While the technical complexity of the methodology is understood, **as we have previously stated in letters with similar topics, the resolution of so important issues for the electricity market must take place in an accordingly timely manner.** The current public consultation and the material at hand, presents within a year from the previous public consultation and within two years from the initiation of the respective discussions the overall conclusions of the effort undertaken by the parties involved. **Nevertheless, until today the relevant provisions of the Electricity Market Code have not been completed or implemented.** We therefore believe that following the end of this most reasonable timeframe, the respective final decisions of your Authority with regards to the methodology, the revisions of the Electricity Market Code and in its Manual, as well as the relevant implementation parameters, will be completed within the next time period without additional delays. Besides, the technical adequacy and the multiple parameters for the adjustment of its implementation, offer the ability of immediate corrective changes in case these are deemed needed.

Sincerely,

Giorgos Stamtsis

General Manager