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REGULATORNI URED ZA ENERGIJU
ENERGY REGULATORY OFFICE



REGULATORY REPORT
Preliminary Assessment on Determination of Allowed Revenues for District Heating Termokos
JSC. Heating Season 2016/2017

/Draft for Public Consultation/

Prishtina, September 2016



Table of Contents

Page

1.	Introduction	Error! Bookmark not defined.
2.	Principles and Formulation of Tariff Methodology	4
3.	Determination of Allowed Revenues	Error! Bookmark not defined.
3.1	Evaluation and determination of allowed operational costs	8
3.2	Determination of Regulatory Asset Base(RAB)	15
3.2.1	Determination of Existing Assets.....	15
3.2.2	Determination of allowed New Investments	18
3.2.3	Determination of Working Capital	19
3.2.4	Disposals	19
3.3	Evaluation and Determination of Annual Depreciation	20
3.4	Determination of Allowed Return on RAB (Allowed Profit)	21
3.4.1	Calculation of allowed Rate of Return (RoR).....	21
3.5	Determination of network losses cost	24
3.6	Adjustment	25
3.7	Allowed Revenues Calculation - Summary	25

Table of Contents (Continues)

Figure 1:	Allowed Revenues Calculation Scheme	5
Figure 2:	Schematic presentation of main costs (in €) proposed by DH Termokos and allowed by ERO for the heating season 2016/2017	9
Figure 3:	Schematic presentation of proposed operational costs by DH Termokos and allowed by ERO for the heating season 2016/2017	14
Table 1:	Costs presented by DH Termokos J.S.C., and allowed by ERO (in €)	8
Table 2:	Categorization of existing assets without cogeneration project assets with respective values	16
Table 3:	Categorization of cogeneration project assets with respective values	17
Table 4:	RAB and its components- DH TERMOKOS- heating season 2016/2017	20
Table 5:	RAB_f and its components- DH TERMOKOS- heating season 2016/2017	20
Table 6:	Allowed Return (allowed profit) on RAB_f for DH Termokos- heating season 2016/2017	24



1. Introduction

According to primary legislation- Articles 47 and 48 of the Law on Energy Regulator, Energy Regulatory Office (ERO) is responsible for determination of tariff methodology and approving the tariffs in the regulated energy sector; therein is a set of broad principles such as justification and non-discriminatory principles under which energy enterprises should recover all justified costs including the reasonable return on their investments. Also, Articles 18 and 19 of the Law on Thermal Energy determine that the supplier charged with public service carries out the supply of thermal energy with regulated tariffs.

District heating sector in Kosovo in transmission and distribution of heat is classified as a natural monopoly, while no competition exists for the time being in heat production and supply. Therefore the district heating tariff, containing all the above mentioned components, is subject to approval by ERO.

In line with its legal obligations and powers, Energy Regulatory Office issued Thermal Energy Pricing Rule. This rule sets the procedures for submission, review of tariff application and approval of tariffs as well as Methodology on Calculation of Allowed Revenues and Tariffs.

For determination of allowed revenues for the heating season 2016-2017 have been considered the following:

- Information provided by DH Termokos in its application for tariffs and prices for the heating season 2016/2017;
- Information provided by DH Termokos in its regulatory reporting- costs and revenues, assets/investments, as well as technical and customer information, that has actually taken place in the heating season 2015/2016 and in the previous seasons.

Procedure of tariff review process:

- **On 1 July 2016** –ERO issued a notice letter on commencement of tariff review for DH Termokos for heating season 2016/2017;
- **On 4 July 2016** –ERO sent to DH Termokos, by email, the request for submitting the data and information which includes a detailed description of information that DH Termokos shall submit for tariff review, as well as the Plan and Schedule;
- **On 25 July 2016** –; DH Termokos submitted, by email, the data and information on tariff review;
- **On 29 July 2016** –A meeting between ERO-DH Termokos took place- the meeting topics: i)introduction with Thermal Energy Pricing Rule, especially regarding Tariff Methodology; ii) discussion on tariff review process; and iii) discussion and explanation regarding the submitted information and data;
- **On 17 August 2016** –Following the analysis and evaluation of data and information submitted by DH Termokos, ERO submitted the written comments where the requests for correction, amendment and supplement of initial application were specified;
- **On 30 August 2016** –DH Termokos resubmitted the application with the corrections, amendments and supplements required by ERO through its comments.



2. Principles and Formulation of Tariff Methodology

For the purpose of determination of allowed revenues and thermal energy tariffs for heating season 2016/2017, the Methodology determined in the Thermal Energy Pricing Rule is applied.

Principles

The basic principle of this methodology is that utility tariff must cover the costs, so that in one hand the customers should not pay excessively over incurred cost for their service, while on the other hand the utility should recover all reasonable and justifiable costs plus a reasonable rate of return for its capital investment. Total cost of service is usually defined to include all of utility operational expenses i.e. to recover cost of production, distribution and supply (operation and maintenance, fuel, salaries, common costs, taxes, etc.) plus a reasonable return on its investments devoted to the public service provision.

Given that in some cases such a regulation does not provide incentives for enterprises to increase operating efficiency and cost saving and on contrary may give incentive to over-invest in fixed assets and also considering the obligation of the Regulator to protect the customers, it is required from the enterprise not only have to prove the declared “justifiable costs” but also to demonstrate increasing operational and procurement efficiency. Such measures form the basis for reconciliation of tariffs at the beginning of the new tariff season, in which the regulator rewards or penalizes the enterprise for increasing or decreasing the efficiency and cost control.

Formulation

For the purpose of calculation of allowed revenues and for final tariff calculation, Thermal Energy Pricing Rule (Annexes 1, 2, 3 and 6) provides the detailed formulation of Tariff Methodology. However for consistency reasons the formulation shall be shortly presented in this report.

Schematically, the Tariff Methodology can be shown as below. The costs which enterprise should recover are built up from its operational costs, depreciation representing ability to replace the enterprise assets, costs of network losses and the return on the Regulatory Asset Base (RAB), which in fact represents the allowed profit for the company.

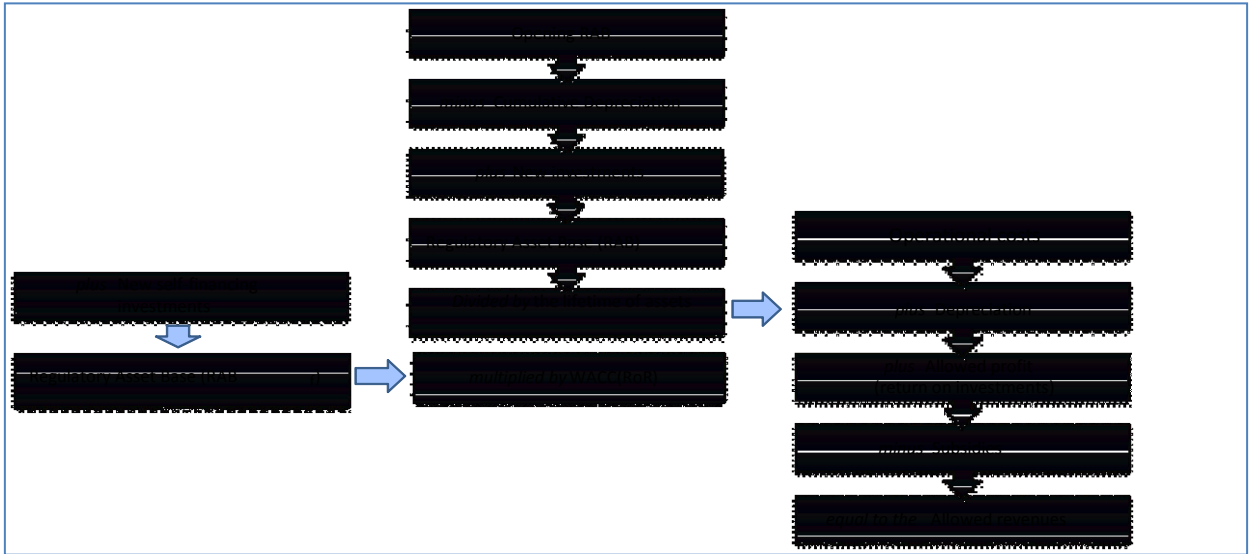


Figure 1: Allowed Revenues Calculation Scheme

Basic Regulation Formulas:

Allowed Revenues are calculated according to the formula:

$$\mathbf{MAR = OPM + DEP + RTN + LOS + ADJ}$$

Where:

- MAR** Maximum Allowed Revenues;
- OPM** Operating and Maintenance Costs;
- DEP** Annual Allowed Depreciation;
- RTN** Allowed Return on Assets;
- LOS** Cost of Network Losses;
- ADJ** Revenues Adjustment.

The allowed revenues represent the annual cost of the enterprise and consist of: i) operational costs, which are “justifiable”; ii) annual depreciation; iii) cost of network losses; and iv) allowed return on Regulatory Asset Base (RAB).

Operational Costs consists of the sum of the fixed and variable costs as follows:

$$\mathbf{OC = OC_f + OC_v}$$

Operational costs represent the total yearly estimated justified costs, including: i) costs of fuel, costs of thermal energy purchase and other costs such as electricity, water treatment chemicals, spare parts; ii) other system operation costs, repairs and maintenance; and iii) personnel costs and common costs. Allowed operational costs do not include: i) subsidies; ii) costs rejected by tax authorities and costs of setting aside and distributing reserves; and iii) lease payments for items not kept in the bookkeeping, financial or other unjustified costs.



Regulatory Asset Base is calculated according to the formula:

$$RAB_n^{end} = RAB_n^{start} + INV_n - DIS_{n-1} - DEP_{n-1} + WC_n$$

Given that the tariff review process for this season is conducted after a period of four (4) years, during which significant changes in the structure and value of assets have occurred mainly due to the cogeneration project, therefore it is considered that the Opening RAB is determined and the above mentioned formula is modified as below:

RAB = Book Value of Existing Assets (after cumulative depreciation) + New Investments + Working Capital – DIS (Disposals).

The Regulatory Asset Base (RAB) represents the enterprise assets considered to be used and useful in the public service, that include: i) book value of assets (after depreciation) or the initial book value of assets minus the cumulative depreciation; ii) new investments when planned and approved by the regulator; iii) working capital sufficient for the company to carry out its activities and iv) disposed assets .

ERO will take as a rate of return the value of WACC (Weighted Average Cost of Capital). WACC (%) is the sum of weighted average of the equity cost and debt cost, and is calculated according to the formula:

$$WACC = [(D/V) * k_d] + [(E/V) * k_e]$$

Where:

D/V-	Debt Share of the total capital base
E/V -	Equity Share of the total capital base
V -	Total capital base, which is the total of equity and debt
k_d-	Cost of debt
k_e-	Cost of equity

3. Determination of Allowed Revenues

For determination of Allowed Revenues of DH Termokos JSC. for heating season 2016/2017, according to Thermal Energy Pricing Rule, ERO has undertaken the following:

- 1) Evaluation and determination of allowed operational costs;
- 2) Evaluation and determination of depreciation;
- 3) Determination of Allowed Return on RAB (allowed profit for company), which includes:
 - a) Establishment of the RAB – evaluation and approval of company assets, verification and approval of planned investments and working capital; and
 - b) Calculation of the allowed Rate of Return (RoR)/ WACC;
- 4) Evaluation and calculation of the allowed cost for network losses.

In determining the Allowed Revenues, ERO has taken into consideration the following:



- Information provided by DH Termokos in its application for tariffs for the heating season 2016/2017- information regarding estimated revenues from heat related services, forecasted total costs, forecasted assets and planned investments and forecasted heat production and supply, as well as forecasted heating area;
- Information provided by DH Termokos in its regulatory reporting- costs and revenues, assets/investment, as well as technical and customers information, that has actually taken place in the previous season 2015/2016;
- Information that ERO possesses from tariff reviews and monitoring of realizations and performance of previous seasons/years.

Knowing that forecasted information is the key to determination of allowed revenues, it should be reliable and realistic. Generally, in forecasting/planning the business a realistic approach should be applied, followed by a comprehensive assessment of multiple factors affecting the business; i.e assessment of the market and forecasting the expansion of customer base, assessment of production/supply capabilities and financial capabilities of the company. Of course, the proper forecasting/planning has to be based on the past data that the company has realized during a certain period.

It must be noted here that DH Termokos' tariff application was quite detailed and complete. However, in some of the data and information were noted inaccuracies, noncompliance and inconsistencies. This occurred despite ERO intervention during regular meetings and written comments, where it was insisted on correct and consistent data. However, for some of the key positions the information and data received were unreal and not supported by the appropriate documentation, which has caused additional difficulties during the evaluation of the application.

In fact, as far as forecasted information is concerned (as stipulated in Annex 4 of Thermal Energy Pricing Rule), DH Termokos has submitted to ERO, the statements/spreadsheet consisting of forecasted incomes and costs, technical and customer data, operational assets and forecasted investments for one year period covering full district heating season: 15 October 2016 – 14 October 2017. While as support documents it has submitted: i) Audit Report, as well as statutory and financial statements for 2015; ii) list of substations- data on heating area and respective capacities and other technical data, ii) list of assets- detailed data on fixed assets where the initial value (purchase value) is provided, the cumulative depreciation and the current value of assets (submitted in regular annual/seasonal reporting); iii) planning of new connections for heating season 2016/2017; iv) planning for customer billing based on supply/metered consumption; v) registered metering for thermal energy produced by cogeneration (submitted in regular annual/seasonal reporting); and vi) data on customer billing based on metered consumption in previous season 2015/2016.

Notwithstanding the above, ERO has made efforts and has engaged the expertise available to make a realistic evaluation of the forecasted information submitted by Termokos. It made a comprehensive analysis and evaluation of the information presented, followed by a comparison of data from past seasons, in order to make an accurate determination (forecasting) of allowed revenues for the coming season 2016/2017.



3.1 Evaluation and determination of allowed operational costs

Operational costs planning submitted by DH Termokos for the period 15 October 2016-14 October 2017, a period covering full district heating season 2016/2017, are structured as variable and fixed costs which is mainly in compliance with provisions of Thermal Energy Pricing Rule as well as advanced accounting principles and Kosovo Accounting Standards.

In this section will be presented in table all forecasted costs presented by DH Termokos and the allowed operational costs allowed by ERO (Table 1). The table will follow with the analytical explanation of each item of operational costs.

Table 1: Costs presented by DH Termokos JSC. and allowed by ERO (in €)

Operational costs DH Termokos - 2016/2017 season		Proposed by DH Termokos	Allowed by ERO
Variable costs			
1	Own cogeneration	230,000	230,000
2	Energy purchase from cogeneration – variable comp.	334,298	334,298
3	Water treatment chemicals	60,000	35,000
4	Water	85,000	75,000
5	Electricity (prod. & subst. Distr.)	550,000	450,000
6	Personnel costs (direct labour)	876,301	786,734
7	Annual license fee	0	1,017
8	Allowed bad debt		273,447
9	Total variable cost	2,135,599	2,185,496
Fixed costs			
10	Materials, services	85,000	81,270
11	Repair and maintenance	150,000	107,670
12	Energy purchases from cogeneration- fixed comp.	737,954	737,954
13	Administration expenses	65,000	55,000
14	Personnel expenses (different from direct labour)	700,287	642,000
15	Sales and other administrative costs	700,000	75,000
16	Total fixed costs	2,438,241	1,698,894
17	Total operational costs	4,573,840	3,884,390

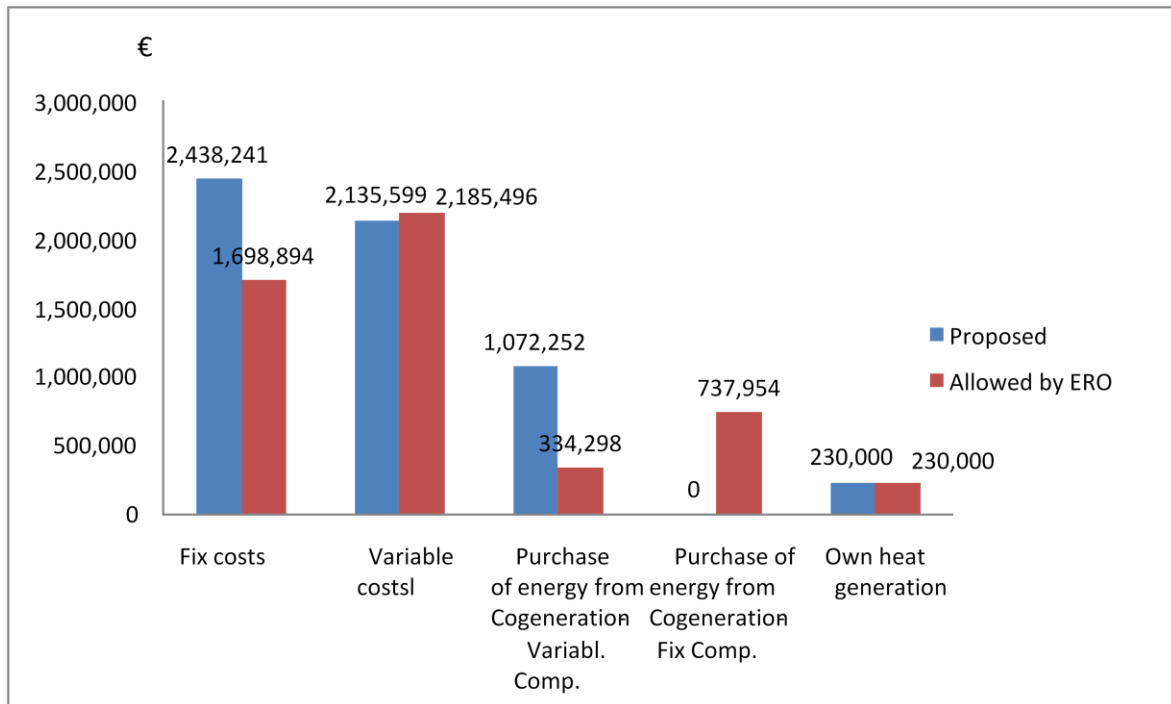


Figure 2: Schematic presentation of main costs (in €) proposed by the DH Termokos and allowed by ERO for the heating season 2016/2017

Analytical explanation

Detailed explanations and justifications for determination/allowance of each group of costs, namely for the main positions of operational costs, are provided below

Variable costs:

- Cost of thermal energy purchase from cogeneration in TPP Kosovo B- payment component for thermal energy amount:
 - DH Termokos proposed the total cost of thermal energy purchase from cogeneration in the amount of 1,134,236 €. This cost is based on: the reserved capacity according to energy balance planning and planned amount of thermal energy, as well as based on respective regulated prices of electricity generation- ERO Decision V_801_2016.

Concretely , payment component for the amount of thermal energy is based on the planned amount of 244, 014 MWh_T and the charge of 1.27 €/MWh_T .

- Evaluation –DH Termokos proposal is evaluated to be mainly real and well-grounded, but DH Termokos has made some errors in calculation and did not include the payment component for the annual license tax (which should have been calculated based on the annual license tax for thermal energy production, stipulated by the Rule on Taxes issued by ERO). ERO carried out its calculations which resulted as follows:
 - Payment component for the amount of thermal energy: 309, 897 €, and



- Payment component for annual licensing tax: 24, 401 €.

The above mentioned components give the result of the payment component for the amount of thermal energy from cogeneration in TPP Kosovo B, in the amount of **334, 298 €** which is allowed for 2016/2017 season.

- It is worth mentioning that the overall cost of thermal energy purchase from cogeneration of TPP Kosovo B - which includes the reserved capacity component and the component for thermal energy amount is **1, 072, 251 €**.
- **Fuel cost – heavy fuel oil:**
 - The cost of heavy fuel oil proposed by Termokos in the amount of 230,000 is based on the estimated amount of consumption of 1,000 ton and estimated purchase price of 230 €/ton;
 - Evaluation –Upon the functioning of cogeneration project, the boilers of thermal energy production are a reserve capacity to be activated only during unplanned interruptions of TPP Kosova B. Therefore, their eventual usage would last for short periods until the necessary repairs are done. Considering that the average daily consumption, based on historical data (14 years) is estimated to be around 70 ton/day, then it is evaluated that the estimated quantity of 1,000 ton is sufficient to produce thermal energy for a period of two weeks. With respect to the purchase price, it is evaluated as real and based in the actual price in the international (stock) markets – around 220\$/ton, namely around 190 €/ton; considering that the price of heavy fuel oil supply and the “premium” to cover supplier expenses (has usually been around 30-35 €/ton), then it can be concluded that the price provided by DH Termokos is real. Based on what was stated above, it can be estimated that the planning for heavy fuel oil proposed by DH Termokos is real and therefore the proposed heavy fuel oil cost of **230,000€** is allowed. Regarding the cost of heavy fuel oil for own generation of thermal energy, it shall be emphasized that despite that it was not presented by DH Termokos, ERO has also added the annual licensing tax. This payment is calculated to be **1,017 €**, based on the estimated thermal energy production from heavy fuel oil in the amount of 10, 170 MWh and annual licensing tax 0.10 €/MWh (based on Rule on Taxes, issued by ERO)
- **Cost of water for (re)filling of heating system**
 - DH Termokos has proposed the amount of 85,000€ for the estimated amount of water of 75, 000m³ for replenishment of the system; this cost represents a small increase compared to the realization in the last season 2015/2016.
 - Evaluation –ERO carried out its evaluations based on the estimated consumption and actual tariffs of RWC Prishtina for water services- water supply: 0.88 €/ m³ and for wastewater services: 0.105 €/m³. So, based on the respective calculations the water cost of **75,000 €** is allowed, evaluated as real and sufficient.



- **Cost of water treatment chemicals**
 - DH Termokos has proposed the cost of water treatment chemicals for water treatment in the amount of **60,000€**, which represents a big increase- around 236%- compared to the realization of this cost in the previous season (2015/2016).
 - Evaluation- ERO evaluates that the proposed amount is very high and not grounded, firstly because the realization of this cost in the previous season has been slightly lower – 17, 858€. However, considering the amount of water that shall be treated, water flows (losses) and the planned increase of heating area , ERO evaluates that the amount of **35,000 €** is sufficient to cover the cost of water treatment chemicals.

- **Cost of electricity**
 - DH Termokos has proposed the amount of 550,000€ for the cost of electricity, an amount increased for 124, 635€ or around 29% compared to the amount realized in the last season 2015/2016 (425, 365€). This increase was justified mainly with the increase of the number of substations due to the increase of customer base, namely the increase of heating area and new equipment- mainly pumps for flow control and regulation in 50 substations which are undergoing the rehabilitation process.
 - Evaluation –Although the above mentioned justifications remain, ERO evaluates that this increase does not fully correspond with the increase of the number of substations, namely heating area, since the respective percentages are significantly lower than the increase of estimated electricity cost. Therefore, it is evaluated that the allowed cost of electricity in the amount of **450,000€** is sufficient to cover the entire consumption of electricity for the period in question, including additional expenses due to the increase of heating area and installation of additional equipment (new).

- **Personnel cost (“direct labour”)**
 - DH Termokos presented staff cost- direct labor in the amount of **876, 301€**, which represents an increase of around 17% compared to the realization in the previous period. The details required by ERO through written comments were not provided for this proposal, except for a note stating that “an increase of 20% is estimated...”.
 - Evaluation –The increase proposed by DH Termokos does not contain required details, such as: increase of the number of employees, increase of wages, average wage, etc. which are necessary to justify the proposed increase. Also, there is no significant expansion of DH Termokos operations which would cause a significant increase of the number of employees. Consequently, ERO evaluates that an increase of 5 % of this cost is justifiable and allows the staff costs (direct labour) in the amount of **786, 734€**.



- **Bad Debt Cost**

- As emphasized above under the “fixed costs” section, DH Termokos included these costs in “sales and other administrative costs” by foreseeing the amount which corresponds with 10 % of planned billing.
- Evaluation - Pursuant to Thermal Energy Pricing Rule, bad debt cost is calculated as a justifiable share of the enterprise revenues (i.e. the billing value from heating sale). This “justifiable share” shall be appointed in a manner to stimulate the enterprise for increasing their efforts in enhancing the share of payment collection by customers but at the same time taking into consideration the fact that a considerable amount cannot objectively be collected, therefore it shall remain a debt that actually will not be realized. From what was stated above, ERO’s opinion is that the share of 5% of the bad debt is justifiable and therefore allows the cost of bad debt in the amount of **273, 447€**.

From what was said above, it results that **variable costs** allowed by ERO are determined in a value of **2,185,496 €**.

Fixed costs

- **Cost: Repairs and Maintenance;**

- DH Termokos for the cost of maintenance and repairs has planned an amount of **150,000€**- therefore a significant increase of **90, 350€** or **151%** compared to the realization of this cost during the last period/ season 2015-2016 (59,650€). There is also an increase of 63,864 € compared to the cost realized according to Financial Statements for 2015.
- Evaluation - ERO evaluates that such an increase is not sufficiently justified and does not fully reflect the ordinary expenses for repair and maintenance which are incurred to the enterprise. Considering the increase of heating area, respectively the planned new connections, provision of a quality supply and a stable operation of plants, equipment and network, it can be concluded that an increase of 25% compared to the cost realized in 2015 is justifiable. Consequently, ERO allows the cost for repairs and maintenance in the amount of **107, 670€**.

- **Cost: Materials and Services**

- For this item DH Termokos proposed the amount of 85, 000€, and no further details or respective justification was provided; this amount represents an increase of 19, 986€ or around 30% from the realization in the last period/season 2015-2016 (65, 014€).
- Evaluation –Taking into consideration that this cost is closely related to the repairs and maintenance cost, it is evaluated that it is necessary to apply the same increase as for the repair and maintenance cost- therefore an increase of 25% from the realized value of “Materials and Services” cost. So, ERO allows the cost of “Materials and Services” in the amount of **81, 270€**.



- **Cost of thermal energy purchase from cogeneration of TPP Kosova B- payment component for reserved capacity**
 - The payment component for reserved capacity proposed by DH Termokos is based on the reserved electric capacity: 37, 214 MWh_{EL}/h and the respective charge 19.83 €/MWh_{EL}/h;
 - Evaluation–The proposal of DH Termokos is evaluated as real and well-grounded, but DH Termokos made a calculation error in their proposal. ERO has conducted its calculations from which resulted that the payment component for reserved capacity is **737, 954€**;

- **Administration costs:**
 - DH Termokos proposed administration cost in the amount of 65, 000€ without providing further details or justification. The proposed amount shows an increase of 13, 658€ or around 27% compared to the amount realized in the last period, which also represents a considerable increase compared to the amount declared in the Financial Statements for 2015.
 - Evaluation –Based on the fact that administrative costs are classified as pure fixed costs which do not depend from the produced and supplied amounts of thermal energy, ERO considers that there is no standing justification for any significant increase of this cost. However, in order to allow the improvement of services of the enterprise, especially customer service, ERO decided to allow an small increase compared to the realization in the last period and allow the amount of **55,000€ for this cost**.

- **Staff cost (different from “direct labor”)**
 - DH Termokos has proposed an amount of 700,287€ for the cost of the staff engaged in administration and other supporting services - same as for “personnel cost- direct labour”, this proposal is also increased for 88, 523€ or 14% compared to the realization of this cost in the last period (611, 764€).
 - Evaluation –Same as for personnel cost “direct labor”, the increase proposed by DH Termokos does not contain required details: increase of the number of employees, increase of salaries, average wage etc, which are required in order to justify the proposed increase. Also, there is no significant expansion of operations of DH Termokos which would imply a significant increase of the number of employees. Consequently, ERO evaluates that an increase of 5% for this cost from the cost realized in the last period is reasonable and allows the amount of 642, 000€.

- **Sales and other administrative costs**
 - This cost is proposed by DH Termokos in an extremely high amount of 700, 000, meanwhile they did not provide any details or justification.
 - Evaluation–Following the reporting from the previous years, ERO knew that the highest cost in this category is “costs related to the provision of accounts receivable”- for



illustration, in the last season the sales and other administrative costs were 529, 771€, where the main part belonged to the sub-component “costs related to the provision of accounts receivable” in the amount of 458, 263€. This is why ERO required extra explanations in its written comments and also emphasized the fact that in accordance with provisions of Thermal Energy Pricing Rule, ERO determines/allows a justifiable share of the bad debts share. Given that the cost of bad debt has been categorized under variable costs, ERO assigned the amount of **75,000€** as the amount allowed for sales and other administrative costs which does not include “costs related to the provision of accounts receivable”.

From what was stated above, it results that fixed costs allowed by ERO are determined in the amount of **1,698,894€**.

- Total allowed operational costs

Allowed operational costs consist of the sum of the fixed and variable costs and are calculated according to the formula written below:

$$\text{OC} = \text{Variable costs} + \text{Fixed costs}$$

From the formula it is calculated that:

Allowed operational costs are in the value of 3,884,390 €

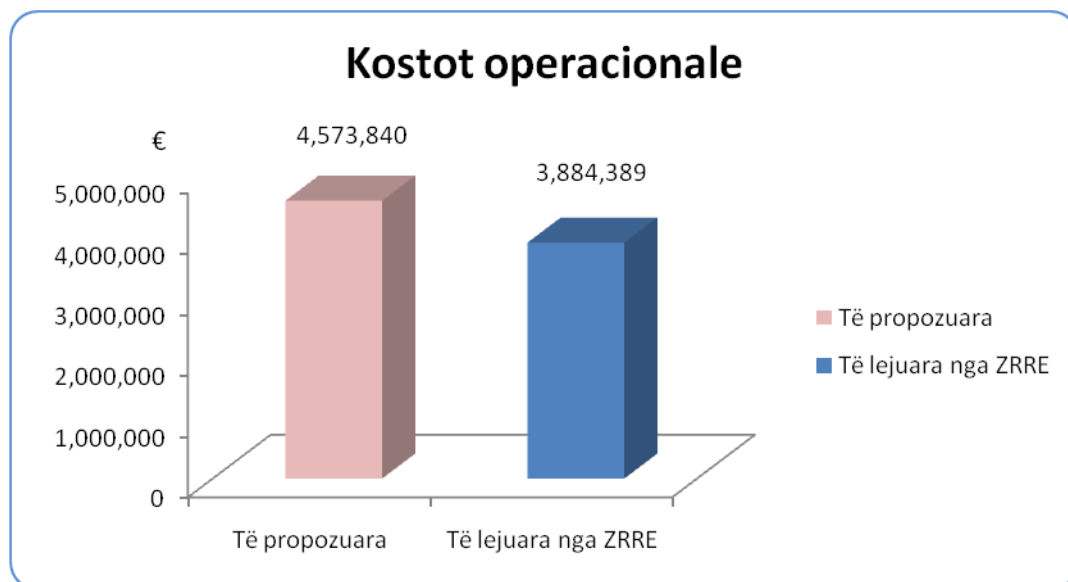


Figure 3: Schematic presentation of proposed operational costs by DH Termokos and allowed by ERO for the heating season 2016/2017



3.2 Determination of the Regulatory Asset Base (RAB)

Determination of RAB is the main factor for calculating the Annual Depreciation and Allowed Return on Assets, which in fact represents the allowed profit from the regulated business activity.

The Regulatory Asset Base- RAB, pursuant to Annex 2 of Thermal Energy Pricing Rule, is calculated according to the following formula:

$$RAB_n^{end} = RAB_n^{start} + INV_n - DIS_{n-1} - DEP_{n-1} + WC_n$$

Given that the tariff review process takes place in this season after a four years period, during which the assets of DH Termokos have undergone significant changes in the structure and monetary value, mainly because of the investments in the cogeneration projects, then it is considered that an opening RAB is determined and consequently the formula is modified as below:

$$RAB = \text{Net Book Value of Existing Assets (after cumulative depreciation)} + INV (\text{new investments}) + WC (\text{working capital}) - DIS (\text{Disposals}).$$

3.2.1 Determination of Existing Assets

Due to the specifics of DH Termokos, mainly conditioned from the implementation of cogeneration project where there has been a significant increase of assets, ERO decided to conduct the evaluation of existing assets separately for the following two sub-components:

- a) **Existing assets without cogeneration project assets**—these assets include assets registered from 1992 (by re-evaluation of the assets of that year) and on, and for which deficient information exist, in the meaning of financing manner, methods of re-evaluation that have been conducted until now etc.
- b) **Existing assets of cogeneration project** —These assets are a result of investments in cogeneration project which was made functional by the end of November 2014 sufficient information exists for them.

a) Existing assets without cogeneration project assets

For evaluation of these assets, the List of Assets submitted by DH Termokos is mainly used as a source of information. As described in the formula above, the current net book value shall be taken for evaluation (year 2016) i.e after cumulative depreciation; calculation as follows:

$$\begin{aligned} \text{Current net book value} &= \text{Opening value} - \text{Cumulative depreciation} = 13,621,957 \text{ €} - 7,601,132 \text{ €} \\ &= \mathbf{6,020,825 \text{ €}} \end{aligned}$$

Based on the categorization according to the list of assets and also referring to the international regulatory practices, Existing assets are categorized with respective monetary values, as follows:



Table 2: Categorization of existing assets without cogeneration project assets with respective values

Categories	Value of assets [€]
Plants, electro-mechanical installations and equipment	434,539
Network – pipes, fittings and integral equipment	5,560,525
IT equipment, Control syst. equipment., and office tiny inventory	25,761
Total existing assets without cogeneration project assets	6,020,825

This categorization serves for calculation of annual depreciation projections, where according to regulatory practices different depreciation rates are determined for each category, namely the lifetime of assets (further details in chapter 3.3: Determination of Annual Depreciation)

Financing manner

As mentioned above, deficient information exists for the financing manner of these assets. However, for assets acquired after 1999 is known that a considerable part of these assets is financed by donations but there are no accurate data on the value of financing of these assets by donations, respectively self-financing.

Therefore, ERO decided to use the share 75% (financing by donations): 25 % (self-financing). According to this share, respective values of the financing of assets based on the total value of 6,020,826€ are calculated as follows:

- (Existing assets without cogeneration project assets)_{DONATION} = 4,515,619 €; and
- (Existing assets without cogeneration project assets)_{SELF-FINANCING} = 1,505,206 €.

b) Existing assets of cogeneration project

For evaluation of cogeneration project assets, ERO has utilized the information from DH Termokos- the list of assets and data from regular monitoring of investments as well as data from German Development Bank (KfW) as a project promoter. With respect to this, it shall be emphasized that the assets of this project are registered as a whole in the list of assets- therefore not separated by respective categories/departments of the enterprise. Whereas, data from KfW and data from regular monitoring contain necessary details which are presented and summarized below.

- Package 1: Group line (transport) of thermal energy 15,239,256 €
 - Construction work for network track;
 - Pipes purchase and supply;
 - Pipe installations and fittings.



- Package 2: Thermal energy exchangers stations 15,613,444 €
 - Thermal energy extraction station in TPP Kosova B;
 - Thermal energy admission station in DH Termokos;
 - Steam extraction installations in units B1 and B2 turbines;
 - Installations of connection with distribution network of DH Termokos.

Referring to the categorization described above, Package 1 is classified under the category: Network- Pipes, fittings and integral equipment, whereas Package 2 under the category: Plants, electro-mechanical installations and equipment- table below.

Table 3: Categorization of cogeneration project assets with respective values

Categories	Assets value [€]
Plants, electro-mechanical installations and equipment	15,613,444
Network - pipes, fittings and integral equipment	15,239,256
Total existing assets of cogeneration project	30,852,700

Current net book value of cogeneration assets

Current net book value is calculated by subtracting the cumulative depreciation from the opening value (at the set-in-operation time). To calculate the cumulative depreciation, for a period from set-in-operation time until now, the average rate of depreciation of 6.67% for cogeneration assets is used, derived from the List of assets.

This calculated rate of 6.67% is used to calculate cumulative depreciation for each category of assets. Consequently, the current net book value of cogeneration assets (after the subtraction of cumulative depreciation) is determined as follows:

- Net book value.: Package1/Network - Pipes, fittings and integral equipment: 14,222,798 €;
- Net book value.: Package 2/ Plants., electro-mechanical ins. and equ.: 14,572,027 €;
- Total current net book value of cogeneration assets: **28,794,825 €**

Financing manner

First, it shall be emphasized that the major part of cogeneration project investments were donations (from German Government, European Commission and central and local institutions); whereas the amount of 5,000,000€ is the loan from KfW with an annual interest rate of 8.79% with maturity of 11 years. Normally, financing through credit is considered as self-financing of the enterprise, and consequently is concluded as follows:

- (Existing assets of cogeneration project)_{DONATION} = 23,794,825 €; and
- (Existing assets of cogeneration project)_{SELF-FINANCING.} = 5,000,000 €.



Summary - Determination of net book value of existing assets

As mentioned at the beginning of this chapter, existing assets are calculated as follows:

- Existing assets without cogeneration project assets (a):	6,020,825 €;
- Existing assets of cogeneration project (b):	28,794,825 €;
- Total existing assets (Net Book Value)	34,815,650 €

Same as above, the total value of existing assets is divided according to the financing manner, as follows:

- (Existing assets) _{DONATION} = 28,310,444 €; dhe
- (Existing assets) _{SELF-FINANCING} = 6,505,206 €.

3.2.2 Determination of allowed new investments

New and planned investments for the period 2016-2017 mainly belong to the rehabilitation of substations network and network expansion; the majority of these projects are planned to be financed by donations whereas a small amount by self-financing- details below:

- Investments in the amount of **4,483,032 €** are under the ongoing project for rehabilitation of the network and substations. Therefore, as stated above, the works under this project are still continuing (are not fully completed) and these are considered “ongoing investments” and are included in new allowed investments.

Financing details:

- Donations from German Government through KfW and Munic. of Prishtina: 4,133,032 €;
- Self-financing by DH Termokos: 350,000 €

- Investments in the total planned amount of **7,093,610 €** are dedicated mainly to the network expansion and a smaller part in the rehabilitation of network and modernization of integral equipment. The planned investment amount is part of a broader project under IPA 2015, which is mainly planned to be financed by donations of European Commission (EC) and German Government through KfW and a small share as a donation of Municipality of Prishtina and self-financing from DH Termokos- these are “commitments” made by local and international institutions.

Financing details:

- Donation from EC: 3,250,000 €;
- Donation from German Government through KfW: 2,978,610 €;
- Donation from Municipality of Prishtina: 625,000 €;
- Self-financing of DH Termokos: 240,000 €.



Summary of allowed new investments

Given that ERO has continually monitored the development of these investment projects and within the cooperation, the parties involved in these projects have been precisely informed for the details of these projects, ERO entirely allows new investments presented by DH Termokos; therefore, the new investments in the total amount of **11,576,642€** are allowed.

Division by Asset Categories

The above mentioned investing projects are mainly dedicated to the distribution network of DH Termokos and substations as an integral part of the grid, therefore the planned amount of new investments (**11, 576, 642**) falls under the category: **Grid- Pipes, fittings and integral parts.**

Division by financing manner

Referring to the financing details described above, the division of allowed new investments by financing manner is as below:

- (Allowed new investments)_{DONATION} = 10,986,642 €; and
- (Allowed new investments)_{SELF-FINANCING.} = 590,000 €.

3.2.3 Determination of Working Capital

According to respective provisions of Thermal Energy Pricing Rule-Annex 2, Working Capital is usually determined to allow circulating monetary means for a period no longer than a month, respectively the amount of average monthly revenues. Consequently, ERO determines the ratio 1/12 in the revenues from the sale of heat realized in season 2015/2016 and allows the working capital in the amount of **455,754€**.

3.2.4 Disposals

Disposal means the assets that the regulated enterprise has removed from usage- the damaged assets that cannot be repaired in order to be reused again, the assets that have been sold/leased(when they were evaluated as unusable)etc; According to the formula given at the beginning of chapter 3.2, the value of disposed assets is subtracted (minused). Given that for this tariff review the net book value of assets was taken according to the list of assets updated at the first half of this year and since no other disposal was reported by DH Termokos following the update of the List of assets, the amount of disposals is 0€.

Summary -Determination of RAB and RAB_f

The following table presents the summarized integral components and respective amounts of Regulatory Asset Base (RAB) and the Regulatory Base of Self-financed Assets (RAB_f)



Table 4: RAB and its components - DH Termokos, heating season 2016/2017

Regulatory Asset Base (RAB) - DH TERMOKOS Heating season 2016-2017		Allowed by ERO [€]
3.2.1	Net book value of fixed assets (after cumulative depreciation)	34,815,650
3.2.2	New investments	11,576,642
3.2.3	Working Capital	455,745
	Regulatory Asset Base (RAB)	46,848,037

Table 5: RAB_f and its components - DH TERMOKOS , heating season 2016/2017

Regulatory Base of Self-financed Assets (RAB _f)- DH TERMOKOS Heating Season 2016-2017		Allowed by ERO [€]
3.2.1	Net book value of fixed assets (after cumulative depreciation) without donations	6,505,206
3.2.2	New investments (without donations)	590,000
3.2.3	Working Capital	455,745
	Regulatory Base of Self-financed Assets (RAB_f)	7,550,951

3.3 Evaluation and Determination of Annual Depreciation

Based on the categorization of assets and respective values provided in table 2- chapter 3.2.1 (a) and table 3 – chapter 3.2.1 (b), table 6 presents a summary of RAB categorization according to asset categories, respective lifespan, namely the depreciation rate for each asset category, as well as the weighted average depreciation rate.

Table 6: Categorization of RAB and weighted average depreciation rate

Categories	Value of assets [€]	Lifespan of Assets (years)	Depreciation rate
Plants , electro-mechanica installations and equipment	15,006,566	25	0.04
Grid – Pipes, fitting and integral equipment	31,359,965	35	0.029
IT equipment, Cont. syst. equipment., and office mini inventory	25,762	5	0.20
Total RAB - Work. Cap. /Weighted average depreciation rate	46,392,293		3.24



As it can be seen from the table above, the weighted average depreciation rate (NZH_{MP}) is calculated 3.24%. Based on the total value (RAB – Working Capital) and weighted average depreciation rate, the annual allowed depreciation is calculated, as follows:

$$\text{Allowed annual depreciation} = \text{Total RAB} * NZH_{MP} = 46,392,293 \text{ €} * 3.24 \% = \mathbf{1,501,414 \text{ €}}$$

3.4 Determination of Allowed Return on RAB (Allowed profit)

As previously mentioned, calculation/determination of Allowed Return is calculated based on the Regulatory Base of Self-financed Assets (RAB_f) and Rate of Return (RoR), therefore, it includes the following two components:

- Determination of Regulatory Base of Self-financed Assets (RAB_f) ; and
- Calculation of allowed Rate of Return (RoR), determined in the WACC value

The first component - RAB_f is calculated in chapter 3.2 – table 5, whereas the calculation of the second component- RoR is determined in the following chapter:

3.4.1 Calculation of Allowed Rate of Return

The objective of a reasonable Rate of Return (RoR) on the Regulatory Asset Base (RAB) is to provide a guarantee for the district heating enterprises for a profit that allows to continue to invest in their assets, in order to be able to replace and expand them.

A reasonable RoR is considered to be the rate of the “ Weighted Average Cost of Capital” (WACC), which is calculated in the components of capital base, taking into account the weights of the sums of these capital components. In other words, WACC is the sum of weighted average cost of equity and cost of debt.

For the cost of equity, ERO applied the internationally recognized methodology called “ Capital Asset Pricing Model” (CAPM). The CAPM expresses the expected equity cost of equity as the risk-free rate (r_f) plus an equity risk premium (ERP). We can define ERP as the difference between the equity market risk- i.e. the the return expected on the well developed market- and the risk-free rate of return , express in the formula below:

$$\text{ERP} = (r_m - r_f)$$

The rate of ERP depends on the risk of investing in the particular country’s market.

Value of pre-tax WACC can be calculated according to the following formula:

$$\text{WACC}_{\text{pre-tax}} = [(D/V) * k_d] + [(E/V) * k_e]$$



Where:

D/V	Debt share of the total capital base (as a percentage)
E/V	Equity share of the total capital base (as a percentage)
V	Total capital base, which is the total of equity and debt
k_d	Cost of debt
k_e	Cost of equity

The cost of Debt (k_d) is a contractual commitment and the interest rate the enterprise will pay in actual loans (credits) :

Cost of equity (k_e) is calculated as follows:

$$k_e = r_f + \beta_e * (r_m - r_f)$$

Ku:

r_f	risk-free rate and it is derived from the estimates on Government bonds return
β_e	“Beta”: risk measure for the respective company
(r_m - r_f)	Equity market risk premium minus risk-free rate of return

“The risk premium” is determined by “beta” and by the expected market risk premium that investors will demand from the market as a whole. The “beta” factor measures the unpredictability of a company’s return relative to the stock market as a whole.

Below we estimate / calculate the cost of debt and the cost of equity for the district heating enterprises in Kosovo in order to come to a pre-tax WACC.

Cost of Debt

For this district heating season and the following ones, ERO decides to have a D/V ratio in the value of 60/100 (60% debt and 40% equity). This 60% ratio should be used in the estimations / calculations of commercial pre-tax WACC for district heating season 2016 – 2017 and for the following seasons, if no significant change is noticed.

Currently, DH Termokos has a loan from KfW with the interest rate of 8.79% (details on chapter 3.2.1). Consequently, the cost of debt shall reflect the actual loan and is fixed to the value of 8.79%, presented with the following formula:

Therefore, cost of debt is:

$$k_d = 8.79 \%$$

Cost of Equity

The cost of equity is expressed with the following formula:

$$k_e = r_f + \beta_e * (r_m - r_f)$$



Where:

$$\text{ERP} = (r_m - r_f)$$

Recent regulatory authority decisions estimate the equity risk premium in a range from 3.5 to 5%. Since DH Termokos is a public enterprise, it is considered that the equity risk is minimal therefore we propose for Kosovo to use **ERP equal to 3.5%**.

The average asset beta for EU electricity networks and integrated utilities is 0.42 compared to 0.54 - 0.63 for stand-alone generation and supply utilities in the EU and USA. Given the small size of the Kosovo district heating industry, it seems reasonable to assume that demand growth – which is the main driver of revenue growth – will be more unpredictable than the GDP growth – which is the main driver of stock market growth – than in developed and larger countries. The addition of a single major customer in the central heating will mean an increase in district heating demand compared to previous demand, while the impact on GDP may be much lower. In order to take into account the potentially more volatile nature of the revenues of district heating enterprises compared to GDP growth, we consider that the cost of equity is above the average set by the EU regulators and we consider that a reasonable “ β_e ” for district heating companies in Kosovo is as below:

$$\beta_e = 1$$

Post-tax cost of equity is as follows:

$$k_{e \text{ post tax}} = 1.5\% + (1 * 3.5\%) = 5.00\%$$

Pre-tax cost of equity is found by multiplying the above figure of the post-tax cost of equity with the tax wedge, as below:

$$\text{Tax wedge} = 1/(1-t)$$

Where:

t Tax rate on corporate profit

The corporate tax (t) in Kosovo is 10% and the tax wedge is:

$$1/(1-0.10) = 1.11$$

Pre-tax cost of equity is:

$$k_{e \text{ pre-tax}} = 5.00\% * 1.11 = 5.55\%$$

As a consequence of the above calculations, it is calculated the pre-tax WACC – rounded to two decimals – as below:



$$\text{WACC}_{\text{pre-tax}} = [8.79\% * 0.6] + [5.55\% * 0.4] = 7.50\%$$

Calculation of Allowed Return on RAB (Allowed Profit) for DH TERMOKOS

Based on the calculated $\text{WACC}_{\text{pre-tax}}$ of 8.42% as mentioned in 3.4.1, we are now able to calculate the Allowed Return or Allowed Profit for DH TERMOKOS, according to the formula below:

$$\text{RET} = \text{RoR} \times \text{RAB}_f$$

Therefore, the Allowed Return on RAB_f is equal to $7,550,952\text{€} * 7.50\% = 566,036\text{€}$.

Table 6: Allowed Return (Allowed Profit) on RAB for DH TERMOKOS for the heating season 2016 – 2017

Allowed Return (Allowed Profit) on RAB for DH NQ TERMOKOS		Allowed by ERO[€]
RABf	Regulatory Asset Base – self-financed	7,550,952
RoR	Rate of Return at WACC level	7.50%
	Allowed Return or Allowed Profit	566,036

3.5 Determination of Network Losses Cost

The allowed cost of network losses is used to cover the enterprise costs caused due to the loss of thermal energy during transmission and distribution. In accordance with Article 1 of Thermal Energy Pricing Rule, this cost is calculated as the quotient of the amount of network losses and generation of thermal energy that enters the network (share of overall network losses), multiplied by generation total variable cost.

From what was said above, ERO has carried out the Thermal Energy Balance for DH Termokos for heating season 2016/2017, through which it determined the amount of network losses of **41, 813 MWh**, being the amount of transmission network losses TPP Kosova B- DH Termokos (4,500 MWh) and the amount of distribution network losses (37,313 MWh). Expressed in percentage, the total share of network losses is 16.84%- the share of transmission network losses 1.84% and share of distribution network losses 15%. Also, from the Thermal Energy Balance is derived the amount of net production (generation) and net purchases of thermal energy – in a total amount of 248,753MWh.

Based on the above mentioned amounts and variable operational cost (2,185,496 €), the **cost of losses** in the amount of **367,361 €** is calculated.



3.6 Adjustment

Adjustment is used to correct eventual changes between the planning for the tariff review for the period (season) 'n' and realizations that have actually occurred during that period (season) and those changes are included (corrected) in the next review- period (season) 'n+1'.

Given that the tariff review process takes place in this season after a four (4) years period, therefore the tariff review of this season serves as a basic review, so the adjustment shall not be applied for this review. However, adjustment shall be determined for the new reviews and shall be an integral component of Allowed Revenues.

3.7 Calculation of Allowed Revenues - Summary

Maximal Allowed Revenues are calculated with the following formula:

$$\text{MAR} = \text{OPM} + \text{DEP} + \text{RTN} + \text{LOS} + \text{ADJ}$$

And it is equal to **6,319,200 €** as presented in detail in table 8.

Table 8: Allowed Revenues for DH Termokos for heating season 2016-2017

Allowed Revenues for DH Termokos for heating season 2016-2017		Allowed by ERO [€]
OC	Allowed Operational Costs	3,884,390
DEP	Annual Depreciation	1,501,414
RTN	Allowed Return on RAB	566,036
LOS	Allowed Cost of Losses	367,360
MAR	Maximum Allowed Revenues	6,319,200

In order to be in compliance with the tariff structure which estimates the division in thermal capacity component (fixed component) and thermal energy amount component (variable component), the split of MAR is made according to the share: fixed part 15% and variable part 85%. Consequently, split of MAR in fixed part and variable part for heating season 2016/2017 is as follows:

Fixed part of Maximum Allowed Revenues (MAR_F) **947,880 €;** and
Variable part of Maximum Allowed Revenues (MAR_v) **5,371,320 €.**