

## ASPECTS OF THE POSSIBILITY OF DETERMINING THE ELECTRICITY CONSUMPTION UNDER FIXED AMOUNT SYSTEM

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**Abstract:** Given the fact that in the distribution process of electricity to final consumers, some situations arise where electricity can not be charged by distribution system operator due to objective reasons and it is required an estimate calculation in a fixed amount. The calculation of the recovery of the amount of electricity can be done according to some procedures developed by the operators of distribution and also approved by the competent authority.

**Key words:** electricity, electric receiver, distribution operator, fixed amount system, competent authority, installed capacity, period of operation

### 1. Introduction

Under the National Energy System, distribution operators monitor the electricity consumption recorded by electric receivers owned by final consumers. Electricity distribution operators manages electricity consumption through measuring groups and provide necessary logistics regarding to the billing of electricity consumed. The paper took as a reference the situations where within the supply of electricity to consumers, it is required the recovery of electricity that could not be measured and recorded by a group of measurement.

The recovery of the electricity, estimated to be consumed and unregistered

by a meter measuring electricity, requires a specific calculation of a fixed amount. The calculation of an amount of electricity in a fixed amount regime shall be in accordance with the provisions of laws and procedures of calculation.

Regulations governing the calculation of electricity in sum electricity system are Rules of electricity supply to consumers and Electricity Law. These laws and regulations have undergone changes over time and referred to the calculation procedure whose validdate was subject to the approval of the competent authority.

The competent authority shall

endorse the procedures for calculation of electricity for some situations (failure groups extent tampering of measurement groups) that may occur in the supply of electricity to final consumers. The electricity that was estimated to be consumed in a fixed amount regime could be determined by electric receivers at the place of consumption and operating time allocated to each type of electric receivers [1-3].

The paper aims to identify the possibility of calculating the amount of electricity in a fixed amount regime, for a hypothetical situation of electrical receivers, allegedly existing in a consumer-phase, powered by a three-phase grid street. The duration of this calculation in a fixed amount regime is a year (6 months of summer and winter six months), and the configuration of electrical receivers (their number and nominal output) is presented in Table 1.

## 2.Determining the amount of electricity in a fixed amount regime

Table 1

No.	Receiver type	Amount [buc]	Pn [kW]
1.	TV device	2	0,100
2.	Vacuum cleaner	1	2,00
3.	Light bulbs in.	20	0,025
4.	Light bulbs in.	20	0,075
5.	Light bulbs ex.	4	0,100
6.	Electric water heater	2	2,00
7.	Bread machine	1	0,60
8.	Microwave	1	2,00
9.	Iron	1	2,00
10.	Coffee maker	1	0,75
11.	Fridge	4	0,36
12.	Electric hood	2	0,40
13.	Washing machine	2	2,50
14.	Electric stove	1	5,5
15.	Sandwich maker	1	0,70
16.	Toaster	1	0,70

According to the nominal power of the receivers placed at the place of consumption we calculated the electricity consumed in a fixed amount regime in a year, using computational relationship [1]:

$$W = P_i * D * k \quad (1)$$

where,

$P_i$ -installed power of the receivers[kW]

$D$ -the time interval for which is determined the electricity consumption [hours]

$k$  – the life of the electrical receivers [hours/month]

Applying relationship one for each handset shown in Table 1, it results the amount of afferent electricity , and by aggregating all quantities of electricity for each receiver we get the total amount of electricity at the place of consumption for a period of one year (Table 2) .

Table 2

Electrical receivers existing at the place of consumption	Amount [buc.]	Power [kW]	Installed power [kW]	Operating period [months]		Operating period hours/month		Amount of energy calculated [kWh]		Total energy calculated [kWh]
				Summer	Winter	Summer	Winter	Summer	Winter	
				TV device	2	0,100	0,200	6	6	
Vacuum cleaner	1	2,00	2,00	6	6	20	20	240	240	480
Light bulbs in.	20	0,025	0,5	6	6	100	180	300	540	840
Light bulbs in.	20	0,075	1,5	6	6	100	180	900	1 620	2 520
Light bulbs ex.	4	0,100	0,40	6	6	180	300	432	720	1 152
Electric water heater	2	2,00	4,00	6	6	100	100	2 400	2 400	4 800
Bread machine	1	0,60	0,60	6	6	20	20	72	72	144
icrowave	1	2,00	2,00	6	6	20	20	240	240	480
Iron	1	2,00	2,00	6	6	10	10	120	120	240
Coffee maker	1	0,75	0,75	6	6	10	10	45	45	90
Fridge	4	0,36	1,44	6	6	200	100	1 728	864	2 592
Electric hood	2	0,40	0,80	6	6	60	60	288	288	576
Washing machine	2	2,50	5,00	6	6	50	50	1 500	1 500	3 000
Electric stove	1	5,5	5,5	6	6	100	100	3 300	3 300	6 60 0
Sandwich maker	1	0,70	0,70	6	6	20	20	84	84	168
Toaster	1	0,70	0,70	6	6	20	20	84	84	168
24 510 [kWh]										

The amount of electricity in the variant of a fixed amount regime is 24 510 kWh / year and it corresponds to an average daily consumption of 67 151 kWh / day.

Depending on the strength resulting from the calculation for the consumption of a fixed regime, it can be determined the cost of resulting electricity can. The cost of electricity resulted from the calculation in a fixed regime is determined based on the prices of electricity and the related additional charges applied by sales operators of electricity to domestic and industrial consumers.

Applying electricity unit prices corresponding to the electricity, for the amount of electricity 24 510 kWh, it results the values presented of table no.3.

Starting from the installed capacity of all electrical receivers (28.09 kWh) and without allocating an hourly operating duration of each type of electric receiver for a period of one year, it will result an amount of electricity of 24 6068.4 kWh / year, which corresponds to a daily intake of 674.16 kWh / day.

Table no.3

No.	The type of the fee applied on the energy market	Unit	Amount of electricity	Unit price (without TVA)	Value (without TVA)	Value ( TVA)	Total value [lei]
1.	Active electric energy	kWh	14 706	0,4956	7 288,294	1 749,19	9 037,484
2.	CPC Captives homes	kWh	9 804	0,4491	4 402,976	1 056,714	5 459,69
3.	Co generation fee	kWh	24 510	0,0181	443,631	106,471	550,102
4.	Green certificates	MW	24, 51	35,9172	880,33	211,28	1 091,61
5.	Non commercial duty	MW	24, 51	4,74	116,177	27,88	143,997
<b>Total</b>							<b>16 282,883 lei</b>

As it can be seen from Table 2, for a 24% VAT, the amount of electricity 24 510 kWh is equivalent to 16 282 883 lei.

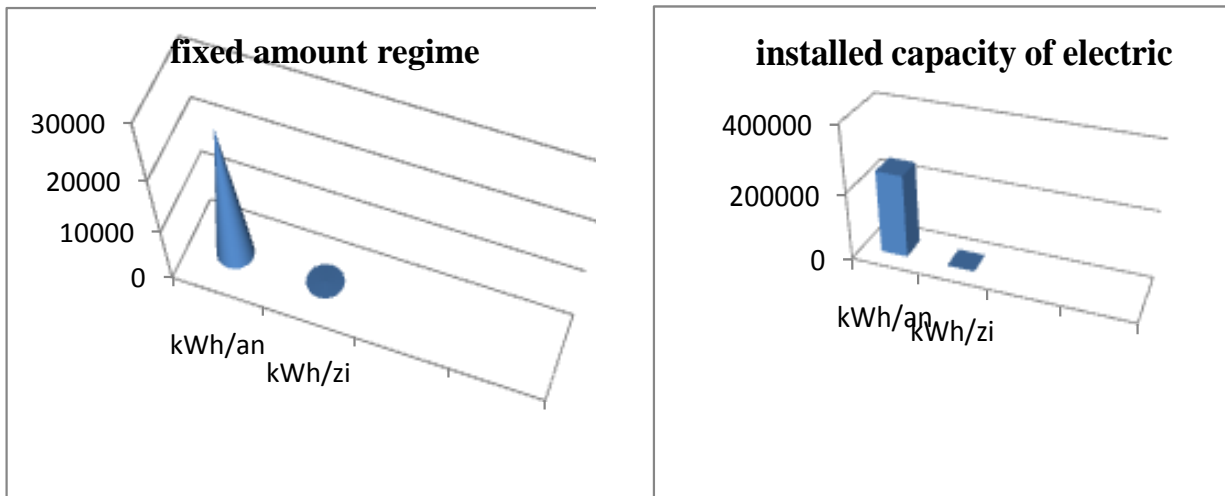


Figure 1. Graphs of variation for the two variants of calculation: the assigning of a fixed regime allocating a duration of use for each category of electrical receivers; depending on the installed capacity of electric receivers and without reference to duration of use for each category of electrical receivers

### 3. Conclusions

By analyzing the results the following conclusions can be drawn:

1. The amount of electricity calculated in the fixed amount system depending on the duration of use allocated to each class of receivers is about 10 times less than the amount of electricity calculated according to the total installed capacity and without reference to the duration of use for each category the electrical receivers.
2. The amount of electricity is lower in the case of calculating in a fixed amount system because, each electric receiver is assigned a specific monthly duration and not a

continuous running operation in the time period considered (one year).

3. These findings are in agreement with that all electrical receivers have assigned a coefficient of demand (below par) of which value has been established in the literature for each category of handsets.

### 4. Bibliography

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