

Estimation method for billing

a. How bill estimations are determined



In cases when the network operator fails to disclose metering data, The supplier, issues an invoice with reference value. For the regulation of billing modalities in such circumstances, ERE has approved the «Methodology of reference values in case of measurement data is temporarily available and unavailable».

For electricity supply contracts that do not have a measurement billing of consumption, on previous years, billing with reference values shall be made based on the average measured consumption, registered during the last year in the billing system.

Estimation method for billing

b. What regulation is applied in this regard.



The methodology provides that: *In cases where the Supplier finds that the metering data are temporarily unavailable or unavailable for a longer period than one month (meter is damaged, the meter is out of technical condition or there is no access to data metering), electricity billing will be done at reference value.- This value will be calculated based on the arithmetic average of metered invoices during the previous 3 years, of the same month as the billed one. Period of billing according to these reference values **may not last more than three months.***

For invoices with reference value due to lack of access to data of the measurement, at the time of reading the measurement data, the Supplier shall adjust to the next electricity bill, the difference between the amount of energy, billed with reference value and the amount of energy consumed, referring to measurement data.

Estimation method for billing

a. How bill estimations are determined

- Billing is quarterly for low voltage and low pressure customers, and monthly for medium and high voltage/pressure customers.
- Accordance with the regulations, non-real reading of the energy meter is due to :
 1. No access to the meter ;
 2. Defective meter.
- The estimate bill is established, by supplier, according to the following terms and conditions:
 - a) For LV/LP customers:** the estimation is done automatically by the customer management system, based on a consumption history (not less than 11 consecutive months).
 - b) For MV/MP & HV/HP,** the regulations cover two cases:
 - Customer who has accumulated at least (12) consecutive months of consumption:
Consumption of the expired month = consumption of the same month of the previous year.
 - Customer who hasn't accumulated (12) consecutive months of consumption :
Consumption of the month due = Power provided x K x 720 hours.

Estimation method for billing

b. What regulation is applied in this regard.

- The determination of the K coefficient, is based on the analysis of the consumption history, stratified according to the economic activity code, the level of power provided /flow provided and tariff code.

Direction/ guidance issued by the regulator

- In accordance with current regulations (Executive decree n°10-95):
 - Billing estimation may not exceed two (2) consecutive billings.
 - For all other unresolved situations, and beyond these two billing cycles, a file will be submitted to the CREG for approval of the measures and solutions proposed by the distributor and the customer
- During 2021, CREG submitted to the Minister of Energy and Mines, a draft amendment of the Executive Decree 10-95 (setting the technical rules for the rights of connection to networks and other actions necessary to meet the demands of supply of customers in electricity and gas). This project provides that the distributor must submit to the CREG for approval, a procedure that describes the methodology for estimating the quantities consumed during the period when the real index is unavailable.

Estimation method for billing

a. How bill estimations are determined (Method of calculating consumed electricity)



The procedure for calculating the amount of consumed electricity is approved by the Rules of supply and use of electricity (hereinafter the Rules).

The amount of consumed electricity is determined by the difference between the readings of the consumer's commercial meter in the billing month or by multiplying that difference by the meter ratio (multiplication of the transformers of the current-voltage measuring transformers).

If the commercial meter directly records the amount of consumed electricity during the billing month, that amount of electricity is accepted.

The value of the electricity consumed by the consumer during the billing month is determined by multiplying of the tariff set by the Commission and the amount of consumed electricity .

In case of violation of the commercial metering device, the supplier recalculates the amount and value of consumed electricity using the formulas approved by the Rules (here I will conditionally use formula 1. 2...)

In case, when the violation of commercial metering device is not due to failure of voltage or current measuring transformers:

1. If there is an control metering device, the recalculation of the amount of consumed electricity is performed according to the indication of the control metering device for the period from the date of disassembly of the commercial metering device to the day of registration of the penultimate indication of the commercial metering device. The amount of recalculated electricity is determined by **the formula1** approved by the Rules.
2. If there is no control metering device, but the amount of consumed electricity is recorded by an electronic meter, then the amount of recalculated electricity is determined using the data extracted from the electronic meter memory. The amount of recalculated electricity is determined by the **formula2** approved by the Rules.

Estimation method for billing

a. How bill estimations are determined



3. If there is no control metering device and as a result of checking the commercial metering device it is not possible to output the electronic metering device memory data, but the commercial metering device is included in the automated metering and control system and the consumer is given access to the automated system memory for monitoring, then the recalculation is performed by **formula 3**. The amount of recalculated electricity is added in case of a positive value, and in case of a negative value is subtracted from the amount of electricity registered by the meter. *If the period of violation of the commercial meter exceeds 20 days, the recalculation is carried out for 20 days from the day of detection of the violation.*

4. If there is no control metering device, as a result of checking the commercial metering device it is not possible to output the electronic metering device memory data, the commercial metering device is not included in the automated electricity metering and control system, but according to the expert opinion of the Metrological Authority, it was possible to determine the percentage of error of the commercial metering device, then the recalculation is performed by **the formulas 4.5** approved by the Rules.

5. If according to the expert opinion of the Metrological Authority, it was not possible to determine the percentage of error of the commercial metering device, then the recalculation is performed by the **another formula 6** approved by the Rules.

In case of violation of the commercial metering device, when the supplier has reasonable arguments that the breach is due to the consumer's actions (including cases when the seal of the commercial metering device is torn, forged or damaged), the supplier has the right to demand from the consumer to pay a penalty in the amount of five times the recalculated value of electricity.

In case of violation of the commercial metering device, the value of recalculated electricity is determined by multiplying the amount of recalculated electricity and the corresponding tariff for the month of detection of the violation of the commercial metering device.

Estimation method for billing

b. What regulation is applied in this regard.



- The procedure for calculating the amount and value of consumed electricity is approved by the Rules of supply and use of electricity approved by the Public Services Regulatory Commission of the Republic of Armenia.
- In some cases, in order to balance the interests of the consumer and supplier, the Commission may make individual decisions about recalculation based on the specifics of consumption, based on the application of the supplier or the consumer (with attached justifications).

Estimation method for billing



a. How bill estimations are determined

The supplier shall ensure that the end customer is billed for the consumed energy and realized peak load in accordance with the readings obtained from the DSO and in line with the contractual tariff rates for each billing period.

The DSO shall perform proper and regular reading of meters on all points of power supply/take-on. As a rule, end customers' meters shall be read monthly, pursuant to the timeframe defined in the contract on the usage of the distribution network. The DSO shall submit to the supplier the data read in the manner and within deadlines stipulated in the contract on mutual relations. When the DSO, independently or upon reporting from the end customer, except in the case of unauthorised consumption, determines that the metering device has not registered consumption, the calculation of unregistered consumption will be made on the basis of readings of the same period of the previous year or readings of the previous month for end customers connected in the current year. The period for which unregistered consumption is determined cannot be longer than three months.

Estimation method for billing

b. What regulation is applied in this regard.



In accordance with its competencies under the law, FERK adopted the General Conditions for Electricity Supply. General Conditions specify a number of obligations and rights for DSOs and suppliers, including provisions linked to reading of meters and billing. The previous slide cites the provisions of the General Terms and Conditions.

Estimation method for billing

a. How bill estimations are determined



When Balance is Achieved

"Electricity Distribution Network Rules" sets various cases if the supplier failed to obtain the actual read of the meter. Such as:

Article 14

If the electricity meter is installed in a consumer's protected area (including a residential apartment) and the meter cannot be read through the fault of the consumer, also when it's impossible to read meter display because of difficult climatic conditions, in this case, the system operator has the right to charge the customer payment for a period of one month, which is calculated from the average monthly consumption of the amount of electricity consumed by the customer (taking into account seasonality). The difference between actual and billed consumption must be corrected (recalculated) according to the actual display of the customer's electricity meter.

Article 16

In the case of force majeure, the system operator contacts to consumers whose meters are installed in their protected area (including a dwelling) by a text messaging and an email and asks to share photo of their meter display. If a consumer doesn't cooperate, the system operator is authorized to calculate the amount of electricity, according to the amount of electricity consumed in the same month of the previous year. (If less than one year has passed since the start of the electricity supply to the customer, the bill is made on the average monthly amount of electricity consumed. The difference between actual and billed consumption must be corrected (recalculated) as soon as the consumer meter display system is taken over by the operator.

Article 32

If the metered electricity consumption (via electricity meter) has not been read for a certain period of time and / or it is impossible to determine the electricity use. During this period (in case of damage to the electricity meter) the quantity should be determined by the most accurate method (including network metering system and other technical characteristics); And, if it is impossible to calculate such a methodology, the customer will be charged for the period of unrecorded consumption of electricity, which is calculated from the average monthly consumption of the amount of electricity consumed during the same three calendar months. This method should be used only once and should not exceed three calendar months.

In case of removal of electricity meter and/or detection of damage, before solving the problem, only with the written agreement by consumer, The customer will be charged a fee calculated from the average amount of electricity consumed by him/her. This method should be used only once and should not exceed one calendar month.

Estimation method for billing

b. What regulation is applied in this regard.



When Balance is Achieved

“Electricity Distribution Network Rules” is a regulatory framework document. It regulates the relationship between the distribution of electricity, the operator of the electricity distribution system, the supplier and the final consumer. As well as the relationship between the system operator and the transmission system operator.

Estimation method for billing

a. How bill estimations are determined

Estimated bills are based on load profiles

- profile: an electricity demand index prepared by statistical analysis on the basis of normalized or benchmarked 1000 kWh annual consumption;
- all DSOs create the profiles – based on a uniform method – on the consumption behaviour of different groups of consumers;
- the load profiles differentiates between 3 characteristically different days (in regard of consumer behaviour): workdays, Saturdays and Sundays/holidays;

DSOs create an annual plan categorizing the days of the given year (load profile calendar)

- each daily load curve shall be determined so that the total area under the curve corresponds to a consumption of 1000 kWh / year;
- in case of consumers with different annual consumption, the load profile must be updated by the consumption factor. **Thus the estimated consumption equals load profile X consumption factor;**
- In order to use load profiles DSOs have to determine the Indicative Annual Consumption (IAC):
 - by default, the IAC is determined for the next billing period based on the measured historical consumption;
 - in absence of data for historical consumption IAC is based on agreement of the DSO and the consumer
 - the DSOs determine the IAC for the next year by calculating the consumption for 365 days between 2 annual readings.

Estimation method for billing

b. What regulation is applied in this regard

Usage of load profiles is allowed in case of:

- household consumers;
- low voltage consumers whose connection capacity does not exceed 3x80A;
- public lighting providers;

Billing

- in case of consumers with load profiles the difference between the estimated and the actual consumption must be settled at least once in a year, but on request in every 3 months;
- consumers receive partial bills for each month with an estimated consumption, and a settlement bill with the actual consumption at the end of the settlement period (once a year or in every 3 months)
- the partial bill based on estimation can only then be applied if the DSO did not read the meter or the consumer did not send the metering data to the DSO

Regulation (3 levels)

- law (Act LXXXVI of 2007 on Electricity): general rules;
- decree (Governmental decree No 273/2007 on the implementation of the Act on Electricity): detailed rules of some of the provisions of the law;
- commercial codes of the DSOs (approved by the NRA): detailed and technical provisions

Estimation method for billing

a. How bill estimations are determined (1)

The ground for settling payments for **electricity** and **natural gas** between the user and the trader is the information provided by the system operator regarding consumption of electricity or natural gas, which can be determined in three ways:

- 1) using smart meters,
- 2) on the basis of historic average consumption or
- 3) according to readings of the meter declared by the user.

The consumption of electricity or natural gas of the user is corrected according to the reading of the meter declared by the user at the end of the settlement period in the second case or according to the reading of the meter recorded during control inspections in the second and third cases.

Estimation method for billing

a. How bill estimations are determined (2)

Electricity

If the system user fails to communicate readings of electricity meters, the system operator calculates the quantity of the consumed electricity taking into account the average amount of electricity and services in the previous 12 month. If a wrong operation or error in the calculations of the electricity meter is detected, the amount of the supplied electricity and services shall be updated for the entire period from the moment when the electricity meter has commenced to operate incorrectly or, if this moment cannot be determined, for the last settlement period. The recalculation shall be performed, taking into account the average amount of electricity and services in the previous settlement period or the average amount of electricity and services after renewal of accounting.

Natural gas

If the system user fails to communicate readings of gas meters, the system operator calculates the quantity of the consumed gas according to the consumption standard profile (developed by the system operator on the basis of historical data of gas consumption). If a gas meter is damaged or disconnected, the quantity of the gas consumed per each gas day is determined according to the average load of a gas appliance installation under similar circumstances in a similar time period or calculated according to the system user's maximum permitted consumption of natural gas per hour.

Estimation method for billing

b. What regulation is applied in this regard.

Regulations issued by the Cabinet of Ministers:

- Regulations Regarding the Trade and Use of Electricity <https://likumi.lv/ta/id/263945-elektroenergijas-tirdzniecibas-un-lietosanas-noteikumi>
- Regulations Regarding the Trade and Use of Natural Gas <https://likumi.lv/ta/id/289031-dabasgazes-tirdzniecibas-un-lietosanas-noteikumi>

The Public Utilities Commission is not authorized to issue any regulations/guidances to standardize bill estimation process (in case the supplier has failed to obtain actual meter readings).

Estimation method for billing

a. How bill estimations are determined

Supplier does not have any duties, related with obtaining actual read of the meter.

Electricity and gas consumers have an obligation to declare the readings of electricity and gas meters to the supplier and (or) distribution system operator by the end of each month (except if have smart meters). If the consumer fails to fulfill this obligation, the meter readings shall be calculated by the energy distribution operator on the basis of the average consumption of the consumer's facility. (mainly on the basis of the average consumer's consumption during the last 12 calendar months).

Distribution system operator is responsible for the installation and maintenance of meters. The operator, as the owner of the meters, has the right to check the meter readings at any time at its discretion (if there are suspicions regarding meter readings declared by the consumer, consumer hasn't declared the readings for a long time, regarding meter failure and etc.). In this case, the consumer is billed according to the actual readings, recorded during the inspection.

Estimation method for billing

b. What regulation is applied in this regard.

All rules, mentioned in previous slide and other related rules are reglamented in:

- *Rules for the supply and use of electricity, approved by order of the Ministry of Energy;*
- *Description of standard terms and conditions for electricity purchase and sale and transmission service contracts concluded by household customers with suppliers, approved by order of the Ministry of Energy;*
- *Rules for the supply and consumption of natural gas, approved by order of the Ministry of Energy;*
- *Description of standard terms and conditions for contracts with household customers for the supply, transmission and distribution of natural gas, approved by order of the Ministry of Energy.*

Estimation method for billing

a. How bill estimations are determined

According to the legislation of the Republic of Moldova, in case if DSO does not have access for reading the meter, the supplier issues a bill in the base of the estimative consumption, determined by the DSO, for a period which does not exceed 3 months.

The legislation does not provide the mechanism of determination of consumption, but from the practice, the DSO estimates the bill taking into account the consumption from the last year in a similar period.

At the same time, the supplier and the DSO are obliged to contact the consumer for obtaining the access to the meter. In case if the consumer is not paying the bill and did not react to the request, the supplier will demand the DSO to disconnect the consumer.

Estimation method for billing

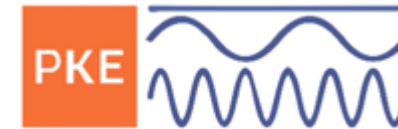
b. What regulation is applied in this regard.

In this regard, is applicable the point 81 from the Regulation on the supply of natural gas, approved by ANRE.

Other regulation are not provided by the legislation.

Estimation method for billing

- a. **How bill estimations are determined**
- b. **What regulation is applied in this regard.**



- According to the Electricity Supply Rules, the DSO is obliged to read the meters on a yearly basis, while the invoices for consumed electricity are issued monthly.
- Meter reading in practice is done monthly (billing period), although there might be exemptions. Article 31 of the Electricity Supply Rules sets the procedure in cases when the meters are not read in the billing period.
- If the DSO did not read the meter within the stipulated deadline, the volume of the consumed electricity in the current billing period will be added to the volume of the consumed electricity in the following billing period. In this case the DSO has the right to estimate the consumption and provide such data to the supplier. The exact consumption and the appropriate settlement in these cases will be done when the conditions for meters reading are established.
- Additionally, for the billing periods in which the DSO didn't provide exact meter reading data, the electricity supplier can accept self-reading meter data provided by the consumer.
- In practice, estimated consumption is calculated as the average of electricity consumed in the last 12 months, although this is not official method set by the ERC.

Estimation method for billing

a. How bill estimations are determined



In case the Supplier failed to record the reading for a specific month due to any reason/ force majeure then an estimated bill based on the consumption of the last year's corresponding month will be issued on provisional basis, and upon taking accurate reading of next month; the said reading will be divided into two months and a final bill will be generated after adjustment of the bill which was issued provisionally.

Estimation method for billing

b. What regulation is applied in this regard.



In case the Supplier failed to obtain reading for a specific month due to meter being faulty, then the Consumer will be charged based on the consumption of the corresponding month of the last year or last 11 month's average, whichever is higher.

However, data of the digital meters can be retrieved and upon receipt of actual data, the consumer's bill can be revised accordingly.

Estimation method for billing

a. How bill estimations are determined

1. The service providers are not allowed to estimate the consumption.
2. If the service provider failed to issue the bill for certain month, it can issue the bill in the next month with actual meter reading and giving the consumer the right to pay the bill in installments.

Estimation method for billing

a. How bill estimations are determined

The service providers have the right to do correction only in two cases:

1- In case of an inaccurate meter (after conducting meter accuracy test) and the accuracy test measurement exceed the limit specified in Electricity Service Guide (accuracy percentage). The service provider must do the following:

- Promptly repair and calibrate the meter or replace the meter with a typical one.
- Calculate the actual consumption according to specified equation in Electricity Service Guide.

2- In case of discovering that the value of the meter multiplier of the billing system data mismatches the actual one on the site, the service provider must do the following:

- Inspect the meter promptly and ensure that the value of the actual meter multiplier matches the billing system data.
- Calculate the consumer's bills based on the actual meter multiplier.

Estimation method for billing

b. What regulation is applied in this regard.

Electricity Service Guide approved by WERA is applied in these cases as following:

1. Item (36) Consumption Calculation and Bills Issue.
2. Item (40) Dealing with Errors in Calculation of Consumption and Billing
 - Item (40.1): Meter Accuracy
 - Item (40.2): Meter Multiplier Error
 - Item (40.3): Meter Damage and Wrong Wiring

Estimation method for billing



a. How bill estimations are determined

In Natural Gas:

For household consumers, the average readings for the same quarters of the last two years is taken. If there is not any data available, consumption data for other customers with similar consumption tendencies is used.

For commercial consumers, the monthly usage amounts corresponding to the contracts are taken into account for meter failures. If monthly usage amounts are not specified in contracts, reports for meter calibration and consumption amounts of burning devices are used.

Estimation method for billing

a. How bill estimations are determined

E_{T_n} = Estimated Consumption
 GD_n = Change in Installed Power(if there is)
 M_t = Seasonal Impact Coefficient
 E_{O_n} = Index of Last Current Reading
 $E_{O_{n-1}}$ = Index of Previous Actual Reading
 t_{O_n} = Last Current Actual Reading Day
 $t_{O_{n-1}}$ = Previous Actual Reading Day

In Electricity: The methodology is below

$$E_{T_n} = GD_n * M_t * \frac{E_{O_n} - E_{O_{n-1}}}{t_{O_n} - t_{O_{n-1}}} * (t_{T_n} - t_{O_{n-1}}) + E_{O_{n-1}}$$

E_{T_n} = Estimated Consumption

GD_n = Change in Installed Power(if there is)

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$E_{O_{n-1}}$ = Index of Previous Actual Reading

t_{O_n} = Last Current Actual Reading Day

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Estimation method for billing

b. What regulation is applied in this regard.



In natural gas, there is not any directive or guidance issue for bill estimation process defined by EMRA.

In electricity, there is a directive methodology for estimation of customer's bill. But it can use only switching process not in normal periods. If there is no actual read in that month, the supplier must delay to billing. (Just a short reminder: In Turkey, meter readings are done in the range of 25-35 days in electricity)