



Georgian National Energy and Water Supply  
Regulatory Commission

# **Monitoring Energy Market Participants and the Reliability and Quality of Energy Supply and Commercial Services**

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# Main Objectives

- Monitoring the economic effectiveness of companies (including the licensed companies) in the power sector
- Monitoring the condition of the equipment and its adherence to existing standards
- Monitoring the quality of service (reliability of energy supply to customers and quality of commercial services)
- Monitoring the power market
- Monitoring the environmental impact of companies (including the licensed companies)

# Applicable Legislation

## Georgian Laws:

- On Licenses and Permits
- On Electricity and Natural Gas

## Applicable Regulations:

- GNERC Decree 23 of September 18, 2008, entitled  
“Regulation in the Energy, Natural Gas, and Water Supply Sectors  
and Licensing Procedures”
  1. Regulating activities in the energy, natural gas, and water  
supply sectors
  2. Regulation of licensing

- GNERC Decree 20 of September 18, 2008:

“Approving the regulation of transmission and consumption of energy (capacity)”

- GNERC Decree of April 1, 2009:

“Monitoring the quality of commercial services by licensed distribution companies”

- GNERC Decree 9 of June 4, 2009:

“Monitoring the reliability standards of licensed power distribution companies serving end users”

# **Regulating Different Types of Operations and Reporting Requirements in the Energy Sector**

- Submitting reports on compliance with the requirements for service provision
- Selective auditing
- From April 1 to May 1, all energy sector companies submit their annual reports on compliance with the requirements for the provision of services. The reports conform to the GNERC's approved format. Also, within a month of the end of each quarter, quarterly reports are due.
- Licensed distribution companies submit to GNERC a previous year report on power supply as well as quarterly reports on customer services

# **Energy Sector Operations Terms and Requirements**

- Company's equipment must comply with applicable technical standards
- Company must report the volumes of transmitted energy
- Company must comply with GNERC's requirements
- Company must register and submit reports to GNERC for each of its lines of business separately
- Additional reports may be submitted based on the specific line of business

# Annual Reports

Must include:

- Technical and financial report for the previous year
- Next year working plan
- Plan for improving quality of services
- Plan for preventing accidents
- Proposal to reduce company's impact on environment (if requested)
- Signed agreements (if requested)
- Other information at GNERC's discretion

Both financial and technical reports must be verified by professionals with appropriate competence and authority

## **Selective Auditing Procedures**

- A company can be audited at GNERC's discretion
- GNERC can conduct an audit with the help of a competent employee in charge
- GNERC determines:
  - purpose and date of auditing
  - auditors
  - a person in charge for recording administrative violations



## **In monitoring the operations of licensed companies GNERC uses:**

- Analysis of the annual reports submitted by the licensed companies
- Auditing the licensed companies on the basis of complaints received from different sources in relation to the violation of licensing terms
- Auditing company's records on site by GNERC's experts

## **Based on the analysis of the reports received from the licensees, the following actions might be taken:**

- A recommendation letter, which specifies the deadline for the company to resolve identified violations.
- Penalties for failure to implement regulator's decisions.
- If a licensee does not implement GNERC's recommendations within the required timeframe, a triple fine is applied. The licensee is then given additional time to resolve the problem. If the licensee fails to resolve the problem before the extended deadline, a triple fine is applied.
- If the above mentioned requirements are not met, GNERC may decide to revoke the license. However, the company may still continue its operations at GNERC's discretion.
- Based on the situation, a manager might be appointed by GNERC to supervise licensed activities.

# **Monitoring the Quality of Customer Services by a Licensed Distribution Company**

- Monitoring the indicators for the reliability of energy supply
- Monitoring the indicators for the quality of commercial services
- Monitoring power quality

# **Monitoring the Quality of Customer Services**

## **Structure of Monitoring**

- Collecting information on the quality of customer services by a licensed distribution company
- Submitting the information on the quality of services to GNERC by the licensed company
- Information analysis, verification, and preparation of recommendations on what the company has to do to improve its service
- Issuing recommendations by GNERC

## **Recording Instances of Interrupted Power Supply**

- A licensed company must record all instances of power supply interruption, both manually and electronically. Such records must include:
  - Information related to all prolonged interruptions ( $> 3$  wt)
  - Number of transitory ( $\leq 3$  wt) interruptions

(Information types are included in GNERC's decree)

- Records of interruptions are stored for no less than three years in order for the recorded data to be reviewed later if needed. These records must be accesible for people in charge

# Indices of Prolonged Power Transmission Interruptions

- SAIDI – index of average outage duration – average outage duration per customer in the reporting period (quarterly, annually)
- SAIFI – index of average frequency of power outages – an average number of power outages per customer in the reporting period (quarterly, annually)
- ENS – amount of undelivered power due to interruption in the reporting period (quarterly, annually)

## **Information to be Presented to GNERC by a Licensee**

- Information about planned and unplanned prolonged interruptions must include:
  - a) Report on interrupted power supply to DZ customers in each region (SAIDI, SAIFI)
  - b) Report on interrupted power supply to MZ and SZ customers in each region (SAIDI, SAIFI)
  - g) Report on causes of undelivered power supply to MZ, SZ, and DZ customers
- Number of temporary power supply interruptions
- A licensee is responsible for the accuracy of data on uninterrupted and undelivered power supply. Also, a licensee must provide guarantees for the availability of reviewed information in order to determine reliability indicator

## **Reviewing Uninterrupted Power Transmission Indicators**

- If during selective analysis of the data submitted by a licensee GNERC discovers that the data was not recorded according to the requirements, GNERC determines reliability indicators based on the information collected during review.

The following indices are used:

- a) Completeness index \_ AI ( $AI \geq 90\%$ )
- b) Accuracy index \_ PI ( $\pm 5\%$ - )
- c) Correctness index \_ CI ( $CI \geq 95\%$ )



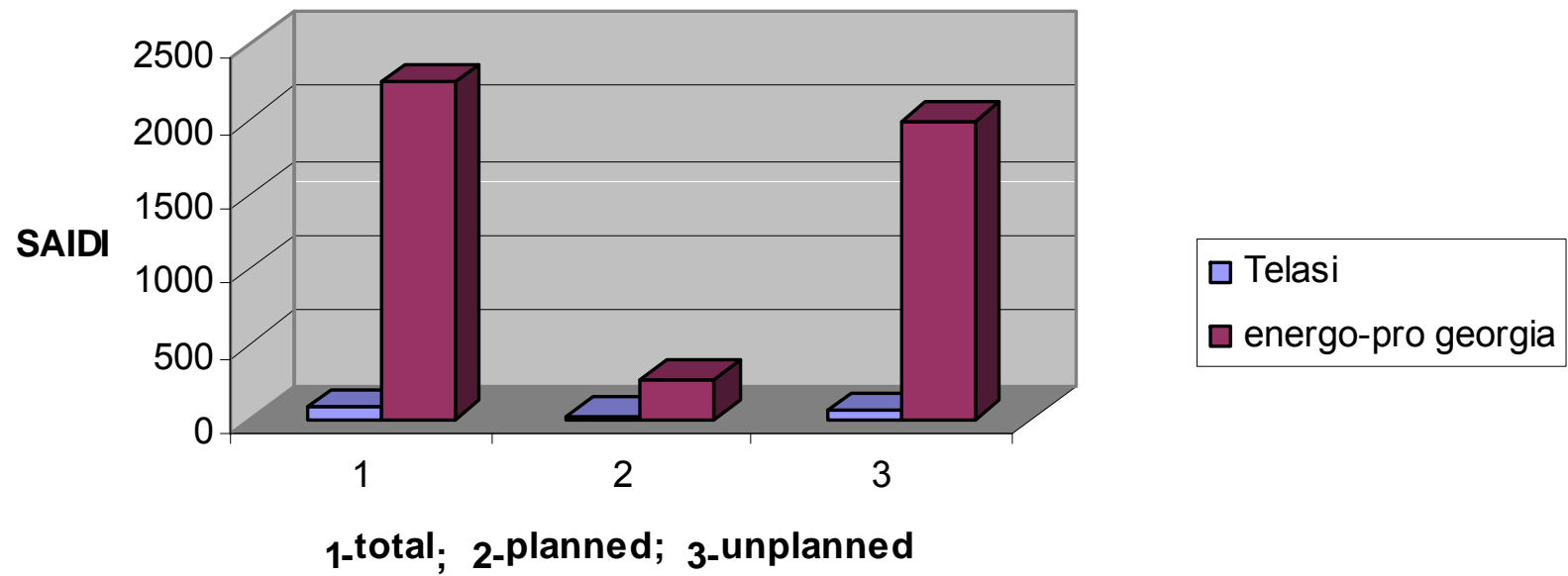
## **GENERC's Regulation of Power Transmission Reliability Indicators**

- GNERC monitors the accuracy of data on power transmission interruptions according to the following rules:
  - a) Completeness of data: all instances of interruption must be recorded;
  - b) Accuracy of calculations: statistical data (errors) should be calculated based on SAIDI and SAIFI
  - c) Correct determination of causes for interruption: reported reason and place (voltage level) of interruptions must be verified

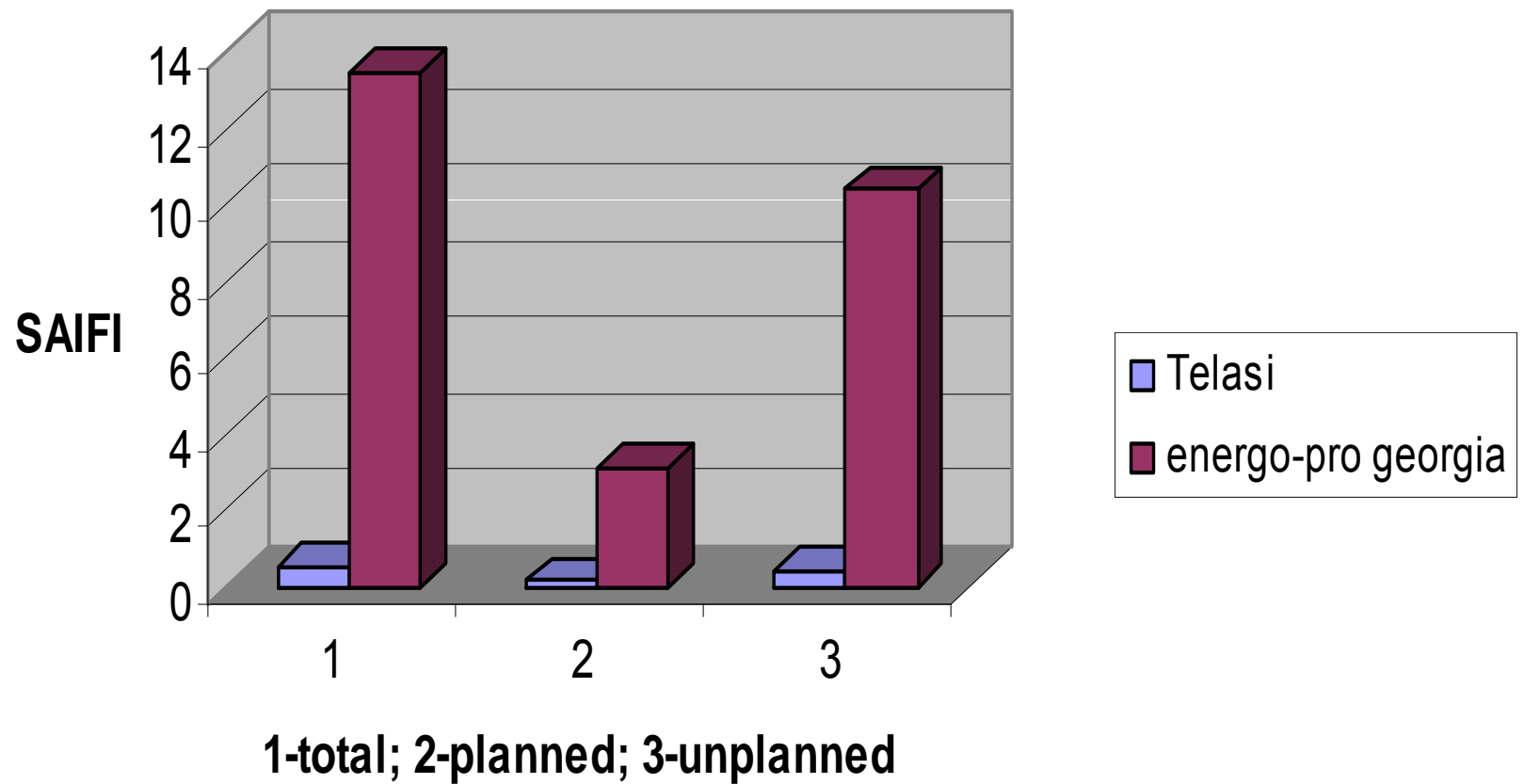
## Basic Data of Power Distribution Companies

Data	Energo-Pro Georgia	Telasi	Kakheti Energy Distribution
Service area (sq. km)	48,790	400	11 040
Number of customers	871,774	437,114	125,574
Residential	841,000 (96%)	415,195 (95%)	117,000 (93%)
Commercial	30,774 (4%)	21,919 (5%)	8,574 (7%)
Total length of network (km)	71,832	3,633	9,122
Number of transformers	11,434	1,638	884
Annual volume of distributed energy (bln kWh)	2.684	2.03	0.25

## SAIDI - TELASI - ENERGO-PRO



## SAIFI - Telasi - energo-pro



## **Criteria and Requirements for the Quality of Commercial Services**

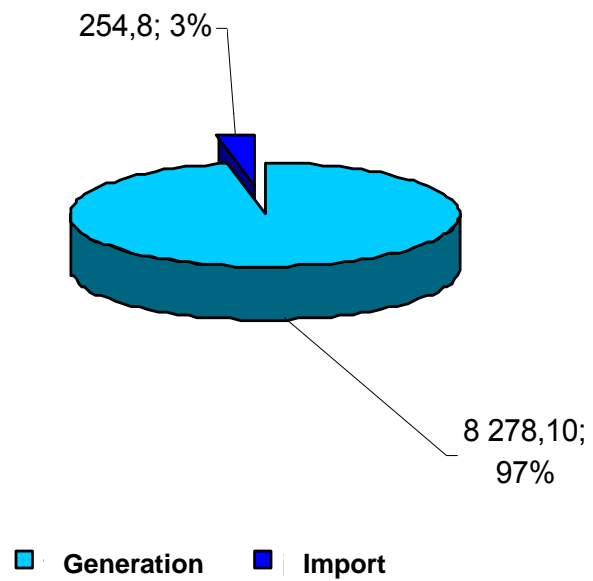
- Responding to customer complaints no later than within two weeks
- Informing customers about the date and duration of planned interrupted power supply at least three working days prior to the interruption
- Regular repairs for unplanned power supply interruptions must be completed within 6 hours to resume power services to customers
- Complex repairs must be completed in no more than two working days. If additional documentation is required for restoring services (e.g., re-connecting a customer to the network), repairs must be completed, depending on the availability of documentation, no later than within 5 working days
- Resuming power delivery to the customers whose services were terminated due to non-payment no later than within 6 hours of receiving or scheduling a payment from a customer

- Investigating a customer's complaint within 5 working days from receipt of the complaint
- Investigating voltage failures (flickering or deviating from standards) reported by customers; visiting customer site; establishing causes of failure and determining required repairs within 5 working days
- Examining customer metering equipment, revolving frequency etc. in a customer's complaint within 2 working days from receipt of the complaint
- Operators must respond to a call at the call centers within 2 seconds

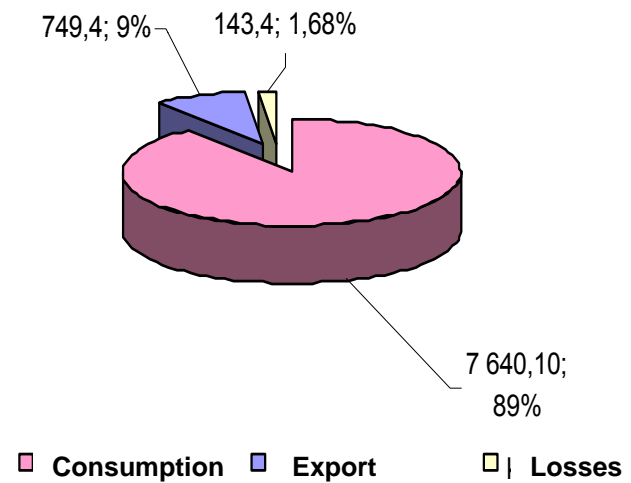
## **Submitting Data on Quality of Commercial Services to GNERC**

- a) A report submitted to GNERC must include information on customer complaints and service requests; the data in the report should be collected from the company's database of complaints
- b) Total number of service requests, actual time of services, and total number of service requests when required procedures were not followed; also reported are reasons, which prevented the delivery of quality service (e.g., force majeure, external, or internal reasons)
- c) Complete data on delivery of services according to quality service requirements

# Energy Balance in 2009 (mln kWh)

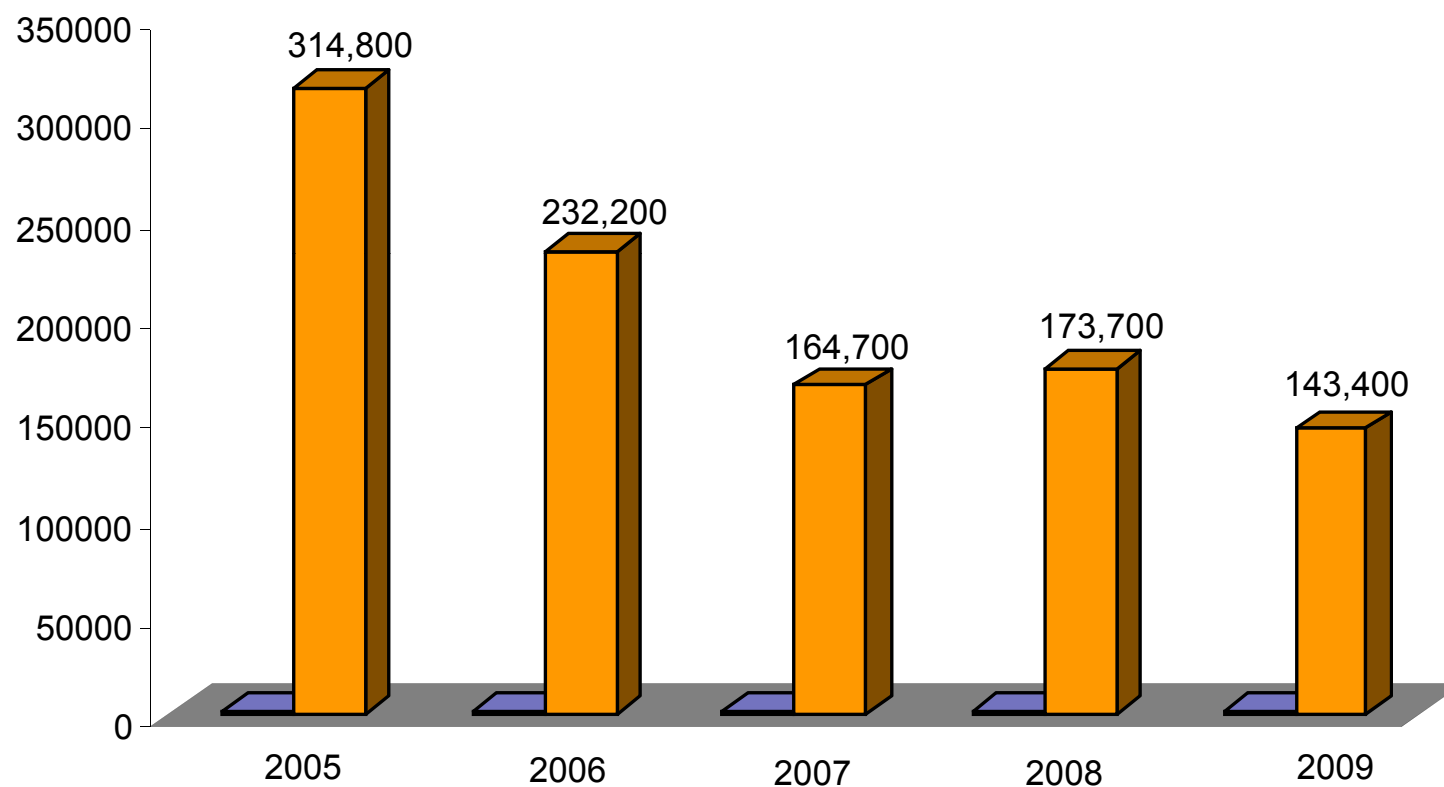


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## Dynamics of Power Loss in the Georgian Power System 2005 - 2009 (000 kWh)



## Power Market Basic Characteristics

- **Market share**

$$s_i = \frac{q_i}{Q}$$

- **Herfindahl-Hirschman Index**

$$HHI = \sum_{i=1}^n s_i^2$$

- **Residual Supply Index**

$$RSI = \frac{P_{\Sigma} - P_m}{P_{pik}} \times 100\%$$

## Some Market Monitoring Results

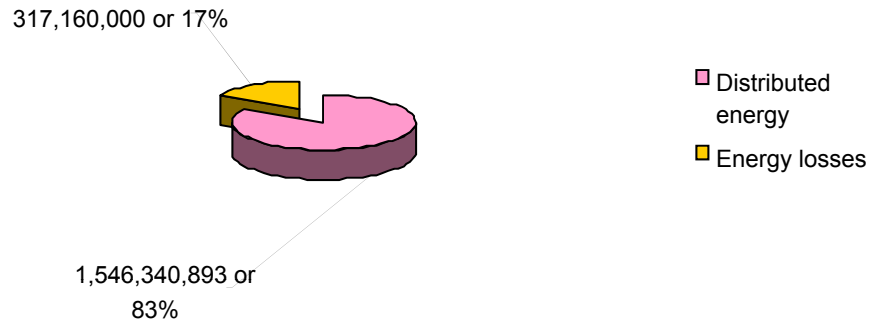
- Free market quality in 2009 was:

$$l = \frac{\sum W_{lm}}{\sum W_c} 100\% = 24.7\% \text{ vs. } 26.6\% \text{ in 2008}$$

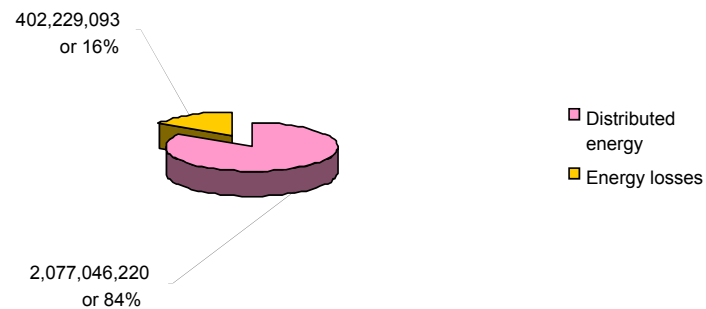
- Market shares for three major companies were distributed as follows: Engurhesi - 35.4 %; Energo-Pro Georgia – 16.8 %; Mtkvari Energy – 8.4%
- HHI for the same companies was 1.605. Thus the Georgian energy market may be characterized as a moderately concentrated market in the generation sector
- RSI for Engurhesi is 170%, which means that its capacity is not sufficient to meet the demand. In other words, it is not a major player in the market

## Energy Losses in the Grids of Distribution Companies

Produced and Distributed Energy in Telasi Power Grid  
(kvthr; %) in 2009



Produced and Distributed Energy in  
Energo-Pro Georgia Power Network  
(kvthr; %) in 2009



Generated and Distributed Power in Kakheti  
Power Distribution (kWh, %) in 2009

