



# **Actions Taken by the Regulatory Authority and the Public Company to Reduce Technical and Non-Technical Losses**

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## **Actions Taken by the Regulatory Authority and the Public Company to Reduce Technical and Non-Technical Losses**

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- **The Topic focuses on the following issues:**
    - **Losses in the Albanian Electric System**
    - **Some details related to the background of the problem**
    - **Actions taken by the Public Company to reduce Technical and Non-Technical Losses**
    - **Actions taken by the Regulatory Authority to reduce Losses**
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## Losses in the Albanian Electric System

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- In general, the present electric system is divided into the following sectors:
    - Generation plants
    - Transmission networks that connect generation plants and transmit large amounts of energy to the primary load centers
    - Distribution networks that carry energy to users
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## Losses in the Albanian Electric System

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- According to the data in 2006, the Albanian electric system consists of:

● Generation plants	(over 5 MWA)	11
● Transmission lines	400 kv	120.2 km
● Transmission lines	220 kv	1102.3 km
● Transmission lines	150 kv	34.4 km
● Transmission lines	110 kv	1232.1 km
● Substation OST	220 kV	11
● Substation OSSH	110/35 kV	326
● Distribution lines TM		13502 km
● (of which cable lines are 6/10/20 kV	881km)	
● Transformers' cabins TM/TU		17879
● Distribution lines TU		24393 km
● Customers connected to the		971500
● network (of which 855,812 are		
● residential)		

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## **Actions Taken by the Public Company to Reduce Technical and Non-Technical Losses**

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- **The energy transmission from power plants to substations and the distribution of energy to users via 20, 10, and 6 kV tension lines, transformation centers 20/04 kV, 10/04 kV, 6/04 kV as well as TU 0.38 kV is associated with great power losses**
  - **The following table shows losses in the Albanian Electric System as well as detailed annual balance (in 2006) in the Power Generation – Transmission - Distribution.**
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# Actions Taken by the Public Company to Reduce Technical and Non-Technical Losses

Organization unit		Annual	
Generation Division		Generation	3.874.139
		Hydro	3.828.430
		Personal consumption	10.708
		Generation losses	58.112
		Generation losses for big hydro power plants	57.427
		Generation losses for power plants of Bistrica 2.Selita	685
		Power generated	3.805.318
		Injected to the transmission network	3.760.413
		Generation by mid sized facilities	44.905
Transmission System Operator	Exchange	Given ( + )	513.444
		Received ( - )	279.924
		Balance (Given- Received )	233.520
		Exports( + )	0
		Imports(- )	362.680
		Balance (Export-Import)	-362.680
		Import for Qualified Suppliers	-60.210
		Total Balance of net Exchanges	-189.370
	Transmission	Transmission System Operator	4.202.490
		Individual Transmission Consumption	1.585
		Transmission losses	141.939
		Losses %	3,38
		Energy transmitted to Distribution	3.806.259
Distribution Division	Generation	Generation by Mid Prodhimi i Implanteve te Mesem	44.905
		Generation by small facilities	0
		Generation by private companies and by concession	47.170
		Total generation in distribution	92.075
	Distribution	Distribution	3.898.334
		Distribution losses	1.523.492
		Losses in (%)	39,08
		Technical losses	876.982
		Technical losses in %	22,5
		Non technical losses	646.510
	Non technical losses in %	16,6	
	Energy sales	2.374.842	
		Energy sale to Qualified Customers	57.592
		KESH energy sale	2.317.250
Sold	Total energy bill for consumers		2.317.248
	Out of it: :		
	Billed for household customers		1.444.900
	Energy billed for other customers		872.348



## Losses in the Electric System (GWh) 2001-2006

GWh	2001	2002	2003	2004	2005	2006
Transmission and Distribution losses	2500	2375	2367	2330	2281	2259
Technical losses in transmission	340	335	330	338	266	256
Technical losses in distribution	1060	1070	1066	1067	1079	1073
Non-Technical losses in Distribution	1100	970	971	925	936	930



## Energy losses in the system

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- In this Balance we notice:
    - Annual losses in the transmission network of the Albanian electric system are 3.38%.
    - Annual losses in the distribution network TM and TU are at 39.08% (high).
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## Losses in the Electric System

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- **The system of losses is the summation of two types of losses (in reference to the 2006 balance):**
    - **Technical losses which are at 22.5%, and depend directly on the network characteristics and the mode of operation.**
    - **Non-technical losses which are at 16.6%, and result from many factors related to meter reading, billing of customer energy consumption, as well as energy thefts.**
    - **The above figures show that:**
      - **Technical losses are not at normal levels**
      - **Non-technical losses are very high**
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## **Losses in the Electric System**

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- Losses in the electric system as a whole (technical and non-technical) are important to KESH because they directly effect the economic, financial, and technical indicators of this Public Company**
  - They have a direct impact on energy sale rates**
  - They increase imports from other countries in order to meet the domestic demand.**
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## **Some Details Related to the background of this Indicator**

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- **After the year 1992, consumer power consumption increased (due to widespread use of home appliances).**
  - **Before 1990, monthly household consumption was 30-50kWh in the countryside and 50-89kWh in the city.**
  - **Household consumption versus total customer consumption was only 8 percent, the remaining part was consumed by the industry.**
  - **Household consumption increased by about 5-6 times and now accounts for 70 percent of total consumption.**
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## **Some Details Related to the background of this Indicator**

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- **Participation (load) at peak for each household is 4-5 times higher.**
  - **The current distribution network cannot not cope with such loads (a lot of defects occurred in the TM networks, transformers' cabins and TU networks).**
  - **The unexpected load increase was reflected in the increase of technical losses above the normal level (not calculated for these networks).**
  - **Energy theft became a reality. It became a widespread phenomenon leading to the fast rate increase of losses: from 36% in 1992 up to 49.4% in 1996.**
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## **Actions taken by the Public Company to Reduce Technical and Non-technical Losses**

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### **Technical losses**

- It has always been the objective of the company to reduce these losses. To this end, projects, funded by the World Bank, other countries, as well as KESH, were implemented in order to:
  
  - Develop the distribution networks at 20kV tension together with 110/20 kV substations in the main cities and densely populated rural areas, avoiding gradually feeders at tension 6kV and 10 kV. The project was launched after 1992, and it was implemented in Tirana, Shkodra, Vlora, Durres, Elbasana, Korca, Berat, Lushnja, and Kavaja. Presently, data about the extension of such networks is as follows:
    - Tirana                      20% TM network (200 km)
    - Shkodra                    4% of network (55 km)
    - Vlora                        7% of network (56 km)
    - Durres                      28 % of network (95km)
    - Elbasani                    8.7% of network (58 km)
    - Berati                       9.4 % of network (49 km) – It is completed in the city
    - Lushnja                    9.6 % of network ( 39 km)
    - Kavaja                      23.7 % of network (52 km) - It is completed in the city
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## **Actions taken by the Public Company to Reduce Technical and Non-technical Losses**

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- **Construction and strengthening of some Substations were completed:**

- Sub/st Selite 110/20 kV installed capacity 80 MVA
- Sub/st Traktora 110/20 kV installed capacity 80 MVA
- Sub/st Shkozet 110/20 kV installed capacity 80 MVA
- Sub/st Kavaje 110/20 kV installed capacity 50 MVA
- Sub/st Sukth 110/20 kV installed capacity 25 MVA
- Sub/st Portoromano 110/20 kV installed capacity 50 MVA
- Sub/st Sarande 110/20 kV installed capacity 40 MVA
- Sub/st Shkoder/1 110/20 kV installed capacity 40 MVA
- Sub/st Shkoder/2 110/20 kV installed capacity 80 MVA
- Sub/st Plastmasit 110/20 kV installed capacity 40 MVA
- Sub/st Vlora/1 110/20 kV installed capacity 50 MVA
- Sub/st Uznova 10/20 kV installed capacity 40 MVA
- Sub/st Berat 110/20 kv installed capacity 50 MVA
- Sub/st Vlora/2 110/20 kV installed capacity 50 MVA
- Sub/st Fiber 110/20 kV installed capacity 50 MVA
- Sub/st Elbasan 110/20 kV installed capacity 50 MVA

**As it is seen above, the new installed capacity in the 20kV network is 775 MVA**

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## **Actions taken by the Public Company to Reduce Technical and Non-technical Losses**

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- **Current 10 kV lines and 110/10 kV substations are reconstructed and strengthened.**
  - **So far, 867,317 customers have been provided with meters with about 87,000 (10 %) remaining.**
  - **KESH sh.a is organizing bidding procedures to purchase 60,000 one-phase individual boxes for household customers, 11,000 three-phase boxes for private customers and 2,600 panels with measurement transformers for private customers.**
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## **Actions taken by the Public Company to Reduce Technical and Non-technical Losses**

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- **KESH continues to replace transformers manufactured using old technology (with steel and copper constructions that result in great losses) with new transformers whose losses are below 2%.**
  - **Replacement of new transformers began after 1995 with the purchase of 400 KVA transformers, mainly manufactured in the West in compliance with IEC international standards.**
  - **Implementing legal obligations to improve  $\cos \phi$  and metering the reactive energy for consumers with over 50KVA capacity, KESH identified the demand for this category of customers and planned to purchase 2,600 metering panels with active/reactive electronic meters.**
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## **Actions taken by the Public Company to Reduce Technical and Non-technical Losses**

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- **Work started to provide electric cabins with active and reactive energy meters. KESH has supplied new 20/0.4 kV cabins with meters (about 1,200 cabins or 7% of the total number of cabins).**
  - **KESH sh.a is taking actions to invest in TU networks, introducing ABC lines technology that increases conductors' sections and reduces technical losses because this technology minimizes interventions in the network.**
  - **Accuracy of technical losses in the TU distribution networks remains a problem because it is hard to update these networks, particularly in rural and suburban areas.**
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## **Actions taken by the Public Company to Reduce Technical and Non-technical Losses**

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- **Updating of the distribution networks in outskirts of the major cities has been initiated along with the need for investments in TU networks.**
  - **From an organizational point of view, KESH sh.a is working to set up the regimen groups to check network loads and to determine load coefficient in order to estimate technical losses in the distribution network, to implement the Distribution Code obligations.**
  - **It is the duty of KESH to manage technical losses at the network designing stage by determining design and implementation standards.**
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## **Actions taken by the Public Company to Reduce Technical and Non-technical Losses**

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### **Non-technical losses**

- Adoption of actions to reduce these figures is related to the accuracy of the figures in general and specific network connections.
  - KESH has applied in every distribution zone the project for the automatic billing of the energy called “Billing System.”
  - This computer software helps to identify energy that goes to the local distribution network in each zone, energy sold to customers, total network losses and to determine energy losses:
    - For every feeder      ( $\text{Losses}_{TM} = E_{Fider} - \sum E_{Kab.}$ )
    - For every cabin      ( $\text{Cabin losses}_{TU} = E_{kab.} - \sum E_{kons.TU}$ )
  - This requires:
    - To provide all feeders, cabins, and customers with a metering system.
    - The metering system installed should meet technical requirements
    - To apply strict reading and billing rules
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## **Actions taken by the Public Company to Reduce Technical and Non-technical Losses**

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- **Collective boxes are placed in skyscrapers, and before KESH takes over possession of these boxes, strict controls are carried out to check that technical requirements are implemented during installation.**
  - **Until now, 1,200 electric cabins (about 7%) have been provided with meters. It is expected that an additional 8,000 of other transformers' cabins will be provided (bringing the percentage to about 51).**
  - **Supplying 60,000 household customers with meters this year avoids the influence of advance billing for customers without meters.**
  - **The energy sales/purchases sector has been established at OSSH and it operates as a separate sector. This is also done in the electric zones of the Distribution System, thus creating the customer energy supply sector.**
  - **The KESH structure contains the Electric Police that provides opportunities for cooperation in order to strengthen monitoring of delinquent customers.**
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## **Actions Taken by the Regulatory Authority to Reduce Non-technical Losses**

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- **ERE drafted a set of rules, technical requirements, and norms on the operation of the distribution network that directly or indirectly impact the reduction of network losses which are referenced in the Law “On the Energy Sector” such as the Distribution Code, Metering Code, Electric Supply Contracts, Rules and Tariffs for New Connections to the Distribution Network, Monthly advance billing for Household Customers without electric meters, etc.**
  - **This legislation intends to:**
    - **Enable the distribution system to operate in compliance with security conditions.**
    - **Provide customers with sufficient electric power in compliance with quality of service requirements.**
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## **Actions Taken by the Regulatory Authority to Reduce Non-technical Losses**

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- **In compliance with the Law “On the Energy Sector“, ERE has assigned the Public Company the duty to provide all customer categories with meters within 2007.**
  - **In the context of the Decision of the Council of Ministers “On the permitted norms of the power factor and obligations deriving from the Measurement Code” according to which users of power over 50 KVA should achieve  $\Phi=0.9$ , ERE set the tariffs of reactive energy for non-residential customers connected to the TU with installed capacity over 50 kWA and those connected to TM.**
  - **Taking into consideration the technical situation of the distribution system and investments underway, for the first time ERE, set a norm of the tension level for residential and non-residential customers with a tolerance of  $-/+10\%$ .**
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## **Actions Taken by the Regulatory Authority to Reduce Non-technical Losses**

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- **In order to protect the measurement system and to minimize energy thefts, ERE has determined rules in the Measurement Code that address:**
    - **Accuracy of measurements, meter reading, and data records.**
    - **The measurement system has to be sealed.**
    - **Protection of the measurement system from interventions and damages.**
  - **When implementing the law “On the Energy Sector” as amended, ERE recently approved a system of fines that also estimates economic damage caused by users who receive energy illegally.**
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## **Actions Taken by the Regulatory Authority to Reduce Non-technical Losses**

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- **Based on the authority provided by the Law No. 9072 dated 22 May 2003 “On the Energy Sector”, ERE has:**
  - **Monitored and reviewed activities of licensees to comply with obligations in order to achieve approved targets for energy losses by:**
  - **Obtaining from licensees a monthly information (Information System approved by the ERE Board of Commissioners) on the achievement of such assignments as:**
    - **The generation-transmission-distribution balance and energy losses in relevant systems.**
    - **Energy losses in the distribution network, providing details on losses in the local network for each zone.**
    - **Provide customers with meters.**
    - **Energy sales to customers in compliance with bills.**
    - **Investments made to implement planned projects.**
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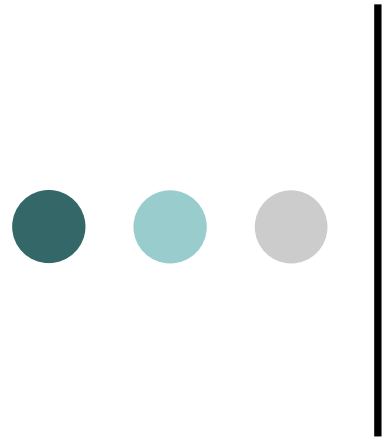




## **Actions Taken by the Regulatory Authority to Reduce Non-technical Losses**

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- **ERE analyzes the information and determines the problematic zones for monitoring and review.**
    - **Determines the main directions of review programs**
    - **Monitors the program compliance**
    - **The monitoring group informs the Board of Commissioners and a determination is made for the licensee.**
  - **During this time, ERE organized meetings with directors of the licensed companies, KESH sh.a., OST, and KPGJ, which proved to be very fruitful. ERE presented monitoring findings and made concrete technical, economic, and organizational proposals to overcome the grave situation.**
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THANK YOU FOR  
YOUR ATTENTION