

Quality of Electricity Supply

Serbian National Report

by

The Energy Agency of the Republic of Serbia (AERS)

Continuity of supply

Continuity of supply in the transmission network

According to the Information rules for monitoring continuity of supply that were defined by the Energy Agency of the Republic of Serbia (AERS), Serbian Transmission Company PE “Elektromreža Srbije” (PE EMS) was obliged to register data on long interruptions (longer than three minutes) in their network consisting of 400, 220 and 110 kV voltage levels, in order to allow for calculation of continuity of supply indicators, namely ENS (Electricity Not Supplied), ENS in % of delivered electricity and AIT (Average Interruption Time). PE EMS delivered 40 TWh of electricity in 2009. Calculated continuity of supply indicators for transmission network in 2009 are presented in the following table:

Table 1: Data on interruptions in transmission network

	ENS [MWh/year]	ENS %	AIT [min/year]
planned	971.67	0.00242%	12.75
unplanned	1524.79	0.00381%	20.00
total	2496.46	0.00623%	32.75

Exceptional events are included in the calculation of continuity of supply indicators given in the Table 1.

Share of planned and unplanned interruptions in the ENS and AIT indices is depicted in the Figure 1:

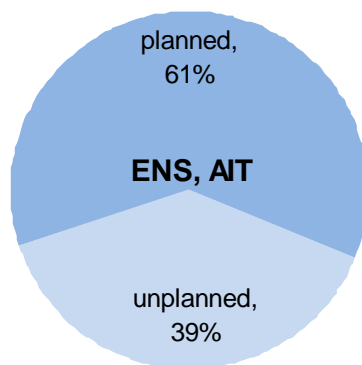


Figure 1: ENS and AIT indices

Continuity of supply in the distribution network

According to the Information rules for monitoring continuity of supply that were defined by the AERS, distribution companies were obliged to register data on long interruptions in their network, in order to allow for calculation of continuity of supply indicators, namely SAIDI, SAIFI and CAIDI. All five distribution companies were registering interruptions on high (110 kV) and medium voltage levels (35, 20 and 10 kV) in the scope, format and deadlines defined by the Information rules. Only one distribution company, out of five, was not able to provide data on 10 kV interruptions in its distribution network in 2009. Due to that, this company has been excluded from the calculation of continuity of supply indicators on the Serbian level.

Taking into account interruptions provided by four distribution companies average annual value for SAIDI for Serbia was calculated and results are depicted in the following figure:

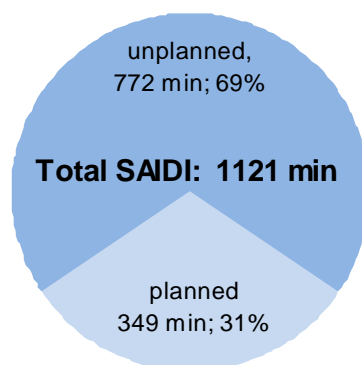


Figure 2: SAIDI index

Based on the same set of interruptions data average annual SAIFI for Serbia was calculated and results are presented in the following figure:

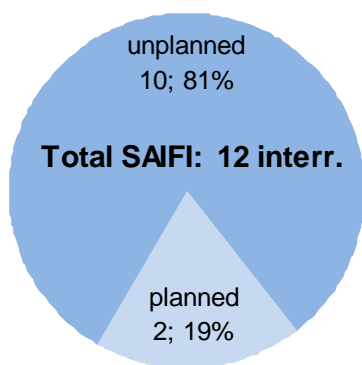


Figure 3: SAIFI index

From these values for SAIDI and SAIFI, CAIDI was calculated and shown in the Table 2.

Table 2: CAIDI index

CAIDI	total	planned	unplanned
[min/interr.]	96	159	81

Exceptional events are included in the calculated SAIDI, SAIFI and CAIDI indicators.

Commercial quality in electricity transmission and distribution

Voltage quality

Having in mind that systematically continuous monitoring of technical indicators of the voltage quality is not possible to conduct at the moment, due to a lack of appropriate metering systems that would register and monitor voltage characteristics in the network, Information rules for monitoring the voltage quality in 2009 were mainly based on collecting commercial data on:

- number of customers' voltage complaints
- response time to customers' voltage complaints
- number of justified customers' voltage complaints
- number of resolved voltage problems.

As a result of the voltage quality monitoring in transmission and distribution network, AERS has obtain following results regarding voltage quality complaints:

Table 3: Voltage quality complaints

Voltage quality complaints		HV	MV	LV	SUM
No. of	complaints	3	75	1339	1414
	justified complaints	3	54	902	956
	resolved complaints	3	8	475	483

Represented in the percentages it comes out that around 68% of all voltage complaints were justified, while 51% of justified complaints were resolved in 2009.

Average response time to complain (check-up and response to customer) was 3 days on average, approximately.

Out of the total of 3,430,550 metering points in the whole transmission and distribution network, a total of 1414 received complaints on voltage quality represent 0.04% of voltage complaints per total number of metering points.

In 48 cases distribution companies were ordered to resolve voltage problems by electric power inspector's decision.

Connections

The statistics on connection applications, and transmission and distribution network companies' decisions upon connection applications is given in the following table:

Table 4: Connection applications and TSO/DSO responses

Connection applications		HV	MV	LV	SUM	
No. of	received	1	155	35460	35615	
	decided	accepted	1	119	25819	25938
		rejected	0	0	625	625
		resolved in other way	0	16	6049	6065
		Sum	1	135	32493	32628
%	decided per received	100%	87%	92%	92%	
	accepted per received	100%	77%	73%	73%	

With respect to a timeframe within which companies decided application for connection (set at a maximum of 30 days), submitted data has shown that approximately 70% of applications were decided within 30 days, with average response time of approx. 23 days for connection applications on low voltage network. Due to a complexity of application, deciding on connection applications on medium and high voltage levels took longer, but still up to 30 days.

Number of connection to transmission and distribution network in 2009, as well as percentage of connections per accepted connection applications for each voltage level are given in following table:

Table 5: Number of connection applications and TSO/DSO responses

Connections	HV	MV	LV	SUM
Number of connections	1	106	17434	17540
connected per accepted in %	100%	89%	68%	68%

Suspensions of electricity delivery

Depending on the cause of suspension, number of suspensions of electricity delivery is depicted in the following figure:

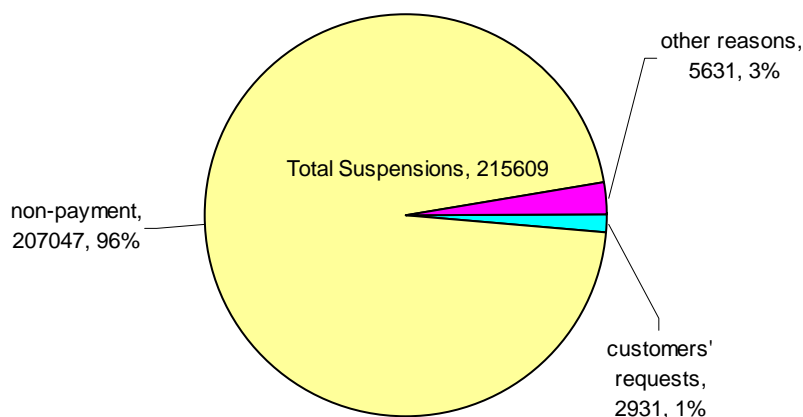


Figure 4: Number of suspensions of electricity delivery

There were 6.2% of suspensions in 2009 compared to 3,430,550 of customers.

Disconnection

Depending on the cause of disconnection, number of disconnections undertaken by distribution network companies is shown in the following figure:

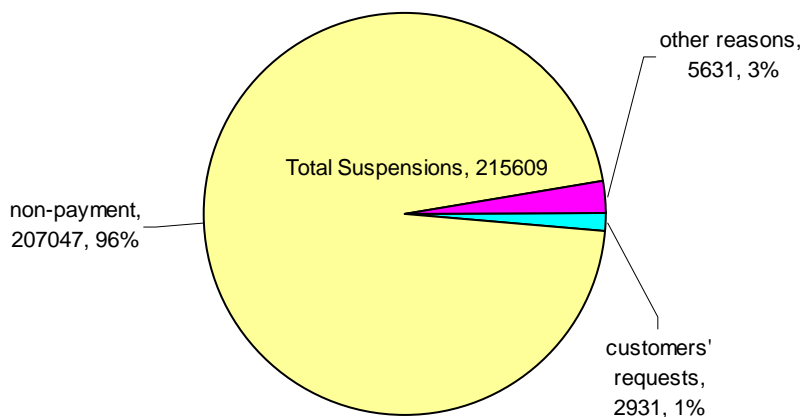


Figure 5: Number of disconnections

There were 0.9% of disconnections in 2009 compared to 3,430,550 of customers.

Billing and collection

Statistics of invoicing is given in the following table:

Table 6: Statistics of invoicing

Billing		Total
No. of invoices	regular	39865424
	for unauthorized consumption	14344
	corrected	447473
	other	15038
	Total	40342279
%	corrected	1.11%
	for unauthorized consumption	0.04%

Structure of corrected invoices according to a reason for issuing wrong invoice is depicted in the following figure:

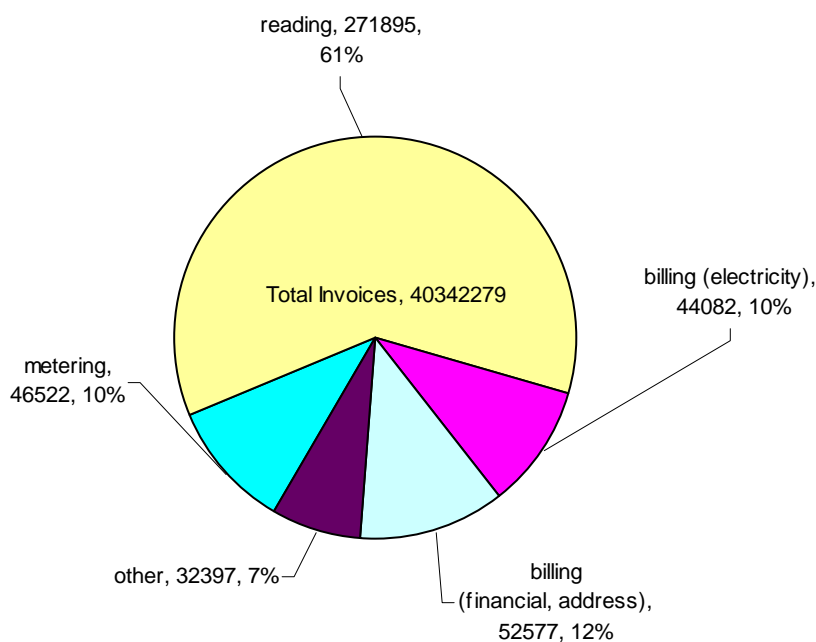


Figure 6: Structure of corrected invoices

Number of customers' complaints to the invoices was 79,906, which was 0.2% out of the total number of issued invoices in the 2009.

Collection rate in 2009 was 93.9%, while collection rate in 2008 was 97.41%. Collection rate drop of 3.61% in the last year is noticeable.

Customers' appeals and complaints to the AERS

According to the existing Energy Law, AERS is given the competence to decide appeals against the act of the transmission/distribution system operator refusing access or connection to the network, i.e. him failing to pass a decision on submitted application for connection to the system in due time. All submitted appeals were against the act of the distribution system operators regarding process of connection to the system. Apart from that, there are complaints that customers submitted to the AERS regarding issues that are not directly related to the process of connection or in the competence of the AERS such as complaints to the billing, voltage quality etc. Also, there is a set of customers' enquires to the AERS related to the other AERS activities such as requesting explanation of pricing methodologies and tariff systems issued by the AERS etc.

Number of appeals on one side and complaints and enquires on the other side submitted to the AERS since AERS has become operational in 2006 until 2009 is presented in the following graph:

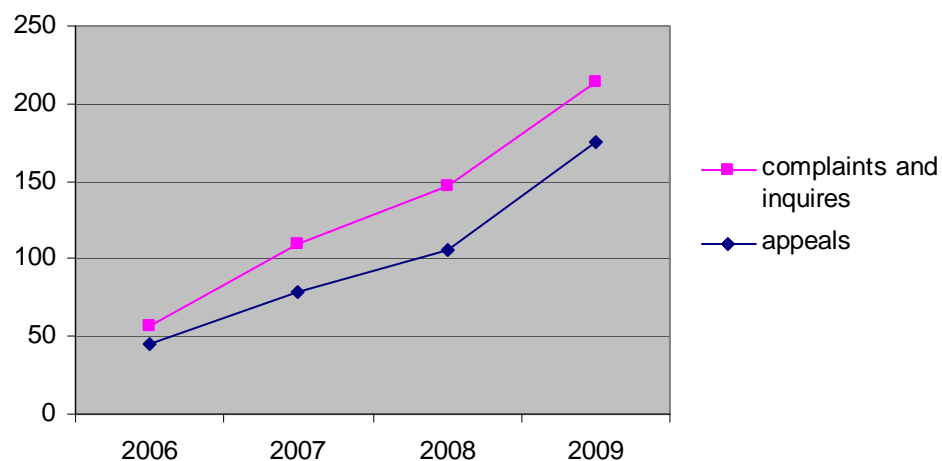


Figure 7: Number of appeals and complaints to AERS

Almost all customers' appeals against the act of the distribution system operators regarding process of connection to the system were decided in favor of the customer (approx. 95%), for the time being.