

# SECURITY OF SUPPLY IN GEORGIA



**MINISTRY OF ENERGY**



**GEORGIAN STATE ELECTROSYSTEM**

**Vienna  
December 2016**

# Energy community and Georgia

- **PROTOCOL CONCERNING THE ACCESSION OF GEORGIA TO THE TREATY ESTABLISHING THE ENERGY COMMUNITY** was signed in 14<sup>th</sup> of October of 2016. At the beginning of 2017 we are expecting submission of the protocol to the Parliament for the ratification.
- **Deadline for the implementation of the Directive 2005/89/EC concerning measures to safeguard security of electricity supply and infrastructure investment is determined By 31 December 2019 with subsequent period of one year necessary for testing and adjusting the relevant implementing provisions and market instruments.**



14.12.2016

# MAIN CHALLENGE of the DIRECTIVE

For ensuring the main challenges in field of the security of supply which are also defined in article 1 of the Directive 2005/89/EC:

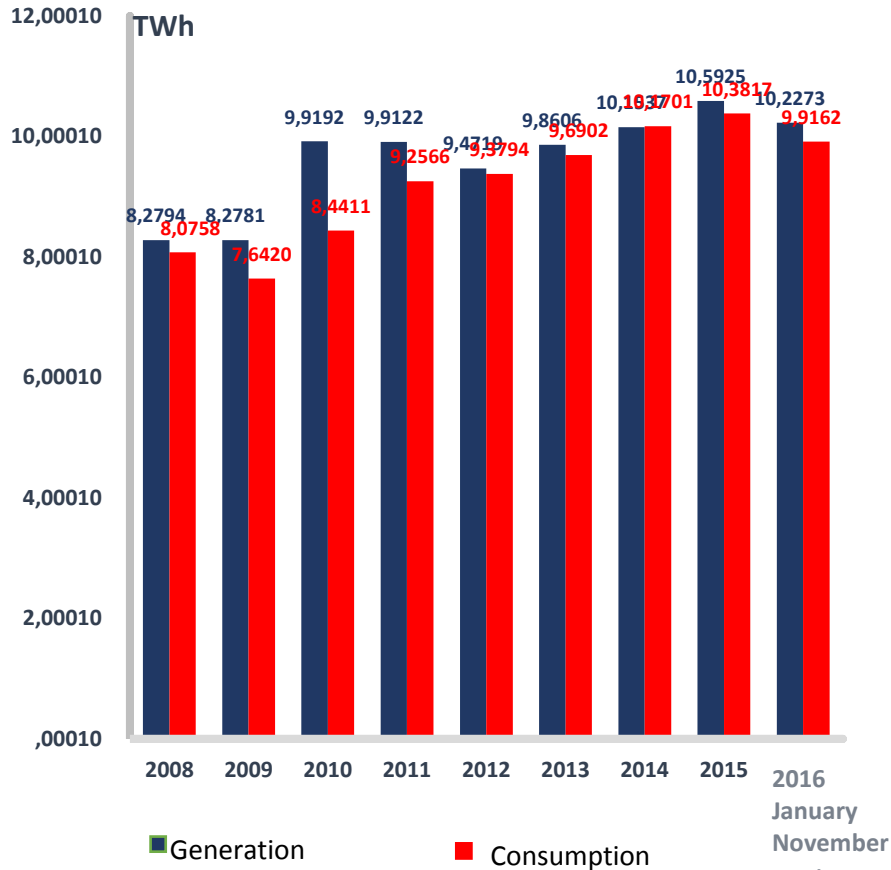
- Is established ten year network development plan of Georgia which is the subject to update annually. The rules of elaboration and update of this plan are determined by the Georgian Law on Electricity and Natural Gas.
- With support of EBRD Georgian Government started development of the electricity market design concept compatible with Energy Community requirements. For the same reasons GSE has a relationship with several TSOs in EU and also tried to achieve close relationship with ENTSO-E and become of its observer member.
- GSE actively cooperates with its neighboring TSO-s in Turkey, Russia, Azerbaijan and Armenia in field of ensuring electricity export, import, transit and emergency assistance.
- GSE is involved in process of researching the opportunities to develop North-East energy corridor with Russia, Armenia and Iran.



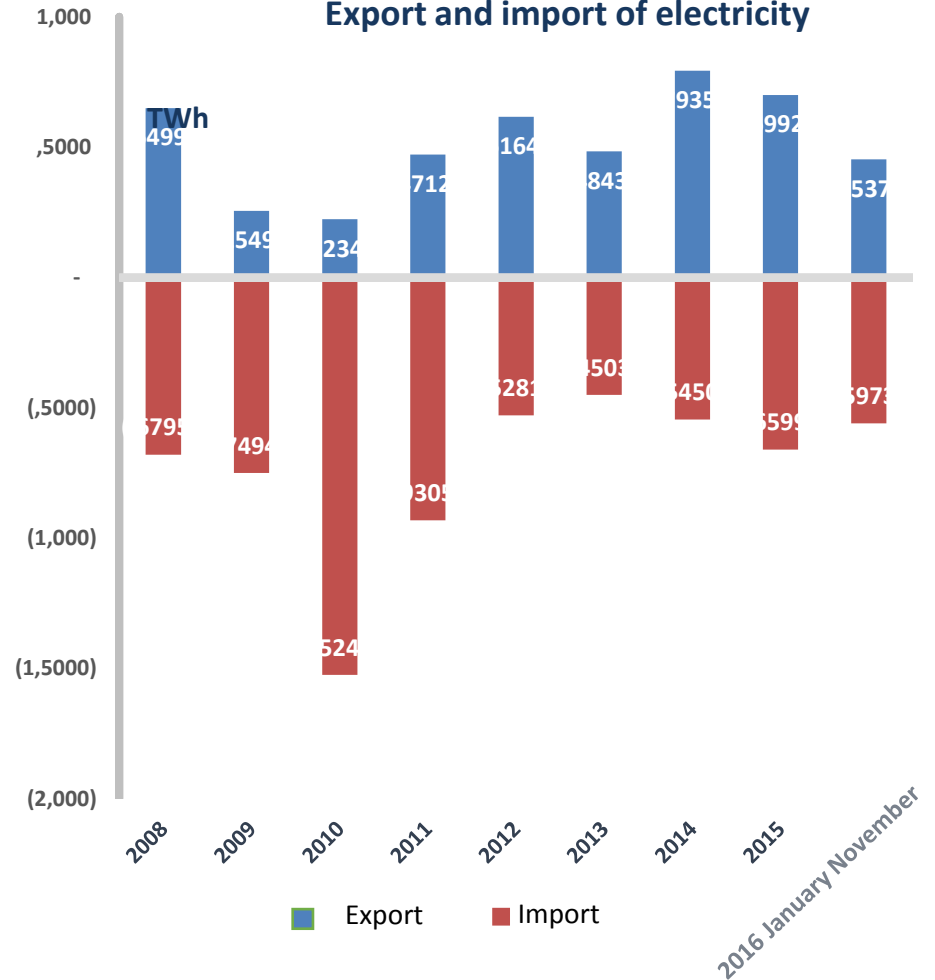
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# STATISTIC DATA – Generation and Consumption

## Power generation and consumption



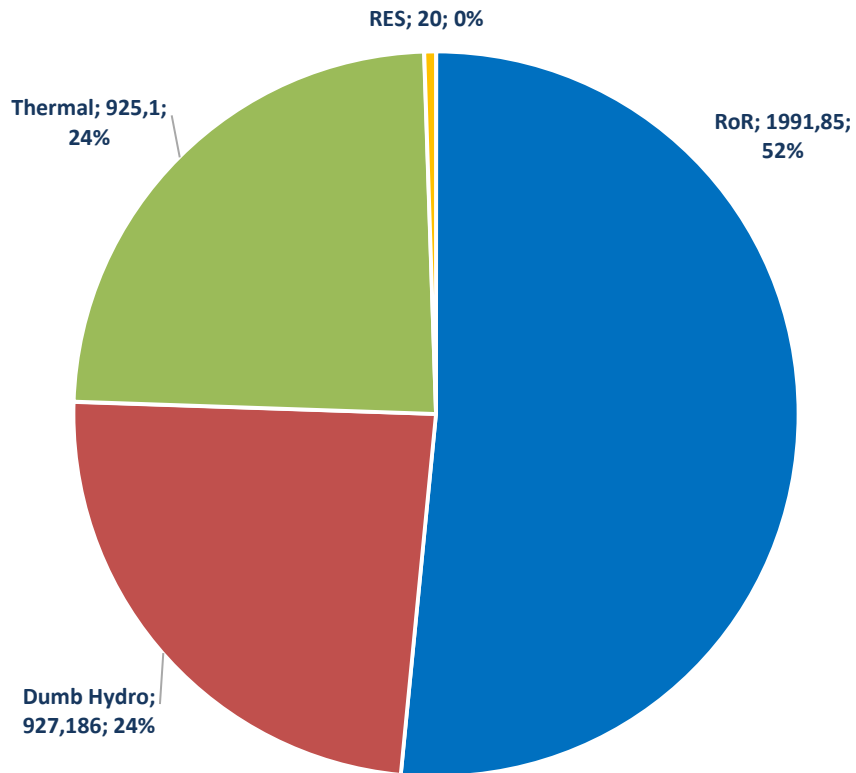
## Export and import of electricity



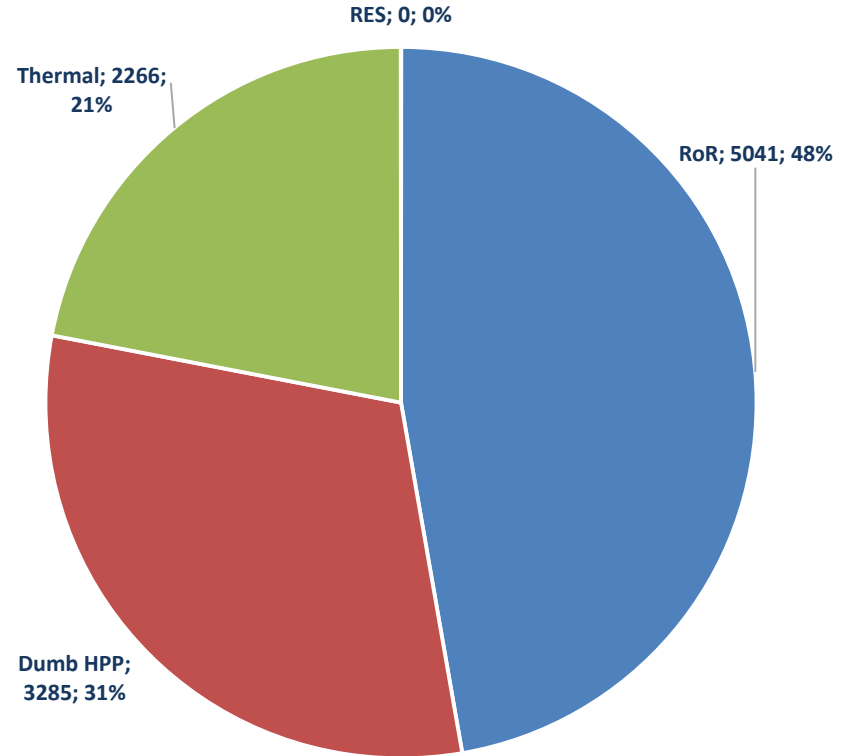


# Installed Capacity and Generation Structure

## Installed Capacity, Nov 2016 , MW



## Generation TWh 2015



## Energy not supplied through years Outages of overhead lines

YEAR	Total numb. of outages	Total Energy not supplied [kWh]	Share in total consumption
2006	347	3342220	0.0424%
2007	250	3641868	0.0467%
2008	197	1285250	0.0159%
2009	241	4476424	0.0586%
2010	369	1821532	0.0216%
2011	237	2143492	0.0232%
2012	199	3125957	0.0334%
2013	181	4888112	0.0505%
2014	264	4216926	0.0415%
2015	282	1823017	0.0176%

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Outages of 500, 400, 330 and 220 kV OHLs are taken into account



# Energy not supplied through years

## Outages of Generation units

Generation Unit	OUTAGES									
	2011		2012		2013		2014		2015	
	Numb	Energy not supplied [kWh]	Numb	Energy not supplied [kWh]	Numb	Energy not supplied [kWh]	Numb	Energy not supplied [kWh]	Numb	Energy not supplied [kWh]
Enguri G1	-	-	-	-	3	99142	2	61438	-	-
Enguri G2	-	-	6	151151	1	627912	-	-	-	-
Enguri G3	-	-	1	94040	-	-	-	-	1	59250
Enguri G4	1	5917	3	112210	4	190144	1	14043	-	-
Enguri G5	2	22495	-	-	-	-	-	-	-	-
Gardabani G3	-	-	-	-	-	-	-	-	-	-
Gardabani G4	-	-	1	3312	-	-	-	-	-	-
Gardabani G9	1	427078	1	1800	-	-	1	1255846	-	-
<b>Sum</b>		455490		362513		917198		1331327		59250







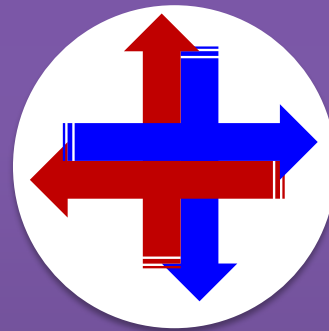
# The main objectives



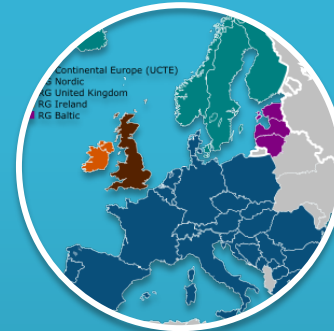
Security of  
Supply  
Quality



Integration of  
Power Plants



Mastering of  
Transit  
Potential



Integration  
into ENTSO/E  
and European  
Market

Ten Year Network Development Plan, Projects, Technical Calculations













# Completed Projects for 2020 and their role

Several projects are considered in 10-year network development plan of Georgia which will resolve problems of security of supply, integrate new HPPs into the grid and reinforce transit ability of Georgian system.

Together projects “**Jvari-Khorga**”, “**Tskaltubo-Zestaponi**” (already commissioned) and “**Rehabilitation of Kolkhida-1**” will:

1. Reserve the following present weak points:

- 500/220 kV Autotransformer Enguri;
- 220 kV double-circuit line Egrisi-1,2;
- 220 kV OHL Kolkhida 2a;
- 220 kV OHL Kolkhida 2;
- 220 kV OHLs Ajameti-1,2;

2. reinforce of Security of Supply of ss Batumi;

3. partly reserves 500 kV OHL Imereti and reduces value of consumers to be tripped by system automatic in case of emergency outage of above mentioned line.





# Completed Projects for 2020 and their role

**“Jvari-Tskaltubo-Akhaltzikhe”** Project (in parallel of integration of Enguri HPP, Namakhvani HPP and other HPPs) will resolve the most problematic issue in Georgian transmission network – whole reserve of 500 kV OHL Imereti and Zekari, after outage of which system automatic will not trip consumers in Georgia.

**“Marneuli”** Project (500 kV OHL Marneuli-Airum) will fully replace 220 kV OHL Alaverdi and ensure reinforcement of power transit ability among Russia-Georgia-Armenia-Iran.

This projects, besides of above mentioned goals may have some other designations, for example, integration of HPPs and increase of cross-border capacity.

Project **“Akhaltzikhe–Batumi”** will increase reliability of supply of “Adjara” region (besides integration of “Shuakhevi”, “Koromkheti” and other HPPs of Upper Adjara region) and will help to backup 500 kV OHL “Imereti” with projects “Jvari – Khorga” and “Tskaltubo – Zestafoni”.

Project **“Guria”** will integrate prospective HPPs from this region into the grid as well as will increase security of supply of Guria and Batumi regions and will increase reliability of power evacuation from Vartsikhe cascade.





# RENEWABLE ENERGY SOURCES

- **Realization of hydropower projects are most welcomed due to their economic feasibility. Currently, we have around 110 ongoing renewable energy projects (4688MW) expected to be completed before 2025.**
- **The first wind pilot project with the installed capacity of 20MW has recently been set into operation. In addition, six renewable energy based power generation plants are expected to be completed with the installed capacity of 420MW by the end of the year.**
- **Besides developing small and medium sized HPPs (hydro power plants), the country plans to construct large HPPs with reservoirs as the most efficient way to meet seasonal peak demand of power in the country.**



# Prospective Hydro Power Plants' Installed Capacity

Power Source	2017	2018	2019	2020	2021	2022	2023	2024	2025	2026	2027	2028	2029	2030	2031
<b>Hydro</b>	3229	3374	3874	4044	4438	4706	4927	5717	6419	6419	6419	6419	6419	6419	6419
<b>Thermal</b>	925	925	655	1205	905	905	905	905	905	1155	1155	1155	1155	1155	1155
<b>Wind</b>	21	21	21	21	21	21	21	21	21	21	21	21	21	21	21
<b>Solar</b>					*	*	*	*	*	*	*	*	*	*	*
<b>Biomass</b>				*	*	*	*	*	*	*	*	*	*	*	*
<b>Other*</b>															
<b>Total</b>	4175	4320	4550	5270	5364	5632	5853	6643	7345	7595	7595	7595	7595	7595	7595

\* Under Study process



# Thermal Power Plants

## Prospective Thermal Power Plants

No	Name	Installed Capacity (MW)	Coefficient of Efficiency	Type	Commissioning date	Category <sup>3</sup>
1	1-Thermal	250	55	Combined-cycle	01.01.2020	3
2	2-Thermal	250	55	Combined-cycle	01.01.2026	3
3	3-Thermal	300	40	Coal	01.01.2020	3

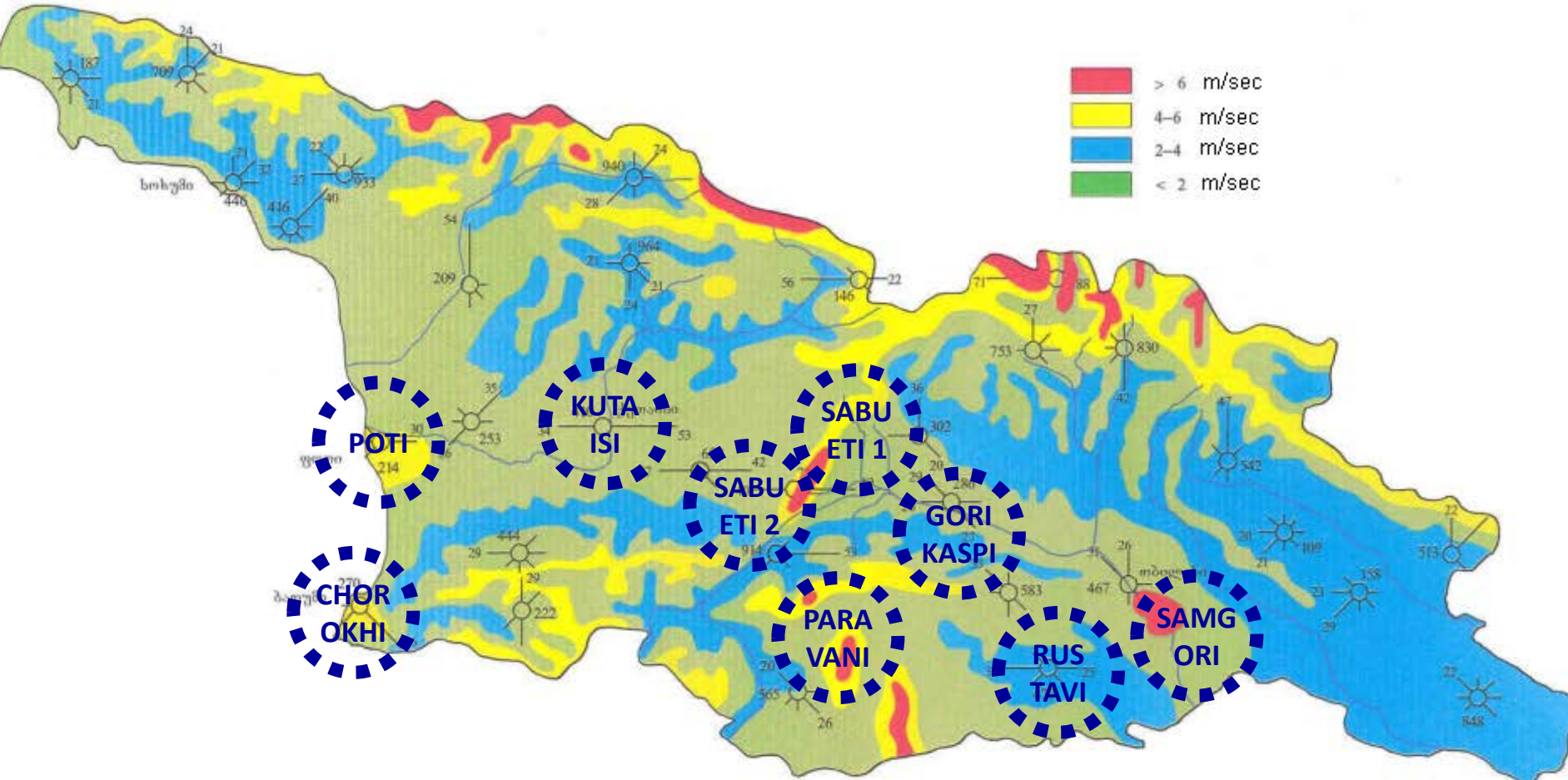
## Thermal Power Plants to be decommissioned

No	Name	Installed Capacity (MW)	Type	Decommissioning date
1	Thermal Unit №3	130	Steam TPP	01.01.2019
2	Thermal Unit №4	140	Steam TPP	01.01.2019
3	Thermal Unit №9	300	Steam TPP	01.01.2021





# Georgian Wind Energy Potential and Zones



# Determination of Total Available Wind Power Capacity To Be Connected To Zones

Year	2017	2018	2019	2020	2021	2022	2023	2024	2025	2026	2027	2028	2029	2030
<b>SUMM</b>	100	100	100	100	180	270	315	360	405	405	405	405	405	405
<b>POTI</b>	10	10	10	10	20	30	35	40	45	45	45	45	45	45
<b>CHOROKHI</b>	10	10	10	10	20	30	35	40	45	45	45	45	45	45
<b>KUTAISI</b>	10	10	10	10	20	30	35	40	45	45	45	45	45	45
<b>MOUN SABUETI 1</b>	10	10	10	10	20	30	35	40	45	45	45	45	45	45
<b>MOUN SABUETI 2</b>	10	10	10	10	20	30	35	40	45	45	45	45	45	45
<b>GORI-KASPI</b>	20	20	20	20	20	30	35	40	45	45	45	45	45	45
<b>PARAVANI</b>	10	10	10	10	20	30	35	40	45	45	45	45	45	45
<b>SAMGOR I</b>	10	10	10	10	20	30	35	40	45	45	45	45	45	45
<b>RUSTAVI</b>	10	10	10	10	20	30	35	40	45	45	45	45	45	45



*Thank you for your attention !*



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