The Electric Power System

- Montenegro -

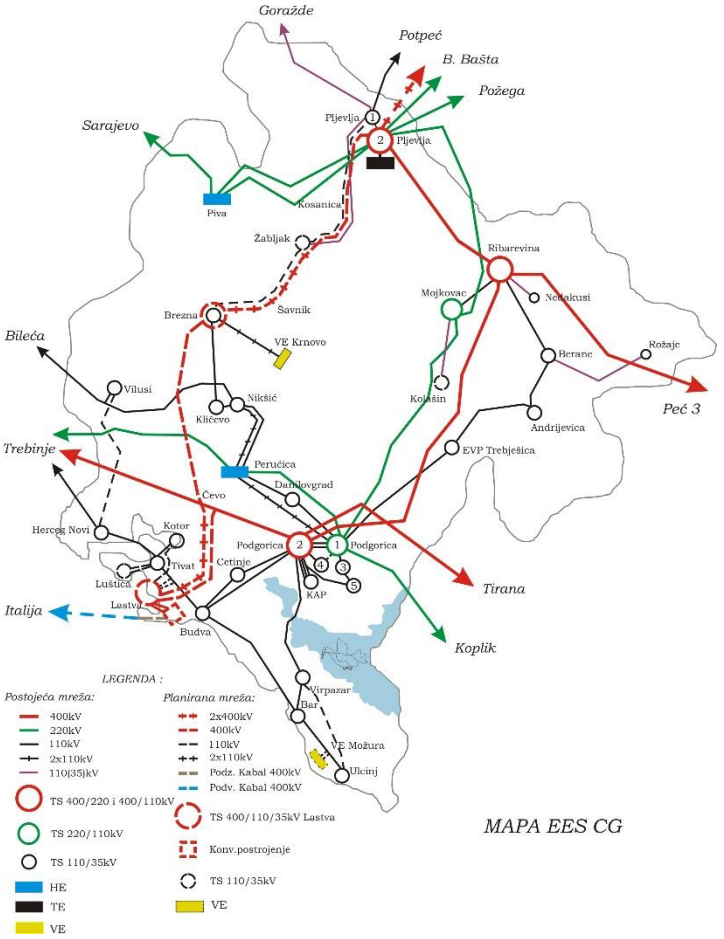
Basic facts

- Area: 13 812km²
- Population: 622 781 (2016)
- 382 552 consumers
- 1 TSO
- 1 DSO
- Peak load: approx. 654 MW
- Average interruption of electricity (2017): 139.5 min

Global map of the grid and of its interconnections

Bosnia and Herzegovina

Serbia



Albania

Interconnectors with:

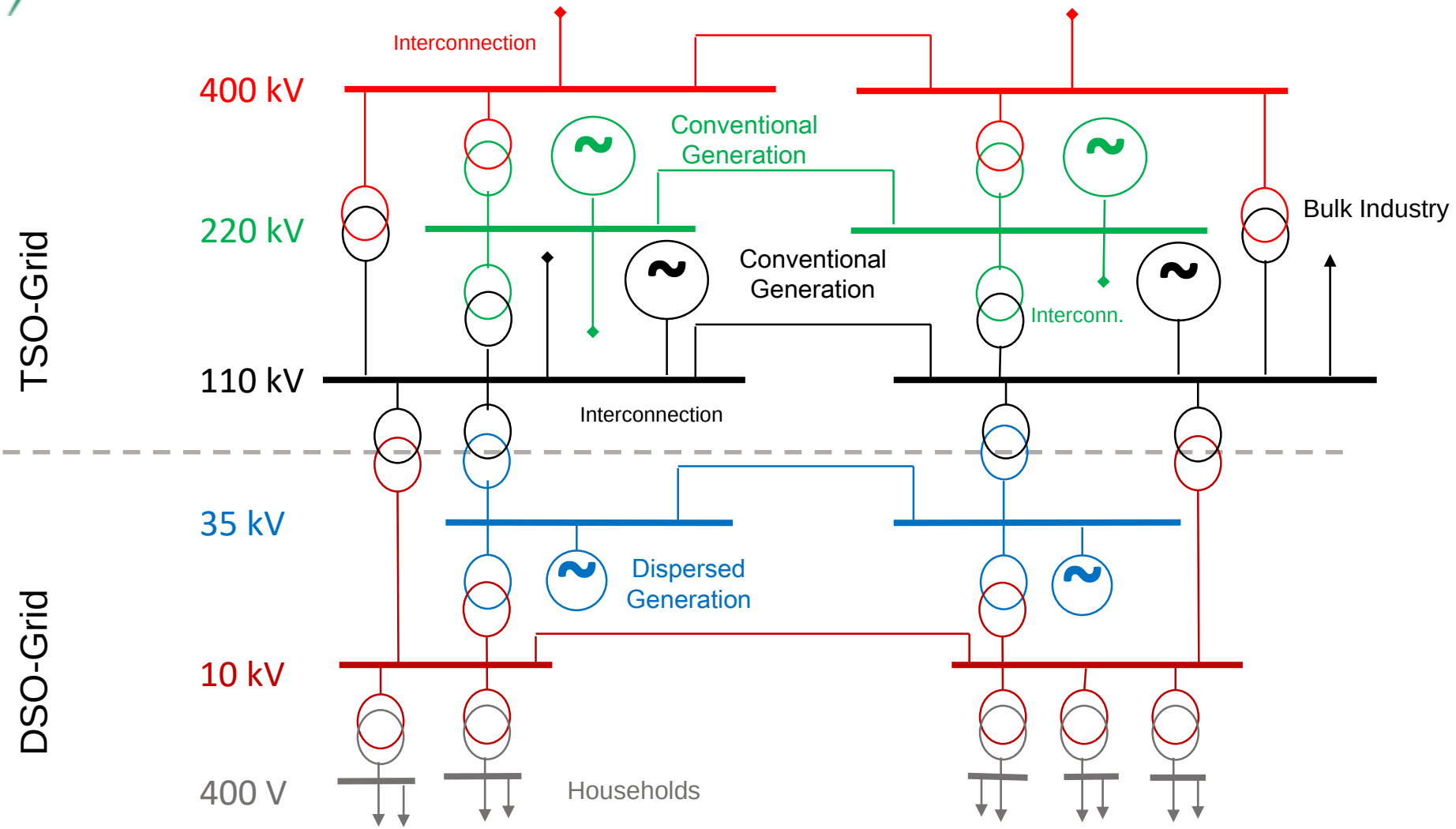
- Serbia
- Bosnia and Herzegovina
- Albania

Grid facts and characteristics

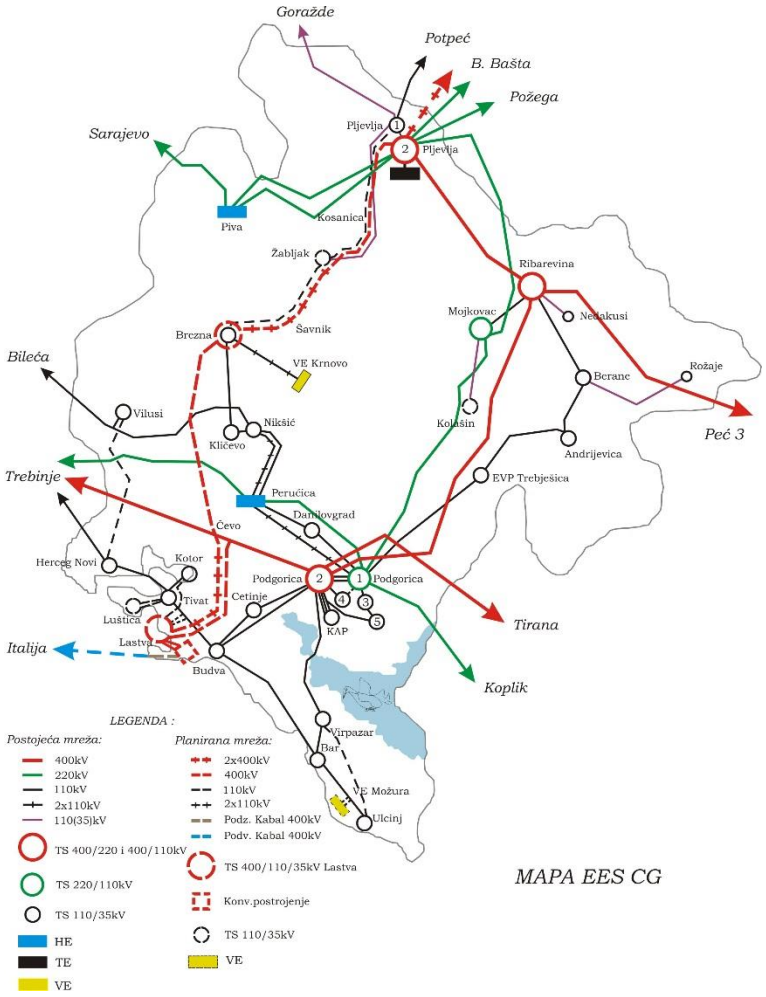
- The electricity grid in Montenegro is divided into transmission grid (400kV, 220kV and 110kV) and distribution grid (35kV, 10kV and 0.4kV)

	Voltage level	Total length	Responsibility
Transmission grid	400kV	284 km	TSO
Transmission grid	220kV	372 km	TSO
Transmission grid	110kV	642 km	TSO
Distribution grid	35kV	1017km	DSO
Distribution grid	10kV	5054km	DSO
Distribution grid	0.4kV	13351km	DSO

Structure of electrical power system



Map of the high voltage grid



400kV power lines

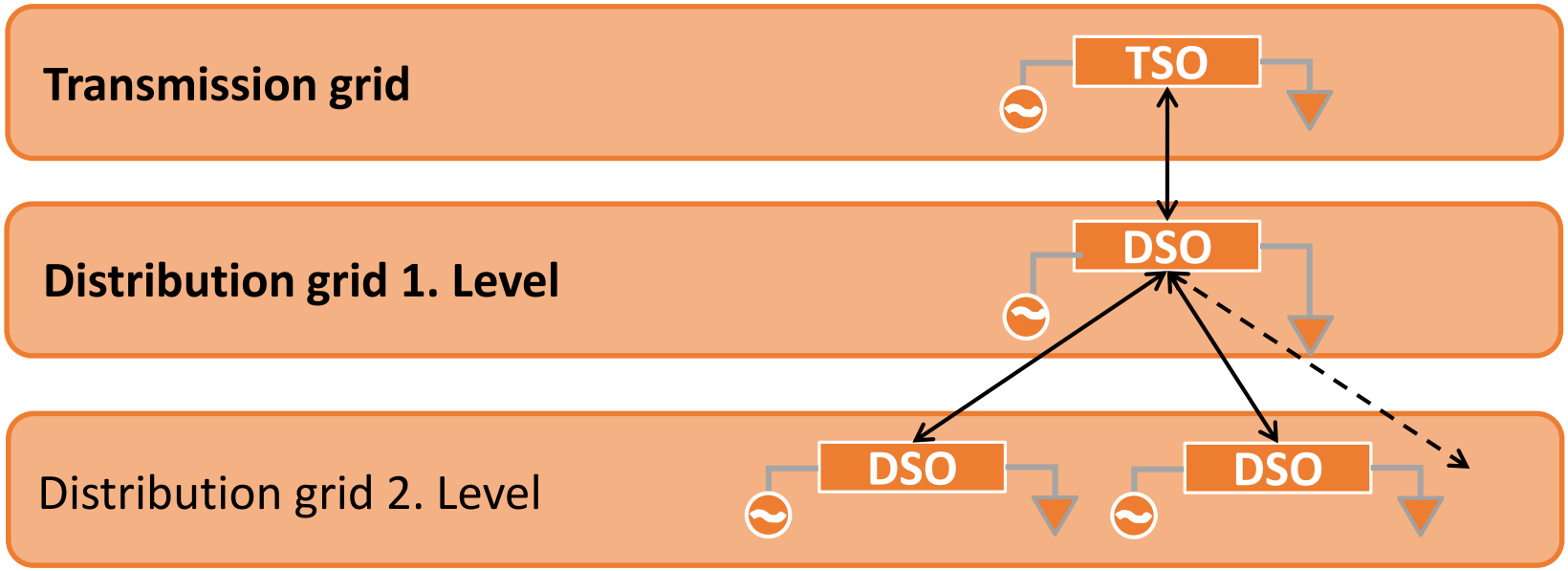
220kV power lines

110kV power lines

Information on TSO

- Name: CGES
- Network length: 1 298 km
- Served area: 620 029 km²
- Annual transmitted energy: 4 494 GWh
- Website: http://cges.me/

Cooperation of TSO and DSOs



Responsibilities of TSO & DSOs

TSO

- Safe and reliable operation of the power system in real time
- Long-term and short-term planning of the system
- In transparent and non-discriminatory manner provide access to the transmission network to producers and eligible customers connected to the transmission network
- System services and balancing system and to this end has the right to purchase electricity
- Purchase of electricity to cover losses in the transmission network
- Approval and implementation of the electricity transit
- Calculates and monitors deviations in real time and implemented a program to balance deviations of the electric power system of Montenegro

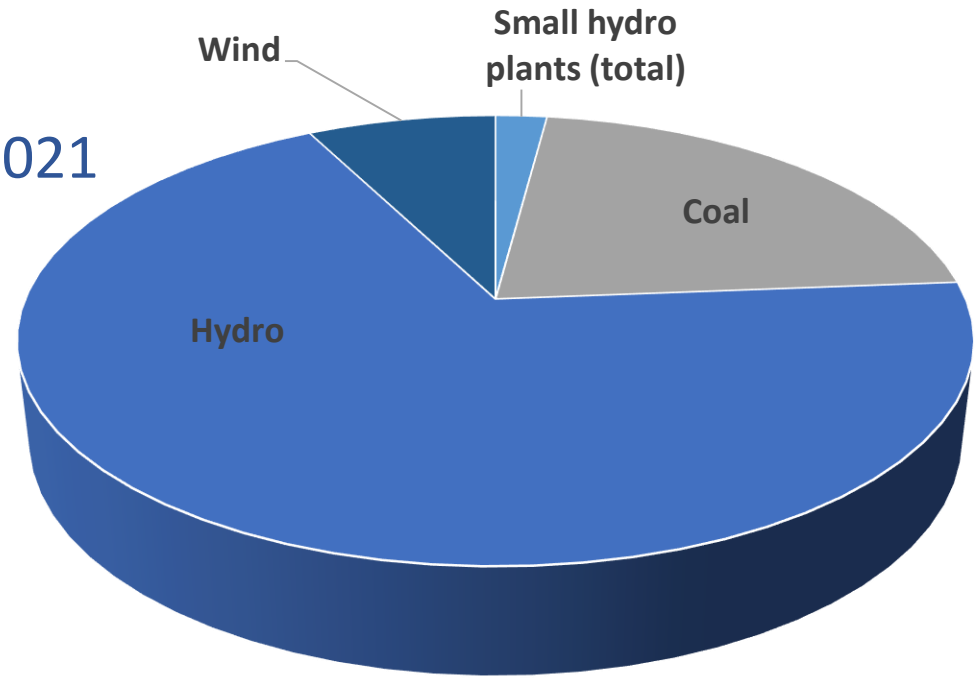
DSO

- Safe and reliable operation of the distribution system in real time
- Long-term and short-term planning of to the distribution system
- In transparent and non-discriminatory manner provide access to the distribution network to producers and qualified customers connected to the distribution network, as well as public suppliers and all licensed suppliers
- Buy electricity to cover losses in the distribution network

Power structure of the country

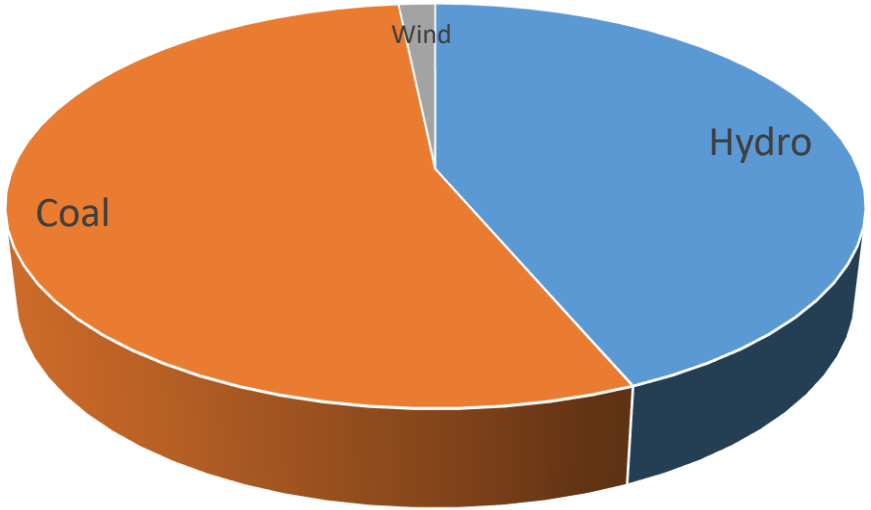
Installed capacity with reference to primary resources

- Installed capacities (GW), year 2017
  - Coal 0.217
  - Hydro power 0.686
  - Wind power 0.076
  - Small hydro plants 0.021



Energy production with reference to primary resources

- Electricity generated (GWh), year 2017:
  - Coal 1265
  - Hydro power 1009
  - Wind power 38

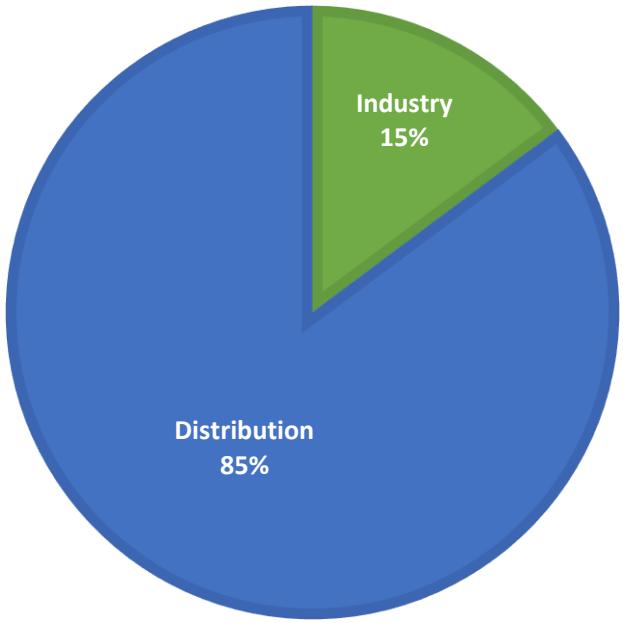


Development of generation capacity

- No significant power plant was built in the past 30 years
- Small hydro power „Jezerštica" was built in 2013
- Small hydro power „Vrelo" was built in 2015
- Small hydro power „Bistrica" was built in 2015
- Small hydro power „Orah" was built in 2015
- Small hydro power „Rmuš" was built in 2015
- Small hydro power „Spalevići 1" was built in 2015
- Small hydro power „Bradavec" was built in 2015
- Small hydro power „Šekular" was built in 2016
- Small hydro power „Jara" was built in 2016
- Small hydro power „Babino polje" was built in 2017
- Small hydro power „Piševska rijeka" was built in 2017
- Wind Power Plant „Krnovo" was built in 2017

Comsuption

- Power consumption in 2017:
  - distribution 2 653 GWh
  - industry 461 GWh



Location of renewable energy sources

- Podgor(0.46MW)
- Rijeka Crnojevića(0.65MW)
- Rijeka Mušovića(1.95MW)
- Slap Zete(2.4MW)
- Glava Zete(6.4MW)
- Šavnik(0.2MW)
- Lijeva Rijeka(0.11MW)
- Jezerštica(1MW)
- Vrelo(0.59MW)
- Bistrica (5.10MW)
- Orah (1.17MW)
- Rmuš (0.48MW)
- Spaljevići (0.61MW)
- Bradavec (1MW)
- Šekular (1.71MW)
- Jara (4.57MW)
- Babino Polje (2.12MW)
- Piševska Rijeka (1MW)
- WPP Krnovo (72MW)

Development of wind power

- WPP Krnovo (installed power 72 MW) is under operation from 2017
- WPP Možura (installed power 46 MW) is expected to be build soon

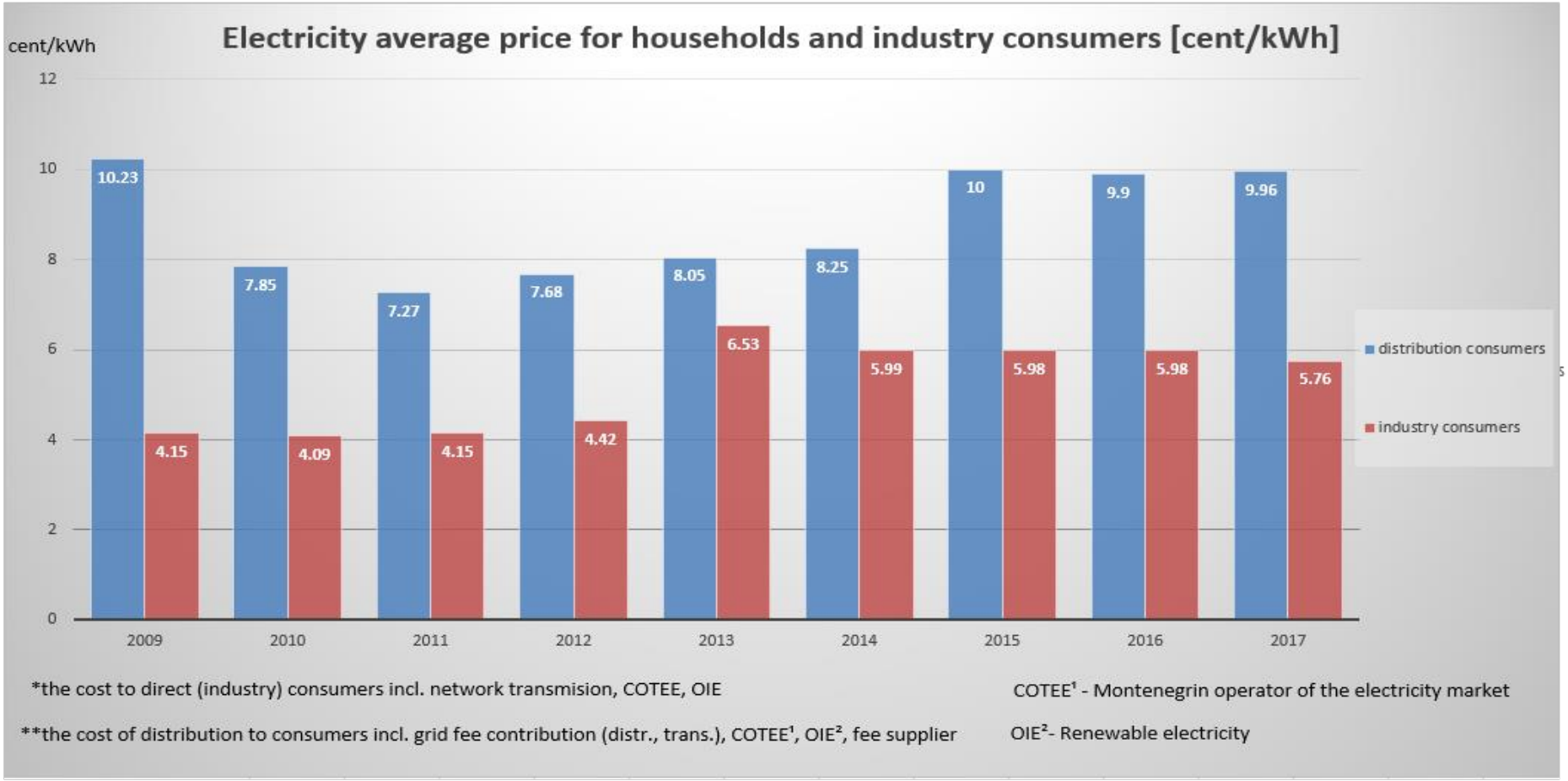
Development of photovoltaic power

- There aren't any photovoltaic power sources in Montenegro

RES installed capacity and production

- Small hydro power plants produced 84.47 GWh in 2017
- Wind power plnat Krnovo produced 37.98GWh in 2017 (production started in decembre 2017.)
- Hydro power plants (HPP Perućica and HPP Piva) produced 561.48GWh and 360.445GWh respectively

Price development for households and industry consumers



Electricity market organisation

The electricity market in Montenegro is officially open from 1st January 2009.

It consists of wholesale and retail markets.

Established the model of the wholesale electricity market including:

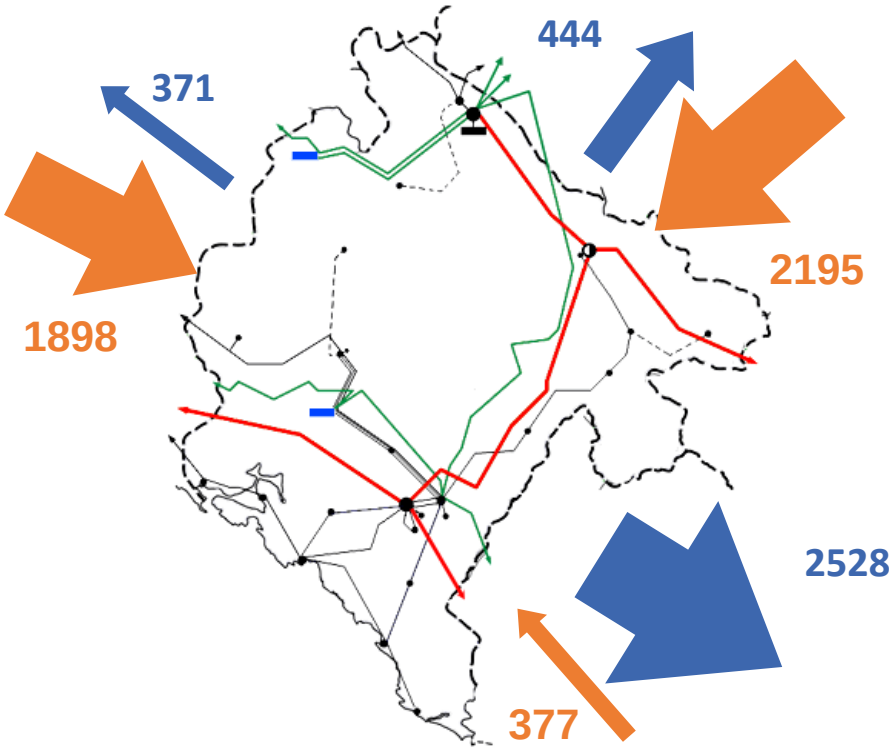
- long-term - market based on bilateral contracts,
- in the medium term - the day ahead market,
- in the short term - the balancing market.

Power balance in 2017

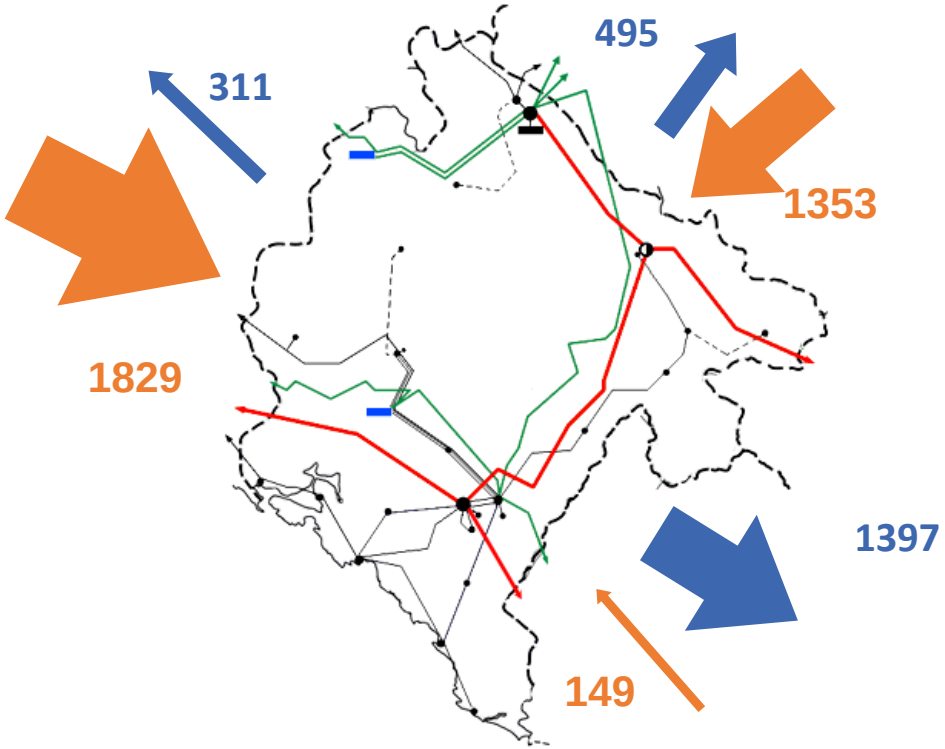
- Generation 2 292 GWh
- Consuption 3 325 GWh
- Imports 3 331 GWh
- Exports 2 202 GWh
- Losses 126 GWh

Energy exchanges in 2017.

Commercial flows (MWh)



Physical flows (MWh)



Specific aspects of the electricity market

- Market coupling
- Market splitting
- Day-ahead
- Futures