



The Electric Power system

KOSOVO



cigre

For power system expertise

Power system of KOSOVO

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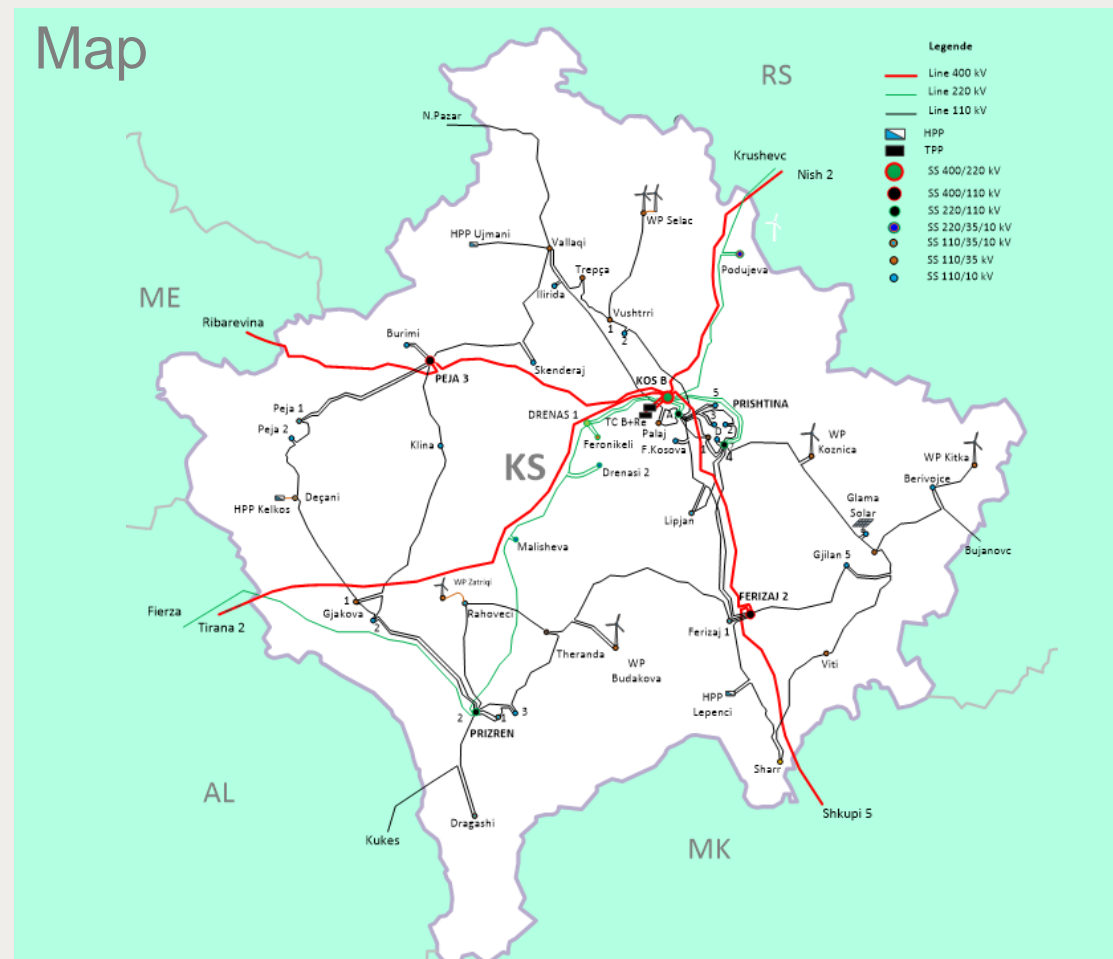


Basic facts

- Area: 10.905 km²
- Population: 1.782 million (2019 estimate)
- Number of electricity consumers: ~600,000
- Number of TSOs: 1 (KOSTT)
- Number of DSOs: 1 (KEDS)
- Peak load: 1253 MW (2019, Winter)
- Average interruption of electricity(2019): 612min/interruption

Global map of the grid and of its interconnections

- Interconnectors with:
 - Albania
 - Montenegro
 - North Macedonia
 - Serbia



Grid facts and characteristics (1/2)

Transmission network (part of network operated by TSO - KOSTT)

Substations	Voltage ratio	No. of Substations	Installed capacity of Power Transformers (MVA)
	400/220 kV	1	900
	400/110 kV	2	1200
	220/110 kV	3	1350
	220/x kV	2	160
	110/x kV	33	2271

Lines	Voltage level	Length (km)
	400 kV	280
	220 kV	238
	110 kV	893
	All levels (sum)	1411

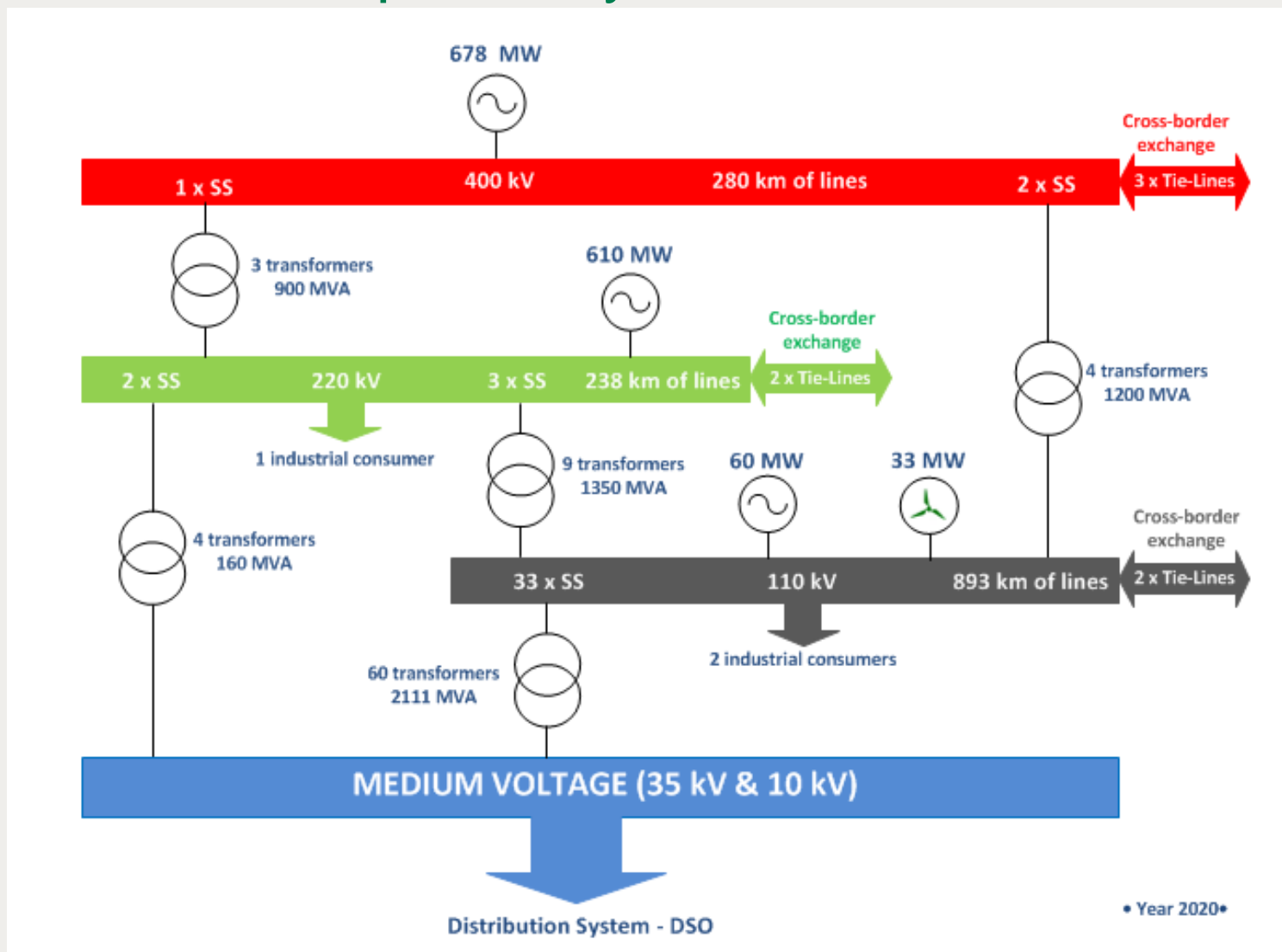
Grid facts and characteristics (2/2)

Distribution network (part of network operated by DSO - KEDS)

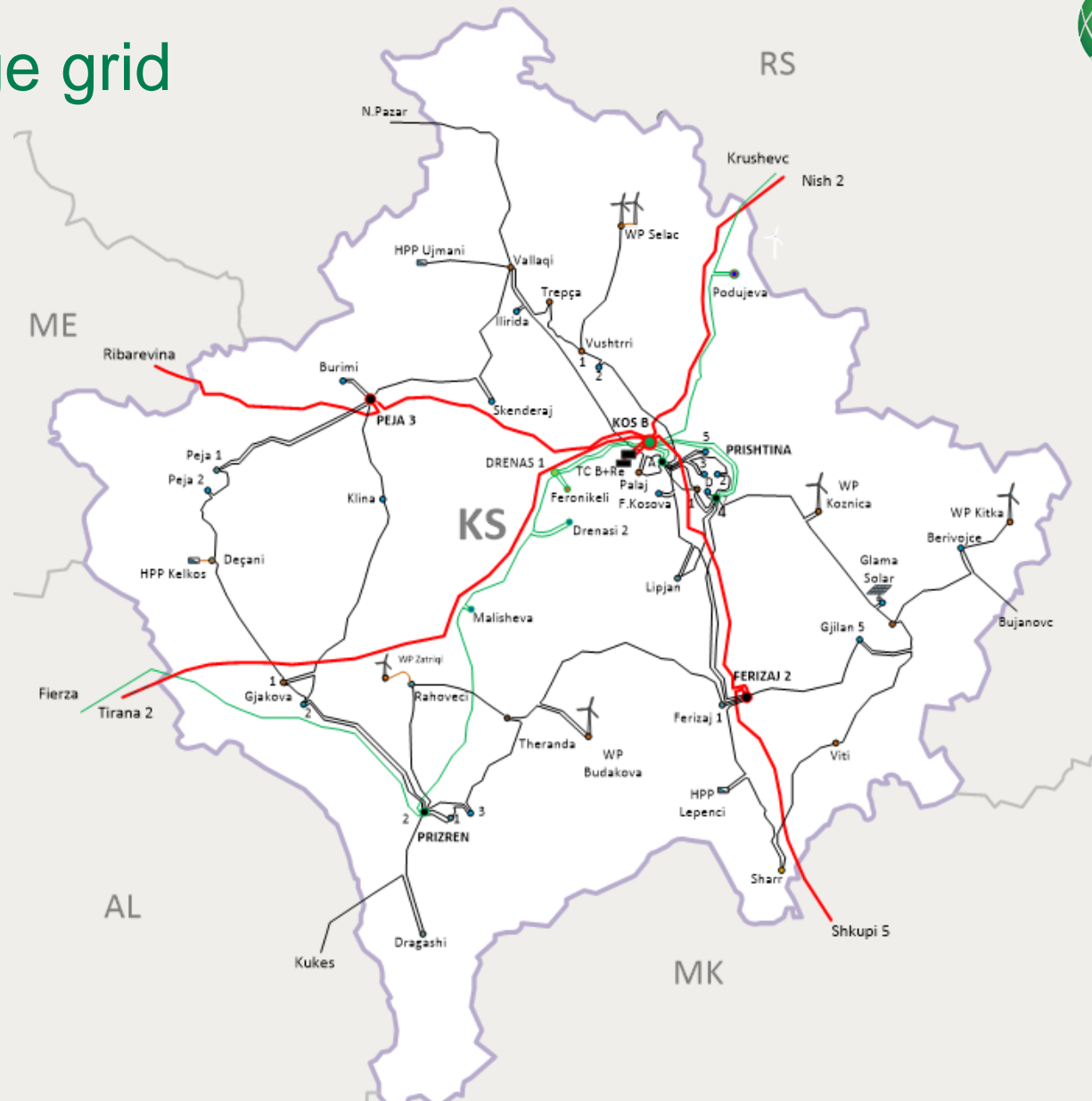
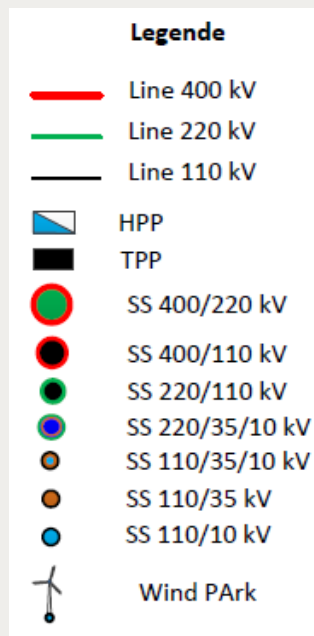
Substations	Voltage ratio	No. of Substations	Installed capacity of Power Transformers (MVA)
	35/10 kV	54	725
	35/20 kV	1	4
	35/0.4 kV	17	22
	10(20)/0.4 kV	4881	2471
	10/0.4 kV	4112	1474

Lines	Voltage level	Length (km)
	35 kV	613
	10(20) kV	1,946
	10 kV	5,069
	0,4 kV	19,632

Structure of electrical power system



Map of the high voltage grid



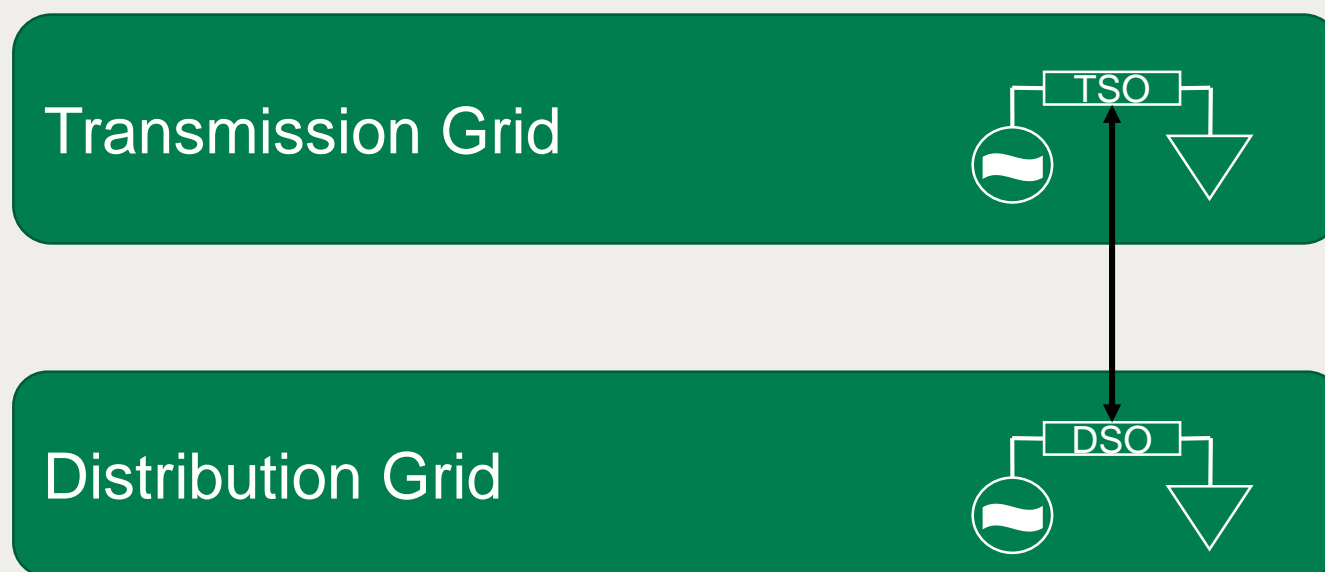
Power system of KOSOVO

Information on TSO(s)

- Name: KOSTT J.S.C – Transmission, System and Market Operator
- Network length (km): 1411
- Served area (km²): 10,905
- Annual transmitted energy (TWh): 8,267
- website: <http://www.kostt.com>

Cooperation of TSO and DSOs

- Cooperation between TSO and DSO in Kosovo is very well connected.
- The border between TSO and DSO is the secondary side of the power transformers 110/x kV.



Responsibilities of TSO & DSOs

- The responsibility of TSO:
 - Transmission of electricity safely and reliably from power plants connected to transmission grid or import from neighbor power systems to the distribution system, 24 hours a day, 365 days a year.
 - Control, maintenance and development of high voltage network
 - Transparency and non-discrimination for transmission system users in the competitive electricity market.
- The responsibility of DSO:
 - Distribution of electricity from transmission network up to the last consumers, manages and maintains assets in site.
 - Control, maintenance and development of medium and low voltage networks
 - To operate in the most efficient way, etc.

Power structure of the country / countries

Electric energy sources	Installed capacity (2019)	Energy Production (2019)	Production share (2019)
Thermal	1288 MW	5403 GWh	94,49%
Hydro	49 MW	156 GWh	2,73%
Renewables	93 MW	159 GWh	2,78%
• Hydro	49 MW	57 GWh	35,85%
• Wind	34 MW	91 GWh	57,23%
• Solar	10 MW	11 GWh	6,92%
TOTAL	1430 MW	5718 GWh	100,00%

Installed capacity with reference to primary resources

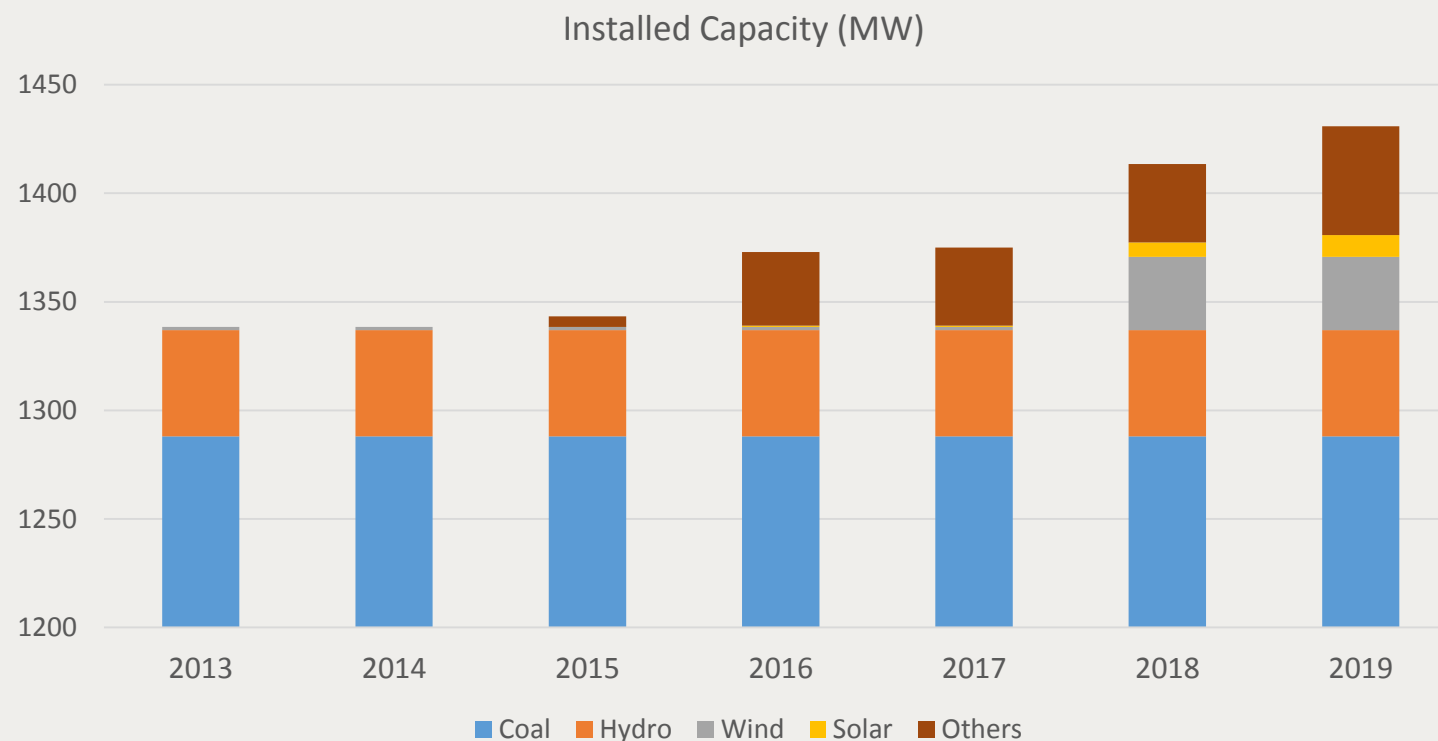
No.	Primary resource	Installed capacity (GW) 2019
1.	Biomass	0.000
2.	Coal	1.288
3.	Gas	0.000
4.	Hydro power	0.049
5.	Lignite	0.000
6.	Nuclear	0.000
7.	Oil	0.000
8.	Solar power	0.010
9.	Wind power	0.034
10.	Others	0.049

Energy production with reference to primary resources

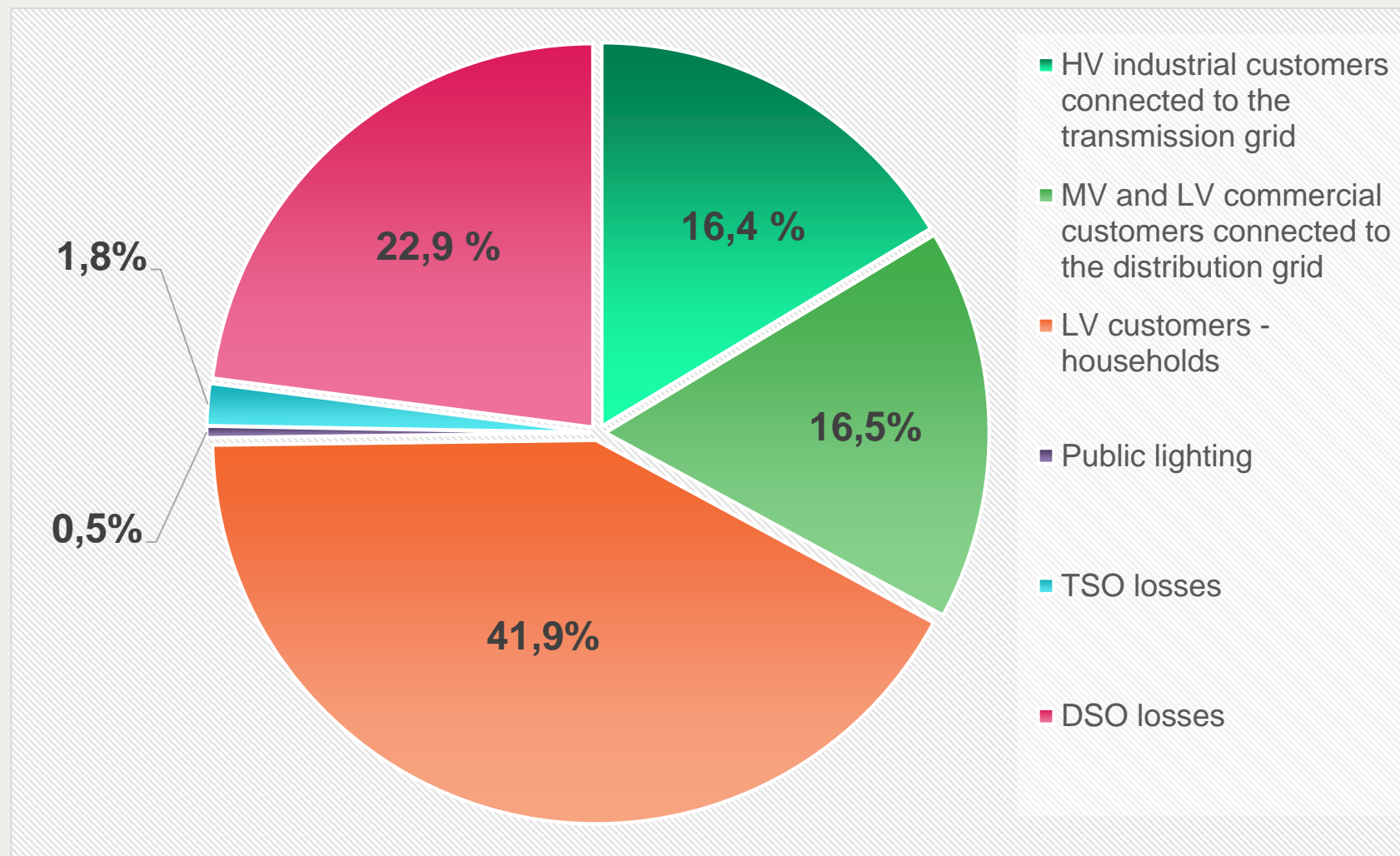
No.	Primary resource	Energy generated (TW) 2019
1.	Biomass	0.000
2.	Coal	5.403
3.	Gas	0.000
4.	Hydro power	0.156
5.	Lignite	0.000
6.	Nuclear	0.000
7.	Oil	0.000
8.	Solar power	0.011
9.	Wind power	0.091
10.	Others	0.057

Development of generation capacity

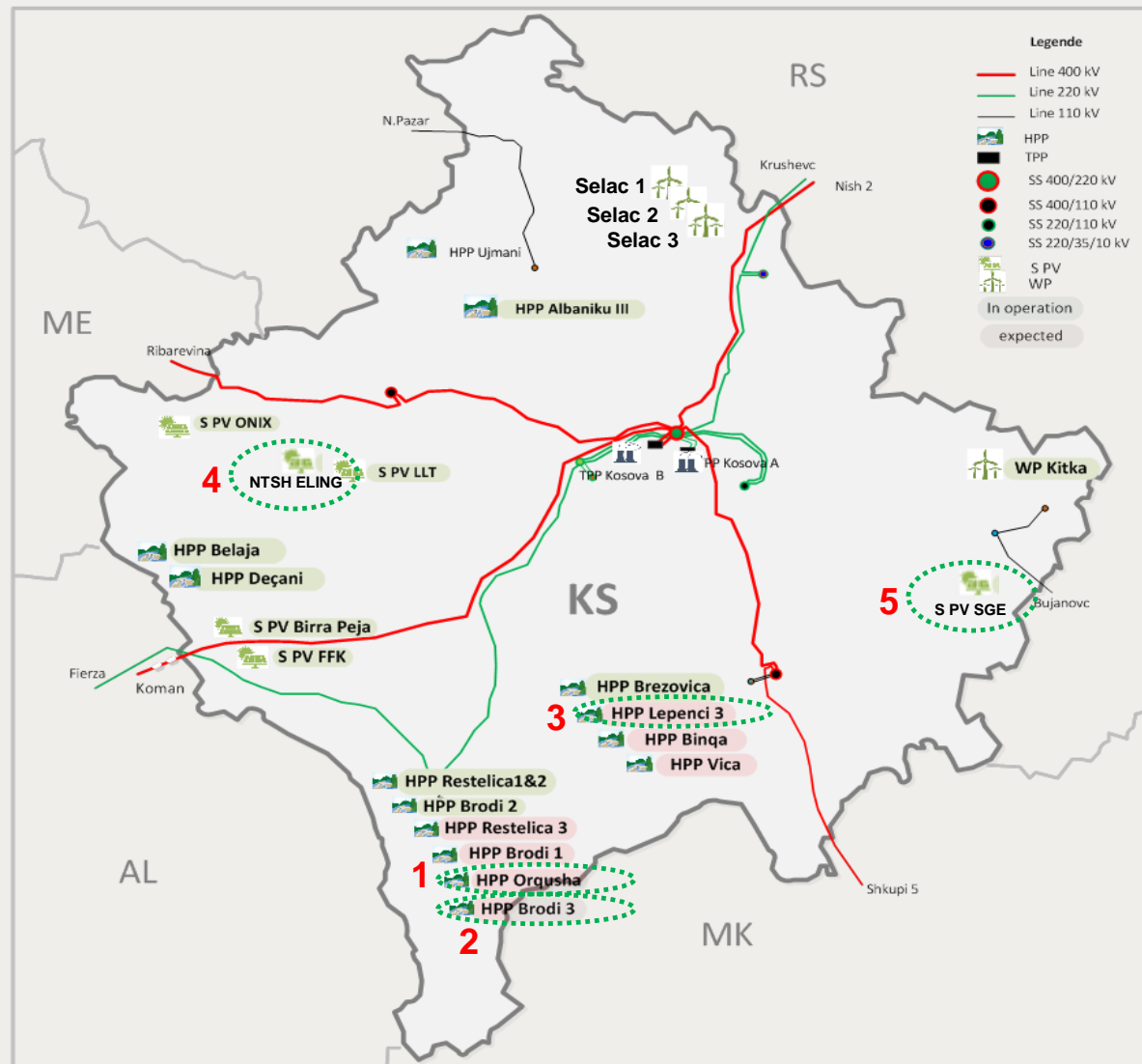
Year	Coal	Hydro	Wind	Solar	Others
2013	1288	49	1	0	0
2014	1288	49	1	0	0
2015	1288	49	1	0	5
2016	1288	49	1	1	34
2017	1288	49	1	1	36
2018	1288	49	34	7	36
2019	1288	49	34	10	49



Consumption per customer groups



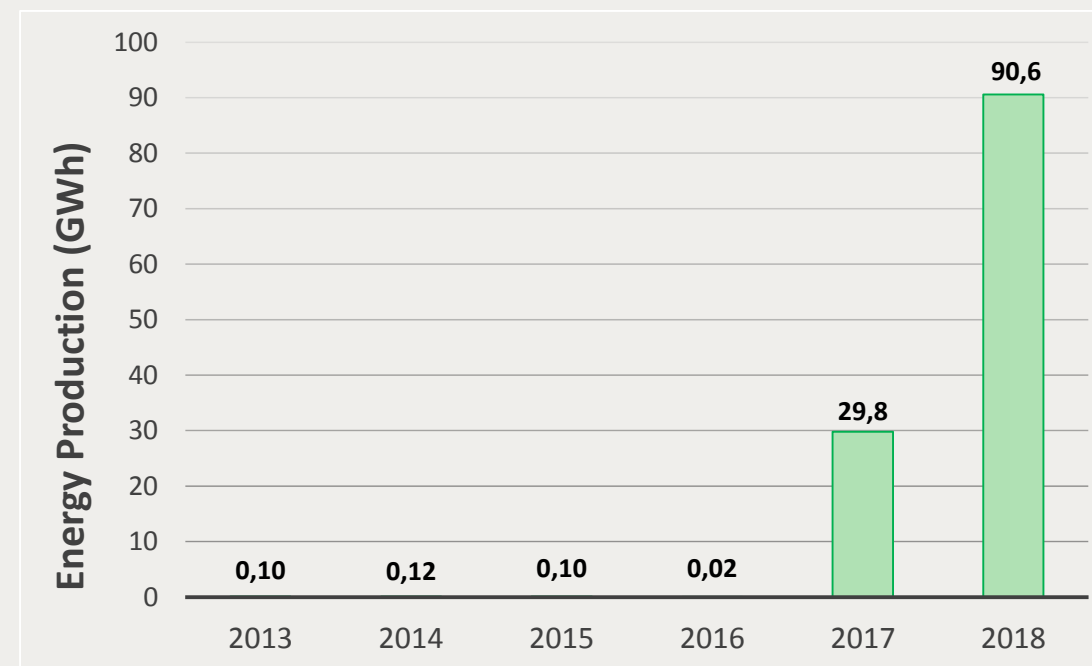
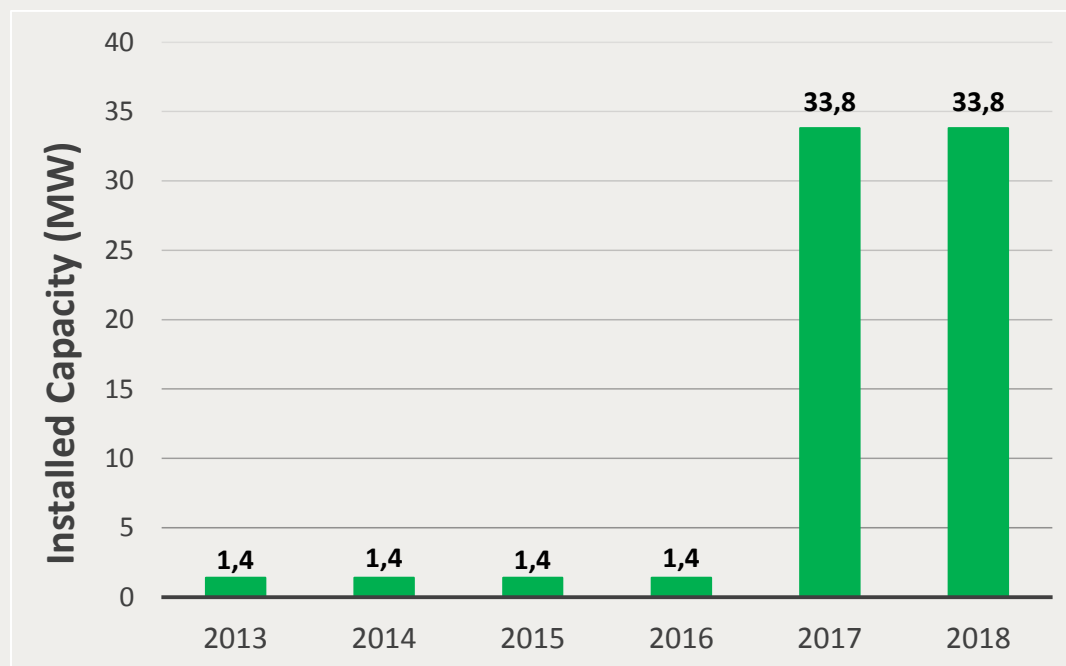
Location of renewable energy sources



Power system of KOSOVO

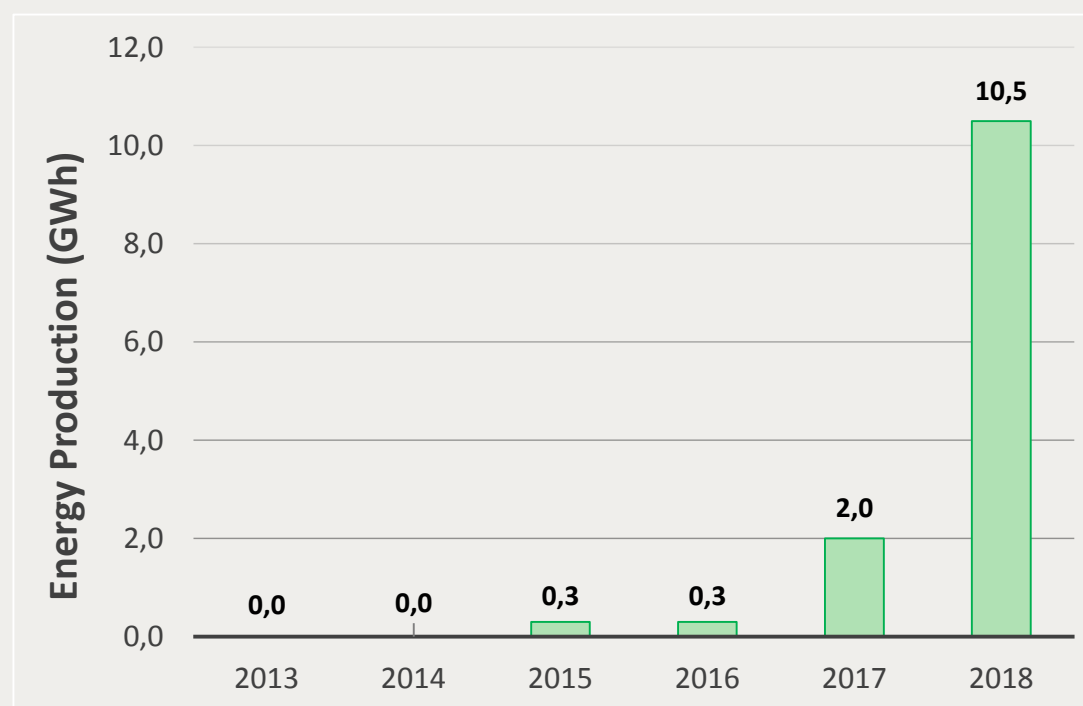
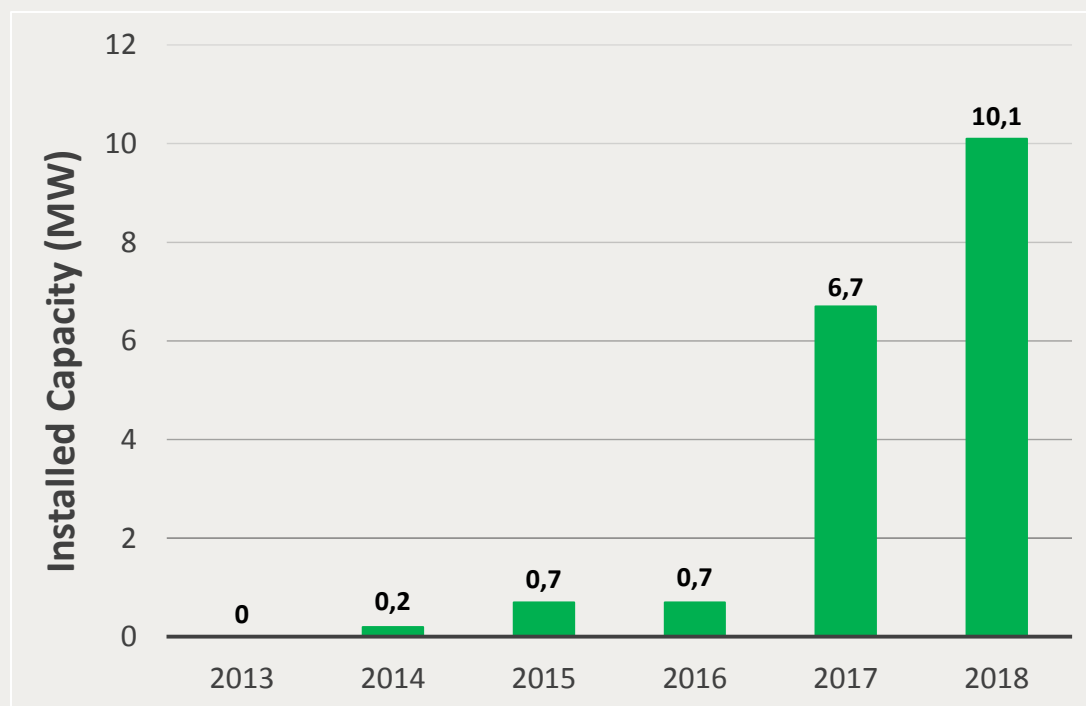
Development of wind power

Year	2014	2015	2016	2017	2018	2019
Installed Capacity (MW)	1.4	1.4	1.4	1.4	33.8	33.8
Energy Production (GWh)	0.10	0.12	0.10	0.02	29.8	90.6



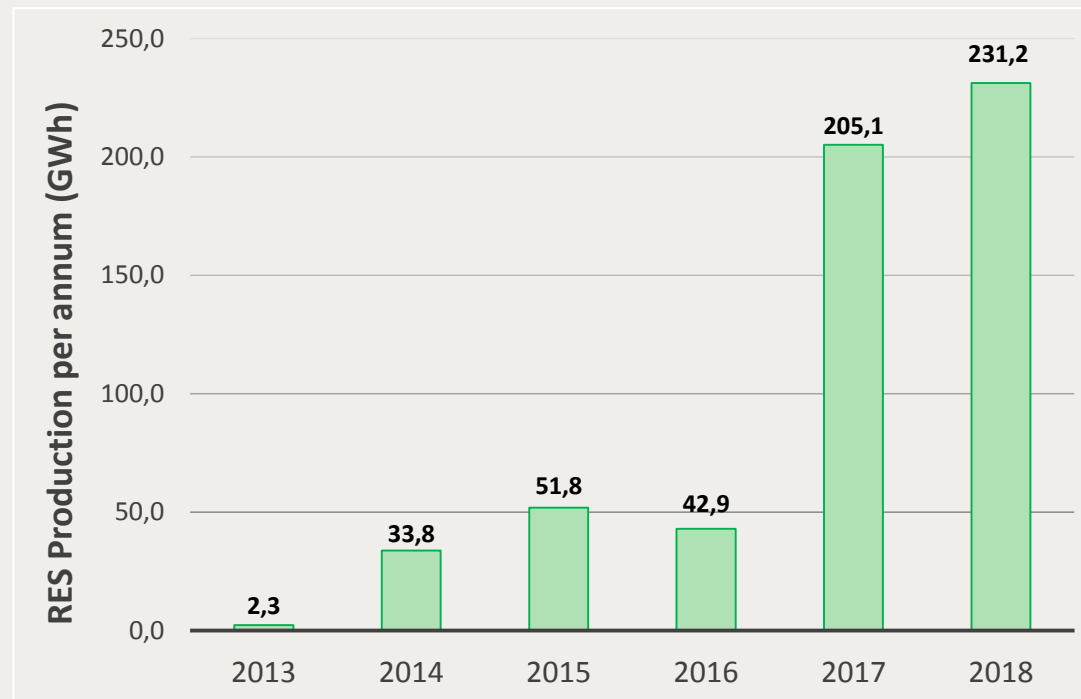
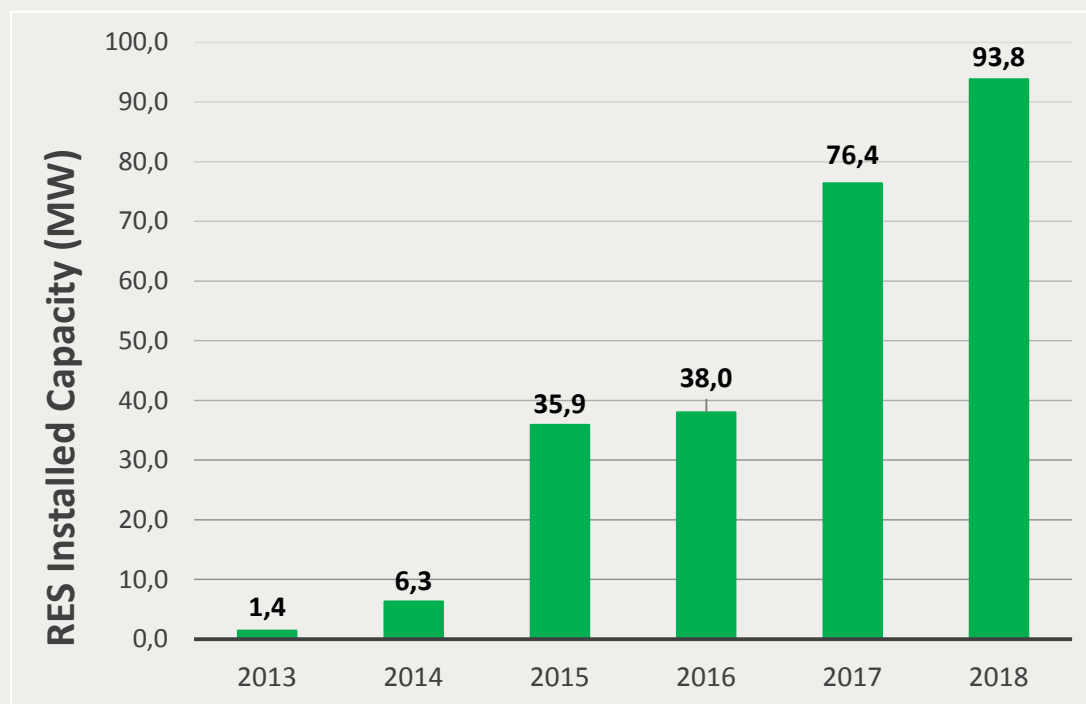
Development of photovoltaic power & CSP

Year	2014	2015	2016	2017	2018	2019
Installed Capacity (MW)	0.0	0.2	0.7	0.7	6.7	10.1
Energy Production (GWh)	0.0	0.0	0.3	0.3	2.0	10.5



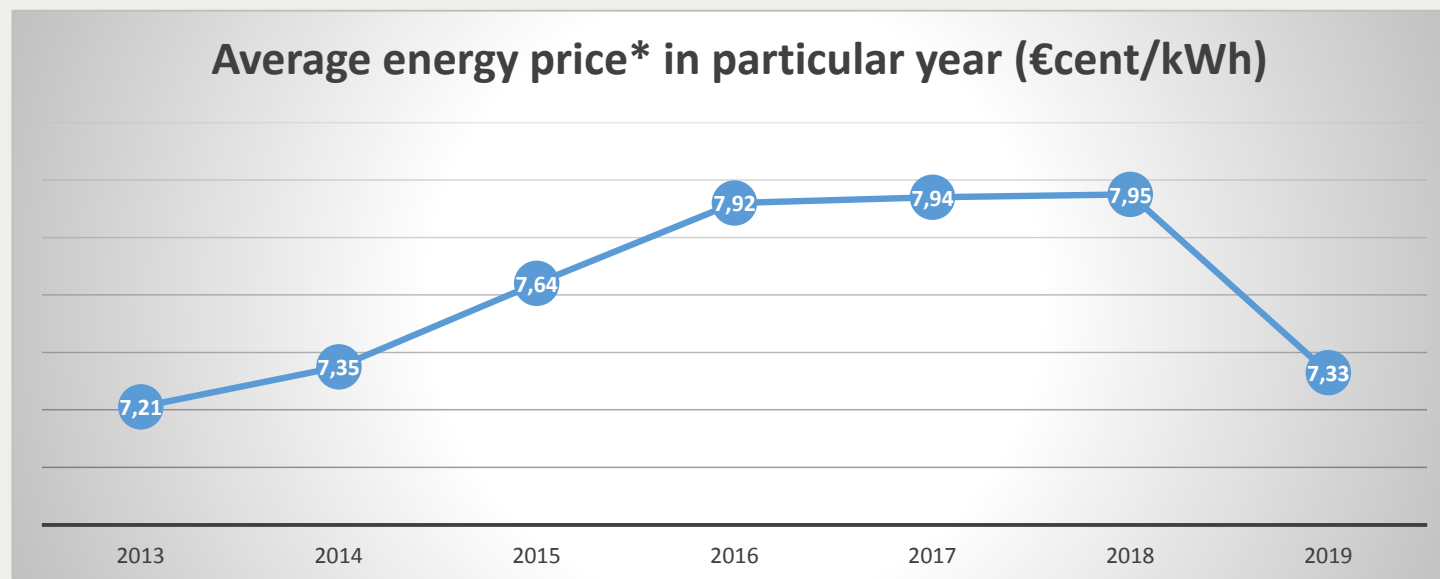
RES installed capacity and production per annum

Year	2014	2015	2016	2017	2018	2019
Installed Capacity (MW)	1.4	6.3	35.9	38.0	76.4	93.8
Energy Production (GWh)	2.3	33.8	51.8	42.9	205.1	231.2



Price development for industry consumers

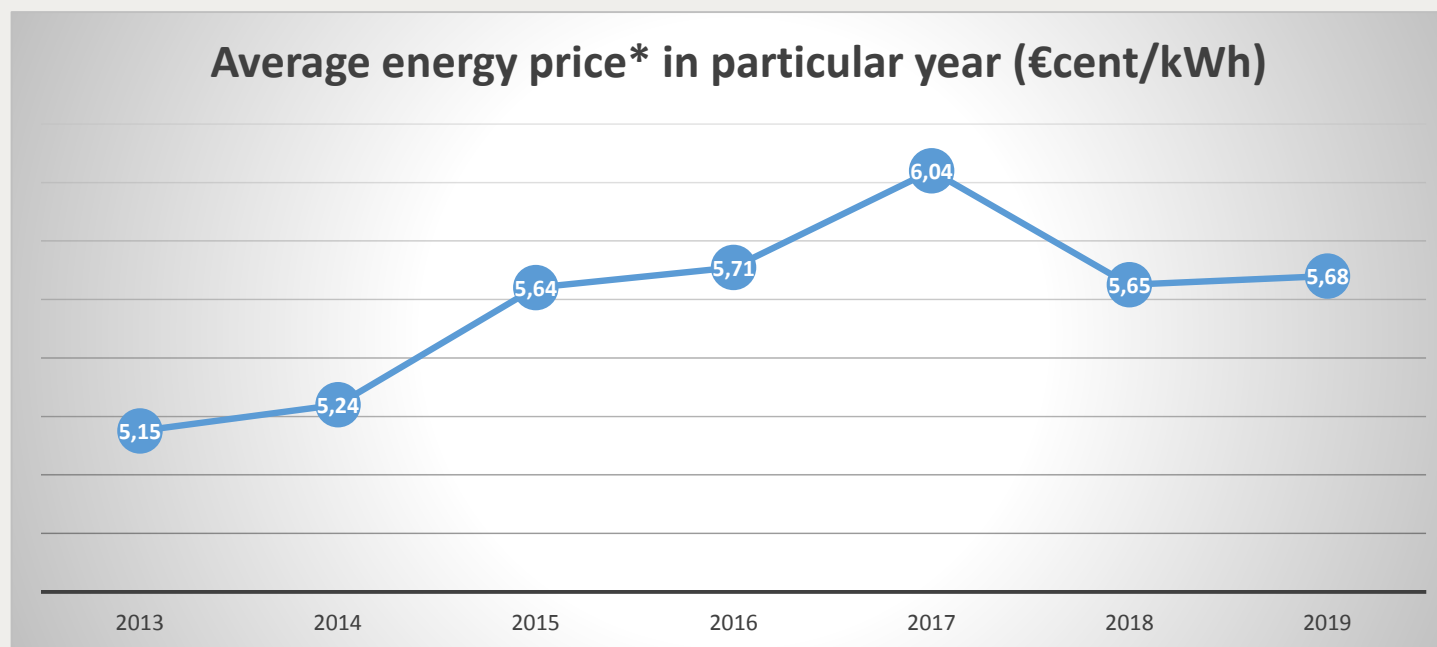
Consumer category	Voltage level	Average energy price* in particular year (€cent/kWh)						
		2013	2014	2015	2016	2017	2018	2019
Industry, Commercial, Public lights	medium & low	7,21	7,35	7,64	7,92	7,94	7,95	7,33



*prices are without VAT

Price development for households

Consumer category	Voltage level	Average energy price* in particular year (€cent/kWh)						
		2013	2014	2015	2016	2017	2018	2019
Households	low	5,15	5,24	5,64	5,71	6,04	5,65	5,68



*prices are without VAT

Electricity market organisation

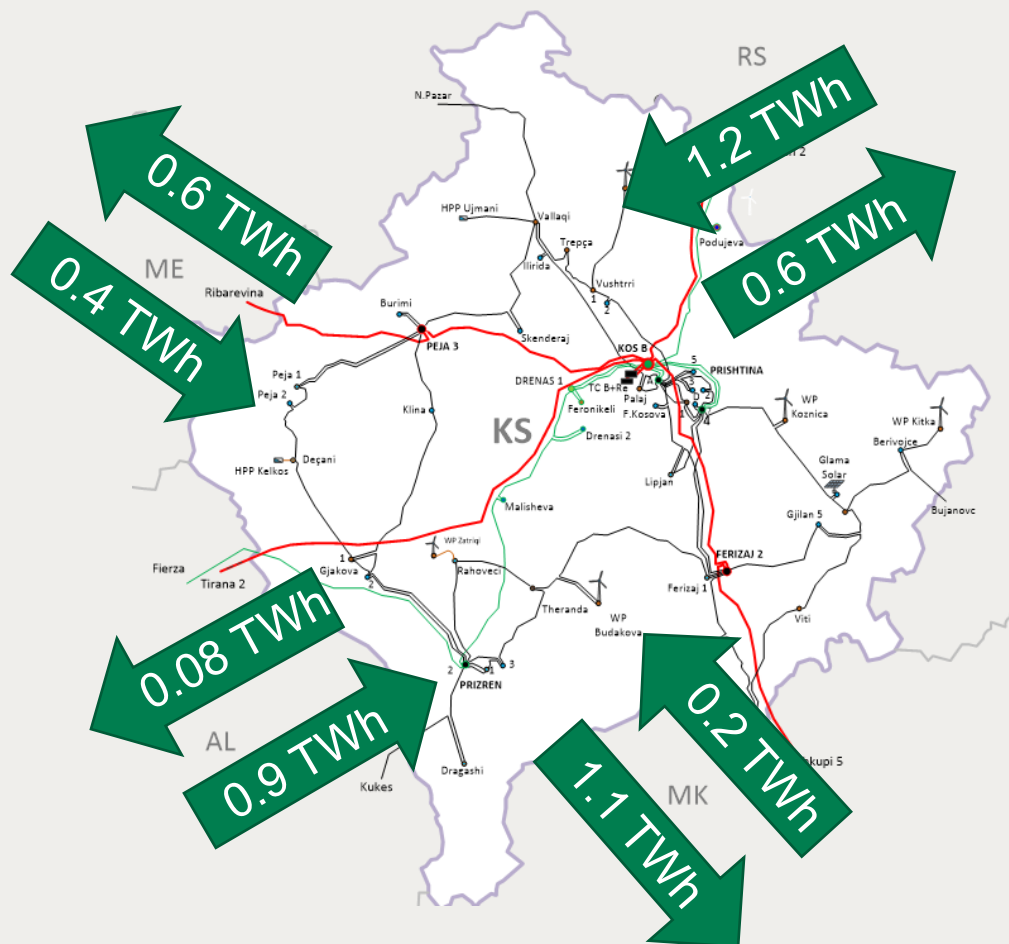
- Kosovo's power system is characterized by main entities such as:
 - KEK is a dominant party in generation;
 - KOSTT is transmission system and market operator;
 - KEDS is a fully independent network distribution operator unbundled from supply activities;
 - KESCO is a supply company which is also obliged with the role of the Public Services Obligation to supply consumers with the right to get universal supply service.
- The wholesale electricity market in Kosovo is mainly bilateral market supported by Balancing Mechanism.
- Wholesale electricity market in Kosovo is deregulated.
- Retail Market is largely regulated and reforms in retail market are underway.
- All consumers at the market have the right to freely change their supplier.

Power balance in 2018 / 2019

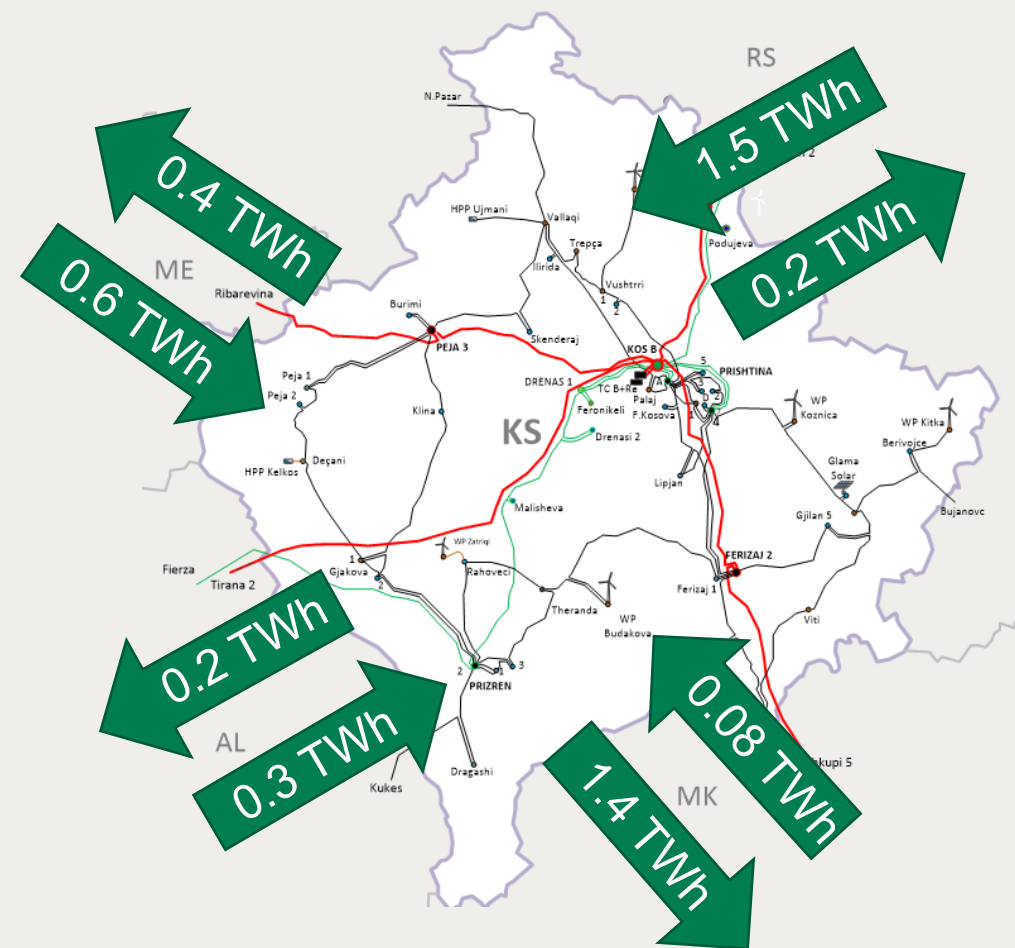
- Generation (TWh): 5.311 / 5.718 GWh
- Consumption (TWh): 5.740 / 6.070 GWh
- Imports (TWh): 825 / 928 GWh
- Exports (TWh): 677 / 905 GWh
- Losses (TWh): 111 / 105 GWh

Energy exchanges in 2018 / 2019 – Physical flows

2018



2019



Specific aspects of the electricity market

- The electricity wholesale models in Kosovo is based on bilateral contracts without organized marketplace.
- Kosovo and Albania are in process to establish joint PX and it is scheduled to start operation in mid-2021.
- The balancing mechanism has started real operation from June 1, 2017, but lack of competition is observed.
- KOSTT(KS) and OST(AL) have signed agreement for establishment of LFC Block which enables sharing reserves and balancing market.