

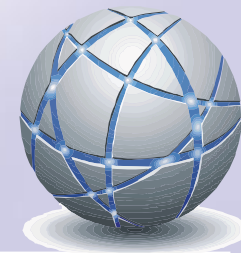


UTILITY RESILIENCE

Emergency situations and lessons learned in SEE region

WEBINAR
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Elektroenergetski Koordinacioni Centar d.o.o.
Electricity Coordinating Center Ltd.
V. Stepe 412, 11040 Belgrade 33, Serbia
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About EKC

- ☉ EKC was founded in 1993 by Electric Power Enterprises of Serbia, FYR Macedonia, Montenegro and Power Utility of RS in B&H
- ☉ Primary activity was to coordinate and control the electric power systems in South Eastern Europe
- ☉ **EKC today** - engineering consultancy firm that provides a full range of incorporated strategic business, technical and software services in the area of electric power systems, transmission and distribution as well as generation development and electricity market

Founders and Owners



Serbian Transmission System
and Market Operator
www.ems.rs



Montenegrin Transmission
System Operator
www.cges.me



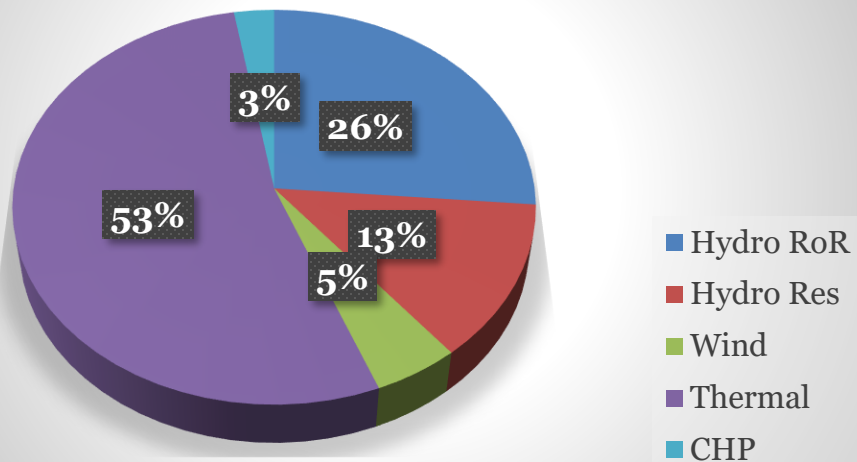
Macedonian Transmission
System Operator
www.mepso.com.mk



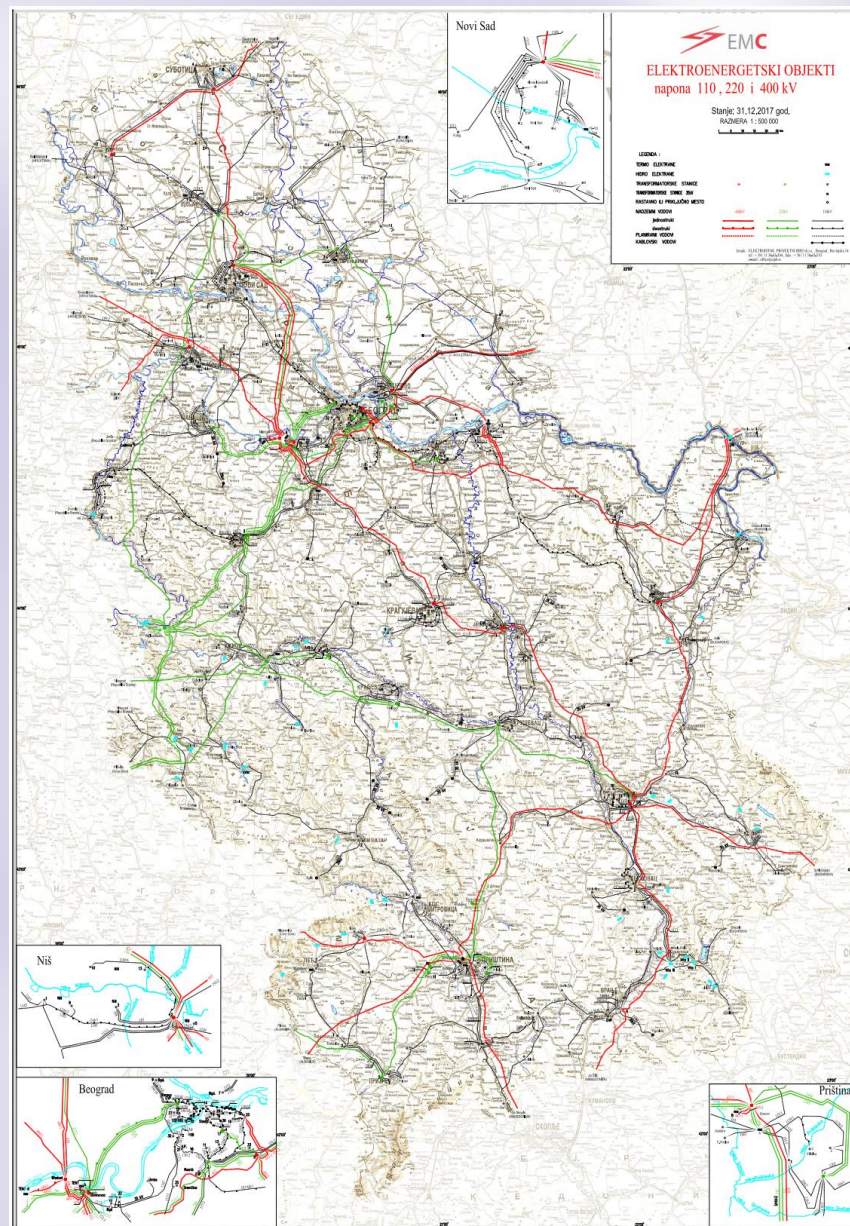
ELEKTROPRIVREDA RS

Power Utility of the Republic
Srpska
www.ers.ba

Installed capacities

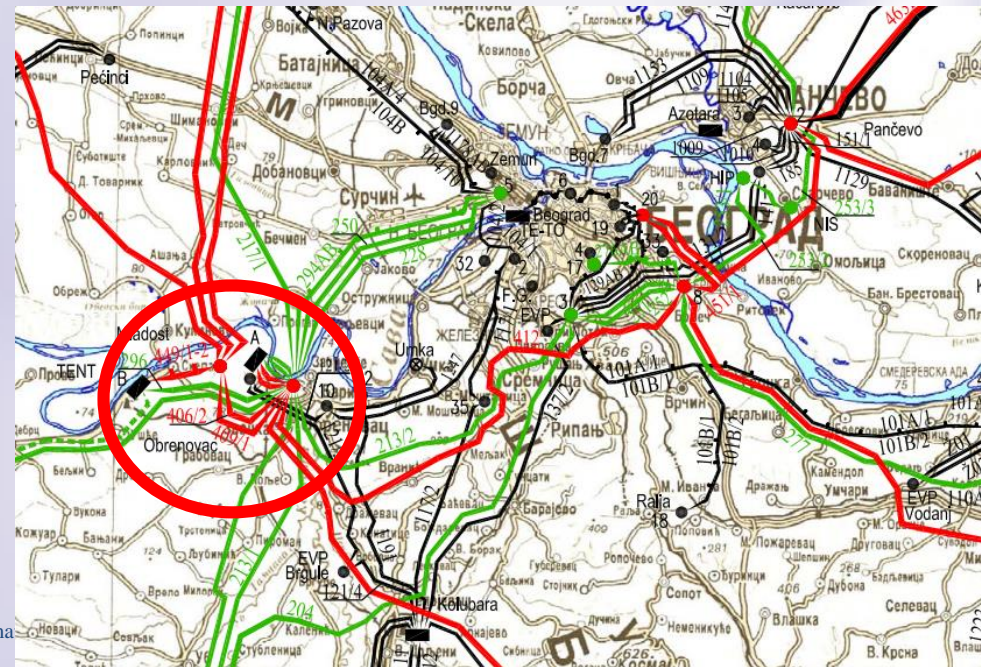


Total capacity is 7665 MW



Emergency situation - Southeast Europe floods

- The heaviest rain in 120 years of recorded weather measurements
- Damage in Serbia stands at 1.55 billion euros
- During the flooding period, an estimated 300,000 households were left without electric power
- Flood waters filled the largest coal field of RB Kolubara with 210 million cubic meters of water
- The mining equipment was damaged (coal railway)
- The water penetrated into major 400 kV substation in vicinity of thermal power plan Nikola Tesla A and B



Emergency situation - Southeast Europe floods

Over 1000 MW of thermal capacities were unavailable + 1500 MW in the regular annual maintenance period

Major hydro facility opened the gates in order to lower the level of the river Danube – additional 500 MW was lost

The lack of power is covered from the neighboring systems

No load shedding in non-flooded areas





Emergency situation - Southeast Europe floods

DEFENSIVE MEASURES

- ☉ Preventive disconnection of distribution substations
- ☉ Voltage reductions in distribution network
- ☉ Emergency import of electricity
- ☉ Crisis headquarters 24/7 – the most experienced dispatchers were engaged for shift work

Emergency situation – Extreme winter in 2012

- ☉ Extreme weather conditions during winter in 2012 (up to -30 degree Celsius with strong wind)
- ☉ After 30 years, ice showed up on Sava river, suction pumps were clogged
- ☉ Coal mining reduced to less than 70% of planned amount
- ☉ The record of daily consumption in Serbia – 163 millions KWh
- ☉ Coal railway collapsed (coal landfills are used)
- ☉ Cross-border capacities in the region are used only for national purposes





Lessons learned

- Detailed system defense plan needs to be prepared in advance
- Non-centralized production portfolio → More investments in distributed generation
- Increasing capacities of coal landfills
- Continuous training of dispatchers for emergency situations
- Investment in demand response
- Short and Medium Term Adequacy Forecasts