



# Ukrainian NC CIGRE

## Energy transition and war in Ukraine



**cigre**

For power system expertise



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Before 24.02.2022

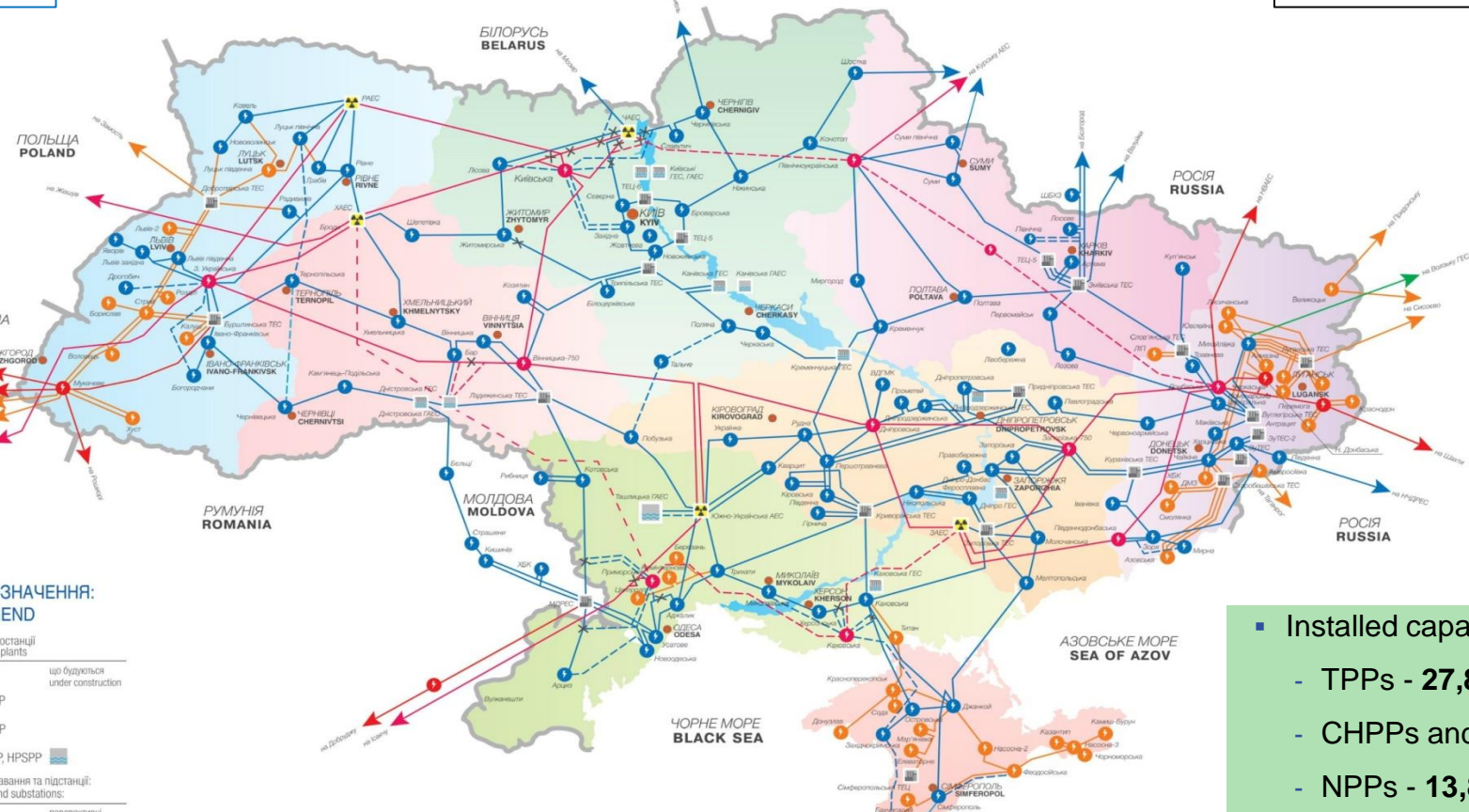
One of the biggest power systems in Europe



NTSO-E

Russia

Burshtyn Island



УМОВНІ ПОЗНАЧЕННЯ: LEGEND

Електростанції Power plants	
діючі currently in operation	що будуються under construction
	АЕС/НРР
	ТЕС / ТРР
	ГЕС, ГАЕС / НРР, НРСПП
Лінії електропередавання та підстанції: Power lines and substations:	
діючі currently in operation	перспективні future projects
	• ±400 кВ/кВ
	• 750 кВ/кВ
	• 400-500 кВ/кВ
	• 330 кВ/кВ
	• 220 кВ/кВ

- Electricity Generation was 157,67 TW·h
- Electricity consumption - 118 billion kW/h
- Consumption, capacity max – 30 GW

- Installed capacity 54,83 GW
  - TPPs - 27,80 GW
  - CHPPs and other TPPs - 6,59 GW
  - NPPs - 13,84 GW
  - HPPs, НРСППs – 6,04 GW
  - Renewable energy – 6,93GW



After 24.02.2022

Power system is operating in insolated mode and is destroyed



Consumption – 11,1 – 14,4 GW

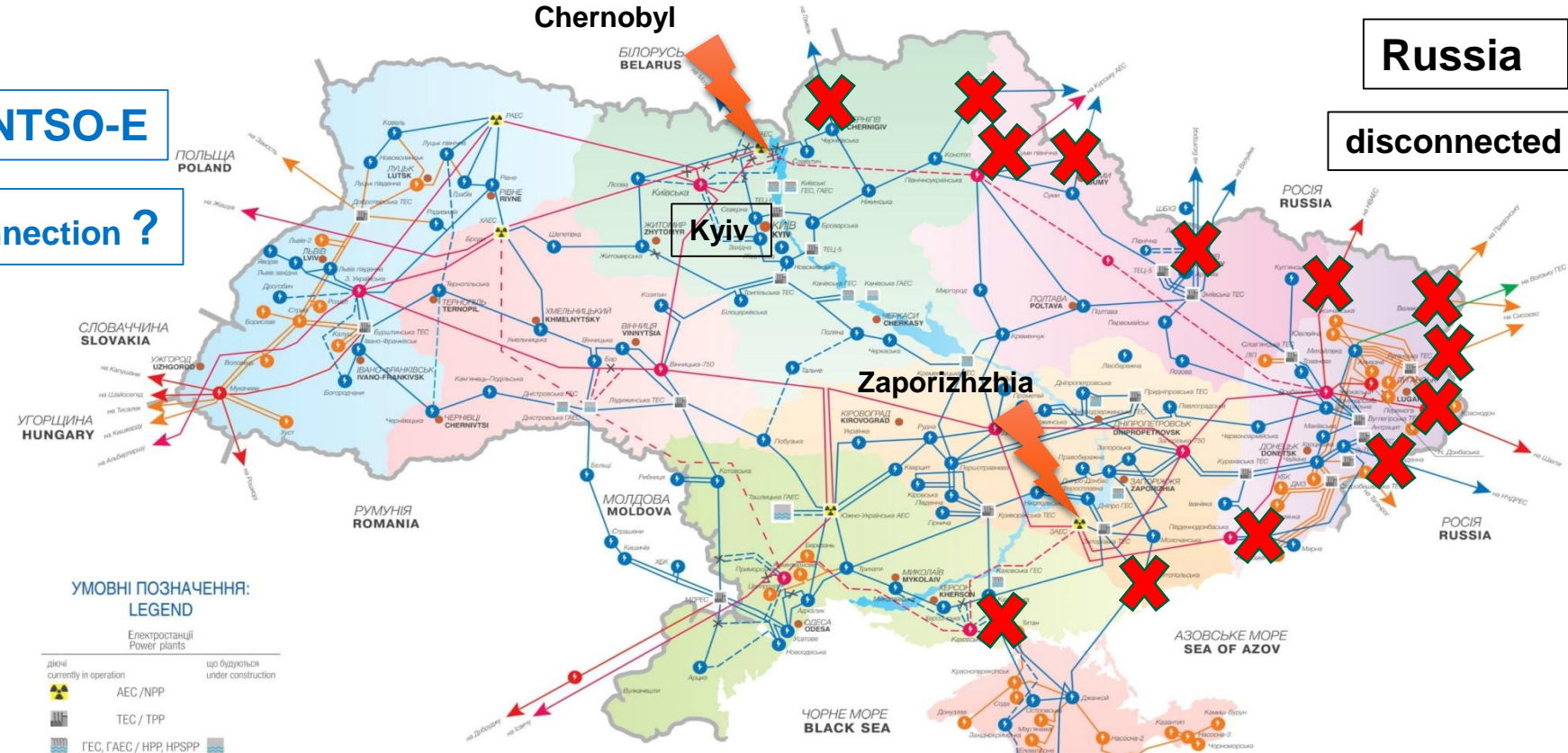
Chernobyl and Zaporizhzhia nuclear power plants are under control of the terrorists

ENTSO-E

Connection ?

Russia

disconnected



УМОВНІ ПОЗНАЧЕННЯ: LEGEND

- Електростанції Power plants
- дочі currently in operation
  - що будується under construction
  - AEC / NPP
  - TEC / TRP
  - ГЕС, ГАЕС / НРР, НРСПР
- Лінії електропередавання та підстанції: Power lines and substations:
- дочі currently in operation
  - перспективні future projects
  - ±400 кВ/kV
  - 750 кВ/kV
  - 400-500 кВ/kV
  - 330 кВ/kV
  - 220 кВ/kV

**Destroyed:**  
 Substation 330 kV – 7  
 Air Insulated Substation 750 kV – Chernobyl nuclear power plant (CNPP),  
 Substation Pivdennodonbaska 750kV/330kV

**Destroyed:**  
 HV lines 750 kV – 6  
 HV lines 330 kV – 27  
 HV lines 220 kV – 2  
 9116 villages and cities without electricity

## Power system

Ukrainian power system is one of the largest ones in Europe with capacity of 54 GW including 15 nuclear units, thermal power plants with units of 200,300,800 MW, Hydroelectric power plants on the Dnieper and Dniester rivers and lines with a voltage of 110-750 kV. Since February 24, our power system has been separated from the power system of Russia, and has been working locally, the system operator supports the 50 Hz mode of operation and ensures the stability of the mode despite the destruction of some 110-330 kV power lines.

The Russian army entered the territory of the Chernobyl nuclear power plant **where radioactive elements** are buried. There is a threat of invasion of Zaporizhzhia NPP where six 1000-MW units are installed. **Chernobyl and Zaporizhzhia nuclear power plants are under control of the russian terrorists. Missile strikes on Ukrainian nuclear power plants could destroy our planet and endanger not only Ukraine but also Paris.**

In these conditions, the system operator Ukrenergo continues to operate. Ukrhydroenergo, Energoatom, and electric network companies have not stopped working. We understand that energy security is the security of the country. As engineers, my colleagues and I work with our energy companies to support the operation of the power system. **The dozens of the specialists have been killed** until 14<sup>th</sup> of March.

**There is the question of synchronization of the Ukrainian power system with ENTSO-E and we need the support of partners.**

### Conclusion.

I believe that we, all members of CIGRE, will have many joint projects to improve the reliability of the power system in the "energy transition". Today these words gain a new definition in Ukraine.

**This war must be stopped.**

**This is war of putin's Russia against not only Ukraine, but against the World civilization.**



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Thank you and wish peaceful sky over your countries!