



The Power System of UKRAINE

Basic facts

❑ Area: 603 500 km²

The figure shown includes the area of Crimea (27 000 km²), occupied by Russia

❑ Population: 42 418 235 (as of 2017)

❑ Number of electricity consumers: 16 749 319 (households) and 579 083 (non-households)

❑ Number of TSOs: 1

❑ Number of DSOs: 39 licensed

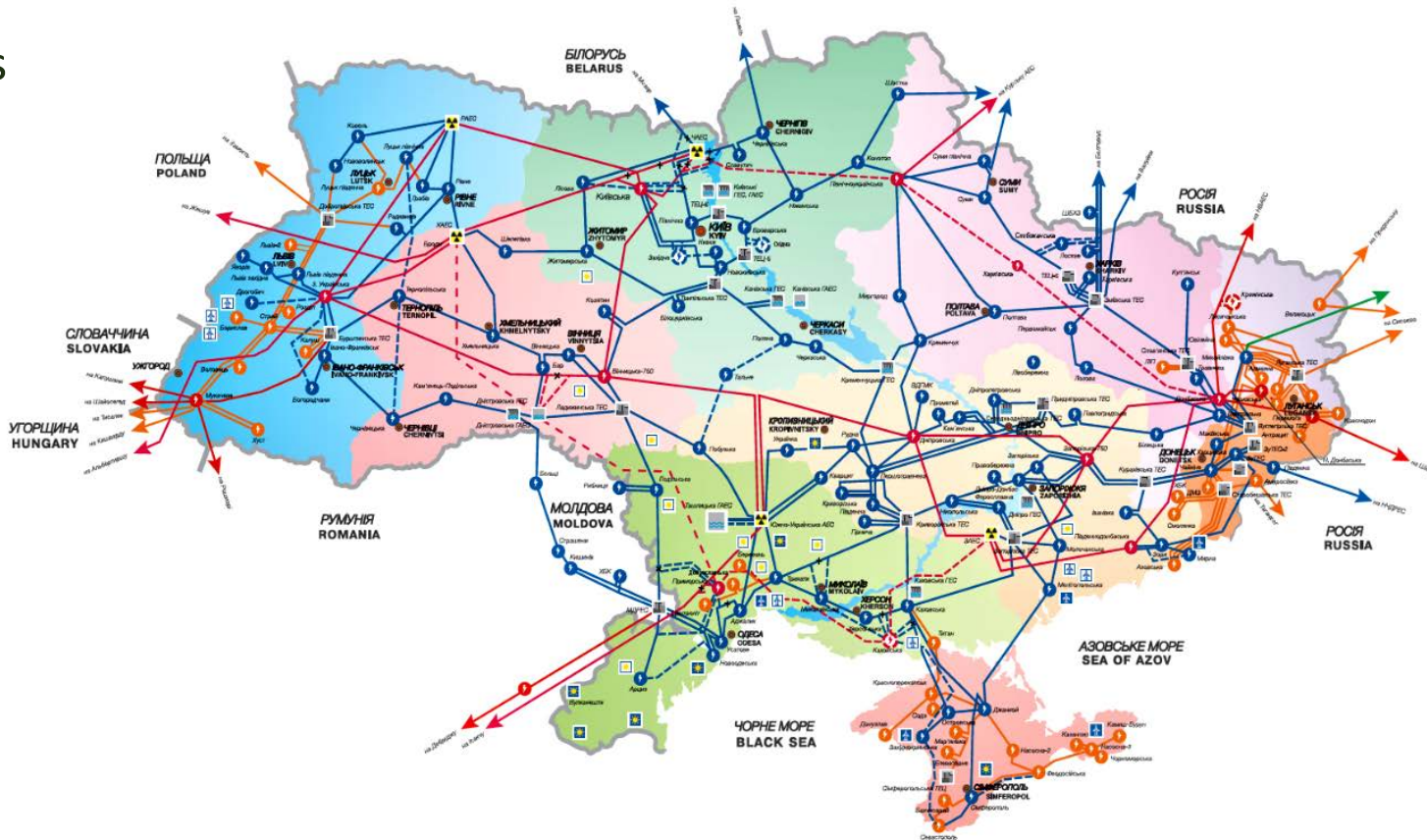
❑ Peak load: app.25 GW

❑ Average interruption of electricity: 728 minutes per year

Global map of the grid and of its interconnections (1)

Interconnectors with:

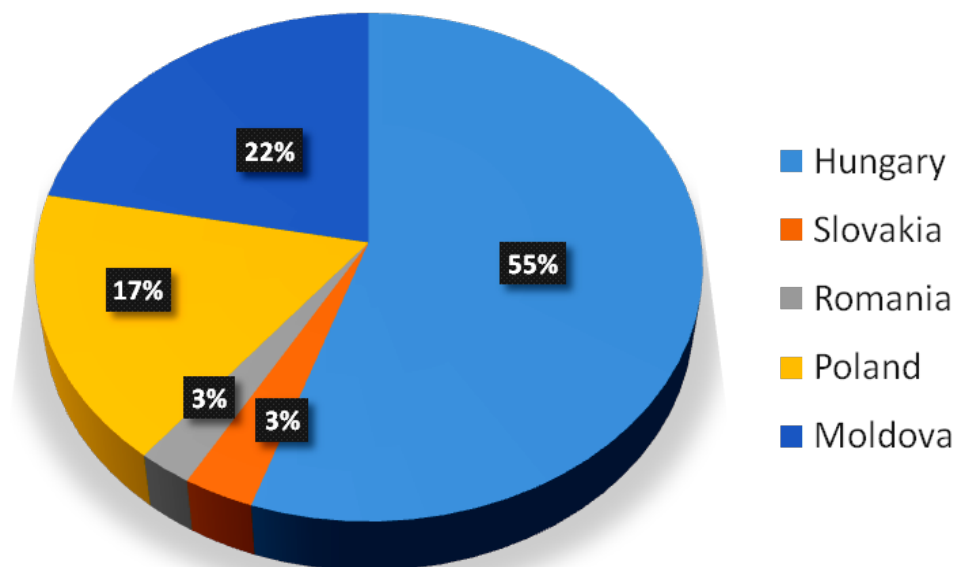
- Russian Federation
- Moldova
- Belarus
- Poland
- Slovakia
- Hungary
- Romania



Global map of the grid and of its interconnections (2)

The cross-border transmission lines of Ukrainian power system ensure the electricity exchange with the power systems of Hungary, Slovakia, Poland, Romania, Moldova, Belarus and Russia.

Country	Volume of electricity export from IPS of Ukraine in 2017 (GWh)
Hungary	2851,58
Slovakia	162,03
Romania	124,08
Poland	894,76
Russia	0,00
Moldova	1133,90
Belarus	0,00
Total export	5166,35



Grid facts and characteristics

The IPS of Ukraine has more than fifty communication links with power systems of neighbouring countries in various voltage types, including a number of power lines of voltage 220-750 kV that contributes to electricity export.

Country	Transmission lines, voltage class kV							
	750	500	400	330	220	110	35	6,10
Russia	1	2	-	6	3	5	-	-
Moldova	-	-	-	7	-	11	1	1
Belarus	-	-	-	2	-	2	1	-
Poland	1	-	-	-	1	-	-	-
Slovakia	-	-	1	-	-	-	1	-
Hungary	1	-	1	-	2	-	-	-
Romania	1	-	1	-	-	-	-	-

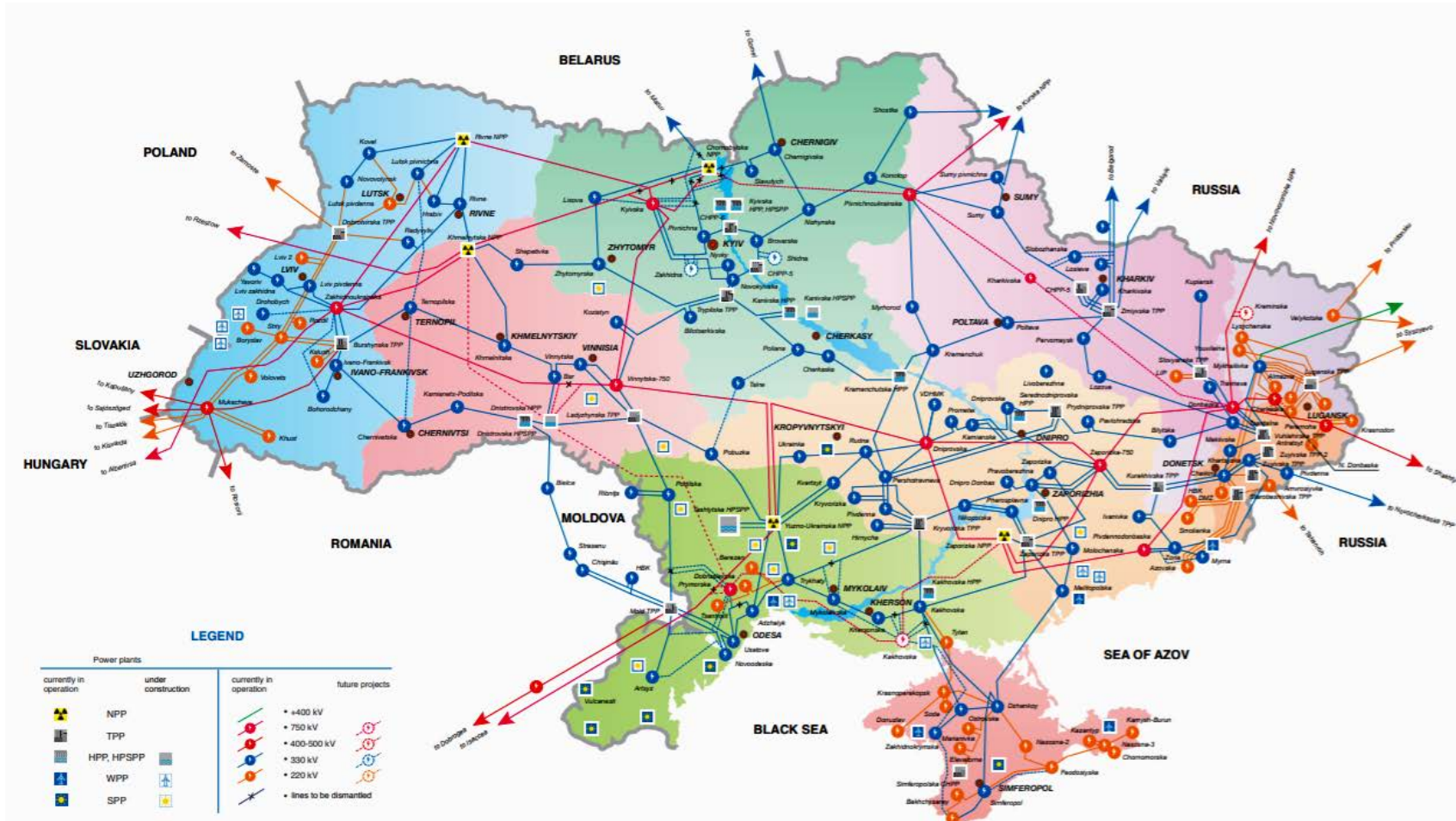
Structure of electrical power system

Installed capacity of power plants of the IPS of Ukraine, MW

	2015	2016*	2017*
NPP	13 835.0	13 835.0	13 835.0
TPP GC	27 803.0	24 565.0	24 565.0
CHPP and unit stations	6 463.0	5 946.8	5 972.3
HPP	4 698.5	4 711.0	4 719.2
HPSPP	1 185.5	1 509.5	1 509.5
WPP	427.6	300.4	328.4
SPP	359.1	458.0	758.4
Other (biomass and biogas)	54.4	62.6	96.9
Total	54 826.1	51 388.3	51 784.7

**Excluding producers from the AR Crimea and temporarily occupied territories of Luhansk and Donetsk regions*

Map of the high voltage grid



Information on TSO(s)

- ☐ Name: National Power Company UKRENERGO
- ☐ Network length (km): 21,3 thousand km of trunk and cross-border 220-800 kV overhead power transmission lines
- ☐ Annual transmitted energy (TWh): 113 837, 2 (for 2017)
- ☐ website: <http://www.ua.energy>

Responsibilities of TSO & DSOs

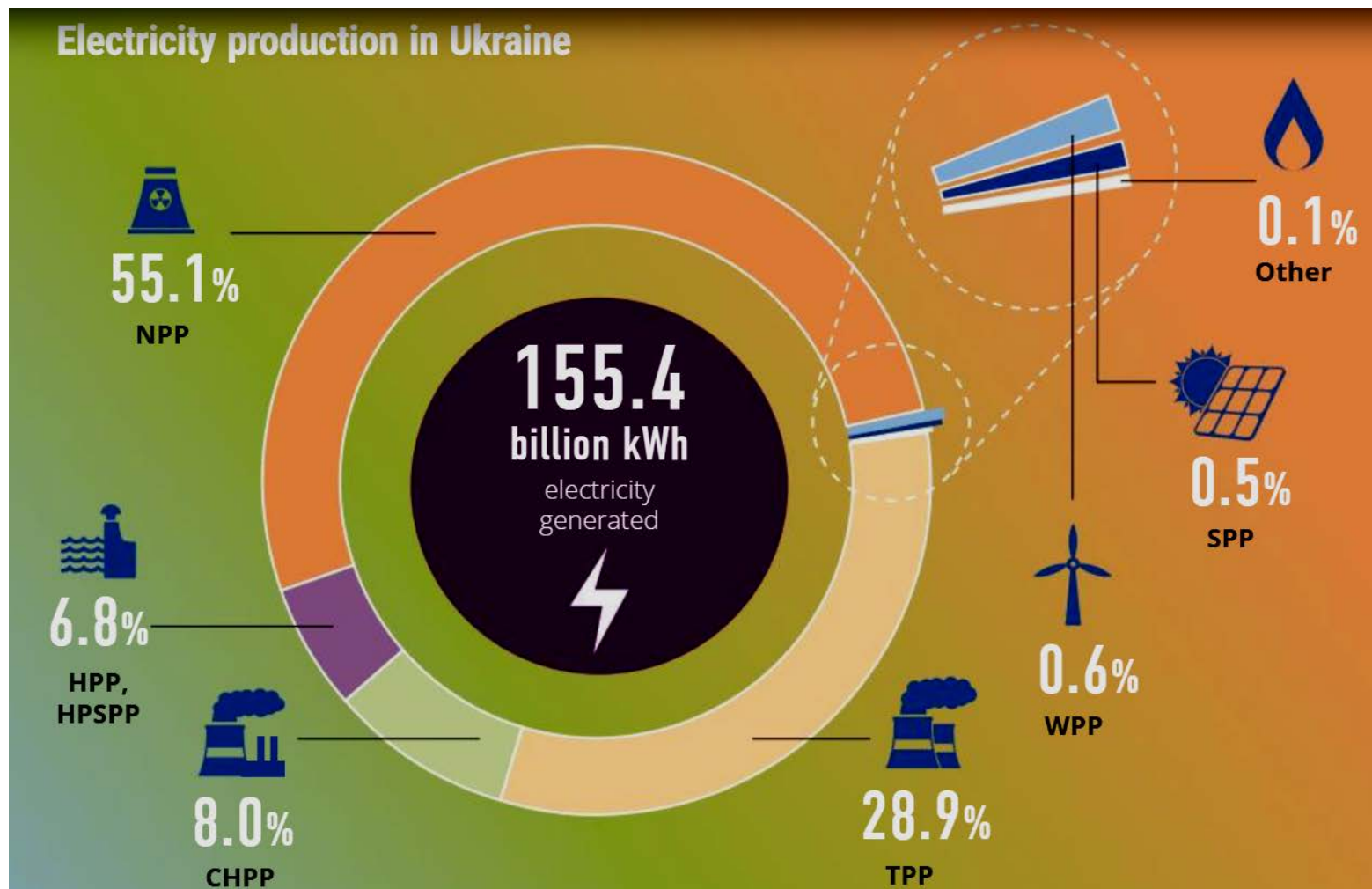
Responsibilities of TSO:

- ❖ Exercising centralized dispatcher control (operation and process control) over the IPS of Ukraine
- ❖ Operation and development of main and interstate power grids (220 – 750 kV)
- ❖ Electricity transmission from power plants to power supply companies and for the purpose of export/import
- ❖ Information and technical support of the wholesale electricity market
- ❖ Development of fundamental principles of science and research policy in electric power industry and development plans for the IPS of Ukraine

Responsibilities of DSO:

- ❖ supply of electricity at regulated tariffs and transmission over the local 0.4 - 110 kV grids;
- ❖ ensure quality and uninterrupted power supply in the region, the most effective cooperation with customers;
- ❖ balanced meeting the needs of all stakeholders;
- ❖ improve the quality of power supply to consumers and technological improvements in power consumption for its transportation

Power structure of the country (for 2017)



Installed capacity with reference to primary resources

❑ Installed capacities (TW), as of 01.01.2018

- Biomass – 0,1
- Coal – 24,6
- Hydro power – 6,2
- CHPs – 6,0
- Nuclear – 13,8
- Solar power – 0,8
- Wind power – 0,4

Energy production with reference to primary resources

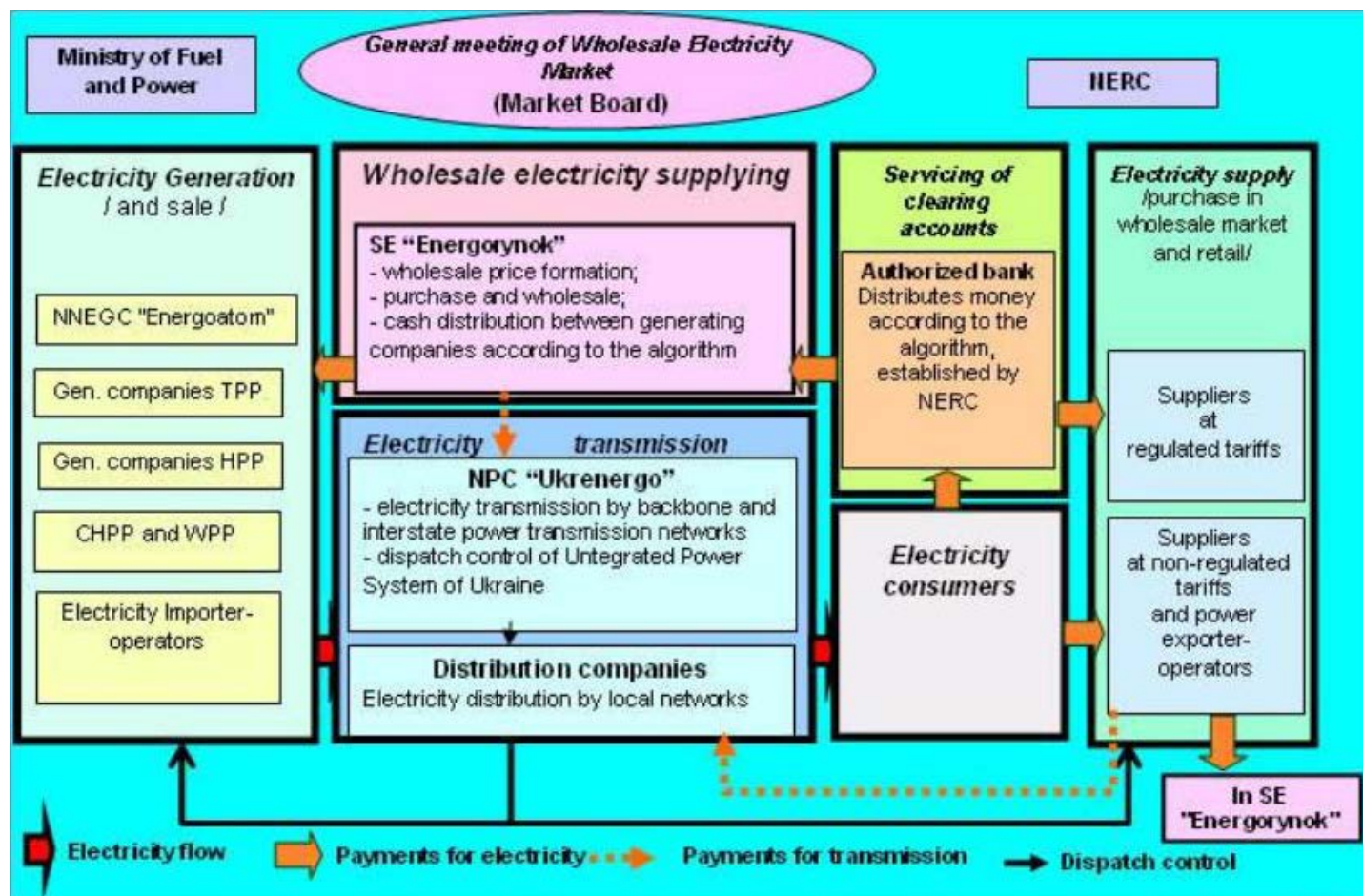
□ Electricity generated (TWh), for 2017

- Biomass – 0,2
- Coal – 45,0
- Hydro power – 10,5
- CHPs – 12,4
- Nuclear – 85,6
- Solar power – 0,7
- Wind power – 1,0

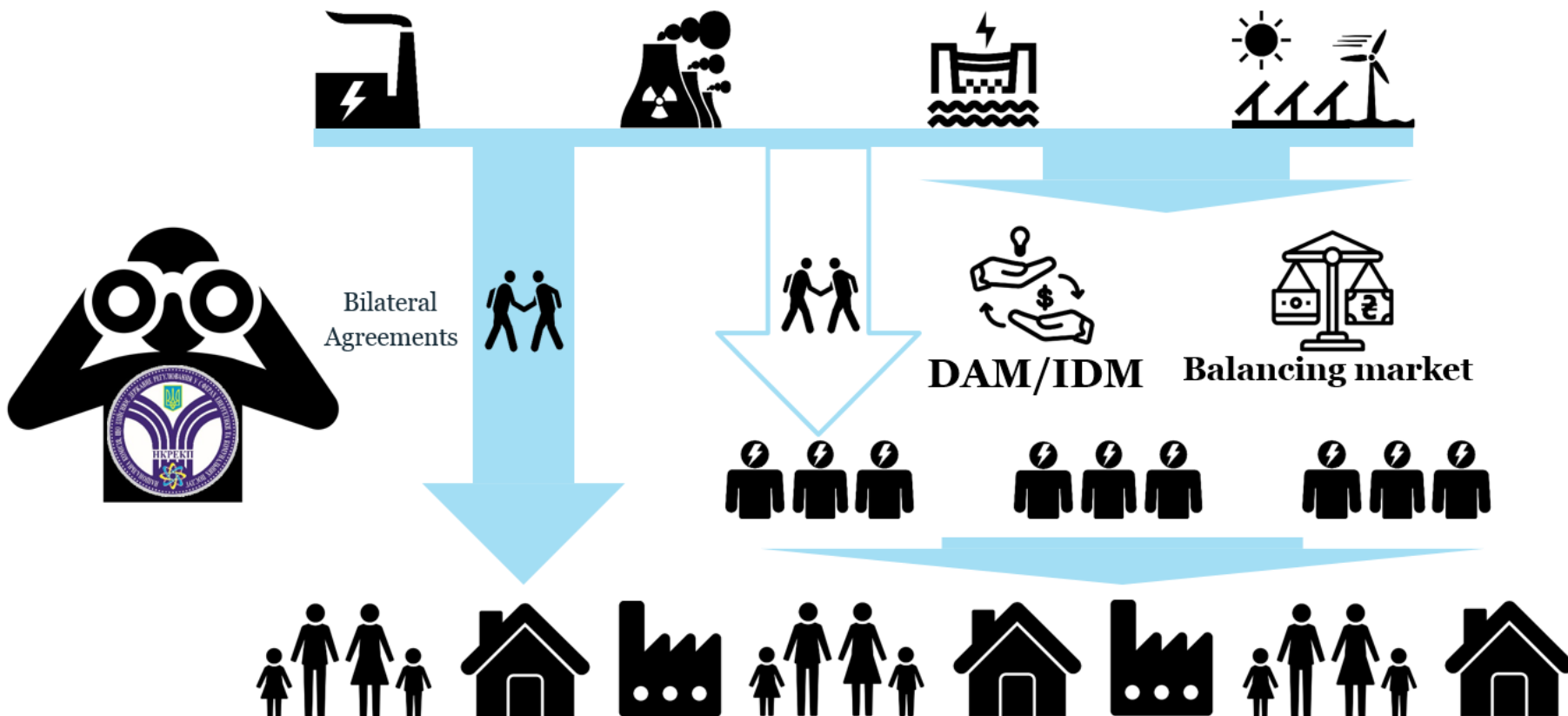
Development of generation capacity since

- ☐ Renewables (excluding hydro)
- ☐ Hydro
- ☐ Coal
- ☐ Lignite
- ☐ Gas
- ☐ Nuclear

Electricity market organisation (current model)



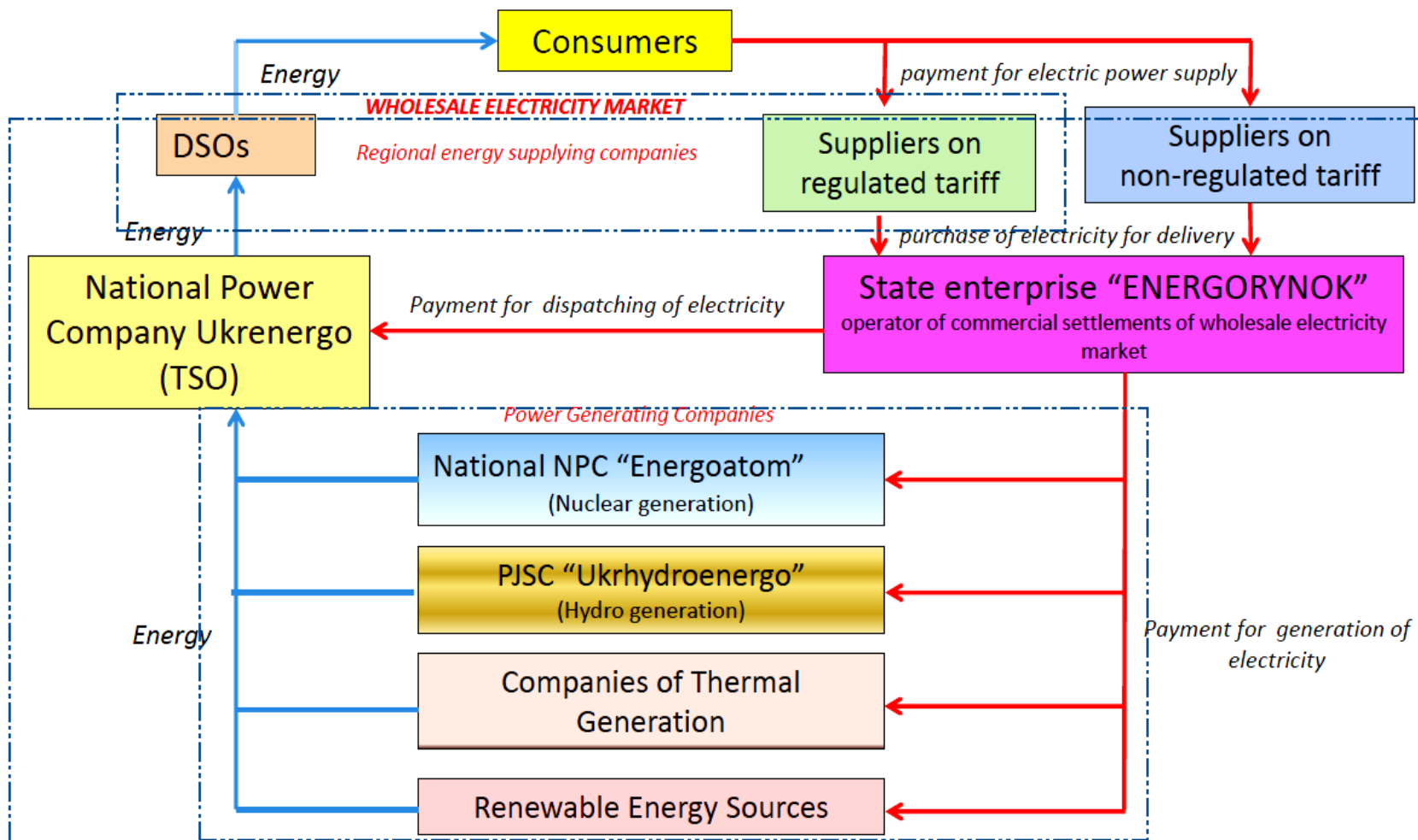
Electricity market organisation (model to be implemented from July 1, 2019)



Power balance in 2017

- ☐ Generation (TWh) – 155,4
- ☐ Consumption (TWh) – 149,7
- ☐ Imports (TWh) – 0,0
- ☐ Exports (TWh) – 5,1
- ☐ Electricity transfer to temporarily occupied territory of Donetsk and Luhansk region (TWh) – 0,6

Energy exchanges in commercial and physical flows



Specific aspects of the electricity market

- ☐ Market coupling (time frames not defined yet, however, as a 1st step in market coupling process, common auctions with MD to be implemented in the near future)
- ☐ Market splitting (time frames not defined yet)
- ☐ Day-ahead (beginning from July 1, 2019)
- ☐ Bilateral contracts, Ancillary services market and Balancing market – beginning from July 1, 2019