The Electric Power System

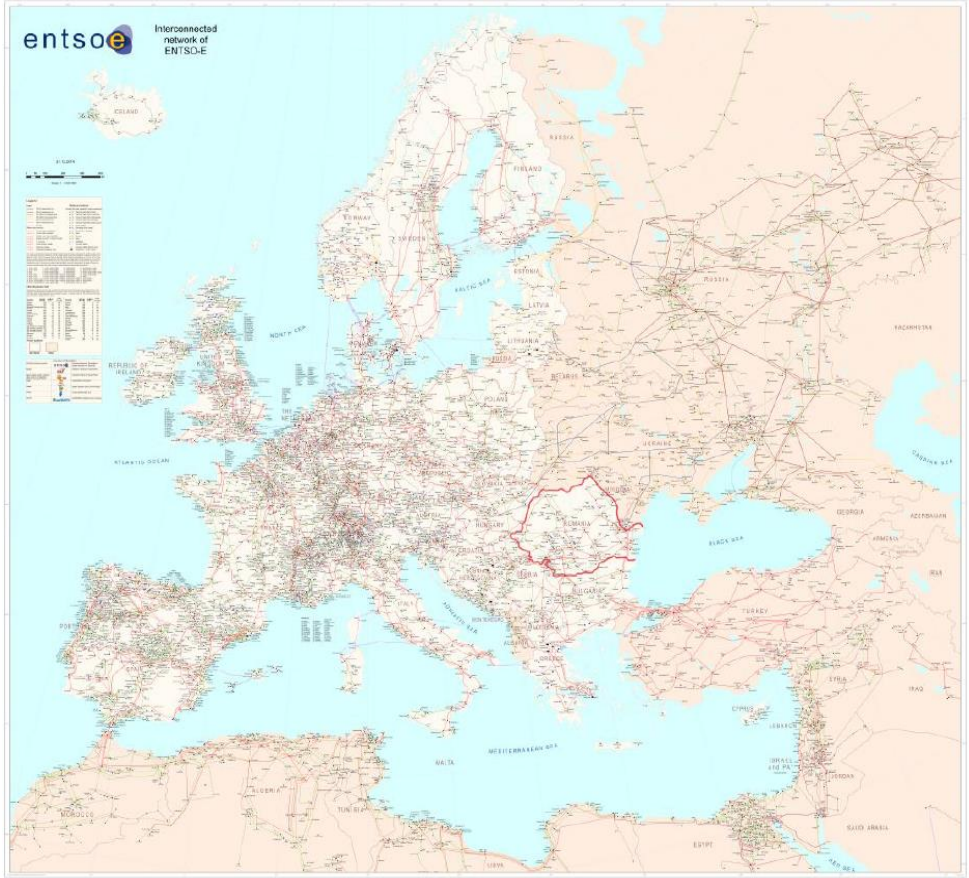
- Romania -

Basic facts

- Area: 238 397km^2
- Population: 19, 71 mil
- Number of electricity consumers: 9,15 mil
- Number of TSOs: 1
- Number of DSOs: 8
- Peak load (2017): 9 865 MW
- Average interruption of electricity (2017): 2,76 min

Global map of the grid and of its interconnections

- Interconnectors with:
  - Ukraine
  - Hungary
  - Serbia
  - Bulgaria



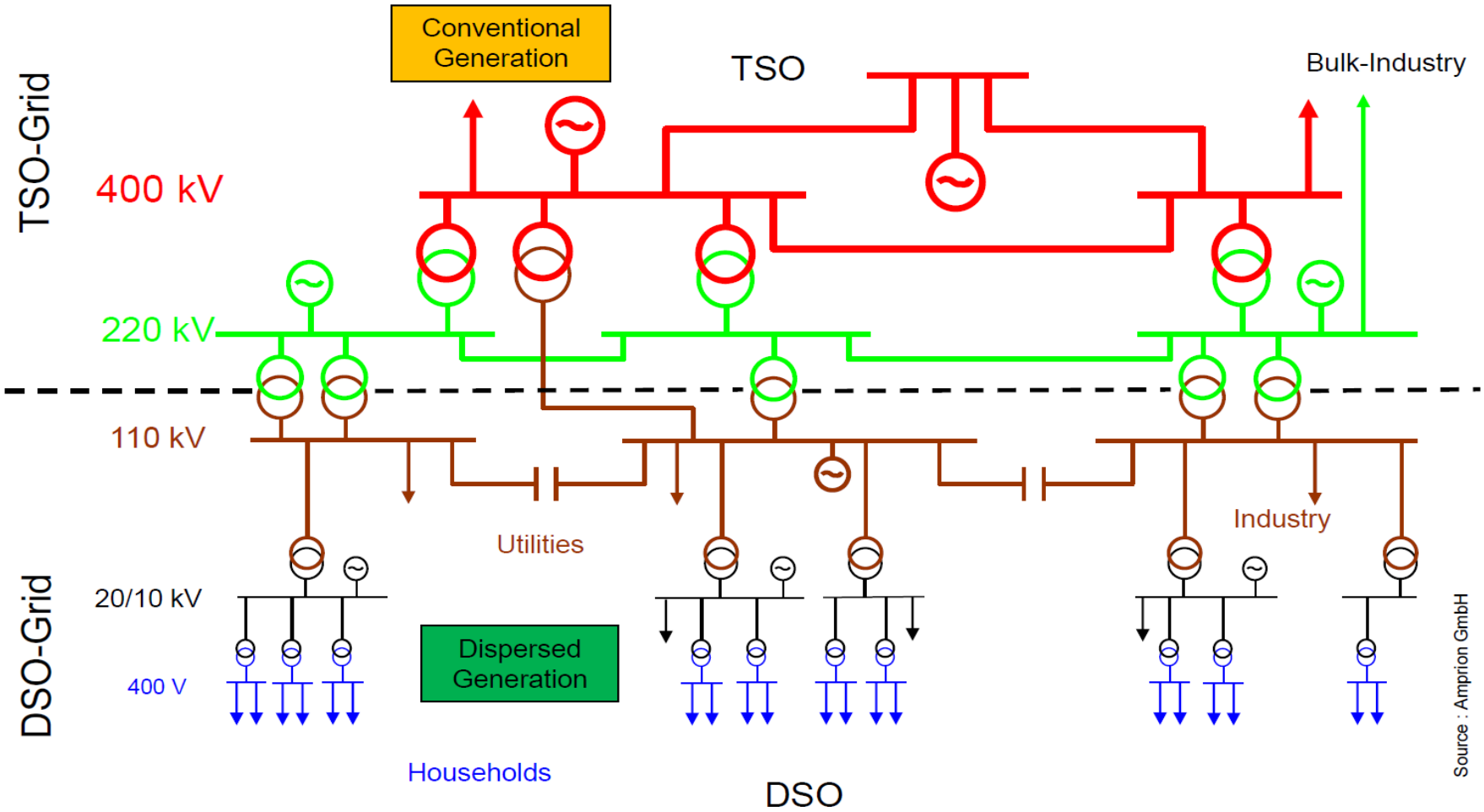
Source: ENTSO-E

Grid facts and characteristics

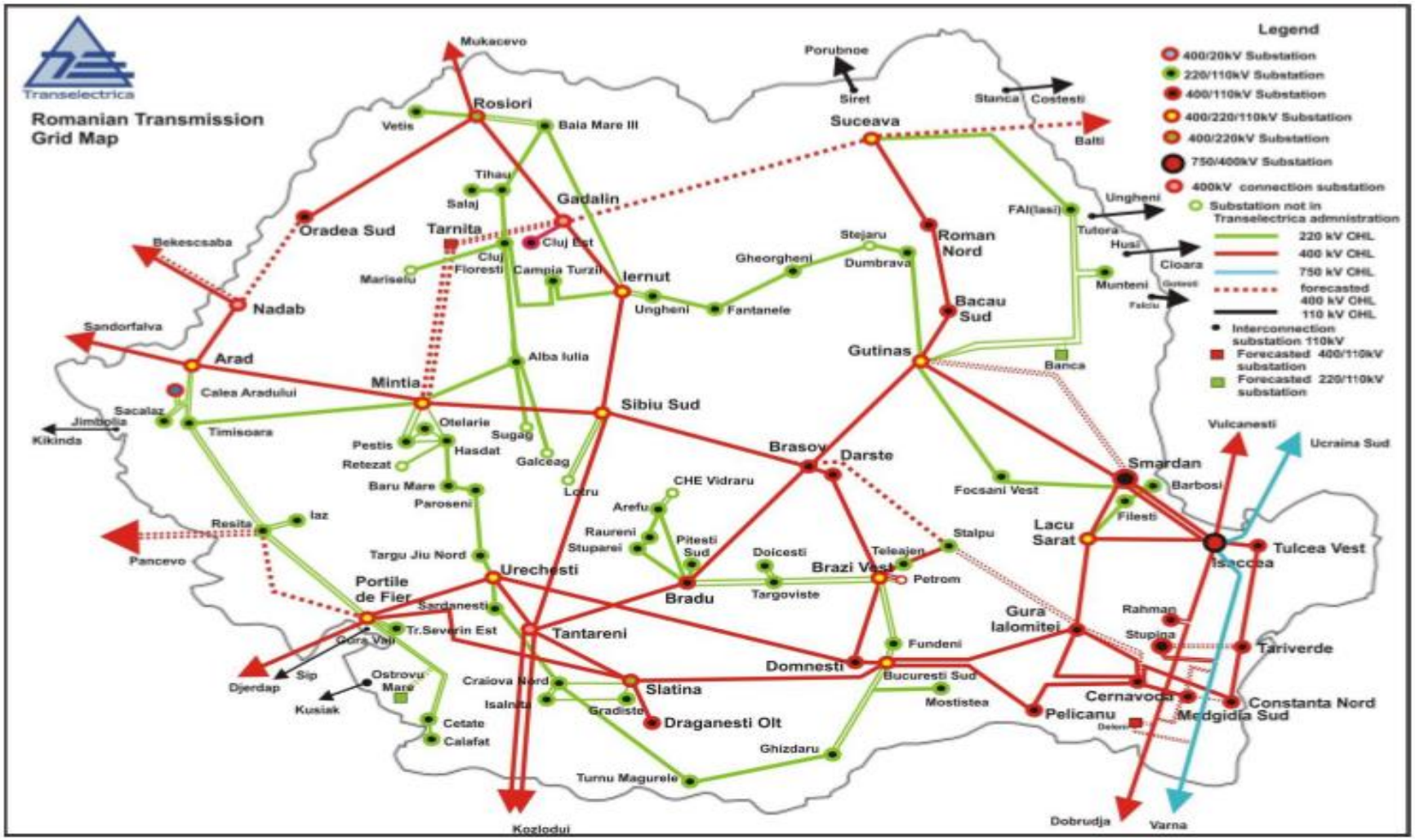
- The power grid in Romania is divided into transmission grids (maximum voltage) and distribution grids (high, medium and low voltage).

Responsibility	Voltage Level	Total length (approx.)
TSO	750 kV	3,1 km
TSO	400 kV	4 915,2 km
TSO	220 kV	3 875,6 km
TSO	110 kV	40,4 km
DSO	≤ 110 kV	337 500 km

Structure of electrical power system



Map of the high voltage grid

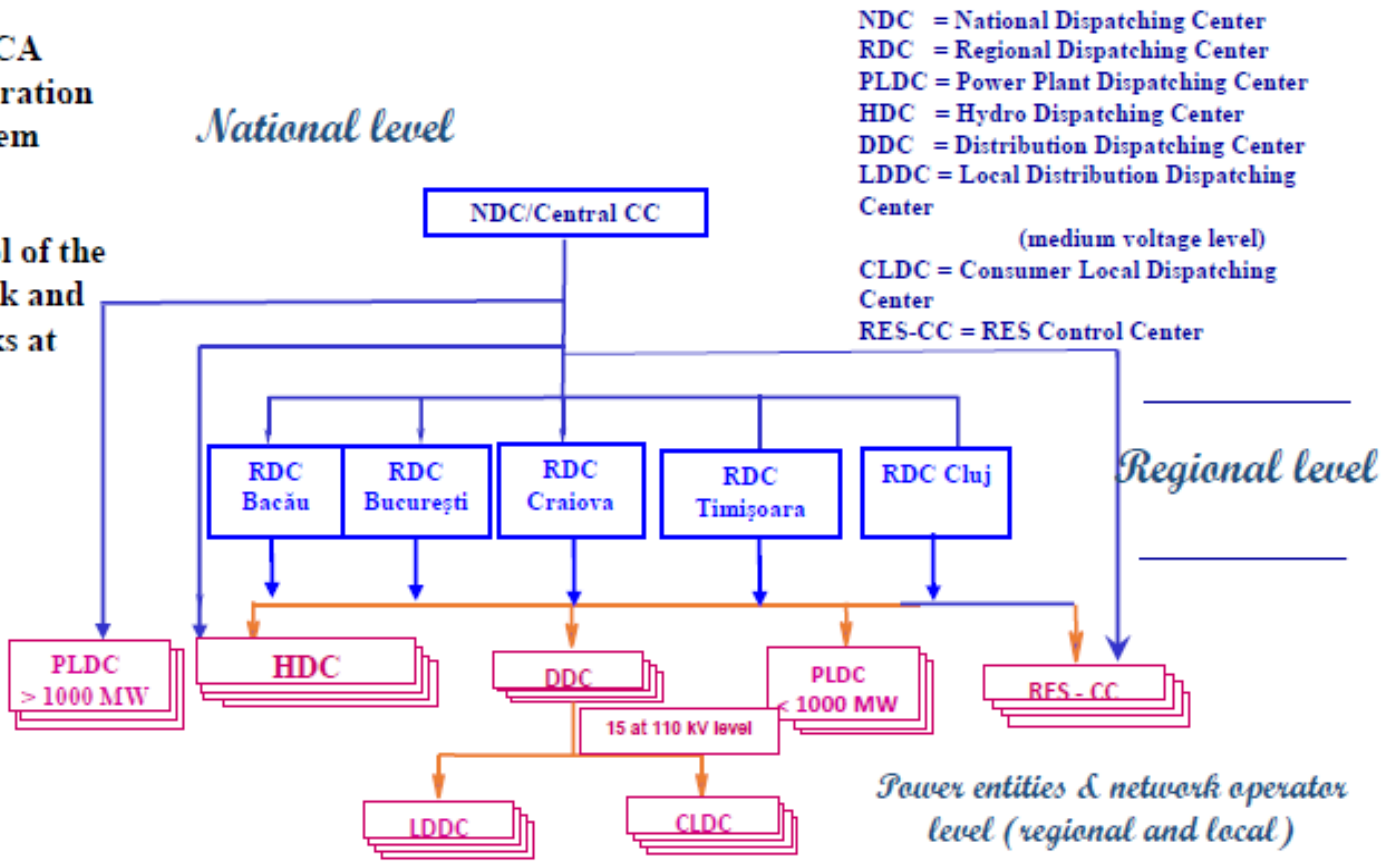


Information on TSO

- Name: CNTEE TRANSELECTRICA SA
- Network length (km): 8 834 km
- Served area (km²): 238 391 km²
- Annual transmitted energy (TWh): 56,9 TWh
- website: http://www.transelectrica.ro

Cooperation of TSO and DSOs

- **TRANSELECTRICA coordinates the generation & technological system services**
- **Operational control of the transmission network and distribution networks at 110 kV level**



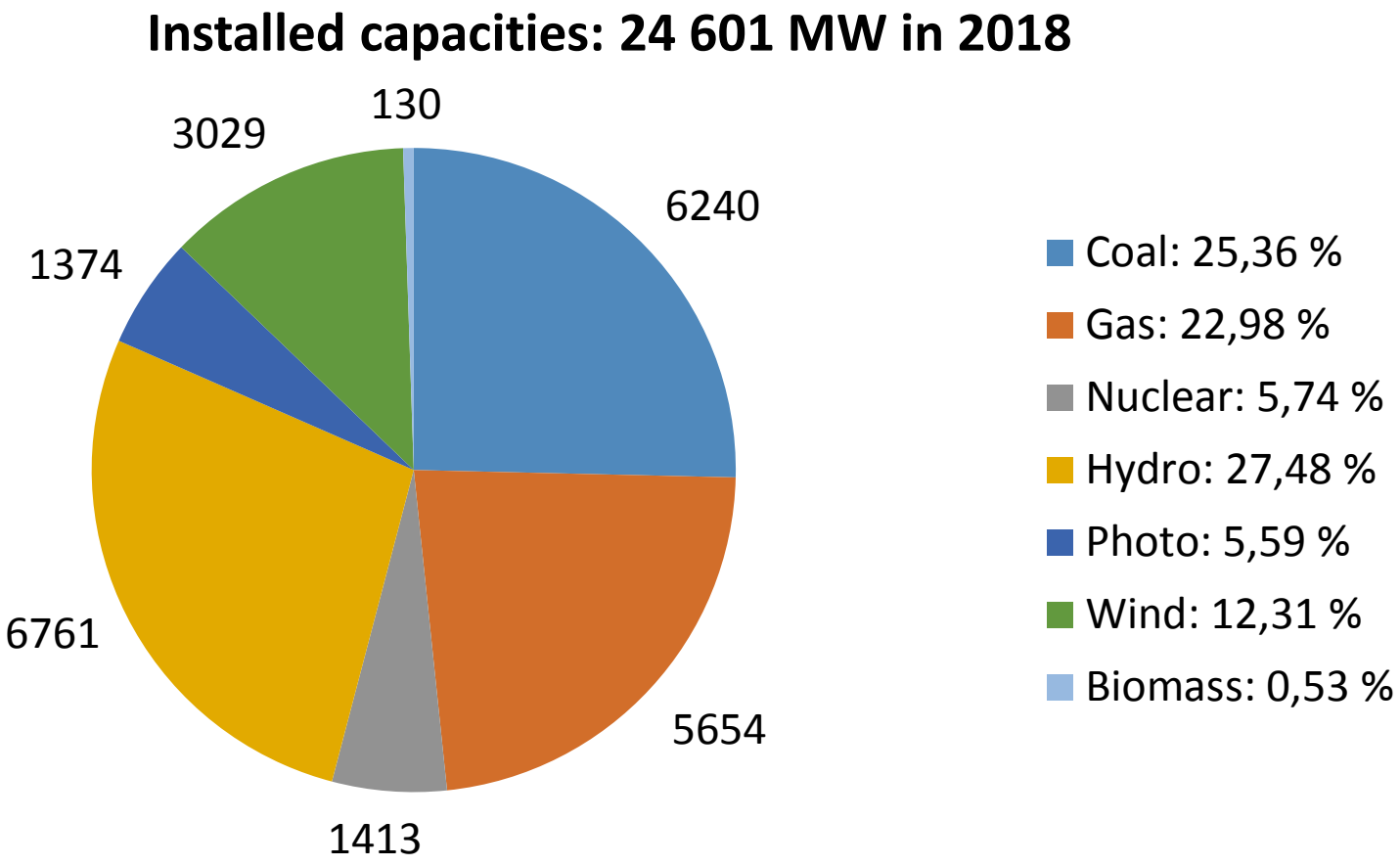
→ **hierarchical structure of the operational control management within TRANSELECTRICA:**

National Dispatching Centre & 5 Regional Dispatching Centers.

Responsibilities of TSO & DSOs

- ***operational planning*** activity covers the following components:
  - Planning the normal operational diagram;
  - Planning the withdrawing from operation of generation, transmission and distribution installation within the RPS;
  - Planning the protection and automation systems;
  - Voltage levels planning.
- ***operational management***
  - ***operational scheduling*** and
  - ***operational control***
- ***balancing market (only for TSO)***

Power structure of the country



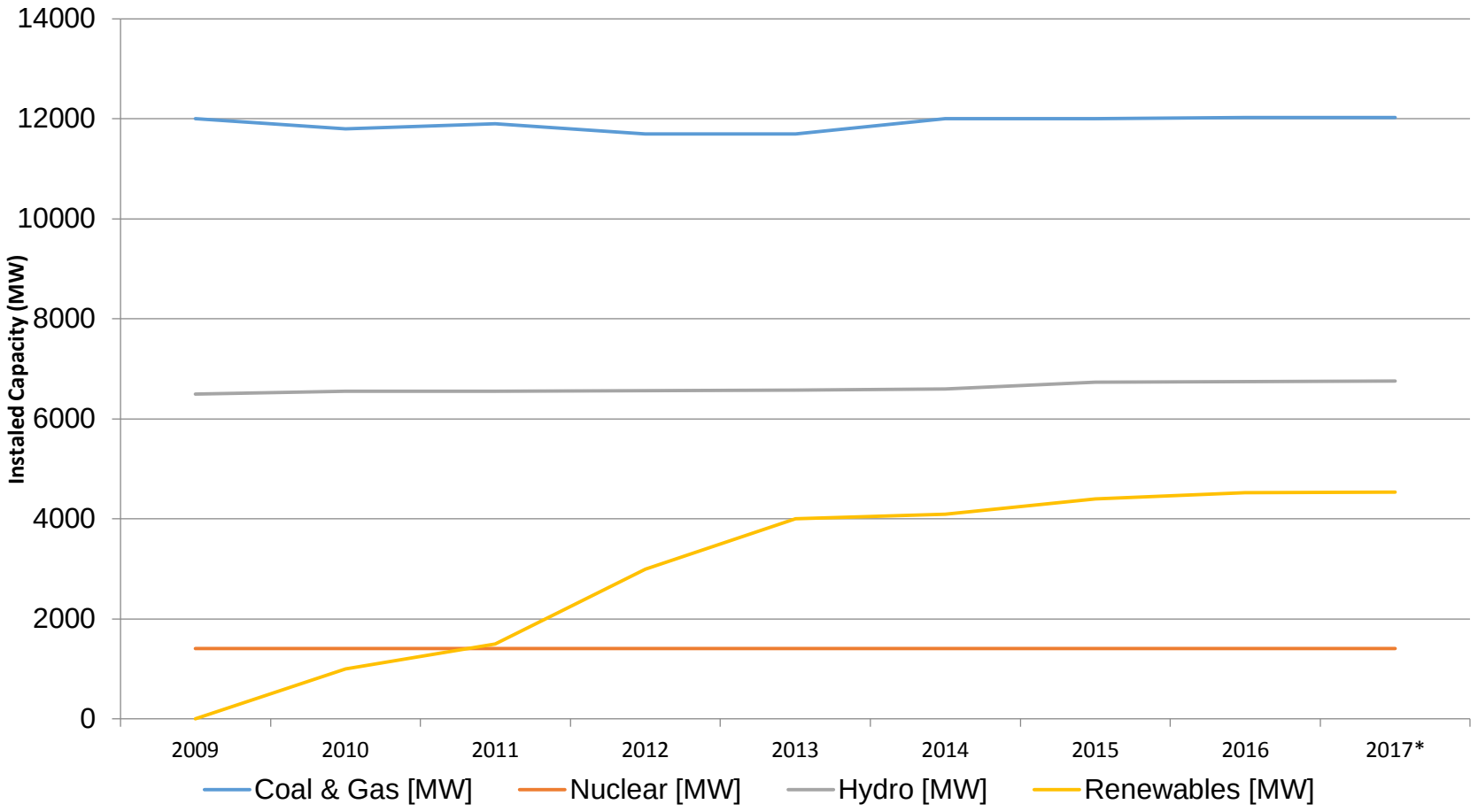
Installed capacity with reference to primary resources

- Installed capacities 24,601 GW, in 2018
  - Coal: 6240,267 MW
  - Gas: 5654,48 MW
  - Hydro: 6761,007 MW
  - Nuclear: 1413,000 MW
  - Solar: 1374,787 MW
  - Wind: 3029,739 MW
  - Biomass: 130,435 MW
  - Others: 0,05 MW

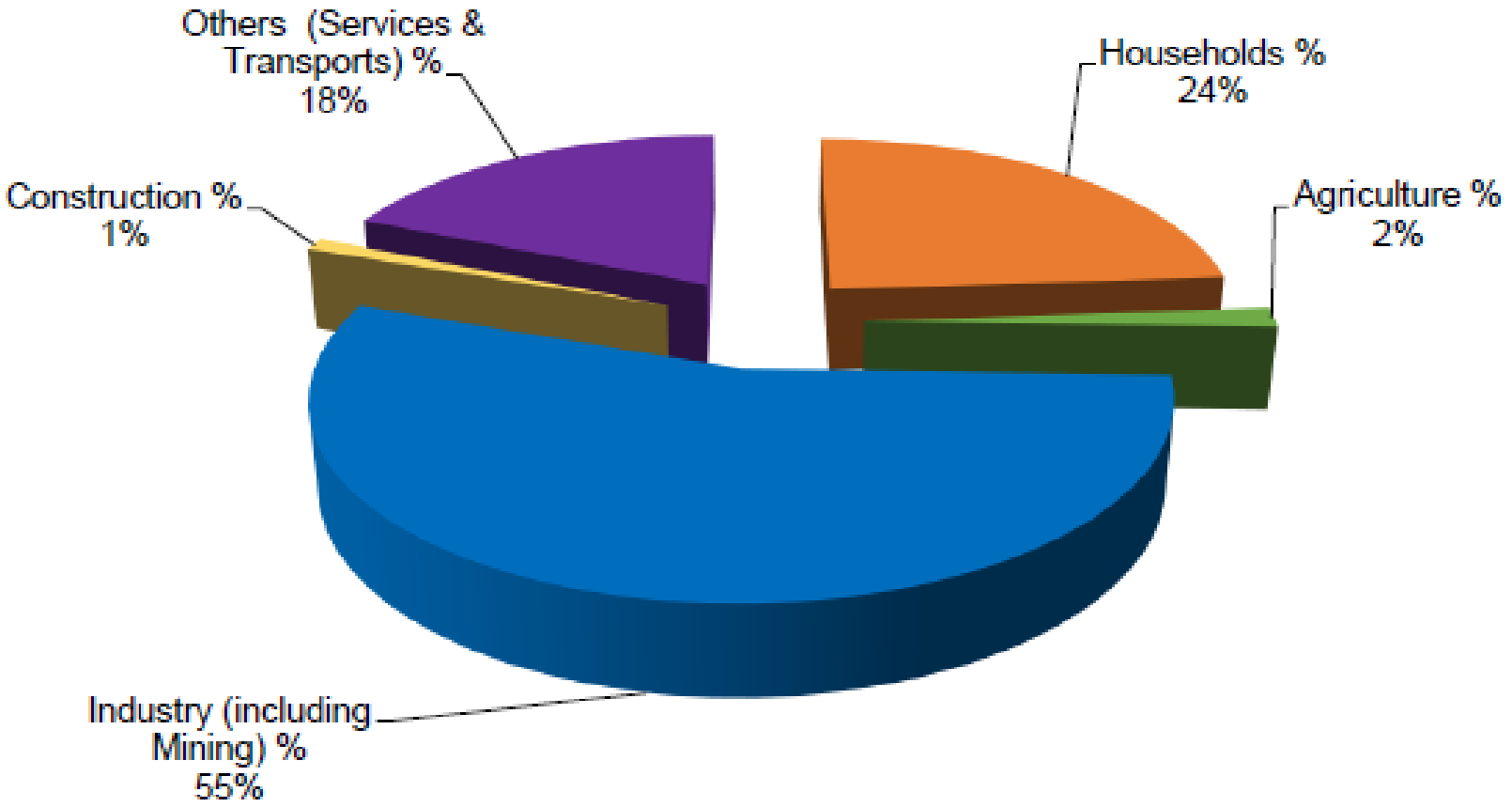
Energy production with reference to primary ressources

- Electricity generated 59,8 TWh in 2017
  - Coal and Gas: 25,1 TWh
  - Nuclear: 10,6 TWh
  - Hydro: 14,5 TWh
  - Renewables: 9,6 TWh

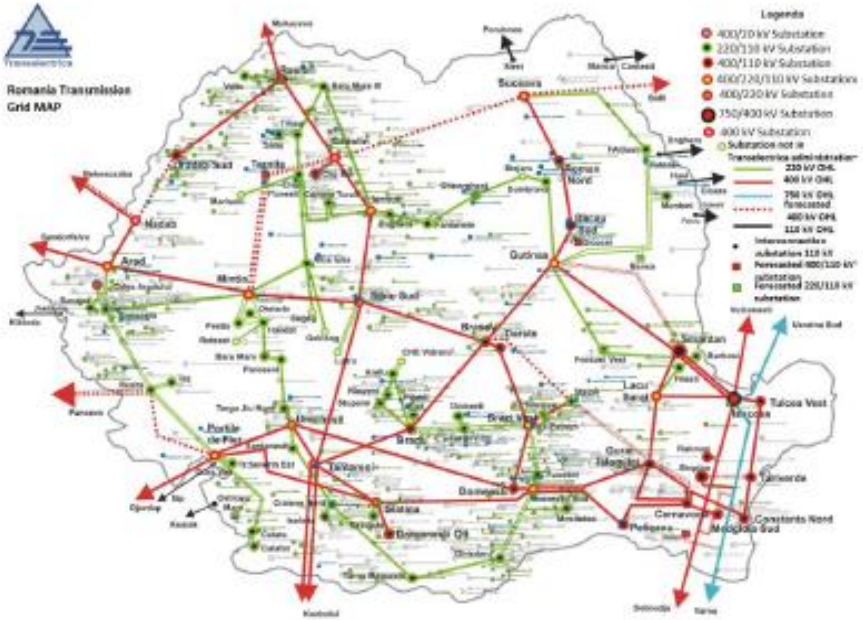
Development of generation capacity since 2009



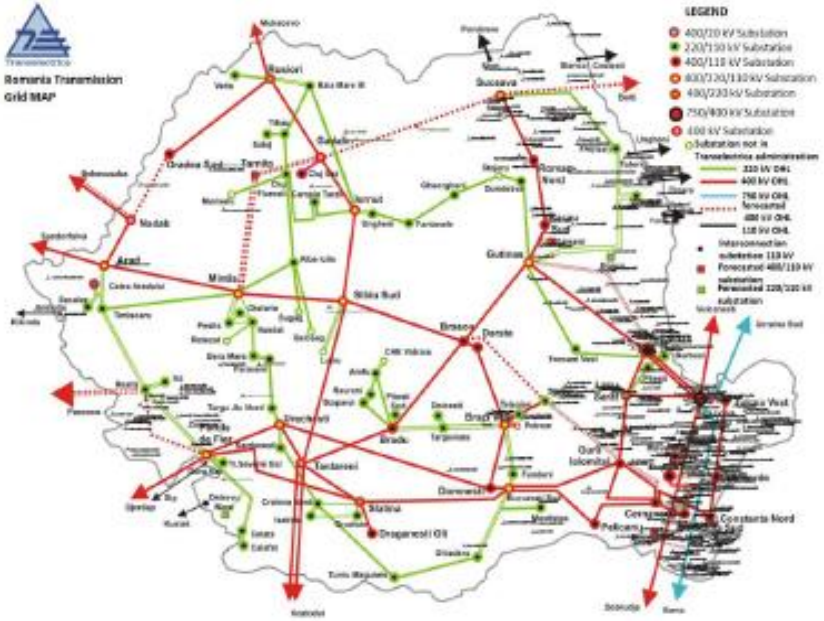
Consumption per customer groups



Location of renewable energy sources

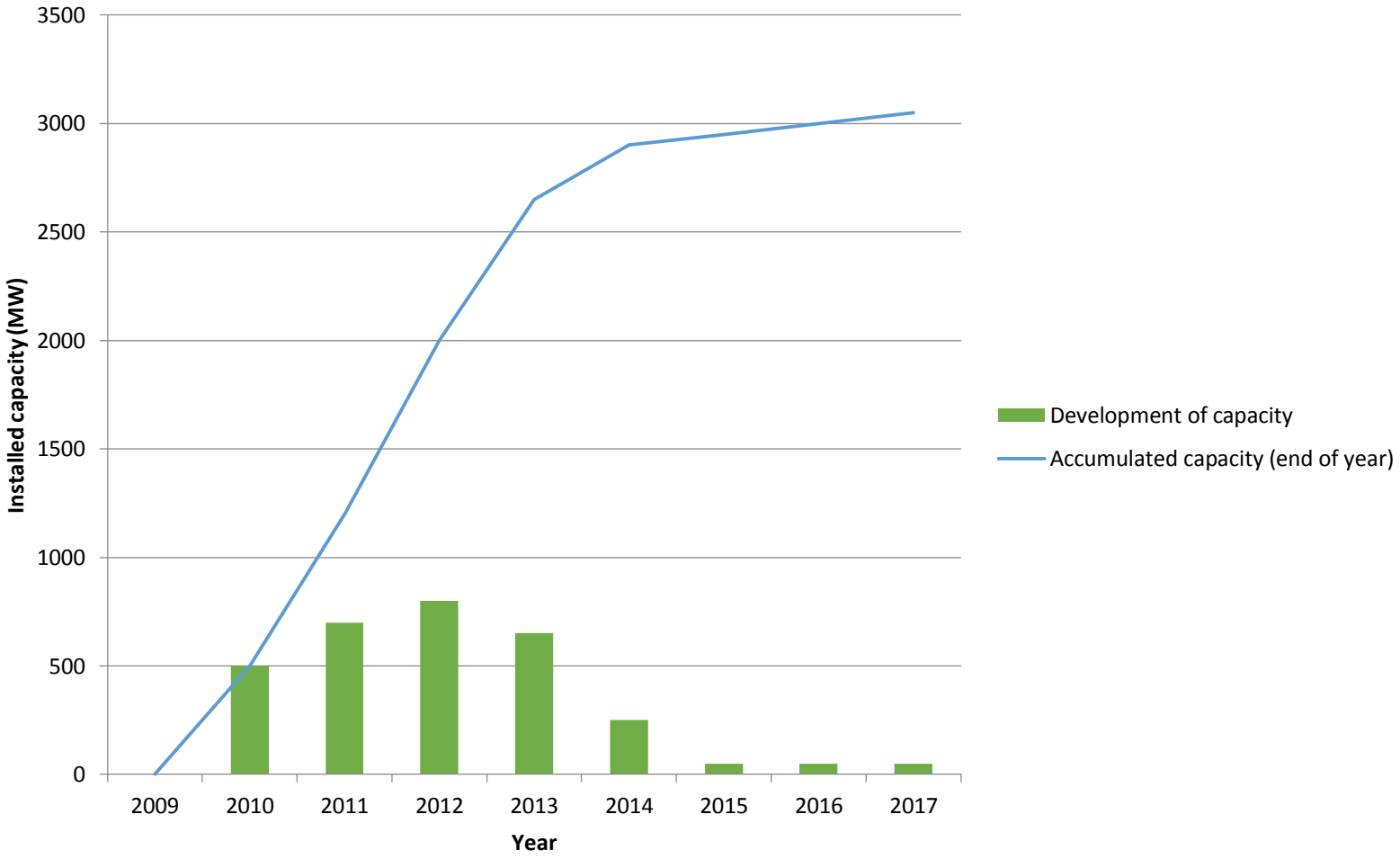


Installed PV panels

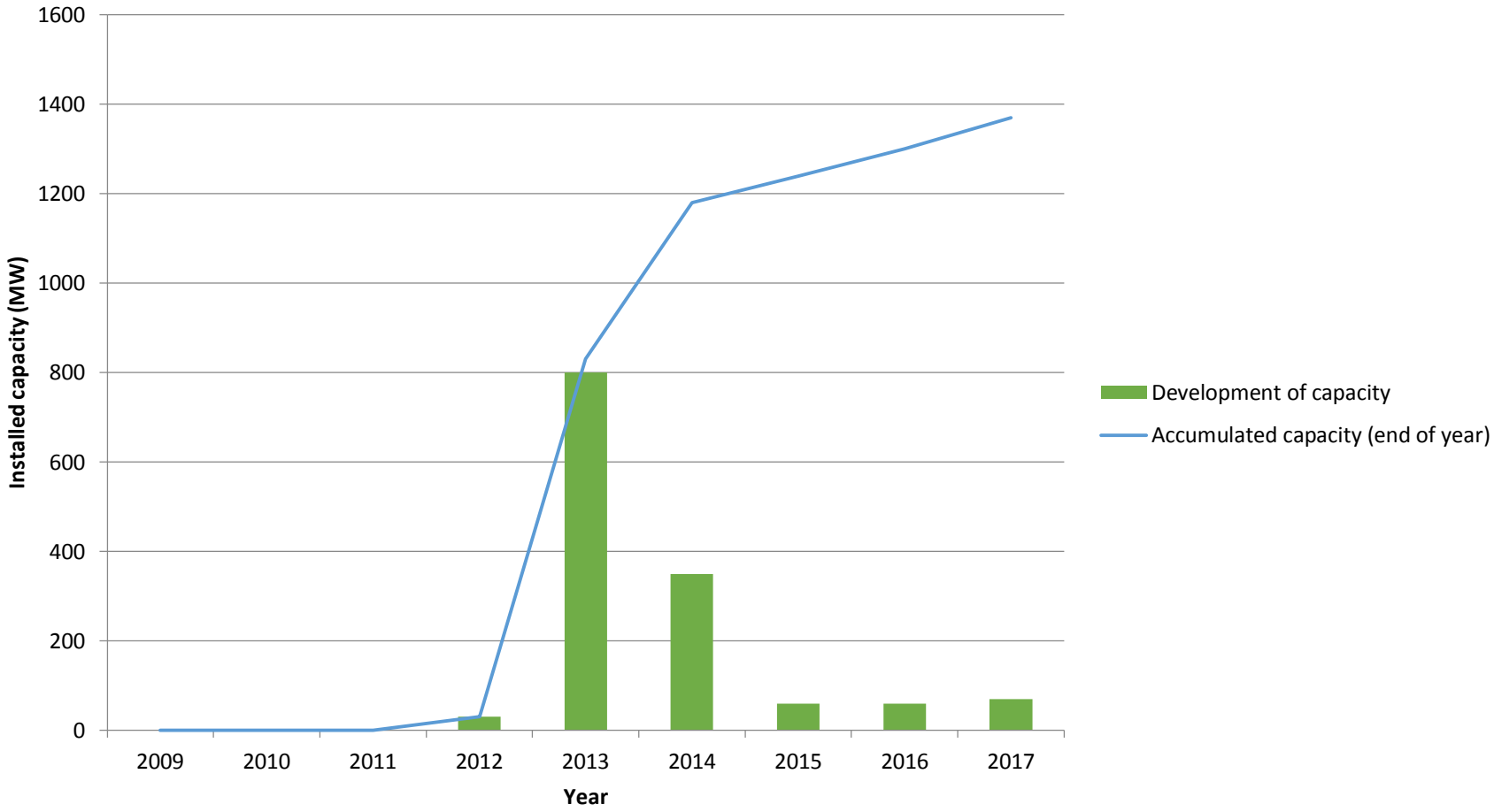


Installed Wind turbines

Development of wind power



Development of photovoltaic power



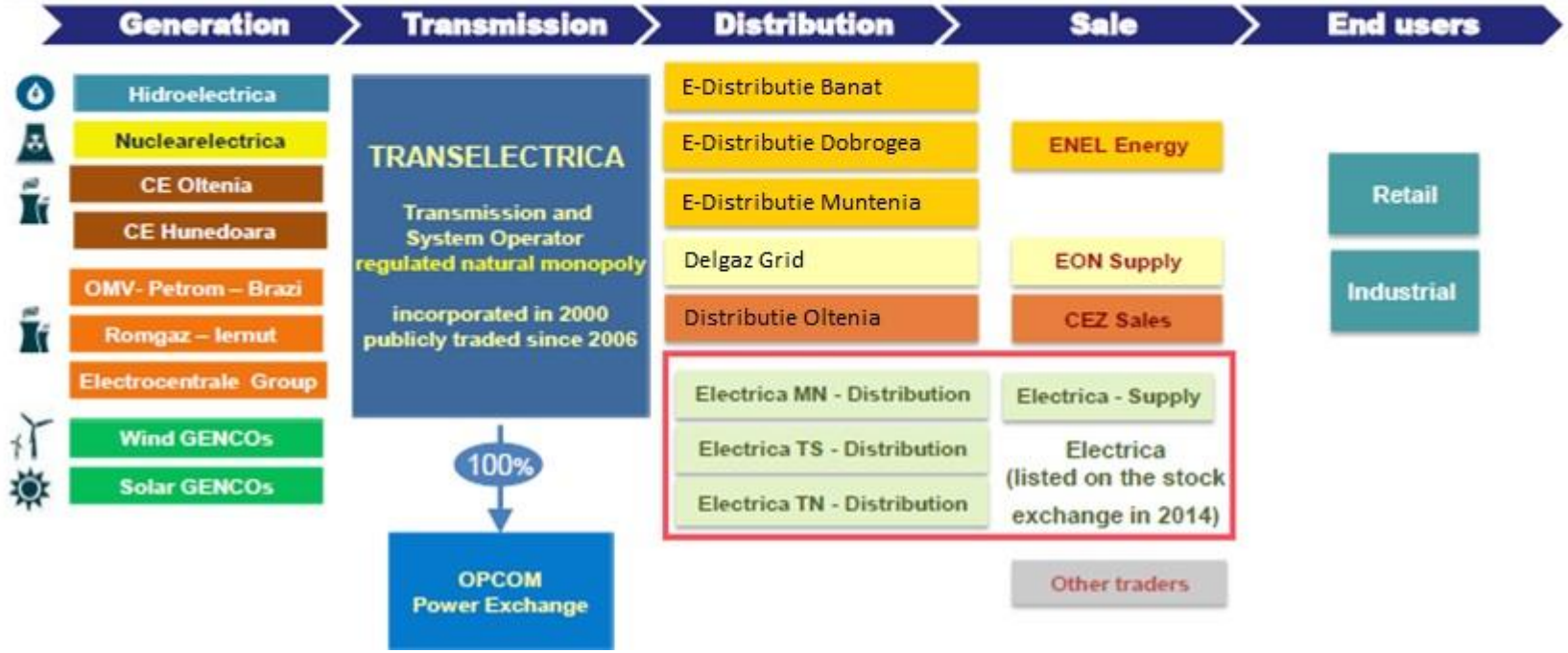
Electricity market organisation

State ownership interests in the sector
- Bulk of generation (Ministry for Energy)
- Transmission (Ministry of Economy)

Large state-owned businesses recently listed to the stock exchange
- Generation: small stakes of Nuclearelectrica, Romgaz
- Distribution & Sale: majority share of Electrica

Unbundling √
- Network business fully separated from market side (generation and sale)

Corporate governance Ordinance (no. 109/2011) being gradually implemented at state-owned companies



Power balance in 2017

- Generation: 59,8 TWh
- Consuption: 56,9 TWh
- Imports: 3,2 TWh
- Exports: 6,1 TWh
- Losses: 0,965 TWh

Specific aspects of the electricity market

Romanian Market Structure 2005 - present

- Market for bilateral contracts – 100 % centralized market since 2012
- Day Ahead Market – voluntary and centralized market (2005); 4M MC (CZ-SK-HU-RO Day Ahead Market Coupling) since November 2014
- Intraday Market – voluntary and centralized market (2011)
- Balancing Market – mandatory and centralized market (2005)
- Cross Border Capacity Allocation Market (bilateral coordinated starting with 2009, 4M MC – implicit allocation 2014 RO – HU)
- Ancillary Services Market – mandatory / voluntary centralized market
- Green Certificates Market – centralized market

Specific aspects of the electricity market

Romanian Market Structure ADVANTAGES

- system balancing – using market based mechanisms
  - **balancing energy suppliers receive at least the offered price;**
  - **the imbalances are penalized (imbalance price);**
  - **contractual obligations are guaranteed (bilateral, day–ahead and intraday contracts);**
  - **congestion management – costs supported by TSO.**
- self - scheduling

Specific aspects of the electricity market

Romanian Market Structure

Energy

- **Market for bilateral contracts**
- **Day Ahead Market**
- **Intraday Market**
- **Balancing Market**

Capacity

- **Cross Border Capacity Allocation Market**
- **Ancillary Services Market**

Promote

- **Green Certificates Market**

Romanian TSO - administrates

- **Cross Border Capacity Allocation Market**
- **Ancillary Services Market**
- **Balancing Market**

integrated under one market platform (DAMAS)

- **The monitoring activity is done according with the Regulator Authority Methodology and the internal procedures, in compliance with the international practice.**