

The Electric Power System

POLAND

Country facts

- Area: 312 679 km²
- Population: 38 483 957
- Number of electricity consumers: 16,6 mln
- Number of TSOs: 1
- Number of DSOs: 5
- Peak load: 25,8 GW





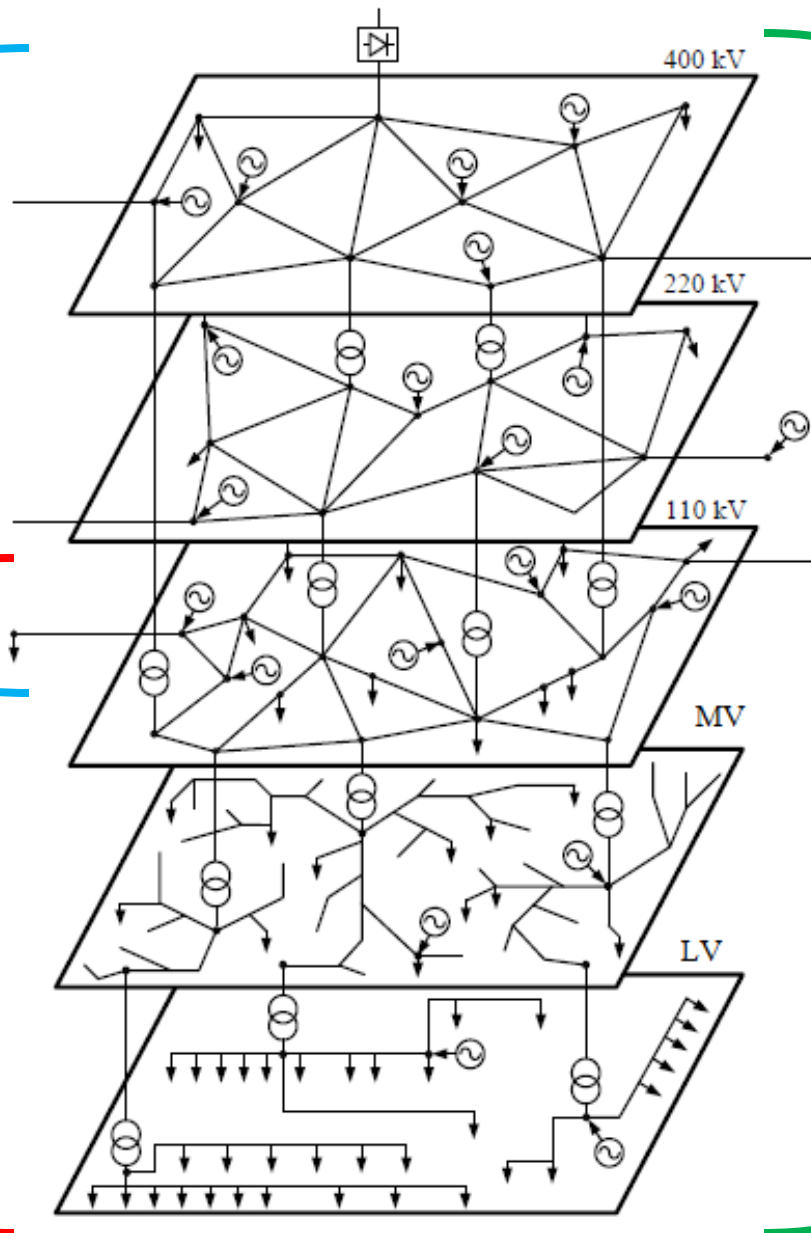
- Network divided into transmission grid levels (EHV) and distribution grid levels (HV, MV, LV)

Grid level	Nominal voltage	Total length (approx.)	Responsibility
Transmission	750 kV	114 km (1 line)	TSO
	400 kV	6 326 km (93 lines)	
	220 kV	7 755 km (164 lines)	
Trans./Distrib.	110 kV	Approx. 33 000 km	TS/DSOs
Distribution	6 – 60 kV	Approx. 320 000 km	DSOs
	<1 kV (230/400 V)	Approx. 450 000 km	



Transmission
grid (TSO)

Distribution
grid (DSO)



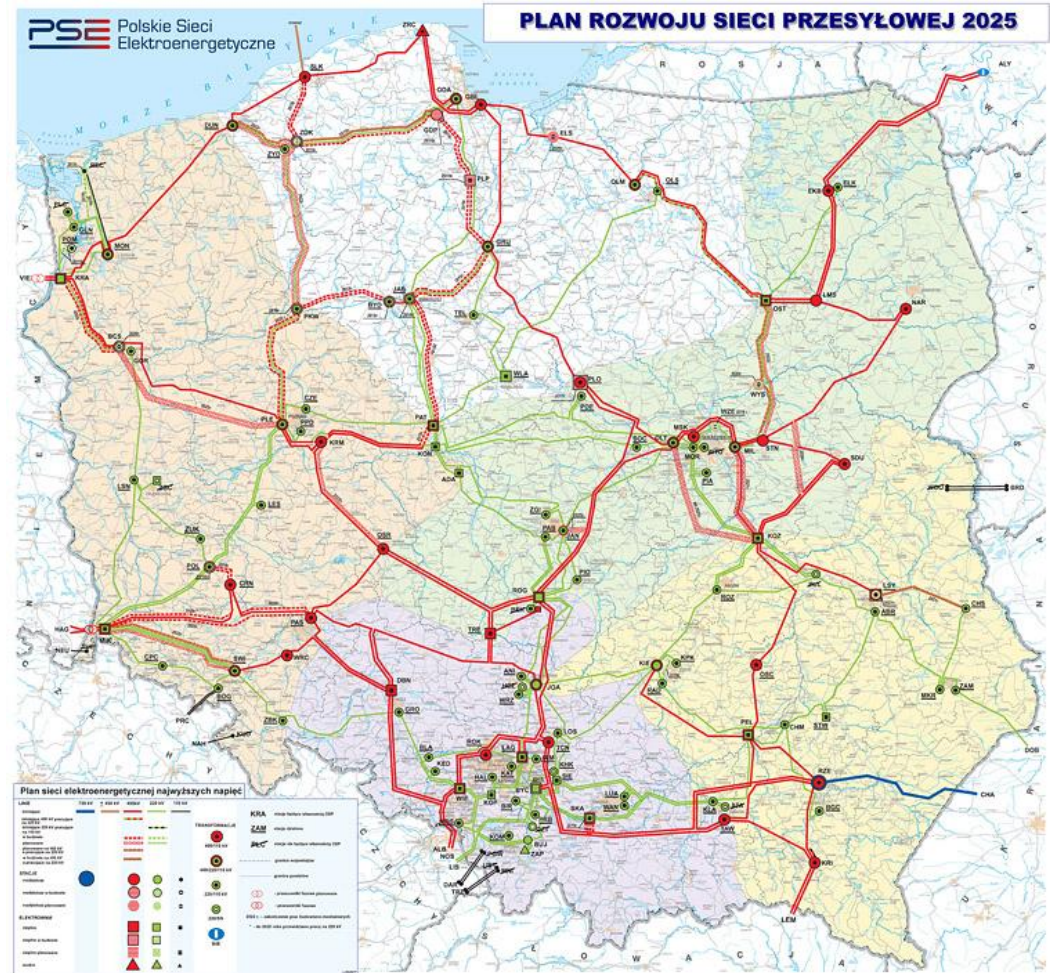
Generation
connection



Polish Transmission System map and interconnection

Interconnections with:

- German (2 PST link)
- Sweden (HVDC link)
- Czech Republic
- Slovakia
- Ukraine
- Belarus
- Lithuania (HVDC link)



Polskie Sieci Elektroenergetyczne (PSE) S. A.

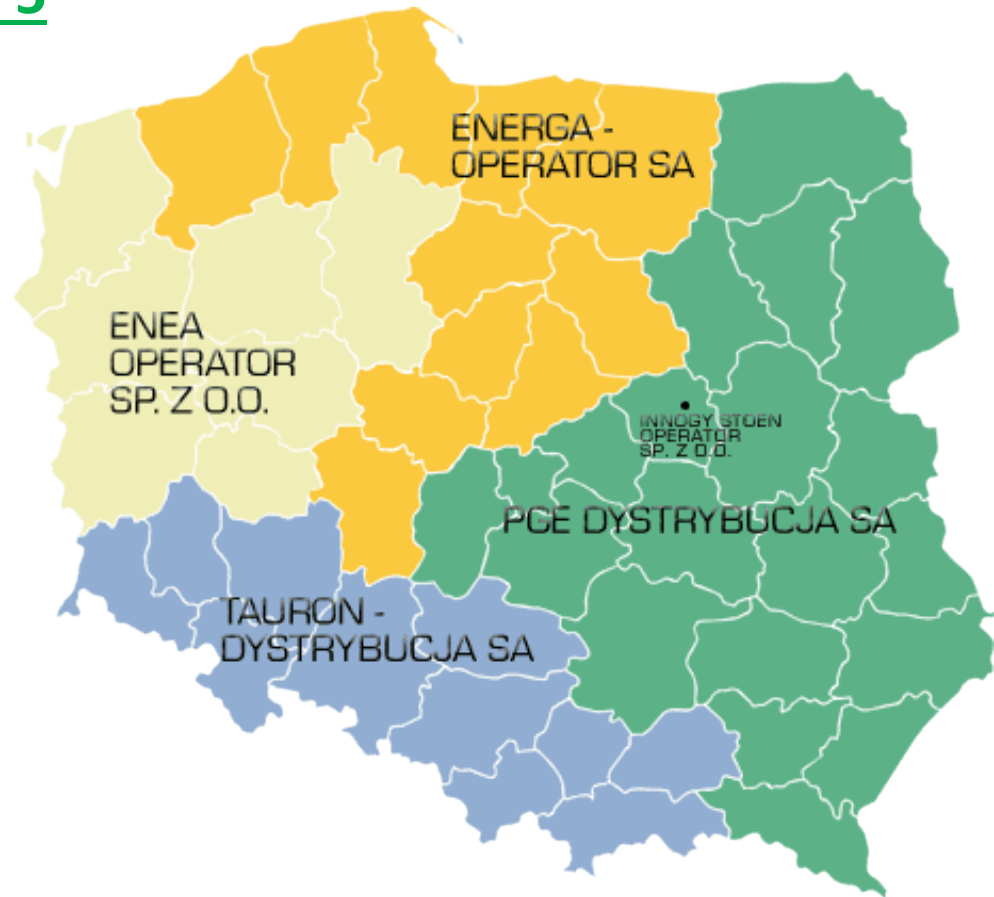
- Transmission grid length: 14 195 km (258 lines)
- 106 transmission system power stations (400, 220 and 110 kV)
- Annual transmitted energy: 168 139 TWh
- Website: <http://www.pse.pl>



Distribution grid is divided into 5

sectors managed by 5 DSOs:

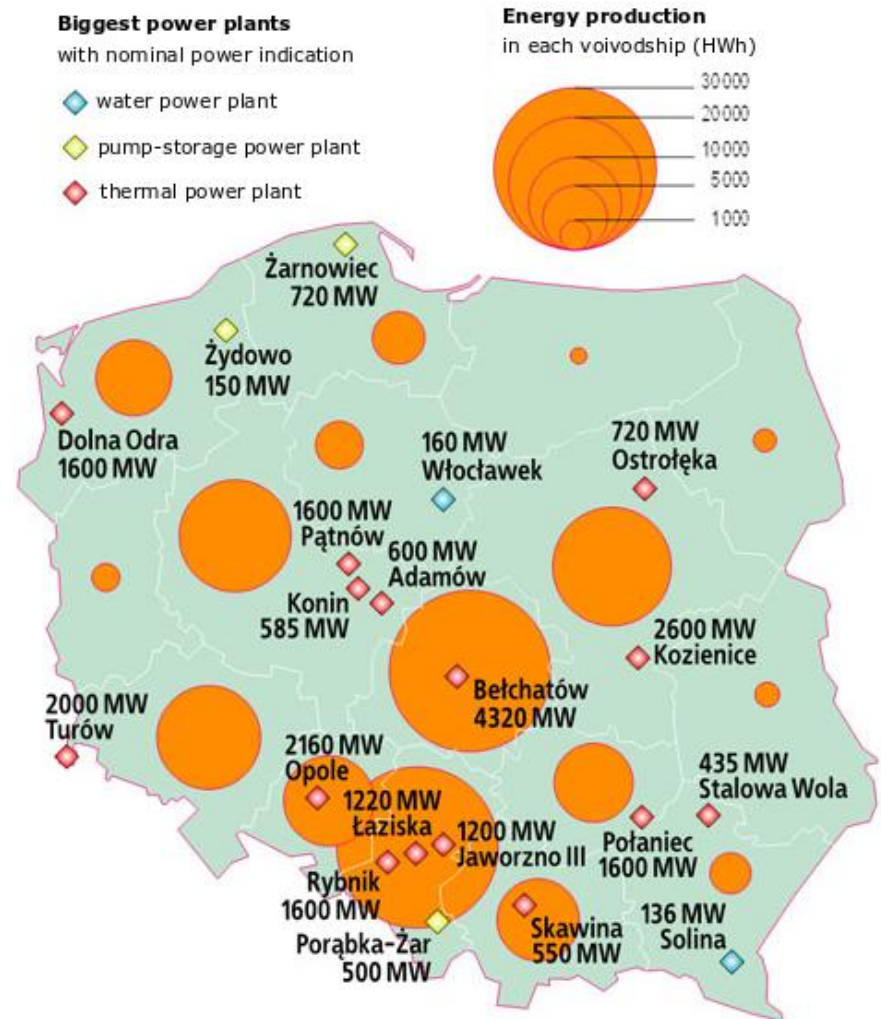
- ENEA Operator S. A.
- Energa Operator S. A.
- Innogy Operator Sp. z o. o.
- PGE Dystrybucja S. A.
- Tauron Dystrybucja S. A.



Power generation structure

Main power plants

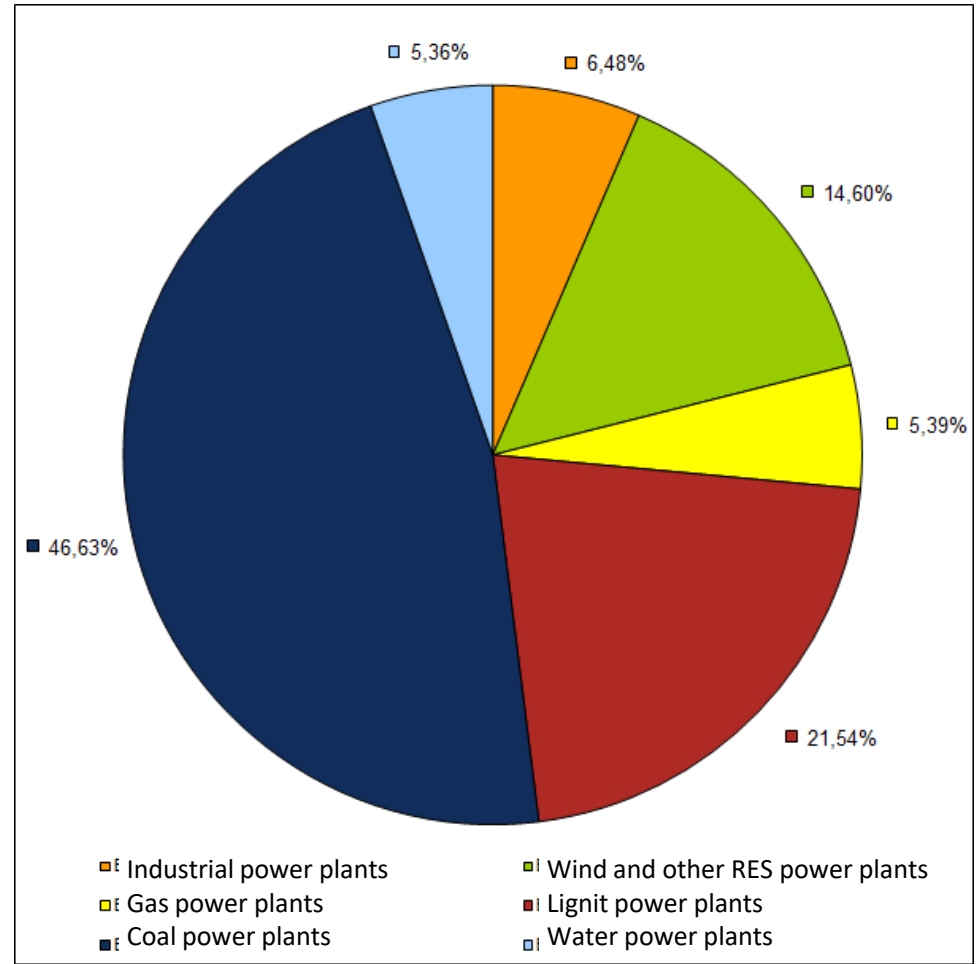
- Bełchatów (lignite):
12x380 + 856 MW
- Kozienice (coal): 8x235 MW +
2x580 MW + 1000 MW
- Opole (coal): 4x380 MW
- Turów (lignite):
3x260 MW + 3x235 MW



Installed capacity with reference to primary resources

Installed capacity: 43,421 GW

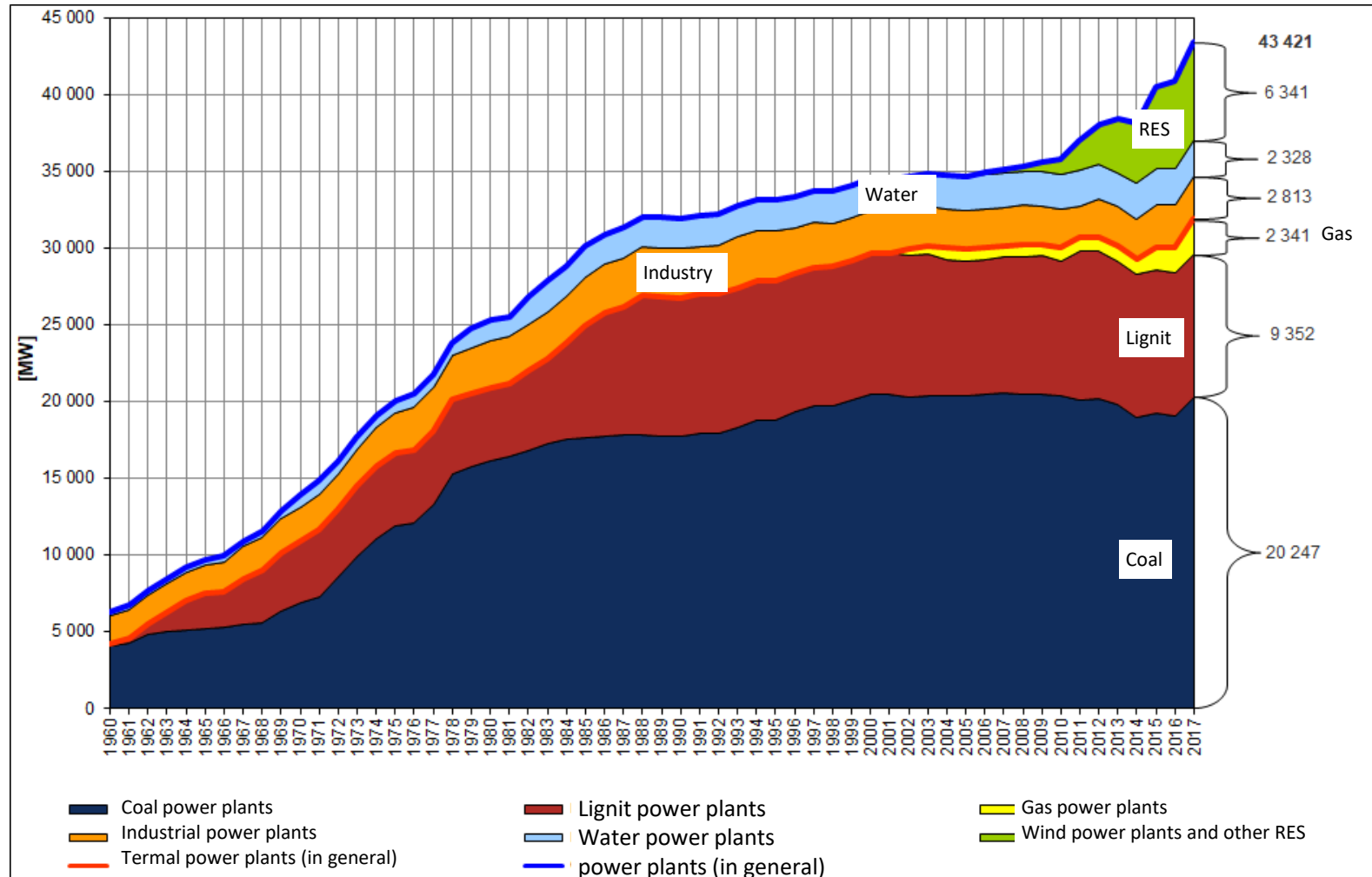
- Coal – 20 247 MW
- Lignite – 9 352 MW
- Gas – 2 341 MW
- Hydro power – 3 467,7 MW
- Wind power – 5 856,8 MW
- Solar power – 110,6 MW
- Biomass – 1363,7 MW
- Biogas – 239,9 MW





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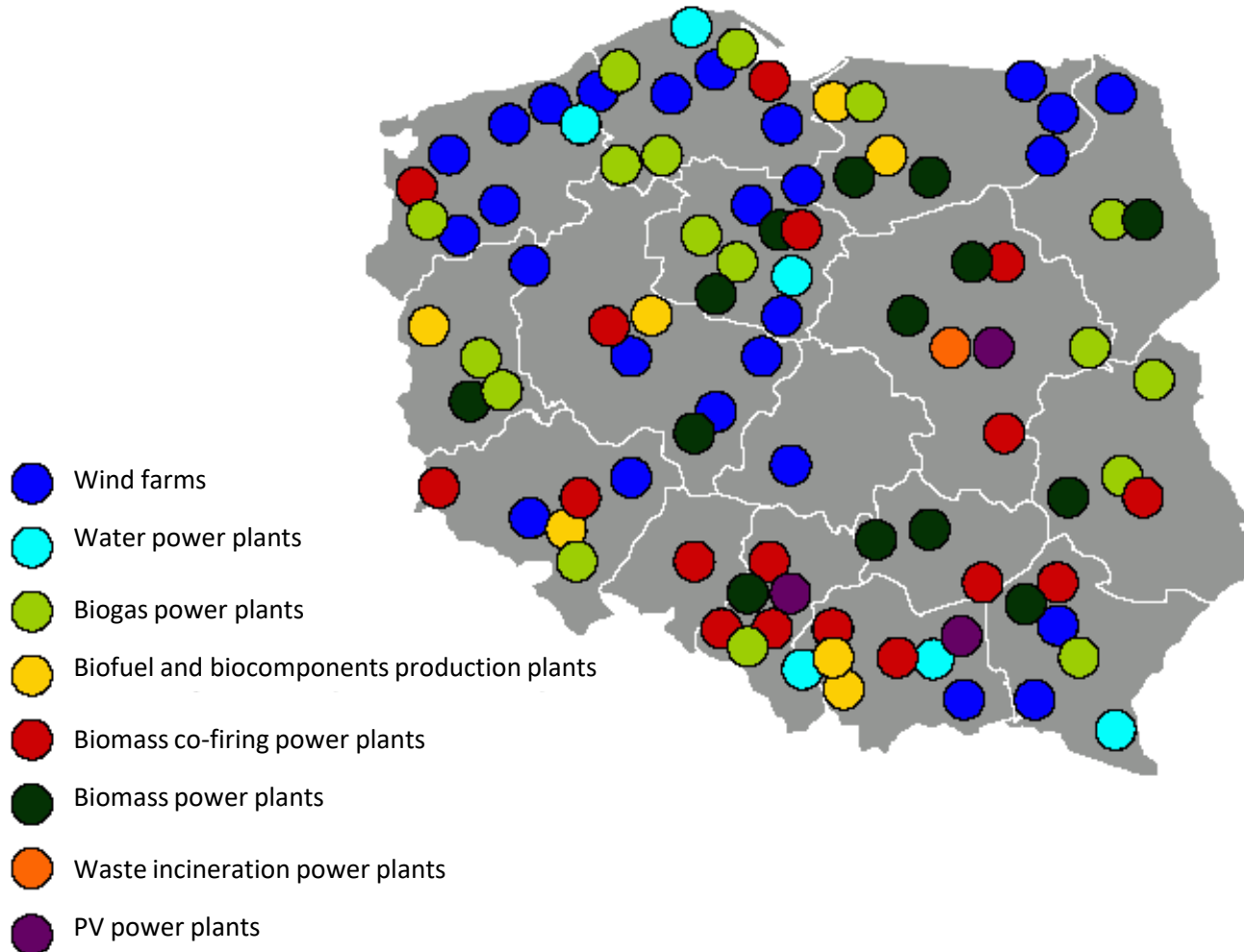
Development of installed capacity



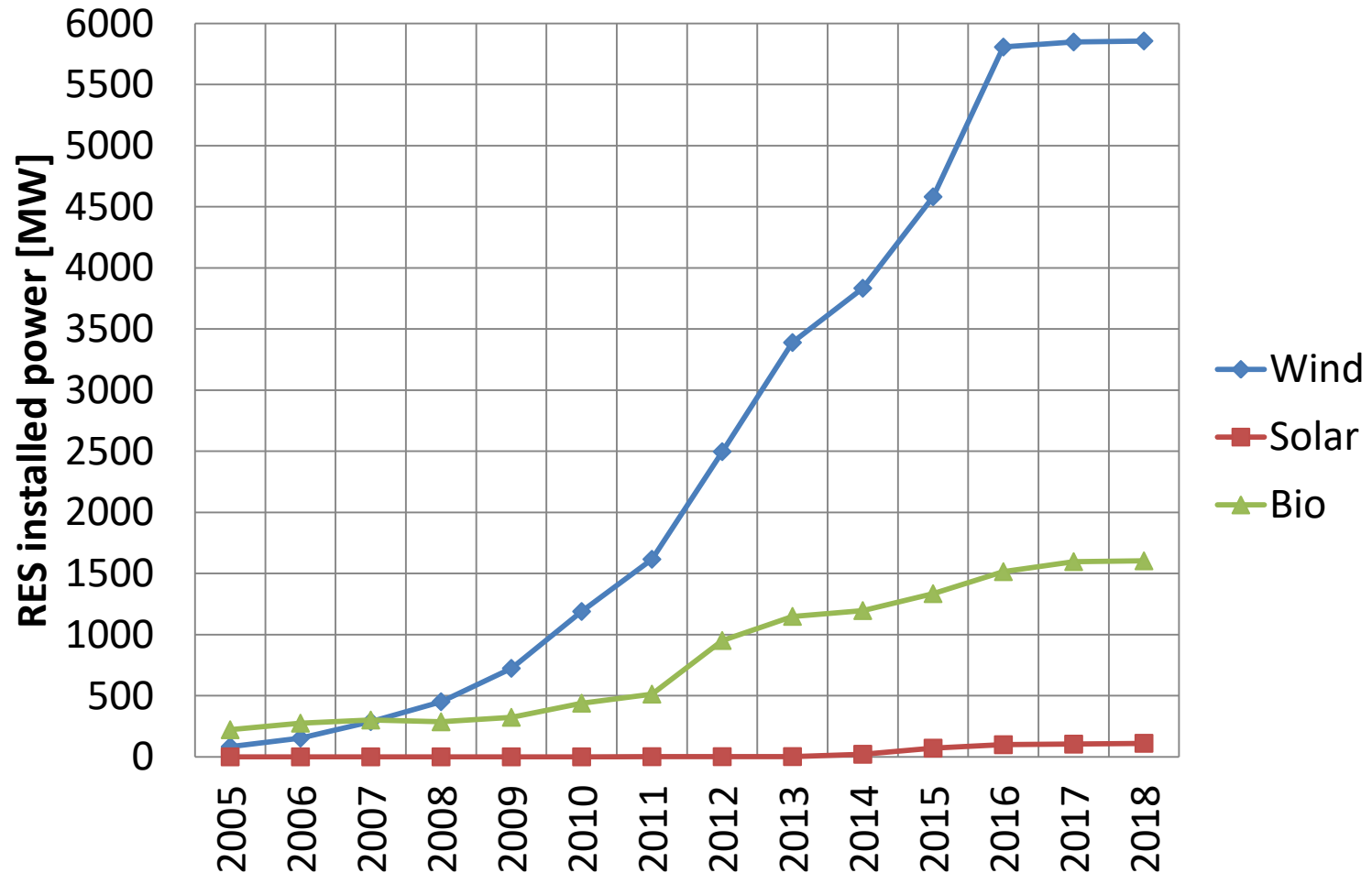


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Renewable energy sources location



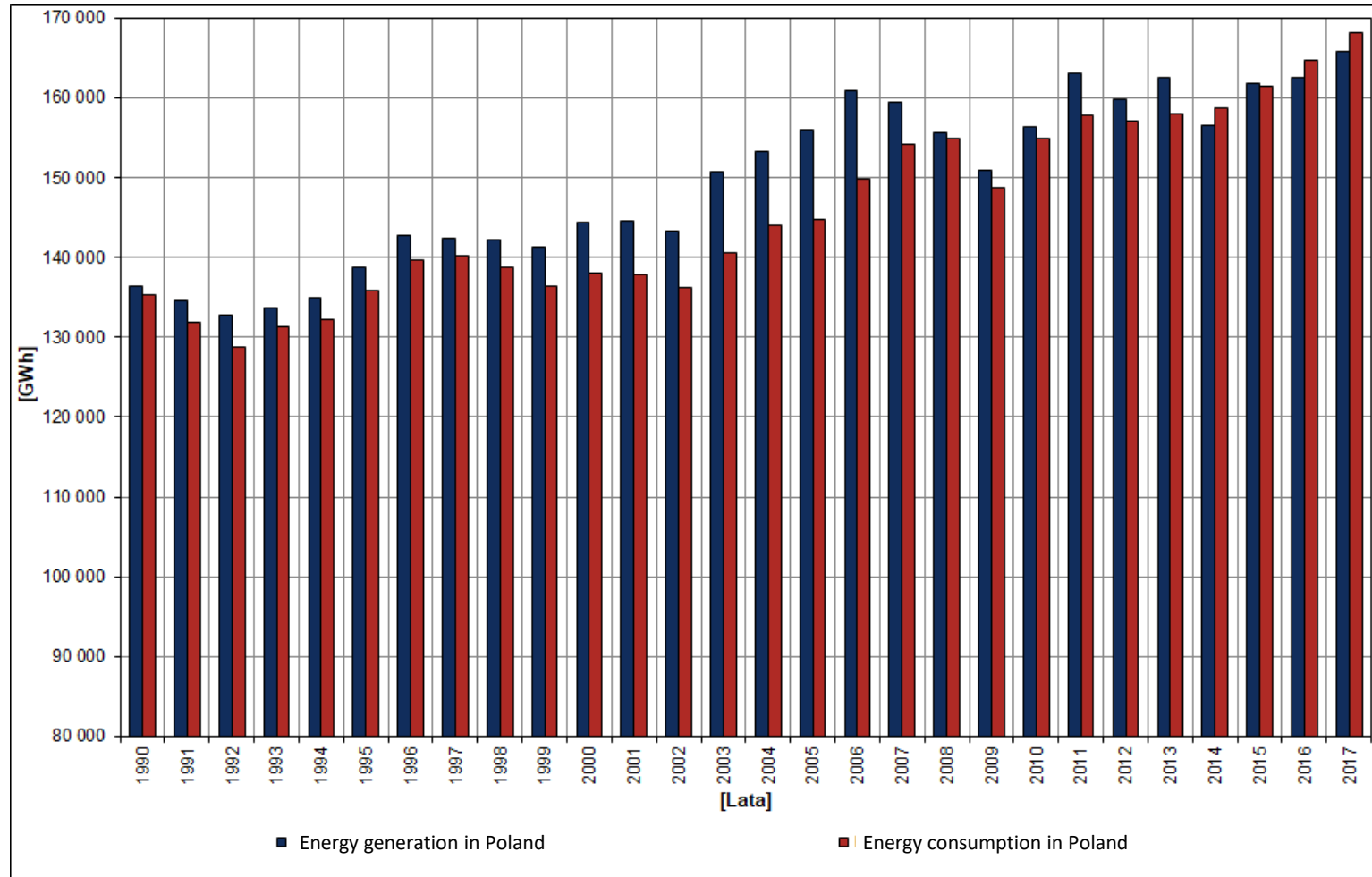
Renewable energy sources development





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Development of energy generation and consumption



Interconnection energy exchange (in 2017)

No.	Neighboring country	Energy import [GWh]	Energy export [GWh]	Balance [GWh]
1.	Belarus	0,0	0,0	0,0
2.	Czech Republic	373,7	5 946,3	-5 572,5
3.	Lithuania	1 536,7	494,3	1 042,3
4.	Germany	7 340,4	20,9	7 319,5
5.	Slovakia	0,3	4 372,1	-4 371,8
6.	Sweden	3 124,9	150,5	2 974,4
7.	Ukraine	894,8	0,0	894,8
8.	In general	13 270,7	10 984,0	2 286,7



Energy balance (in 2017)

Generation = 165,852 TWh

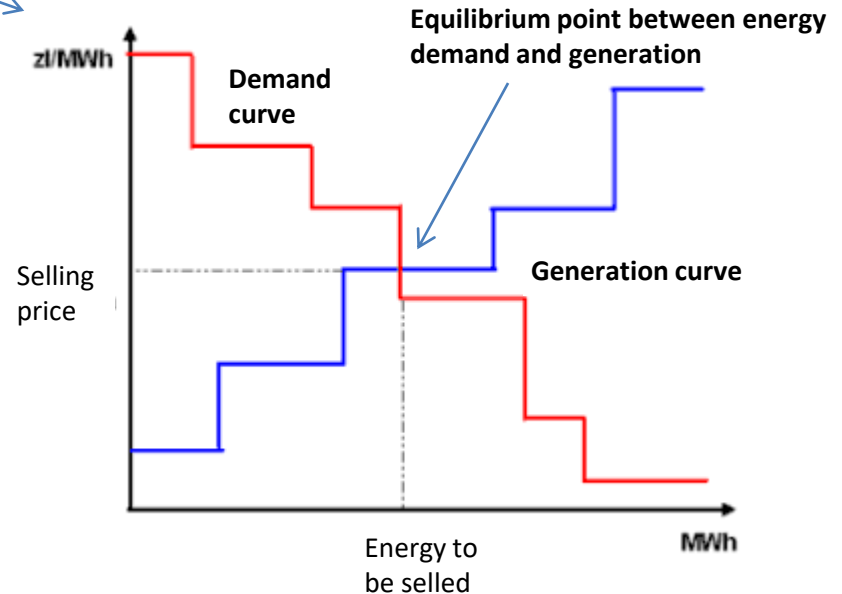
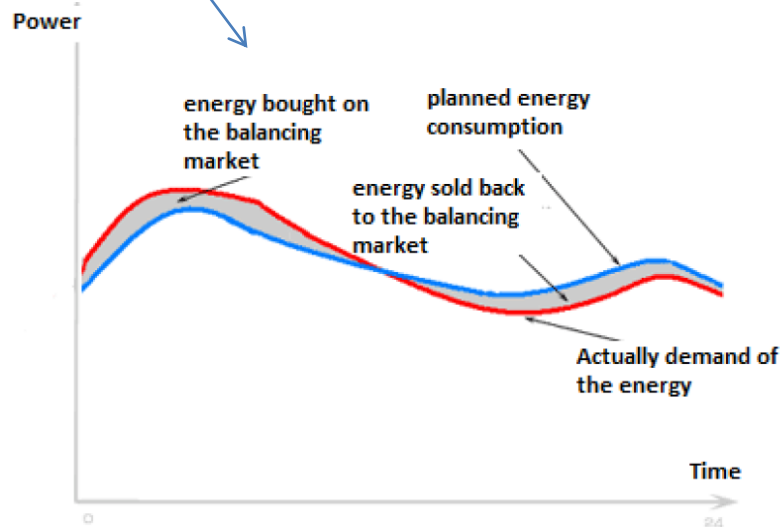
Consumption = 168,139 TWh

Balance of international exchange = +2,287 TWh



Electricity market (TGE)

- Contract market – Contract between generating company and energy trades
- Stock market (day-ahead)
- Balancing market



- Power market – emergency power demand

