

Nuclear power program in Poland

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Polish Power System

The total maximum capacity in Polish Power System (PPS) reached **43 421 MW** (as of 31 December 2017).

- Coal-fired power plants – **20 247 MW**
- Lignite-fired power plants – **9 352 MW**
- Gas power plants – **2 341 MW**
- Industrial power plants – **2 813 MW**
- Hydroelectric power plants – **2 328 MW**
- Renewable resources – **6 341 MW**
- **Nuclear: 0 MW**

Energy consumption:

168 139 GWh/year (2017)

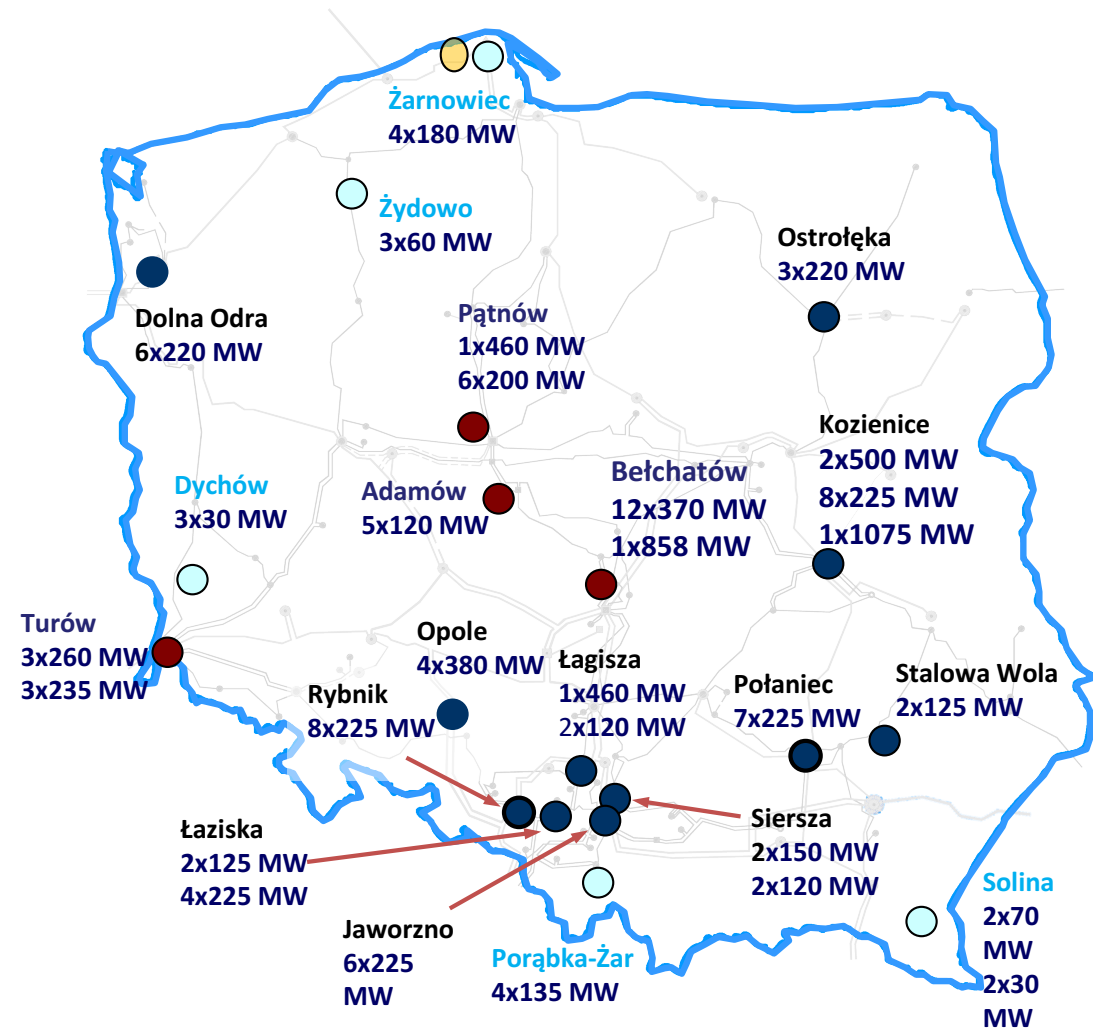
4,37 MWh/per citizen/year; one of the lowest in Europe.

According to all estimations energy consumption in Poland will grow in coming decades.

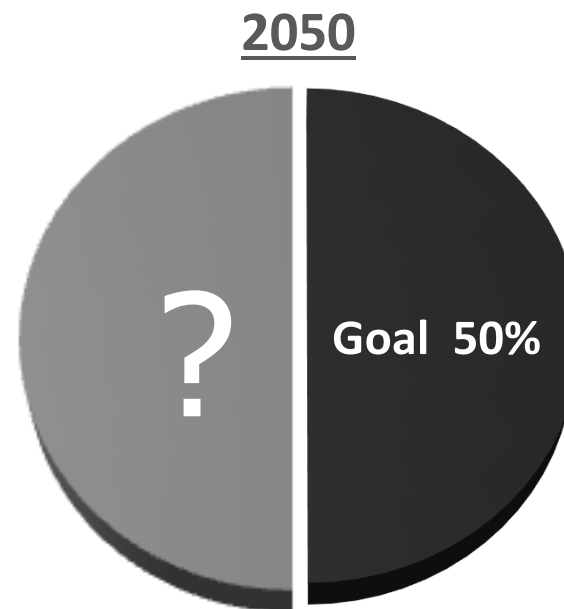
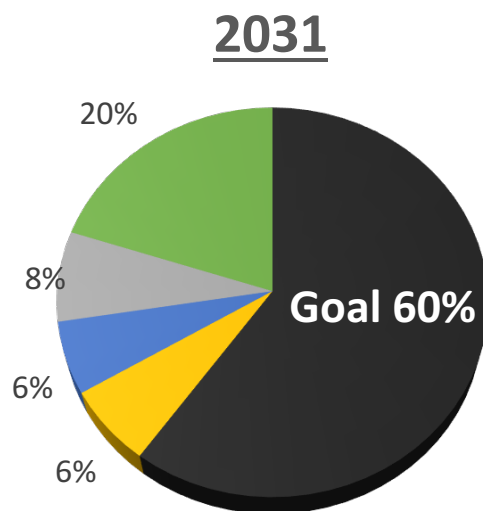
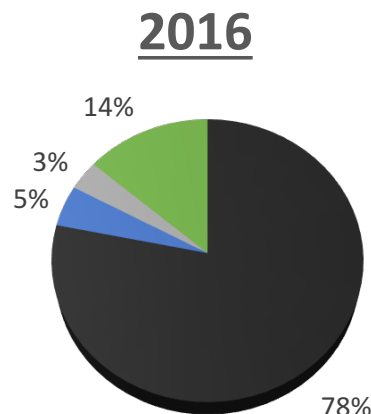
Transmission grid - 14 195 km:

- 1 line of 750 kV (114 km),
- 93 lines of 400 kV (6 326 km),
- 164 lines of 220 kV (7 755 km),

Under-sea 450 kV DC connection between Poland and Sweden(245 km)



Current and future energy generation structure



Assumptions:

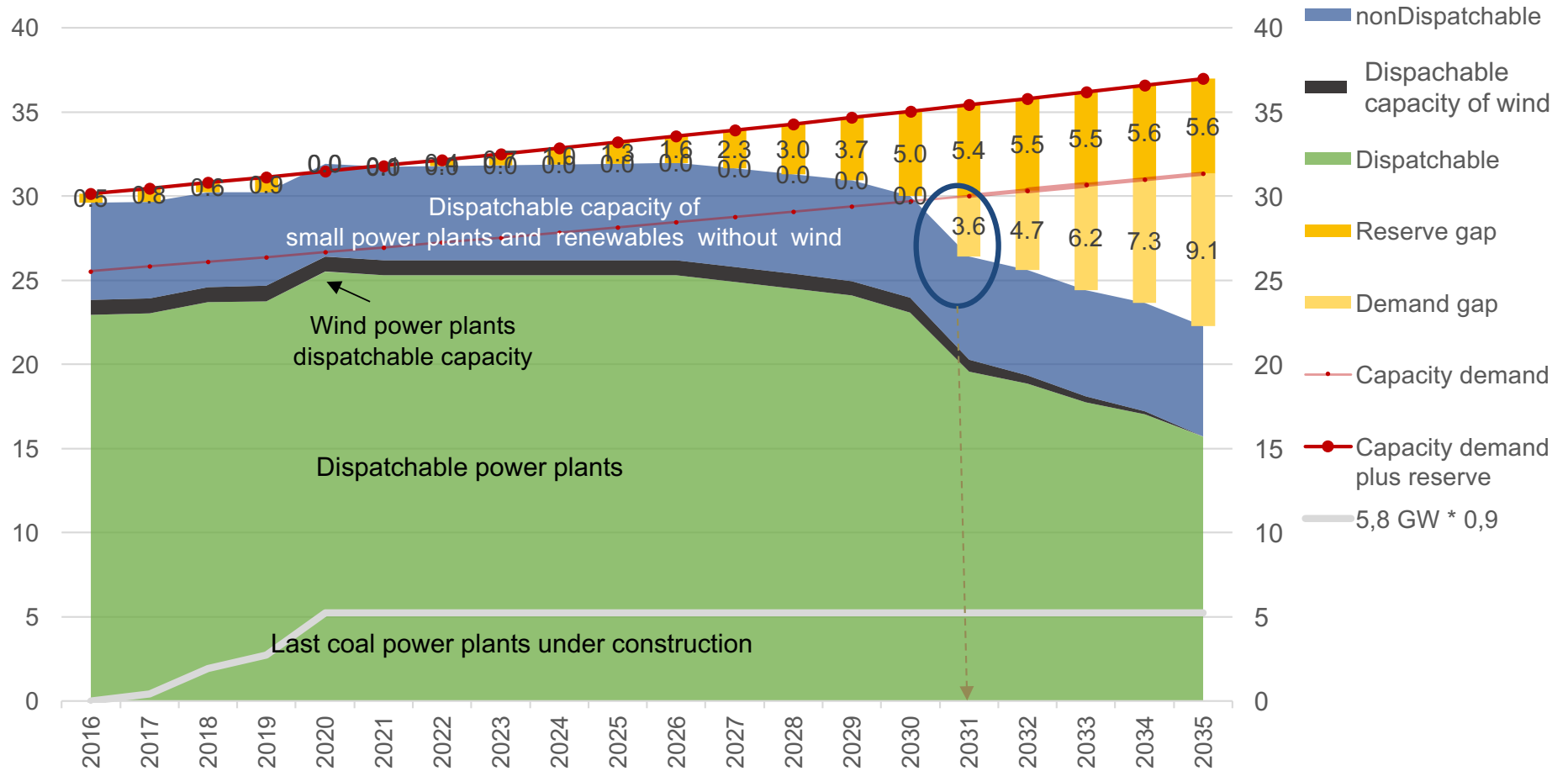
- ✓ slight decline of consumption of coal by 2031 and without changes after 2031
- ✓ 1,5 GW by NPP in 2031, 6 -9 GW by 2050
- ✓ Average increase of production by 0,86% y/y (accelerated increase by 2030, slowdown by 2050)

coal and lignite
 nuclear power
 gas fuels
 other
 renewables



Peak load and current and planned capacity

[GW]

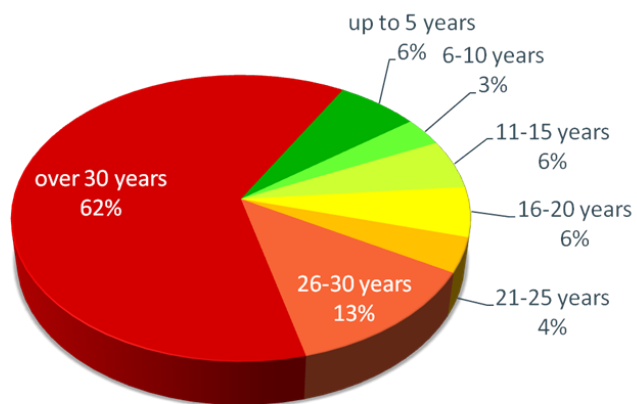


SOURCE: ME, PSE



Main challenges

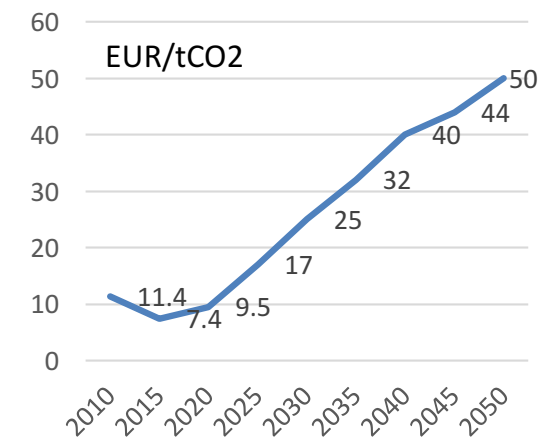
Aging structure of the existing power plants in Poland (2016)



Lignite resources already mined out (2040)



Increasing costs of coal power generation (CO₂, air pollutants)

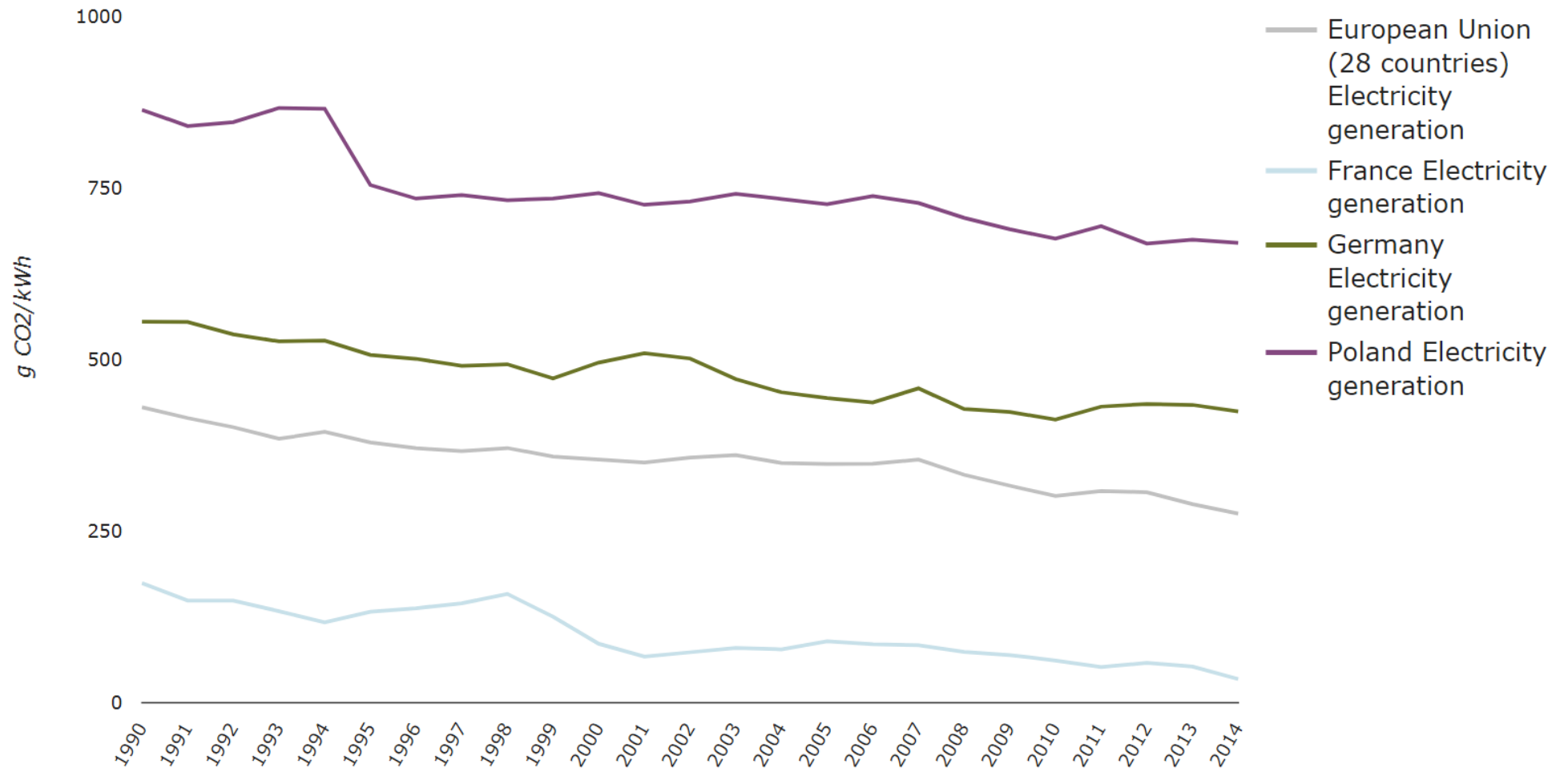


Source: Polish Energy Market Agency 2017. Projection based on:

- 1) OECD/IEA, World Energy Outlook 2016, Paris, November 2016.
- 2) European Commission: EU Reference Scenario 2016. Energy, transport and GHG emissions trends to 2050, July 2016.
- 3) "Thomson Reuters Carbon Market Survey 2016", Nordeng, A. et al., May, 2016.
- 4) KfW/ZEW CO₂ Barometer 2016– Carbon Edition.



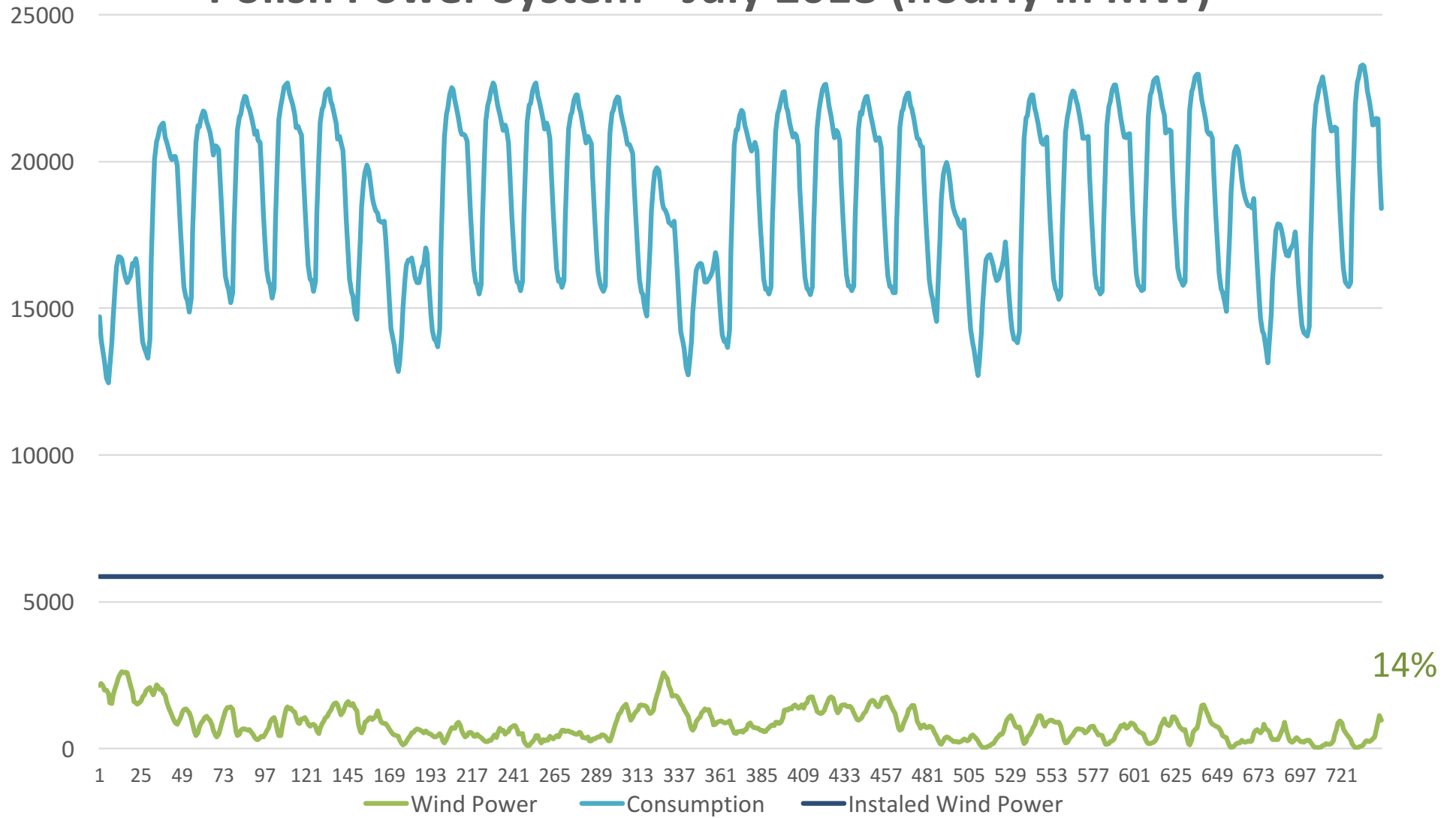
Electricity generation – CO₂ emission intensity



Source: European Environment Agency



Polish Power System - July 2018 (hourly in MW)



Polish Nuclear Power Program

- PNPP was approved on January 28th 2014 by the Council of Ministers. Its key goals resulting from the Energy Policy of Poland until 2030 are following:

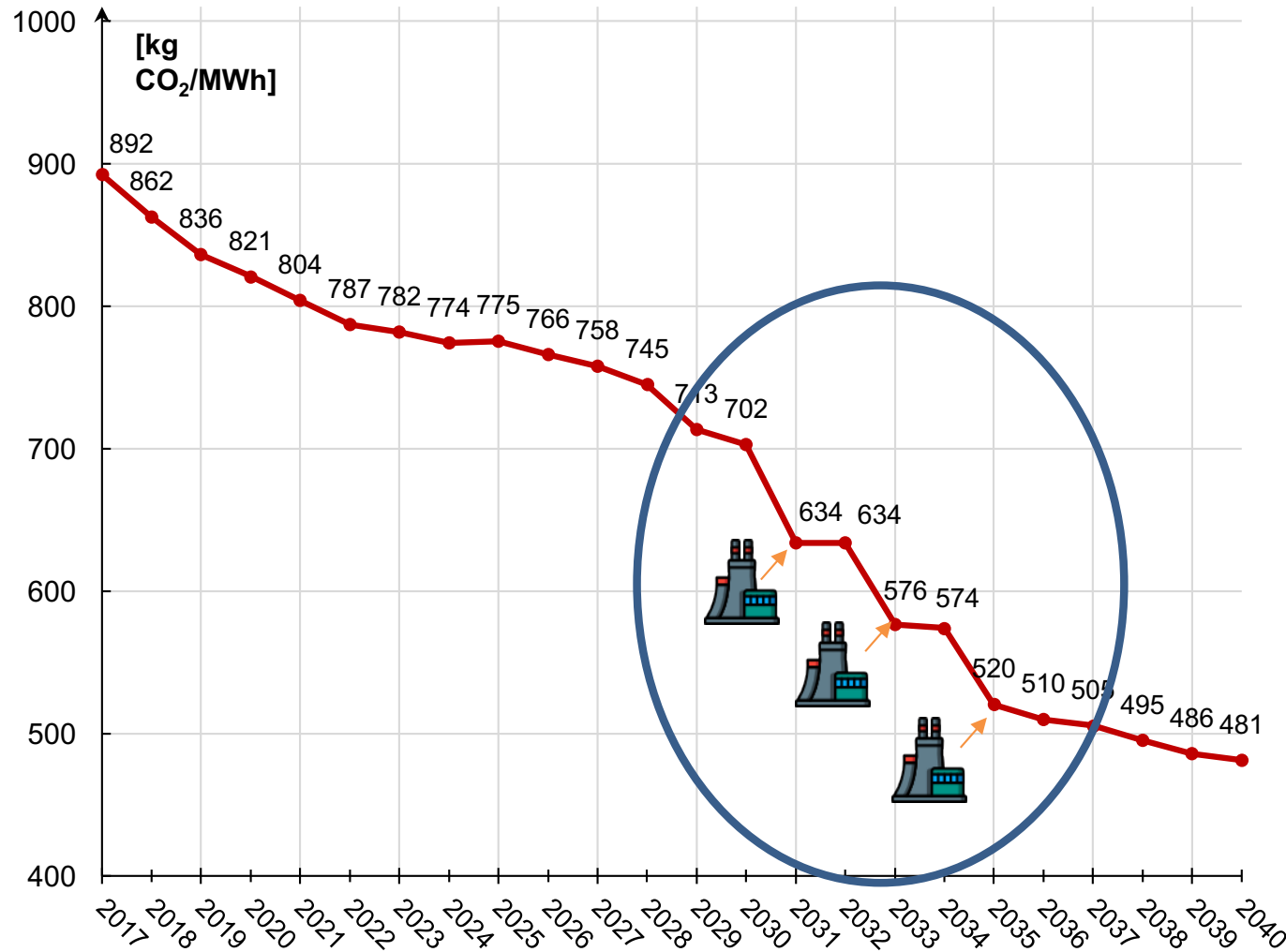
- ✓ assuring long-term security of electricity supply
- ✓ maintaining electricity prices at levels acceptable by the national economy and the society
- ✓ **reducing emissions of CO₂ and other air pollutants**

- 2 NPP planned with total installed capacity: 6000 MWe
- Current status:

The government is working on update of the document and new business model for the first NPPs.



Average CO₂ emission per 1 MWh



Assumptions:

- ✓ 1,5 GW since 2031, further 2 units after 2 and 4 years
- ✓ 7,5-10 GW installed capacity in wind turbines
- ✓ Included CCGT, new coal power units, gas units, oil units and other renewables.



Thank you for attention

