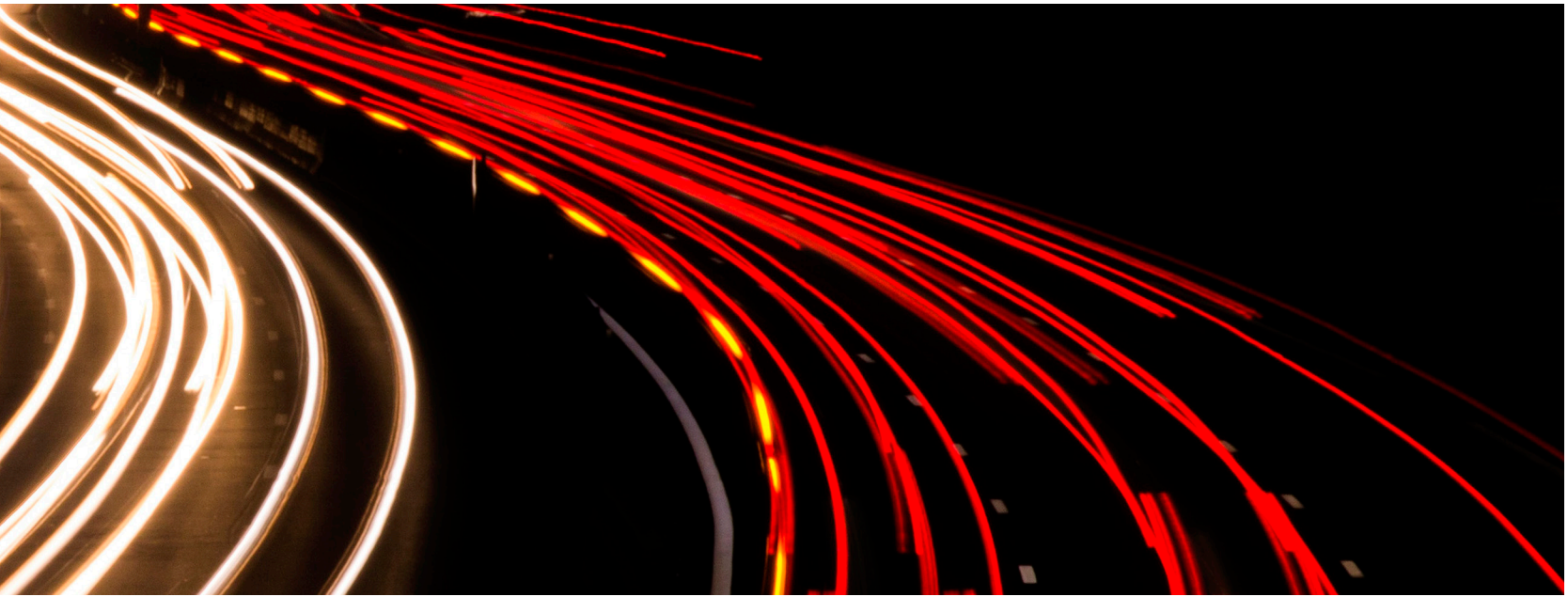
Forum Energii
Analizy i dialog



Energy transition in Poland

Edition 2019

www.forum-energii.eu

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Forum Energii is the Polish think tank forging the foundations of an effective, secure, clean and innovative energy system.

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Foreword

We are pleased to present you the second edition of our review of the most important data describing the condition of the energy transition in Poland.

Last year's report indicated a slow beginning of the process of changes in the Polish power sector. However, this year's data are interpreted in a different way. The figures confirm that the current energy model is coming to an end, but it is still not clear what will come instead.

The trend of gradual decrease in the share of coal and diversification of the energy mix continued. However, this is not the result of the commitments made by our country until 2020 and 2030. The direction of the changes is neither consistent with the objectives of the Winter Package. Changes of the Polish energy mix do not result from the growing role of RES, but from the increased use of gas units.In 2018, the volume of electricity from new RES investments was symbolic. Greenhouse gas emissions were increasing.

I particularly encourage you to have a closer look at the coal import data. Growing imports have not been off the front pages of the newspapers in the last year. In our report, we demonstrate that simultaneously to beating import records, mainly from Russia, Poland is no longer an exporter of this fuel. For decades we have learned to think of coal as a pillar of energy security and trade balance of our country. The facts we have gathered prove that it is time to forget about it.

Yours faithfully
Joanna Maćkowiak-Pandera
President of Forum Energii

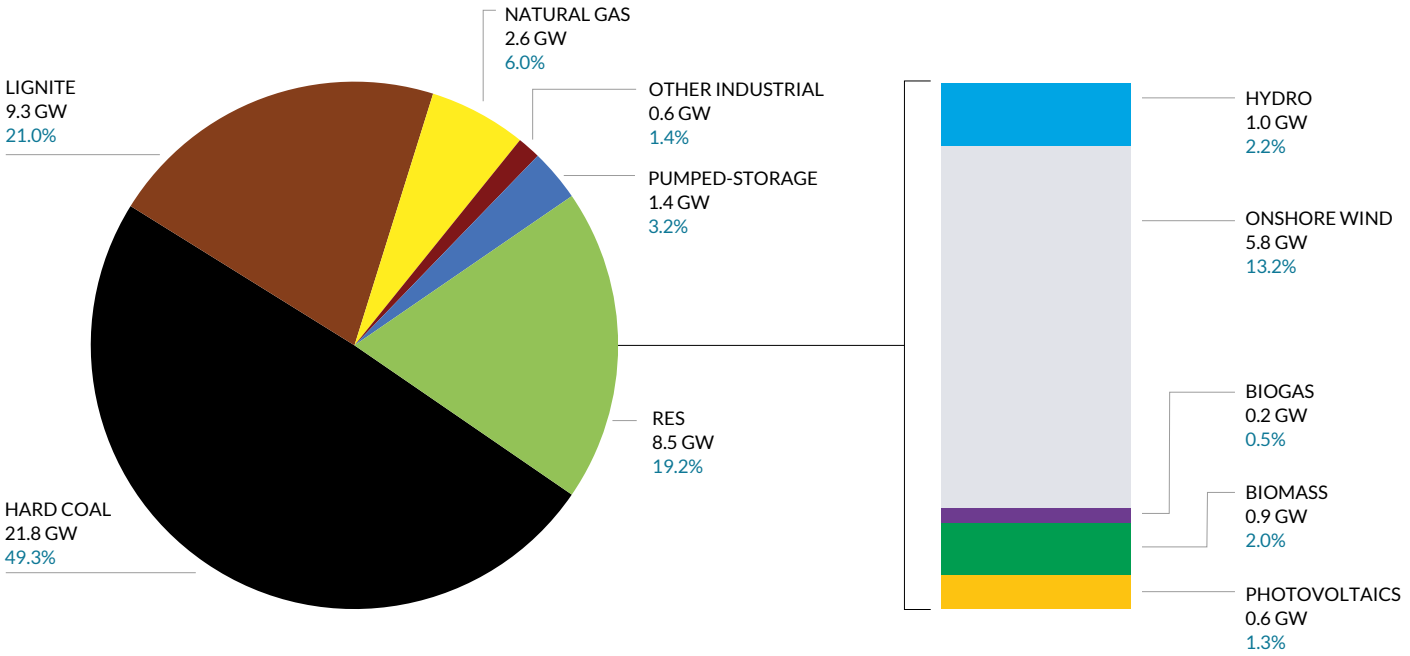
Main conclusions

- The share of imports in covering domestic energy needs is increasing. Record imports of electricity, coal and gas were noted.
- Energy mix diversification is progressing towards greater utilization of gas units. The share of coal remains unchanged.
- Greenhouse gas emissions are on the rise, including in the power sector.
- In 2018, the share of RES in Polish energy mix did not grow. New investments are missing.

Generation capacity

Installed capacity in the Polish system in 2018

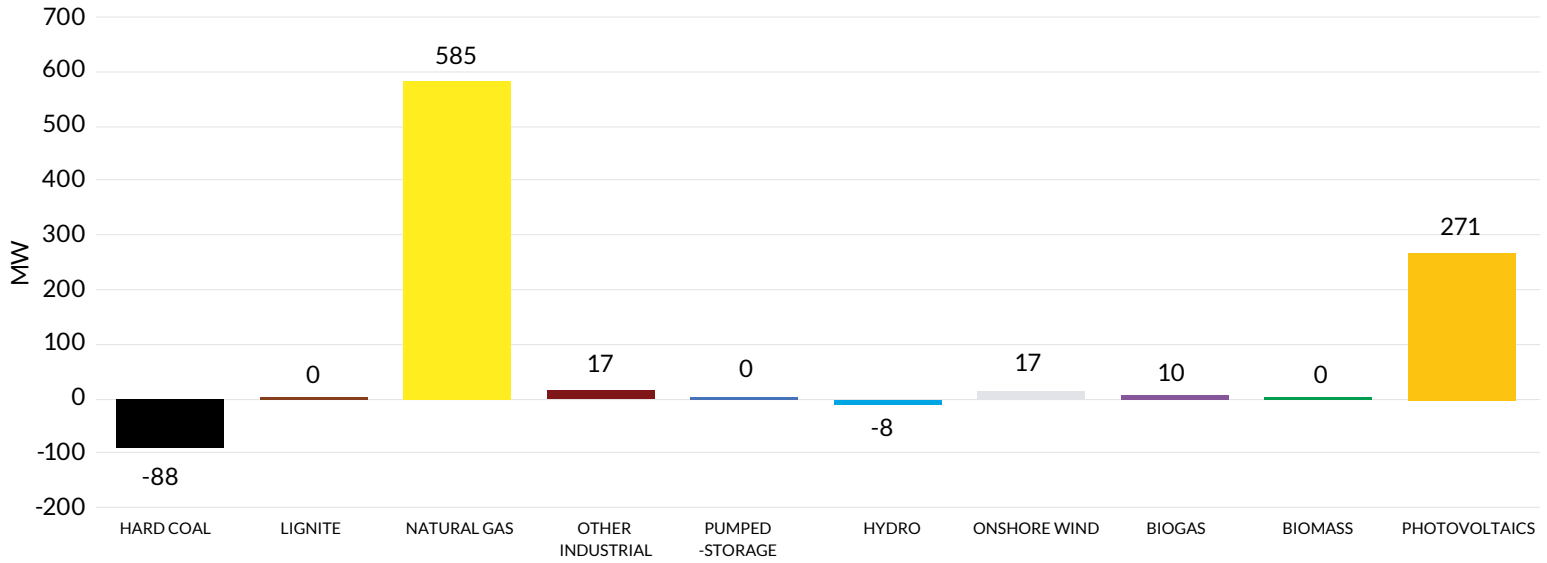
- The share of installed capacity in lignite and hard coal decreased from 72% in 2017 to 70% at the end of 2018.
- The share of installed capacity of gas units increased by 1 p.p.



Source: based on data of the Agencja Rynku Energii S.A. (ARE).
As of 31.12.2018

Change in installed capacity in 2018 as compared to 2017

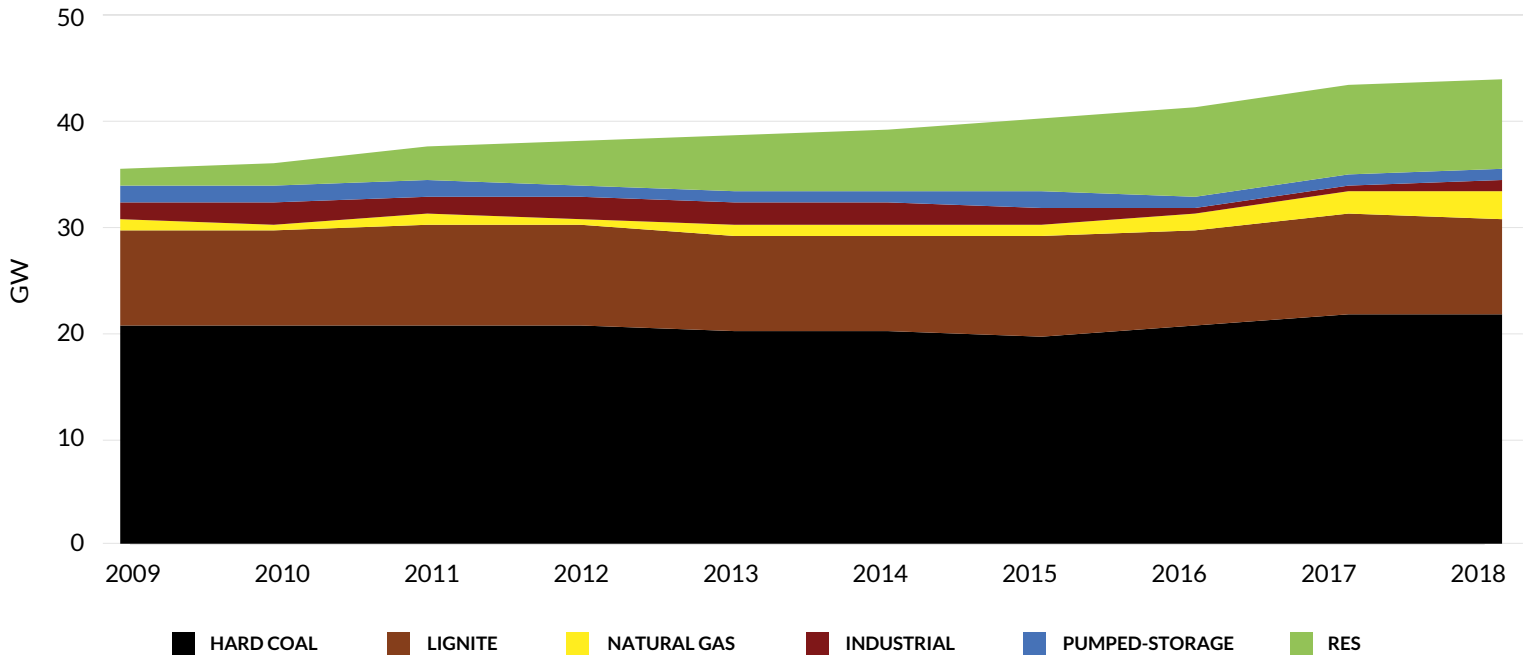
- The increase in installed capacity in gas units is a result of the completion of the investment in the industrial CHP plant in Płock.
- The installed capacity of photovoltaic panels increased by more than 80% year-to-year.



Source: based on data of ARE.

Changes in installed capacity

- In the last decade, new capacities consisted of mainly RES and gas-fired industrial units.

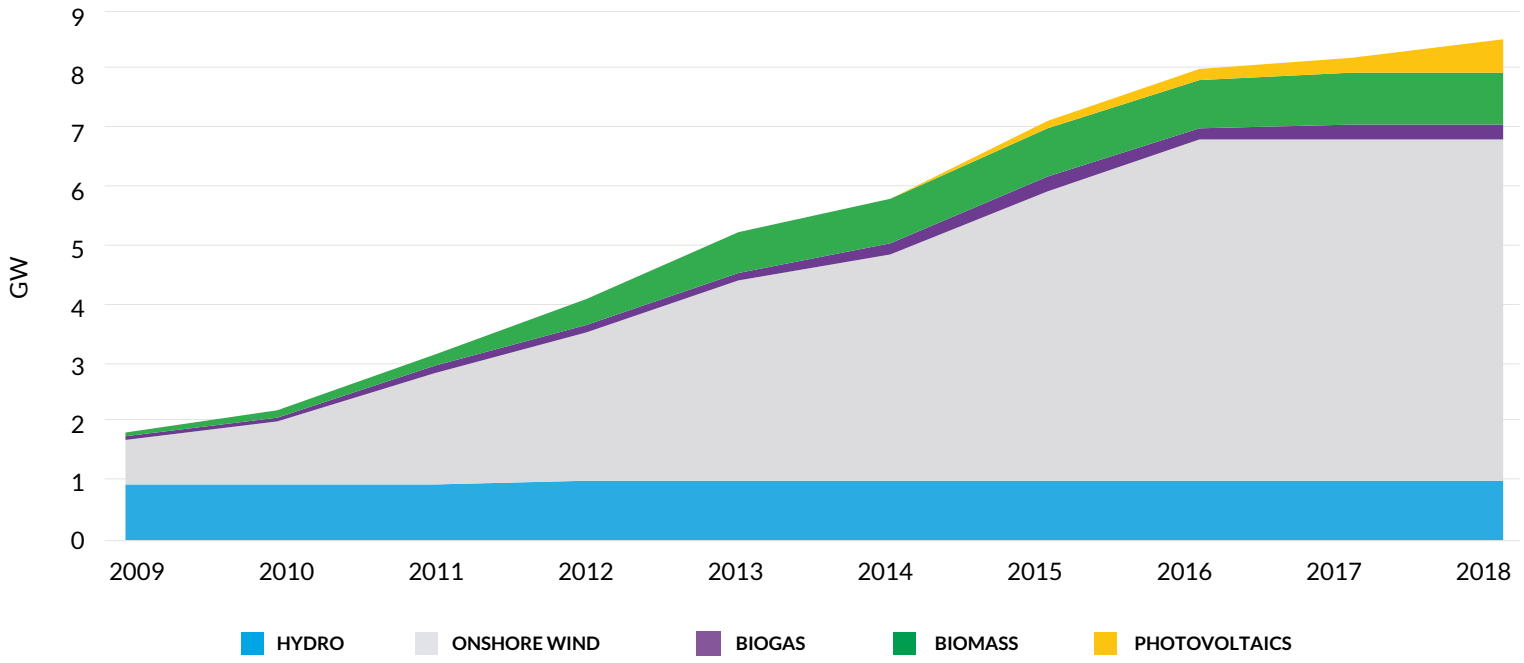


Source: based on data of ARE.

* Since 2016, the "industrial" category has been disaggregated by fuel type.

Changes in installed RES capacity

- The installed PV capacity tripled to 560 MW in 2016-18.
- Other renewable sources development is halted since 2016.

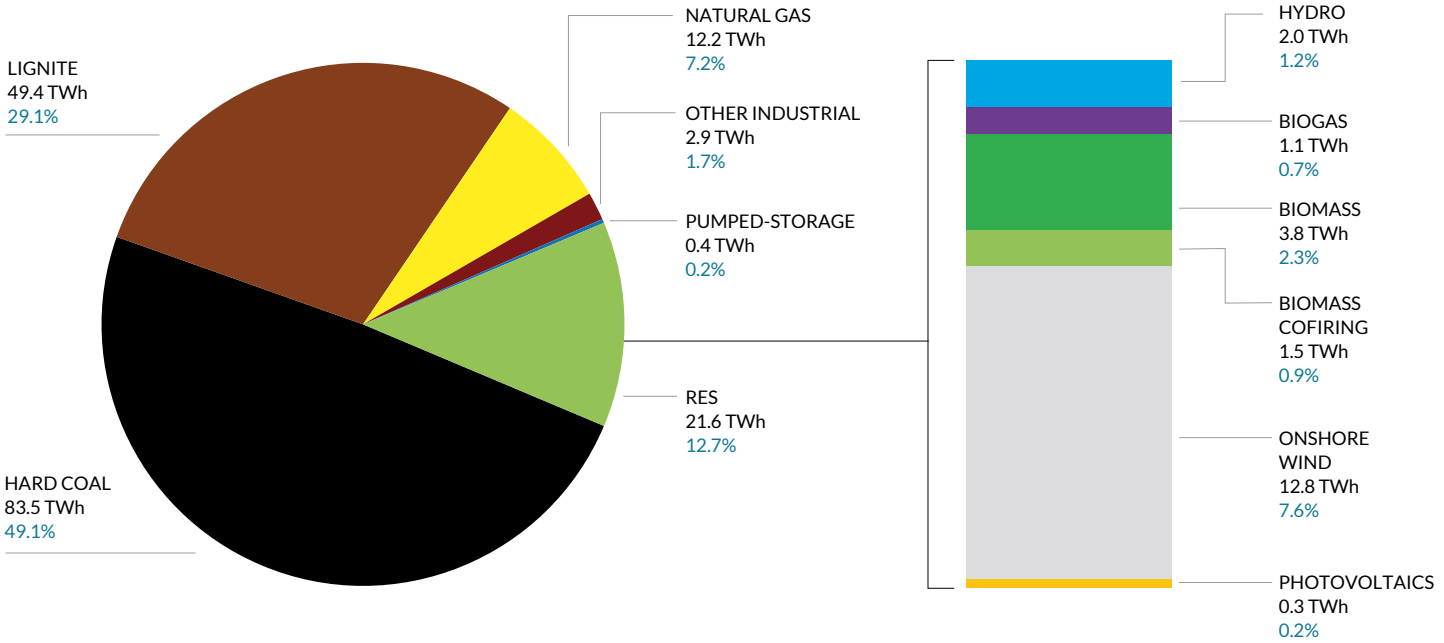


Source: based on data of ARE.

Electricity production

Electricity production in 2018

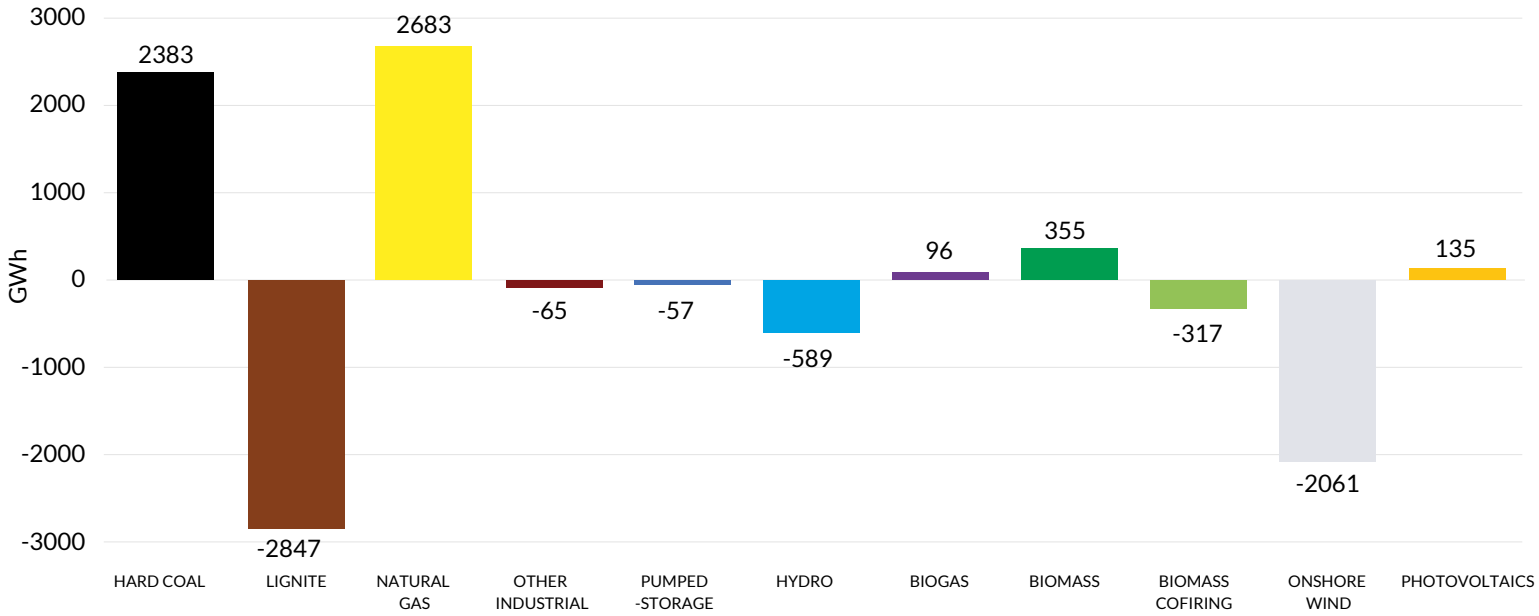
- Coal is the most important fuel in electricity production - its share was 78.1% compared to 78.4% in 2017.
- The importance of gas is growing. Its share in the energy mix was 7.2% compared to 5.6% in 2017.
- The share of RES in electricity production decreased to 12.7% from 14.1% in 2017.



Source: based on data of ARE.

Change in electricity production in 2018 as compared to 2017

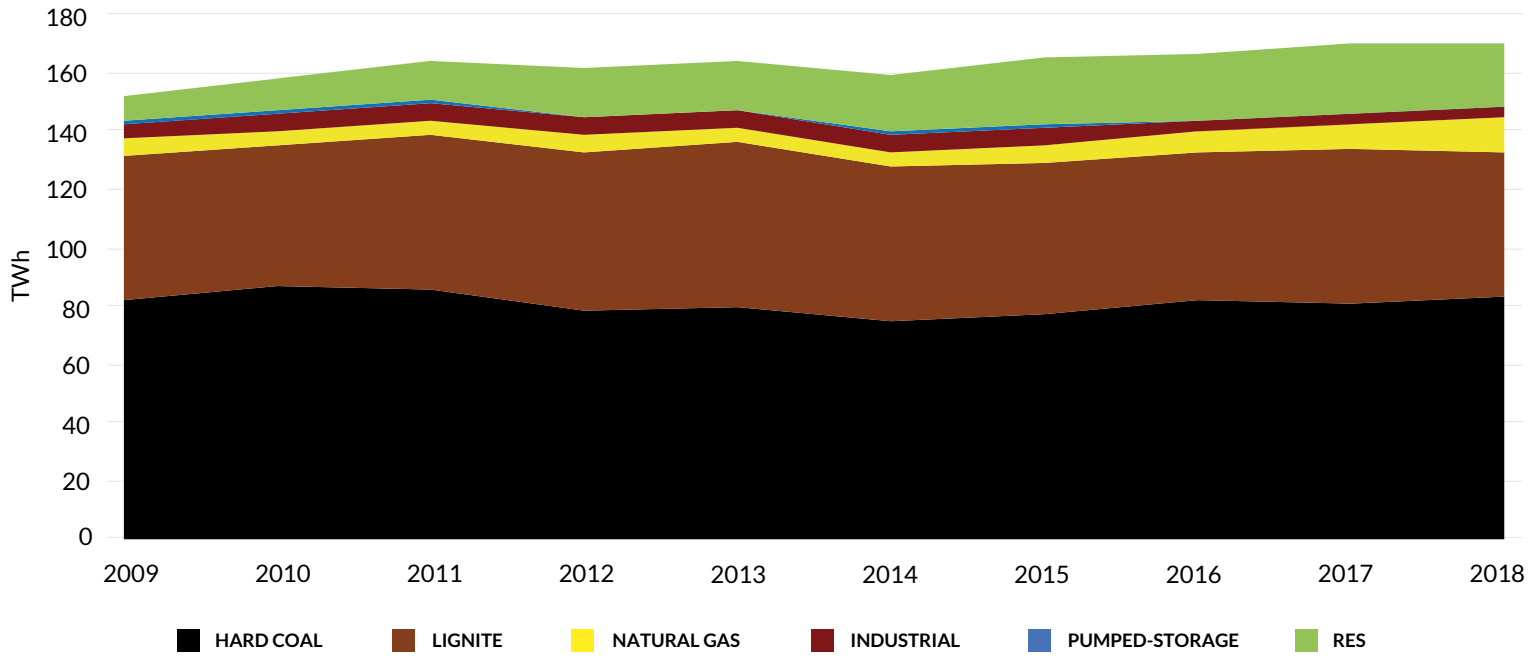
- The decrease in lignite production results mainly from the shutdown of the Adamów power plant.
- The decrease in production from onshore wind power plants is related to unfavourable legal regulations and less wind.
- The production of electricity from coal and gas increased after the completion of the Kozienice power plant and the CHP plant in Płock.



Source: based on data of ARE.

Changes in electricity production

- In the last decade, the share of natural gas in the energy mix has increased significantly.
- The changes in other sources were minor.

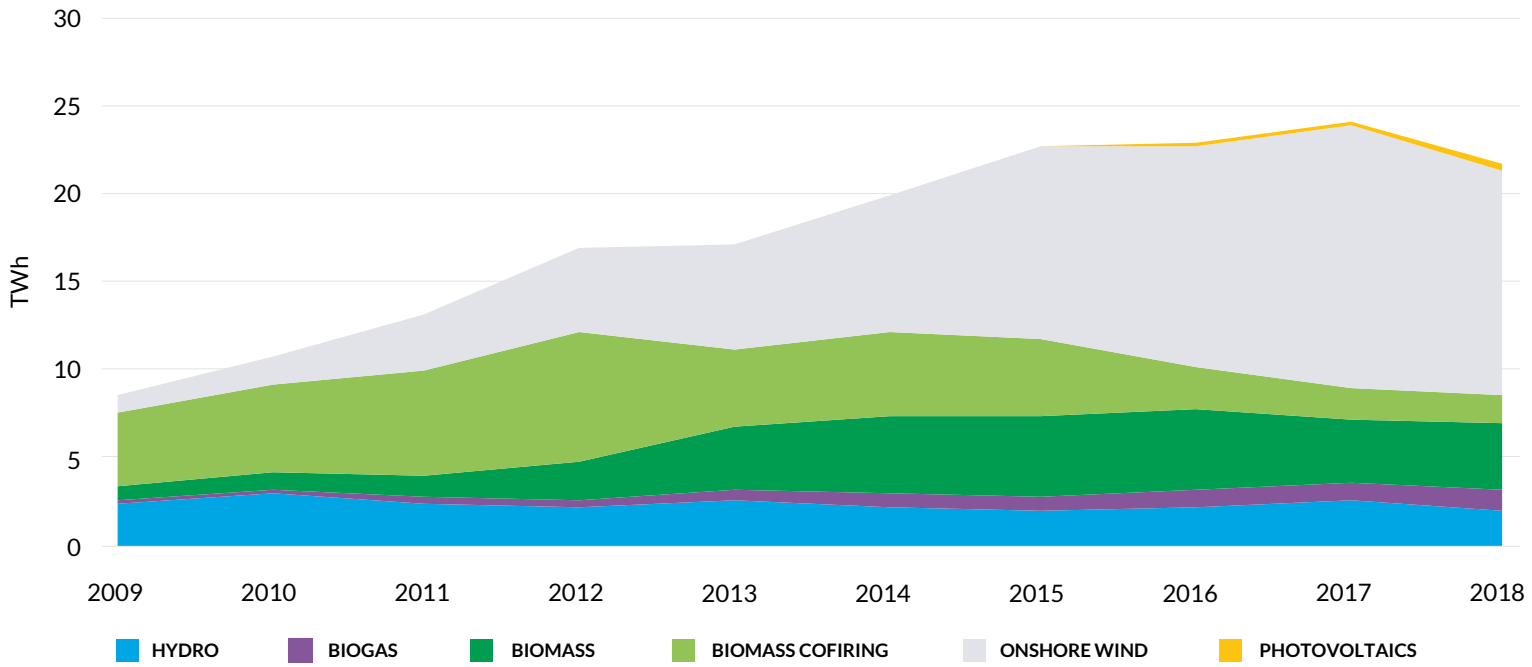


Source: based on data of ARE.

* Since 2016, the "industrial" category has been disaggregated by fuel type.

Changes in electricity production from renewable energy sources

- In 2018, the lowest production and the lowest share of RES in the mix after 2014 were noted.

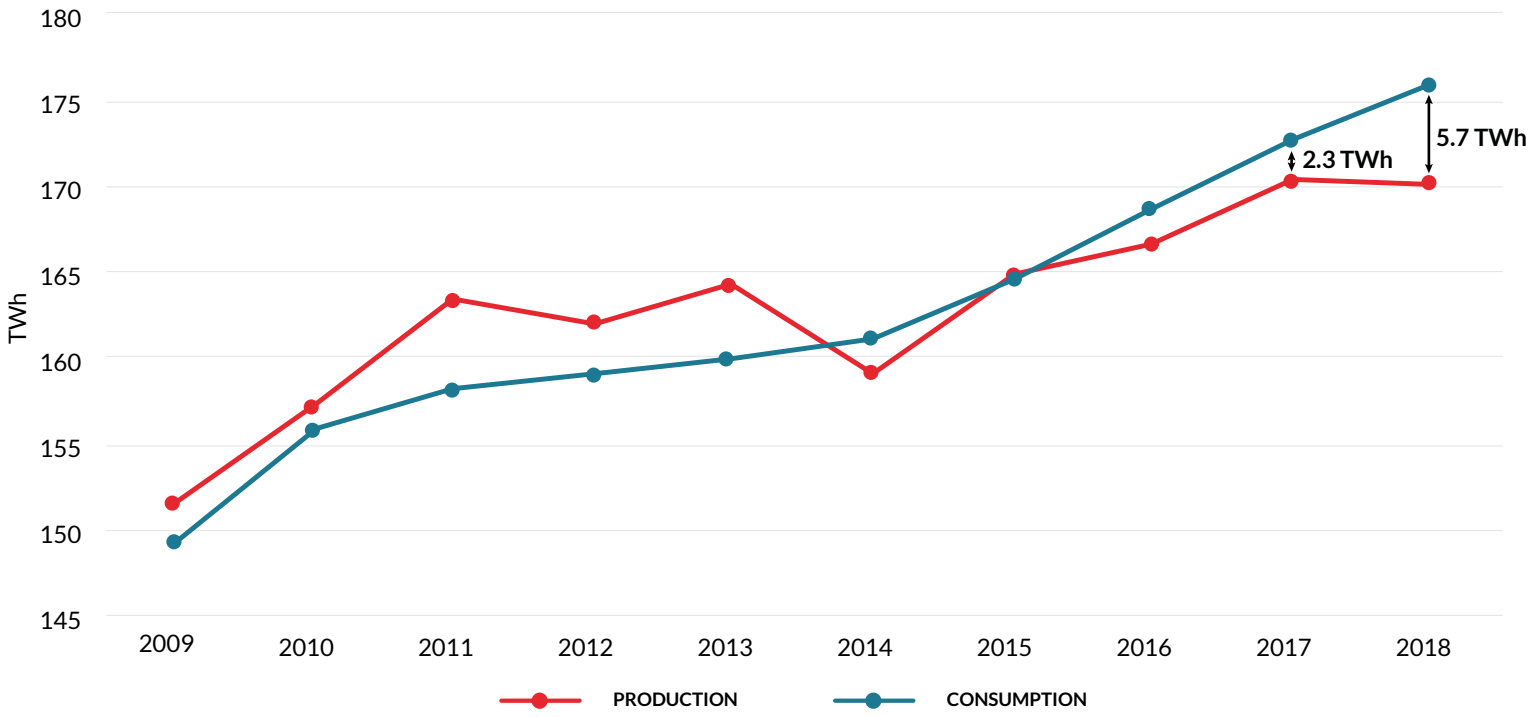


Source: based on data of ARE.

Energy balance

Balance of domestic electricity production and consumption

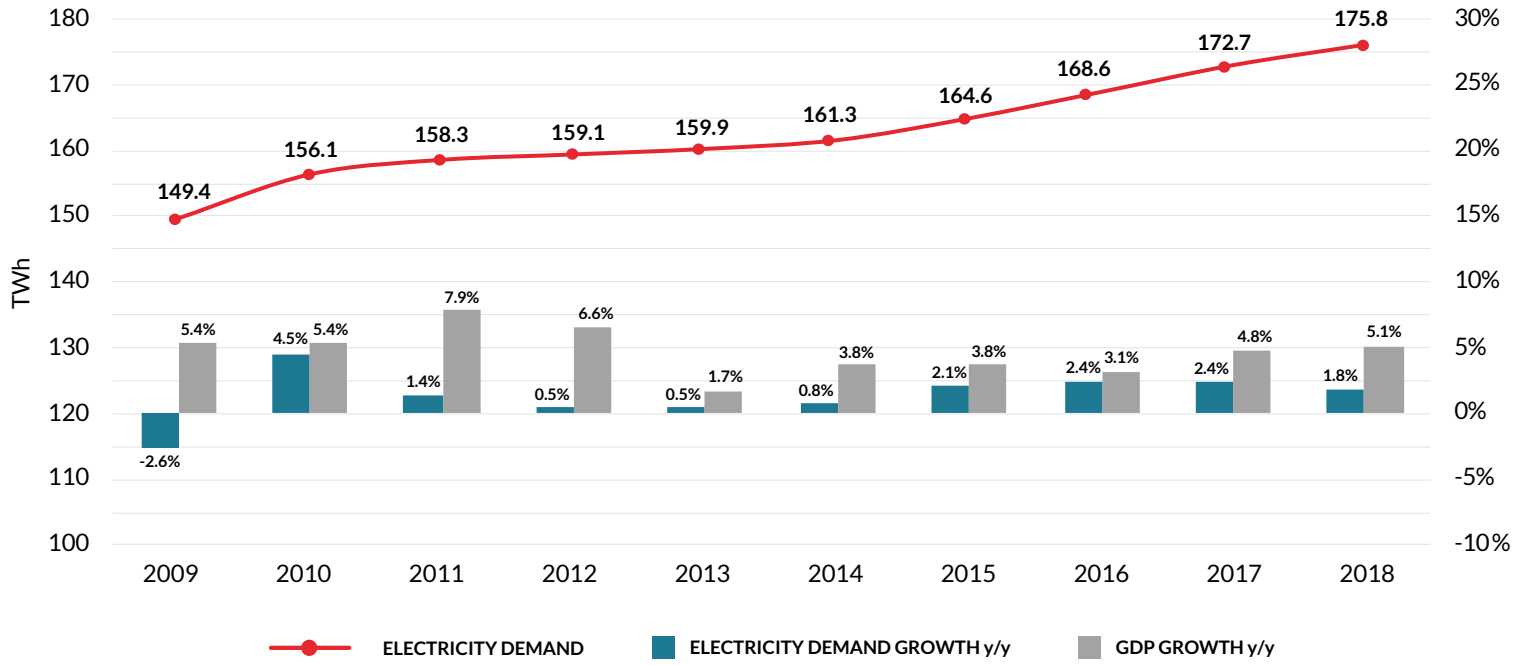
- In 2018, electricity production remained at the 2017 level.
- The growing demand for electricity was covered by imports. The net import volume increased two-and-half-fold.



Source: based on data of ARE.

Change in electricity demand

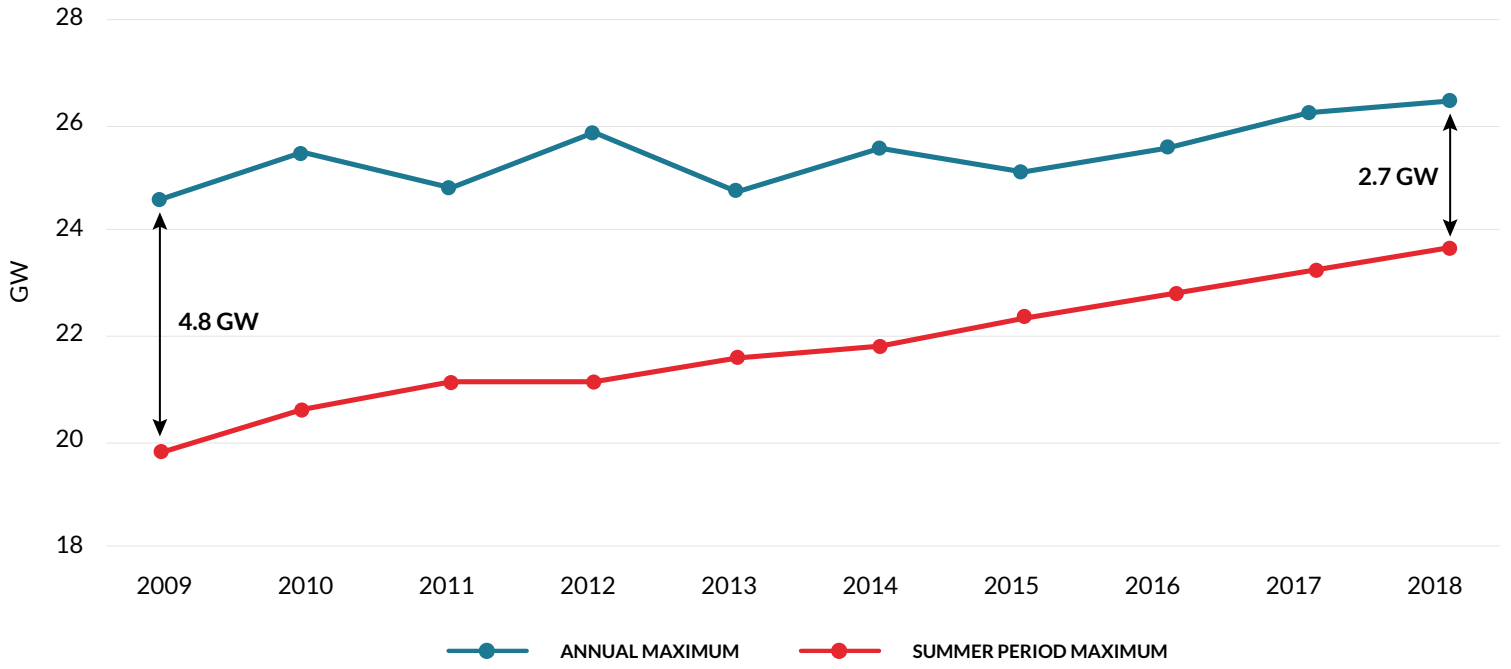
- In 2009-18 the demand for electricity in Poland increased on average by 1.6%, and last year by 1.8%.
- GDP is growing faster than electricity demand.



Source: based on data of ARE and Główny Urząd Statystyczny (GUS).

Change in peak power demand

- The annual maximum peak power demand in the Polish system is growing - in 2018 it reached a new record level of 26.45 GW.
- The problem of rapidly growing peak power demand in summer is worsening.

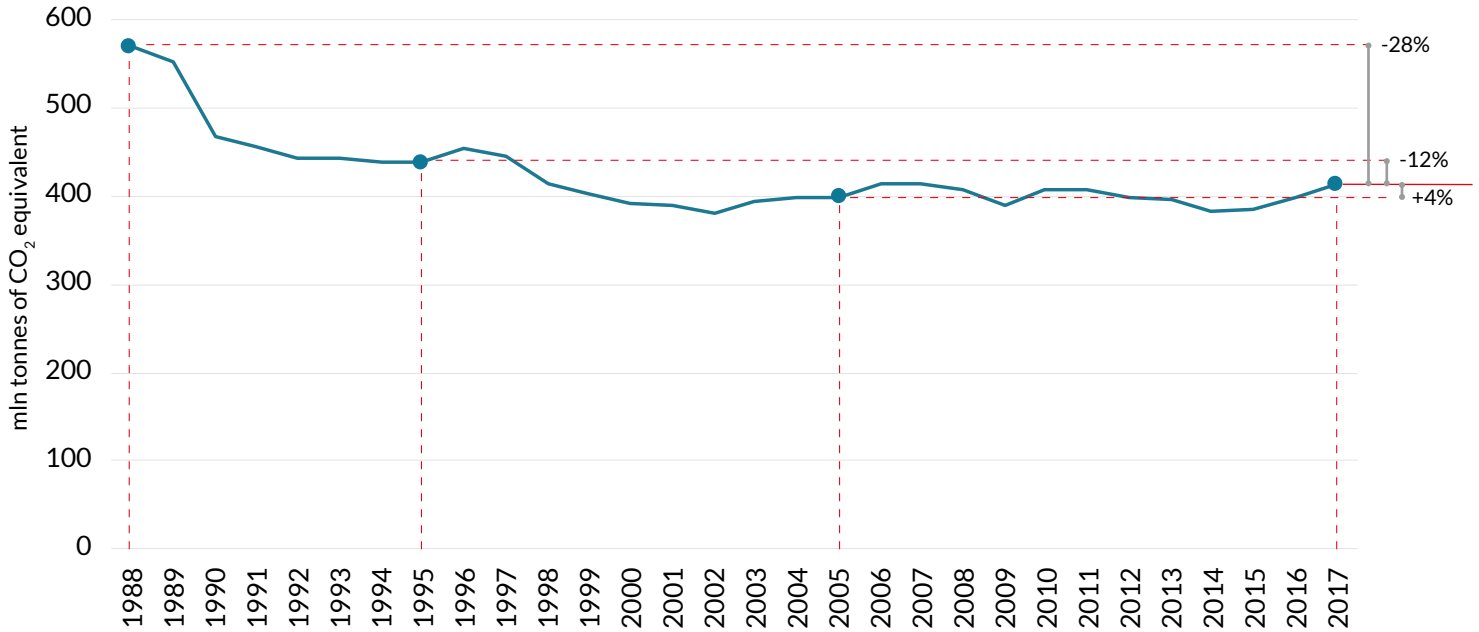


Source: based on data of the Polskie Sieci Elektroenergetyczne S.A. (PSE).

Emissions

Total national greenhouse gas emissions

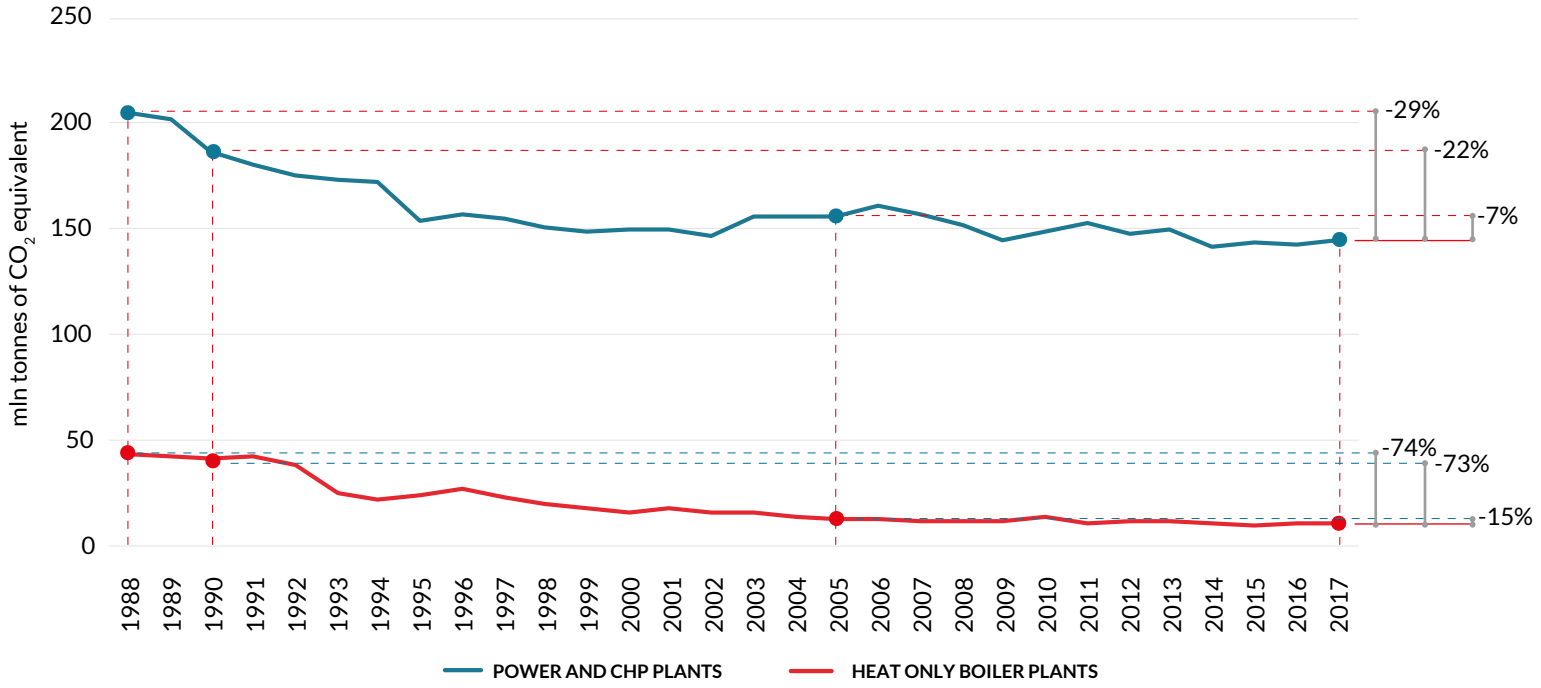
- In 2017, total greenhouse gas emissions increased by 16 million tonnes or about 4% compared to the previous year.
- The upward trend has been continuing since 2014.



Source: based on data of the European Environment Agency (EEA).

Power and heating sector greenhouse gas emissions

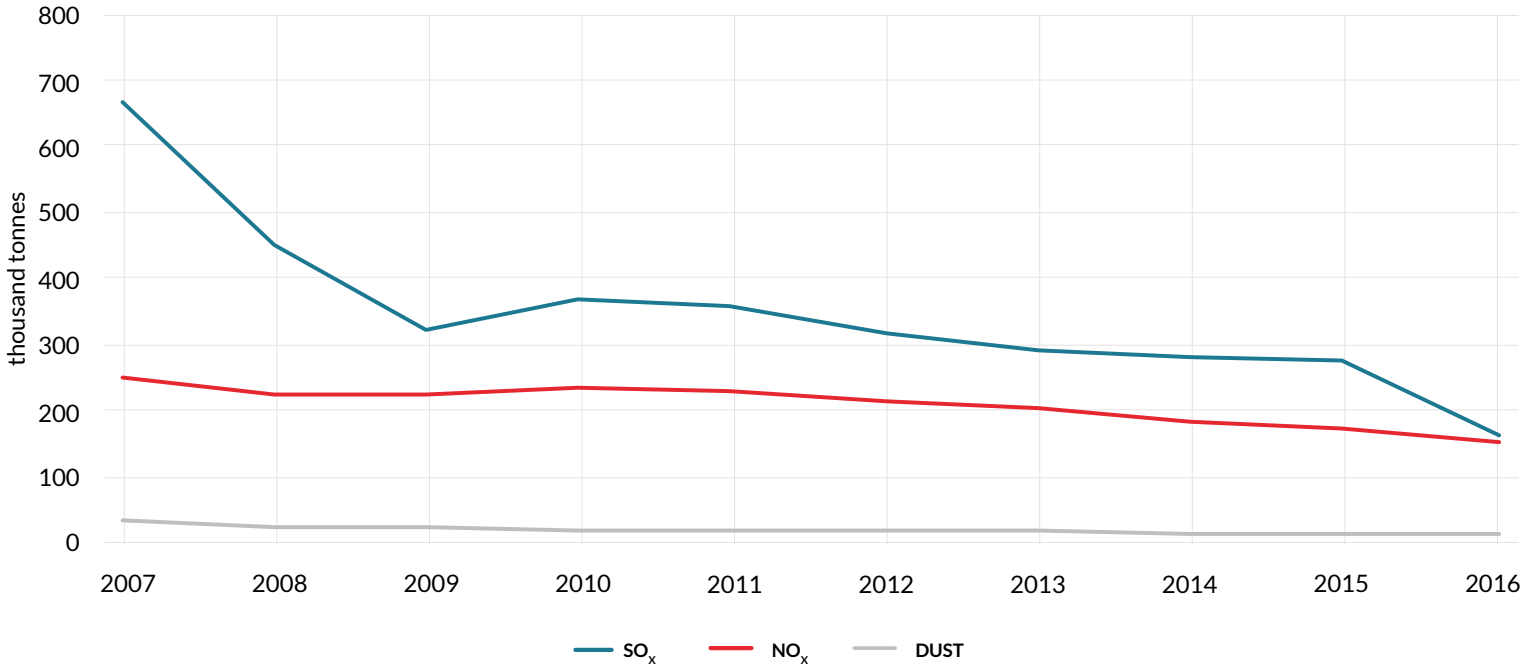
- Emissions from the power sector increased in 2017 by 1% compared to 2016.
- Emissions from the heating sector remain constant.



Source: based on data of EEA.

Power sector gas and dust emissions

- In 2016, over 40% reduction in SO_x emissions was observed. Emission reductions result from the implementation of the Industrial Emissions Directive.
- In 2016, the trend of slow NO_x and dust emission reduction continued.

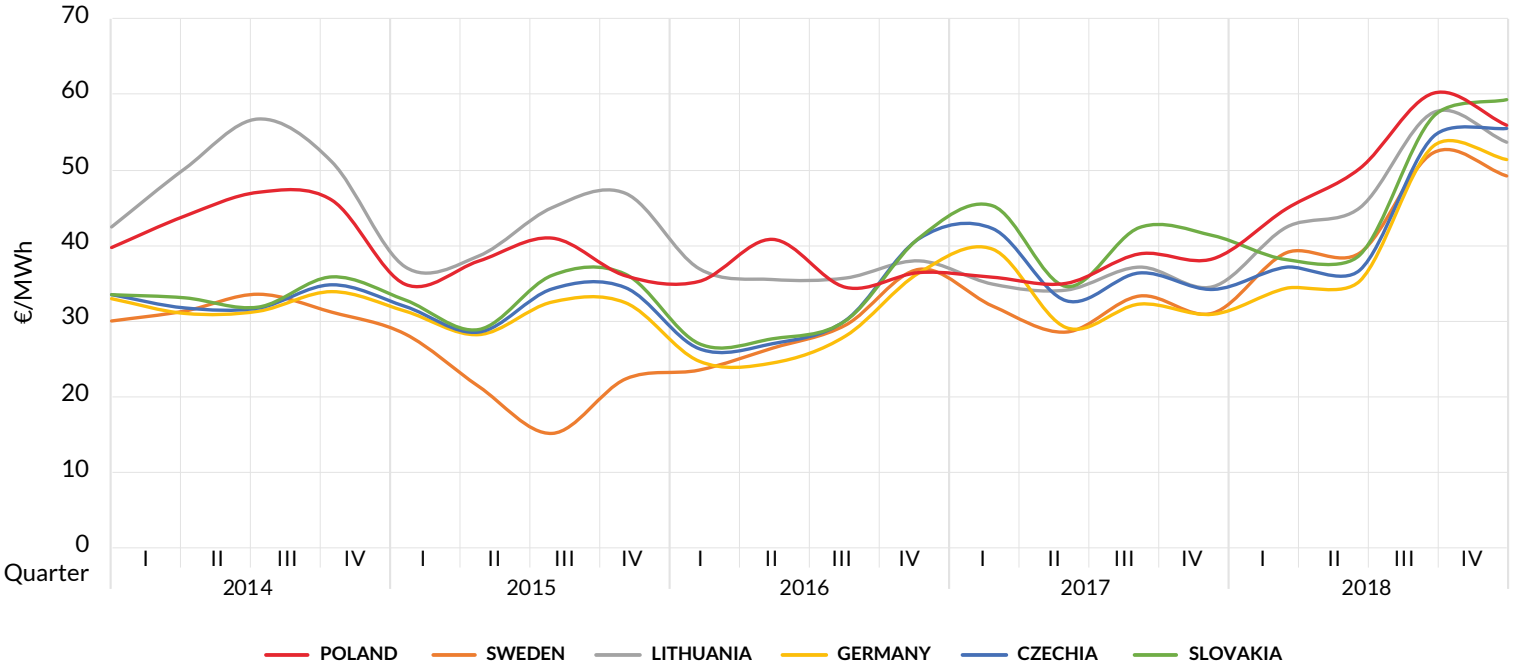


Source: based on data of GUS.

Electricity prices

Comparison of spot electricity prices on neighbouring markets

- In 2018, the whole region experienced a significant increase in electricity prices.
- It is evident that prices on neighbouring markets in the European Union are progressively levelling out, as a result of the functioning of the internal electricity market.

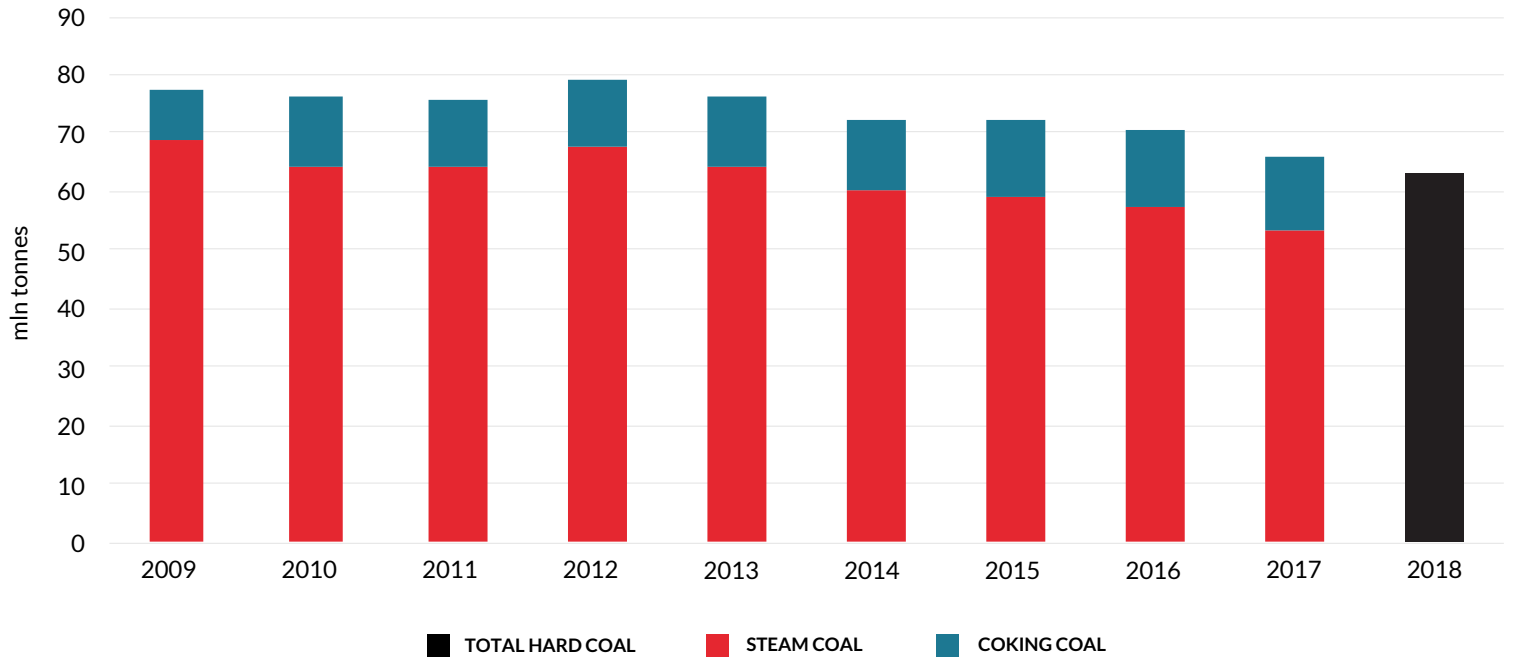


Source: based on data of Towarowa Giełda Energii S.A. (TGE), European Energy Exchange AG (EEX), Nordpool, OTE, a.s.

Power sector fuels

Domestic production of hard coal

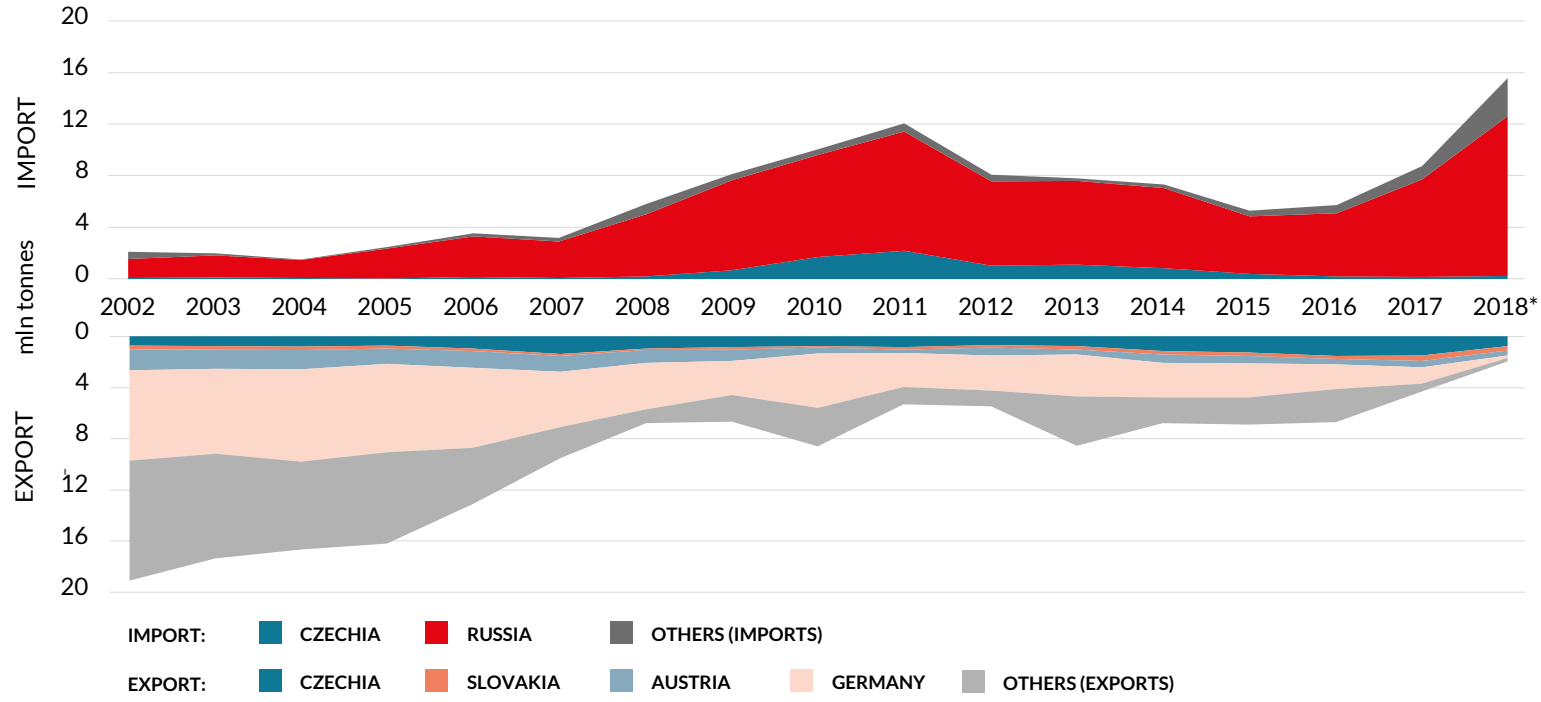
- In 2018, hard coal production decreased by 2 million tonnes compared to 2017.



Source: based on data of GUS and Polski Rynek Węgla

Trade balance of steam hard coal

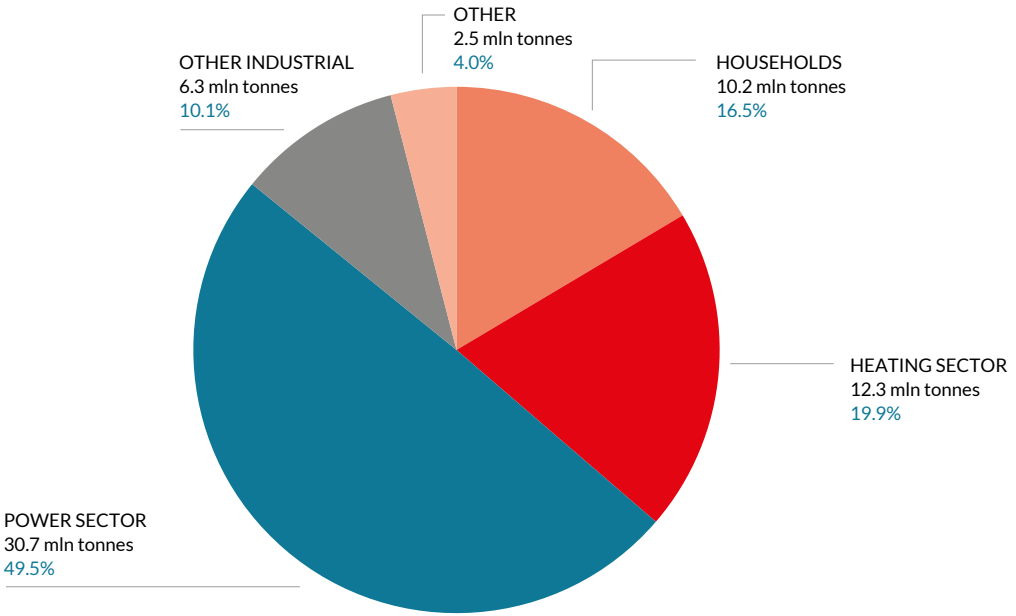
- Steam coal imports are a record high, with over 78% of the volume coming from Russia. Other main import directions are Colombia, the USA and Kazakhstan.
- Exports from Poland are the lowest in 15 years.



Source: based on data of Eurostat.
*preliminary data

Domestic consumption of steam hard coal in 2017

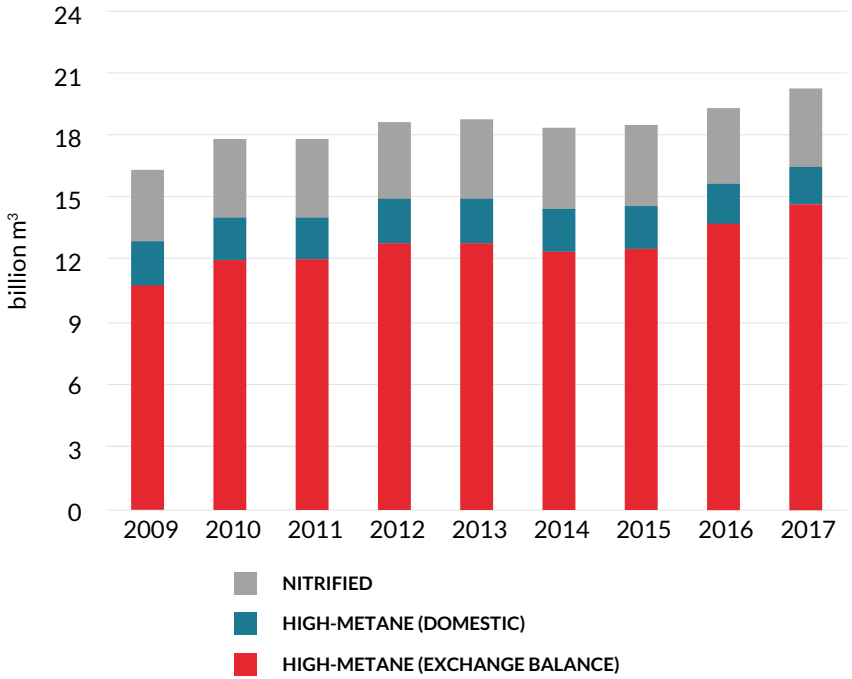
- Almost half of the steam coal, 30.7 million tonnes, was used to generate electricity.
- Over 40% of the volume, i.e. 25 million tonnes, was used for heating purposes.

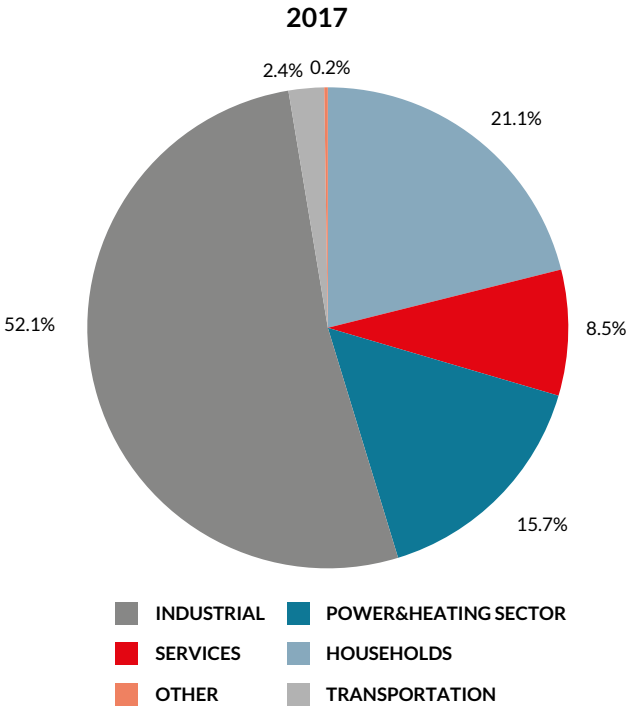


Source: based on data of GUS and Polski Rynek Węgla.

Domestic natural gas consumption

- In 2017, the consumption of high-methane natural gas increased to 16.4 billion m^3 , i.e. by over 25% in 9 years.
- In the same period, domestic production decreased by 18% and amounted to 1.7 billion m^3.
- Nitrified natural gas comes entirely from domestic production. Its use is at a constant level of approx. 3.8 billion m^3 annually.

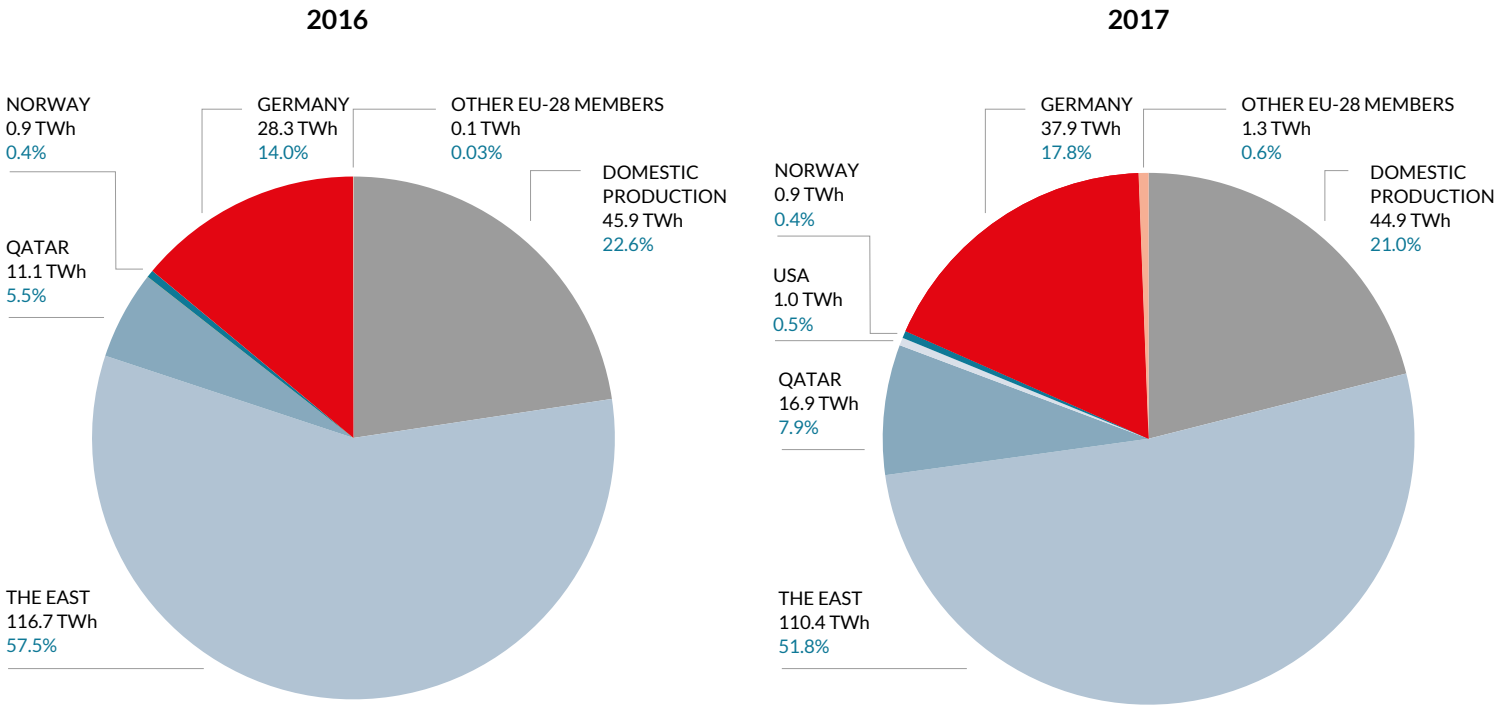




Source: based on data of GUS, Energy Regulatory Office (URE), and Ministry of Energy.

Supply of natural gas

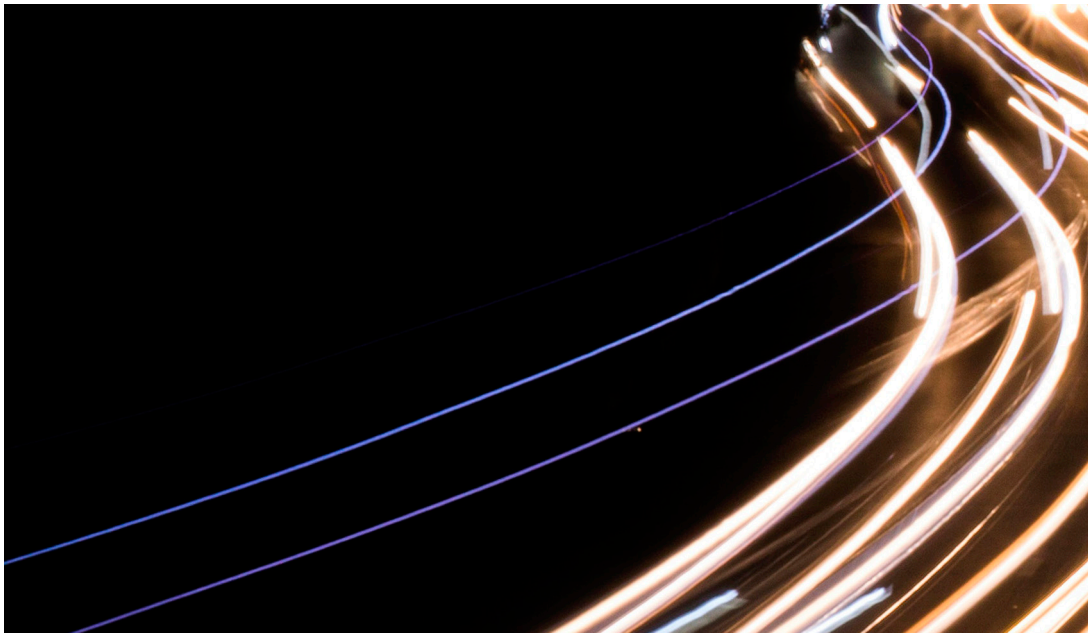
- Imports from the East account for more than 50% of gas supplies.
- In 2017, imports from other directions increased, mainly due to contracts for the purchase of liquefied gas.



Source: based on data of GUS, URE, and Ministry of Energy.

Notes

Energy transition in Poland Edition 2019



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