Emissions

For many years, the Enea Capital Group has been investing in modernisation of installations limiting emissions of sulphur, nitrogen and dust oxides, preparing to meet new emission standards.

Compatibility with the Guidelines

According to the EU's IED directive, we have been subject to stricter pollution standards since 1 January 2016. However, the law provides for the possibility to postpone their validity in the form of a derogation mechanism – the National Transitional Plan (NTP) – which will be in force until 30 June 2020. PSC gives the possibility of total settlement of limits within the Group. This is how the Kozienice Power Plant settles accounts with the Białystok Heat and Power Plant within the limits of SO2 and dust. In addition, the Kozienice Power Plant benefited from a derogation from the Accession Treaty regarding the NOx emission standard (in force until 31 December 2017). Enea Elektrownia Połaniec enjoys a derogation from the IED directive, which covers boiler no. 1.

Compliance with formal and legal requirements

In 2017, there were no violations related to emissions in Enea Wytwarzanie, except for a few violations of SO2 emission standards in the Białystok Heat and Power Plant related to the control traffic of the newly built flue gas desulphurisation installation. Both Enea Wytwarzanie and Enea Elektrownia Połaniec did not exceed the emission standards specified in the integrated permit.

Carbon dioxide emissions [MG]

	CO_2 emission level [MG]	**CO_2 emission level [MG]**
	2016	**2017**
Enea Wytwarzanie sp. z o.o.[16]	12372636.00	12663362.31
Enea Ciepło sp. z o.o.[17]	5434.00	17973.00
Przedsiębiorstwo Energetyki Cieplnej sp. z o.o. w Obornikach	14274.40	15190.22
Miejska Energetyka Cieplna Piła sp. z o.o.	82481.00	84345.00
Enea Elektrownia Połaniec SA[18]	7733638.00	7733638.00

Emissions of sulphur oxides, nitrogen oxides and dust [MG]

	NO_x emission level		Dust emission level		SO_2 emission level	
	2016	2017	2016	2017	2016	2017
Enea Wytwarzanie sp. z o.o.	14812.00	12461.83	no data	360.61	10833.00	11315.43
Enea Ciepło sp. z o.o.	4.00	27.00	3.00	6.00	1.00	3.00
Przedsiębiorstwo Energetyki Cieplnej sp. z o.o. w Obornikach	26.27	28.93	no data	16.13[19]	33.63	53.23
Miejska Energetyka Cieplna Piła sp. z o.o.	107.38	86.93	no data	25.54	155.90	151.15
Enea Elektrownia Połaniec SA[20]	no data	11901.09	no data	555.78	no data	7112.70

Pollution emissions under the NTP for the year 2017 and the level of use of annual allowable emission thresholds have been presented in the table below.

Installation		SO_2		Dust		NO_x	
		[Mg]	use (%)	[Mg]	use (%)	[Mg]	use (%)
Elektrownia Kozienice	emission annual threshold	8 583.89 12 522.5	68.5	211.26 1 502.7	14.1	-	-
Elektrociepłownia Białystok	emission annual threshold	1 525.2 2 666.56	57.2	58.72 215.69	27.2	297.04 1347.75	22.0
in total	**emission annual threshold**	**10 109.09 15 189.06**	**66.6**	**269.98 1 718.39**	**15.7**	**297.04 1 347.75**	**22.0**

[16] The sum of CO_2 emissions in 2017 was given for units no. 1 to 10, 11 and the start-up boiler room in Świerże Górne (Kozienice Power Plant), Białystok and Koronowo.

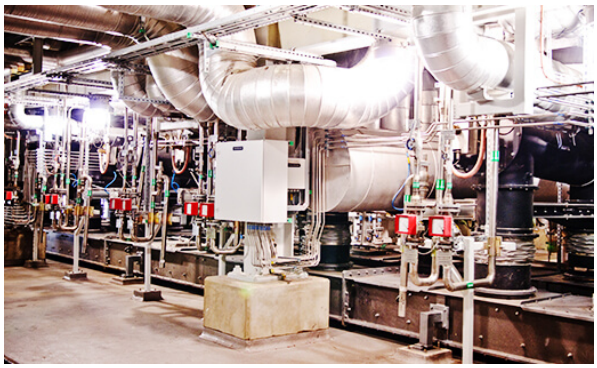
[17] The increase in carbon dioxide emissions results from the increase in the amount of coal burned by the company. In 2016, 2500.41 Mg of coal was combusted and in 2017 9204.76 Mg of coal was combusted.

[18] The company was not a member of the Enea Capital Group in 2016.

[19] Dusts arising from the combustion of fuels.

[20] The company was not a member of the Enea Capital Group in 2016.

Pollutant concentration in the Połaniec Power Plant in 2017:



Pollutant concentration in the Połaniec Power Plant in 2017:

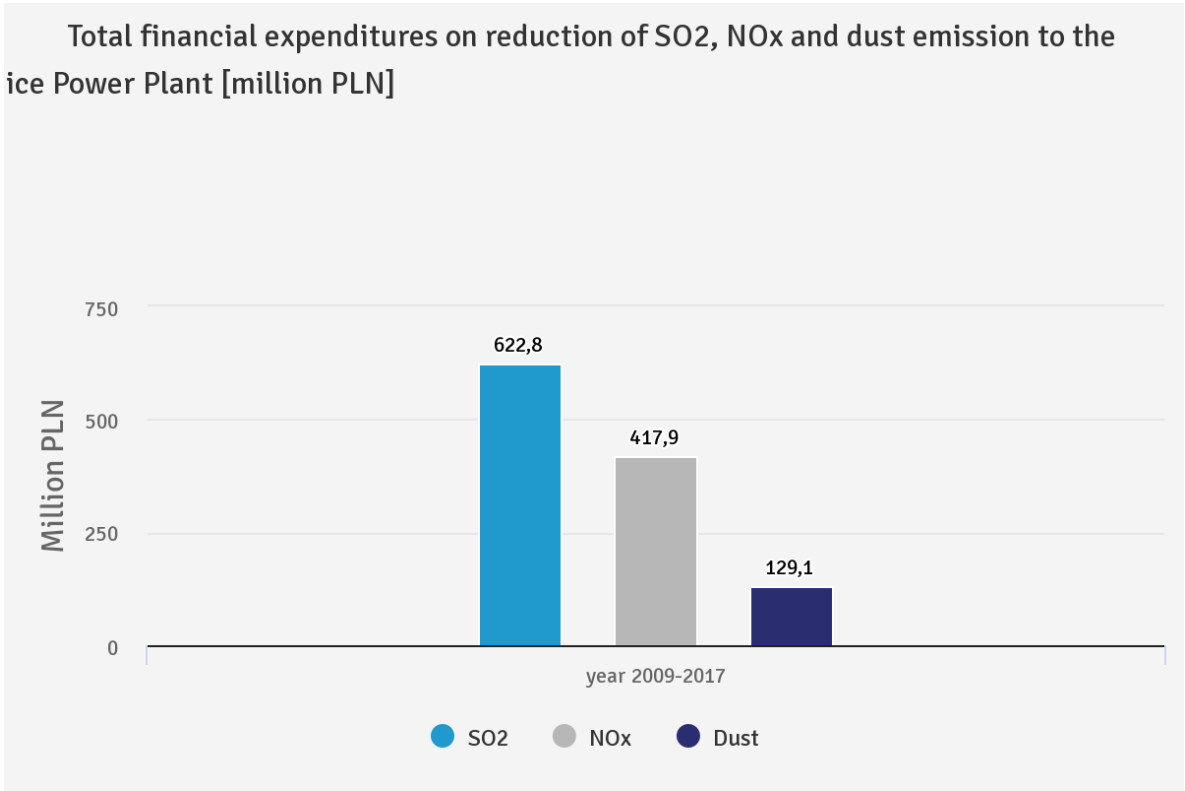
dust **lower by**

20%

than the allowable concentration

- SO_2 **lower by 16%** than the allowable concentration
- NO_x **lower by 21%** than the allowable concentration

Pollutant concentration in the Kozienice Power Plant in 2017



What have we done to reduce emissions?

- We continued our efforts to align Enea Generation with the requirements of the BAT conclusions.
- In order to significantly reduce nitrogen oxides in Kozienice, we installed further SCR units in two units of 200 MW, no. 4 and no. 8 (with achievable concentrations below 100 mg/Nm3). We are in the process of implementing a flue gas denitrification installation at 500MW unit no. 10, and in 2018 we planned to build an SCR installation at 500MW unit no. 9.
- In Białystok, we carried out a number of investments directly affecting the change in emissions, including the conversion of OP-140 Boilers no. 5 and no. 6 fired with coal to OFB-105 Biomass Fluid, SNCR flue gas denitrification installation on OFB-105 Boilers no. 5 and 6, SCR flue gas denitrification installation on OP-230 Boilers no. 7 and 8, heat recovery system on K6 Boiler and flue gas desulphurisation for OP-230 Boilers no. 7 and 8.
- Finally, we installed SCR catalysts on units no. 2, 3, 7, which reduced NOx emissions from about 500 mg/Nm3 to less than 200 mg/Nm3 , and a formic acid dosing unit on C and D absorbers of the IOS unit, which improved the desulphurisation process efficiency by 1%. In addition, we are in the process of building an SCR catalytic converter at unit no. 4.