

## AIR QUALITY MANAGEMENT IN POLAND

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The protection of the air against pollutants from individual boiler plants is a big challenge in Poland. It results mainly from the preference for coal, the national energy carrier, the use of old low-efficiency boilers and the location of Poland in a temperate climate where the heating period lasts at least 5 months.

The combustion of fuels for the purposes of central heating and domestic hot water preparation in buildings causes emissions of gaseous and particulate matter pollutants into the air, considered to be one of the key factors affecting the state of the natural environment. This negative impact is reduced primarily by optimising the consumption of energy in buildings, for example through the application of thermal insulation in buildings and heat pipes or the replacement of old boilers. The costs of such projects are high and often exceed investors' financing capabilities. This has contributed to the introduction of a number of tools to give preferential financial support to environmental protection projects in Poland, including those in the field of the protection of the atmosphere. The introduction of the instruments for the support of the protection of the atmosphere in Poland has not been historically intended to provide economic support only, but has also been the result of Poland's commitments to improve environmental conditions. Financing environmental activities is intended to accelerate the process of changing and serving as an incentive for investors.

It should be noted that Poland, Romania and Germany are the EU countries where emissions of benzo(a)pyrene have increased over the last decade. The overall emission level for this gas in all the EU countries (between 2004 and 2013) remained unchanged. In 2013, 87 % of the EU's urban population were exposed to PM<sub>2.5</sub> concentrations that exceeded the values established by the WHO as the limit levels for the protection of human health. The exposure to ozone in urban areas is still very high. In 2013, 98 % of the EU citizens were exposed to O<sub>3</sub> concentrations that exceeded the limits recommended by the WHO. The increased emission of pollutants into the atmosphere in Polish cities does not result only from the combustion of fuels for the production of thermal energy in buildings—other factors include transportation, waste management and manufacturing. However, the low emission (the emission from individual boilers) is one of the major problems affecting the state of the atmosphere in Poland.

The heating cost for hard coal is one of the lowest among those presented for individual households. The lowest heating cost is that of wood (biomass), but this type of energy carrier is not very popular in Poland, among others due to higher frequencies of boiler operation. The heat obtained from biomass—pellets—is nearly three times as expensive but eliminates the nuisance of having to operate the boiler at more frequent rates. The highest costs are generated by heating with oil and liquid gas. The network heat cost, in turn, is more or less at the average level. The cost of producing heat from sources considered to be more environmentally friendly is high in Poland; this does not apply to burning wood (biomass).

Mostly coal with low heating parameters was used in Poland—imported until 2015 from Russia. However, in 2015 an amendment to the Act of 25 August 2006 on the fuel quality monitoring and control system was passed to prevent this from happening. The amendment introduced quality standards for solid fuels—coal and its derivatives. The Customs Service was tasked with ensuring that only coal of a specific quality may enter the Polish market, and the Trade Inspection Agency was made responsible for its trade control.

Another problem that contributes to the increased emissions is the technical condition of boilers, which does not meet the technical requirements. The inspection of the condition of central heating boilers in individual buildings is limited, as well. It is used rarely only for the purposes of the energy certification when a building is being sold or rented. Central heating boilers have relatively low efficiency, which negatively affects the combustion processes and also contributes to the increased emissions. According to the statistical data, the average life of a solid fuel boiler in Poland is 10.3 years.

Looking for legal solutions conducive to the reduction of the environmental impact of the low emission, a recommendation is made to introduce a tax on pollutants contained in coal, as it is done for individual households in Western European countries. Such a solution would increase the competitiveness of the heat sources with a lower pollutant load emitted into the atmosphere. An alternative to the above-mentioned solution can be changes in tax law pertaining to the periodic reduction of the amount of property tax for the households using an environmentally friendly heat source.

An important element for the improvement of the current low emission reduction system is the introduction of tools of “indirect” stimulation of greener attitudes among owners of residential buildings in the form of preferential loans and/or grants and the use of the funds obtained in this way for a non-refundable support to owners/administrators of individual residential buildings. Actions of this kind allow to reduce the use of residents’ own funds in the investment process, which, in turn, results in the acceleration of the implementation of the projects and achievement of real environmental and energetic benefits.

The low emission reduction programmes assume that as users of the environment, single-family building owners, tenants and managers will be motivated to replace boilers with higher-efficiency and/or greener boilers, a result of the application of the appropriate financial instruments.

As the experiences of different local government units show, the implementation of the low emission reduction programmes contributes significantly to the improvement of the atmosphere. This is achieved mainly by notifying building owners of the financing sources available for thermal modernisation projects. The building owners see economic benefits in these activities, first and foremost. The implementation of the LERP programmes has a significant impact on the change of primary energy carrier for the purpose of heating buildings—from a solid fuel (hard coal, often of poor quality) to other greener fuels (natural gas, fuel oil or biomass).