

EGU21-16085

<https://doi.org/10.5194/egusphere-egu21-16085>

EGU General Assembly 2021

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## Effectiveness of residential heating emission reduction scenarios in Poland

**Pawel Durka**<sup>1</sup>, Jacek W. Kaminski<sup>1,3</sup>, Grzegorz Jeleniewicz<sup>1</sup>, Joanna Struzewska<sup>1,2</sup>, Marcin Kawka<sup>1</sup>, Paulina Jagiello<sup>1</sup>, Aneta Gienibor<sup>1</sup>, Aleksander Norowski<sup>1</sup>, Karol Szymankiewicz<sup>1</sup>, and Lech Gawuc<sup>1</sup>

<sup>1</sup>Institute of Environmental Protection - National Research Institute, Warsaw, Poland (pawel.durka@ios.edu.pl)

<sup>2</sup>Warsaw University of Technology, Faculty of Building Services, Hydro and Environmental Engineering, Department of Environmental Protection and Management, Warsaw, Poland

<sup>3</sup>Institute of Geophysics - Polish Academy of Sciences, Warsaw, Poland

The residential sector is one of the most important emissions sources affecting air quality in Poland.

According to KOBiZE IEP-NRI, in 2018 this sector accounted for 63% and 82% of the national totals for PM10 and PM2.5.

We attempted to assess the impact of the national "Clean Air" Programme that focuses on the replacement of old solid-fuel furnaces and boilers.

The proposed scenarios assumed that the heating devices were replaced in approx. 2 million single-family houses. A random selection of the building was applied:

- Scenario-1 - emission reduction for all administrative units in Poland.
- Scenario-2 - emission reduction for administrative units where the annual average PM2.5 concentrations in 2019 exceeded the threshold of 20 µg/m<sup>3</sup>

The emission factors were changed to represent the fuel standards set for modern heating systems. The GEM-AQ air quality model was used as a computational tool (Kaminski et al. 2008).

We will present the scenario effectiveness based on different metrics. The implementation of

emission reduction in the residential sector would significantly reduce health exposure due to PM10, PM2.5, and B(a)P dust. Due to the assumptions regarding the fuel mix of new installations, the background concentrations of nitrogen oxides and ozone would slightly increase, but this would not change the exposure.