

BioMW2022

Assessment of biomass burning components contained in fine dust (PM10) at Walferdange.



Inspiration

Fine particle emissions from domestic biomass burning are identified as an important contributor to ambient air pollution in Europe. Biomass burning is routinely used for residential space heating, but recent evidence suggests that it might be even more widespread.

In Luxembourg, the use of wood for residential heating becomes more and more popular as it is a renewable source of energy, but investigations concerning the contribution of biomass burning – including sources e.g., from agriculture – to the fine dust levels are still missing.

Especially in the winter season under the presence of temperature inversions and locations in valleys, the short-term threshold values (35 exceedance days of 50 $\mu\text{g m}^{-3}$ PM10) for particulate matter set by the EU might be exceeded.

Innovation

The overarching objective of BioMW2022 is to measure particulate biomass burning emissions. From October 2022 to September 2023, LIST researchers will perform a long-term monitoring of ambient PM10 and PM2.5 levels with one optical particle counter (GRIMM EDM 164) with a time resolution of one minute at a monitoring site in Walferdange (LU). Additionally, they will collect dust samples (PM10) with one low volume sampler (ComdeDERENDA LVS 3.1) on Teflon filters (PALL), which will be analysed by liquid chromatography-tandem mass spectrometry (LC-MS/MS) for the chemical compounds Levoglucosan and the isomers Mannosan and Galactosan. These are commonly used as chemical tracers for biomass burning in atmospheric chemistry studies, particularly with respect to airborne particulate matter.

Impact

BioMW2022 will deliver a dataset on the seasonal variation of the contribution of biomass burning tracers to the total amount of atmospheric dust near the surface. By assessing the Levoglucosan/Mannosan ratio, this project will also allow to identify the type of biomass burnt and to quantify the contribution of residential wood combustion.

Partners

Administration communale de Walferdange (LU)

Financial Support

Administration communale de Walferdange (LU)

Contact

5, avenue des Hauts-Fourneaux
L-4362 Esch-sur-Alzette
phone: +352 275 888 - 1 | [LIST.lu](https://www.list.lu)

Ivonne TREBS (ivonne.trebs@list.lu)
Céline LETT (celine.lett@list.lu)
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