

OUTPUT FACT SHEET

Pilot actions (including investment, if applicable)

Version 3

<b>Project index number and acronym</b>	AWAIR-CE116
<b>Output number and title</b>	pilot action
<b>Investment number and title (if applicable)</b>	Emission processes in FUA-Budapest-research
<b>Responsible partner (PP name and number)</b>	Zuglo pp7
<b>Project website</b>	<a href="https://www.interreg-central.eu/Content.Node/AWAIR/AWAIR.html">https://www.interreg-central.eu/Content.Node/AWAIR/AWAIR.html</a>
<b>Delivery date</b>	12.01.2019

Summary description of the pilot action (including investment, if applicable) explaining its experimental nature, demonstration character and transnational added value

The main idea of the pilot to reveal the emissions in Budapest FUA. In order to test WP T1 mitigation and adaptation actions comprising administrative and technological pilot test and the assessment of the effectiveness of mitigation and adaptation actions (D.T2.2.6). We wanted to explore the different emission sources to get a wild database and knowledge about what are the main pollutants and how they effect Budapest air quality. The research study made by Róbert Meszaros professor of ELTE University Meteorology Faculty. The research study was necessary to provide data for policy and technical pilots (D.T2.2.2 and D.T.2.2.3).

There are many different types of sources of atmospheric emissions, for example industry, energy supply (power plants, refineries, incinerators, factories, fossil fuel extraction and production sites etc.) transport, animals and humans, agricultural activities, natural and managed vegetations, soil etc.(EEA Technical report, 2009).The three main types of emission sources are the following: Point source: a single, fixed point(e.g. chimney, smokestack)from where air pollutants can be emitted into the atmosphere continuously or instantaneously (for example during an accidental release). Area source: emission of air pollutants from a specific area (e.g. city, forest fire. Line source: generally refers to emissions from transport (vehicle emissions from road transport, railways, shipping or aviation) along a line of the road, railway-track, sea-lane etc.

Due to the high variability and complexity of emission sources, it is not possible to measure emissions from all the different source types. In practice, atmospheric emissions are generally estimate based on measurements made at selected or representative samples of the (main) sources and source types. Several emission inventories and proxy database are available for different purposes (e.g. for estimation of air quality or climate change related studies). In Europe, the European Monitoring and Evaluation Programme(EMEP) coordinates the collection and reporting of national emission data.

Focusing on FUA-Budapest area, the emission inventories for this specified region Figures show the gridded emission of NO<sub>x</sub> and PM<sub>2.5</sub> from industry road transport and other stationary combustion sectors for 2015. These general pictures show the temporal variability of total yearly emission of each pollutant over the region. Part of pilot measures in schools (D.T2.2.8) could not be implemented due to that in Hungary the school system is centralized and belongs to the state.

**NUTS region(s) concerned by the pilot action (relevant NUTS level)**

NUT 1 Budapest HU

**Investment costs (EUR), if applicable**

No investment cost

**Expected impact and benefits of the pilot action for the concerned territory and target groups and leverage of additional funds (if applicable)**

The expected income of the research to provide detailed figures about the emissions in Budapest FUA.

Most of the point sources are generally found in the core city Budapest. The largest sources in Budapest are typically power plants, different factories, most of them located in the Pest transitional and suburban zone. Among the type of line emission sources, road transport is the most significant sector in FUA-Budapest, especially in the core city and along main roads. Shipping, aviation and off-road sectors have less contribution to total traffic emission and limit just to a smaller area (e.g. airport). Communal heating is one of the most problematic environmental issues in Hungary and also in FUA-Budapest. These main statements are provided a good base for the policy recommendations for Budapest new Air quality strategy. The outcome of the research will be the base of the Budapest Airquality action plan status report.

**Sustainability of the pilot action results and transferability to other territories and stakeholders**

The outcome of the research will be the base of the Budapest Airquality action plan status report.

The research can be used in Budapest FUA as this was our main goal, therefore it is only valid for stakeholders and Municipalities in this region.

Using this dataset, the original emission inventories can be weighted for each municipality of FUA region.

Also the available emission inventories on a regular grid with a resolution of  $0.1^\circ \times 0.1^\circ$  (it means 86 grid cells over FUA-Budapest region -) can be downscaled for a settlement-based spatial resolution (using geographical coordinates and sum of the road lengths of each settlement) to refine the spatial distribution of road traffic related emission.

**If applicable, contribution to/ compliance with:**

- relevant regulatory requirements
- sustainable development - environmental effects. In case of risk of negative effects, mitigation measures introduced
- horizontal principles such as equal opportunities and non-discrimination

Not applicable.

References to relevant deliverables (e.g. pilot action report, studies), investment factsheet and web-links  
If applicable, additional documentation, pictures or images to be provided as annex

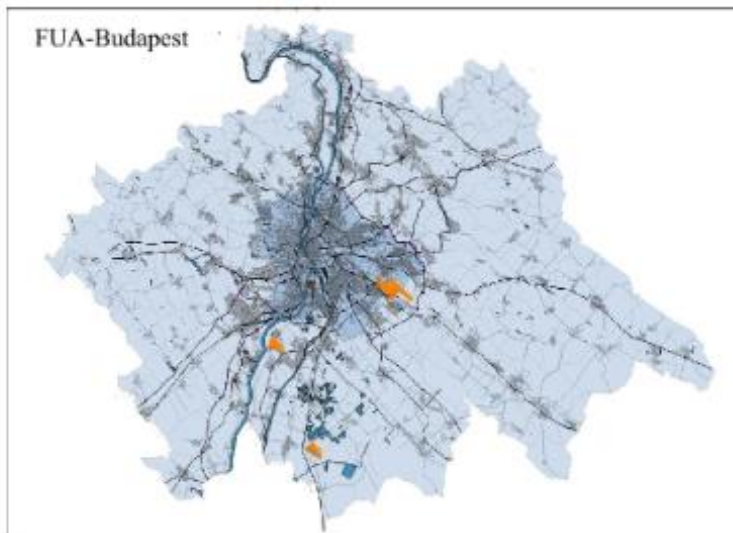


Figure 31: Traffic systems in FUA-Budapest region: gray lines: roads and streets, black lines: highways and railways, red area: river port, orange areas: airports.

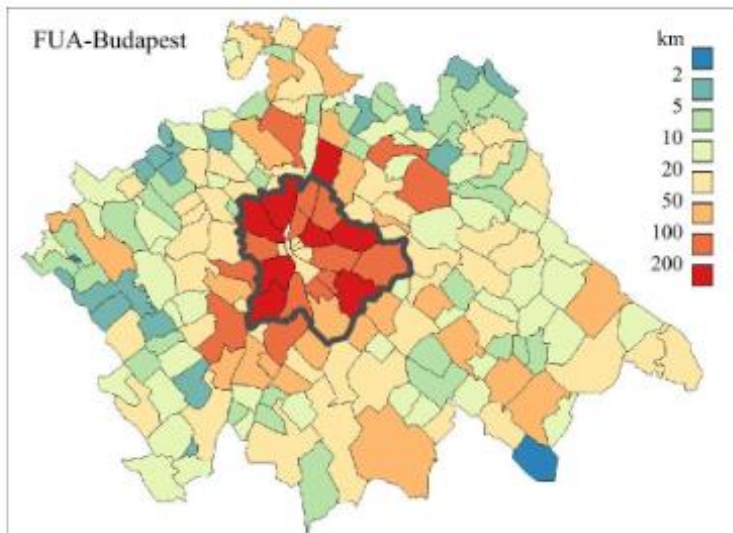


Figure 32: Length of road of each settlement of FUA-Budapest  
(Source of data: Central Statistical Office)

Table 4: The 10 largest solid materials point sources in 2017 within FUA-Budapest region.  
(Source of data: <http://web.okir.hu/sse/?group=LAIR>)

Emission (kg/year)	Point source	City/district
55324	Cement factory	Vác
21252	Oil refinery	Százhalombatta
21186	Building Industry site	Dunavarsány
15993	Plaster factory	Bugyi
9835	Woodworking factory	Tápióság
7721	Power Plant	Szentendre
6128	Feed mixing site	Csévharaszt
5443	Sand mine	Sóskút
5372	Plastic processing factory	Budapest 09.
3748	Crop dryer	Baracska

### 2.5 Summary of point sources

Most of the point sources within FUA-Budapest region are related to industrial activity. The spatial distribution of industrial sites in FUA is shown in Figure 30.

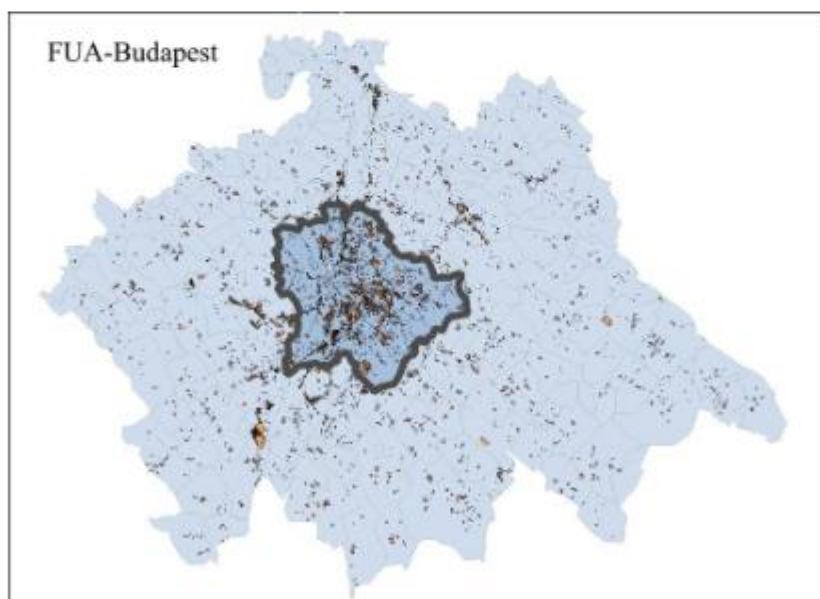


Figure 30: Industrial areas in FUA-Budapest region



2.4 Particles (solid materials) emission from point sources

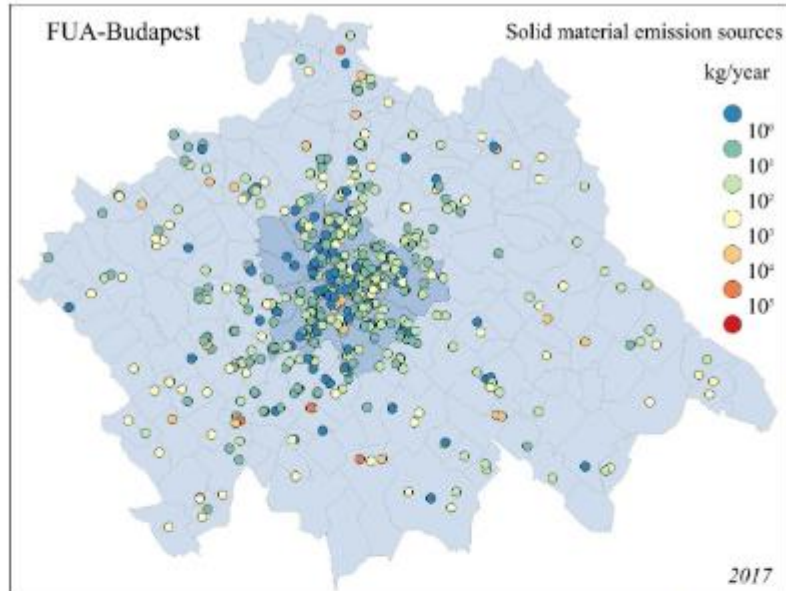


Figure 26: Geographical location of point sources and the emitted amount of solid materials within FUA-Budapest region for 2017. (Source of data: <http://web.okir.hu/sse?group=LAIR>)

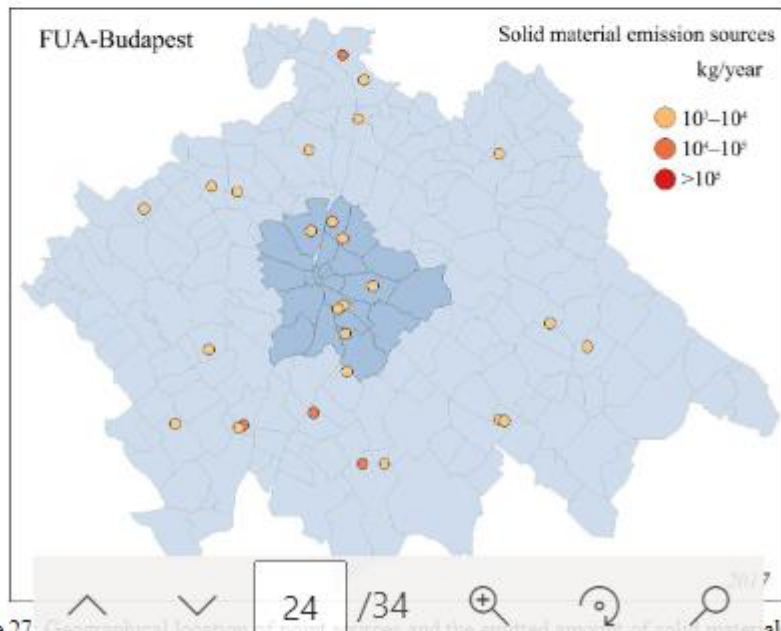


Figure 27: Geographical location of point sources and the emitted amount of solid materials within FUA-Budapest region for 2017. (Source of data: <http://web.okir.hu/sse?group=LAIR>)