



ACTION C6 INTER-REGIONAL AIR QUALITY MODELLING

MONITORING VISIT
NOVEMBER 2018

INTRODUCTION ON ACTION C6 INTER-REGIONAL AIR QUALITY MODELLING

OVERVIEW OF ACTION C6 - INTER-REGIONAL AIR QUALITY MODELLING

» What?

Development of an **inter-regional framework for both emissions and air quality**, to ascertain the 'current' AQ situation & use it as a reference to assess large-scale emission scenarios based on planned/proposed (residential) emission reduction actions in the regions (by 2023).

» Who?

VITO in cooperation with the Małopolska & the Silesia Region, the Slovak Hydrometeorological Institute (SHMU), the Czech Ministry of Environment (MZP) including the Czech Hydrometeorological Institute (CHMI)

» How?



ACTION 6 - TASK 1: HARMONISED LOW STACK EMISSION INVENTORIES

» Who?

- » Lead: VITO
- » Partners: MZP/CHMI, SHMU, Małopolska & Silesia

Harmonised
Low Stack
Emission
Inventories

Trans-
boundary
Emission Data
Base

Inter-regional
Air Quality
Modelling

Capacity
building
Outreach

» What?

- » High-resolution emission inventory for residential heating emissions
- » Harmonized over & fulfilling the requirements of the different sub-regions

» How?

- » Capacity building - Harmonisation
- » Framework built upon the Emission Inventory Support System - Air (EISSA)
 - » Kernel = EISsys - ref. WEISS, LIFE08 ENV/B/042

ACTION 6 - TASK 2: TRANS-BOUNDARY EMISSION DATABASE

» Who?

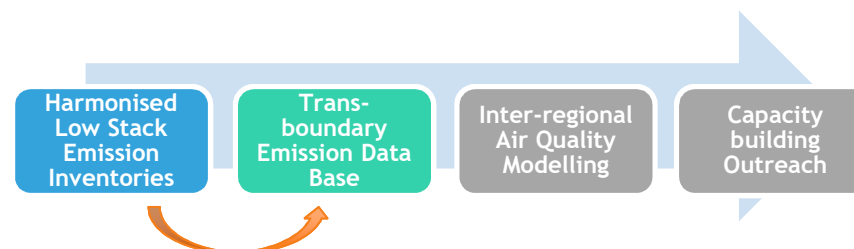
- » Lead: MZP
- » Partners: VITO, SHMU, Małopolska & Silesia

» What?

- » Compilation of a trans-boundary emission data base enabling calculation of homogeneous inter-regional emission fields

» How?

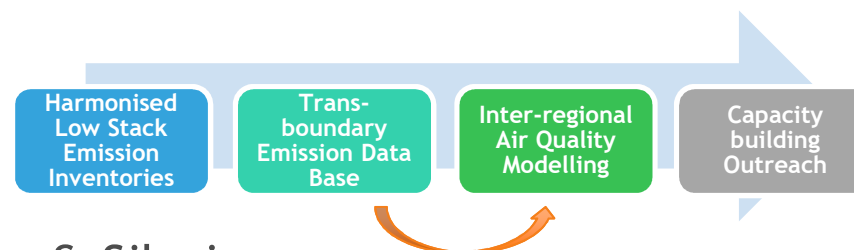
- » High resolution bottom-up residential emissions (Task 1)
- » Top-down TNO-MACC emission inventory (TNO, EU FP7)
- » Development of benzo[a]pyrene (BaP) emission data base for regional modelling
- » Reference year and for different emission reduction scenarios



ACTION 6 - TASK 3: INTER-REGIONAL AIR QUALITY MODELLING

» Who?

- » Lead: MZP
- » Partners: VITO, SHMU, Małopolska & Silesia



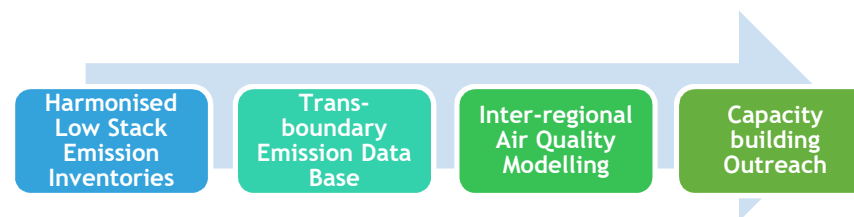
» What?

- » Assessment of the regional air quality in the hotspot region of Southern Poland, the Czech Republic and Slovakia for the current situation and for (possible) future scenarios.

» How?

- » Implementation of BaP chemistry module to regional CTM
- » Setting up and running CAMx & CMAQ
- » Setting up of RIO for NRT and historic AQ assessments
- » Capacity building to transfer skills required to operate RIO and CAMx
- » Intercomparison of CAMx and RIO model results
- » Combination of CAMx and RIO tools for the evaluation of emission reduction scenarios

ACTION 6: CAPACITY BUILDING OUTREACH



» What?

- » To transfer the expertise and tools towards different authorities responsible for emission compilation and air quality modelling
 - » Between LIFE IP partners
 - » Any relevant authorities from other regions/countries

TASK 1

HIGH RESOLUTION RESIDENTIAL EMISSIONS EISSA - EMISSION INVENTORY SUPPORT SYSTEM

ACTION 6 - TASK 1: HARMONISED LOW STACK EMISSION INVENTORIES

» What?

- » High-resolution emission inventory for residential heating emissions
- » Harmonized over & fulfilling the requirements of the different sub-regions

» How?

- » Overview of the different methods
- » Identification of similarities and differences

- » Harmonization of general parameters (substances, (sub)sectors, fuel types, ...)
- » Harmonization of methods & specific parameters (e.g. fuel parameters, combustion efficiencies, emission factors, ...)
 - » Pair-wise: SK/CZ and Silesia/Malopolska

- » Framework built upon the Emission Inventory Support System - Air (EISSA)
 - » Kernel = EISsys - ref. WEISS, LIFE08 ENV/B/042

ACTION 6 - TASK 1: HARMONISED LOW STACK EMISSION INVENTORIES

The screenshot displays the Slovakia.mn software interface, which is used for managing emission inventories. The interface is divided into several panels:

- Sources Panel:** Lists various sectors and sub-sectors, including Agriculture, Energy, Industry, Transport, and Waste. Each sector has a tree view of its sub-sectors and a list of sources with their respective emission types (diffuse, point).
- Map Panel:** Shows a map of Slovakia with a legend for 'Base - Emission - NOx (NO2) - Car'. The legend includes six categories with numerical ranges:
 - 0.33 ... 614224.65
 - 614224.65 ... 1228448.97
 - 1228448.97 ... 1842673.29
 - 1842673.29 ... 2456897.61
 - 2456897.61 ... 3071121.93
 - 3071121.93 ... 3685346.25
- Top 10 Panel:** Displays a table of the top 10 sources for a selected substance. The table is as follows:

Substance	Zone	Source	Emission
PM10	Total	Heating by households/ Renewable fuels/Wood	7,777,393,640.3694
PM10	Total	Heating by households/Solid fuels/Coal	3,359,788,575.6755
PM10	Total	Heating by households/Gaseous fuels/Natural gas	20,944,281.9193
PM10	Total	Heating by households/Liquid fuels/Fuel Oil	2,103,703.4674
- Table Panel:** Shows a detailed table for a selected substance and source. The table is as follows:

Substance	Zone	Source	Emission
NOx (NO2)	Total	F_RoadTransport/Bus	4,849,192,273.3
NOx (NO2)	Total	F_RoadTransport/Car	5,725,953,584.9
NOx (NO2)	Total	F_RoadTransport/HDV	20,795,897,752.6
NOx (NO2)	Total	F_RoadTransport/LDV	2,945,406,410.6
NOx (NO2)	Total	G_Shipping/Shipping	610,516,729.1
NOx (NO2)	Total	H_Aviation/H_Aviation - point	640,482,273.6

ACTION 6: CAPACITY BUILDING OUTREACH ~ EMISSIONS AND TOOLS

» What?

- » To transfer the expertise and tools towards different authorities responsible for emission compilation and air quality modelling
 - » Between LIFE IP partners
 - » Any relevant authorities from other regions/countries

- » Between LIFE IP partners
 - » EISSA: Slovakia/Czech Republic - Poland
- » Other regions/countries
 - » Bulgaria, Romania
 - » Hungary

IMPROVING AIR QUALITY AT EIGHT HUNGARIAN REGIONS THROUGH THE IMPLEMENTATION OF AIR QUALITY PLAN MEASURES (LIFE17 IPE/HU/000017)

- » **Contracting Authority:** EC, EASME Unit, LIFE 2018 Integrated Projects
- » **Coordinator:** Herman Ottó Institute Nonprofit Ltd. (HOI), Hungary
- » **Begin:** 01/2019
- » **End:** 12/2026
- » **Summary:**
 - » In this project **VITO's ATMOSYS assessment and action planning support tools** will be applied in a capacity building format for the Hungarian authorities.
 - » VITO's ATMOSYS planning web application will be deployed so that the **Hungarian Meteorological Service (OMSZ) and the authorities** can use it thereafter to assess the impact of emission reduction scenarios for reducing local pollutant emissions (e.g. traffic management, residential combustion, industrial emission source abatement...).
 - » The modelling chain requires **emission data in high detail** to adequately reproduce the emissions observed on an urban scale. VITO will provide support to the Hungarian partners so that they can improve their current emission database for use as input for the modelling chain described above. VITO will also present and share the methodologies, tools and experience gained from the ongoing Małopolska Integrated LIFE project (LIFE14 IPE/PL/000021) for bottom-up preparation of residential emissions.

TASK 2

TRANSBOUNDARY EMISSION INVENTORY

TASK 3

INTER-REGIONAL AQ MODELLING