MEthane goes MObile

MEasurements and MOdelling

Research

Training

Networking

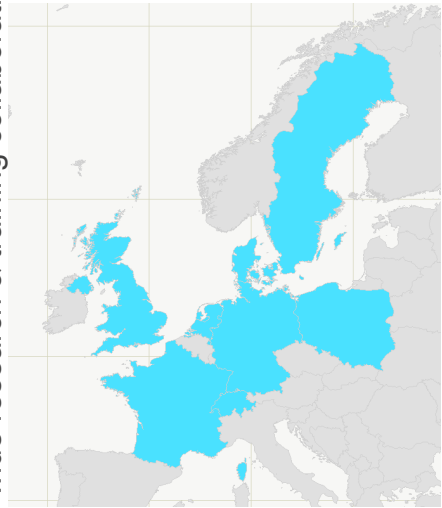
H2020 ITN-ETN
GA 722479

MEMO^2

MEthane goes MObile – MEasurements and MOdelling

MEMO^2 is a Horizon2020 Marie Skłodowska-Curie Innovative Training Action (MSCA-ITN-ETN), with 25 academic, non-academic and industrial partners from 8 European countries.

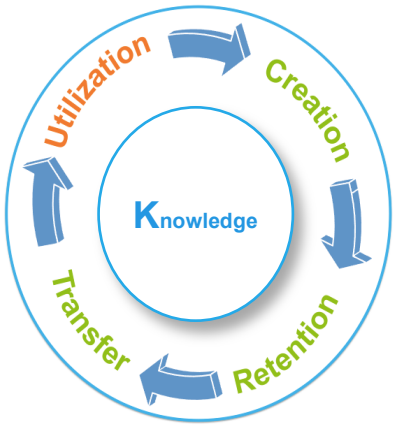
We will develop & implement unique small–scale mobile measurement and modelling systems for policy-relevant CH_4 emission estimates through EU-wide research & training collaboration.



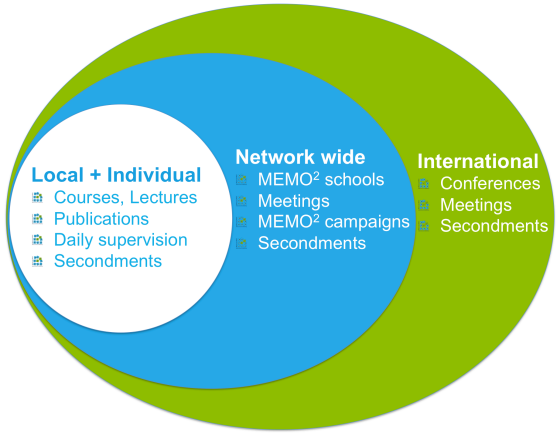
Aim

MEMO^2 aims to identify and evaluate CH_4 emissions, to improve the objective verification of CH_4 emission reduction strategies, and also to support mitigation measures by

- Developing novel measurement and modelling tools,
- CH_4 source identification and
- Educating qualified scientists



MEMO² Training



Within MEMO² we will educate a new generation of "cross–thinking" scientists, who are able to effectively implement novel measurement and modeling tools in an interdisciplinary and intersectoral context.

The MEMO² training program follows a holistic approach including interdisciplinary, individual and collective training elements, all aiming on key competences to tackle scientifically complex and societally relevant issues.

Targeted competences are e.g. the ability to effectively and interactively use and develop innovative technologies, build up knowledge in an interdisciplinary way, and act autonomously within the "big picture" of climate sciences and synergistically within a socially heterogeneous group.

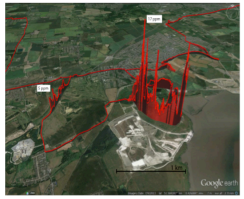
MEMO² Overview

Scientific Work Packages

WP1

Mobile measurements of CH_4

- Key measurement components are fast and accurate analysers on mobile platforms
- Aim: **map the small-scale distribution of CH_4 across Europe**, which will allow identifying and quantifying CH_4 emissions at the local scale
- Assigned on „focus source types" as wetlands, landfills, emissions of cities/ agriculture/mining, lakes, gas leaks



Detection of CH_4 plumes during mobile CH_4 measurements around the Mucking landfill site near London, UK (Zazzeri et al. 2015)

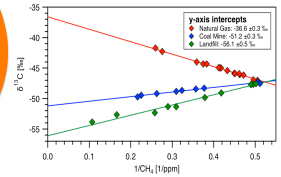
MEMO2 will cover CH_4 emissions on a European scale.

WP2

Isotopic measurements of CH_4

- Measurements of the isotopic composition of CH_4 will identify responsible sources for atmospheric CH_4 observations
- Aim: provide a **novel EU-wide "isotopic source signature maps"** of the most important CH_4 sources, which provides important input for the use of isotope information in atmospheric models

We can distinguish between overlapping sources for better quantification.



"Keeling plot" for identification of different CH_4 sources with isotope measurements. In a plot of δ versus inverse mole fraction, the y-axis intercept of the linear fit to the data returns the isotopic composition of the source (Zazzeri et al. 2015)

take samples for isotopic analyses

Provide source information

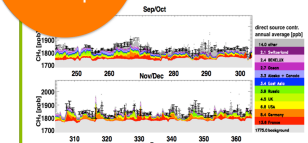
Provide source information

WP3

Modelling – A multi–scale interpretation framework for mobile CH_4 observations

- Linking modelling and measurement WPs by joint bottom-up and top-down activities
- Aim: **qualify and quantify CH_4 emissions** by developing / using innovative modelling tools, **provide improved CH_4 inventories**
- Modelling tools are complementary and applicable on various scales
  - LES at local scales
  - Flow patterns including mixed sources at regional scales
  - Forward simulations of CH_4 concentrations and top-down emissions at European scales

MEMO² will deliver improved CH_4 emission maps for Europe.



Inverse modelling attribution of measured CH_4 mixing ratios (end 2011) at Schauinsland to source regions in and outside Europe, as indicated by the colors (Bergamaschi et al. 2005)

MEMO² partners

Utrecht University
WAGENINGEN UNIVERSITY & RESEARCH
Empa Materials Science and Technology
UNIVERSITÄT HEIDELBERG ZUKUNFT SEIT 1386
Technical University of Denmark
DTU
Environment and Climate Change Canada
LUNDS UNIVERSITET
university of groningen
ROYAL HOLLOWAY UNIVERSITY OF LONDON
UNIVERSITÉ DE VERSAILLES ST-QUENTIN-EN-YVELINES
université PARIS-SACLAY
AVFALL SVERIGE
AGH
TNO innovation for life
ECN
GEOMAR Helmholtz Centre for Ocean Research Kiel
Umwelt Bundesamt
PICARRO

Further project partners: National Physical Laboratories (GB), SHELL (NL), Isoprime (GB), OonKAY (NL), Afvalzorg Deponie (NL), Viridor (GB), Whiffle Weather Finecasting (NL)

www.H2020-MEMO2.eu

management@h2020-MEMO2.eu