

Deliverable D6.4: *Mid-term report on training and education activities*

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Training and Education activities

Since many of the EUROCHAMP-2020 partners are educators (professors/lecturers) at Universities across Europe, with vast experience of teaching atmospheric science and training young researchers, it has been planned in the EUROCHAMP-2020 Work Programme to produce a range of novel educational materials to aid the teaching of atmospheric science, air quality and climate. Such educational material should include:

- the production of online teaching resources to explain major scientific issues
- information flyers and other supporting materials, e.g. demonstration kits
- short, easy-to-understand short movie clips that explain the EUROCHAMP-2020 research infrastructure and its role in supporting European research.

Educational movies

During the first 22 months of the project, two educational movies have been produced and widely distributed. Both of them target more specifically undergraduate students but can be used by educators with less expert audience.

The first one – entitled “[Smog in a box](#)”- is rather focussed on the experimental simulation approach and its benefits for the understapollution chemistry. It illustrates how smog event are linked to non-linear processes that mix the effect of primary emissions with solar radiation to generate secondary pollution. Thanks to a real experiment carried out in a simulation chamber, it demonstrates how researchers from the EUROCHAMP-2020 consortium are able to reproduce smog in chamber to study such complex phenomena.

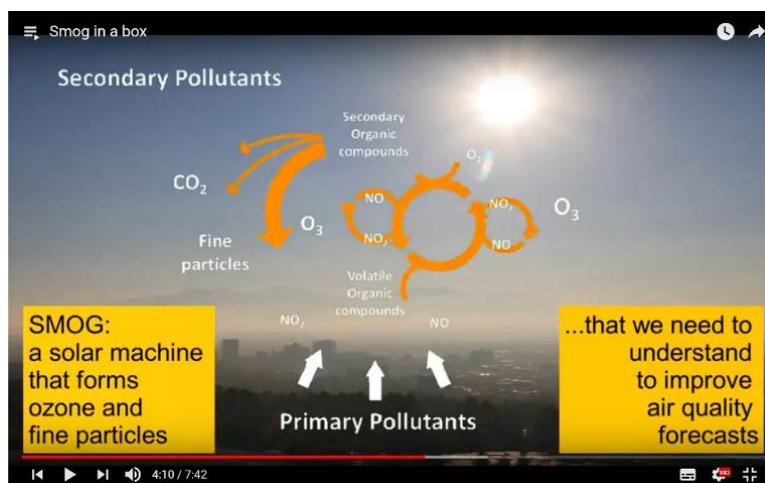


Figure 1: Image from "Smog in a box" movie

The second movie - entitled “[Clouds, soot and light](#)” - aims at explaining the concept of hygroscopicity of aerosol, its links with cloud formation and how it can change during the atmospheric transit of particles due to atmospheric chemistry. Using a small tabletop experiment (that can be reproduced by the educator if required), it demonstrates how the formation of free radicals under the effect of UV lights can change the affinity of water for soot.



Figure 2: View of the "Clouds, soot and light" movie

In-person training and education

Training of young researchers is planned in the EUROCHAMP-2020 Work Programme through a number of activities such as two EUROCHAMP-2020 summer schools, aimed at Masters and PhD students.

In September 2018, EUROCHAMP-2020 took part, through two lectures focused on atmospheric simulation chambers, to the well-established summer school of the Jülich research centre, called "Kompaktkurs Atmosphärische Chemie und Dynamik". More than 40 young scientists from all over the world attended this course.

In 2019, it is planned to extend the participation of EUROCHAMP-2020 to two days, which will be exclusively devoted to atmospheric simulation chambers. This first EUROCHAMP-2020 summer school will take place during summer 2019, and will still be hosted by FZJ/BUW. In addition to basics and advanced knowledge in atmospheric sciences, the attendants will be provided with information on the use of atmospheric simulation chambers and with more specialized know-how concerning standardised methodologies and procedures to perform high-quality measurements in atmospheric simulation chamber studies.

In addition, within the framework of the first "Organic Tracers and Aerosol Constituents Calibration Center" training school, held in TROPOS in January 2018, training sessions about general atmospheric chemistry, aerosol composition and atmospheric sampling were conducted. They involved 18 participants from 7 different European countries (France, Spain, Poland, Ireland, Romania, Denmark and Germany). This training school involved both theoretical and practical courses which contributed to a significant capacity building in the field of aerosol tracers measurement across Europe.

There is currently work in progress regarding: collecting educational material from the EUROCHAMP-2020 partners, production of supporting material and the provision of input for lab courses with a special focus on modelling, e.g. the atmospheric degradation of ethylene by OH radicals and corresponding sensitivity analyses.

Integration of European Simulation Chambers for Investigating Atmospheric Processes. Towards 2020 and beyond

Several of the TNA activities that took place within the first reporting period gave young researchers the opportunity to learn how to work with highly sophisticated and novel instrumentation at various simulation chambers. Details can be found in the TNA reports of the individual activities at <https://www.EUROCHAMP.org/Project/Documentation/TNAdocuments.aspx>. Up to now ca. 30 % of the users involved in TNA were undergraduate and postgraduate researchers.

We are currently in the process to establish whether the KINTECUS software simulation tool can be used. Kintecus is a powerful Research Grade chemical modeling software for simulation of atmospheric and many other chemical kinetic and equilibrium processes. It can be used to exercise students skills to perform modeling studies and understand the underlying processes. This software is freely available for students, and easy to use in combination with Microsoft Excel; it is therefore applicable for our needs. It will be available in the project's Data Centre.