



Horizon
Europe



COORDINATOR'S EXPERIENCE

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PROJECT FOCI

NON-CO2 FORCERS AND THEIR CLIMATE, WEATHER, AIR QUALITY AND HEALTH IMPACTS

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Motivation



1. Horizon Europe Call HORIZON-CL5-2021-D1-01-01 Improved understanding of greenhouse gas fluxes and radiative forcers, including carbon dioxide removal technologies
 - a) greenhouse gas fluxes and Earth system feedbacks
 - b) global warming contribution of different, non-CO2 radiative forcers
 - c) climate and Earth system responses to climate neutrality and net negative emissions
2. IPCC AR6 WGI: Well mixed CO2, and its impacts on global to continental scales well understood with a high level of confidence, however, there are knowledge gaps concerning the impact of many other non-CO2 radiative forcers leading to low confidence in the conclusions:
 - a) anthropogenic and natural precursor emissions of short-lived GHGs, aerosols effects
 - b) subsequent effects on atmospheric chemistry and climate, through direct emissions dependent on changes in e.g., agriculture and technologies based on scenarios for future development as well as feedbacks of global warming on emissions, e.g., permafrost thaw
 - c) albedo changes connected to land-use and land-cover can play a role, depending on the adaptation or mitigation measures included in different scenarios.
3. Strong group based around air quality modelling (R. Sokhi), with some contacts to ESM groups



FOCI basic info



Title: Non-CO2 Forcers and their Climate, Weather, Air Quality and Health Impacts

Partners: 17 (14+3), cooperating institutes over the world

Charles University (CU) - coordinator	Czech Republic
Max Planck Institute – Chemistry (MPI-C)	Germany
Finnish Meteorological Institute (FMI)	Finland
University of Hamburg (UHam)	Germany
Consejo Superior de Investigaciones Científicas (CSIC)	Spain
Koninklijk Nederlands Meteorologisch Instituut (KNMI)	The Netherlands
Barcelona Supercomputing Center (BSC)	Spain
World Meteorological Organization (WMO)	International
University of Helsinki (UHel)	Finland
Tel Aviv University (TAU)	Israel
European Centre for Medium-Range Weather Forecasts (ECMWF)	International
World Health Organisation (WHO)	International
ARIANET (R&D Industrial partner)	Italy
Stockholm University (SU)	Sweden
University of Hertfordshire (UH) – co-coordinator	UK
Stockholm Environment Institute, University of York (SEI)	UK
World Energy and Meteorology Council (WEMC) – SME	UK



Budget: nearly 8 M€

Duration: September 2022 – August 2026



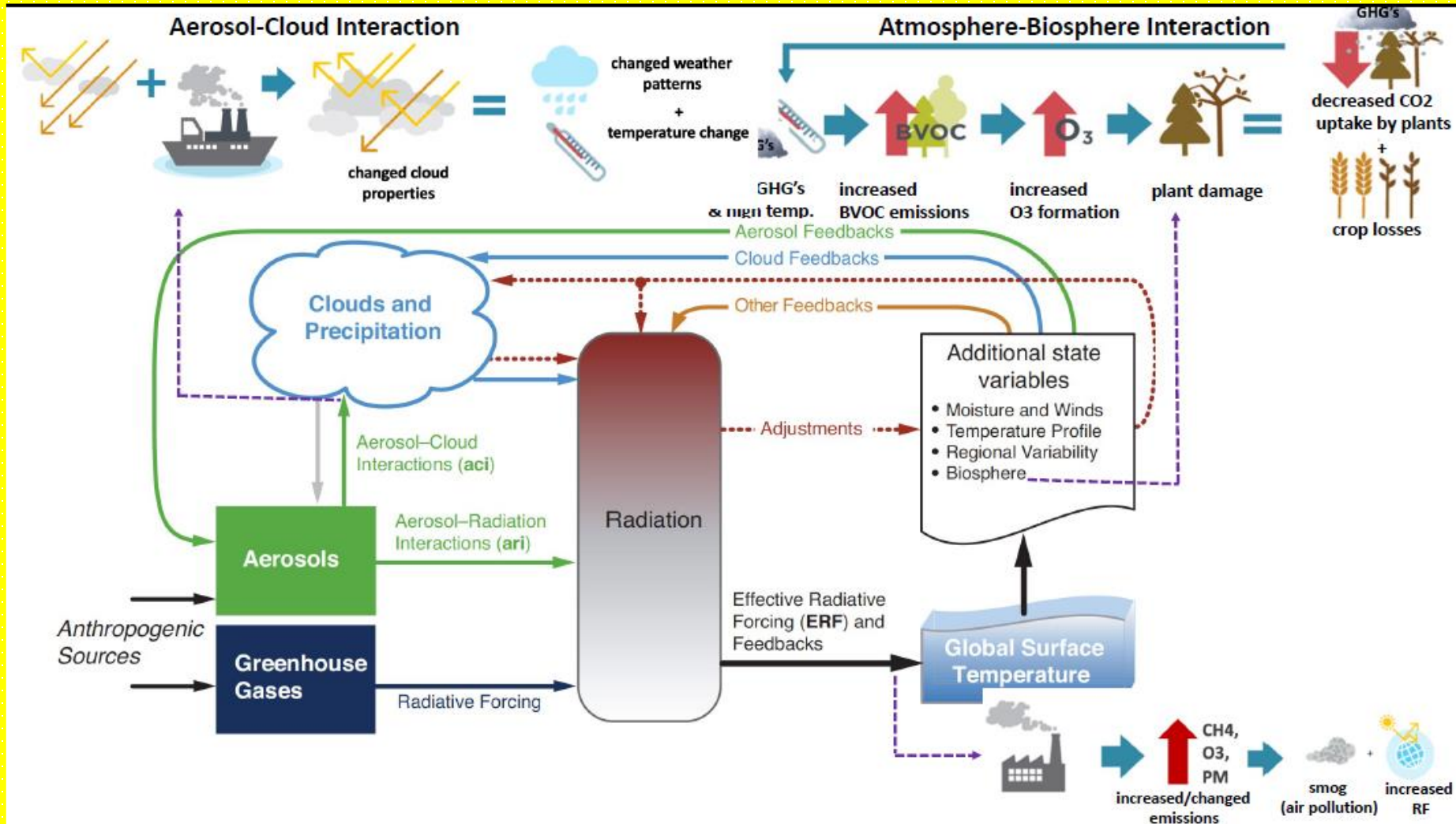
Specific tasks of the Call (part b)



- improve knowledge concerning the individual and cumulative contribution of short- and long-lived radiative forcers, including GHGs other than CO₂, and their precursors, aerosols, refrigerants and other climate forcers, to climate change, including their impact on atmospheric and ocean circulation, as well as other environmental issues
- may focus on a subset of forcers, and should concentrate on those where the relationship between emissions, atmospheric lifecycle, climate system feedbacks, and global warming is least well understood
- assess the climate and non-climate impacts, over multiple time scales, of policies and measures targeting forcers other than CO₂
- examine the application of this knowledge in relevant sectors (such as transport, industry, agriculture and health) with a view to better understand co-benefits and trade-offs of mitigation policies with other societal benefits, including human health



Need of full ESM with chemistry





FOCI Aims



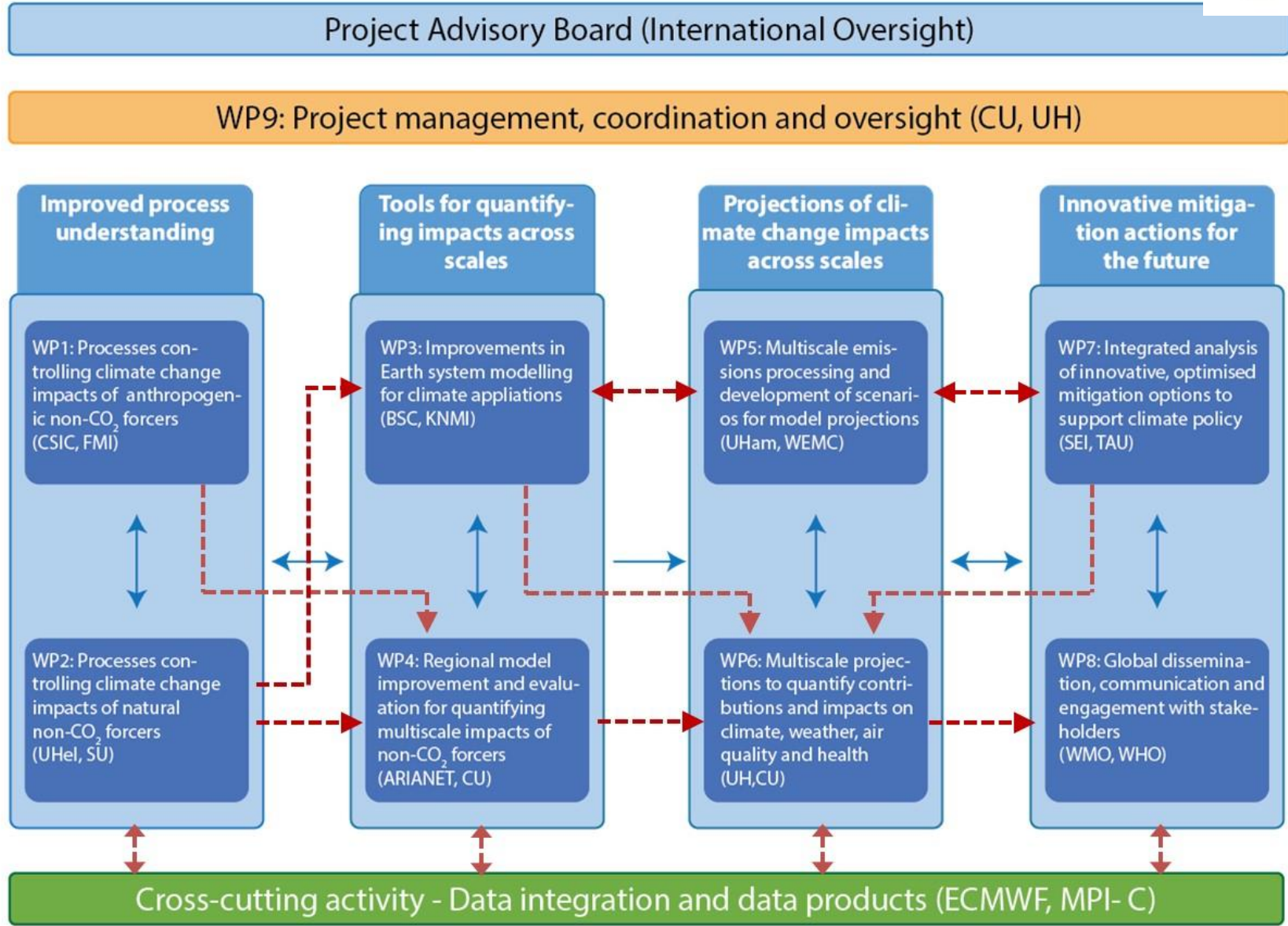
The overall aim of FOCI is to improve our knowledge of individual and cumulative contribution of non-CO₂ radiative forcers and their precursors.

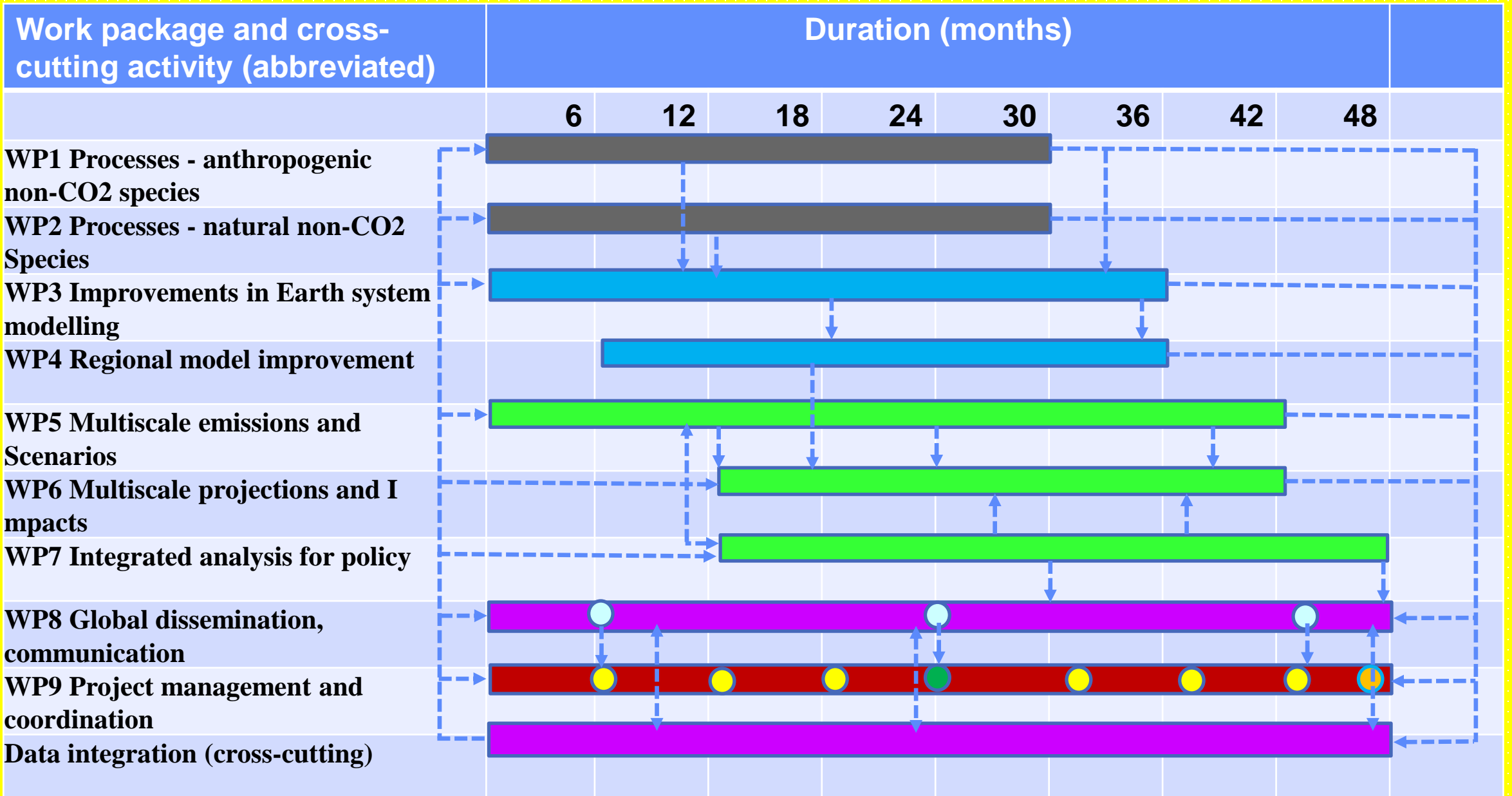
Main goals are

- To assess the key non-CO₂ radiative forcers, where and how they arise, the processes of their impact on the climate system.
- To find and test an efficient implementation of these processes into global Earth System Models and into Regional Climate Models, eventually coupled with CTMs, and finally to use the tools developed to investigate mitigation and/or adaptation policies incorporated in selected scenarios of future development targeted at Europe and other regions of the world.
- To target specifically species with the greatest uncertainty in determining their impact on climate change and the associated influence on weather patterns (e.g., atmospheric and ocean circulation and extreme weather events), air pollution episodes and health impacts.
- To focus in integrated observational and modelling analysis on the radiative forcing properties of PM_{2.5}/PM₁₀, CCN and their components (e.g., POA, SOA, BC/EC, SIA, dust), O₃ (and its precursors NO_x, VOCs, SO₂, carbon monoxide (CO)), CH₄, and N₂O in the wider context of the warming potential of all key GHGs.



FOCI scheme







Cooperations envisaged



Relevant Project (Title and FOCI partner)	How the project feeds into the FOCI work programme (relevant WPs are shown)
TRANSPHORM FP7 (UH coordinator, FMI)	Downscaling strategies for climate simulations (WP4, WP6)
EMERGE H2020 (FMI Coordinator, UH)	High-resolution simulations of climate interactions for non-CO ₂ species (WP6)
FORCeS H2020 (SU, BSC, KNMI)	Improvements in the description of aerosol and cloud processes in EC-Earth3-AerChem that will be brought into EC-Earth4 (WP3)
COST Action CA16109 COLOSSAL (CSIC coordinator)	Chemical On-Line cOmpoSition and Source Apportionment of fine aerosol (COLOSSAL) to consistently assess spatial and temporal variability, chemical composition and sources of fine aerosols across Europe (WP1).
ACTRIS (CSIC, BSC)	ACTRIS EU H2020 projects, ACTRIS IMP; ACTRIS PPP; ACTRIS-2 (Aerosol, Clouds, and Trace gases Research Infrastructure-2); ACTRIS is a pan-European RI producing high-quality data (WP1).
VEG-GAP LIFE18 (ARIANET)	Developing a strategy for urban air quality assessment considering urban vegetation characteristics, such as plant type, green area extension, etc. Compute species-dependent BVOC emissions (WP5).
PrepAIR LIFE15 (ARIANET collaboration through ARPA Lombardia)	The Italian Po Valley Regions and Slovenia aim to strengthen the sustainability and durability of Po basin air quality measures. The project includes actions dealing with biomass burning and agriculture (WP5).
MEGAPOLI FP7 (CU, UH, UHel, UHam, MPI-C, FMI, ARIANET, WMO)	MEGAPOLI, modelling tools and methodology will be used in WP4 and WP6 for estimation of the impacts of different scenarios of urban development on human health and climate change.
CORDEX FPS CP RCM, FPS URB-RCC (CU)	High resolution (CP) RCM, with urbanization and coupled to CTM



Advisory Board



Name of PAB international member and organization	Membership of PAB and role within FOCI
Dr. François Dejean, EEA, Denmark	Joint workshop, advice on climate policy implications
Dr. Julian Wilson, JRC, Italy	Emissions inventory (EDGAR), co-benefits of climate/air quality policy measures (FASST); acting as a conduit for fast-tracking results from the consortium into the EU policy landscape
Praveen Bains, IEA, France	Energy bases scenarios and sharing of data and modelling approaches
Prof. Chandra Venkataraman, IIT Bombay, India	Provide access to improved emission inventories for non-CO ₂ radiative forcers for climate and impact projections for South Asia, evaluate simulations from coupled modelling frameworks for South Asia, Contribute to the development of mitigation strategies for South Asia.
Prof. Shaofei Kong, CUG, Wuhan, China	Access to analysis of aerosol properties and their radiative forcing potential and impacts over South Asia
Prof. Greg Carmichael, Iowa State University, USA	Advice and inputs into WPs 1-4 and 7, including helping to design experiments, analyse data and contribute to publications/report.
Dr. Jean-François Lamarque, Director of the CGD Laboratory, NCAR, USA	Collaborative opportunities on the use of Community Earth System Model (CESM) to understand long-term changes of short-lived climate forcers (i.e. O ₃ , aerosols and CH ₄)
Dr Rohit Mathur, USEPA	Advice and sharing of improving representation of composition, distribution and optical/radiative properties of non-CO ₂ climate forcers, impacts on earth-atmosphere radiation budget, share modelling and measurement data sets
Prof. Paolo Laj, UGA, France	A coordinator of the European Research Infrastructure ACTRIS (Aerosol, Cloud and Trace Gases Research Infrastructure)



Wish us good luck!



THANKS FOR YOUR ATTENTION !