Partners presentation

Italian National Agency for New Technologies, Energy and Sustainable Economic Development

ENEA - Italian National Agency for New Technologies, Energy and Sustainable Economic Development

ENEA is the second major Italian research organization, with 9 research centres distributed all over the national territory. The Agency's activities are focused on Energy Efficiency, Renewable Energy Sources, Nuclear Energy, Climate and the Environment, Safety and Health, New Technologies, Electric System Research.

ENEA's multi-disciplinary competencies and great expertise in managing complex research projects are put at the disposal of the Country system. Specifically, its activities are devoted to basic, mission-oriented, and industrial research exploiting wide-ranging expertise as well as experimental facilities, specialized laboratories, advanced equipment.

ENEA also develops new technologies and advanced applications; provides public and private bodies with high-tech services, studies, measurements, tests and assessments; delivers training and information activities aimed at providing greater public knowledge and awareness on the Agency's fields of competence, and a higher level of dissemination and transfer of research results, thus promoting their exploitation for production purposes.

VEG-GAP Life Pre project is carried out by the Laboratory of Atmospheric Pollution (INAT) of Division Models and Technologies for Risks Reduction who gathers a multidisciplinary approach in research, promotion and technology transfer for the understandings of atmospheric processes and air quality including climate system, to support stakeholders at national and international level. It also develops tools to integrate models of pollutants transport in the atmosphere with models for environmental impact and cost effectiveness assessment of pollution-reducing policies. INAT is supporting the Italian Ministry of Environment, Land and Sea Protection (MATTM - Ministero dell'Ambiente e della Tutela del Territorio e del Mare) in the International and European negotiation processes leading to Protocols and Directives on air pollution such as EU Directives on National Emission ceilings and on Air Quality. INAT had also supported the MATTM in building the National Network of

Special Purpose Air Quality Monitoring Stations and is assessing air quality at national level every five years according to Legislative Decree Dgl. 155/2010 as requested by Air Quality Directives and is evaluating national AQPs in support to NEC Directive according to Dgl. 181/2018. INAT also participated at air quality assessments at European level in the framework of EURODELTA III modelling exercise evaluating the trends of ozone, PM2.5, PM10, NO_2, SO_2, O_3, etc. concentrations from 1990 to 2010, their impacts on human health and vegetation. The laboratory is also actively participating in UNECE Working groups (Task Force on Measurements and Modelling (TFMM), International Cooperative Programme on Effects of Air Pollution on Natural Vegetation and Crops (ICP Vegetation), Task Force on Integrated Assessment Modelling (TFIAM), etc.), European networks (FAIRMODE, ACTRIS, etc), experimental campaigns and modelling exercises regarding air pollution and its impact on health, ecosystems, buildings, and materials at national and European level. INAT is collaborating with Copernicus Atmosphere Monitoring Service (CAMS50) on air quality regional forecasting aiming to become a new member of the current ensemble of atmospheric chemistry models by 2021.

The INAT activities are supported by an integrated computational infrastructure (ENEAGRID/CRESCO) offering a production quality, service-oriented system for high performance and/or high throughput computing. CRESCO Clusters provide a unified user environment and homogeneous access to all researchers and implements tools to facilitate the integration individual resources and to support to experimental facilities.

ENEA is the coordinator of VEG-GAP Life Pre project and is responsible for the following implementation actions:

Action A1: Collect relevant information on initiatives and projects related to urban ecosystems/vegetation and air pollution.

Action A4: Assess the role of ecosystems/vegetation on urban heating/cooling and the relation with air pollution in the partner municipalities.

as well as for the project management and monitoring of project progress.

ENEA computational infrastructure hosts the project web site and the information platform which will be created by the implementation action A6: Develop an information platform and tools to support authorities.

CITTÀ METROPOLITANA DI BOLOGNA

Metropolitan city of Bologna

The Metropolitan City of Bologna (MCBO), former Province of Bologna, is an intermediate public authority with important responsibilities on policies for economic development, tourism, infrastructures, transport, environment and strategic planning at local level. The Metropolitan City of Bologna has an area of about 3,700 km2 with 54 municipalities and over 1 million inhabitants. Bologna is the capital and largest city of the Emilia-Romagna Region, the 3rd Italian region by n. of firms that have invested in green technologies. Bologna boasts some significant research centre on environment and climate change (e.g. ENEA, CNR, ECMWF data center soon).

It is Italy's 2nd most important location for innovative tech startups, and the Italian city with the highest n. of invention patents in ratio to the n. of companies. In June 2017 Bologna hosted the G7 Environment. This was the occasion for the Italian Metropolitan Cities to sign the "Bologna Charter for the Environment". From waste to air and water quality, from energy transition to sustainable mobility, from biodiversity to circular economy, eight are the macro objectives identified by the Bologna Charter for Environment to be included in the metropolitan agenda for sustainable development, in line with the UN 2030 Agenda. Bologna has become the coordinator of this pact, having since some years initiated a process toward sustainability and the circular economy, involving actively citizens and businesses as a sign of a 'resilient city', able to adapt positively to change and to be a promoter.

The Metropolitan Mayor is the national ANCI (Italian National Association of Municipalities) coordinator for the development of the Urban Agenda for sustainable development of the Italian metropolitan cities.

MCBO is partner of the Horizon2020 project "Connecting Nature" aiming to measure the impact of nature-based solutions on climate change adaptation, air quality, health and well-being, social cohesion and sustainable economic development in the cities. MCBO collaborate with Emilia Romagna Region and local municipalities for the implementation of the regional Air Quality program

(PAIR2020) which foresees the increase of urban green areas in addition to many other measures for reduction of urban air pollution. Therefore, MCBO is interested in to know the role of vegetation on atmospheric emissions and air quality, in order to develop better policies to include in Air Quality Plans.
MCBO is responsible of Action B1: Communication and dissemination of project activities to stakeholders and general public.

MADRID

Municipality of Madrid

Madrid City Council (MAD) is the local authority of Madrid. The Municipality is the main responsible for environment, urban planning and social affairs in the city. Madrid is the largest city in Spain (3.300.000 inhabitants in its 605 km2 municipality, with a population density of 5.265 inhabitants/ Km2, and over 6.300.000 people living in its metropolitan area). Environmental issues are one of the main axes that address the city's policy, where air quality, climate change adaptation, green infrastructure and water management are relevant part of it.
MAD joined the Covenant of Mayors in 2008 and is an active member of the new Global Covenant of Mayors for Climate & Energy, Eurocities network and the C40 Cities Climate Leadership Group (Urban Development and Resilient Cities networks). Madrid is one of the most active cities in Spain developing air quality plans, as well as short-term actions, such as the protocol for high NO2 episodes. Recently Madrid approved the air quality and climate change plan for the city of Madrid (Plan A), that includes a nature-based climate adaptation program. The so-called 'Madrid + Natural' proposes the implementation of solutions based on nature, mainly vegetation, to combat the urban heat island effect, the loss of biodiversity, and water management during episodes of intense precipitation.
Green infrastructures are key elements to tackle climate change adaptation, acting against global warming and air pollution effects in the city. Madrid has a large surface of green areas in its municipality (over 62 km2 of public parks with a ratio of more than 20 m2 of public green area/inhabitant, and over 183 km2 of well-preserved mediterranean forest, which is part of the European network of protected natural areas, NATURA 2000). In order to improve the design, planning and management of these green areas, the municipality has just approved the Green Infrastructure and Biodiversity Plan. This Plan sets criteria for connectivity and spatial distribution of green areas and choice of plant species, considering their benefits for ecosystem services, biodiversity and for

improving air quality and reducing extreme heat episodes, and thus for human health, among other environmental and social benefits.
MAD is also developing an Urban Regeneration Strategy, and a project of naturalization of Manzanares River. Besides, MAD is partner of the European H2020 project 'CLEVER' (Co-designing Locally tailored Ecological solutions for Value added, socially inclusive Regeneration in Cities), focused on the search of nature-based solutions integrated in urban Planning, for adaptation to climate change, and is the leader of the CIVITAS Project 'ECCENTRIC', working on the adoption of sustainable mobility measures to improve air quality. Consequently, the role of vegetation in urban green areas on emissions of PM_{10}, O_3 and NO_2, is a key issue for Madrid city in order to broaden the scope of the Air Quality and Climate Change Plan, and linking it with the Strategy for Green Infrastructure and Biodiversity, leading to a more holistic vision of urban sustainability.
MAD is the responsible of Action B2: Demonstrative days for stakeholders interested to replicate the project.

Comune di Milano

Municipality of Milan

The Municipality of Milan (CDM) is responsible for delivering a large number of services across the city (among the others, environmental quality, education, social services, economic development,). Second largest city in Italy with 1.400.000 inhabitants in and population density of 7272 inhabitants/sqKm, Milan is also the administrative and business center in the largest Italian Metropolitan Area, with a population of about 5.000.000 people, and the main city of Lombardy, the most populated and rich Italian region.
The Municipality of Milan has signed the Covenant of Mayors and the World Mayors and Local Governments Climate Protection Agreement. CDM is also member of several international networks, such as Eurocities, C40 Cities Climate Leadership Group, Urban Development Network and Resilient Cities.
In 2017, in the framework of the 100 Resilient Cities program, the Municipality established a City Resilience Department that developed Milan's Preliminary Resilience Assessment (PRA): a holistic scan of the city's current state of resilience. The Department is now working towards the finalization of Milan's Resilience Strategy, where nature-based solutions as urban forestry play a prominent role in strengthening city resilience to its key shocks and stresses.

CDM is currently drafting the first integrated Air&Climate Action Plan to individuate priority measures for air quality and climate change mitigation and adaptation. Despite the substantial reduction of anthropogenic emissions in the last fifteen years, there are still widespread exceedances of the PM10, O3 and NO2 limits set by Air Quality Directive 2008/50/EC. Milan's integrated approach focuses on identifying the main local risks (such as heat-islands, extreme storm water events, flash floods) and on transforming them into urban regeneration opportunities.
In order to contrast the city's heat-island effect and to face the air pollution emergency, Urban Forestation program has been designed, named ForestaMI, to plant approximately 3 million trees in the city and its peripheral areas within the next 10 years. The City launched the Forestation Plan in May 2018, in concurrence with the process of revision of the PGT - Piano di Governo del Territorio, the land-use plan for the city of Milan. This phase has been specifically planned to integrate in the general plan also visions related to forestation,sustainability, resilience and energy issues. In order to reach these objectives, it has been proposed a strategic plan to create a new park at the metropolitan scale. To achieve this long-term governance objective, a protocol was signed between the following partners: Milan Municipality, Milan Metropolitan Authority, Parco Agricolo Sud Milano (South Agricoltural Park) Parco Nord Milano (North Park), with the scientific support of Politecnico di Milano and Regional Authority for Agricultural and Forestry Services (ERSAF).
Within VEG-GAP project, CDM is the responsible of Action B3: Networking with other LIFE and/or non-LIFE projects.

ARIANET

ARIANET is an environmental consulting company based in Milan, founded in year 2000 by a group of scientists, experts in air pollution and meteorological modelling coming from research centres (ENELformer electricity board and universities). ARIANET expertise include: applied meteorology and air quality modelling from regional to urban; air quality forecasting; real-time pollution control for industrial sites; development of emission inventories and scenarios; source apportionment and air quality plans assessment; integration between simulation models and geographic information systems (GIS), reconstruction of

traffic flows and evaluation of their impact on air quality. ARIANET develops air quality models in cooperation with national and international research institutions: ENEA, CNR, INAIL, Univ. of Iowa. ARIANET recent activities include: support to ENEA and Italian Environmental Ministry in the development of MINNI/RAINS-Italy project (http://www.minni.org/) and to several Italian environmental agencies (ARPA) to perform air quality assessment and management studies (e.g. scenarios analysis for the definition of mitigation measures) and to implement air quality forecast systems. ARIANET participated in EC FP5 project FUMAPEX, as WP leader, developing an urban air quality forecasting system for Turin city, and in the FP7 project MEGAPOLI, as responsible for the Po valley area, to analyse megacities emissions impact on air quality and climate. ARIANET participated as associated beneficiary to the LIFE+ EXPAH project. ARIANET scientists have been members of the COST Actions 710, 715, 728, ES0602, ES1006 e TD1105. ARIANET cooperated with CNR/IBIMET to develop a biogenic emission model over Italy.
ARIANET is the responsible of Action A3: Assess and map biogenic emissions as a function of ecosystems/vegetation type and as a function of meteorological conditions in the partner municipalities.

crea
Consiglio per la ricerca in agricoltura e l'analisi dell'economia agraria

CREA

Council for Agricultural Research and Economics (CREA) is a national research organisation with general scientific competence within the fields of agriculture, agroindustry, food, fisheries and forestry. CREA operates under the supervision of the Ministry of Agriculture and Forestry and has legal personality under public law. The CREA is composed by 12 Research Centres. The CREA-Research Centre for Forestry and Wood (CREA-FL) is the associated beneficiary which contributes to this project, with Dr. Silvano Fares.
The staff is composed by 52 permanent units (25 researcher/technologists, 15 technicians; and 16 administrative) and by temporary units hired on specific projects. The CREA-FL in Rome has laboratories with advanced analytical instruments and field experiments. The laboratory of biometeorology is involved in experimental research on plant-atmosphere interactions in response to environmental stress and modelling plant responses to climate change. Since 2010, Dr Silvano Fares (M) leads the laboratories of plant

ecophysiology and biometeorology of CREA in Rome as a permanent senior researcher. He is an expert on gas exchange between plants and the atmosphere in response to abiotic stress. He is coordinator (e.g. Marie Curie EXPLO3RVOC and AQURI) or principal investigator (e.g. LIFE SMART4ACTION and MOTTLES) of EU projects. Dr Fares published more than 80 articles in peer review journals including Science and Nature, with a h-index of 31. Recently, Dr. Alivernini joined the biomet lab at CREA with skills in remote sensing and programming. Dr Alivernini is actively involved in the activities of VEG-GAP.
CREA is the responsible of Action A2: Collect, evaluate and map the air pollution characteristics of ecosystems/vegetation in the partner municipalities.

MEEO
Meteorological Environmental Earth Observation

MEEO – Meteorological Environmental Earth Observation
Meteorological and Environmental Earth Observation - MEEO S.r.l. is a privately held company devoted to the implementation and development of products and services based on remote sensing of the Earth-Atmosphere system. MEEO is a consolidated partner of the European Space Agency (ESA) and since 2011 an affiliated partner of the Climate-KIC association.
The main expertise offered deals with implementation and operation of Earth Observation and geospatial data infrastructure tools, Climate data services, Image information mining tools, satellite and ground data integration, Change detection application, multi-source/multi-temporal analysis, WebGIS Applications development and implementation for private and public local administrations; standardization of processes and data storage / transmission tools (OGC, INSPIRE).
The Multi-sensor Evolution Analysis (MEA) platform is an efficient and robust system implemented to manage the full data cycle: discovery, access, exploration, processing, and visualization services are made available on top of the 3D virtual globe powered by ESANASA Web World Wind, the natural environment where the Earth Scientists find easy-to-use service functionalities to dynamically interact with Earth Observation products.
MEEO operates a series of web portals (Earth Observation Data Service - http://eodataservice.org - one of the EarthServer-2 services; EO Datacube portal - http://eodatacube.eu - the European Space Agency initiative to facilitate access to European Coverage of Landsat8 data; InSAR Italy –

http://insaritaly.services.meeo.it - the open data portal which aims at disseminating maps of the ground deformation over the Italian territory; WatEner-Cast service portal - http://wec.services.meeo.it, a portal to adapt, through tailored weather-related forecast, the water and energy operations to the increased weather fluctuations and to climate change).
MEEO is the responsible of Action A6: Develop an information platform and tools to support authorities.

UNIVERSITÀ POLITECNICA DI MADRID

Universidad Politécnica de Madrid (UPM) is the oldest and largest Spanish technical university, with more than 4,000 faculty members, around 36,000 undergraduate students and 6,000 postgraduates in 18 Schools of study including most of engineering disciplines. The industrial engineers' school, to which the participants in this project are affiliated, dates from 1845. This school is host to the UPM research group on Environmental Technologies and Industrial Resources, framework for the research activities of the participants involved in this project. The participants from UPM have promoted and participated in tens of R&D projects, mainly in the air quality modelling field, funded by public administrations (national, regional and local) as well as private companies.
From 2002, the UPM works for the Spain's Ministry of Environment in the development and analysis of atmospheric emissions (main pollutants and greenhouse gases). The methodology for future-year emissions estimation (including model sensitivity and uncertainty) has been also applied to some regions across Spain and successfully integrated in Life-Cycle-Asssessment (LCA) studies. Within the research group on Environmental Technologies and Industrial Resources, the Laboratory of Environmental modelling has a long experience in the assessment of air quality via multiscale modelling techniques including on-line models as well as model inventory development and integration for both anthropogenic and biogenic sources.

They have made relevant efforts to integrate alternative modelling techniques to consistently cover all the scales from sub-street level to continental scale by incorporating scalable physics and chemical schemes as well as scale-dependent parameterizations. The participants have also experience in the field of analytical chemistry and air pollution and have participated in an important number of R&D activities involving experimental campaigns and air quality measurements.

Universidad Politécnica de Madrid (UPM) is the responsible of Action A5: Assess the impact of ecosystems/vegetation on health and ecosystem risks due to their effect on air pollution in the partner municipalities.