Capacities/Research Potential

FP7-REGPOT-2012-2013-1

Project No. 316173

EnTeC

"Enhancing the capacity for Environmental Technology and Climate Research"

Enhancing the Research Potential of the NCSR “Demokritos” Institute of Nuclear & Radiological Sciences & Technology, Energy & Safety, National and Regional Research Areas

EnTEC

FINAL REPORT

01/01/2013 – 30/06/2016

Project objectives

The specific objectives of EnTeC for INRaSTES remain the same as described in the Action Plan of Integrated Environmental technologies for Atmospheric pollution and Climate Research (AP-IECR), of Annex I and become realized to a great extent with the progression of the project. In more detail it becomes more evident than before that the project:

1. Enhances the research potential of INRaSTES, through targeted activities in specific research areas related to integrated atmospheric pollution and climate research.

2. Strengthens and diversifies the Research Portfolio on climate related research to ensure that INRaSTES becomes one of the pre-eminent institutions in the SouthEast Europe. Consolidates the ability of INRaSTES to be self-standing in terms of funding and not just relying in EC and National funding.

3. Consolidates the capacity of INRaSTES to retain the services of high level scientists and maintain acquired equipment fully operational once the EnTeC project is terminated. The core elements of this strategy are analysed in WP5.

4. Provides seed funding and institutional infrastructure for collaborations that can best compete for funding to support climate related research from a variety of public and private entities at the European, national, and regional level.

5. Improves research management capacity of INRaSTES. The role of the Project Steering Committee which has already overviewed INRaSTES potential and has advised on its R&D agenda and priorities or contribution to emerging research priorities on a National and ERA level.

6. Outreaching actions proposed within EnTeC are becoming a bridge in strengthening bonds of INRaSTES with National Authorities (e.g. Ministry of Environment, Energy and Climate Change) and potential End Users (e.g. countries beyond EU, East Europe, China). Within the Action Plan direct and effective pathways are defined to promote innovative R&D activities, research outcome and specialized services to the mutual benefit of INRaSTES and policy makers (WP4-6).

7. Alignment of the INRaSTES Action Plan on Environmental technologies for Atmospheric pollution and Integrated Climate Research in response to research activities and thematic priorities described in (a) Regional Operational plan of Attica, (b) GSRT Strategic Plan "Innovation, Research and Technology 2007-2013", (c) ERA, (d) the European Climate Change Programme and (e) International Activities (WP4- 6).

8. Upgrade of the scientific expertise of INRaSTES members. Such actions will be achieved with the recruitment of leading experts (WP1), the training of the personnel of INRaSTES (WP3), and two-way secondments with leading EU institutions (WP3), in support of R&D activities and expansion of knowledge and research horizons.

9. Embed the R&D activities of INRaSTES in international networks of added value (e.g. EMEP-ACTRIS-ICOS). This would sustain active networking of INRaSTES with high quality research entities on a regional, national and European level (WP4)

10. Upgrade existing equipment and experimental infrastructure to support high innovative R&D activities and the provision of high quality services (WP2). This also includes the upgrading of computational facilities, to enhance the modelling capabilities of INRaSTES.

11. Promotion and dissemination of knowledge and innovative R&D activities that are produced by the members of INRaSTES (WP4).

12. Set up an appropriate Innovation Plan towards the financial self-sustainability of the INRaSTES R&D activities and infrastructure included in EnTec (WP5).

Work progress and achievements during the period

01/01/2016-30/06/2016

An Overview of the project structure can be given by the general Description of the INRaSTES Action Plan on Integrated Environmental technologies for Atmospheric pollution and Climate Research (i.e. AP-IECR) which is given at the schematic below (Fig.1)

The plan covers not only R&D activities but also all matters that contribute to the continuous operation for more than 25 years. In order to deal with such an interdisciplinary topic, the research has been split into five specific R&D priorities (Actions), which are by nature interdependent and the outcome of each is used to provide valuable input to any other, and one horizontal Action related to Research Management, as illustrated schematically in Figure 1 It must be stressed that the research activities themselves are not funded by the present project EnTeC (such funding would exceed by far the proposed budget).

EnTeC is actually funding the necessary actions to enhance the research potential of INRaSTES so that the Institute will be capable to proceed towards the realisation and long-term sustainability of its future R&D vision in the selected areas.

The **Progress of work** is described in **the 5 major work packages** except project management, which will be reported in the management section. Administration and Management is discussed and described in an overall summary report of all actions challenges and proposals for ensuring successful completion of the project at a final chapter in the end of the report

During the period 1/01/2013-30/06/2016 and despite the limitations on implementation posed to the beneficiary from “Capital Controls” the Infrastructure is continually upgraded and the working experts in the projects have been increased from 16 to 20 members of the ENTEC team plus 2 Administrative Members of staff.

The training of INRaSTES team members have been implemented in five instances and they have made 20 training travel.

There have been 30 secondements of INRaSTES staff and 10 secondments from members of Partner Organizations

Presentations of the INRaSTES research achievements have been made in 30 Conferences and 31 Workshops and scientific meetings

There has also been procurement of the remaining major equipment for supporting INRASTES infrastructure at the amount of 1.103.000 euros

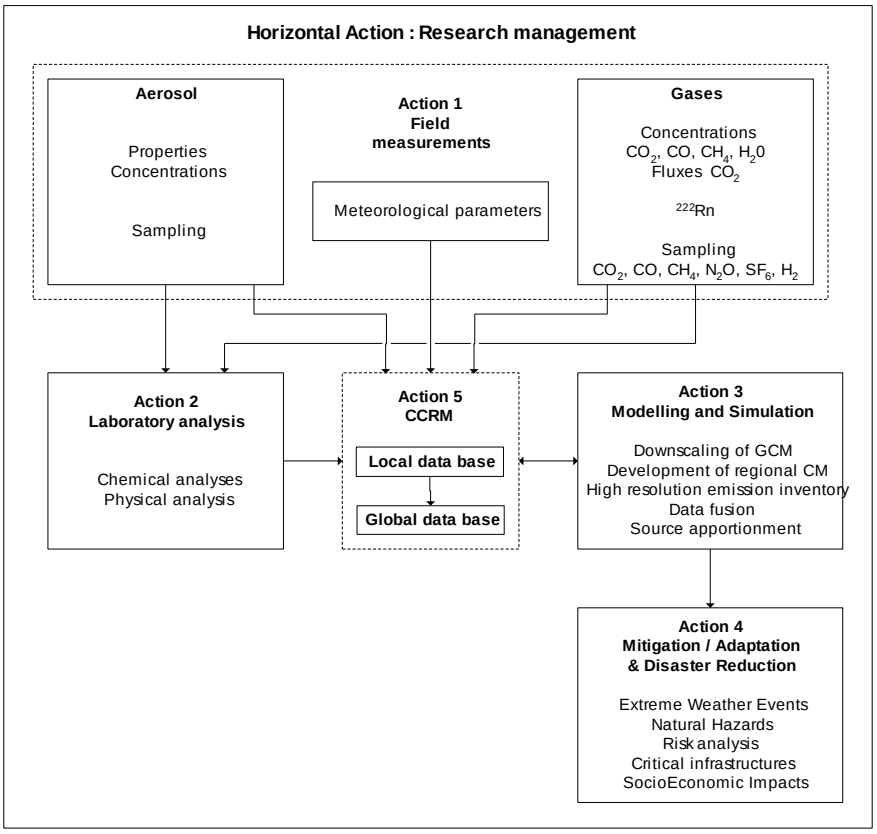


Figure 1. Schematic representation of AP-IECR

WORK PACKAGE 1: RECRUITMENT IN SUPPORT OF INRASTES R&D ACTIVITIES

Structure of project priorities for recruits, main mission and action involvement for new experts.

Task	Priority	Main mission	Action line(s)
1.1	**Field sites and laboratory infrastructure establishment and operation**	- Installation of new background field station, adaptation / optimization of the existing NCSRD station - Laboratory equipment calibration/testing - R&D on methodologies for assessment of climate relevant aerosol properties to assist long term studies at the field stations	**1,2**
1.2	**Size-resolved aerosol measurements**	- Size-resolved aerosol measurements (incl. maintenance / calibration of the measurement systems, for uninterrupted field monitoring of aerosol species. - Development of novel measurement techniques for characterisation (e.g. physicochemical properties) of aerosol species. - Special sample environments, e.g. humidity controlled measurements and Cloud Condensation Nuclei studies	**1,2**
1.3	**Data acquisition, transfer and processing**	- Collection and treatment of the infrastructure data, required for the construction and maintenance of the CCRM, in line with the NILU global database. - Direct processing of raw data and integration to Near Real Time (NRT) facilities of the Global Database (EBAS)	**1,5**

1.4	**Analytical Chemistry, Chemical analysis of gaseous pollutants and aerosols**	- Air pollutants sampling techniques, chemical analysis of climatic gases (CO_2, N_2O, CH_4, ozone) and other typical air pollutants (SO_2, hydrocarbons, etc.) - Chemical analysis and characterization of fine and ultra-fine particles, as well as the development and application of new techniques and methods for estimating the origin, the attitude and the effect of air pollutants - Analytical and sampling techniques (GC-MS, GC-ECD, GC-FID, HPLC, AAS, ICP-AES, ICP-MS, XRF etc. as well as other and OC/EC analysis)	**2**
1.5	**Sorbents for gaseous pollutants**	- Materials engineering for the development of suitable sorbents capable to retain a wide range of air pollutants (gaseous, organic etc,) operating at different conditions and environments	**2**
1.6	**GCM Downscaling for regional air pollution simulations - compilation of high resolution emission inventories**	- Development / application of Global Climate Models and Chemical Transport Models focusing on Western Mediterranean. - Development of a predictive tool of the planetary response to anthropogenic and natural environmental perturbations → effects to atmospheric composition / climate and vice-versa. - Understanding human-induced activities related to climate change and detailed analysis of the uncertainties and unresolved issues surrounding tropospheric aerosols → high quality and low uncertainty emission inventory for various spatial and temporal resolutions	**3,5**
1.7	**Source apportionment and statistical modelling**	- Development and application of source apportionment techniques, to estimate the number and properties of the major pollutants sources	**3**
1.8	**Fluid transport processes**	- Study of the diffusion of different pollutants (gaseous, chemical etc.) in the atmosphere and/or soil, groundwater. - Determination of the dispersion and prediction of the fate of different gaseous and chemical pollutants in a series of environments	**2,3**

1.9	**Climate change and critical infrastructures protection**	- Risk analysis of heterogeneous and interconnected critical infrastructures. - Evolution of existing risk analysis tools with emphasis on climate change scenarios and critical infrastructure protection, and possess related background	**4**
1.10	**Multi-risk methodologies for disaster reduction of climatic change**	- Enhancement of multi-hazard risk methodologies currently under intense research effort in INRASTES. - Quantitative risk analysis, where as experience on climate change impacts is highly desirable	**4**
1.11	**CCRM development and operation**	- Management of the EnTeC data, and development of CCRM (cyber-infrastructure for climatic research management). - Development of an integrated and comprehensive database, in line with the NILU global database for standard and emerging climate species parameters. - Gas and aerosol data processing and database management submission of data to European and Global databases. - Daily calculation and mapping of the Canadian Fire weather Index, based on seasonal WRF-ARW model, for Greece, for the fire seasons 2014, 2015. - Organization and processing of available spatial data sets for the calculation and validation of meteorological indices as well as for the study of emissions at a national and European level. - Design and implementation of a spatial data base of hourly wind-field values of WRF model, for the needs of G-FMIS fire-simulation web-service - Implementation of dedicated GIS software tools and routines , for the automatic transformation and processing and mapping of spatial data, according to the modelling requirements. - Development of a methodology for the classification of the Canadian Fire Weather Index (FWI) for fire danger mapping based on the meteorological data of WRF model. Calculation and study of FWI in Greece in relation to fire history data for 5 years (2009-2013).	**5**

	Exploitation of research results Presentation of the results related to Fire Weather mapping in international Conferences, participation in one networking meeting and coordination of one round table representing NCSR "DEMOKRITOS", in the frame of FLIRE research project(LIFE11ENV/GR/975)	**ALL**
	Project Management	**ALL**

The EnTEC team

Task	Priority	Researcher(s)
1.1	Field sites and laboratory infrastructure establishment and operation	- **Stergios Vratolis** - **Evangelia Diapouli** - **Athina – Ceriz Kalogridi**
1.2	Size-resolved aerosol measurements	- **Maria Gini**
1.3	Data acquisition, transfer and processing	- **Prodromos Fetfatzis**
1.4	Analytical Chemistry, Chemical analysis of gaseous pollutants and aerosols	- **Kyriaki Bairachtari** - **Styliani Pateraki**
1.5	Sorbents for gaseous pollutants	- **Ioannis Bratsos**
1.6	GCM Downscaling for regional air pollution simulations - compilation of high resolution emission inventories	- **George Emmanouil** - **Stylianos Karozis**
1.7	Source apportionment and statistical modelling	- **Dikaia Saraga** - **Manousos-Ioannis Manousakas**

1.8	Fluid transport processes	- **Andreas Yiotis**
1.9	Climate change and critical infrastructures protection	- **Nikolaos Moustakidis** - **Anastasia Eleftheriadou**
1.10	Multi-risk methodologies for disaster reduction of climatic change	- **Aggeliki Demertzi** - **Constantina Politi**
1.11	CCRM development and operation	- **Vassiliki Varela** - **Anastasia Toufeggopoulou**
	Project management	- **Eleni Bairaktari** - **Vasileios Galifianakis**

Work content and results on ENTEC actions and work packes by the ENTEC team

1) *EVANGELIA DIAPOULI*

Short CV

- Background: Chemical Engineering (Post-Doctoral Research Expert)
- Research interests/experience:
  - Physico-chemical characterization of atmospheric aerosol
  - Aerosol ambient and indoor measurements
  - Source apportionment modeling

Role in EnTEC

Dr. Evangelia Diapouli has been recruited under WP1, Task 1.7 Recruitment and R&D activities in the area of "Source apportionment and statistical modelling" (**Action 1,2 &3**). During the period June 2014 – June 2016,

- Dr. Diapouli has been involved in the following activities: Measurement of organic (OC) and elemental carbon (EC) in aerosol samples: Dr. Diapouli is responsible for the EC/OC measurements performed at Demokritos station, by Semi-continuous ECOC analyzer (Sunset Laboratory, Inc.). Performed QA/QC of data, and statistical analysis
- Facilitated INRaSTES participation in EC/OC inter-comparison exercises (organized by ACTRIS European Center for Aerosol Calibration (ECAC))
- Application of receptor modeling for source apportionment of particulate matter (PM)
- 7 peer review publications and 6 articles in Conference Proceedings
- Preparation and submission of research proposals in the framework of EU calls

2) STERGIOS VRATOLIS

Short CV

Background: Chemical Engineering (Highly Skilled Technical Expert)
Research interests/experience:

- Design and function of experimental measurement systems for the size distribution and physical properties of aerosols at the IPTA-NCSR "DEMOKRITOS" in Athens, Greece.
- Responsible for the function and database of the Environmental Radioactivity Laboratory station in Athens, Greece (ACTRIS associate).
- Data analysis of the measured quantities.

Role in EnTEC

Recruitment period: 1/5/2013-31/10/2014
Thematic areas / Actions: 1, 2, 5
Specific tasks:

- Field sites and laboratory infrastructure establishment and operation
- Size-resolved aerosol measurements
- Data acquisition, transfer and processing

3) *MARIA GINI*

Short CV

Background: Physics, Environmental Science and Meteorology (Post-Doctoral Research Expert)

- Research interests/experience:
  - Aerosol instrumentation and sampling techniques
  - Aerosol particle size characterization (Surface, Number, Mass)
  - Statistical analysis of air pollution time-series/Monitoring aerosol physicochemical properties
  - Air mass transport by Back trajectory analysis
  - Source Apportionment methods (PCA)
  - Alpha spectrometry on air filters/Radon concentration measurements

Role in EnTEC

- In the framework of the EnTec project, Ms Gkini Maria is working on the size classification and physical characterization of aerosol particles, in particular on number and surface concentration measurements. Her responsibilities also involve instrument maintenance, calibration and testing on a regular basis for data reliability and quality assurance, implementation of intercomparison exercises, statistical analysis of air pollution time-series, data reporting and publication of the results.

4) *PRODROMOS FETFATZIS*

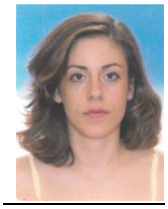
Short CV

- Background: Physics, Experimental Physics (Post-Doctoral Research Expert)
- Research interests/experience:
  - Experimental physics
  - Aerosol in situ station measurements
  - Data analysis – Data reporting
  - HSR-LIDAR design for Ultra High Energy Cosmic Ray experiments- Experimental optics for atmospheric monitoring
  - Modeling and simulation
  - Photovoltaic systems
  - Electrical – Electronic – Automated systems

Role in EnTEC

Recruitment period: 01/5/2013-30/06/2016
Thematic areas / Actions: Task 1.3 - Data acquisition, transfer and processing" (Actions 1 & 5)
Specific tasks: computational tools, applications to atmospheric data collection, development of statistical algorithms for data processing and data reporting. Customization of laboratory devices. Installation of instruments at Helmos Hellenic Atmosheric Aerosol and Cilmatic Change station.

5) KYRIAKI BAIRACHTARI



Role in EnTEC

Recruitment period: 01/05/2013 - 30/06/2016
Thematic area / Action: Analytical Chemistry, Chemical analysis of gaseous pollutants and aerosols (Action 2)
Dr. Kyriaki Bairchtari has been recruited under WP1, Task 1.4 Recruitment and R&D activities in the area of "Analytical Chemistry, Chemical analysis of gaseous pollutants and aerosols " (Action 2).

During the period July 2014 – December 2015, Dr. Bairachtari has been involved in the following activities:

- Installation of greenhouse gas sampling facility. The latter is used for the sampling of greenhouse gases (CO2, CH4, SF6, N2O) from the background station as well as from other field sites.
- Installation of a Greenhouse Gas analyzer which is configured using a GC-FID/ECD coupled with pneumatic control modules and automated port valves for simultaneous detection of greenhouse gases: methane, carbon dioxide, nitrous oxide and SF6 in air.
- Chemical analysis of particulate matter for i) polyaromatic hydrocarbons (PAHs) using GC-MS and ions using ion chromatography (IC) DIONEX 1100. Performed QA/QC of data and statistical analysis.
- 2 peer review publications and 8 articles in Conference Proceedings.
- Preparation and submission of research proposals in the framework of EU calls.

6) STYLIANI PATERAKI

Short CV

Background: Physics, Environmental Physics, Atmospheric Chemistry and Meteorology

(Post-Doctoral Research Expert)

Research interests/experience:

- Monitoring and Analysis (concentration and chemical composition) of air pollutants (PM, VOCs, climatic gases, inorganic pollutants) according to the standard methods of measurement, in outdoor and indoor environment
- Investigation of the role of meteorology (synoptic/ meso scale) in the configuration of the air pollution status,
- Atmospheric Chemistry, Qualitative and quantitative analysis of atmospheric air pollutants with the use of Gas and Liquid chromatography (GC-MS, GC-FID, IC, OC/EC), Participation in action plans for Environmental field campaigns.
- Publications: Peer reviewed Journals (12),Conferences (23), Books (1)

Role in EnTEC

Dr. Styliani Pateraki has been recruited under WP1, Task 1.1 Recruitment and R&D activities in the area of "**Field sites and laboratory infrastructure establishment and operation" (Actions 1 and 2).**

During the period May 2013 – June 2016, Dr. Pateraki has been involved in the following activities:

- Upgrading of the experimental equipment, the monitoring and sampling of various air pollutants including key climatic active species and parameters within the Athens basin including the Demokritos station, the analytical and chemical laboratory techniques as well as the analysis of the role of the prevailing meteorology.
- Facilitated INRaSTES participation in Field Validation Tests (Task 2 of the CEN/TC264/WG15) in order to investigate the practicality of the QC checks proposed in the prEN/TS 16450:2012. The field work has been organized by CEN (the European Committee for Standardization).
- 10 peer review publications and 13 articles in Conference Proceedings.
- Preparation and submission of research proposals in the framework of EU calls.

7) IOANNIS BRATSOS

Short CV

Background: Chemistry (Post-Doctoral Research Expert)
Research interests/experience:

- Inorganic Chemistry (Synthesis, characterization of metal based compounds)
- Experimental skills/techniques: 1D and 2D NMR, X-RAY (single and powder), IR, UV-Vis, SEM/TEM.
- Previous employment: Univ. Trieste (It) - Postdoctoral Researcher (2005-2007 & 2009-2011).
- Publications: 26; Citations: 463; h-index: 11.

Role in EnTEC

Dr. Ioannis Bratsos has been recruited under WP1, Task 1.5 Recruitment and R&D activities in the area of "Sorbents for gaseous pollutants" (**Action 2**). During the period June 2014 – June 2016,

- Dr. I. Bratsos has been involved in the synthesis and characterisation of new types of porous materials for the sorption of air pollutants at different conditions and environments.
- Contributed to the operation of the Intelligent Gas Analyser system purchased in the framework of the project and its use for the provision of services to external users.
- **1** peer reviewed publication, **2** manuscripts under preparation and **1** article in an international Conference Proceedings
- Contributed to the preparation and submission of research proposals in the framework of EU and national calls.

8) GEORGE EMMANOUIL

Short CV

- Background: Physics, Atmospheric Physics-Meteorology (Post-Doctoral Research Expert)
- Research interests/experience:
  - Regional and Global Atmospheric and Sea Wave modeling
  - Weather analysis and forecasting - evaluation

Role in EnTEC

Dr. Georgios Emmanouil has been recruited under Actions 3 (Modelling and Simulation), 4 (Mitigation / Adaptation and Disaster Reduction) and 5 (Cyber-infrastructure for climatic research management). During the period September 2014 – June 2016.

Dr. Emmanouil has been involved in the following activities:

- Installation, setup and fine tuning of the atmospheric model WRF-ARW for high resolution simulations of important weather events. Use of proper statistical and dynamic downscaling techniques.
- Performed analytical study of extreme weather events.
- Performed QA/QC of data, and statistical analysis
- Validated model results with measurements of the main meteorological parameters
- 1 publication in a scientific journal in progress and 3 articles in Conference Proceedings
- Preparation and submission of research proposals in the framework of EU calls

9) STYLIANOS KAROZIS

Short CV

- Background: Chemical Engineering (Highly Skilled Technical Expert)
- Research interests/experience :
  - Air pollution dispersion, Computational Fluids Dynamics, Molecular Simulations, Stochastic algorithms, High Performance Computing (HPC), Unix bash scripting, Fortran, MPI, HTML, PHP
- Up to 10 publications in international conferences and journals
- Other research projects participations:
  - 2009 – 2010: *Research project funded by the Greek General Secretariat for Research and Technology (GSRT). Title: "Fuel Quality", Laboratory of Fuel and Lubricants, School of Chemical Engineering, National Technical University of Athens, Greece*
  - 2011 – 2013: *Research project funded by the Greek General Secretariat for Research and Technology (GSRT). Title: "Analysis of climate change and air pollution in Greece: estimation of environmental and socio-economic impacts on local scale"*

Role in EnTEC

Mr Stylianos Karozis has been recruited under WP1, Task 1.7 Recruitment and R&D activities in the area of "Downscaling of GCM, Development of regional CM & CCRM installation" (**Action 3&5**). During the period July 2014 – June 2016, Mr Karozis has been involved in the following activities:

- Parameterization and execution of scientific algorithms, the coupling of different scientific codes
- Utilization of the cyber-infrastructure for climatic research management (CCRM)
- Start his PhD studies
- 1 peer review publications and 17 articles (4/2013-12/2015) in Conference Proceedings
- Preparation and submission of research proposals in the framework of EU calls

10) ANASTASIA K. ELEFTHERIADOU

Short CV

- Background: Civil Engineering, Earthquake Engineering, Seismic Vulnerability Assessment (Post-Doctoral Research Expert)

Research interests/experience:

- Seismic vulnerability assessment and risk analysis, Structural and economic loss, Earthquake engineering, Assessment of capacity of RC existing buildings, Energy consumption due to climate change, Climate change vulnerability and risk assessment, Risk management of natural hazards, Disaster resilience
- Participation in several national and EU research projects.
- Co-author of 22 refereed papers and invited reviewer in journals.
- Extensive teaching and organizing experience since 2002 (Teaching Assistant, Adjunct Lecturer & Assistant Professor) in structural engineering.

Role in EnTEC

Dr. Anastasia K. Eleftheriadou has been recruited under WP1, Task 1.9: Climate change and critical infrastructures protection and Task 1.10: Multi-risk methodologies for disaster reduction f climatic change in the area of "Mitigation / Adaptation and Disaster Reduction" (**Action 4**). During the period June 2014 – June 2016,

- Dr. Eleftheriadou has been involved in the following activities: Review of the existing methodologies and current approaches incorporated within the climate change vulnerability and risk assessment of the build environment sector and critical infrastructure. Identification of the climate change impacts on the European building exposure and especially of Greece. State of the art of Damage Functions and Vulnerability Assessment regarding several types of extreme weather and Natural Hazards (wind, temperature, flood, landslides, etc) for specific structural building types and bridges. Establishment of a consistent and extensive bottom-up framework for assessing building sector-specific vulnerability to climate change: energy supply and demand with the application of a very high resolution downscaled regional model. Hierarchy of the most vulnerable regions in GIS maps due to energy consumption in Greece leading in the improved risk management of climate change for the planning of appropriate and cost effective mitigation measures.
- 2 peer review journal publications and 2 articles in Conference Proceedings
- Preparation and submission of research proposals in the framework of EU calls
- Participation in Climate Change and Critical Infrastructure Workshops and Meetings

11) DIKAIA SARAGA

Short CV

Background: Physics, Environmental Physics and Meteorology (Post-Doctoral Research Expert)

Research interests/experience:

- Air sampling techniques - indoor and outdoor field measurements
- Application of Reference Methods for PM10, PM2.5, VOCs, OC/EC, ions analysis
- Receptor modelling application in experimental data
- Experience in air exchange rate and thermal comfort estimation in indoor micro-environments
- 18 peer reviewed publications in international journals and over 50 publications in international conference proceedings

Role in EnTEC

Dr Dikaia Saraga has been recruited under WP1, Task 1.7 Recruitment and R&D activities in the area of "Source apportionment and statistical modelling" (**Actions 2 &3**). During the period May 2013 – June 2016,

- Dr. Saraga has been involved in the following activities: chemical analysis for organic and elemental carbon (OCEC) in atmospheric particulate matter samples by a thermal-optical analyzer (Sunset Laboratory Inc.). Performed QA/QC of data and statistical analysis.
- Application of receptor modeling for source apportionment of particulate matter (PM)
- 14 peer review publications and 21 articles in Conference Proceedings.
- Preparation and submission of research proposals in the framework of EU LIFE+ call.

12) ANDREAS YIOTIS

Short CV

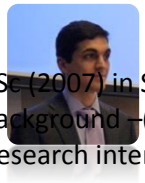
- Background: Chemical Engineering (Post-Doctoral Research Expert)
- Research interests/experience:
  - Transport phenomena in porous materials (soils, rocks, membranes, Fuel Cell components)
  - Pore network modeling, Lattice Boltzmann modeling
  - Experimental Study of 2p flows in model and micronengineered porous media (drying in bead packings, blob dynamics)

Role in EnTEC

Dr. Andreas Yiotis has been recruited under WP1, Task 1.8 Recruitment and R&D activities in the area of "Fluid transport processes" (**Actions 2 and 3**). During the period June 2014 – June 2016,

- Dr. A. Yiotis has been involved in the development of models for the theoretical study of the uptake and diffusion of pollutants in porous media with particular emphasis on the interaction between soil and the environment.
- Contributed to the parallelization of codes in order to enhance the performance of atmospheric modeling computations.
- **4** peer reviewed publication, **1** manuscript under review, and **3** articles in international Conferences Proceedings
- Contributed to the preparation and submission of research proposals in the framework of EU calls.

13) NIKOS MOUSTAKIDIS



Short CV

BSc (2007) in Statistics from the Athens University of Business and Economics
Background – (Highly Skilled Technical Expert)
research interests:

- Critical Infrastructure Protection (CIP)
- Statistical Modeling
- Implementation of 114/2008 EU Directive
- Critical Infrastructure Asset Taxonomy
- Extreme weather and climate change risk assessment
- Analysis of critical infrastructures interconnections and interdependencies

Role in EnTEC

Mr. Nikolaos Moustakidis has been recruited under WP1, Task 1.9 Recruitment and R&D activities in the area of "Climate change and critical infrastructures protection" (**Action 4**). During the period June 2014 – December 2015, Mr. Moustakidis has been involved in the following activities:

- Detailed specification, description and taxonomy definition of the Critical Infrastructure (CI) network
- Analysis of CI interconnections and interdependencies
- Weather and climate-related threats taxonomy
- CI threat response policies examination
- Risk barriers and mitigation analysis
- Harmonization of critical event parameters
- Study of Resilience Indicators
- Development of a holistic, risk assessment framework for heterogeneous and interconnected CIs against weather and climate-related threats
- Publication in the International Journal of Transportation
- Research proposals preparation, consortium negotiation, contribution and submission in the framework of EU calls

14) AGGELIKI DEMERTZI

Short CV

- Background: Economics (Highly Skilled Technical Expert)

Research interests/experience:

- Input-Output Analysis, Regional Input-Output Analysis, Environmental Input-Output Matrices, Impact Assessment, Scenarios' Construction
- Public Economics, Economics of production, Intersectoral Relationships, Urban Economics
- 12 publications in International Conferences and Journals

Role in EnTEC

Mrs. Aggeliki Demertzi has been recruited under WP1, Tasks 1.9/1.10 Recruitment and R&D activities in the area of 'Climate change and critical infrastructures protection' & 'Multi-risk methodologies for disaster reduction of climatic change' (**Action 4**). During the period June 2014 – June 2016,

- Mrs Demertzi has been involved in the following activities:
  - IPCC scenarios
  - Investigation of the inter-relationships of the economy and the environment using the Input/Output Models focusing also on the technological changes in production and generally the changes of the whole structure of economy (by sector of activity)
  - Ex-ante sectoral analysis and investigation of the environmental impacts
  - Impact Assessment
  - Risk Analysis
- 3 peer review publications in Conference Proceedings
- Preparation and submission of research proposals in the framework of EU calls

15) KONSTANTINA POLITI

Short CV

- Background: Physics (Highly Skilled Technical Expert)
- Research interests/experience:
  - Environmental Physics and Meteorology
  - Climate indices, risk assessments on natural disasters, climate change, downscaling methods
  - GIS, IDL, Fortran

Role in EnTEC

Konstantina Politi has been recruited under WP1, Task 1.10 Recruitment and R&D activities in the area of "Multi-risk methodologies for disaster reduction of climate change" and "Modelling and Simulation" (**Action 3&4**). During the period June 2014 – June 2016.

- Konstantina Politi has been involved in the following activities: collecting of the appropriate **indicators** related to drought monitoring, weather extremes, human health indices etc.
- High resolution Dynamical downscaling method of WRF model, forced by reanalysis data and GCM's data for climate simulations.
- Participation in one training course and one secondments
- Start my PhD studies in climate modelling on February 2015
- 2 poster presentations in Conference and 1 upcoming article in Conference Proceedings.
- Preparation of research proposals in the framework of EU calls

16) VASSILIKI VARELA

Short CV

Background: Forestry and Natural Environment (Highly Skilled Technical Expert)
Research interests/experience:

- More than twenty (20) years of experience in GIS programming, analysis and development of Environmental Management Information Systems.
- Participation as a technical partner or technical team leader in several National and European research projects, related to Environmental management and mainly Forest Fires management.
- Experience in the creation and use of spatial data for environmental purposes and a very good knowledge of Inspire Directive and National and European Spatial Data-Bases.

Role in EnTEC

Mrs Varela Vassiliki has been recruited under WP1, Task 1.11 Recruitment and R&D activities in the area of "Exploitation of research results" (action 5)
During the period June 2014 – June 2016, Mrs Vassiliki Varela has been involved in the following activities:

- Daily calculation and mapping of the Canadian Fire weather Index based on seasonal WRF-ARW model, for Greece, for the fire seasons 2014, 2015.
- Organization and processing of available spatial data sets for the calculation and validation of meteorological indices as well as for the study of emissions at a national and European level.
- Design and implementation of a spatial data base of hourly wind-field values of WRF model, for the needs of G-FMIS fire-simulation web-service
- Implementation of dedicated GIS software tools and routines , for the automatic transformation and processing and mapping of spatial data, according to the modelling requirements.
- Development of a methodology for the classification of the Canadian Fire Weather Index (FWI) for fire danger mapping based on the meteorological data of WRF model. The methodology is based on the calculation and study of FWI in Greece in relation to fire history data for 5 years (2009-2013).
- Preparation of a scientific paper based on the above work to be submitted shortly (April 2016) in an international scientific journal.
- 3 articles in Conference Proceedings, participation in one networking meeting and coordination of one round table representing NCSR "DEMOKRITOS", in the frame of FLIRE research project(LIFE11ENV/GR/975),
- Participation as an invited expert representing NCSR "DEMOKRITOS", in two workshops of PREFER (EU-FP7) project
- Contribution to the preparation of research proposals in the framework of EU calls

<u>17) MANOUSOS – IOANNIS MANOUSAKAS</u>

1.7

Dr. Manousos-Ioannis Manousakas has been recruited under WP1, Task Recruitment and R&D activities in the area of "Source apportionment and statistical modelling" (**Action 1, 2 &3**) during the period January 2015 – June 2016

- Dr. Manousakas has been involved in the following activities: Measurement of aerosol samples with ED-XRF technique: Dr. Manousakas is responsible for the ED-XRF measurements performed at Demokritos, by high-resolution energy dispersive X-Ray fluorescence spectrometer Epsilon 5 by PANanalytical. Performed calibration of the instrument as well as QA/QC of data, and statistical analysis

- Facilitated RER project participation in PM elemental analysis and source identification (International Atomic Energy Association (IAEA))
- Application of receptor modeling for source apportionment of particulate matter (PM)
- 2 peer review publications (1 submitted) and 3 articles in Conference Proceedings (submitted)

18) GEORGIOS KUBURAS

Dr Georgios Kuburas has been working since April 2014 as collaborating researcher at the Environmental Radioactivity Laboratory, Institute of Nuclear and Radiological Sciences and Technology, Energy and Safety, National Centre for Scientific Research "Demokritos", Athens, Greece.

His expertise is on experimental and applied nuclear physics.

He is involved in the following activities:

Applications of nuclear physics in radioecology

Supervision of nuclear measurements systems

Energy and efficiency calibration of HPGe detectors

γ spectroscopy measurements in environmental and air samples

Total b- measurements in air samples

Participation in intercomparison exercises and interlaboratory tests

Statistical analysis of the data and interpretation of the results

Preparation and submission of research proposals in the framework of EU

During his stay at the Environmental Radioactivity Laboratory Dr Georgios Kuburas has participated in 2 workshops and presented his work at 2 international conferences.

19) ATHINA- CERISE KALOGRIDI

Dr. Athina-Cerise Kalogridis has been recruited under the EnTeC project for the period between 15th February 2015-30stJune 2016.

During this period, she has been involved in the measurements of atmospheric pollutants (for both gaseous and particulate phase) at Demokritos (urban background) and Helmos (high altitude-remote) monitoring stations.

Dr. Athina-CeriseKalogridis has been responsible for the experimental setup, data acquisition and data processing of non-reactive gases (carbon dioxide, carbon monoxide and methanol) measured by cavity ring-down spectroscopy.

Additionally, she was responsible for the data-acquisition, data-processing (QA/QC) and data-reporting for the measurements of aerosol light absorption and scattering.

She has worked on the application of a source apportionment model (Sandradewi et al. 2008) to attribute aerosol light absorption to black carbon from wood burning and fossil fuel combustion in Athens.

Athina-Cerise Kalogridis has attended the ACTRIS-2 1st WP3 Workshop, organized in Athens, Greece, on 10 - 12 November 2015.

She has presented her results at the "Chemistry in the Urban Atmosphere: Faraday Discussion" conference held in London (UK) from 6-8April 2016.

Eventually, she has participated to the preparation of research proposals in the framework of EU calls.

20) Anastasia Toufeggopoulou

Anastasia Toufengopoulou is Urban and Regional Planner and she holds a Ph.D. in Tourism by the School of Architecture/ National Technical University of Athens (NTUA). She has nine (9) years of experience in the field of urban and regional planning and development issues (land planning, urban studies, master plans, strategic development plans, urban observatory). Also, she has experience in counseling (she was special adviser to the General Secretary of Attica Region in matters of planning and environment). Finally, she has academic and research experience in urban planning and regional development. As researcher, she has been involved in researches and studies examining the spatial approach of tourism, the role of traditional enterprises in the Greek economy, the urban structure of cities and settlements and their development prospectives. Additionally, since 2015 is member of the teaching team in postgraduate courses at the National Technical University of Athens/School of Architecture. Her academic course has been awarded by numerous actors (Ministry of Education, Technical Chamber of Greece, Association of Greek Women Engineers, National Technical University of Athens). She has nineteen (19) publications/ conference papers/ posters on relevant issues.

He has been recruited under the EnTeC project for the period between 1st January 2016-30th June 2016.

Participation in ENTEC:

Analysis and connection between spatial and climatological data of the urban environment using GIS platform

21) VASILEIOS GALIFIANAKIS

He holds a Master's degree in the field of Spatial design (NTUA, 2008) and a Bachelor in Urban and Spatial Planning and Regional Development (UTh, 2005). He has participated in a significant number of National and European research programs as a Research Associate of the Universities of Thessaly and Piraeus, covering a wide range of issues. He has worked in several projects of Ministry of Rural Development, Municipality of Athens, Ministry of Interior and Administrative Reconstruction. He has been recruited under the EnTeC project for the period between 1st November 2015-30thJune 2016.

Role in EnTEC

Recruitment period:1/11/15-30-6-2015
Thematic area(s) / Action(s): Works on the administrative and management support
Specific tasks:

- Administrative support at all levels
- Human resources
- Financial monitoring

22) ELENI BAIRAKTARI

Short CV

Background: Social sciences (Management)
Experience:

- Secretarial, administrative and management support in National and European research projects
- Knowledge of computer programs, electronic documents and Quality Management Systems (ISO/CEN)

Role in EnTEC

Recruitment period:1/12/14-30/06/2016
Thematic area(s) / Action(s): Works on the administrative and management support
Specific tasks:

- Administrative support at all levels
- Human resources
- Financial monitoring

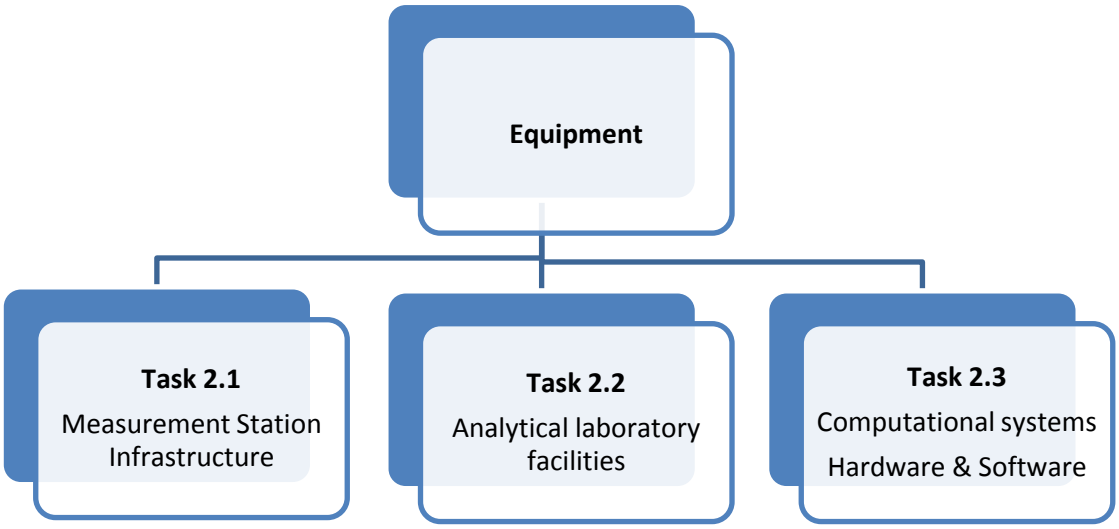
Work Package 2: Upgrading of INRaSTES experimental and computational equipment and infrastructure

Equipment to be purchased according to EnTEC DoW

Equipment			
T 2.1.2	Basic Weather Data	Ultrasonic anemometer	√
T 2.1.2		Meteorological sensors	√
T 2.1.2		222Rn measurement system	√
T 2.1.2	Dat a Acquisition	Data logger, 1x	√
T 2.1		Multiplexer, 2x	√
T 2.1.2		PC etc, 1x	√
T 2.1.2	Greenhouse gases monitor	Picarro G2401 (CO_2, CO, CH_4, H_2O),)	√
T 2.1.1		Pumps, gas collection systems	√
T 2.1.2		Nephelometer	√
T 2.1		Absorption coefficient counter, CAPS PMssa, Aethalometer AE33	√, one prototype on test
T 2.1.2	Aerosols monitor	CPC, 2x for Tandem Mobility system	√
T 2.1		DMA, 1x unit, for Hygroscopicity Tandem Differential Mobility Analyzer (HTDMA)	√
T 2.1		Optical counter OPS(TSI), GRIMM	√
T 2.1		Nafion & sensors	√
T 2.1.2		Background station infrastructure	√
T 2.1		Mast	√

T 2.1.2	**Site preparation**	**Intelligent gas analyzer**	√
T 2.1.1		**High energy, polarizing geometry, Energy dispersive XRF spectrometer**	√
T 2.2.1,2,3	**Gas & aerosols chemical analysis**	**GC, flasks, parts, "GasLab"** **EC/OC Thermo-optical analyzer**	√
		ACSM - TOF	√
		Be-7 Pb210 30% efficiency Germanium detectors	√
		Valves, flasks, tubing	√
		Modification 3 labs and/or stations	√
T 2.2	**Sampling, extraction setup**	**cluster**	√
WP 2	**Lab preparation**		√
T 2.3	**Computing**	**CCRM and etc**	√

Equipment purchased in the frame of EnTEC



Task2.1

Measurement field sites and stations (Urban and free tropospheric background)

DEMOKRITOS URBAN GAW/ACTRIS STATION

Intelligent gas analyzer (WP2, T.2.2)

Installation: January 2014

Key features: ultrasensitive microbalance (0.1 μm resolution), high pressure vessels and pipelines (0-20 bar), temperature and pressure controllers, gas manifold, ultravacuum system, full range of thermostatting options including rapid response heating and cooling (-196 °C to 1000 °C), connectivity with MS, etc.

Use: fully automated for precise gravimetric measurement of gas/vapor (incl. CO_2, CH_4, H_2, H_2O, VOCs, gaseous pollutants etc. - single component and mixtures) sorption and kinetics on solid samples at controlled pressure and temperature.

Applications:

- assessment of the exposure of a wide range of solid samples (soil, dust, particles, porous sorbents, ceramics, polymers, tissues etc.) to gas/vapor environments.
- the obtained data can support the development and optimisation of new materials(e.g. gas and pollutant sorbents)
- unique equipment for Greece (the 3rd instrument in the country) → opportunities for services to / collaborations with a large number of groups in academia and industry.

X-RAY FLUOROSCENCE SPECTROMETER (WP2, T.2.2)

Installation: July 2014

Key features: Epsilon 5 is a unique high-resolution energy dispersive X-ray fluorescence spectrometer specifically designed to deliver enhanced sensitivity and accuracy with significantly reduced backgrounds. The result is superior and often shows sub-ppm detection limits for mid to heavy elements (Fe – U).

Use: Epsilon 5 provides high-performance trace element analysis

Applications:

The instrument is calibrated for 35 elements in particulate matter deposited on air filters (Ag, Cd, Sn, Sb, Cs, Ba, Ce, Pt, Au, Hg etc.)

Epsilon 5 (X-ray fluorescence (XRF) spectrometer

by Panalytical), has taken place at July 17 2014 at NCSR Demokritos.

Figure 1. The Epsilon 5 ED-XRF system

Along with the instrument the following were delivered:

- 1 Dell desktop PC with monitor
- 1 printer HP OfficeJet Pro 8100
- 2 XRF monitors (Omnian monitor and Sample C3)
- 1 External modem (multiModem ZDX)
- 12 Sample holders or cups (6 designed for solids and 6 for liquids)
- 100 Liquid cells (with hat)

After the installation the performance of the instrument and the factory calibration were checked by the support engineer responsible for the installation (Gianfranco Groppelli). The support engineer remained on site for 3 additional days (14-17 July), to train the two operators of the instrument (V. Kantarelou and M. Manousakas) on the basic functions of the instrument as well as the basic maintenance procedures. During that period the operators were trained on how to safely activate and deactivate the instrument, on how to use the software, on how to perform the main maintenance procedures, and were informed of the safety features.

The main training of the operators took place at Almelo (at PANanalytical headquarters) Holland from 26th to 29th of August 2014. The two operators were trained by two application specialists (Ch. Zarkadas and Y. Xiao) at the following:

- Performing calibration
- Creating applications especially designed for air filters
- Use of the auto quantify application

- How to monitor the performance of the instrument
- Spectra analysis using the software of the instrument
- How to calculate instrumental limits of detection

After the training an appropriate application specially designed for PM sample analysis was created by the users/operators. For the calibration Micro Matter thin standards (evaporated on Mylar 6.3 μm film) were used as well as NIST CRMs 2584 and 2583. In the absence of suitable APM reference standard on membrane filters, the CRMs 2584 and 2583 (indoor dust) were dispersed and collected on membrane filters (PTFE filters with PMP support ring and PTFE filters without support ring). The reference material dust particles became airborne in dry form using a 220 Topas Aerosol Generator, by means of compressed pure N2.Using the aforementioned standards the instrument was calibrated for 35 elements (Z=11-38 plus Ag, Cd, Sn, Sb, Cs, Ba, Ce, Pt, Au and Hg).

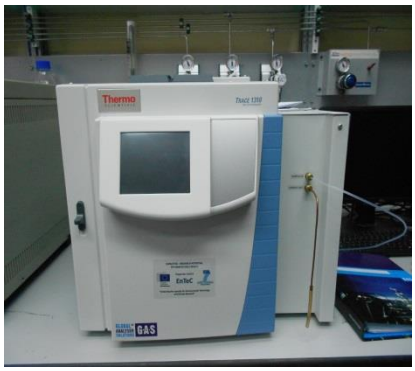
Acquisition of other auxiliary components and parts for refurbishment and upgrade of current instrumentation

Purchase of:

- vacuum pumps and a Ceccato compressor
- pressure sensors
- a regulated high flow blower
- electrode distance regulating device
- replacement pumps for an optical aerosol spectrometer
- personal computers
- pc screens

GC/ECD/FID system for lab Greenhouse Gases Analysis

(WP2, T.2.2)



Installation: October 2014

Key features: The special design greenhouse gas analyzer, TRACE 1300 GC from G.A.S (Global Analyzer Solutions) THERMO Scientific, consists of two parallel channels for simultaneous detection of greenhouse gases in air and is coupled with pneumatic control modules and automated port valves. The system is established in the lab and now running the testing period

Use: Detection of methane, carbon dioxide, nitrous oxide and SF_6 in air

Applications:

Provides High-Precision concentration measurements of greenhouse gases - CH_4, CO_2, N_2O, SF_6 - **in air samples collected in canisters**

FOUR GAS SPECIES ANALYZER USING CAVITY RING DOWN SPECTROSCOPY (WP2, T.2.2)

Installation: November 2014

Key features: The method used is cavity ring-down spectroscopy (CRDS).
Use: The instrument gives simultaneous concentration measurements of the following species: CO, CH_4, CO_2 and H_2O.

Applications:
Picarro greenhouse gas instrument enable extremely precise and simultaneous measurements of CO, CO_2, CH_4 and water vapor at their ambient levels. The analyzer can be **operated in a remote, unattended monitoring station**

ACTION 2 Analytical Techniques for gaseous species

 Participated in the configuration of greenhouse gas (CO2, CH4, SF6, N2O) sampling facility. More specifically she participated in the design and the implementation of the greenhouse gas sampling apparatus which mainly consists of a diaphragm pump, a stainless steel cylinder (flask) and pressure regulators. On site testing of the apparatus under different conditions were elaborated

 Participated in the installation of the Greenhouse Gas analyzer which is configured using a GC-FID/ECD coupled with pneumatic control modules and automated port valves. The special design greenhouse gas analyzer, TRACE 1300 GC from G.A.S (Global Analyzer Solutions) THERMO Scientific, consists of two parallel channels for simultaneous detection of methane, carbon dioxide, nitrous oxide and SF6 in air. The system is established in the lab and high accuracy calibration gases are used for calibration purposes.

For the purpose of the above actions a visit to the Earth System Research Laboratory (ESRL) of the National Oceanic & Atmospheric Administration (NOAA) in Boulder, Colorado U.S was considered necessary as it leads the Global Greenhouse Gas Reference Network. ESRL measures the atmospheric distribution and trends of the three main long-term drivers of climate change, carbon dioxide (CO2), methane (CH4), and nitrous oxide (N2O), as well as carbon monoxide (CO). The ESRL measurement program includes around the clock measurements at 4 baseline observatories and 8 tall towers, air samples collected by volunteers at more than 50 sites all over the world and air samples collected regularly from small aircraft mostly in North America.

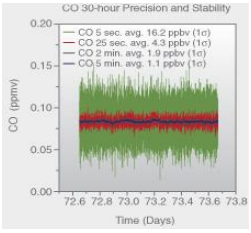
The visit of Dr. Thomas Maggos to the above world leading greenhouse gas monitoring laboratory aimed at:

1) informing and following closely the sampling and analytical techniques for greenhouse gases monitoring.

2) setting the potential cooperation conditions in order to propose INRASTES as possible monitoring site of NOAA network

 Dr. Bairachtari is responsible for the analysis of the collected samples in terms of their PAHs with the use of GC-MS (Agilent). She has undertaken the maintenance of the instrument as well as QA/QC of the data.

 Participated in the analysis of the collected samples in terms of their ionic mass (Cl-, , SO , , K+, Mg2+, Ca2+) with the use of DIONEX ICS 1100. She has undertaken the maintenance of the instrument as well as QA/QC of the data.



Condensation Particle Counter (WP2, T.2.1)

Installation: January 2014

Key features: The Model 3772 CPC operates in single particle count mode up to 10^4 particles/cm^3. Rather than simply counting individual electrical pulses generated by light scattered from individual droplets, the CPC uses a continuous, live-time coincidence correction to improve counting accuracy at high particle concentrations

Use: The Condensation Particle Counter (commercial name: CPC 3772) is a compact, rugged, and full-featured instrument that detects airborne particles down to 10 nm at an aerosol flow rate of 1.0 L/min, over a concentration range from 0 to 10^4 particles/cm^3.

Applications:

- It is ideally suited for applications that do not require measurement of high concentrations. That condition is met as it will be used as part of Scanning Mobility Particle Sizer systems.; in this respect it is of utmost value for the study of particle size distribution and composition, investigated within EnTEC.

FILTER ABSORPTION PHOTOMETER (WP2, T.2.1)

Installation: February 2014

Key features: The 'Next Generation' Aethalometer®, Model AE33, incorporates the patented DualSpot™ measurement method. This provides two significant advantages: elimination of the changes in response due to 'aerosol loading' effects; and a real-time calculation of the 'loading compensation' parameter which offers insights into aerosol optical properties.

Use: Real-time measurement of Black Carbon aerosol particles in the atmosphere

Applications:

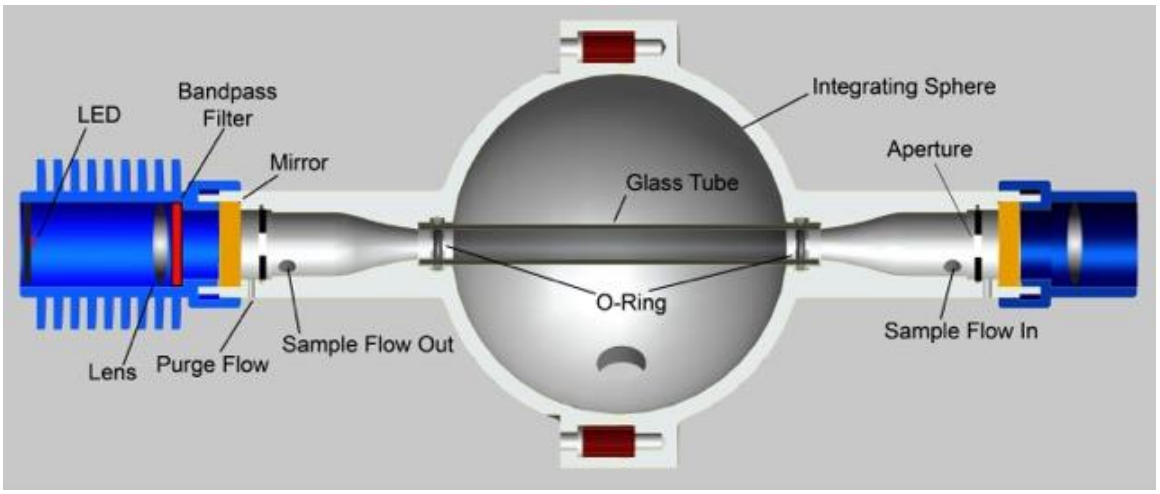
- Particles reduce visibility, adversely impact human health, and contribute to regional and global climate change. For that purpose measurement of BC aerosol particles is of high importance

CAPS PM_{SSA} monitor (single scattering albedo)

The CAPS PMSSA MONITOR simultaneously measures both scattering (by means of Integrating Sphere Nephelometry technique) and extinction (by means of Cavity Attenuated Phase Shift Spectroscopy technique).

Particles with aerodynamic diameter below 2.5 μm are drawn into the instrument and they are directed to a cavity. Absorption of aerosol particles is determined by means of ring down spectroscopy. Subsequently the

sampled air is directed to an integrating nephelometer sphere, where the scattering of aerosol particles is determined (see figure below). Thus, the Single Scattering Albedo is determined, a parameter that provides insight on aerosol composition and state, as well as aerosol optical properties that are needed in climate change modeling.



CAPS PM_{SSA} MONITOR is conducting measurements at GAW DEM station.

Optical Particle Counters

The Grimm 11A optical particle counter (opc) and the TSI 3330 optical particle sizer (ops) were purchased in order to acquire the size distribution of aerosol particles with optical diameter from 300 nm to 10 μm. The instruments measure the particle size distribution (number and size of particles) based on the measurement of radiation scattered by each individual particle when radiation from a laser light source is incident on the particle. The Grimm opc is currently measuring at HAC station, while the TSI ops is currently measuring at an urban location in the Athens Metropolitan Area.

TSI OPS

3 wavelength integrating nephelometer

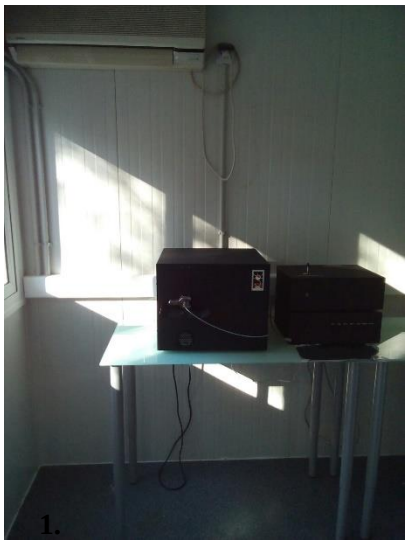
The instrument measures the total scattering and backscattering coefficient of aerosols in the spectral regions of red, green, and blue light. These parameters are very important in order to determine the aerosol optical properties. The sensitivity of the instrument is at 60-sec averaging time equal to or better than the following:

For Aerosol Scattering Coefficient measured at Blue and Green wavelengths: $1*10^{-7}$/m

For Aerosol Scattering Coefficient measured at Red wavelengths: $3*10^{-7}$/m

The instrument is currently measuring at HAC station where the low aerosol concentrations anticipated require increased sensitivity.

LAB OC-EC AEROSOL ANALYZER, SUNSET LABORATORY, INC.



1.

Installation: June 2016

Key features: The instrument measures the mass concentration of organic and elemental carbon of particulate matter samples, collected on quartz fibre filters, by thermo-optical method. The quantification of carbon mass is performed in two stages, at an inert atmosphere (for organic carbon) and at oxidizing atmosphere (for elemental carbon). The analyser allows optical correction for pyrolysis, through the monitoring of sample transmittance and reflectance during analysis. The analyser is compatible with the thermal protocols used internationally (NIOSH, EUSAAR2 και IMPROVE), while it provides the possibility to program alternative thermal protocols as well.

Use: The instrument gives simultaneous concentration measurements of the following species: organic carbon (OC) and elemental carbon (EC).

Applications:
The instrument may be used for the analysis of airborne particulate matter samples collected on quartz fibre filters, for the quantification

HELMOS BACKGROUND FREE TROPOSPHERE

Auxiliary instruments purchased to upgrade current instrumentation

SCANNING MOBILITY PARTICLE SIZER SYSTEM UPGRADED ACCORDING TO ACTRIS RECOMMENDATIONS

Existing instrument: A Scanning Mobility Particle Sizer (SMPS) is an instrument that separates aerosol particles in respect to their electrical mobility diameter and thus acquires the particle size distribution in the atmosphere and originally purchased from TSI

Upgrade: SMPS was upgraded at the Institute for Tropospheric Research in Leipzig, Germany, following the ACTRIS standard operating procedure guidelines. Relative humidity sensors, differential pressure sensors to measure instrument flows and temperature sensors were added to the instrument. New software was provided in order to acquire the instrument data output. Finally, new aerosol and sheath flow nafion dryers were added to the instrument.

Upgrade of PM automated instrument TEOM (Tapered Oscillating Element Microbalance) by coupling FDMS system

Existing instrument: TEOM 1400a was installed in INRASTES/EREL since 2003 to measure PM-10 or PM-2.5 mass concentrations in ambient air. It consists of a TEOM mass sensor and control unit in a network ready configuration.

Upgrade: The system was upgraded by coupling an FDMS unit (Series 8500 Filter Dynamics Measurement System). To that end we manage to accomplish the challenging task of accounting for both the volatile and non-volatile components of particulate matter (PM), and reporting the combination as a mass concentration result. This is done by measuring the volatile portion of the sample independently from the total incoming sample, and using this fraction in calculating the PM mass concentration.

Outcome: Fulfill the requirements of an EU tender for PM automated measurements tests with successful outcome

Mixing Chamber

A cylindrical mixing chamber with a length of 1 was constructed from stainless steel by Inox Solutions. The chamber has 8 side inlets, one inlet on the circle on the top and one outlet on the circle at the bottom. In that configuration, 8 instruments can sample simultaneously from the same inlet flow.

The above facility will assist in testing the newly purchased instruments simultaneously and also provide the potential to mix atmospheric and generated aerosol with air at various RH conditions. It will therefore be a significant asset in the infrastructure of the Environmental Radioactivity Laboratory. The chamber is already installed in the Lab.

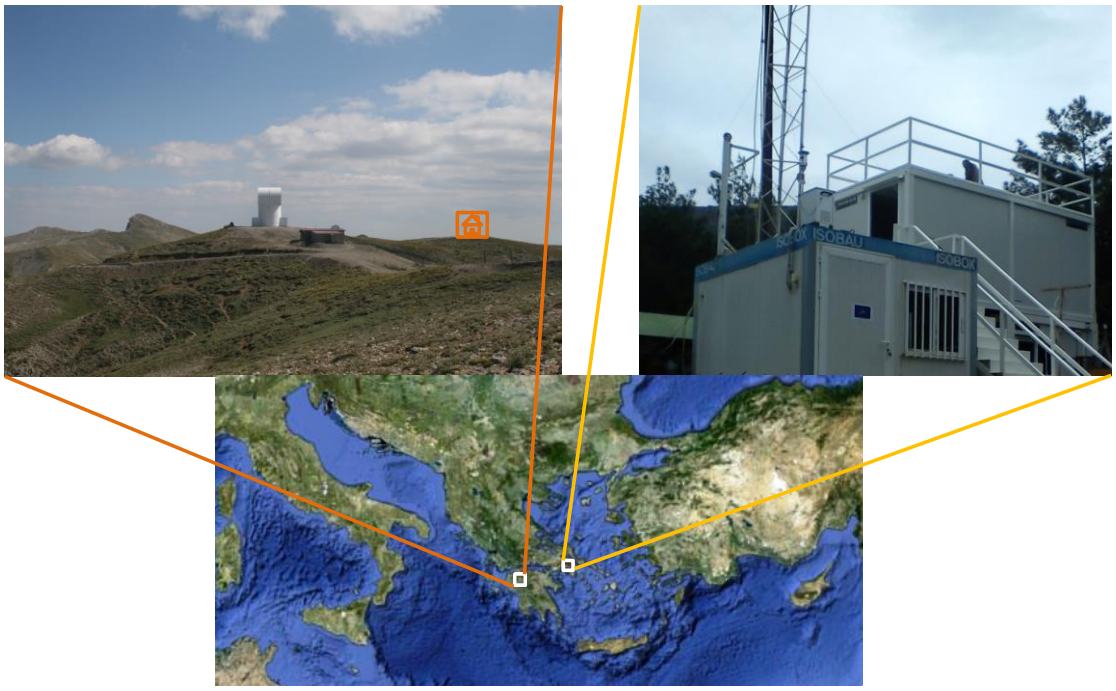
ISOBOX metal containers

Two metal containers were purchased and installed, in order to expand GAW (Global Atmosphere Watch) DEM station.

Three instruments are currently measuring on the upper floor, sampling through a newly installed aerosol inlet.

The overall plan for the field sites developped during EnTeC is shown below, where although the upgrade of the GAW/Actris Demokritos station is almost completed, the establishment of the Free Troposophere background Station at the helmos mountain is under development.

INRASTES, NCSR Demokritos EnTeC Research Stations
New Helmos station* and upgraded GAW/ACTRIS Demokritos Athens station



***Proposed location, construction in progress**

Grimm OPC (Optical Particle Counter) for size distribution measurements

Four Gas Species Analyzer using cavity ring down spectroscopy calibration valve

In order to ensure the quality of the gases measurements (CO, CO2, CH4 and H2O) , a valve for the autocalibration of the instrument was purchased. Compressed synthetic air with gases concentration levels at different intervals will be used for the calibration at HAC.

DIGITEL DHA 80 high volume aerosol sampler

High volume sampling is a technique capable of acquiring filter samples of particulates with various aerodynamic diameters. The purchase of a DIGITEL high volume sampler is of utmost value for the study of the processes and materials investigated within EnTeC. The instrument flow can be regulated to range from 6 to 60 m^3/h. The analysis of the filters acquired by DIGITEL DHA are then analyzed by the X-ray fluorescence instrument purchased earlier in the context of EnTeC, and the Elemental Carbon/Organic Carbon off line analyzer at EREL, providing the main constituents of mass of aerosol particles.

The instrument is in operation, installed inside HAC station.

PART II

Acquisition of other auxiliary instruments, , components and parts for refurbishment and upgrade of state of the art instrumentation. Refurbishment of laboratory and measurement station infrastructure

Nafion dryers, vacuum pumps and sensors to record relative humidity (RH) and temperature (T)

Instrument inlet flows have to have relative humidity below 40%, according to ACTRIS recommendations. In order to accomplish that, nafion dryers, vacuum pumps and RHT sensors were purchased. Vacuum pumps create the necessary vacuum for nafion dryers to function. The sensors have a probe diameter of 5 mm in order to be inserted in the flow system. Their accuracy details follow:

RH :±0.5 % , T: ±0.1 K, at 10...30 °C

The data acquisition system for the sensors is currently at operation, using the Labview software purchased also in the frame of ENTEC.

Aluminum frames

In order to use all available space in the station, 3 aluminum frames were constructed so as to place the instruments. The frames are at HAC station.

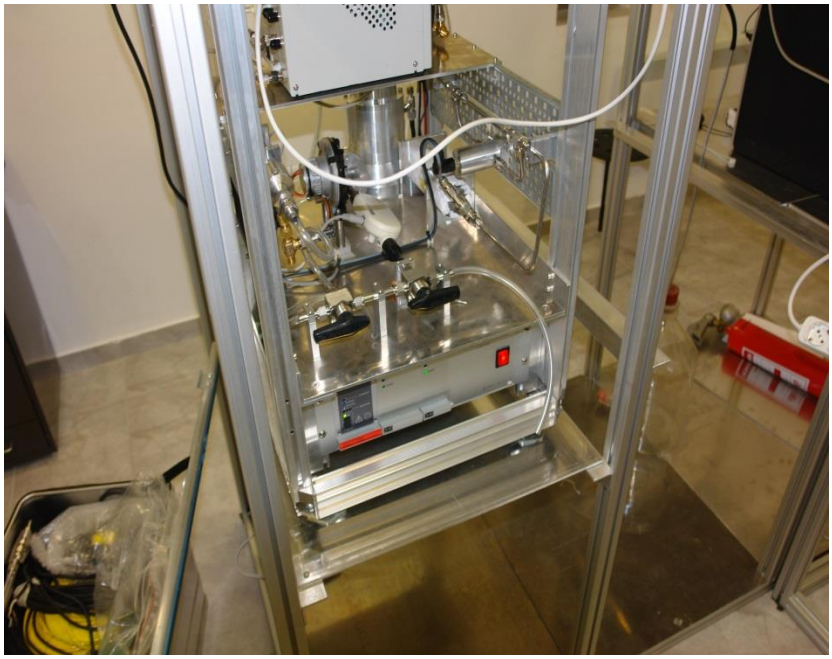
Meteo station for HAC

A meteorological station was purchased in order to record 3 dimensional wind speed and direction with a heated ultrasonic anemometer, solar radiation, temperature and relative humidity. The meteo station can withstand the high wind speed and low temperature that dominate the remote background station HAC.

Ultrasonic anemometer

Pyranometer

Scanning Mobility Particle Sizer System Upgraded According To Actris Recommendation



Existing instrument: A Scanning Mobility Particle Sizer (SMPS) is an instrument that separates aerosol particles in respect to their electrical mobility diameter and thus acquires the particle size distribution in the atmosphere and originally purchased from TSI

Upgrade: SMPS was upgraded at the Institute for Tropospheric Research in Leipzig, Germany, **following the ACTRIS standard** operating procedure guidelines. Relative humidity sensors, differential pressure sensors to measure instrument flows and temperature sensors were added to the instrument. New software was provided in order to acquire the instrument data output. Finally, new aerosol and sheath flow nafion dryers were added to the instrument. As a result of the above upgrade, the instrument now complies with ACTRIS specifications. The measured aerosol size distributions are reported to ACTRIS database.

Time-of-Flight Aerosol Chemical

ACSM-ToF provides a valuable and robust tool for measuring chemical composition of submicron aerosol (PM_1), thus providing insight into aerosol origin and chemical evolution pathways. Specifically, it enables to determine the mass concentrations of non-refractory species, such as *particulate ammonium*, *nitrate*, *sulfate*, *chloride*, *and organic species*.
Measurements are performed with high-time resolution (on the order of minutes to hours) as opposed to the collection of filter, which are often prone to sampling artefacts.
Additionally, ToF-ACSM design has been optimized for long-term deployment with minimal maintenance, enabling field measurements on a long-term basis which are essential to capture long-term trends and inter-season variations.

The ToF-ACSM provides the advantage of high sensitivity (compared to other spectrometric methods using a quadrupole) making it more suitable when low mass concentrations are expected, i.e for free tropospheric or pristine background air masses in remote locations.
Overall, the acquisition of the ACSM-ToF will allow for a detailed analysis of chemical composition of aerosol from high-pollution urban/suburban s (e.g GAW-DEM station) to pristine background (i.e high-altitude Helmos monitoring station) environments.

RAD7

The RAD7 (DURRIDGE)is a is a highly versatile instrument that can be used for either for long- or short term radon and thoron monitoring. The operation principle of the RAD7 device is based on the spectral analysis of alpha-emitters. High-precision alpha-energy spectrum obtained from the solid-state ion–implanted planar silicon detector identifies isotopes from radon and thoron decay chains. Since the RAD7 has virtually no background, it has a much lower detection threshold than other electronic detectors, easily measuring down to below 0.1 pCi/l. The RAD7 has been installed at the Helmos High Altitude Monitoring Station for continuous and real time Radon and Thoron gas monitoring.

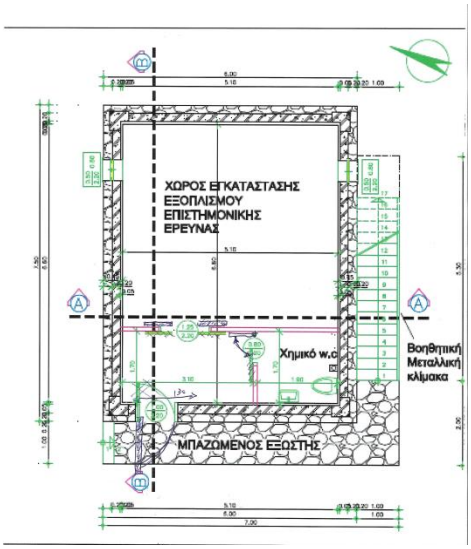
Helmos Hellenic Atmospheric Aerosol and Climate Change station

Some photos from Helmos Hellenic Atmospheric Aerosol and Climate Change station (HAC^2), working instruments and facilities. Fist outside, then inside, instruments and systems.


HAC^2 1. Northern and eastern view of the station.


HAC^2 2. Western - southern and eastern - northern view of the station.

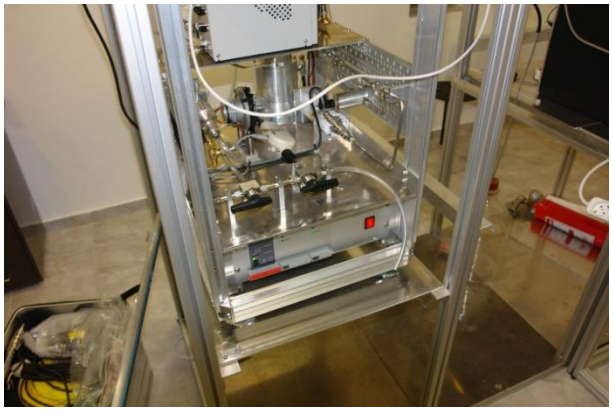

HAC^2 3. View of the Heated inlets working in snow and during the installation.

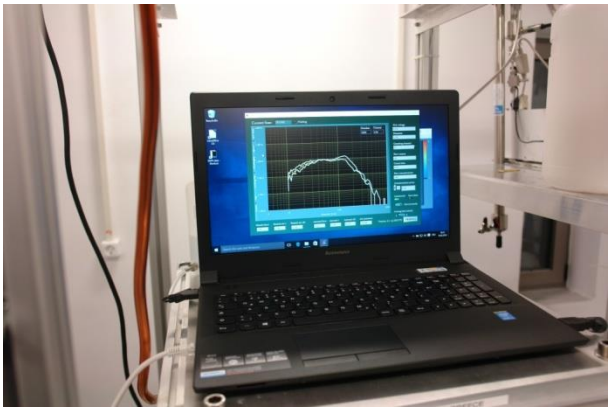


HAC^2 4. Design of the building and general view of the main room during the installation of the instruments.

Line 1

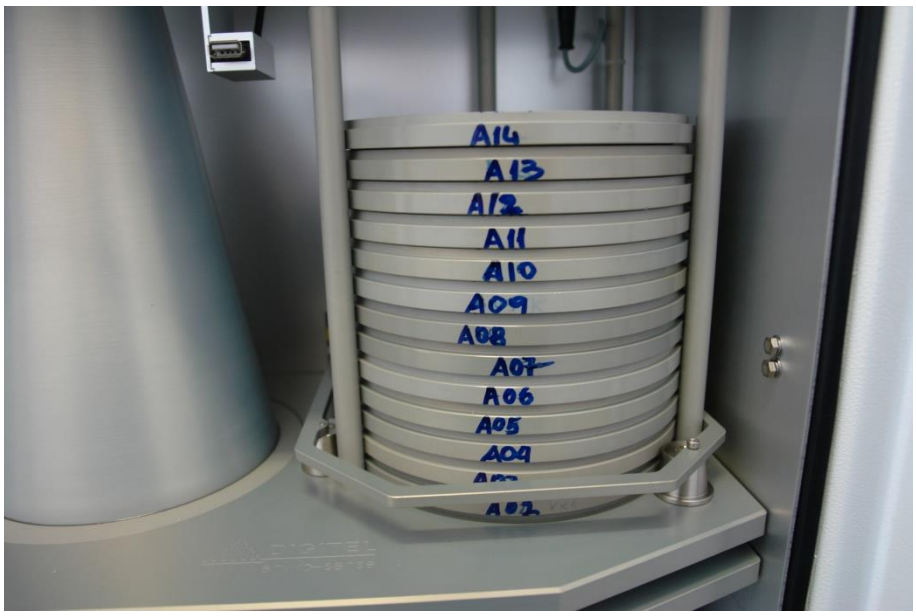
Line 1. 1. Line 1 is the inlet of SMPS, OPC (and Athalometer to be installed). The first photo taken from the entrance s view from all the parts of the SMPS and line 1 PM10 head inlet and 3 line nozzles for every instrument. Also three dryers are used one for every instrument, the size corresponding to the flow





SMPS Laptop of the instrument while the instrument is running, this screen has a size distribution of aerosols from the TROPOS software.

Line 2



Line 2 The Digitel sampler

Line 3



Line 3. Inlet for the three instruments, nephelometer, O_3 monitor and Picarro.

Vacuum pumps to maintain flow rate at sampling lines, swagelok pipe fittings and valves

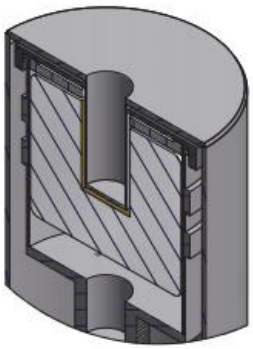
Becker vacuum pumps were also purchased in order to keep a constant flow rate in the sampling lines. In order to assure that the flow systems in inlet lines are leak tight, Swagelok fittings, stainless steel pipes and valves were used.

Task 2.2

Analytical laboratory facilities

1. Canberra Well Type detector

The detector is by Canberra, it is a well –type detector and is the model GCW2022-7905-30U/S. It is being used for gamma spectroscopy of environmental samples. This detector is being used mainly in the analysis of small samples and for low-gamma spectroscopy.



The detector is accompanied by the DSA-LX. It is a full featured 16K channel integrated Multichannel Analyzer based on advanced digital signal processing techniques (DSP). It is paired with a computer running Genie 2000 software for spectra analysis.

Task 2.3

Acquisition of other auxiliary components and parts for refurbishment and upgrade of current instrumentation.

Computational systems (Hardware & Software)

HPC Infrastructure



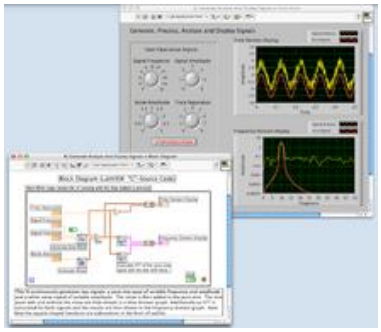
Installation: April 2014

- **Key features:** 4 Supermicro Microcloud High Performance Systems
- **Use:** Increase computational capacity
  - Massive parallel code execution
  - More computations per second
  - Increase bandwidth and capacity

Applications:

- Prognostic - diagnostic meteorology and data assimilation
- Seasonal prognostic – diagnostic meteorology

Labview full development system and data acquisition card



General Description: NI LabVIEW is an award-winning development environment optimized for engineers and scientists creating test, measurement, and control applications. With LabVIEW, we can quickly and easily acquire real-world signals, perform analysis to ascertain meaningful data, and communicate or store results in a variety of ways.

Application: This software is required for the function of the Scanning Mobility Particle Sizer (SMPS) system operating at GAW DEM station, upgraded by IFT institute in order to follow ACTRIS sampling requirements.

In this respect it is of utmost value for the study of the processes and materials investigated within EnTEC.

Acquisition of other auxiliary components and parts for refurbishment and upgrade of current instrumentation.

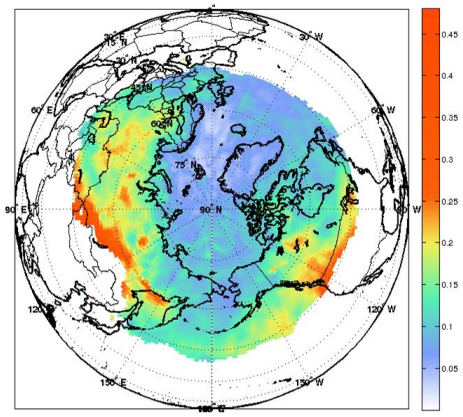
Purchase of:

- vacuum pumps and a Ceccato compressor
- pressure sensors
- a regulated high flow blower
- electrode distance regulating device
- replacement pumps for an optical aerosol spectrometer
- personal computers
- pc screens

AIR MAA TRANSPORT AND ORIGIN TOOL

FLEXPART

The Lagrangian particle dispersion model FLEXPART with a 1^{o} x 1^{o} resolution is now running on a server that belongs to the Institute of Nuclear & Radiological Sciences & Technology, Energy & Safety. It was used to track EBC transport history for the period 2007 to 2014. Twenty-day backward simulation was performed, using hourly releases of 40,000 particles per release, in daily runs covering the aforementioned period. A Potential Source Contribution Function (PSCF) model based on FLEXPART footprints will be subsequently applied. Similar runs will be performed for the measurements obtained from HAC and DEM-GAW stations. The fact that the model is fully functional and running at the server that is accessible to ERL personnel is accomplished thanks to the collaboration of NILU – Norwegian Institute for Air Research.



FLEXPART preliminary results for Zeppelin station Black Carbon measurements.

CCRM (Cyber-infrastructure for Climatic Research Management)

The dissemination of the climate information of the INRASTES climate modelling group can also take place through the Cyber-infrastructure for Climatic Research Management (CCRM), an important infrastructure obtained with the ENTEC project. CCRM is envisioned as a service-oriented, open-source, web-based network of climate research outcome, pollutant emissions, data repositories of existing and new data analysis tools. In addition, CCRM could additionally provide data hosting and access services to user groups from other relevant infrastructures in the Region. The development and establishment of CCRM as long term sustainable data centre, hosting the data generated in the various R&D activities of the INRASTES reinforces the visibility of the group among the climate research and stakeholders community. The company that the computational infrastructure was purchased is Geospatial Enabling Technologies

The CCRM emphasizes the following areas related to climate research:

- Air pollution modelling, inventories
- Air emissions
- Risk management related to natural and anthropogenic phenomena
- Short term weather forecast
- Seasonal climate forecast

The platform for the management and visualization of meteorological information is based on ELLAK(Open Software) technologies and includes spatially enabled Postgresql database, the diffusion Geoserver software mapping services and cartographic surveying GET NEXT Viewer software. O GET NEXT Viewer is a modern software cartographic surveying and analysis based on modern computing frameworks such as HTML5 and javascript as well as openlayers 3 library for the cartographic management.

Work Package 3: Exchange of Know-how and experience

Task 3.1 Planned Secondments with Partner Organizations

1. Norwegian Institute for Air Research (NILU), Norway
2. Leibnitz Institute for Tropospheric Research (IfT), Germany
3. Institute of Environmental Assessment and Water Studies (IDAEA), Spain
4. Instituto Dom Luiz, Faculty of Sciences, University of Lisbon, Portugal

Status: NILU (Norway) Secondments

NAME of SECONDED PERSONNEL	Organisation	Period	NAME of Hosting Personnel	Hosting Organisation	Aim
Dr. E. Diapouli Dr. K. Eleftheriadis	INRASTES	27/04-01/05/14 16/4/14- 4/5/14	Dr. K.-E. Yttri	NILU	Determination of carbonaceous particles by thermo-optical analysis and the possibility to develop standard methodologies.
Dr. D. Saraga Dr. K. Eleftheriadis	INRASTES	27/04-01/05/14 16/4/14- 4/5/14	Dr. O. Hermansen	NILU	To assist in the development of the background station in Helmos Mountain, since he has significant expertise in analytical techniques for greenhouse gas monitoring
Dr. K. Eleftheriadis	INRASTES	26/11-5/12/14	Dr. Andreas Stohl Dr. Sabina Eckhardt Dr. Kjetil Torseth Dr. Markus Fiebig Dr. Karl – Espen Yttri	NILU	Usage and application of Air mass trajectory models for integration in the CCRM system and combination with measurement data.
Dr. Stergios Vratolis	INRASTES	27/11-6/12/2014	Dr. Sabina Eckhardt Dr. Ignacio Pisso	NILU	Hands-on training on applying and using modeling software (Dispersion model FLEXPART)
Dr. Prodromos Fetfatzis	INRASTES	30/11-5/12/2014	Dr. Sabina Eckhardt Dr. Ignacio Pisso	NILU	Hands-on training on applying and using modeling software (Dispersion model FLEXPART)
Dr. Thomas Maggos	INRASTES	2-6/12/2014	Dr. Ove Hermansen	NILU	To enhance knowledgebase of INRASTES in the development and application of greenhouse gas analytical techniques for climate change monitoring

Dr. Ignacio Pisso	NILU	3-7/5/2014	Dr. Stergios Vratolis Dr. K. Eleftheriadis,	INRASTES	To assist in installation and hands-on training on applying and using modeling software (Dispersion model FLEXPART)
Dr Konstantinos Eleftheriadis	INRASTES	9-22/6/2015	Dr. Andreas Stohl Dr. Sabina Eckhardt Dr. Kjetil Torseth Dr. Markus Fiebig Dr. Karl – Espen Yttri	NILU	SECCODMENT TO NILU FOR INSTALLATION AND COMPARISEMENT
Stergios Vratolis	INRASTES	30/9-3/10/2015	Dr. Sabina Eckhardt Dr. Ignacio Pisso	NILU	Hands-on training on applying and using modeling software (Dispersion model FLEXPART)
Dr Ove Hermansen	NILU	19/6-27/6/2016	Dr Konstantinos Eleftheriadis	INRASTES	Installation and Calibration one of the equipment (PICARO), EXPERINMENTAL SETUP

Status: IfT (Germany) Secondments

NAME of SECONDED PERSONNEL	Organisation	Period	NAME of Hosting Personnel	Hosting Organisation	Aim
Dr. Stergios Vratolis	**INRASTES**	**16/06-22/06/13**	**Prof. Dr. Alfred Wiedensohler**	**Leipzig, IFT**	**Upgrading of SMPS instrument and training on the instrument operation**
Maria Gini	**INRASTES**	**04/03-11/03/13**	**Dr. Thomas Mueller**	**Leipzig, IFT**	**Intercomparison and development of novel methods for aerosol absorption and scattering measurements in the framework of ACTRIS WORKSHOP.**
Prof. Dr. Alfred Wiedensohler	**IFT**	**15/07-17/07/13**	**Dr. K. Eleftheriadis**	**INRASTES**	**Inspection and proposal for upgrades regarding measurements of aerosol microphysical properties. Proposals implemented with the prospect of including GAW DEM station in the ACTRIS network.**

Dr. Prodromos Fetfatzis	**INRASTES**	**28/9-4/10/2014**	**Prof. Dr. Alfred Wiedensohler**	**IFT**	**Instrument intercomparison:** **Optical Partical Sizer Spectrometers OPSS**

Kay Weinhold	**Tropos Institute**	**1-4/12/2015**	**Dr K. Eleftheriadis**	**INRASTES**	**Installation of the equipment**
Dr Maria Gini	**INRASTES**	**29/5-4/6/2016**	**Prof. Dr. Alfred Wiedensohler**	**IFT**	**Instrument Calibration:** **Optical Partical Sizer Spectrometers OPSS**
Dr. Prodromos Fetfatzis	**INRASTES**	**5-11/6/2016**	**Prof. Dr. Alfred Wiedensohler**	**IFT**	**Instrument intercomparison:** **Nefelometer & Caps Equipment**

Status: IDAEA (Spain) Secondments

NAME of SECONDED PERSONNEL	Organisation	Period	NAME of Hosting Personnel	Hosting Organisation	Aim
Dr. Aggeliki Karanasiou	**IDAEA**	**05/10-13/10/13**	**Dr. K. Eleftheriadis**	**INRASTES**	**Exchange of Best Practices for aerosol characterization measurements**
Dr. K. Elefteriades	**INRASTES**	**26/4-3/5/2015**	**Dr. Teresa Moreno**	**IDAEA, Spain**	**SOURCE APPORTIONMENT AND DUST TECHNIQUES**
Dr. K. Elefteriades	**INRASTES**	**6-8/9/2014**	**Dr. Teresa Moreno**	**IDAEA, Spain**	**Exchange of novel methodology for aerosol characterization measurements and settling arrangements for loan of IDAEA instrumentation to INRASTES for common measurements**

Dr. Vania Isabel Ferreira Martins	**IDAEA, Spain**	**10/5-2/6/2016**	**Dr. Konstantinos Eleftheriadis**	**INRASTES**	**Exchange of novel methodology for aerosol characterization measurements and settling arrangements for loan of IDAEA instrumentation to INRASTES for common measurements**

Status: Instituto Dom Luiz, Faculty of Sciences, University of Lisbon, Portugal

NAME of SECONDED PERSONNEL	Organisation	Period	NAME of Hosting Personnel	Hosting Organisation	Aim
Politi Konstantina	**INRASTES**	**19/04/-05/05/15**	**Dr. Pedro M. M. Soares and Dr. Rita Margarida Antunes de Paula Cardoso**	**Instituto Dom Luiz, in the Faculty of Sciences, University of Lisbon**	**Set up WRF model for climate simulations, explanations of main structure of WRF model, short runs with EC-EARTH data**
Dr Ath. Sfetsos	**INRASTES**	**19/04/-24/04/15**	**Dr. Pedro M. M. Soares and Dr. Rita Margarida Antunes de Paula Cardoso**	**Instituto Dom Luiz, in the Faculty of Sciences, University of Lisbon**	**Set up WRF model for climate simulations, explanations of main structure of WRF model, short runs with EC-EARTH data**
Anastasia Eleftheriadou	**INRASTES**	**19/04/-24/04/15**	**Dr. Pedro M. M. Soares and Dr. Rita Margarida Antunes de Paula Cardoso**	**Instituto Dom Luiz, in the Faculty of Sciences, University of Lisbon**	**Set up WRF model for climate simulations, explanations of main structure of WRF model, short runs with EC-EARTH data**

Dr Konstantinos Eleftheriadus	**INRASTES**	**2-11/5/2016**	**Dr Pedro Soares**	**Instituto Dom Luiz, in the Faculty of Sciences, University of Lisbon**	**Workshop on Dust transport in Mediterranean**
Dr Pedro Soares	**Instituto Dom Luiz, in the Faculty of Sciences, University of Lisbon**	**22-30/6/2016**	**Dr D. Vlachogiannis**	**INRASTES**	**Set up WRF model for climate simulations, explanations of main structure of WRF model, short runs with EC-EARTH data**

Task 3.2 Short Secondement Activities - Technical Visits (according to Technical Annex)

NAME of TRAINED PERSONNEL	Organisation	Period	Short Secondment activity	Location	Description
Dr. Thomas Maggos	**NOAA**	**16/09-22/09/13**	**Gas Chromatography analysis for greenhouse gases**	**Boulder Colorado** **NOAA**	**Collaboration with the National Oceanic and Atmospheric Administration (NOAA) - Earth System Research Laboratory (ESRL) - Carbon Cycle Greenhouse Gases Group (CCGG)**
Dr. Ioannis Bratsos	**University of Rome &** **Italian Synchrotron Radiation Society**	**14/09-29/09/13**	**XII School on Synchrotron Radiation (16-27 /9/2014)**	**Grado, Italy**	**Characteristics and potentiality of synchrotron radiation**
Dr. Olga Popovicheva	**Un. of Moschow**	**20/08/-24/08/13**	**Expert**	**INRASTES** **(Athens)**	**Transfer of knowledge for production of black carbon reference material for absorption measurements**

Ms. Aggeliki Demertzi	**University of Athens**	**11/11-15/11/13**	**Seminar "Internat. Short Secondment Seminar on Climate Change Policies"**	**Athens**	**Trained and updated on international policy trends, data collection, scenarios development, policy mixture selection with the use of LEAP and their assessment with the use of AMS (for climate change policy mixtures).**
Dr. Prodromos Fetfatzis	**HYYTIALA**	**02/05-10/05/14**	**Participation to the 10th Summer School on Atmospheric Aerosol Physics**	**Finland**	**ACTRIS –Short Secondment school for aerosol properties including absorption coefficient**
Dr. Andrew Freedman	**INRASTES**	**16/7-3/8/2014**	**Absorption coefficient prototype counter**	**Athens**	**Installation of prototype instrument for aerosol optical properties (extinction absorption and scattering), in situ calibration and testing data analysis for local Mediterranean and urban aerosols**
Dr. Vasiliki Kandarelou	**INRASTES**	**25-29/8/2014**	**XRF Spectrometer**	**Amsterdam**	**Short Secondment in E5 XRF Spectrometer and data analysis**
Dr. Manos Manousakas	**INRASTES**	**25-29/8/2014**	**XRF Spectrometer**	**Amsterdam**	**Short Secondment in E5 XRF Spectrometer and data analysis**
Aggeliki Demertzi	**INRASTES**	**11-16/5/2015**	**ECCA 2015**	**Copenhagen**	**Workshop ECCA 2015 for the WP4 of ENTEC**
Georgios Emmanuil	**INRASTES**	**6-11/7/2015**	**Downscaling of GCM**	**Paris**	**In the framework of WP4 " Exploitation and Dissemination Activities" of the ENTEC project, Dr. G EMMANOUIL will disseminate his results carried under Task 1.6, Thematic areas 3 & 5: "Downscaling of GCM for regional air pollution simulations and compilation of high resolution emission inventories" to the CFCC CONFERENCE 2015**
Anastasia Eleftheriadou	**INRASTES**	**11-16/5/2015**	**ECCA 2015**	**Copenhagen**	**Workshop ECCA 2015 for the WP4 of ENTEC**
Politi Konstantina	**INRASTES**	**19-23/10/2015**	**International Training course on Seasonal Forecasts and Water Management in the**	**WMO Regional Training Center IBIMET-CNR, Firenze, Italy**	**Build capacities for the application of climate seasonal forecasts for water management in the Mediterranean countries**

			Mediterranean Basin: Integrated Approach		
Dikaia Saraga	**INRASTES**	**23-26/6/2015**	**Technical Meeting**	**Aveiro Portugal**	**Fairmode technical meeting University of Aveiro secondments in partering organization**
Evangelia Diapouli	**INRASTES**	**23-26/6/2015**	**Technical Meeting**	**Aveiro, Portugal**	**Fairmode technical meeting University of Aveiro secondments in partering organization**
Evangelia Diapouli	**INRASTES**	**7-12/9/2015**	**Workshop EAC 2015**	**Milan,Italy**	**Workshop EAC 2015**
Stergios Vratolis	**INRASTES**	**7-12/9/2015**	**Workshop EAC 2015**	**Milan,Italy**	**Workshop EAC 2015**
Kvnstantinos Eleftheriadis	**INRASTES**	**7-12/9/2015**	**Workshop EAC 2015**	**Milan,Italy**	**Workshop EAC 2015**
Maria Gini	**INRASTES**	**7-9/9/2015**	**Workshop EAC 2015**	**Milan,Italy**	**Workshop EAC 2015**
Prodromos Fetfatzis	**INRASTES**	**7-12/9/2015**	**Workshop EAC 2015**	**Milan,Italy**	**Workshop EAC 2015**
Dr. Konstantinos Eleftheriadis	**INRASTES**	**11-17/3/2016**	**Workshop**	**Moscow**	**Workshop in collaboration with Tomsk University**
Dr. Athina –Cerize Kalogridis	**INRASTES**	**21-26/3/2016**	**Training Course**	**Paris**	**Technical meeting with the Laboratory "LSCE" for training for the use one Fasmatometer**
Dr Athina-Cerize Kalogridis	**INRASTES**	**5-9/4/2016**	**Workshop**	**London**	**Workshop "Chemistry in the Urban Atmosphere"**
Dr Konstantinos Eleftheriadis	**INRASTES**	**20-22/4/2016**	**EGU**	**Vienna**	**Workshop EGU (European Geoscinces Union)**
Dr Georgios Emmanuil	**INRASTES**	**19-23/4/2016**	**EGU**	**Vienna**	**Workshop EGU (European Geosciences Union)**
Dr George Emmanouil	**INRASTES**	**16-21/5/2016**	**CORDEX**	**Stockholm**	**Participation in conferences: To participate in the CORDEX initiative (an important initiative to advance and coordinate the science and application of regional climate downscaling through global partnerships). Downscaling activites is**

					an important part of Action 3 of ENTEC.
Dr Konstantinos Eleftheriadis	**INRASTES**	**2-7/5/2016**	**Workshop**	**Lisbon**	**8th International Workshop on Sand/Dustrooms ans associated Dustfall**
Dr Maria Gini	**INRASTES**	**6-11/6/2016**	**Technical Meeting**	**Boston**	**Training and Seminar for an equipment**
Dr Athina –Cerize Kalogridis	**INRASTES**	**6-11/6/2016**	**Technical Meeting**	**Boston,USA**	**Training and Seminar for an equipment**
Dr Stergios Vratolis	**INRASTES**	**27/6-1/7/2016**	**Technical Meeting**	**Zagreb**	**Fairmode technical meeting: Zagreb 27-29/06/2016 και στο "JRC-Danube Strategy Meeting"**
Konstantinos Eleftheriadis	**INRASTES**	**1-3/3/2016**	**Workshop**	**Frascati, Italy**	**ACTRIS II-General Assemply Conference**
Dr Maria Gini	**INRASTES**	**16/5/2016**	**Workshop HAAR**	**Pylos**	**Workshop HAAR**
Dr Stergios Vratolis	**INRASTES**	**15-16/5/2016**	**Workshop HAAR**	**Pylos**	**Workshop HAAR, presentation FLEXPART**
Dr Konstantinos Eleftheriadis	**INRASTES**	**15-16/5/2016**	**Workshop HAAR**	**Pylos**	**Workshop HAAR and presentation**
Dr Athina –Cerize Kalogridis	**INRASTES**	**16/5/2016**	**Workshop HAAR**	**Pylos**	**Workshop HAAR**
Dr Evangelia Diapouli	**INRASTES**	**16/5/2016**	**Workshop HAAR**	**Pylos**	**Workshop HAAR**
Dr Konstantinos Eleftheriadis	**INRASTES**	**30/3-1/4/2016**	**Conference**	**Madrid**	**Conference to IUR task group “Radionuclides in arid regions”**
Dr Athanasios Sfetsos	**INRASTES**	**23-26/3/2016**	**Workshop**	**Brussels**	**Participation in networking workshop IMGS**

Work Package 4: Exploitation and Dissemination Activities

SERVICES

INRASTES Provision of Services 2014-2016

Analytical services

1. Assessment of ambient air quality near Seed-Oil industries at Messenia region (2015-2016)

2. PAHs analysis in air samples of ALUMINIUM S.An industry (2014-2016)

3. Air pollutants emission measurements at TITAN cement industry (2015-2016)

4. Indoor Air Quality assessment in a Navy Warship (2015)

5. Assessment of ambient air quality in Aspropyrgos (Attica region) after a fire at recycling plant (2015)

6. Indoor Air Quality assessment in CONVEX industry (2015)

7. Provision of Consultancy Services and Analysis of Indoor and Outdoor Air monitoring stations' filters in Doha, Qatar (2015)

8. Air pollutants emission measurements in VIVECHROM paint industry (2014-2015)

9. Air pollutants measurements in AIR LIQUIDE industry (2014-2015)

10. PM chemical analysis and characterization at Athens International Airport (AIA) environmental monitoring stations (2014)

11. Indoor air quality in NEXANS industry (2014)

12. Assessment of indoor air quality in "MHTERA" hospital (2014)

13. Assessment of workplace environment of EGNATIA Motorway surveillance buildings (AKTOR)

13 Atmospheric air quality assessment at the Katakolo peninsula (ENVECO S.A.)

14. Heavy metal air quality monitoring at a mining Region (ENVECO S.A.)

15. Air filter analysis for elemental concentrations at various countries (IAEA)

Exploitation of new and upgraded infrastructure for services:

Electrothermal Atomic Absorption Spectroscopy (ETAAS) An appropriate application specially designed for PM sample analysis was created by the users/operators. For the calibration Merck solution standards were used, as well as NIST CRMs 2584 and NIST 1648 for the quality control of method.
The instrument is used for different types of measurements such as university support, research, monitoring, service provision and scientific projects. The following list provides information about the type and the number of the measurements for the period 2014-2015:

- University and PhD studies support: 210 samples
- Research: 144 samples
- Monitoring: 60 samples
- Service provision: 118
    - ENVEKO: 40 (As, Pb, Cd, Cu,Ni, Cr, Mn)
    - Airport: 71 (V, As, Cd, Pb, Ni)

    - AKTOR: 6 (Pb)
    - Alfa: 1 (As, Cd, Pb, Ni)
- Scientific projects:20 samples
    - RER: 20 samples

The total number of measurements is approximately 550.

Epsilon 5 (X-ray fluorescence (XRF) spectrometer

Since the completion of the installation and the calibration procedure, the instrument is continuously used for different types of measurements, such as university support, research, monitoring, service provision and scientific projects. The following list provides information about the type and the number of the measurements conducted:

- University and PhD studies support: 1088 samples
- Research: 355 samples
- Monitoring: 369 samples
- Scientific projects: 595 samples
    - HEXACOM: 23 samples
    - RER 1013: 409 samples
    - THALIS 2011: 163 samples
- Service provision: 100 samples
    - ENVEKO: 40 samples
    - Airport: 29 samples
    - AKTOR: 31 samples

The total number of measurements is approximately 2500.

Electrothermal Atomic Absorption Spectroscopy (ETAAS) An appropriate application specially designed for PM sample analysis was created by the users/operators. For the calibration Merck solution standards were used, as well as NIST CRMs 2584 and NIST 1648 for the quality control of method.
The instrument is used for different types of measurements such as university support, research, monitoring, service provision and scientific projects. The following list provides information about the type and the number of the measurements for the period 2016:

- University and PhD studies support: 410 samples
- Research: 144 samples
- Monitoring: 100 samples
- Service provision: 100
    - ENVEKO: 60 (As, Pb, Cd, Cu,Ni, Cr, Mn)
    - Airport: 40 (V, As, Cd, Pb, Ni)
- Scientific projects:120 samples
    - RER: 120 samples

The total number of measurements is approximately 1094.

Epsilon 5 (X-ray fluorescence (XRF) spectrometer

Since the completion of the installation and the calibration procedure, the instrument is continuously used for different types of measurements, such as university support, research, monitoring, service provision and scientific projects. The following list provides information about the type and the number of the measurements conducted:

- University and PhD studies support: 1088 samples
- Research: 355 samples
- Monitoring: 369 samples
- Scientific projects: 595 samples
- RER 1013: 409 samples
- Service provision: 100 samples
- ENVEKO: 60 samples
- Airport: 40 samples

The total number of measurements is approximately 2916.

Objectives of this WP is concerned with a targeted set of activities to boost outreaching of INRaSTES. Exploitation and dissemination activities are proposed to promote transfer of knowledge on a regional, national level and the ERA.

Description of work

i) Organization of advanced workshops / seminars.

This Task involves the organization of specialised seminars that world class scientists and INRaSTES personnel will

Mrs Vasiliki Varela has participate at the **4rth Stakeholders' Meeting – Round Table 13th of May 2015**

A Round Table was organized in the frame of the 4th Stakeholders Meeting of FLIRE project, which took place in the City Hall of Rafina-Attika, the 13th of May 2015. About 40 people participated, including the Mayor of Rafina, representatives from the Municipality of Eastern Attika, the Fire Brigade, the Civil Protection authority and citizens of Rafina. During the Round Table, brief presentation of aspects related

to Fire prevention and Fire protection were made by the coordinators of the Round Table sessions and the attendees participated in open discussions, which were organized for each session.
Vassiliki Varela participated as coordinator of a round table discussion on Fire Prevention, representing NCSR "DEMOKRITOS", in the frame of ENTEC project.

TAGARIS

For the **dissemination** of ENTEC we presented air quality modeling results in the European Geosciences Union General Assembly 2015 (**EGU 2015**) international conference in Vienna. An **oral presentation** presented by our modeling team estimating the contribution of the different **anthropogenic emission sources** on ozone and $PM_{2.5}$ concentrations over Europe since anthropogenic activities (and the related emissions) are the reason of air quality degradation

DALAKA

For the implementation of **ENTEC**, WP3, Task 3.2 Training Activities, a trip from Athens to the atmospheric aerosol and climate change station at Helmos was organized from 23/10/2015 to 24/10/2015. During this trip sampling inlets at the roof of the building were set. Also some of the sampling instruments were carried and connected such as the Digitel High Vol sampler, Picaro. The Digitel High Vol sampler was put in a trial sampling program. Also in the station, racks were set for the instruments and additional cleaning work was done. Finaly soil samples were taken for gamma-spectroscopy analysis in the laboratory.

Thanasis Sfetsos made a presentation for "Seasonal forecast mapping of meteorological fire danger". The presentation concerned the methodology of calculation of a series of seasonal forecast maps of meteorological fire danger, as well as drought, for the whole of Greece, using the Fire Weather Index (FWI) of the Canadian System CFFDRS. The meteorological data that are used are produced from the dynamic downscaling of a seasonal model, for a period of six (6) months, using the WRF model (v3.5.1) and a 6x6 km2 resolution covering the entire area of Greece. The final maps can be a very useful operational tool, as they provide the important information of the level of meteorological danger very early on, thus permitting fire management planning for a more effective spatial distribution and organization of forest fire detection and initial attack resources on a regional and national level.

Dr Maria Gkini and Dr Prodromos Fetaftzis has participated to SMPS and CAPS intercomparison 30/05-03/06/2016, ECAC, TROPOS, Leipzig, Germany

Dr Maria Gkini. & Dr Ath. Kalogridis has participated to "ToF-ACSM traing Course (7-9 June, 2016), Aerodyne Research, Boston"

Mr Stergios Vratolis : Fairmode Technical Meeting :Zagreb 27-29/6/2016 "JRC-DANUBE Strategy Meeting"

Subtask 4.1.4 Advanced Seminar on the economic aspects of climatic gases using Input – Output Models The workshop has taken place in NCSR "DEMOKRITOS" on 29/5/2015 the title of the workshop is "**Aspects of climatic gases using Input – Output Models."**

The main topics of discussion were:

- ✓ Greek Environmental Input Output matrix and the assessment of emission reduction options
- ✓ NAMEA Tables – the case of Greek and European NAMEA (National Accounting Matrix with Environmental Accounts)
- ✓ Environmental impacts of energy production technology. An analysis based on a NAMEA table for the Greek economy
- ✓ NAMEA as a methodological framework for brownfields restoration
- ✓ Optimizing Production under GHG emission reduction constraints

List of Participants

1. N. Stromblos, Hellenic Statistics

2. S. Karagianni, University of Macedonia – Department of Economics

3. M. Pepetzoglou, Democritus University of Thrace

4. D. Hristu, University of Macedonia – Department of Applied Informatics

5. A. Sfetsos, NCSR D

6. D. Vlachogiannis, NCSR D

7. A. Demertzi ,NCSR D

8. K. Politi NCSR D

9. V. Varela NCSR D

10. St. Karozis NCSR D

11. A. Eleftheriadou NCSR D

More information for the workshop you could find in the deliverable 4.4

ii) Participation in international conferences

Post-Doctoral Fellows and INRASTES scientist's presentations at

International Conferences and workshops

- **S. Vratolis**: Presentation **"Particle Number Size Distribution Statistics at Urban and Suburban Background and Remote Sites in Greece during Summer"** S. Vratolis (Presenting author) 1, M. Gini1, D. Siakavaras2, S. Bezantakos1,2, I. Stavroulas4, N. Kalivitis4, E. Kostenidou5, E. Louvaris5, G. Biskos2,3, N. Mihalopoulos4, S. Pandis5,6, C. Pilinis2, K. Eleftheriadis1**,**

Poster **"Effect of the extensive use of fireplaces on carbonaceous particle concentration levels in Athens, Greece"**, E. Diapouli (Presenting author) , V. Vasilatou, S. Vratolis, M. Gini, D. Saraga, Th. Maggos and K. Eleftheriadis
European Aerosol Conference (EAC 2013), Prague

- **S. Pateraki:** Poster Presentation of the work entitled **"Greater Athens PM pollution: Local or regional origin** (Authors: St. Pateraki, T. Maggos, D.N. Asimakopoulos, A. Bougiatioti, Ch. Vasilakos and N. Mihalopoulos)"
    - International Conference European Geosciences Union (EGU), Vienna
- **E. Dalaka & Eleftheriadis:** Poster Presentation **"Long Term Measurements of Radioactive Tracers at the Demokritos GAW Station"** (Authors: E. Dalaka, K. Eleftheriadis, M. Anagnostakis)
    - Ro5 Radioecology Workshop, Barcelona
- **G. Emmaniouil** Poster presentation under the title "Climate change and extreme weather events in Mediterranean Sea: studies with WRF atmospheric model"
    - International Scientific Conference "Our Common Future Under Climate Change", held in Paris in July 2015,

Eleftheriadis, Diapouli, Gini, Fetfatzis Oral and poster presentations at the European Aerosol Conference 2015, organized in Milan, Italy, on 6 – 11 September, 2015 In the framework of INRaSTES personnel has participated in the European Aerosol Conference 2015, organized in Milan, Italy, on 6 – 11 September, 2015

Dr Ioannis Bratsos has participated to the 7th Panhellinic Symposium on porous Materials 2-4/7/2016 in Ioannina, Greece

Dr. Konstantinos Eleftheriadis (Frascati, Italy)

1-3/03/2016

Dr Konstantinos Eleftheriadis has attend the 2nd ACTRIS Conference in Frascati Italy. For more information see the link below http://actris2.nilu.no/Events/Eventsdescriptions/2ndACTRIS2GM.aspx

Dr. Athina – Ceriz Kalogridis (London, UK)

5-10/04/2016

Dr Athina Kalogridis has participated to the international conference "Chemistry in the Urban Atmosphere: Faraday Discussion" she has a poster presentation during the conference.

This meeting aimed to address both the key questions and the over-arching issues related to understanding chemistry in the urban atmosphere.

The poster presented was entitled "**Investigating wood burning and fossil fuel contribution to Black Carbon and Carbon monoxide concentrations in Athens, during wintertime"** For more information see the link below http://www.rsc.org/events/detail/18145/chemistry-in-the-urban-atmosphere-faraday-discussion

Dr. Diamando Vlachogiannis (Budapest)

9-11/5/2016

Dr Diamando Vlachogiannis has participated to the **17th International Conference on Harmonisation within Atmospheric Dispersion Modelling for Regulatory Purposes** she has a poster presentation during the conference. For more information see the link below http://www.harmo17.org/site/index.html

Title of the Poster: "Investigation of atmospheric dispersion of gas compounds from

an industrial installation over a realistic topography"

Diamando Vlachogiannis[1], Athanasios Sfetsos[1], Nikolaos Gounaris[1] and Athanasios Papadopoulos[2]

Dr G. Emmanuil (Stockholm, Sweden)

16-21/5/2016

Dr George Emmanouil has attend the 'International Conference on the Coordinated Regional Climate Downscaling Experiment - CORDEX'

CORDEX Vision

The CORDEX vision is to advance and coordinate the science and application of regional climate downscaling through global partnerships.

CORDEX Goals

1. To better understand relevant regional/local climate phenomena, their variability and changes, through downscaling.
2. To evaluate and improve regional climate downscaling models and techniques
3. To produce coordinated sets of regional downscaled projections worldwide
4. To foster communication and knowledge exchange with users of regional climate information

Dr. George Emmanouil and Dr Konstantinos Eleftheriadis (Vienna, Austria)

19-23/4/2016

Dr George Emmanouil and Dr Konstantinos Eleftheriadis participate to the European Geosciences Union General Assembly 2016 Vienna | Austria | 19 – 23 April 2016. For the dissemination of ENTEC we presented air quality modeling results in the European Geosciences Union General Assembly 2016 (EGU 2016) international conference in Vienna. **For more information see the link below http://www.egu2016.eu/**

Poster Title of Dr G. Emmanouil: "An evaluation study of WRF-ARW model with observations during a usual low pressure system over eastern Mediterranean area (Greece) and comparison of the results with an extreme weather event"

George Emmanouil[1], Diamando Vlachogiannis[1], Athanasios Sfetsos[1], Stylianos N. Karozis[1,] Tasopoulou A.[2]

and

Dr K. Eleftheriadis presentations "Aerosol absorption coefficient and Equivalent Black Carbon by parallel operation of AE31 and AE33 aethalometers at the Zeppelin station, Ny Ålesund, Svalbard " **Konstantinos Eleftheriadis**, Athina-Cerise Kalogridis, Sterios Vratolis, and Markus Fiebig**:**

Presentations by collaborating institutes: "Season - dependent and source-influenced aerosol in Northern Siberia" **Olga Popovicheva**, Alexander Makshtas, Peter Bogorodsky, Kostantinos Eleftheriadis, Evangelia Diapouli, Natalia Shonia, and Taneil Uttal

Dr Konstantinos Eleftheriadis (Tomsk, Russian)

14-16/03/2016

Dr Konstantinos Eleftheriadis participate in 2nd Russina-german Workshop for AEROSOL-HEALTH 14-16 March 2016 at Tomsk with presentations. The workshop present the below

Contents

- Collaboration in the 2012 LAC experiment (EC/OC analysis)
- Contribution in understanding the microphysics and chamber dynamics
- Analysis of data from individual organics and ions
- Prospects for contribution in new LAC experiments (from dark to light)

Presentations: "**LAC Aging and Chemistry *Making use of aerosol dynamics, microphysics and chemical tracers to interpret LAC processes"***

Athina Kalogridis, Lila Diapouli , P. Fetftazis, D. Saraga & Kostas Eleftheriadis, (NCSR Demokritos), Valerii Kozlov (IAO, RAS), **Olga Popovicheva (MSU), Guenther Engling (Tsing Hua U.)**

Conferences

A list of presentations is provided below:

1. **European Aerosol Conference 2015, organized in Milan, Italy, on 6 – 11 September, 2015** In the framework of INRaSTES personnel has participated in the European Aerosol Conference 2015, organized in Milan, Italy, on 6 – 11 September, 2015. A list of presentations is provided below:
2. E. Diapouli, M. Gini, K. Eleftheriadis, F. Cavalli, K. Douglas, J.P. Putaud, A. Karanasiou, M. Viana, A. Alastuey, C. Theodosi, N. Mihalopoulos, K.E. Yttri, "Assessment of state of the art methods for the determination of carbonate carbon on aerosol filter samples", oral presentation by Dr. E. Diapouli.

3. E. Triantafyllou, C. Psanis, A.A. Floutsi, E. Diapouli, K. Eleftheriadis, G. Biskos, "Air Pollution at a coastal city of the Northern Aegean Sea".
4. K. Eleftheriadis, E. Diapouli, S. Vratolis, O. Popovicheva, "Aging of biomass burning aerosol after long-range transport from large scale wildfires in the PEEX region".
5. V. Vasilatou, E. Diapouli, D. Abatzoglou, E. Bakeas, M. Skoullos, K. Eleftheriadis, "Characterization of fine particles' chemical composition at the Demokritos suburban background station, in Athens Greece. The influence of Saharan dust".
6. M. Gini, S. Vratolis, E. Diapouli, C. Helmis, K. Eleftheriadis, "Physicochemical properties of ambient aerosol particles at a suburban background site in Athens",=
7. D.E. Saraga, E. Diapouli, T. Maggos, S. Karavoltsos, A. Sakellari, C. Vasilakos, K. Eleftheriadis, "PMF source apportionment study of outdoor and indoor PM10 during a period of extensive biomass burning in Athens, Greece".
8. St. Pateraki, K. Bairachtari, A. Stamatelopoulou, P. Panagopoulos, C. Markellou, Ch. Vasilakos, N. Mihalopoulos, Th. Maggos, "Vertical Characteristics of the PM10 and PM2.5 Profile in an a real urban street canyon: Concentration, chemical composition and associated health risks", 18th International Symposium on Environmental Pollution and its Impact on Life in the Mediterranean Region, 26-30 /9, 2015 Crete,Greece.
9. St. Pateraki, Th. Maggos, V.D. Assimakopoulos, K. Bougiatioti, K. Bairachtari, D.N. Asimakopoulos, Ch.Vasilakos, N. Mihalopoulos, "Analysis of PM2.5 and PM1 profile during different pollution events: Chemical characteristics and origin", European Aerosol Conference 2015, 6-11/9, Milan, Italy.
10. St. Pateraki, K. Bairachtari, C. Markellou, G. Chousos, A. Stamatelopoulou, N. Mihalopoulos, Ch.Vasilakos, Th. Maggos, "Chemical characteristics and health risk assessment of traffic related particles" 2015, European Aerosol Conference 2015 2015, 6-11/9, Milan, Italy.
11. C. Theodosi, P. Nicolaou, J. Sciare, T. Maggos, K. Bairachtari, D. Paraskevopoulou, E. Liakakou, E. Gerasopoulos, N. Mihalopoulos, "Biomass burning tracers in aerosols over Athens, Greece during winter time", 2015, European Aerosol Conference 2015, 6-11/9, Milan, Italy.
12. K. Bairachtari, D. Saraga, A. Moysiadi, Ch. Vasilakos, Th. Maggos,"PAHs concentration levels in the ambient air of a suburban area in Athens and in a rural area near a timber processing plant", 14th International Conference on Environmental Science and Technology, 3-5/9 2015 Rhodes, Greece.
13. St. Pateraki,, G. Belesiotis, D.N. Asimakopoulos, K. Bairachtari, Ch. Vasilakos, Th. Maggos, "Analysis of vertical and horizontal characteristics of the PM profile in a major roadway, in Athens, Greece", 14th International Conference on Environmental Science and Technology, 3-5/9 2015 Rhodes, Greece
14. St. Pateraki, K. Bairachtari, M-I. Manousakas, K. Eleftheriadis, Ch.Vasilakos, V.D. Assimakopoulos, Th. Maggos, "Vertical profile of different sized particles in an urban roadside environment" 2015, CEMEPE, 14-18/6 2015 Myconos, Grrece.
15. Thomas Maggos, Kyriaki Bairachtari, "Determination of Polyaromatic Hydrocarbons (PAHs) in Ambient Air & Stationary Sources using Gas Chromatography-Mass Spectrometry", Symposium on Mass Spectrometry and Health, Athens, 18-19/11 2014
16. Ev. Samoli, As. Stamatelopoulou, **St. Pateraki**, Aik.Bougiatioti, Th. Maggos, N. Mihalopoulos, D. N. Asimakopoulos, Kl. Katsouyanni, Fine particulate air pollution and its components in association with mortality in Athens, Greece, Environment and Health Conference 2013, Basel, Switzerland 19 – 23 August **2013** (ID: 3718).
17. **St. Pateraki**, Th. Maggos, D.A. Sarigiannis, M. Kermenidou, S.K. Karakitsios, V.D. Assimakopoulos, Al. Zagkos, D.N. Asimakopoulos, Chemical profile of wood burning PM2.5 and PM1 in the two largest cities of Greece, Athens and Thessaloniki, European Aerosol Conference (EAC), September **2013**, Prague.
18. K. Eleftheriadis, E. Diapouli, A. Karanasiou, S. Vratolis, V. Vasilatou, M. Gini, D. Saraga**, S. Pateraki**, Th. Maggos. PMF source apportionment for fine and coarse PM in Athens, Greece: Evolution of source contributions over the last decade, European Aerosol Conference (EAC), September **2013**, Prague.
19. A. Stamatelopoulou, E. Samoli, **S. Pateraki**, T. Maggos, A. Bougiatioti, N. Mihalopoulos, D.N. Asimakopoulos, K. Katsouyanni. Study of the association of concentrations and chemical composition of

PM2.5 with mortality rates. Bionanotox 2014 5th International Congress 'Biomaterials and nanomaterials recent advances safety-toxicolocy and ecology issues, 4-44 May **2014**, Agapi Beach Heraclion, Crete.

20. **St. Pateraki**, G. Belesiotis, D.N. Asimakopoulos, Ch. Vasilakos, Th. Maggos, Analysis of the vertical and horizontal characteristics of the PM profile in a major roadway, in Athens, Greece. CHEST **2015**, RHODES, Greece.

21. X. Querol, F. Amato, A. Alastuey, A. Karanasiou, F. Lucarelli, S. Nava, G. Calzolai, M. Severi, S. Becagli, V.L. Gianelle, C. Colombi, C. Alves, D. Custódio, T. Nunes, M. Cerqueira, C. Pio, K. Eleftheriadis, L. Diapouli, M. Manousakas, T. Maggos, **S. Pateraki**, D. Saraga, and R.Harrison. AIRUSE-LIFE+: A harmonized PM speciation and source apportionment of ambient PM in five Southern European cities. EAC **2015**

22. K. Eleftheriadis, E. Diapouli, S. Vratolis, M. Manousakas, V. Vasilatou, D. Saraga, **S. Pateraki**, T. Maggos, X. Querol, F. Amato, A. Alastuey, A. Karanasiou, F. Lucarelli, S. Nava, G. Calzolai, M. Severi, S. Becagli, V.L. Gianelle, C. Colombi, C. Alves, D. Custódio, T. Nunes, M. Cerqueira, and C. Pio. AIRUSE LIFE+: Natural contributions to urban PM in Southern Europe and strategies to minimize human exposure. EAC **2015**.

23. T. Soulos, I. Kylafi, **S. Pateraki**, C. Vasilakos, T. Maggos. An innovative aerial platform for topographic and environmental applications. CEMEPE **2015**

24. Th. Maggos, **S. Pateraki**, M. Bessa, Ch. Gikoudis, P. Panteliadis, J. Visser, Ch. Vasilakos, Th. Hafkenscheid. Development of standardized method on automated measuring systems for particulate matter PM10, PM2.5: Field validation tests. Mediterranean Scientific Association of Environmental Protection (MESAEP) 2015. Crete, Greece 26-30 September **2015**.

25. Sfetsos A., Vlachogiannis D., Politi N., Demertzi A., Gounaris N., Papadopoulos A., Karozis S., Emmanouil G., Eleftheriadou A., Moustakidis N., Varela .V, Environmental Research Laboratory, INRASTES, NCSR "Demokritos", Assessing climate change impacts in Greece through localized impact assessment models, Istanbul, MESAEP 2013
26. Eleftheriadou A., Sfetsos A., Gounaris N., Demertzi A., The Application of High Resolution Seasonal Downscaled Models for the Energy Performance of Buildings, Copenhagen, ECCA 2015
27. Sfetsos A., Vlachogiannis D., Demertzi A., Gounaris N., Varela V., INSTRATES, NCSR, Greece and Zachariah Adelman, UNC-Institute for the Environment 'Compilation Emission Inventory for Greece using an Economic Driven Approach', San Diego, USA, EPA 2015

28. Karozis SN, Sfetsos A, Vlachogianni D, Kainourgiakis ME, Gounaris N, The "Demokritos" Cyber-infrastructure for climatic research management, International Conference on Mathematical Modeling in Physical Sciences (IC-MSQUARE), 5-8 June 2015, Mykonos, Greece.
29. Mita C., Sfetsos A., Gounaris N., Vlachogiannis D., Karozis S., Politi N., Marinaki A., Konstantara M., Zeini K., Investigation of extreme precipitation in Greece. Can this phenomenon be attributed to atmospheric rivers? 12th International Conference on Meteorology, Climatology and Atmospheric Physics (COMECAP), 28 – 31 May 2014, Heraklion - Greece
30. *Sfetsos A., Vlachogiannis D., Politi N., Demertzi A., Gounaris N., Papadopoulos A., Karozis S., Emmanouil G., Eleftheriadou A., Moustakidis N., Varela .V, Environmental Research Laboratory, INRASTES, NCSR "Demokritos", Assessing climate change impacts in Greece through localized impact assessment models, Istanbul, MESAEP 2013*
31. Mita C., Sfetsos A., Gounaris N., Vlachogiannis D., Karozis S., Politi N., Marinaki A., Konstantara M., Zeini K., Investigation of extreme precipitation in Greece. Can this phenomenon be attributed to atmospheric rivers? Heraklion, 28-31 May COMECAP 2014
32. Nadia Politi, Panagiotis T. Nastos, Athanasios Sfetsos, Diamando Vlachogiannis, Nikolaos Gounaris, Pedro M.M. Soares and Rita M. Cardoso, Comparison and validation of WRF Model Physics

parameterizations over the Domain of Greece", Thessaloniki, COMECAP 2016. (accepted for presentation)

33. Ioannis A. Sakellaris, Dikaia E. Saraga, Marika Pilou, Krystallia K. Kalimeri, Christos Housiadas, and John G. Bartzis. Particulate matter size distribution measurements and estimation of the particle deposition in the lung of people working on modern offices in Athens, Officair project. Healthy Buildings Conference 2015.
34. Marina Almeida-Silva, Susana M Almeida, Dikaia Saraga, Thomas Maggos, Tiago Faria and Hubert T Wolterbeek. Source Apportionment of Indoor PM10 in Elderly Care Center, Indoor Air Conference 2014, Hong Kong, 7-12/7/2014.
35. Corinne Mandin, Serena Fossati, Nuno Canha, Andrea Cattaneo, Eric Cornrlissen, Otto Hanninen, Yvonne De Kluizenaar, Viktor G. Mihucz, Eduardo De Oliveira Fernandes, Matti Peltonen, Ioannis Sakellaris, Dikaia Saraga, Gabriela Ventura, Rosanna Mabillia, Erica Perreca, Tamás Szigeti, Paolo Carrer and John Bartzis. Indoor Air Quality in Office Buildings in Europe: The OFFICAIR Project. Indoor Air Conference 2014, Hong Kong, 7-12/7/2014.
36. D.E. Saraga, E. Tolis, E. Kougioumtzidis and J.G. Bartzis. Particulate matter source apportionment in the area of Thessaloniki, Greece. Air Quality 2014, Garmisch-Partenkirchen, 24-28 March 2014.
37. I.A. Sakellaris, D.E. Saraga, K.K. Kalimeri, E.M. Kougioumtzidis, V.G. Mihucz, R. Mabilia and J.G. Bartzis. Air quality measurements in indoor environment of modern offices in Athens, Greece (Officair project). Air Quality 2014, Garmisch-Partenkirchen, 24-28 March 2014.
38. Ioannis A. Sakellaris, Dikaia E. Saraga, Krystallia K. Kalimeri, Eleftherios M. Kougioumtzidis, Nikolaos Pavlou, John G. Bartzis. Particulate matter size distribution measurements in modern offices in Athens, Greece (OFFICAIR project). 3rd Workplace and Indoor Aerosols Conference, May 13th – 16th, 2014 Wrocław, Poland.
39. E. I. Tolis, D. E. Saraga, K. F. Filiou, and J. G. Bartzis. Common Mediterranean strategy and local practical Actions for the mitigation of Port, Industries and Cities Emissions (APICE project): The case study of Thessaloniki, Greece. CESAPO workshop, Thessaloniki, January 30 & 31, 2014
40. T. -S. Fan, Guenter Engling, Olga B. Popovicheva, V. S. Kozlov, K. Eleftheriadis, L. Diapouli, D. Saraga. Chemical characteristics of smoke particles emitted during combustion of Siberian biomass in a large chamber. 8th Asian Aerosol Conference. Australia, 2-5 December 2013.
41. C.A. Belis, F. Karagulian, F. Amato, M. Almeida, G. Argyropoulos, P. Artaxo, M.C. Bove, D. Cesari, D. Contini, E. Diapouli, K. Eleftheriadis, I. El Haddad, R.M. Harrison, S. Hellebust, E. Jang, H. Jorquera, D. Mooibroek, S.Nava, J. K. Nøjgaard, M. Pandolf, M.G. Perrone, A. Pietrodangelo, G. Pirovano, P. Pokorná, P.Prati, C. Samara, D. Saraga, A. Sfetsos, G. Valli, R. Vecchi, M. Vestenius, E. Yubero, P.K. Hopke European Intercomparison for Receptor Models Using a Synthetic Database. European Aerosol Conference, Prague, 1-6 Sept. 2013.
42. E. Diapouli, V. Vasilatou, S. Vratolis, M. Gini, D. Saraga, Th. Maggos, K. Eleftheriadis Effect of the extensive use of fireplaces on carbonaceous particle concentration levels in Athens, Greece. European Aerosol Conference, Prague, 1-6 Sept. 2013.
43. T. Szigeti, V.G. Mihucz, P.M. Bluyssen, P. Carrer, A. Cattaneo, D. Cavallo, H.J.M. Cornelissen, S. Dimitroulopoulou, S. Fossati, C. Mandin, E. Oliveira de Fernandes, K.K. Kalymeri, Y. de Kluizenaar, R. Pereira, Y. Sakellaris, D.E. Saraga and J.G. Bartzis. Spatial and seasonal variation of nitrogen dioxide and ozone in modern office buildings. European Aerosol Conference, Prague, 1-6 Sept. 2013.
44. C. Samara, D. Voutsa, A. Kouras, K. Eleftheriadis, Th. Maggos, D. Saraga, M. Petrakakis. Organic and elemental carbon associated to PM10 and PM2.5 in the urban atmosphere - Estimation of secondary organic carbon European Aerosol Conference, Prague, 1-6 Sept. 2013.
45. Dikaia E. Saraga, Thomas Maggos, Evangelia Diapouli, Kostas Eleftheriadis, Sotirios Karavoltsos, Aikaterini Sakellari and Christos Vasilakos. Indoor and outdoor PM source apportionment study during a period of extensive fireplaces use in Athens, Greece. Conference of ISEE, ISES and ISIAQ Basel, Switzerland 19 – 23 August 2013
46. Krystallia K. Kalimeri, Dikaia E. Saraga, Evangelos I. Tolis, John G. Bartzis. Indoor Air Quality in schools in the city of Kozani, Greece. Environment and Health Conference of ISEE, ISES and ISIAQ Basel, Switzerland 19 – 23 August 2013
47. Dikaia E. Saraga, Krystallia Kalimeri, John G. Bartzis. Personal exposure to ambient and indoor ozone: the effect of different commuting modes in Athens, Greece. Conference of ISEE, ISES and ISIAQ Basel, Switzerland 19 – 23 August 2013

48. Szigeti, T., Perreca, E., Sakellaris, I., Kalimeri, K.K., Saraga, D.E., Moreno-Barrero, J., Leva, P., Pereira, R., de Oliveira Fernandes, E., Mandin, C., Bartzis, J.G., Záray, Gy., Mabilia, R., Mihucz, V.G., 2013. Attempt for indoor air quality improvement by change of floor cleaning products: an intervention study, XVII Euroanalysis, Warsaw, Poland, 25-29 August 2013, Paper 0633
49. D. E. Saraga, S. Karavoltsos, A. Sakellari, C. Vasilakos and T. Maggos. PM indoor/outdoor mass concentration and chemical analysis during a period of extensive fireplaces use in Athens. CEMEPE 2013, June 24-28, 2013, Mykonos, Greece, p. 174
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iii) ***Promote a SouthEast European network on climatic activities.***

Development of a SEE network of research entities to identify common issues raised from the climate change in the region, promote the dissemination between participants of high quality data and a forum on recent trends climatic research.

Two invited talks at **AIR PROTECTION 2013**

CROATIAN AIR POLLUTION PREVENTION ASSOCIATION
in cooperation with:
INSTITUTE FOR MEDICAL RESEARCH AND OCCUPATIONAL HEALTH
_ CROATIAN METEOROLOGICAL AND HYDROLOGICAL SERVICE
_ EUROPEAN FEDERATION OF CLEAN AIR - EFCA
EIGHTH CROATIAN SCIENTIFIC AND PROFESSIONAL CONFERENCE
with international participation
"AIR PROTECTION 2013"

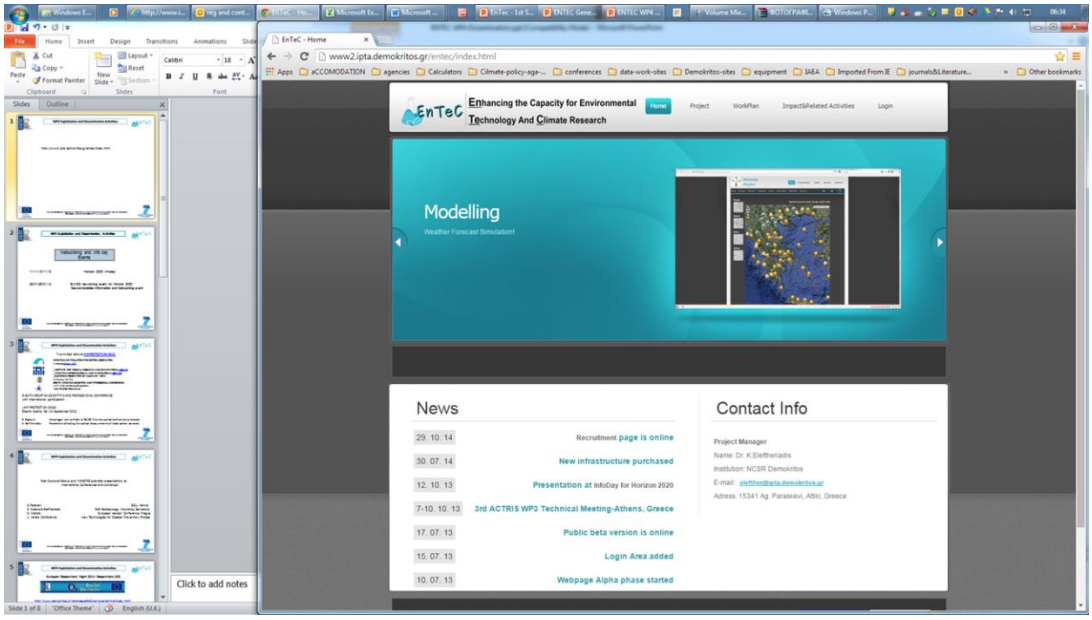
EIGHTH CROATIAN SCIENTIFIC AND PROFESSIONAL CONFERENCE
with international participation
«AIR PROTECTION 2013»
Šibenik Solaris, 09 - 14 September 2013

E. Diapouli: Advantages and artifacts of EC/OC thermo-optical method and protocols
K. Eleftheriadis: Parameters affecting the optical measurements of black carbon aerosols

iv) **Enhancement of INRaSTES Website.**

Targeted effort to increase visibility of INRaSTES efforts and contain an in depth presentation of the INRaSTES climate related activities.

http://www2.ipta.demokritos.gr/entec/index.html



v) Participation of INRaSTES in infodays / exhibitions.

Involves participation of INRaSTES in one national and one international exhibition with the aim to enhance outreaching of the INRaSTES activities and R&D impact.

11/11-13/11/13 Horizon 2020 Infoday"

22/01-25/01/14 SMI2G networking event for Horizon 2020

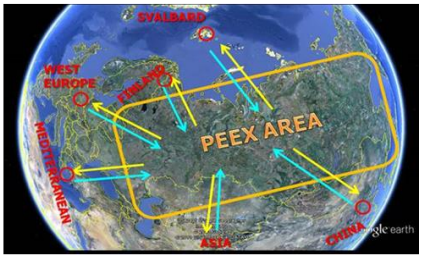
"Secure Societies Information and Networking event

Participation at the Greek INNOVATION FORUM with exhibition stand for demonstration of INRASTES/EnTeC Innovative Environmental Technologies and

vi) Outreach activities towards End Users and the public.

includes the foreseen outreaching activities by the INRaSTES towards the End User community and the public.

PAN EURASIAN EXPERIMENT (PEEX)
– TOWARDS A NEW MULTINATIONAL, MULTIDISCIPLINE
CLIMATE, AIR QUALITY AND ENVIRONMENT
RESEARCH EFFORT IN ARCTIC AND BOREAL
PAN-EURASIA REGIONS



https://www.atm.helsinki.fi/peex/index.php/contributing-institutes

- Promote Research Technologies and Capacity building in Russia and Non-EU countries

- Include INRASTES in the Core of European Research Infrastructures sharing and disseminating Innovative Technologies and Knowhow
- Presentations at Moscow, St Petersburg and Hyytialla meetings, twinning with MSU

INRASTES/NCSR Demokritos is included in the participating Organizations

Common activities with Moscow State University (MSU) have been organized regarding Boreal Forest Fires, long range transport of PEEX area pollutants to the Mediterranean and the Arctic.

Two articles have been published in peer reviewed journals with acknowledgement to the EnTeC project as a result of this co-operation with MSU

1. Diapouli, E., Popovicheva, O., Kistler, M., Vratolis, S., Persiantseva, N., Timofeev, M., Kasper-Giebl, A., Eleftheriadis, K. (2014). Physicochemical characterization of aged biomass burning aerosol after long- range transport to Greece from large scale wildfires in Russia and surrounding Regions, Summer 2010. Atmospheric Environment. doi:10.1016/j.atmosenv.2014.07.055

2. Olga B. Popovicheva, Valerii S. Kozlov, Guenter Engling, Evangelia Diapouli, Natalia M. Persiantseva, Mikhail A. Timofeev, Ting-Sin Fan, Dikaia Saraga, Konstantinos Eleftheriadis (2015) Small-Scale Study of Siberian Biomass Burning: I. Smoke Microstructure, AAQR, in press, doi: 10.4209/aaqr.2014.09.0206

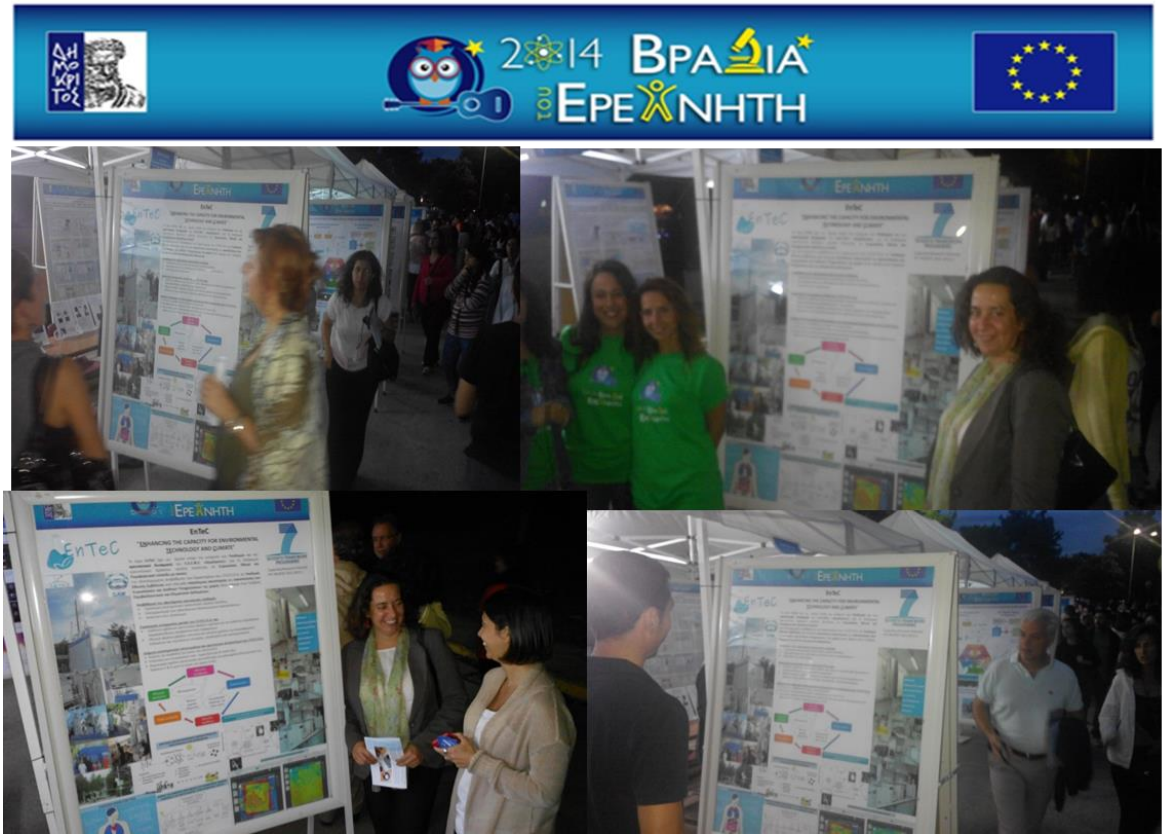
The collaboration within PEEX is an opportunity to provide knowhow and knowledge about establishing and running novel climate and environemntal infrastrucrtures to eastern Europe and Asia

vii) ***Organization of public events on "climate protection" organised by INRaSTES in the premises of NCSR Demokritos.***

Participation in the European Researchers night at NCSR Demokritos

http://www.demokritos.gr/rengreece%40ncsr/programme/index.html

European Researchers' Night 2014 - Researchers [GR]



Work Package 5: Intellectual Property (IP) Development Plan and Mechanisms for sustain R&D capacity after EnTEC

InRaSTES Sustainability Plan

The major objectives are:

- Take advantage of the general IP framework that is currently set up at the hosting center (NCSR Demokritos)
- Formulate a specific complementary plan for EnTeC.

For the IPR related issues the plan includes a three level approach, namely:

- At National level (General Secretariat for Research & Technology (GSRT), Ministry of Education);
- At the level of the Centre (NCSR Demokritos (NCSRD));
- At Institutional level (INRASTES)

National Level

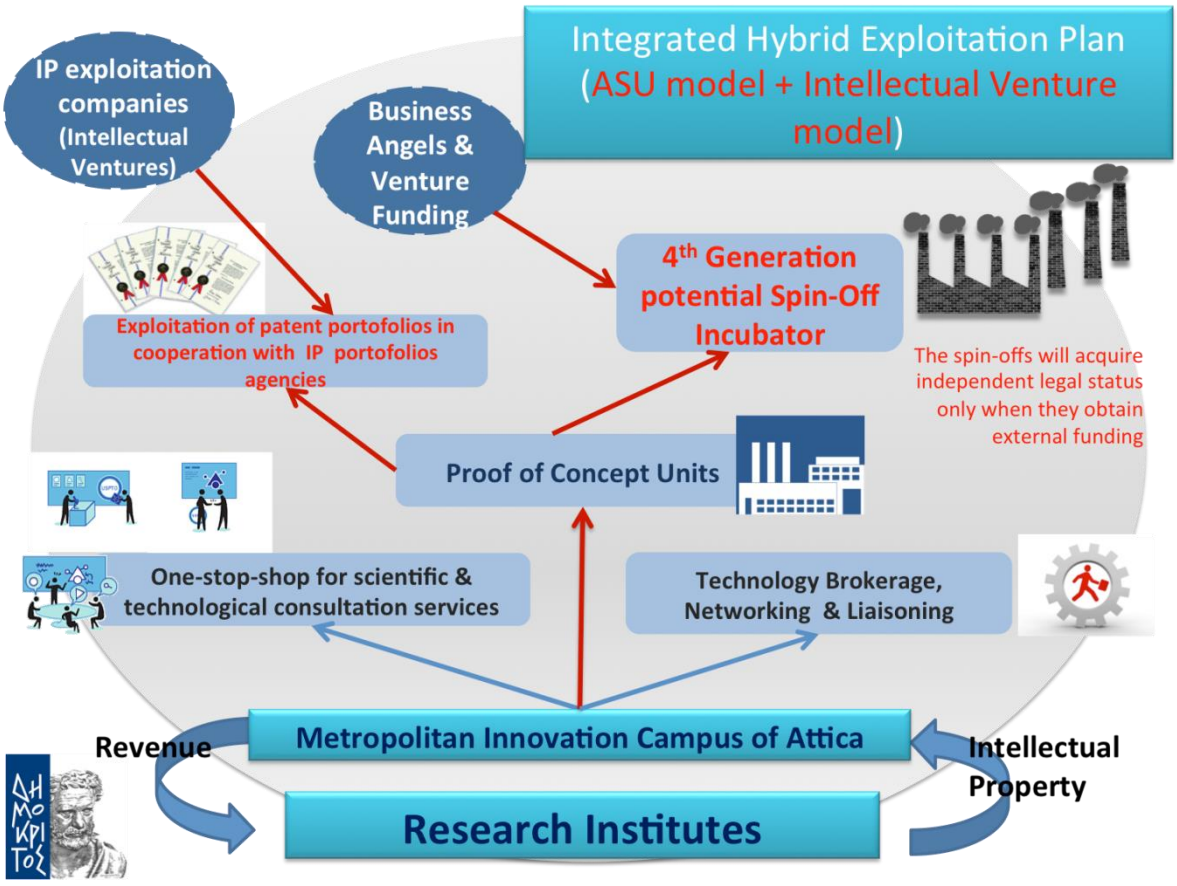
According to GSRT objectives and intentions that have been included in a very recently passed through the Parliament new national law, the following are foreseen:

- Organization of an IPR Support Office at GSRT
- Further cooperation with different R&D organizations
- Market foresight
- Staff training activities sponsored by GSRT

At the Level of the Centre

The relevant NCSRD Master Plan (see attached diagram) includes:

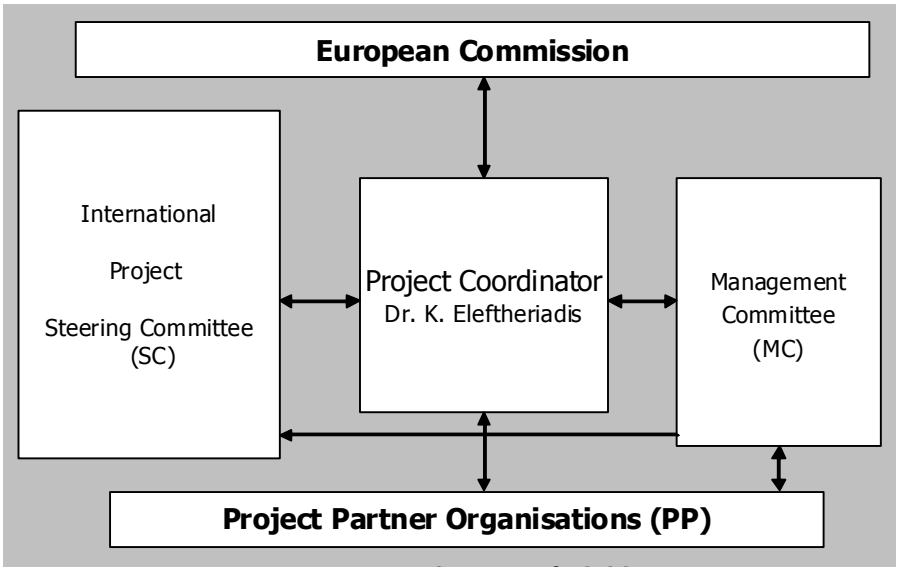
- Exploitation of patent portfolios in cooperation with IP portfolio agencies (IP exploitation companies (IP ventures), Business Angels & venture funding)
- Spin-off Incubator and Proof of Concept Units
- One-stop-shop for scientific and technological consultation services
- Technology Brokerage, Networking & Liaisoning
- Development of virtual technology park


Integrated Hybrid Exploitation Plan
(ASU model + Intellectual Venture model)
IP exploitation companies (Intellectual Ventures)
Business Angels & Venture Funding
Exploitation of patent portofolios in cooperation with IP portofolios agencies
4th Generation potential Spin-Off Incubator
The spin-offs will acquire independent legal status only when they obtain external funding
Proof of Concept Units
One-stop-shop for scientific & technological consultation services
Technology Brokerage, Networking & Liaisoning
Revenue
Metropolitan Innovation Campus of Attica
Intellectual Property
Research Institutes

Project management and requirements for project progress

Organisational structure and decision-making processes

The management structure of EnTeC is described in the following diagram below and mainly includes The Co-ordinato (PC), The International Advisory/Steering Committee (SC) and the WP leaders. They interact with the Comission through the co-ordinator and with the Partner organizations



The PC and the SC are fully responsible for the management and coordination. The SC provides and independent opinion on the progress of the project, and evaluates the scientific issues related to EnTeC, whereas the PP are involved in the scientific program addressed and the related developments. Given these, the roles of the PC, MC, SC and WPLs are the following:

The project Coordinator (PC)

- ✓ Acts as the contact person with the commission in all administrative tasks (signing of the Grant Agreement and submission of all financial statements and annual reports including the final one to the Commission)
- ✓ Collects all scientific and technical reports from the Work package Leaders and prepares the foreseen reports to Commission.
- ✓ Co-ordination of knowledge transfer amongst the different work packages.
- ✓ Calls and chairs the meetings of the Management Committee (MC, see below); prepares the agenda and writes the minutes.
- ✓ Prepares the annual meetings of the International Project Steering Committee (SC) and provides to the chair of SC with the information required for an independent evaluation of the project.
- ✓ Implements the SC recommendations into the project and informs the MC, and the Project Partners (PP) on the annual evaluation results of the SC.
- ✓ Has the full responsibility for all scientific aspects of the project.

The Management Committee (MC) (consisting of all WPLs)

- ✓ Assists the PC in preparing all scientific reports to the Commission and in any coordination task related to the progress of the Impact project.
- ✓ Evaluates the best candidates to be recruited within the project.
- ✓ Meets every month to monitor the progress of the individual work packages and, if necessary, rearrange the time sequence of the tasks of the work packages.

The Work package Leaders (WPLs)

The Work package Leaders are:

WP1: Dr. A. Stubos and Georgia Charalambopoulou

WP2: Dr. Thomas Maggos and Dr. E. Diapouli

WP3: Dr. D. Vlachogiannis

WP4: Dr. Th. Maggos and Dr. K. Eleftheriadis

WP5: Dr. A. Sfetsos

WP6: Dr. K. Eleftheriadis

Their role is described below:

- ✓ Monitor the progress of their Work package. For this purpose they report to and liaise with the PC once a week and interact with the scientists and the technical personnel on a day-to-day basis to facilitate the realization of the tasks.
- ✓ Responsible for assuring the timely completion of the work programme and production of deliverables.
- ✓ If required, they report on the progress of their Work package directly to the chair of SC and not through the PC.
- ✓ Responsible for the dissemination and exploitation of results and treatment of knowledge.

The Project Steering Committee (SC)

The SC consists of scientists with recognized expertise in the research directions addressed by the project and a broad overview of scientific excellence in Climate-related research (Modelling, Greenhouse gases, Aerosols, Emission Inventories) and Methodological-scientific techniques relevant for this Project (Field measurements and Analysis, Modelling implementation and evaluation, Risk analysis). The Advisory Board includes the following members:

Prof. I. Colbeck, Professor at the Department of Biological Sciences ,University of Essex, UK, Graduate Director, Director of MSc/MA Environmental Governance & Joint Writtle MSc courses in Env Sci, expert on atmospheric processes, aerosol optical properties and, in particular their involvement in global warming, environmental impact of oil fires, urban air quality.

Prof. Spyros Pandis Department of Chemical Engineering, University of Patras, Principal Investigator in 25 projects funded by the US Environmental Protection Agency, US National Science Foundation, US Department of Energy, State of California, European Union (EUCAARI, MEGAPOLI).

Prof. K. Sioutas is Fred Champion Professor in the Department of Civil and Environmental Engineering, University of Southern California. His research at USC focuses on the mechanisms that produce health effects associated with exposure to air pollutants generated by a variety of combustion sources and photochemically induced atmospheric reactions.

Prof M. Lazaridis, Professor at the Department of Environmental Engineering,Technical University of Crete, Greece and Head of the Department. His scientific expertise lies on atmospheric dispersion of pollutants, basic research on dynamical behaviour of aerosols, nucleation of binary systems, Monte Carlo simulation of phase transitions, dispersion and transport in the atmosphere, emission inventories and source term modelling and on the effects of pollutants on human health.

Dr. Stephan Nyeki is senior Research Scientist, at PMOD/WRC, Switzerland running the WMO GAW-PFR sun-photometer programme. AOD derivation from sun-photometers at more than 20 sites worldwide. He has also strong experience in in –situ aerosol observations.

Prof. K. Mathioudakis is the Secretary General for Energy and Climate Change in the (Hellenic) Ministry of Environment, Energy and Climate Change. He will aid in the integration of INRaSTES activities in national and regional R&D activities and enhancement of the sustainability in regional and national growth and employment.

The Director of the INRaSTES (ex-officio). He will aid in the integration of INRaSTES activities in the NCSR Demokritos broader scope and national research area. It has occurred that Dr. A. Stubos has been elected as the new Director of INRaSTES.

Prof. N. Mihalopoulos is included in the steering committee as the co-ordinator of the PANACEA Hellenic Infrastructure Network

The First Steering Committee meeting became on 24/09/2013

The SC has already convened once on 24/09/2013 and observed the progress of the project and made specific recommendations. Although the Steering Committee member, S. Nyeki, was not able to attend the 1st Meeting due to other last-minute commitments, he visited INRaSTES from 21 – 22 November 2013.

The main recommendations can be summarized as follows:

The establishment of the high-altitude mountain station for atmospheric measurements at Mt. Helmos (2314 m, 42°N 05' 30", 34°E 14' 25", low scrub bush environment) is confirmed as asuitable location for a free troposphere background site The provisional time-table is to finish the building by mid/end Summer 2014 with the start of measurements to begin by the end of 2014.

However, due to serious delays in construction completion is now rescheduled for summer 2015 allowing only 3 month of operation until the end of the project

It is highly recommended to obtain results after continuous measurements from the Helmos station before the end of the project in order to consolidate the large impact such results may have in the valorisation of the project actions and infrastructure development in South East Europe.

It was also discussed with the committee that during the project execution, it was realised that the need to couple the GCM output data to the Regional model, part of Action 3, could be fulfilled at the same time with the need to improve the knowledge in climate thresholds, vulnerabilities and impacts, part of Action 4. Such tasks could nicely be served simultaneously in the Laboratorio Associado under the supervision of Dr. Pedro M. M. Soares [pmsoares@fc.ul.pt] and Dr. Rita Margarida Antunes de Paula Cardoso

[rmcardoso@fc.ul.pt] and their group of scientists. The group of Dr. Soares carries strong expertise in regional modelling, downscaling methodologies, climate impact assessment and study of extreme events.

It was advised that the two way seconment to DLR for the installation and training of GCM / RCM modelling facilities is proposed to be replaced by one to the University of Lisbon, Faculty of Sciences, Instituto Dom Luiz, Laboratorio Associado (http://idl.ul.pt/node/9).

Other issues are included in the Deliverable 6.3

The second Steering Committee meeting became on 16/06/2016

The SC invited for second time to observed the progress of the program and for the opening made in the research station on Mount Helmos . Although the Steering Committee member, K. Sioutas and Sp. Pandis, was not able to attend the 2nd Meeting due to other last-minute commitments. Also for the opening of the station we have invited researchers from other station all over Europe Paolo Bonasoni, Ivo Kalapov, Christo Angelov, Mrs Severine Dubroecq and Konstantino Ioannidis. We include the agenda of the fistr day of the meeting because the second day the Steering Committee and the researchers travel to the mountain Helmos for the opening where they discuss with person from the Municipality and the Region of the Central Greece.

Thursday, 16 June 2016	
Welcome and general information	
14:00 –14:15	Greetings & Introduction to Work Package Leaders (Dr K. Eleftheriadis)
14:15–14:45	Introduction to INRASTeS activities and role of EnTeC to the Institute Action Plan (Dr A. Stubos)
14:45 - 15:00	Introduction to EnTeC Action Plan and Project Implementation (Dr K. Eleftheriadis)
15:00 –16:15	Scientific Session: Downscaling of GCM and the coupling to regional modelling and impact assessment tools" (Dr. D. Vlachogiannis)
16:15-16:45	Integration of Models and impact assessment tools to INRaSTES and Discussion (All Participants)
16:45 –17:15	Feedback from the Committee and participants

17:15 –18:00	Visit to Infrastructure analytical facilities/labs and stations

2nd Day - Friday, 17 June 2016	
Welcome and general information	
10:00 – 11:30	Concentration in Kalavrita Town Hall and informing local actors
	- Greeting of Mayor
	- Introductory placement from Director of INRASTES, NCSR "Demokritos" (Dr Ath. Stubos)
	- The National Infrastructure of Helmos Station and the exploitation of regional, national and European level for the Protection of the Environment, National Parks and tackling climate change (Dr. K. Eleftheriadis)
	- Statements by the Steering Committee of EnTeC Programm
	- Exchange of views of local regional bodies
11:30 – 14:00	Visit and inauguration of measuring station

Introduction by K. Eleftheriadis (NCSR "D")

After welcoming all guests, K. Eleftheriadis gave a 45-minute talk which gave an outline of the ENTEC project and its overall objectives. He pointed out that the final aim is to follow ICOS (ESFRI mature) and ACTRIS on becoming part of an ESFRI infrastructure.

Following the introductory talk, each participant was invited to make some comments and recommendations. All participants and the Steering Committee were unanimous in their praise and good wishes for the future. Considering the severe logistic difficulties in establishing a high-altitude mountain station with basic facilities such as electricity and a road connection, it was felt that the ENTEC project had been successfully completed. The success is more remarkable when also considering that Greece has faced severe economic challenges in the last several years. All agreed that the new station would enhance the scientific capabilities of Greece in the field of long-term atmospheric measurements, and provide a platform for future European and international cooperation.

Additional comments from the participants included:

Mihalis Lazaridis was looking forward to future studies in which measurements and modelling aspects would be combined.

Christos Housiadas praised the group's tenacity in reaching the goals.

Stephan Nyeki mentioned it was a remarkable feat to have realised the building of a Greek station after the idea came from a visit to the Swiss Jungfraujoch station many years ago.

Ivo Kalapov and Christo Angelov both looked forward to collaboration between activities at Beo Moussala high-altitude station (Bulgaria) and Mt. Helmos.

Paulo Bonnasoni mentioned how Mt. Helmos will be able to function as a background station for lower altitude cities in a similar manner to Mt. Cimone and the Po Valley in Italy.

Thomas Maggos mentioned the greenhouse gas measurements being made at the new station. Now that the infrastructure is available, the "science" begins.

K. Eleftheriadis closed the meeting by thanking all participants. Arrangements were then made to travel 3 hours by minivan to Kalavryta, a village situated just below Mt. Helmos.

Friday 17 June, Inauguration of Mt. Helmos Station

Formal Inauguration at Paleologina Mansions at 10:00, Kalavryta by the Mayor of Kalavryta

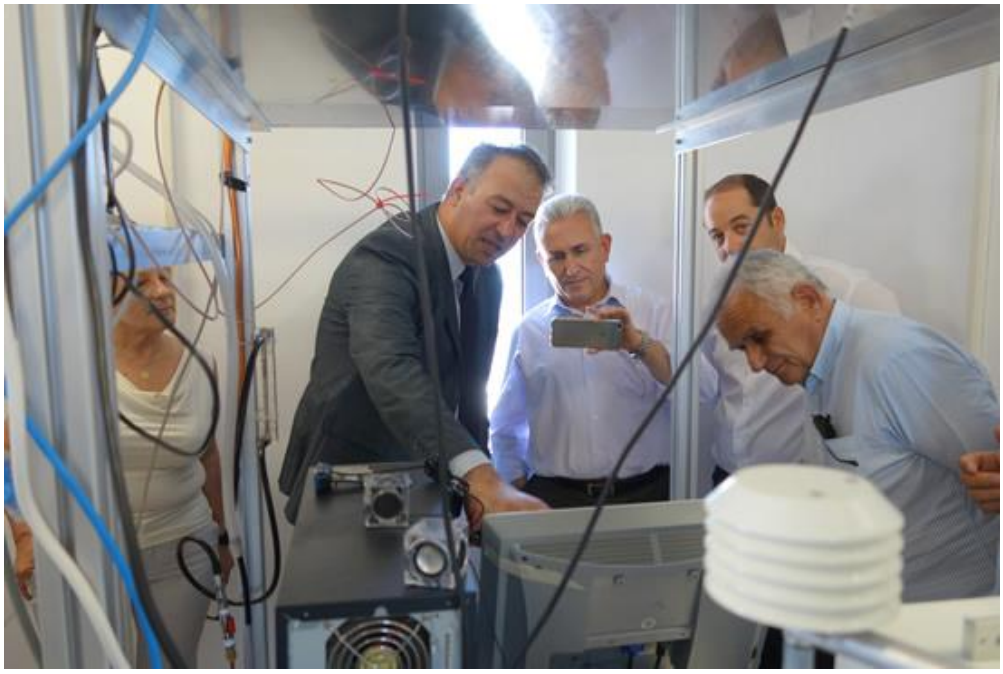
K. Eleftheriadis warmly welcomed all participants including the Mayors of Kalavryta, Aigio city and various other local officials. The Director of INRaSTES made an introduction to the research potential of the institute and the new infrastructure funded by ENTEC project. The Mayor of Kalavryta then also welcomed all guests, and then invited K. Eleftheriadis to give an overview of the Mt. Helmos station. These talks were all given in Greek.

On-Site Inauguration of Mt. Helmos Station at 12:00

Most participants (>20) then drove up to Mt. Helmos station for the on-site opening. The Mayor of Kalavryta then gave a small inauguration speech in the presence of officials and guests.

A tour of the station then began. A number of instruments to measure atmospheric gases and aerosols had already been installed, and were explained to the participants.

Finally, photographs and videos were made for radio and television press releases.



Informal Discussions during the EnTec Meetings

Members of the EnTec Steering Committee were able to discuss various scientific and logistical aspects concerning the Mt. Helmos station during the two days. Some of the more important aspects are listed below in a question-and-answer format. While certain aspects of station operation will no doubt become more stream-lined in the future once more experience has been gained, the Steering Committee is of the opinion that the high standard achieved so far will enable quality atmospheric measurements to be conducted on a long-term scale. Much thought has been given to installing basic infrastructure in order to accommodate more instruments inside as well as outside on the roof. This will ensure that international collaborations in the future will be possible.

Q. Apart from having online access to all instruments at the station, how often will scientific staff visit the station? Will this be possible in winter? Are there facilities to stay overnight at the station or at the nearby Aristarchos Observatory?

A. Visits will be conducted on a 1 – 2 weekly basis. However, depending on the snow-cover from October to April in winter this may vary. Facilities to stay overnight are available at the Observatory, although this is only used when urgently necessary.

Q. Due to the 3-3.5 hour drive from Demokritos to Mt. Helmos, will/can a local person conduct basic station maintenance, instrument cleaning etc.

A. This has been considered, and may be an option in the near-future.

Q. What measures have been taken to remove/reduce potential pollutants from the exhausts of the instruments and vacuum pumps?

A. The Pumps and other instrument exhaust is vented at a 100 m disctance downhill the station so that there is no

Q. Is there any infrastructure for solar irradiance or sun-photometer measurements in the future?

A. Yes, a stainless-steel platform will be installed on the roof, allowing the possible future installation of sun-photometers, pyrgeometers etc. A pyranometer, which has been purchased and is awaiting installation, will be imminently installed on this platform.

Q. Does the Greek Meteorological Authority have a measuring station on Mt. Helmos?

A. Not at present. Hence, we have installed an meteorological mast system for providing such measurements to the network

Final Overview and assessment of Project Conclusion

From the above description of Work packages and actions it can be concluded that the EnTeC project has achieved the major goals foreseen in a difficult working environment that we found ourselves during the course of project implementation in this country.

The project has provided a strong enhancement to the INRaSTES research infrastructure and provided the means for long term achievements in the major activities undretaken

More specifically the activities reported proved to be extremely fruitful and productive

In terms of:

- **Development of skills and effort by permanent staff and recruited experts**

The personnel spent over 544 man months in project actions very close to the 552 originally envisaged with 22 experts and support staff recruited during the project. One expert was succesfully absorbed as permamnt staff while despite the problems encountered with the lack of interest by experts to join a Greek institutions duruing the years of crisis one post doc expert was recruited from outside Greece (France) displaying the dynamic enviropnment generated within the project.

- **New high end equipment and infrastructure**

The maximum amount envisaged for equipment (40%) of the budget was successfully invetsted on high end instrumentation and infrastructure providing the institute with tools and capacity to compete internationally for high calibre research and development of services.

Equipment is operating at

- two Long term stations in Intarnational level
- 3 Analytical labs and computer facilities
- And One integrated CCRM central infrastructure facility

- **High Impact and Dissemination at local and International level**

All necessary and available means of demonstrating the enhancement of research capacity and research potential was equally undertaken and research results was demonstrated by means of

1) 61 publications in peer reviewed journals in citation index
2) 56 Presentations in Conferences mainly abroad
3) 2 accredited labs providing services
4) Organizations of three workshops and meetings
5) Participation in training exercises

- **Intense collaboration with partnering Organizations**

  22 Secondements of INRaSTES staff at the Partner Organizations to gain experience and transfer of expertise

  6 Secondements of Partner Organizations S staff at INRaSTE the transfer knowhow and establish and maintain long term collaboration

The achievements were assessed at a final meeting in June 2016 of the Steering committee. It was concluded by the Co-Ordinator and the steering Committee that The Project Progress has fulfilled the Implementation Plan and all actions within the Described Work Packages after the project was extended for six further months