LIFEINDEXAIR

THE AIR BELONGS TO EVERYONE

Report on stakeholders' consultation (Deliverable A1.1)

Minutes of the 1st meetings with stakeholders (Deliverable D1.1)

Report on questionnaire results (Deliverable A1.2)

March 2017

TÉCNICO LISBOA · universidade de aveiro · Technical University of crete · DEMOKRITOS NATIONAL CENTRE FOR SCIENTIFIC RESEARCH · NATIONAL INSTITUTE FOR HEALTH AND WELFARE

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This document contains:

Deliverable A1.1 – Report on stakeholders' consultation

Deliverable D1.1 – Minutes of the 1st meetings with stakeholders

Deliverable A1.2 – Report on questionnaire results

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SUMMARY

The LIFE Index-Air project aims to obtain feedback from the end-users and interested stakeholders throughout the whole project implementation to optimize the project developments, so as to directly address critical needs of end-users and relevant stakeholders involved in the operation of the project optimization framework.

To achieve this degree of collaboration, LIFE Index-Air established a complete awareness and communication framework with all end-users and stakeholders, either involved in or affected by the project. To this end, the Living Lab methodology employed in LIFE Index-Air involves end-users from the very beginning of a new idea, creating the motivation to share and discuss their experiences and requirements. This collaborative environment where all the stakeholders, relevant to the project, co-create the solutions leads to a natural acceptance by the users who will be empowered not only to test, evaluate and report their own experience with the LIFE Index-Air framework, but mainly to live with it and smoothly accept and incorporate the project framework in their everyday lives. We believe that the early validation and the verification of the protocols by stakeholders are also essential to ensure the reliability of the final outcomes for any development process.

This document, of the LIFE Index-Air project, is being delivered in the context of Action A1 "Authorities and stakeholders consultation" and Action D1 "Networking" and constitutes the <u>Deliverable A1.1 – Report on stakeholders' consultation</u> and captures the key points emerging from the presentations and discussions during the stakeholder consulatation.

This document also includes the:

- <u>Deliverable D1.1 – Minutes of the 1st working meetings with stakeholders</u>
- <u>Deliverable A1.2 – Report on Questionnaire results</u>

LIFE Index-Air Stakeholders

The stakeholders that could best make use of the project's results in the five target cities have already expressed their written support and intention to use the products of the project for their policy making procedures. Some of these stakeholders also expressed their interest in replicate the project results in other cities that are under their responsibilities. During and after the end of the project, national and international dissemination activities (including countries not currently included in the project) will focus on other possible users of the LIFE Index-Air tool. The organizations that could best use The LIFE Index-Air results include:

International Stakeholders

- European Environment Agency
- World Health Organization
- EC Environment Directorate-General
- Climat and Clean Air Coalition
- International Atomic Energy Agency

National Stakeholders

Portugal

- Portuguese Environment Agency
- Lisbon and Tagus Valley Regional Coordination and Development Commission
- North Regional Coordination and Development Commission
- Lisboa E-Nova: Lisbon's Municipal Energy and Environmental Agency
- General Direction for Health - Health Ministry
- General Direction for Energy and Geology – Economy Ministry
- General Directorate of Land and River transport - Ministry of Planning and Infrastructure
- General Directorate of Education – Ministry of Education
- Algarve Coordination and Development Commission
- Centro Coordination and Development Commission
- Alentejo Coordination and Development Commission
- Municipalities from Lisbon Metropolitan Area
- Lisbon Parishes
- Municipalities from Oporto Metropolitan Area
- Oporto Parishes

Greece

- Greek Ministry of Environment and Energy
- Greek Ministry of Health
- Association for Sustainable Development of Cities
- Greek National Health Operations Center

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- City of Athens
- Region of Attica

Finland

- City of Kuopio
- Helsinki Region Environmental Services Authority
- Finish Ministry of Environment
- Finish Ministry of Health

Spain

- Department of Environment and Urban Services, Barcelona
- Environment Ministry, Government of Spain
- Department of Environment and Urban Services, Barcelona
- Spanish Ministry of Health

Italy

- Regional Agency for Environmental Protection and Prevention, Veneto
- Italian Ministry of Environment
- Italian Ministry of Health

Platforms

- FAIRMODE

Portuguese NGO's

- ZERO – Associação Sistema Terrestre Sustentável
- Quercus – Associação Nacional de Conservação da Natureza
- IEEI – Instituto de Estudos Estratégicos Internacionais
- INDE – Intercooperação e Desenvolvimento
- APCD – Gabinete de Estudos e Projectos de Cooperação/APCD
- GEOTA – Grupo de Estudos de Ordenamento do Território e Ambiente
- APEMETA – Associação Portuguesa de Empresas de Tecnologias Ambientais

International NGO's

- American Association for the Advancement of Science (AAAS)
- Consortium of Universities for Global Health (CUGH)
- The Global Health Network
- Center for Strategic and International Studies (CSIS) Global Health Policy Center
- GBCHealth
- The Earth Institute
- Global Health Council
- Global Health Technologies Coalition (GHTC)

- Kaiser Family Foundation (KFF) U.S. Global Health Policy
- Research!America Global Health R&D Advocacy
- UN Foundation (UNF)
- Wellcome Trust
- Worldmapper
- GreenPeace

LIFE Index-Air Consultation channels and processes requiring stakeholder input

This document introduces the planned consultation process within LIFE Index-Air and identifies the principle channels for stakeholder input.

The channels for stakeholder input are summarised below:

Meetings with stakeholders - The national and local authorities of Lisbon, Athens, Kuopio, Oporto and Venice and other stakeholders (schools, regulators, environmental groups and other interested parties) will be consulted in the beginning, middle and end of the project.

Stakeholders' questionnaire - A questionnaire to be applied to the stakeholders will collect their indications about gaps and needs coming from their environmental and health practices.

LIFE Index-Air Stakeholder Forum – The stakeholders forum will present the project results and promote the discussion between stakeholders.

LIFE Index-Air Stakeholder online forum – The online open forum will be organized with the participation of a broad range of stakeholders. This forum will give the opportunity to the participants to get informed on the results achieved throughout the project and to give their feedback.

LIFE Index-Air final conference – Interested parties, experts world-widely and general public will be invited to participate in the final LIFE Index-Air final conference.

LIFE Index-Air website – the project website will serve as a platform for interaction with stakeholders, by providing an overview of the project, making results available and supporting online surveys to gather stakeholder input.

Minutes of the 1st working meetings with stakeholders
Deliverable D1.1

Introduction

The national, regional and local authorities from Portugal, Greece and Finland and other stakeholders (regulators, environmental groups and other interested parties) were consulted by IST, NCSR-D and THL in the first months of the project. Several meetings were performed in order to seek views of all stakeholders on the LIFE Index-Air project that produced practical recommendations to support the implementation actions.

The following entities participated in the meetings:

1. Portuguese Environment Agency (APA) - Portugal
2. Lisbon and Tagus Valley Regional Coordination and Development Commission (CCDR-LVT) - Portugal
3. North Regional Coordination and Development Commission (CCDR-N) - Portugal
4. Lisbon parish of Olivais (JF-Olivais) - Portugal
5. Lisbon parish of Parque das Nações (JF-PN) - Portugal
6. City of Kuopio – Finland
7. University of Eastern Finland – Finland
8. Hellenic Ministry of the Environment and Energy - Greece
9. Hellenic Ministry of Health - Greece
10. Coalition of 21 Local Authorities of North and East Athens - Greece
11. Region of Attica - Greece
12. Association for the Sustainability Development of Cities (SVAP) – Greece
13. Resilient Athens, Athens Municipality - Greece
14. Hellenic Society for the Protection of Environment and the Cultural Heritage - Greece

Meetings in schools for teachers were also organized to present the project, to distribute the questionnaires on time activity patterns, to select the sampling locations, to plan awareness campaigns and to propose the challenge "The air is from everyone". This challenge aims to aware the students (5-9 years) to the problem of air quality and to involve the schools' community in the identification of measures leading to the improvement of air quality in their homes, schools and regions. IST promoted meetings in the following Lisbon schools:

1. Colégio Alegria
2. Colégio de Santa Maria
3. Colégio João de Deus
4. Colégio Pedro Arrupe
5. Colégio Valsassina
6. EB1 Bairro São Miguel
7. EB1 Coruchéus
8. EB1 Dr. Catela Gomes
9. EB1 Santo António
10. EB1/JI Convento do Desagravo
11. EB1/JI Portela

12. EB1/JI Quinta da Alegria
13. Escola Básica O Leão de Arroios
14. Escola Básica Patrício Prazeres
15. Escola EB1 Oliveira Marques
16. Escola EB1 Rosa Lobato Faria
17. Escola São Vicente
18. Escola Vasco da Gama
19. Externato João XXIII
20. Externato Primário da Associação Pró-Infância Santo António de Lisboa
21. Externato Maristas de Lisboa
22. Grouping Padre Bartolomeu de Gusmão
23. EB1 Telheiras
24. Jardim Escola João de Deus

The interaction with the stakeholders gave relevant information about:

- Overall compliance situation;
- National measures either in place, soon to be in place or being considered to contribute for the EU limit values compliance;
- Practical recommendations to support implementation actions such as sampling protocols, sampling locations and strategies for awareness activities to be developed.

Main outputs obtained in the first meetings with stakeholders

This first consultation demonstrated that stakeholder involvement offers many possibilities to enhance LIFE Index-Air work. The principal outputs were:

- The **Portuguese Environment Agency (APA)** demonstrated great interest on the project because LIFE Index-Air is aligned with the National Strategy for Air 2020 having a positive impact on the following priorities:

  - Evaluation of the chemical composition of particulate matter and identification sources;

  - Evaluation of the contribution of emissions from sectors with insufficient information;

  - Development cost-effective methodologies that will optimize the management of air quality;

  - Promotion of projects to support the development of new policies for air quality protection.

- **APA** stated that the project will be useful for the development of Air Quality Plans and support Execution Programmes.
- **APA** will provide to the project data on chemical components of particles from the urban background monitoring station placed in Alfragide, which is located in the metropolitan area of Lisbon.

- **APA** pointed out that the division of education from APA can support the dissemination actions in the schools.
- **APA** agreed to make a presentation about the Portuguese Air Quality Strategy in the stakeholders' meeting that will be organized by IST, in May.

- **Lisbon and Tagus Valley Regional Coordination and Development Commission (CCDR-LVT)** pointed out that the design of the sampling campaign should be modified in order to increase the number of sampling days in each micro-environment.

- **CCDR-LVT** suggested that the selected houses should be near the schools in a way that the outdoor concentrations measured by the samplers installed in the schools' yard represent the outdoor of the correspondent houses. In this way the security and power for the samplers will be guaranteed.
- **CCDR-LVT** pointed-out that the resolution considered for the dispersion models to be used in the tool is not enough to assess the impacts of the measures and suggested to reduce this resolution.
- **CCDR-LVT** stated that the LIFE Index-Air tool should be user friendly and accessible for all the population. In this way the population would be more involved and would better understand the importance of the measures and their positive impact for the health.

- **North Regional Coordination and Development Commission (CCDR-N)** will provide the reports on chemical speciation measurement campaigns that were made in the Northern Region of Portugal in 2008-2009.
- **CCDR-N** stated that the resolution considered in the dispersion models is enough to assess the impacts of the measures.
- **CCDR-N** pointed out that the tool should be user friendly and should be able to create different emission scenarios in a short period of time. The tool should be also available for general population. In this way the population would better understand the importance of improving air quality.
- **CCDR-N** does not have any records of the population mortality/morbidity in the Northern Region but considers that this information would be extremely helpful to support air quality management strategies.
- **CCDR-N** highlighted the lack of communication between environment and health professionals. A closer link between local/regional and national authorities of environment and health would foster a more integrated strategy to reduce air pollution, improve air quality and protect human health.

- The **Lisbon parishes of Olivais and Parque das Nações** will support the work in the schools and the awareness campaigns.

- **Twenty-five schools from Lisbon** agreed to participate in the LIFE Index-Air activities that will involve: questionnaires on time activity patterns of children; air quality assessments; awareness campaigns; and the challenge "The air is for everyone" that aims to aware the students to the problem of air quality and to involve the schools' community in the identification of measures leading to the improvement of air quality in their homes, schools and regions.

- The **City of Kuopio** identified as project's strengths the stakeholder involment and the fact that the project brings health as a new aspect to local authorities.

- The **City of Kuopio** considers that the project will provide information for local decision makers about the health risks of particles, will improve air quality and will help to estimate indoor air quality.

- As threats and weaknesses, **City of Kuopio** mentioned that the project will not contribute to solve indoor air quality problems, that other pollutants should be considered, that no indoor air measurements will be performed in Kuopio and that possible differences can exist in relation to schools in Southern Europe.

- The representatives of **Ministry of Environment & Energy from Greece** stated that the LIFE Index-Air project will be an important opportunity for the development of their activities and to share ideas with partners and stakeholders from other countries and are particularly interested in action B7 – Development of guidelines for action plans formulation.

- The **Association for Sustainable Development of Cities (SVAP)** stated that the local authorities have not developed any action plans; thus, the LIFE Index-Air tool will be very useful for municipalities, in order to assess actions and design action plans and to disseminate the results and exchange ideas with other policy makers, at an international level.

- The **SVAP** proposed to assist the project partners in dissemination activities.

- As a greater risk, **SVAP** identified the danger of the tool not being used. SVAP considered a priority to customize the tool to the end-users needs and to invest on dissemination and training.

- The main outputs that arrived from **Authorities and Stakeholders Greek** meeting heded in Athens were:
    - Local authorities insisted on the importance to ensure the reproducibility and optimum operation of the tool after the implementation of the project.
    - All participants agreed on the importance of visualizing results and to have a web-based platform.

o The Ministry of the Environment and Energy mentioned the need for chemical composition data (such as heavy metals and BaP), which presently are only measured during a small part of the year. In addition, the Ministry noted that, while air quality and related emission sources have been studied in Greece, there is still lack of information regarding the actual population exposure as well as a mapping of pollution levels within the big urban centres. Among future priority areas for the Ministry are the identification of emission sources responsible for exceedances, the use of an Air Quality Index to assess air pollution levels and the application of tools for the assessing the effectiveness of control measures.

o The Ministry of Health noted the need to have access to reliable tools for assessing the relationship between air pollution levels and impact on public health. Action Plans implemented by the Ministry with respect to air pollution include mainly informative actions for the general public, in the case of exceedance events. These plans have been focusing on PM and O3. Regarding PM emission control strategies, the Ministry of Health has identified as major sources vehicular traffic, combustion activities and smoking (for indoor microenvironments).

o The Athens Municipality - Resilient Athens identified the need for computational tools for the evaluation of the impact of the increased concentration of PM (both outdoors and indoors) to human health. The representative for Resilient Athens noted that the quantitative assessment of future measures (short- and long-term) based on air quality and health impacts will empower the city with evidence and will result in the commitment of policy-makers to apply the measures. The lack of systematic evaluation of air quality in public buildings, especially the ones used by sensitive population sub groups, such as school buildings or hospitals, has been also discussed.

o The SVAP highlighted the need to organise informative meetings and workshops for local and regional authorities, in order to communicate the key messages of the Index-Air project and assist local policy makers in identifying and implementing effective control measures. The Association also offered assistance to the project team with respect to the organization of the educational seminars in primary schools.

LIFE Index-Air

Development of an Integrated Exposure – Dose Management Tool for Reduction of Particulate Matter in Air – LIFE15ENV/PT/000674

MEETINGS IN PORTUGAL

LIFE Index-Air

Development of an Integrated Exposure – Dose Management Tool for Reduction of Particulate Matter in Air – LIFE15ENV/PT/000674

Stakeholder Meeting Report

Portuguese Environment Agency (APA)

Date: 2017-01-11
Venue: Rua da Murgueira, 9/9A - Zambujal Ap. 7585, 2610-124 Amadora, Portugal

Chair: Marta Almeida
Rapporteur: Marina Almeida-Silva

Introduction

The present Minute Report has been generated in order to provide an overview of the First Meeting of the LIFE Index-Air project with the Portuguese Environment Agency (APA) from the Ministry of Environment.

APA is the national body responsible by:

1. the coordination and implementation of the national strategy for the improvement of ambient air quality;
2. the methodologies to evaluate the ambient air quality;
3. the approval of the portuguese air quality network for the compliance of the national obligations;
4. the exchange of information with the European Commission about air quality assessment;
5. make available to the public, on its website, the information about the air quality in the national territory;
6. cooperate with other States and with the European Commission to implement the European strategy on air quality;
7. perform the functions of national reference laboratory.

The meeting was hosted by APA and it was held in Lisbon, Portugal, on 11th January 2017. Marta Almeida (IST) was the chair of the meeting and nominated Marina Almeida-Silva (IST) as the rapporteur.

Objectives

The consultation of authorities and stakeholders is an essential component of good environment governance and it is one project's priority. The objectives of this meeting were:

1. to introduce the LIFE Index-Air project to APA;
2. to seek APA views in relation to the proposed activities;
3. to discuss the needs of APA in regard of the tool generated in this project;
4. to plan a timetable for the actions related to the case study in Lisbon;
5. to promote the involvement of APA from the beginning;
6. to obtain APA support for the implementation of project's actions.

Participating Members

The following members of IST and APA participated in the meeting:

- IST – Marta Almeida, Marina Almeida-Silva, Tiago Faria
- APA – Dilia Jardim, Claudia Martins, Filipa Marques, Teresa Anacleto.

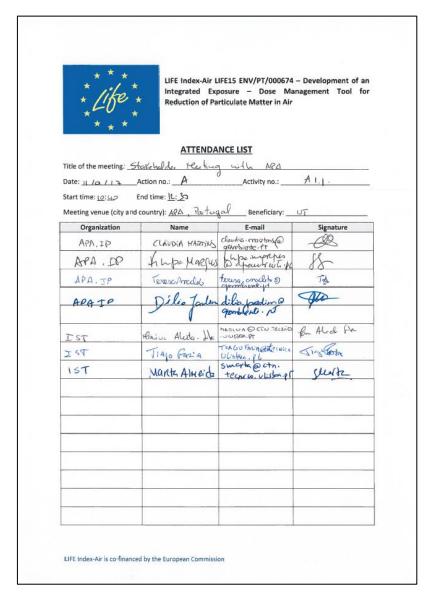The signed list of participants is presented in figure 1.

Figure 1 - List of participants in the first meeting with APA.

Agenda of the meeting

The working agenda of the first meeting with APA was the following:

- Introduction;
- General overview of the project: objectives, team, structure, actions;
- Discussion about the actions;
- Stakeholder questionnaire;
- Closing.

Working resume and discussion

The meeting started at 10:40 with the introduction of all participants. Marta Almeida presented the agenda of the meeting and gave a general overview of the project: objectives,

team, structure and actions. The presentation was supported by the PowerPoint showed in Annex 1.

The overview of the project was followed by a discussion and the team from APA gave the following feedback:

- Access to particle chemical composition data
  APA is monitoring the chemical components of particles in monitoring station placed in Alfragide, which is an urban background station located in the metropolitan area of Lisbon. The data can be requested by email and used by the project.

- Dissemination activities in the schools
  APA pointed out that the division of education from APA can support the dissemination actions in the schools.

- National Strategy for Air 2020
  APA pointed out that the project is aligned with the National Strategy for Air 2020. It will be useful for the development of Air Quality Plans and support Execution Programmes. Moreover the project will have a positive impact on the following priorities defined in the National Strategy for the Air 2020:
  - Evaluation of the chemical composition of particulate matter and identification sources;
  - Evaluation of the contribution of emissions from sectors with insufficient information;
  - Development cost-effective methodologies that will optimize the management of air quality;
  - Promotion of projects to support the development of new policies for air quality protection.

After the discussion the questionnaire for stakeholders was presented and discussed.

APA agreed to make a presentation about the Portuguese Air Quality Startegy in the stakeholders' meeting that will be organized in IST, Lisbon in May. The final date will be communicated as soon as possible.

The meeting was closed at 12:30.

Main conclusions of the meeting

The first LIFE Index-Air meeting held in APA can be summarized as followed:

- An overview of the project goals, structure and timetable were presented.
- APA gave important feedback about the implementation of the actions.
- The stakeholders' questionnaire was applied and discussed.

Approval of the Meeting Minute

According with the LIFE Index-Air Management Guide the minutes shall be considered as accepted if, within 10 calendar days from sending, no Member has sent an objection in writing to the chairperson. The chairperson will send the final version of the minutes by email to all the beneficiaries that were called to the meeting. A copy of the minutes will be archived in the LIFE Index-Air webpage.

LIFE Index-Air

Development of an Integrated Exposure – Dose Management Tool for Reduction of Particulate Matter in Air – LIFE15ENV/PT/000674

Stakeholder Meeting Report

Lisbon and Tagus Valley Regional Coordination and Development Commission (CCDR-LVT)

Date: 2016-12-9
Venue: Rua Alexandre Herculano, nº 37, 1250-009, Lisbon, Portugal

Chair: Marta Almeida
Rapporteur: Marina Almeida-Silva

Introduction

The present Minute Report has been generated in order to provide an overview of the First Meeting of the LIFE Index-Air project with Lisbon and Tagus Valley Regional Coordination and Development Commission (CCDR-LVT).

CCDR-LVT is a decentralized body of central government. Its mission is to promote an integrated and sustainable development of the Lisbon region (NUT II). CCDR-LVT is tasked with coordinating and promoting in the Lisbon region governmental policies with regard to regional planning and development, environment, land management, inter-regional and cross-border cooperation and also support local government and inter-municipal associations. CCDR-LVT's fields of intervention also encompass the management of regional operational programs funded by the European Union, as well as other regional development financing instruments.

More specifically, CCDR-LVT is responsible by:

1. conduct the management and evaluation of air quality in LVT region, ensuring its quality;
1. ensure the accuracy of the pollutant measurements in LVT region;
2. ensure the availability of information on ambient air quality in LVT region;
3. ensure that exceedances in LVT region are communicated to the local authorities, health authorities and the public;
4. develop, promote the implementation and monitor the air quality plans for the LVT territory, which establish measures to achieve the limit values;
5. emit an opinion on private air quality monitoring networks installed under the scope of the facility licensing procedures in LVT region.

The meeting was hosted by CCDR-LVT and it was held in Lisbon, Portugal, on 9th December 2016. Marta Almeida (IST) was the chair of the meeting and nominated Marina Almeida-Silva (IST) as the rapporteur.

Objectives

The consultation of authorities and stakeholders is an essential component of good environment governance and it is one project's priority. The objectives of this meeting were:

1. to introduce the LIFE Index-Air project to CCDR-LVT;
2. to seek CCDR-LVT views in relation to the proposed activities;
3. to discuss the needs of CCDR-LVT in regard of the tool generated in this project;
4. to plan a timetable for the actions related to the case study in Lisbon;
5. to promote the involvement of CCDR-LVT from the beginning;
6. to obtain CCDR-LVT support for the implementation of project's actions.

Participating Members

The following members of IST and CCDR-LVT participated in the meeting:

- IST – Marta Almeida, Marina Almeida-Silva, Tiago Faria
- CCDR-LVR – Luisa Nogueira, Cristiano Amaro, Sandra Mesquita.
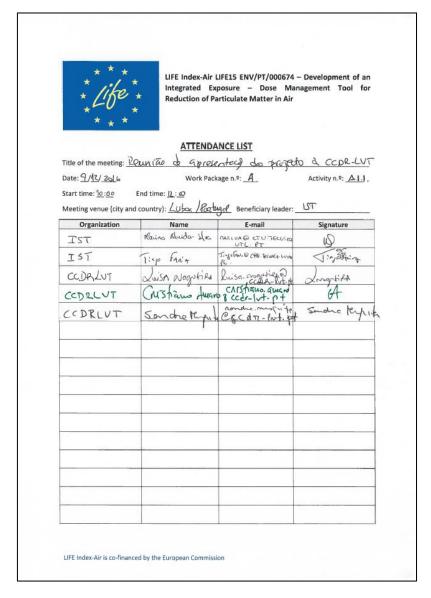
The signed list of participants is showed in figure 2.

Figure 2- List of participants in the first meeting with CCDR-LVT.

Agenda of the meeting

The working agenda of the first meeting with CCDR-LVT was the following:

- Introduction;
- General overview of the project: objectives, team, structure, actions;
- Discussion about the actions;

- Stakeholder questionnaire;
- Closing.

Working resume and discussion

The meeting started at 10:00 with the introduction of all participants. Marta Almeida presented the agenda of the meeting and made a general overview of the project: objectives, team, structure and actions. The presentation was supported by the PowerPoint that is in Annex 1.

The overview of the project was followed by a discussion and the team from CCDR-LVT gave the following feedback:

- Representativeness of the LIFE Index-Air sampling campaign
  The proposal of the project considered 2 sampling days per micro-environment. CCDR-LVT pointed out that this number is insufficient and that sampling should be increased to at least 5 sampling periods per micro-environment.

- Set-up of the equipment in the outdoor of the houses
  The proposal of the project considered parallel sampling in the outdoor and in the indoor of the micro-environments. CCDR-LVT pointed out that it will be difficult to install the equipment in the outdoor of the houses due to security reasons and lack of power supply. CCDR-LVT suggested that the selected houses should be near the schools in a way that the outdoor concentrations measured by the samplers installed in the schools' yard represent the outdoor of the correspondent houses. In this way the security and power for the samplers could be guaranteed.

- Resolution of the models
  The resolution previewed for the air quality models was 1x1Km^2. CCDR-LVT considered that this resolution is not enough to assess the impacts of the measures and suggested to reduce this resolution.

- Target population of the LIFE Index-Air Decision Support Tool
  CCDR-LVT pointed out that the tool should user friendly and accessible for all the population. In this way the population would be more involved and would better understand the importance of the measures and their positive impact for the health.

IST agreed with the suggestions and it was decided that the feedback from CCDR-LVT would be presented in the next project meeting.

After the discussion the questionnaire for stakeholders was presented and discussed.

CCDR-LVT agreed to make a presentation about the Air Quality Plans for Lisbon in the stakeholders' meeting that will be organized in IST, Lisbon in May. The final date will be communicated as soon as possible.

Main conclusions of the meeting

The first LIFE Index-Air meeting held in CCDR-LVT can be summarized as followed:

- An overview of the project goals, structure and timetable were presented.
- CCDR-LVT gave important feedback about the implementation of the actions.
- The stakeholders' questionnaire was applied and discussed.

Approval of the Meeting Minute

According with the LIFE Index-Air Management Guide the minutes shall be considered as accepted if, within 10 calendar days from sending, no Member has sent an objection in writing to the chairperson. The chairperson will send the final version of the minutes by email to all the beneficiaries that were called to the meeting. A copy of the minutes will be archived in the LIFE Index-Air webpage.

LIFE Index-Air

Development of an Integrated Exposure – Dose Management Tool for Reduction of Particulate Matter in Air – LIFE15ENV/PT/000674

Stakeholder Meeting Report

North Coordination and Development Commission (CCDR-N)

Date: 2017-01-16

Venue: Rua Rainha D. Estefânia, 251

4150-304 Porto, Portugal

Chair: Ana Isabel Miranda

Rapporteur: Hélder Relvas

Introduction

The present Minute Report has been generated in order to provide an overview of the First Meeting of the LIFE Index-Air project with the North Coordination and Development Commission (CCDR-N).

CCDR-N is a decentralized body of central government. Its mission is to promote an integrated and sustainable development of the North region (NUT II). CCDR-N is tasked with coordinating and promoting in the North region governmental policies with regard to regional planning and development, environment, land management, inter-regional and cross-border cooperation and also support local government and inter-municipal associations. CCDR-N's fields of intervention also encompass the management of regional operational programs funded by the European Union, as well as other regional development financing instruments.

More specifically, CCDR-N is responsible by:

1. conduct the management and evaluation of air quality in North region, ensuring its quality;
2. ensure the accuracy of the pollutant measurements in North region;
3. ensure the availability of information on ambient air quality in North region;
4. ensure that exceedances in North region are communicated to the local authorities, health authorities and the public;
5. develop, promote the implementation and monitor the air quality plans for the North territory, which establish measures to achieve the limit values;
6. emit an opinion on private air quality monitoring networks installed under the scope of the facility licensing procedures in North region.

The meeting was hosted by CCDR-N and it was held in Porto, Portugal, on 16th January 2017. Ana Isabel Miranda (UA) was the chair of the meeting and nominated Hélder Relvas (UA) as the rapporteur.

Objectives

The consultation of authorities and stakeholders is an essential component of good environment governance and it is one project' priority. The aims of this meeting were:

1. to introduce the LIFE Index-Air project to CCDR-N;
2. to seek CCDR-N views in relation to the proposed activities;
3. to discuss the needs of CCDR-N in regard of the tool generated in this project;
4. to introduce the surveys required to be completed by the stakeholders.

Participating Members

The following members of UA and CCDR-N participated in the meeting:

- UA – Ana Isabel Miranda, Joana Ferreira, Hélder Relvas
- CCDR-N – Vitor Monteiro, Cristina Figueiredo

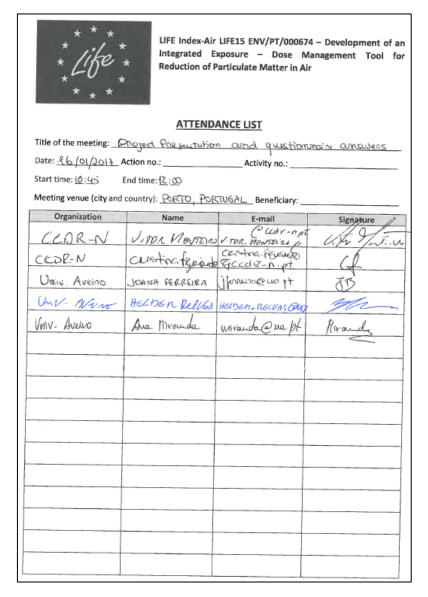The signed list of participants is available in figure 3.

Figure 3 - List of participants in the first meeting with CCDR-N.

Agenda of the meeting

The working agenda of the first meeting with CCDR-N was the following:

- Introduction, general objectives, scope and expectations
- Main project structure and work-phases
- LIFE INDEX AIR – Questionnaire and discussion
- Closing

Working resume and discussion

The meeting started at 10:45 with the introduction of all participants. Ana Isabel Miranda presented the agenda of the meeting and gave a general overview of the project: objectives,

team, structure and actions. The presentation was supported by the PowerPoint that is in Annex 1.

The team from CCDR-N gave the following feedback:

- Chemical speciation measurements

  CCDR-N will provide the reports on chemical speciation measurement campaigns that were made in the Northern Region of Portugal in 2008-2009.

- Resolution of the models
  The resolution previewed for the air quality models by UAVR was $1x1Km^2$. CCDR-N considered that this resolution is enough to assess the impacts of the measures.

- LIFE Index-Air Decision Support Tool
  CCDR-N pointed out that the tool should be user friendly and should be able to create different emission scenarios in a short period of time. The tool should be also available for general population. In this way the population would better understand the importance of improving air quality.

- Records of the population mortality/morbidity
  CCDR-N does not have any records of the population mortality/morbidity in the Northern Region but considers that this information would be extremely helpful to support air quality management strategies.

- Environment and Health links
  CCDR-N highlighted the lack of communication between environment and health professionals. A closer link between local/regional and national authorities of environment and health would foster a more integrated strategy to reduce air pollution, improve air quality and protect human health.

After the presentation, the questionnaire for stakeholders was presented and discussed.

Main conclusions of the meeting

The LIFE Index-Air stakeholder meeting held in CCDR-N can be summarized as followed:

- An overview of the project goals, structure and timetable were presented.
- CCDR-N gave important feedback about the importance of the tool.
- The stakeholder's questionnaire was presented and discussed.

Approval of the Meeting Minute

According with the LIFE Index-Air Management Guide the minutes shall be considered as accepted if, within 10 calendar days from sending, no Member has sent an objection in writing to the chairperson. The chairperson will send the final version of the minutes by email to all the beneficiaries that were called to the meeting. A copy of the minutes will be archived in the LIFE Index-Air webpage.

LIFE Index-Air

Development of an Integrated Exposure – Dose Management Tool for Reduction of Particulate Matter in Air – LIFE15ENV/PT/000674

Stakeholder Meeting Report

Lisbon Parish of Olivais (JF-Olivais)

Date: 2017-02-14
Venue: Lote C 1849-, R. Gen. Silva Freire 28, Lisboa, Portugal
Chair: Susana Marta Almeida
Rapporteur: Nuno Canha

Introduction

The present Minute Report has been generated in order to provide an overview of the First Meeting of the LIFE Index-Air project with Lisbon Parish of Olivais (JF-Olivais), a parish from Lisbon Municipality.

The meeting was hosted by JF-Olivais and it was held in Lisbon, Portugal, on 14th February 2017. Marta Almeida (IST) was the chair of the meeting and nominated Nuno Canha (IST) as the rapporteur.

Objectives

The consultation of authorities and stakeholders is an essential component of good environment governance and it is one priority of the project.

The aims of this meeting were:

1. to introduce the LIFE Index-Air project to JF-Olivais;
2. to seek JF-Olivais views in relation to the proposed activities;
3. to plan the awareness and dissemination activities with schools and population from Olivais.

Participating Members

The following members of IST and JF-Olivais participated in the meeting:

- IST – Marta Almeida and Nuno Canha
- JF-Olivais – Cátia Rosas and Pedro Carvalho

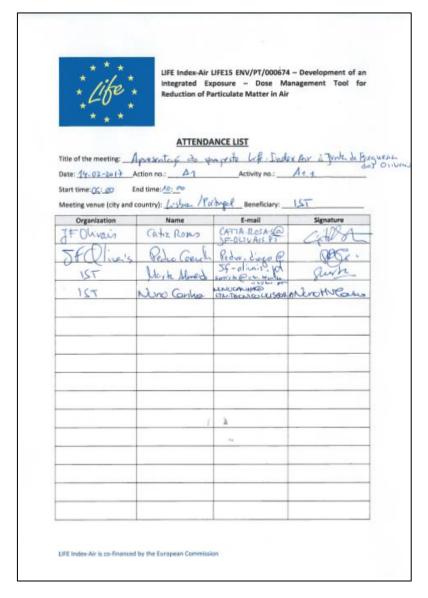The signed list of participants is available in Figure 4.

Figure 4 - List of participants in the first meeting with JF-Olivais.

Agenda of the meeting

The working agenda of the first meeting with JF-Olivais was the following:

- Introduction, general objectives, scope and expectations
- Main project structure and work-phases
- Awareness and dissemination activities in Olivais
- Closing

Working resume and discussion

The meeting started at 09:00 with the introduction of all participants. Marta Almeida gave a general overview of the project: objectives, team, structure, and awareness activities to be developed in schools. Cátia Rosas stated that the project is within the environment goals of JF-Olivais and supported the idea of extend the project awareness activities to all Olivais schools. Cátia also mentioned that the activities developed within the project should be included in an event that JF-Olivais is organizing that intends to join the population of Olivais. The following actions were programmed:

- JF-Olivais will contact the schools from Olivais in order to invite them to participate in the project activities;
- IST will develop the guidelines for the activities to be developed with the schools to present them to JF-Olivais and interested schools;
- A second meeting will be organized with JF-Olivais to plan the participation of the LIFE Index-Air project in the event organized by JF-Olivais.

Main conclusions of the meeting

The first LIFE Index-Air meeting held in JF-Olivais can be summarized as followed:

- An overview of the project goals, structure and timetable were presented.
- JF-Olivais expressed a great interest in the project and will support the LIFE Index-Air awareness and dissemination activities.

Approval of the Meeting Minute

According with the LIFE Index-Air Management Guide the minutes shall be considered as accepted if, within 10 calendar days from sending, no Member has sent an objection in writing to the chairperson. The chairperson will send the final version of the minutes by email to all the beneficiaries that were called to the meeting. A copy of the minutes will be archived in the LIFE Index-Air webpage.

LIFE Index-Air

Development of an Integrated Exposure – Dose Management Tool for Reduction of Particulate Matter in Air – LIFE15ENV/PT/000674

Stakeholder Meeting Report

Lisbon Parish of Parque das Nações (JF-PN)

Date: 2017-02-16
Venue: Alameda dos Oceanos 83, 1990 Lisboa, Portugal
Chair: Susana Marta Almeida
Rapporteur: Marina Almeida-Silva

The present Minute Report has been generated in order to provide an overview of the First Meeting of the LIFE Index-Air project with the Lisbon Parish of Parque das Nações (JF-PN), a parish from Lisbon Municipality.

The meeting was hosted by JF-PN and it was held in Lisbon, Portugal, on 16th February 2017. Marta Almeida (IST) was the chair of the meeting and nominated Marina Almeida-Silva (IST) as the rapporteur.

Objectives

The consultation of authorities and stakeholders is an essential component of good environment governance and it is one project' priority.

The aims of this meeting were:

1. to introduce the LIFE Index-Air project to JF-PN;
2. to seek JF-PN views in relation to the proposed activities;
3. to plan the awareness and dissemination activities with schools and population from Parque das Nações.

Participating Members

The following members of IST and JF-PN participated in the meeting:

- IST – Marta Almeida and Marina Almeida-Silva
- JF-PN – Lucas Lopes and Anabela Carreira
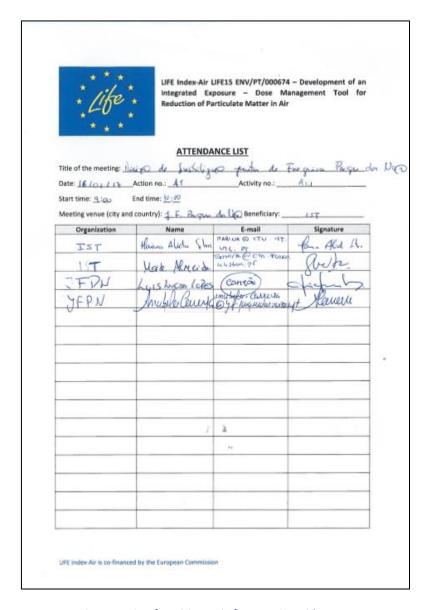
The signed list of participants is presented in figure 5.

Figure 5 - List of participants in first meeting with JF-PN.

Agenda of the meeting

The working agenda of the Stakeholder meeting was the following:

- Introduction, general objectives, scope and expectations
- Main project structure and work-phases
- Awareness and dissemination activities in Parque das Nações
- Closing

Working resume and discussion

The meeting started at 09:30 with the introduction of all participants. Marta Almeida gave a general overview of the project: objectives, team, structure, air quality monitoring campaigns to be performed in Parque das Nações and awareness activities to be developed in schools. JF-

PN pesents the activities that are being developed in Parque das Nações in the scope of the project, namely iniciatives related with the use of bicycles such as Expresso do Oriente iniciative, construction of bicycle lanes, bicycles sharing and installation of bicycle stands in schools. JF-PN also expressed concern about air quality in Parque das Nações due to the emissions from contaminated soils.

JF-PN received the project very enthusiastically and supported the idea of extend the LIFE Index-Air awareness activities to the students who attend the extra-curricular activities promoted by JF-PN (aproximatelly 500 children). JF-PN made available human and technical resources to carry out these activities. JF-PN also mentioned the possibility of disseminate the LIFE Index-Air project activities in the local newspaper. The following actions were programmed:

- IST will develop the guidelines for the activities to be developed with the schools. These guidelines will be presented to JF-PN and to the trainers from the extra-curricular activities promoted by JF-PN;
- The questionnaires about Time Activity Patterns will be delivered in School Parque das Nações.
- Awareness campaigns will be made in School Parque das Nações and School Vasco da Gama.

Main conclusions of the meeting

The LIFE Index-Air meeting held in JF-PN can be summarized as followed:

- The project was presented to JF-PN.
- JF-PN gave an important support to the development of the LIFE Index-Air awareness and dissemination activities.

Approval of the Meeting Minute

According with the LIFE Index-Air Management Guide the minutes shall be considered as accepted if, within 10 calendar days from sending, no Member has sent an objection in writing to the chairperson. The chairperson will send the final version of the minutes by email to all the beneficiaries that were called to the meeting. A copy of the minutes will be archived in the LIFE Index-Air webpage.

LIFE Index-Air

Development of an Integrated Exposure – Dose Management Tool for Reduction of Particulate Matter in Air – LIFE15ENV/PT/000674

Stakeholder Meeting Report

Schools from Lisbon Municipality

Introduction

The present Minutes Report has been generated in order to provide an overview of the first meetings of the LIFE Index-Air project with several schools from Lisbon Municipality. The meeting was hosted in each school's facility between January and March 2017.

Marta Almeida, Marina Almeida-Silva, Nuno Canha and Tiago Faria, from IST team, participated in these meetings.

Objectives

The aims of these meetings were:

1. to introduce the LIFE Index-Air project to the teachers and directors of the schools;
2. to seek schools views in relation to the proposed activities;
3. to introduce and deliver the questionnaire on time activity patterns;
4. to plan the awareness and dissemination activities;
5. to plan air quality monitoring campaigns.

Participating Schools

LIFE Index-Air team from IST gathered with 21 basic schools from Lisbon Municipality. Table 1 presents the list of schools that agreed to participate in the activities of the LIFE Index-Air project and shows the different levels of involvement:

1. Questionnaire on time activity patterns
2. Awareness campaigns
3. Challenge "The air is for everyone"
4. Air Quality Monitoring
5. Complete Air Quality Monitoring

Figure 6 shows the geographical distribution of the schools.

Agenda of the meetings

The working agenda of the first meetings with schools was the following:

*   Overview of the project: motivations, general objectives, structure and work-phases;
*   Questionnaire on time activity patterns
*   Monitoring campaigns in schools;
*   Awareness and dissemination activities;
*   Closing.

Working resume and discussion

The meetings started with the overview of the project: motivations, general objectives, structure and work-phases.

The objective and structure of the questionnaire on time activity patterns was presented. It was agreed that the questionnaire, together with the brochure of the project, should be delivered to all parents to be filled and returned in one week.

The methodology for the air quality measurement campaigns in schools was explained, as well as the structure of the report on air quality results and good practices, which will be delivered to all the schools.

The three phases of the awareness activities with students were presented:

- the project team will make awareness sessions in March 2017;
- the school community will participate in the challenge "The air is for everyone" from March until May 2017;
- the results from the challenge will be presented in the final event, which will be organized in collaboration with Loures Municipality, in June 2017.

Main conclusions of the meeting

The first LIFE Index-Air meetings with schools can be summarized as followed:

- An overview of the project goals, structure and timetable were presented.
- In general the schools expressed a great interest in the project and will support the LIFE Index-Air awareness and dissemination activities.

Approval of the Meeting Minute

According with the LIFE Index-Air Management Guide the minutes shall be considered as accepted if, within 10 calendar days from sending, no Member has sent an objection in writing to the chairperson. The chairperson will send the final version of the minutes by email to all the beneficiaries that were called to the meeting. A copy of the minutes will be archived in the LIFE Index-Air webpage.

Table 1 - List of the participating schools

ID	Schools	Parish	No. of students	Questionnaires	Awareness Campaigns	Challenge "The air is for everyone"	Air Quality Monitoring	Complete Air Quality Monitoring
1	Colégio Alegria	Campo de Ourique	25	●	●	●	●	
2	Colégio de Santa Maria	Lapa	208	●				
3	Colégio João de Deus	Campo de Ourique	270	●	●	●	●	
4	Colégio Pedro Arrupe	Parque das Nações	580	●	●	●	●	
5	Colégio Valsassina	Chelas	350	●	●	●	●	
6	EB1 Bairro São Miguel	Alvalade	400	●	●	●	●	
7	EB1 Coruchéus	Alvalade	140	●	●	●	●	
8	EB1 Dr. Catela Gomes	Moscavide	233	●	●	●	●	
9	EB1 Santo António	Alvalade	200	●	●	●	●	
10	EB1/JI Convento do Desagravo	Graça	277	●	●	●	●	●
11	EB1/JI Portela	Portela	393	●	●	●	●	
12	EB1/JI Quinta da Alegria	Portela	226	●	●	●	●	
13	Escola Básica O Leão de Arroios	Arroios	390	●	●	●	●	●
14	Escola EB1 Patrício Prazeres	Marvila	75	●	●	●	●	
15	Escola EB1 Oliveira Marques	Marvila	95	●	●	●	●	
16	Escola EB1 Rosa Lobato Faria	S. Vicente	120	●	●	●	●	
17	Escola São Vicente	Lumiar	130	●	●	●	●	

18	Escola Vasco da Gama	Parque das Nações	200	●	●	●	●	●
19	Externato João XXIII	Parque das Nações	200	●	●	●	●	
20	Externato Primário da Associação Pró-Infância Santo António de Lisboa	Arroios	180	●	●	●	●	
21	Externato Maristas de Lisboa	Benfica	270	●	●	●	●	●
22	Grouping Padre Bartolomeu de Gusmão	Campo de Ourique	600	●	●	●	●	●
23	EB1 Telheiras	Lumiar	290	●	●	●	●	
24	Jardim Escola João de Deus	Olivais	244	●	●	●	●	

Figure 6 - Spatial distribution of the schools

LIFE Index-Air

Development of an Integrated Exposure – Dose Management Tool for Reduction of Particulate Matter in Air – LIFE15ENV/PT/000674

MEETINGS IN FINLAND

LIFE Index-Air

Development of an Integrated Exposure – Dose Management Tool for Reduction of Particulate Matter in Air – LIFE15ENV/PT/000674

Stakeholder Meeting Report

City of Kuopio

Date: 2017-01-09
Venue: City of Kuopio, Finland

Chair: Otto Hänninen
Rapporteur: Heli Lehtomäki

Introduction

The present Minutes Report has been generated in order to provide an overview of the Stakeholder meeting of the LIFE Index-Air project in Kuopio. The meeting was hosted by the National Institute for Health and Welfare (THL) and it was held in the City of Kuopio on 9 January 2017. This meeting was the first stakeholder meeting with the City of Kuopio.

Otto Hänninen (THL) was the chair of the meeting and nominated Heli Lehtomäki (THL) as the rapporteur.

Objectives

The aim was to introduce the LIFE Index-Air project to the stakeholders, discuss the needs of the City of Kuopio in regard of the tool generated in this project and plan a timetable for the actions related to the case study in Kuopio. In addition, short overviews of the parallel projects at THL which are related to the theme of the LIFE Index-Air meeting were presented.

Participating Members

The invitation for the Stakeholder meeting was sent by e-mail on 14 November 2016 by Otto Hänninen.

The following institutions were invited:

- National Institute for Health and Welfare (THL), Finland
- City of Kuopio, Environmental Office, Kuopio, Finland

The following members of the invited institutions participated in the meeting:

- THL - Otto Hänninen
- THL - Arja Asikainen
- THL - Heli Lehtomäki
- THL - Antti Korhonen
- University of Eastern Finland - Isabell Rumrich
- City of Kuopio - Erkki Pärjälä
- City of Kuopio - Santtu Laitinen
- City of Kuopio - Mikko Sokura

The signed list of participants is available in figure 6.
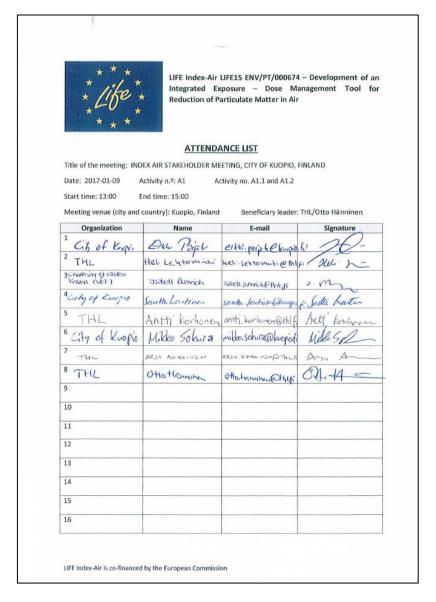
Figure 7 - List of participants in stakeholder meeting with City of Kuopio

Agenda of the Meeting

The working agenda of the Stakeholder meeting was the following:

1. Welcome
2. Introduction
3. Previous collaboration URGHENCE and overview of EBD
4. Health impacts of air pollution in Finland, focus on children
5. Geographical Information System datasets and tools
6. Epidemiological studies (MATEX)
7. LIFE INDEX Air project
8. Stakeholder questionnaire and involvement, Discussion/all
9. Case study AQ and assessment of policies in Kuopio
10. Closing

The detailed description of the LIFE Index-Air Stakeholder meeting Agenda is presented in figure 7.

Figure 8 - Agenda of the meeting with City of Kuopio

Working resume and discussion

The meeting started at 13:05 with a brief welcome speech from Erkki Pärjälä. Otto Hänninen presented the agenda of the meeting and gave a brief introduction about THL and the disease burden topic (all presentation are presented in Annex 2.

Previous collaboration URGHENCE and overview of EBD (started at 13:25) – Arja Asikainen gave a presentation related to an earlier project called URGHENCE and showed disease burden estimates for different environmental factors which clearly showed that air pollution is one of the main environmental risk factors in Finland.

Health impacts of air pollution in Finland, focus on children (started at 13:38) – Heli Lehtomäki presented the ISTE-project's estimates for health impacts of outdoor air pollution in Finland. She also presented explicit burden of disease due to air pollution on children based on the ISTE-project calculations.

Geographical Information System datasets and tools (started at 13:47) – Antti Korhonen addressed the exposure estimation using Geographical Information System datasets and tools.

Epidemiological studies (MATEX) (started at 13:54) – Isabell Rumrich introduced a register project related to maternal exposure and health in the offspring. The addressed exposures were maternal smoking and air pollution.

LIFE INDEX Air project (started at 14:01) – Otto Hänninen went through the participants, structure and timetables of the LIFE Index-Air project.

Stakeholder questionnaire and involvement, Discussion / all – Stakeholders' had received the questionnaire earlier and it was agreed that Erkki Pärjälä and Santtu Laitinen will meet and fill in the questionnaire and send it to Otto Hänninen or Heli Lehtomäki within two weeks. The SWOT table (Figure 8) was filled by all participants. There were six notes for strengths, weaknesses and opportunities and five notes for threaths.

Figure 9 - SWOT Analysis

The main notes from the SWOT analysis were:

Strengths
- Stakeholder involment
- Broad and diverse baseline data available
- Brings health as a new aspect to local authorities

Threaths
- Feasibility and flexibility of the tool
- Implementation in Kuopio
- No help for indoor air quality problems

Opportunities
- Provides information for local decision makers about the health risks of PM
- Improvement of PM
- Validation easy in Kuopio which is a relatively small city
- European-wide assessment
- Helps to estimate indoor air quality

Weaknesses
- Low concentration in Kuopio
- Focus on PM, how about other risks
- Relatively small city
- No indoor air measurements in Kuopio, possible differences in relation to schools in Southern Europe

Case study AQ and assessment of policies in Kuopio – It was brought up that the baseline data for Kuopio is of good quality. Kuopio could thus be used better for validation testing compared to bigger cities. The project results from Kuopio could be rather well extrapolated to other middle sized cities in Finland. An action plan was created (table 1). The time table regarding the planned actions in Kuopio is loose, which provides time to think about ways in which schools could be involved, what the best platform would be for the seminars and awareness campaigns to reach out to a wide audience and which other activities could possibly be organised in regard to the topic. For instance, there is an upcoming awareness campaign in relation to particulate matter and the impact on school children could also be added to the campaign.

Main conclusions of the meeting

The LIFE Index-Air stakeholder meeting #1 in Kuopio can be summarised as followed:

- An overview of the project goals, structure and timetable were presented.
- The parallel projects running at THL were presented shortly.
- The SWOT table regarding the project was filled by the participants.

- Loose time table gives possibilities to organise activities and plan the platform of the seminars and awareness campaigns so that we could reach a wider audience.
- Stakeholders were eager to participate and help organise ways to spread awareness in regard to the health impacts of air pollution on children.

Table 2 - Action list of the project for Kuopio.

Time period	Activity
9 January 2017	The first stakeholder meeting in Kuopio.
January 2017	Erkki Pärjälä will contact the Internal Coordinator Raija Kovanen in regards cooperation with schools in Kuopio. The aim is to find at least three schools which would be interested in being part of this project.
January 2017	Erkki Pärjälä and Santtu Laitinen will fill in the questionnaire for stakeholders within two weeks.
Spring 2017	A seminar for primary education teachers, children and children's families in 2017. It could perhaps be combined with another campaign related to indoor or outdoor air.
Fall 2017	A project meeting with stakeholders at the latest in fall 2017. In that meeting the work plan for 2018 will discussed in more detail and the meetings for the year 2018 will be planned.
Year 2018	The disease burden calculations for the B5 modul.
March 2019	Awareness campaign in three schools. Possibly it could be held in the street dust season to raise more interest in the topic.
February 2020	A seminar for primary education teachers, children and children's families with the project results can be presented.

Approval of the Meeting Minute

According with the LIFE Index-Air Management Guide the minutes shall be considered as accepted if, within 10 calendar days from sending, no Member has sent an objection in writing to the chairperson. The chairperson will send the final version of the minutes by email to all the beneficiaries that were called to the meeting. A copy of the minutes will be archived in the LIFE Index-Air webpage.

LIFE Index-Air

Development of an Integrated Exposure – Dose Management Tool for Reduction of Particulate Matter in Air – LIFE15ENV/PT/000674

MEETINGS IN GREECE

LIFE Index-Air

Development of an Integrated Exposure – Dose Management Tool for Reduction of Particulate Matter in Air – LIFE15ENV/PT/000674

Stakeholder Meeting Report

External Advisory Board Meeting in Greece

Date: 20th October 2016
Venue: National Centre for Scientific Research "Demokritos", Athens, Greece

Chair: Marta Almeida
Rapporteur: Marina Almeida-Silva

Introduction

The present Minutes Report has been generated in order to provide an overview of the External Advisory Board meeting of the LIFE Index-Air project in Greece. The meeting was hosted by National Centre for Scientific Research "Demokritos" and it was held in Athens (Greece) on 20th October 2016.

Marta Almeida, as coordinator of the project, was the chair of the meeting and nominated Marina Almeida-Silva (from IST team) as the rapporteur.

Objectives

The aim was to introduce the LIFE Index-Air project to the stakeholders, discuss the needs of the Athens EAB members in regard of the tool generated in this project and plan a timetable for the actions related to the case study in Athens.

Participating Members

The invitation for the Stakeholder meeting was sent by e-mail on 14 November 2016 by Marta Almeida.

The following institutions were invited:

- Instituto Superior Técnico (IST), Portugal
- National Centre for Scientific Research "Demokritos" (NCSR-D), Greece
- National Institute for Health and Welfare (THL), Finland
- Technical University of Crete (TUC), Greece
- Universidade de Aveiro (UAVR), Portugal
- Ministry of Health, Greece – EAB
- Ministry of Environment, Greece - EAB
- Association for the Sustainability Development of Cities (SVAP), Greece - EAB

The following members of the invited institutions participated in the meeting:

- IST – Marta Almeida, Marina Almeida-Silva, Tiago Faria
- NCSR-D – Konstantinos Eleftheriadis, Evangelia Diapouli, Vassilis Galifianakis,Thomas Maggos, Kyriaki Bairachtari
- THL - Otto Hänninen
- TUC - Mihalis Lazaridis

- UAVR - Ana Miranda, Joana Ferreira
- Ministry of Environment & Energy – Ireve Tsilibari, Anastasios Adamopoulos
- Association for Sustainable Development of Cities (SVAP) – Eugenios Gialias

The signed list of participants is available in figure 10.

Name	Institution / Company	Contact information	Signature
Marta Almeida	C2TN, Instituto Superior Técnico Lisboa	smarta@ctn.ist.utl.pt	
Ana Miranda	University of Aveiro	miranda@ua.pt	
Joana Ferreira	University of Aveiro	jferreira@ua.pt	
Mihalis Lazaridis	Technical University of Crete	lazaridi@mred.tuc.gr	
Otto Hänninen	THL	otto.hanninen@thl.fi	
Marina de Almeida Silva	C2TN, Instituto Superior Técnico Lisboa	marina@ctn.tecnico.ulisboa.pt	
Konstantinos Eleftheriadis	ERL, NCSR "D"	elefther@ipta.demokritos.gr	
Evangelia Diapouli	ERL, NCSR "D"	ldiapouli@ipta.demokritos.gr	
Vassilis Galifianakis	ERL, NCSR "D"	vgalif@ipta.demokritos.gr	
EVGENIOS GIALIAS	ASDC (LBAN)	2iota@ath.forthnet.gr www.SVa.gr	
Anastasios Adamopoulos	HELLENIC MINISTRY FOR THE ENVIRONMENT & ENERGY	a.adamopoulos@prv.ypeka.gr	
Irene Tsilibari	>>	e.tsilibari@prv.ypeka.gr	

Figure 10 - List of participants in the first meeting with EAB members from Greece.

Agenda of the Meeting

The description of the LIFE Index-Air EAB Agenda is showed in figure 11.

LIFE Index Air – LIFE15 ENV/PT/000674
1st External Advisory Board Meeting Agenda

Date:
20th of October 2016

Place:
Institute of Nuclear and Radiological Science &
Technology, Energy & Safety
N.C.S.R. "Demokritos"
15341 Ag. Paraskevi, Attiki, Greece

	LIFE Index Air EXTERNAL ADVISORY BOARD (EAB) MEETING (to be attended by the project partners and EAB members)	
Time	**Topics**	**Speakers**
10:00-10:10	**Opening and Welcome Address**	
	Welcoming Remarks Outline of the meeting	Kostas Eleftheriadis
10:10-11:30	**Overview of the LIFE Index Air project**	
	Introduction of the team (beneficiaries and EAB members*), objectives, general structure of the project, actions description and expected roles and involvement of each EAB member in the action**.	Marta Almeida Beneficiaries EAB Members
11:30-11:50	**Coffee break**	
11:50-13:00	**Round Table***** SWOT analysis of the project	All

*each institution will be invited to make a 2 min. presentation.
**from actions B1 to B7, 1-2 slides will be prepared and explained by the action leader. These slides will be included in a common powerpoint.
***all participants will be invited to participate actively in the round table.

Figure 11 - Agenda of the EAB meeting

Working resume and discussion

External Advisory Board Meeting (started at 10:54) – the main objective was to present the LIFE Index-Air to the EAB members and to receive their feedback about the outputs.

The meeting started with a brief welcome speech from Kostas Eleftheriadis from NCSR-D. Then, the word was given to Marta Almeida that acknowledged the presence of everyone, presented the agenda of the meeting and asked if everyone agreed with it. All members assented.

The partners and EAB members introduce themselves and then Otto Hänninen from THL made a presentation about the motivations of the project and its added value.

Marta Almeida made an overview of the LIFE Index-Air project and presented its goals, structure and products.

After the coffee break in a discussion session, the advantages of the LIFE Index-Air management tools were presented and EAB members were asked to give feedback about it.

The representatives of Ministry of Environment & Energy stated that the LIFE Index-Air project will be an important opportunity for the development of their activities. According to this Ministry, in Athens the levels of particles are exceeding the EU limit values, principally during the winter due to wood burning and meteorological conditions. Exceedances are also observed for ozone. While an air quality plan for Athens already exists, it is necessary to implement further actions in order to reduce the levels of these pollutants. With respect to PM pollution in Athens, exceedances of the 24 h standard are observed. On a yearly basis air quality limit values are attained. In order to assess the effectiveness of the actions plans, the Ministry of Environment & Energy also collaborates with the Ministry of Public Health. Regarding the most recent action plans, there is one related to biomass burning. There is also an action plan with bans and legislation focusing on industrial emissions. In the cities, focus is given on traffic: renewal of cars, natural gas, inner and outer ring (LEZ), a schedule to extend the tram and metro, bus lanes. Konstantinos Eleftheriadis and Marta Almeida explained how the LIFE Index-Air Tool may be able to provide a quantitative assessment of the action plans, not only with respect to ambient concentration but also to the protection of public health. It will thus give support in the definition of new control measures. In addition, Marta Almeida noted that among the project objectives is to demonstrate to the citizens of the studied cities that the measures adopted by the local, regional and national authorities are beneficial for their health, thus promoting the implementation of the mitigation strategies. The representatives of Ministry of Environment & Energy also commented that they consider that the project is an opportunity to share ideas with partners and stakeholders from other countries and are particularly interested in action B7 – Development of guidelines for action plans formulation.

The representative from the Association for Sustainable Development of Cities, Eugenios Gialias, stated that the local authorities have not developed any action plans; thus, the LIFE Index-Air tool will be very useful for municipalities, in order to assess actions and design action plans and to disseminate the results and exchange ideas with other policy makers, at an international level. Eugenios Gialias also proposed to assist the project partners in dissemination activities, such as the events planned for schools and the distribution of the questionnaires to stakeholders. When asked by Marta regarding time activity data, which are necessary in order to assess which microenvironments are relevant during each time of the day, he replied that he may be able to collect this data. Eugenios Yialias also noted that regarding control measures which rely on personal actions, SVAP can be very helpful in disseminating information about good practices in everyday life.

As a greater risk, the danger of the tool not being used was identified. It was considered a priority to customize the tool to the end-users needs and to invest on dissemination and training.

At mid-day, Marta, Kostas and Lila closed the meeting, appreciating the presence of the stakeholders and thanking the collaboration of all in the realization of the meeting.

Main conclusions of the meeting

The first LIFE Index-Air meeting with the Greek EAB members can be summarised as followed:

- An overview of the project goals, structure and timetable were presented.
- The EAB meeting was a great opportunity to receive feedback from the end-users of the project outputs. As a greater risk, the danger of the tool not being used was identified. It was considered a priority to customize the tool to the end-users needs and to invest on dissemination and training.

Approval of the Meeting Minute

According with the LIFE Index-Air Management Guide the minutes shall be considered as accepted if, within 10 calendar days from sending, no Member has sent an objection in writing to the chairperson. The chairperson will send the final version of the minutes by email to all the beneficiaries that were called to the meeting. A copy of the minutes will be archived in the LIFE Index-Air webpage.

LIFE Index-Air

Development of an Integrated Exposure – Dose Management Tool for Reduction of Particulate Matter in Air – LIFE15ENV/PT/000674

Stakeholder Meeting Report

Meeting with the Ministry of Health

Date: 17th March 2017
Venue: Ministry of Health, Athens, Greece

Chair: Evangelia Diapouli
Rapporteur: Evangelia Diapouli

Introduction

The present Minute Report has been generated in order to provide an overview of the first meeting with the Ministry of Health. The meeting was held at the Ministry's premised, in Athens, Greece, on 17th March 2017 (14:00-15:30). Dr Evangelia Diapouli was the only representative participating from the LIFE Index-Air project team and acted both as the chair of the meeting and the rapporteur.

Objectives

The objective of this meeting was to introduce the LIFE Index-Air project to the Ministry of Health. The Ministry of Health, while being one of the key project stakeholders, was not able to partipate in the External Advisory Board Meeting held in Greece in the framework of the project kick-off meeting. For this reason, Dr Diapouli from NCSR Demokritos visited the Ministry and discussed with Mrs V. Karaouli (Director of Public Health at the Ministry) and her team the main objectives of the project and expected outcomes.

Participating Members

The signed list of participants is presented in figure 12.

Agenda of the meeting
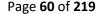
The working agenda of the meeting was the following:

- Overview of the project
- Feedback from the Ministry on the needs of national authorities and their potential to support the project

Working resume and discussion

The meeting started at 14:00 with an introduction by Evangelia Diapouli on the Index-Air project. Specicifally, Dr Diapouli presented to the representatives of the Ministry of Health the project team, its objectives, planned activities and expected outcomes.

The Ministry received very positively the initiation of the project and highlighted the present lack of tools and data for an integrated assessment of air quality and population exposure in Greek urban centres. Mrs Karaouli mentioned that the Ministry of the Environment and Energy is responsible for monitoring and assessing air quality; nevertheless, the role of the Ministry of Health is also very important in relating air quality with population exposure and the

protection of public health. She also observed that presently there is very little collaboration between the two Ministries with respect to the problem of air pollution, and she expressed the wish that through the LIFE Index-Air project this collaboration will be enhanced. Regarding the implementation of air pollution mitigation measures, the Ministry of Health mainly implements measures that relate to the information of the public during exceedance days or extreme pollution events, in order to avoid exposure of sensitive population groups (such as children and elderly) to peak concentrations. Nevertheless, the Ministry showed great interest for the Index-Air tool to be developed in the project and noted the significant value of this kind of tools for national authorities and policy making. Mrs Karaouli also proposed to add a cost-benefit aspect in the tool, which would be very useful for policy makers.

The Ministry requested if there are available data on indoor concentrations of air pollutants in school buildings. Dr Diapouli presented some results from previous measurement campaigns in Athens and informed the Ministry that all available data for Athens will be summarised in a database during the project implementation. She also explained the importance of such data on key indoor microenvironments for assessing the total personal and population exposure. The Ministry showed great interest in having access to this information, once they are collected by the project team.

Main conclusions of the meeting

The LIFE Index-Air meeting held in the Greek Ministry of Health can be summarized as followed:

- The project was presented to the Ministry.
- The Ministry expressed its wish to support the project and follow its activities.

Approval of the Meeting Minute

According with the LIFE Index-Air Management Guide the minutes shall be considered as accepted if, within 10 calendar days from sending, no Member has sent an objection in writing to the chairperson. The chairperson will send the final version of the minutes by email to all the beneficiaries that were called to the meeting. A copy of the minutes will be archived in the LIFE Index-Air webpage.

LIFE Index-Air LIFE15 ENV/PT/000674 – Development of an Integrated Exposure – Dose Management Tool for Reduction of Particulate Matter in Air

ATTENDANCE LIST

Title of the meeting: _Meetup with the Ministry of Health_

Date: _17/3/2017_   Action no.: _A1_   Activity no.: _A1.1_

Start time: _14:00_   End time: _15:30_

Meeting venue (city and country): _Athens, Greece_   Beneficiary: _NCSR-D_

Organization	Name	E-mail	Signature
Ministry of Health	Folios Georgiou	fgzergiou@moh.gov.gr	
Ministry of Health	Katerina Ntini	antini@moh.gov.gr	
<<	Vassiliki Karaati	yupe@moh.gov.gr	
NCSR Demokritos	Evangelia Diapouli	ldiapouli@ipta.demokritos.gr	

LIFE Index-Air is co-financed by the European Commission

Figure 12 - List of participants in the meeting with the Ministry of Health

LIFE Index-Air

Development of an Integrated Exposure – Dose Management Tool for Reduction of Particulate Matter in Air – LIFE15ENV/PT/000674

Stakeholder Meeting Report

Authorities and Stakeholder Meeting in Greece

Date: 21st March 2017
Venue: National Centre for Scientific Research "Demokritos", Athens, Greece

Chair: Evangelia Diapouli
Rapporteur: Athina-Cerise Kalogridis

Introduction

The present Minute Report has been generated in order to provide an overview of the First Consultation of the LIFE Index-Air beneficiaries with the Greek Authorities and Stakeholders. The meeting was hosted by NCSR Demokritos and it was held in Athens, Greece, on 21st March 2017 (09:00-14:00). Dr Evangelia Diapouli was the chair of the meeting and nominated Dr Athina-Cerise Kalogridis as the rapporteur.

Objectives

The consultation of authorities and stakeholders is an essential component of good environmental governance and it is thus a major priority of the project. The objectives of this meeting were:

- to introduce the environmental and health hazards related to air pollution and the European environmental policy and legislation
- to introduce the LIFE INDEX-Air Project to the Greek authorities and stakeholders
- to discuss the needs of stakeholders and authorities in regard to the tool generated in this project
- to obtain support from authorities and stakeholders for the dissemination of the project and organization of seminars in schools

Participating Members

Table 3 presents the members that participated in the meeting.

Table 3 - List of members that participated in Greek meeting

Organization	Name
Hellenic Ministry of the Environment and Energy	Mrs Eirini Tsilibari
	Mr Anastasios Adamopoulos
Hellenic Ministry of Health	Mr Fotis Georgiou
	Mrs Niki Papanikolaou
	Mrs Vassiliki Karaouli
Coalition of 21 Local Authorities of North and East Athens	Mr Pavlos Kamaras
	Mr Giorgos Kourasis
Region of Attica	Mr. Nasos Anagnostopoulos

Resilient Athens, Athens Municipality	Mrs Anastasia Gkika
Hellenic Society for the Protection of Environment and the Cultural Heritage	Mr Militiadis Lazoglou
mSensis S.A.	Mr Michalis Lilos
NCSR Demokritos	Dr Konstantinos Eleftheriadis
	Mr Vasileios Galifianakis
	Dr Evangelia Diapouli
	Dr Athina-Cerise Kalogridis

The signed list of participants is presented in figure 13.

LIFE Index-Air LIFE15 ENV/PT/000674 – Development of an Integrated Exposure – Dose Management Tool for Reduction of Particulate Matter in Air

ATTENDANCE LIST

Title of the meeting: 1st Meetup with stakeholders

Date: 21/3/2017   Action no.: A1   Activity no.: A1.1

Start time: 9:00   End time: 14:00

Meeting venue (city and country): Athens, Greece   Beneficiary: NCSR Demokritos

Organization	Name	E-mail	Signature
Υπουργείο Υγείας Καραγιαννίδης	Φωτης Γεωργιου	fgeorgiou@mch.gov.gr	
ΣΥΝΔΕΣΜΟΣ 21 ΟΤΑ	Παυλος Καμαρας	p.kamaras@yahoo.gr	
Συνδεσμος 21 ΟΤΑ	Κουράσιω	kourasisg@email.com	
Γραφειο Αστικης Ανθεκτικοτητας, Δημος Αθηναιων	Αναστασια Γκικα	gkikatasia@gmail.com	
m Sensis Ar	Michala Lila	m.lilos@... msensis...	
ΥΠΕΝ	Τσιλιμπάρη Ειρηνη	etsilibari@prv.ypeka.gr	
ΥΠΕΝ	Αδαμόπουλος Α.	a.adamopoulos@prv.ypeka.gr	
ΥΠΟΥΡΓΕΙΟ ΥΓΕΙΑΣ	Παπανικολάου Νικ.	npapanikolaou@moh.gov.gr	
Π.Π. Δ. ΑΤΤΙΚΗ	ΑΝΑΣΤΑΣΟΠΟΥΛΟΣ	nasosan@...com	
CRETE "Δ"	ΕΛΕΥΘΕΡΙΑΔΗΣ	eleften@ipta.demokritos	
ΕΚΕΦΕ "Δ"	Γαλιερανάκης Β.	vgal.f@ipta.demokritos.gr	
ΕΛΚΕΤ	Μηλιατο Δ.	entspa@ellinikironi...gr	
Υπ. Υγείας	Β. Καραούλη	yupp@moh.gov.gr	
NCSR Demokritos	A. Καλογρίδη	akalogridi@ipta.demokritos.gr	
NCSR Demokritos	Evangelia Diapouli	ldiapouli@ipta.demokritos.gr	

Figure 13 - List of participants in the Greek meeting

Agenda of the meeting

The working agenda of the meeting with Greek Authorties and Stakeholders is presented in Table 4.

Table 4 - Agenda of the meeting with Greek authorities and stakeholders

09:00-09:30	Welcome coffee
09:30-10:00	*Air Quality and health in Europe* Dr K. Eleftheriadis, NCSR «Demokritos»
10:00-10:30	*Human exposure to air pollutants and indoor air quality* Dr E. Diapouli NCSR «Demokritos»
10:30-11:00	*Presentation of the LIFE15 ENV/PT/000674 "Index-Air" Project* Dr A.-C. Kalogridis, NCSR «Demokritos»
11:00-11:30	*National Strategy for air quality and health – Overview of the questionnaire to stakeholders and authorities* Mr V. Galifianakis, NCSR "Demokritos"
11:30-12:00	Coffee Break
12:00-14:00	Discussion

Working resume and discussion

Presentations:

- Air Quality & Health in Europe (started at 09:45)

Dr Eleftheriadis introduced the project by presenting the scientific, environmental and societal challenges related to air pollution and its health impacts. More precisely, he provided the audience with quantitative information about PM levels in Europe, spatial and temporal trends, as well as events of exceedance of air quality EU limit values in urban areas.

He focused on the health hazards related to exposure to environmental pollution and on the importance to assess the burden of disease related to air pollution.

Results of source apportionment studies from previous LIFE projects were presented and Dr K. Eleftheriadis underlined the importance to have source apportionment studies for characterizing the contributions to personal exposure and global burden of disease from

particular emission source. He also highlighted the need for collaborative efforts between the scientific and environmental regulatory and policy communities for conducting these assessments and designing/evaluating mitigation strategies.
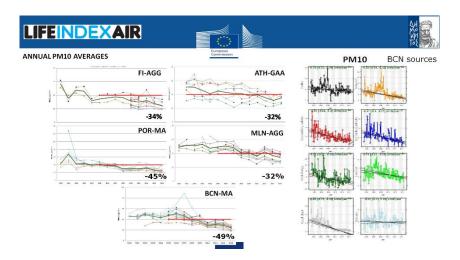
Figure 12 - Long-term trends of PM concentrations and related source contributions in Sourthern European countries

- Human Exposure to air pollutants and indoor air quality

Dr Evangelia Diapouli presented an introduction on the relationships between indoor and outdoor air quality, and quantitative information about the contribution of indoor and outdoor generated air pollutants to human exposure and global burden of disease. She presented the theoretical background required to understand the methodology used in exposure/dose studies, as well as the epidemiological approach to study burden of disease.

Dr Diapouli presented results from previous projects with quantitative information about indoor pollution. She also presented the relationships between hazard identification / exposure assessment / risk characterization / exposure monitoring / risk managment and policy implementation.
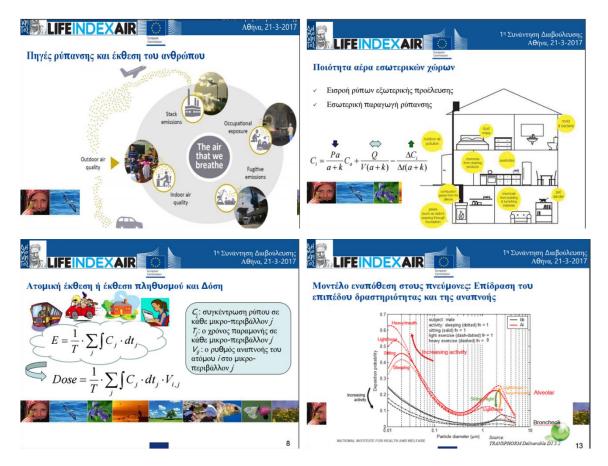
Figure 13 - Indoor and outdoor sources of air pollution and estimation of human exposure and inhaled dose

- Presentation of the LIFE INDEX AIR Project

Dr Athina-Cerise Kalogridis provided the audience with detailed information about the project. First, the LIFE program, as well as the beneficiary organizations and stakeholders of the project were presented. Then, the objective, methodology, working packages, and expected outputs were presented. The principle of operation of the INDEX-AIR tool was explained, and a special focus was given on the operational/user-friendly aspect of the tool designed to be used by non-scientific operators.

Figure 14 - Overview of the LFE Index-Air project

- National Strategy for air quality and health – Overview of the questionnaire to stakeholders and authorities

During his presentation, Mr V. Galifianiakis highlighted the importance of the consultation process and more generally the necessity to have collaborative efforts between the scientific community and regulatory bodies. He also introduced the questionnaire to be filled by the project stakeholders.
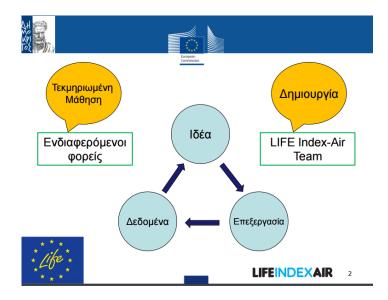
Figure 15 - Consultation process and inter-relationships between LIFE Index-Air beneficiaries and stakeholders

Main conclusions of the meeting

Stakeholders' questionnaire:

All stakeholders' had received the questionnaire a few days before the meeting. Some of them had filled it before the consultation whereas some others filled it after the first session.

The questionnaires were then gathered and the answers were reviewed by the chair, Dr E. Diapouli, and discussed among the participants. Two of the participants asked to fill the questionnaires after the meeting, in consultation with other members of their team/institution. The detailed assessment and analysis of questionnaires will be presented in Deliverable A1.

Conclusions:

The LIFE Index-Air meeting held in Athens can be summarized as followed:

- The discussion mainly focused on the expectation of the different stakeholders about the tool capabilities.
- The representatives from local and regional authorities insisted on the importance to ensure the reproducibility and optimum operation of the tool after the implementation of the project (after-LIFE). There was an active exchange of views between the stakeholders, beneficiaries and the software developer about the means to achieve this reproducibility. There were also some questions concerning the type of data that could be used and the process for creating new input databases.
- Additionally, all participants agreed on the importance of visualizing results and to have a web-based platform.
- The representatives from the Ministry of the Environment and Energy provided information on the National Monitoring Network operated by the Ministry. They

mentioned the need for chemical composition data (such as heavy metals and BaP), which presently are only measured during a small part of the year (14% coverage approximately). In addition, they noted that, while air quality and related emission sources have been studied in Greece, there is still lack of information regarding the actual population exposure as well as a mapping of pollution levels within the big urban centres. Among future priority areas for the Ministry they have included the identification of emission sources responsible for exceedances, the use of an Air Quality Index to assess air pollution levels and the application of tools for the assessing the effectiveness of control measures.

- The representative from the Ministry of Health noted the need to have access to reliable tools for assessing the relationship between air pollution levels and impact on public health. They also identified PM2.5 as a critical atmospheric pollutant, where future research should focus. They informed the project team that the Action Plans implemented by the Ministry with respect to air pollution include mainly informative actions for the general public, in the case of exceedance events. These plans have been focusing on PM and O3. Regarding PM emission control strategies, the Ministry of Health has identified as major sources vehicular traffic, combustion activities and smoking (for indoor microenvironments).

- The representative from the Athens Municipality - Resilient Athens identified the need for computational tools for the evaluation of the impact of the increased concentration of PM (both outdoors and indoors) to human health. She noted that the quantitative assessment of future measures (short- and long-term) based on air quality and health impacts will empower the city with evidence and will result in the commitment of policy-makers to apply the measures. She also observed the lack of systematic evaluation of air quality in public buildings, especially the ones used by sensitive population sub groups, such as school buildings or hospitals.

- The representatives of the Coalition of 21 Local Authorities of North and East Athens highlighted the need to organise informative meetings and workshops for local and regional authorities, in order to communicate the key messages of the Index-Air project and assist local policy makers in identifying and implementing effective control measures. They also offered their assistance to the project team with respect to the organization of the educational seminars in primary schools.

At the conclusion of the meeting, Dr Diapouli thanked all the participants for their active participation and noted that this interaction process with key stakeholders is an integral part of the LIFE Index-Air project and will be continued throughout the implementation of the different project activities.

Report on Questionnaire Rresults

Deliverable A1.2

Introduction

Authorities and stakeholders consultation is an essential component of good environment governance. This is a project's priority towards the fulfilment of the main objective of the project which is the implementation of the management tool by the authorities. This action is fundamental to promote the involvement of the stakeholders from the beginning and to make them part of the project. Their input will be essential for an efficient implementation of the actions.

Therefore, in this context it is necessary to consult the stakeholders, to present the project, to seek their views and to obtain their support for its implementation. Gaps and needs emerging from previous practices will be collected and systematized. The purpose is to gain a better perspective about the more important questions that still need to be addressed and to focus on the policymakers' priorities, envisaging the development of a tool that will really support the preparation of air quality plans and mitigation measures.

In this context a questionnaire was developed and applied to eight stakeholders from the four contries where the LIFE Index-Air tool will be implemented – Portugal, Finland, Greece and Italy:

1. Portuguese Environment Agency (APA);
2. Lisbon and Tagus Valley Regional Coordination and Development Commission (CCDR-LVT);
3. North Regional Coordination and Development Commission
4. Agenzia Regionale Protezione Ambientale Veneto (ARPAV) - Environmental Protection Agency of Veneto Region-Italy
5. City of Kuopio-Finland
6. Hellenic Ministry of Health-Greece
7. Hellenic Ministry of the Environment and Energy - Department of air quality-Greece
8. Hellenic Society for the Environment and Cultural Heritage-Greece
9. Coalition of 21 Local Authorities of North and East Athens
10. Region of Attica
11. Resilient Athens, Athens Municipality
12. mSensis S.A.

Questionnaire Results

The answered questionnaire can be consulted in Annex 2. In this section an analysis of the answers given by stakeholders is performed.

2. Type of institution:
□ **Research / Higher Education**

□ **Applied research**   □ **Fundamental/basic/pure research**

□ **Private Company**

□ **Government Agency/Institution/Administration**

□ **Non-Governmental Organization**

The majority of respondents (88.9 %) work for a Government Agency /Institution/Administration while 11.1 % of respondents work for a Non-Governmental Organization.

5. What type of assessment tools would help you to better include health and health risks in your work?

According to questionnaire results, the development of monitoring and modelling tools is necessary. In particular, an assessment tool that would allow to quantify the health related risk to population exposure to different concentration levels of macro air pollutants (PM_{10}, $PM_{2.5}$, NO_2, CO, O_3, benzene) and micro pollutants (IPA, B(a)P, PCDD/F, PCB). In addition, it would be important to be able to apply the assessment tool both to real data (concentration levels taken from measurements) or estimations coming from scenario analysis, forecasting data for new plants or emission sources or mitigation and action plans. In this moment the tools to properly evaluate the relation between different scenarios and risk are inexistent. In addition, computational tools for the evaluation of the impact of the increased concentration of PM in the atmosphere to the human health that could lead to the quantification of the most appropriate future measures (short and long-term) at municipal/regional level in order to protect public health and improve life in urban cities. Therefore, the LIFE Index-Air project will be very useful for the definition of contingency plans. Finally, will be useful a web-application tool.

How important would you consider availability of such tools is?
Scale 1-5 (not important - essential)

The respondents pointed out that these tools are essentials. In particular, 44.4 % of respondents answered 5 (essential) and the other 33.3 % of respondents answered 4. The remainder of respondents (22.2 %) didn't answer the question.

PART A – MONITORING AND ASSESSMENT

A1. How extensive data set of PM chemical speciation measurements is available? Available data also from research projects may be included. Please specify:

- **Number of sampling stations:** According to questionnaire results, there are 86 sampling stations. In particular, 32 in Portugal (23 stations managed by CCDR-LVT, 7 stations managed by CCDR-N and 2 stations managed by APA), 32 in Italy (managed by ARPAV), 20 in Greece (managed by Hellenic Ministry of the Environment and Energy) and 2 in Finland (only city of Kuopio).

- **Location:** 29 urban background sites (15 in Portugal, 13 in Italy and 1 in Finland), 12 rural background sites (5 in Portugal and 7 in Italy), 17 urban traffic sites (9 in Portugal and 8 in Italy), 6 industrial sites (3 in Portugal and 3 in Italy) and 2 sub-urban background site (1 in Italy and 1 in Finland). Finally, 20 sampling stations in Greece.

- **Techniques:** PM_{10} and $PM_{2.5}$ are measured through Beta Attenuation instruments and standard gravimetric methods. In particular, techniques according to EN *12341* as required by Directive 2004/107/EC are performed. In addition, metals (Pb, As, Cd, Ni) are measured on PM_{10} aerosol with microwave digestion of the samples and analysis by inductively coupled plasma mass spectrometry. Furthermore, IPA and B(a)P are measured with high-performance liquid chromatography-fluorescence detection while water-soluble ions are measured with ion chromatography.

- **Sampling/measurement frequency:** Systematically and continuously with Beta Attenuation instruments while a 24h sampling every 2-3 days or 15 days with standard gravimetric methods.

- **Sampling/measurement duration:** Hourly with Beta Attenuation instruments while 24h every 15 days or 24hr every 2 days for 30 days in winter and 30 days in summer with standard gravimetric methods.

Other information: Data is reported in Qualar website http://qualar.apambiente.pt/ (sampling stations managed by CCDR-LVT and CCDR-N). In addition, preliminary campaigns in 2008 evidenced exceedances to the threshold values of Ni and BaP in 3 locations in Portugal (sampling stations managed by CCDR-N). Furthermore, a more extensive PM chemical speciation campaign is planned for the same Padua site for 2017 year, in parallel with other measurements all around Italy in the framework of an Italian scientific project under the scientific coordination of CNR, the Italian Research Council. For this project ions and EC/OC will be detected on PM_{10} and $PM_{2.5}$ fractions during, at least 2 weeks campaigns for each cold and hot season. IPA will be detected for at least 5 weeks all along the year. For Greece available data in http://www.ypeka.gr/.   In addition, the Municipality of Athens gave the following papers:

Thomaidis N.S., Bakeas E.V. and Siskos P.A. (2003). Characterization of lead, cadmium, arsenic and nickel in $PM_{2.5}$ particles in the Athens atmosphere, Greece. Chemosphere, 52(6), 959 -966.

Szigeti T., Dunster C., Cattaneo A., Cavallo D., Spinazzé A., Saraga D.E., Sakellaris I.A., de Kluizenaar Y., Cornelissen E.J.M.H.O., Peltonen M., Calzolai G., Lucarelli F., Mandin, C., Bartzis J.G., Záray G., Kelly F.J. (2016). Oxidative potential and chemical composition of PM2.5 in modern office buildings across Europe – the OFFICAIR study. Environ. Int. 92-93, 324–333.

A2. What are the main concerns considering the PM measurements?

□ Exceedances , □ Health Impact, □ Other

The respondents gave more than one answer. In particular, 33.3 % of respondents answered exceedances, 33.3 % of respondents answered exceedances & health Impact, 22.2 % of respondents answered health impact and 11.1 % of respondents didn't answer the question. Therefore, the majority of respondents answered exceedances.

A3. Is there any regulation about Indoor Air Quality (IAQ)? □ Yes □ No

Is the IAQ in schools/homes evaluated in a systematic way? What are the main concerns about IAQ in schools/homes?

According to questionnaire results, 44.4 % of respondents answered yes while 33.3 % of respondents answered no. The other 22.2 % of respondents didn't answer the question. In addition, the majority of respondents (77.8 %) answered there is no systematic evaluation of IAQ in schools/homes while 22.2 % of respondents didn't answer the question. In particular, APA and CCDR-LVT pointed out that provision n.º 353-A/2013 establishes the minimum values of fresh air flow per space, as well as the thresholds and reference conditions for indoor air pollutants in service buildings. Schools are included in this legislation but there is no legislation for IAQ in homes. In addition, CCDR-N claimed that systematic evaluation of IAQ is important and essential, not only in schools and homes but also in working places. Furthermore, the municipality of Athens pointed out that there are a few peer reviewed journal papers that have performed measurements occasionally in schools, hospitals and offices in Athens and have correlated the outdoor with the indoor air quality by measuring the concentrations of PM and have developed tools that can estimate the impact in human health. Finally, the main concerns in Finland are molds and microbes.

A4. Environmental risks can be represented as a chain of events as below; please mark by circles and arrows which associations along the chain have been assessed in your city:

emission sources - environmental contamination - population exposures - health effects - economic costs of pollution

According to questionnaire results, 44.4 % of respondents answered that the emission source and the environmental contamination have been assessed while 22.2 % of respondents didn't answer the question. In addition, 11.1 % of respondents answered that all environmental risks have been assessed while 11.1 % of respondents answered all environmental risks (except economic costs of pollution) have been assessed. The other 11.1 % answered all

environmental risks (except health effects) have been assessed. In particular, all environmental risks (except health effects) have been addressed for the Northern Region of Portugal, but for different purposes and not as a chain of events. Finally, emission sources and contamination (concentrations in the atmosphere) are monitored regularly in Finland and Greece. In particular, population exposure and health effects have been assesses in some studies for Finland. Population exposure has been assessed in general level also based on dispersion model calculations. THL has made some studies of indoor air quality on schools in Kuopio.

A5. Have you records of the population mortality/morbidity? If Yes, please clarify.

According to questionnaire results, 44.4 % didn't answer the question, 33.3 % of respondents answered no and only 22.2 % of respondents answered yes. In particular, CCDR-N stated that does not have mortality/morbidity records but they would like to have access to this information. That would be very useful to complement the air quality assessment and management in the region. Likewise, the Ministry of Health of Greece does not have mortality/morbidity database. However, there is available data from epidemiological studies.

In addition, the municipality of Athens pointed out that there is a published study from Aphekom project (http://aphekom.org/c/document_library/get_file?uuid=7f3e524d-85cd-49ed-98d7-112e336330b3&groupId=10347). The aims of the Aphekom project was to estimate, using standardised methodology, the benefit to human health by reductions in the air pollution levels under different scenarios. Mortality and air pollution data (PM_{10}, $PM_{2.5}$ and ozone) from 2004 to 2006 were used for the city of Athens. Decreasing daily average concentrations of PM_{10} by 5µg/m^3 and 20 µg/m^3 could avoid 85 and 371 premature annual deaths, respectively. A decrease in long-term average $PM_{2.5}$ concentrations by 5µg/m^3 and 10µg/m^3 could reduce attributable cardiovascular mortality by 33 and 118 annual cases per 100,000. A 5µg/m^3 reduction in ozone daily mean levels is related to 44 avoidable annual deaths. Finally, Finland has national and local database.

A6. Do you have data/information about time activity patterns for the population in your city? If Yes, please clarify.

The majority of respondents (66.7 %) answered no while 22.2 % of respondents didn't answer the question. Only 11.1 % of respondents answered yes. In particular, only some results from some scientific studies (THL).

A7. What do you see as future research needs/air quality monitoring issues in your area?

According to questionnaire results, the need to establish a closer link between environment and health was identified, since the respective governmental institutions, currently, have no direct collaboration. A bigger effort should be made to work on common interests and research goals. It is important to implement measures to reduce emissions from residential combustion, however, without regulation it is difficult to define a strategy. In addition, the

National strategy for the Air 2020 points out the need of research projects that support the development of new policies for the protection of air quality: (a) assessment of emissions from sectors with insufficient, disjointed and/or inconclusive information e.g. maritime transport and harbours, (b) development of methodologies that optimize air quality management with the best cost benefit ratio, (c) quantification of the effects of air pollution on human health in Portugal and (d) assessment of the effects of air pollution on ecosystems in Portugal. In addition, significant air quality issues are: (a) monitoring of micro-pollutants (mostly organic as benzo(a)pyrene and other IPA, tracers of biomass burning, PCDD-F near specific industrial plants), gas precursors for ozone, UF particles, $PM_{2.5}$ and PM_{10}, (b) determination of compounds in airborne particulate matter (especially for $PM_{2.5}$), (c) monitoring of PM in indoor areas with vulnerable groups (d) odour problems (waste water drains, waste treatment plants etc.) in dwelling areas, (e) air quality impacts of domestic wood combustion, (f) data for population exposure, (g) impact assessment of sources contribution to exceedances and (h) air quality index (AQI) for large cities.

PART B – ACTION PLANS

B1. Have you developed an action/air quality plan in case of exceedances in air quality? □ Yes   □ No

Give Link/document please

The majority of respondents (66.7 %) answered yes while only 22.2 % of respondents answered no. The other 11.1 % of respondents didn't answer the question. Finally, the respondents gave the following links:

http://www.arpa.veneto.it/temi-ambientali/aria/informazione-al-pubblico-sui-livelli-di-pm10

https://www.apambiente.pt/index.php?ref=16&subref=82&sub2ref=1174

http://www.ccdrn.pt/sites/default/files/ficheiros_ccdrn/ambiente/plano_qualidade_ar_rn_oz ono.pdf.

http://www.ccdrn.pt/sites/default/files/ficheiros_ccdrn/ambiente/plano_qualidade_ar_rn_no 2.pdf.

http://www.ccdrn.pt/sites/default/files/ficheiros_ccdrn/ambiente/medidas_programa_no2.pd f.

B2. Can you provide us with some details for the action plan?

CCDR-LVT pointed out that the European legislation in force since 1996 on air quality assessment and management states that Member States in zones and agglomerations where the levels of one or more pollutants exceed the limit values (plus a margin of tolerance, if applicable) shall draw up and implement air quality improvement plans to ensure compliance with the limit value within the time limit. In compliance with this obligation, in 2005 CCDR-LVT elaborated the Air Quality Improvement Plan for the Lisbon and Tejo Valley Region (PMQA-

LVT) for the evaluation period 2001-2004, which was approved by provision n.º 715/2008, of August 6. This plan, which applies to the agglomerations of the Metropolitan Area of Lisbon Norte, Metropolitan Area of Lisbon South and Setúbal (areas where PM_{10} particles and nitrogen dioxide levels were higher than the limit values, plus their margin of tolerance), was designed to evaluate and to propose a set of measures, to be implemented in the short-medium term, to enforce the limit values in these zones, in accordance with the provisions of Decree-Law n.º 276/99, of July 23, amended by Decree-Law n.º 279/2007, of August 6.

In addition, CCDR-N considered that the exceedances of the PM_{10} limit values at four agglomerations namely, Porto Litoral, Braga, Sousa Valley and Ave Valley promoted the development of a strategy to mitigate emissions of this pollutant. This strategy was consolidated through the Plan to Improve Air Quality in the Northern Region which presented a set of measures to be implemented in Porto Litoral, Braga, Sousa Valley and Ave Valley agglomerations, identified as those in which the problems of air quality would justify an intervention and the adoption of measures. This plan was published in the Portuguese Decree 716/2008. Consequently, the PERN was elaborated (PERN–Execution Programme of the Plan to Improve Air Quality in the Northern Region, and approved through the Decree 20762/2009. The air quality plan and action plan for NO2 highlights the traffic as the main sector contributing to the exceedances to the annual and daily limit value. The action plan for PM_{10} also contributes to the reduction of NOx emissions with measures for the transport sector. Since most NO2 exceedances occur in traffic monitoring stations, measures should be implemented at local/municipal level. Regarding the O3 air quality plan, it was found that the main cause of ozone exceedances is related to background concentration levels, and thus, a regional/national based strategy is required. Moreover, measures focusing on transport and residential combustion sectors were proposed, aiming to decrease emissions of ozone precursors.

Furthermore, APA highlighted the National strategy for the Air 2020 (ENAR 2020) aims to improve air quality to protect human health, citizens' quality of life and ecosystems and it is based on three axes: (1) Evaluate, (2) Anticipate and (3) Act. The measures envisaged in ENAR 2020 are intended to achieve the air quality objectives proposed in the Clean Air Program for Europe and to contribute to the Green Growth Commitment, in line with national climate policy instruments. ENAR 2020 is also intended as a reference framework for drawing up air quality improvement plans under the responsibility of the CCDRs, thus enabling effective integration of local, regional and national measures.

In addition, ARPAV pointed out that the Veneto Region action plan foresees different critical levels and correspondent information and actions for PM_{10} exceedances of the daily limit to be act by the Municipalities under a common coordination of the Veneto Region Authority. The critical level 0 means non exceedance of the PM_{10} daily limit of 50 $\mu g/m^3$. The critical level 1 means that in a zone or agglomeration the PM_{10} concentrations have been exceeding the daily limit (50 $\mu g/m^3$) for 7 days. The critical level 2 means in a zone or agglomeration the PM_{10} concentrations have been exceeding twice the daily limit (100 $\mu g/m^3$) for 3 days. Main actions

that the Municipalities adopt are public alert by website news and press releases, road traffic limitations and domestic heating limitations (mainly biomass burning devices).

Finally, Hellenic Ministry of Health informs population through recommendations for exceedances of PM and ozone. The recommendations are being published in http://www.moh.gov.gr/.

B3. Have you implemented in the past action plans and when?

The majority of respondents (55.6 %) answered yes while only 11.1 % of respondents answered no. The remainder of respondents (33.3 %) didn't answer the question.

B4-What emission sector(s) are you addressing with your air pollution mitigation measures?

□ **SNAP1-combustion in energy and transformation industries**

□ **SNAP2-non-industrial combustion plants**

□ **SNAP3-combustion in manufacturing industry**

□ **SNAP4-production processes**

□ **SNAP5-extraction and distribution of fossil fuels and geothermal energy**

□ **SNAP6-solvent and other product use**

□ **SNAP7-road transport**

□ **SNAP8-other mobile sources and machinery**

□ **SNAP9-waste treatment and disposal**

□ **SNAP10-agriculture**

□ **SNAP11-other sources and sinks**

□ **Other**

According to questionnaire results, 22.2 % answered only road transport (SNAP7) while the other 22.2 % of respondents didn't answer the question. The remainder of respondents gave more than one answer. In particular, 11.1 % of respondents answered road transport (SNAP7) & waste treatment and disposal (SNAP 9) & Other (domestic heat), 11.1 % of respondents answered SNAP1 & SNAP2 & SNAP3 & SNAP4 & SNAP7 & SNAP10, 11.1 % respondents answered SNAP7 & SNAP9, 11.1 % of respondents answered non-industrial combustion plants (SNAP2) & road transport (SNAP7) & agriculture (SNAP10) and the other 11.1 % of respondents answered SNAP1 & SNAP2 & SNAP6 & SNAP7 & SNAP8. Therefore, the majority of respondents answered road transport (SNAP7).

B5. Which specific measures for the improvement of air quality and especially for the reduction of particulate pollution are currently being used?
□ **Strategies to reduce PM emissions from traffic, e.g. promotion of low emission vehicles**
□ **Strategies to reduce PM emissions from heating and energy production**
□ **Zoning as a strategy to reduce PM emissions**
□ **Strategies to reduce air pollution emissions from local sources, e.g. traffic or domestic combustion**
□ **Strategies to reduce fugitive dust emissions, e.g. road dust**
□ **Strategies to react on air pollution episodes**

According to questionnaire results, 22.2 % of respondents didn't answer the question, 11.1 % of respondents answered strategies to reduce air pollution emissions from local sources, 11.1 % of respondents answered strategies to reduce PM emissions from traffic & zoning as a strategy to reduce PM emissions, 11.1 % of respondents gave all answers except strategies to react on air pollution episodes, 11.1 % of respondents gave all answers except strategies to reduce PM emissions from heating and energy production & strategies to react on air pollution episodes, 11.1 % of respondents gave all answers except strategies to reduce PM emissions from heating and energy production & strategies to reduce fugitive dust emissions, e.g. road dust, 11.1 % of respondents gave all answers except zoning as a strategy to reduce PM emissions and the other 11.1 % of respondents gave all answers except strategies to reduce fugitive dust emissions, e.g. road dust. Therefore, the majority of respondents answered strategies to reduce air pollution emissions from local sources.

B6. How and how frequent do you evaluate the effect of measures?
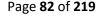
The majority of respondents (55.6 %) didn't answer the question, 11.1 % of respondents answered continuously (mainly yearly basis), 11.1 % of respondents answered that National strategy for the Air (ENAR 2020) will be evaluated in 2019, 11.1 % of respondents answered that evaluation performed with monitoring air quality and the other 11.1 % of respondents pointed out that it's very difficult to evaluate the effect of measures. However, qualitative assessment is reported annually for the National Ministry.

B7. Should further mitigation measures be considered?

According to questionnaire results, 44.4 % of respondents answered yes while 55.6 % of respondents didn't answer the question. In particular, respondents answered only at small (limited) scale while CCDR-N considered that the measures at national level are required namely to reduce emission from the residential combustion sector.

B8. What are the most effective measures for PM compliance in your opinion for European urban environments?
□ **Street washing** □ **Application of dust suppressants** □ **Vehicular traffic regulation** □ **Wood burning regulation** □ **Others**

The respondents gave more than one answer. In particular, 44.4 % of respondents answered vehicular traffic & wood burning regulation, 22.2 % of respondents answered street washing & vehicular traffic & wood burning regulation, 11.1 % of respondents answered vehicular traffic regulation & others and 11.1 % of respondents answered only wood burning regulation. The other 11.1 % didn't answer the question. Therefore, the majority of respondents answered wood burning regulation.

B9. Please, provide reference for your activity (reports, papers, etc.)

The respondents gave the following reports and papers:

"Plans and Programs for the Improvement of Air Quality in the Lisbon and Tagus Valley Region"

"Program for the Implementation of the Air Quality Improvement Plan in the Lisbon and Tagus Valley Region"
"Air Quality Protocols"

"Environmental Air Quality Assessment Report in the Lisbon and Tagus Valley Region for the Period 2001-2013"

"Assessment of the impact on Inhalable particles resulting from the washing on Avenida da Liberdade"

"Atmospheric Emissions Inventory of the Lisbon and Tagus Valley Region"

These documents are available in http://www.ccdr-lvt.pt/pt/qualidade-do-ar/1265.htm

National strategy for the Air 2020 (ENAR 2020), available in
https://www.apambiente.pt/index.php?ref=16&subref=82&sub2ref=1174

Environment Status Reports, available in
https://www.apambiente.pt/index.php?ref=19&subref=139&sub2ref=460

Italian languages
Regional Air Quality network operated by ARPAV, description:
http://www.arpa.veneto.it/temi-ambientali/aria/qualita-dellaria/la-rete-di-monitoraggio

Most recent annual report on air quality measurements recorded by the regional air quality network:
http://www.arpa.veneto.it/temi-ambientali/aria/file-e-allegati/documenti/relazioni-regionali-della-qualita-dellaria/Relazione%20Annuale%20Qualita%20dellaria%202015.pdf

Previous air quality annual reports:

http://www.arpa.veneto.it/temi-ambientali/aria/riferimenti/documenti

On a specific study on strategies and local actions for the mitigation of Port, Industries and Cities Emissions (MED-APICE project, http://www.apice-project.eu/)

F. Liguori, A.Latella, S.Pillon , E.Elvini, S.Patti, P.Prati, C.Bove, P.Brotto, F.Cassola, E.Cuccia, N.Marchand, A.Detournay, D.Salameh, A.Armengaud, D.Piga, J.Pey, N.Perez, X.Querol, A.Poupkou, D.Melas, G.J.Bartzis, K.Filiou, D.Saraga, E.I.Tolis, T. Quaglia , M.T.Zanetti, M. Parra, P.Ferrnández, C. Perez, E.Repa (2012). *Approcci di Source Apportionment a confronto nel progetto MED-APICE.* PM2012 5^ Convegno Nazionale Società Italiana Aerosol - 16-18 May 2012, Perugia. http://www.pm2012.it/sitoweb/contributi.pdf http://www.pm2012.it/sitoweb/presentazioni/Liguori.pdf

F. Liguori (2012). *Il progetto MED-APICE*, capitolo del *Focus su PORTI, AEROPORTI E INTERPORTI. VIII Rapporto Qualità dell'ambiente urbano*. Edizione 2012. ISPRA – Istituto Superiore per la Protezione e la Ricerca Ambientale, Roma, September 2012. ISBN 978-88-448- 0562-3. http://www.isprambiente.gov.it/it/pubblicazioni/stato-dellambiente/focus-su-porti-aeroporti-e-interporti/

Contributo alla pubblicazione Gissi, E., Quaglia, T. (a cura di) (2012), Qualità dell'aria nella laguna di Venezia. APICE: verso la riduzione dell'inquinamento atmosferico, Franco Angeli, Milano, ISBN 978-88-204-1983-7.

AA,VV (2013). Reducing atmospheric pollution in the Mediterranean Port Cities - The results of APICE project. ARPAV febbraio 2012, Padova ISBN 978-88-7504-166-3. http://www.apice-project.eu/img_web/pagine/files/Publication/Final%20Publication.pdf

On a specific study on exposure of population to air pollution due to ship emissions:
(MED-CAIMANS project, http://www.medmaritimeprojects.eu/section/caimans)

F. Liguori, S. Pillon, S. Patti (2016). Progetto MED-CAIMANs. L'esposizione della popolazione agli inquinanti atmosferici dovuti alle navi crociera a Venezia: confronto tra scenario attuale e scenari futuri di sviluppo e di mitigazione, capitolo del *Focus su Inquinamento atmosferico nelle aree urbane ed effetti sulla salute. XII Rapporto Qualità dell'ambiente urbano*. Edizione 2016. ISPRA – Istituto Superiore per la Protezione e la Ricerca Ambientale, Roma, Dicembre 2016. ISBN 978-88-448-0794-8. http://www.isprambiente.gov.it/files/pubblicazioni/statoambiente/FOCUS_RAU_2016_COMPLETO.pdf/view

English languages
On a specific study on cruise and passenger ship iir quality impact mitigation actions (MED-CAIMANS project, http://www.medmaritimeprojects.eu/section/caimans)

AA,VV (2015). Air Quality Impact and Green House Gases Assessment for Cruise and Passenger Ships. Results of the first step of CAIMANs project.

http://www.medmaritimeprojects.eu/download/ProjectCaimans/output/CAIMANs_Final_Report_partA.pdf

On a specific study on strategies and local actions for the mitigation of Port, Industries and Cities Emissions:
http://www.apice-project.eu/
http://www.apice-project.eu/img_web/pagine/files/Publication/Final%20Publication.pdf
Saraga D.E., E.I. Tolis, K.F. Filiou, J. Pey, P. Fernandez, C. Brescianini, M.T. Zannetti,P. Prati, A. Armengaud, D. Piga, D. Melas, A. Poupkou, A. Latella, F. Liguori, S. Patti and J.G. Bartzis (2012). THE AIR QUALITY STATUS OF FIVE EUROPEAN PORT-CITIES: AN OVERVIEW FOCUSED ON PM10. *8th International Conference on Air Quality - Science and Application*. 19-23 March 2012, ISBN: 978-1-907396-80-9 http://www.airqualityconference.org/f/d/Toc_AbstractBook-AQ2012.pdf

A. Detournay, D. Salameh, J.L. Jaffrezo, J. Cozic, J.Pey, N. Perez, X. Querol, P. Prati, M.C. Bove, E. Cuccia, D. Massabo, J. Bartzis, D. Saraga, E. Tolis, K. Filiou, A. Latella, F. Liguori, S. Patti, A. Armengaud, D. Piga and N. Marchand (2012). *Intercomparison of source apportionment approaches within the EU-MED APICE project*. European Aerosol Conference,2-7 September 2012 Granada (Spain). http://www.eac2012.com/; http://www.eac2012.com/EAC2012Book/files/1106.pdf.

Salameh, D., et al. (2015). PM2.5 chemical composition in five European Mediterranean cities: A 1-year study. Atmospheric Research VOL - 155, pp 102-117, 2015/3/15.

On PM source apportionment:

Silvia Pillon, Fabio Dalan, Francesca Liguori and Giuseppe Maffeis (2008), *PM SOURCE APPORTIONMENT ANALYSIS IN THE VENETIAN AREA*. 12th conference on Harmonisation within Atmospheric Dispersion Modelling for Regulatory Purposes. Cavtat, Croatia, October 6-9, 2008.

Elena Vescovo, Fabio Dalan, Silvia Pillon and Francesca Liguori (2009), *SOURCE APPORTIONMENT STUDY OF TROPOSPHERIC OZONE IN NORTH-EAST OF ITALY, USING A PHOTOCHEMICAL MODELLING APPROACH*, 7th International Conference on Air Quality – Science and Application (formerly Urban Air Quality Conference), Istanbul 24-27 March 2009.

Silvia Pillon; Francesca Liguori; Fabio Dalan; Giuseppe Maffeis (2011) 'PM source apportionment analysis in the Venetian area', Int. J. of Environment and Pollution, Vol.47, No.1/2/3/4 , pp.134-148. DOI: 10.1504/IJEP.2011.047330.

On air quality modelling (dispersion and chemical transport modelling):

Silvia Pillon, Fabio Dalan, Francesca Liguori and Giuseppe Maffeis (2009), *MODELLING OF ORGANIC AND INORGANIC MICROPOLLUTANTS ON THE LAGOON OF VENICE*, 7th International Conference on Air Quality – Science and Application (formerly Urban Air Quality Conference), Istanbul 24-27 March 2009.

Bressan, Elvini, Liguori, Pillon (2010). *Making the right choice: trade-offs among operational issues and modelling constraints. A case study for a cement plant located in a complex terrain domain (Calpuff vs Adms)*. 13th International Conference on Harmonisation within Atmospheric Dispersion Modelling for Regulatory Purposes, Paris June 1-4 2010.

Elvini E., Pillon S., Liguori F., Lorenzet K., Silibello C., Radice P., Piersanti A. (2010). *Eulerian modelling application for a highway air quality impact assessment.* 13th International Conference on Harmonisation within Atmospheric Dispersion Modelling for Regulatory Purposes, Paris June 1-4 2010.

M. Bressan, E.Elvini, F.Liguori, S. Pillon, M. Rosa (2011), *Atmospheric dispersion modelling of pollutants emitted from a cement plant*, Ingegneria Ambientale vol. XL n. 2, marzo-aprile 2011.

Benassi, A., Dalan, F., Gnocchi, A., Maffeis, G., Malvasi, G., Liguori, F., Pernigotti, D., Pillon, S., Sansone, M. and Susanetti, L. (2011) 'A one-year application of the Veneto air quality modelling system: regional concentrations and deposition on Venice lagoon', Int. J. Environment and Pollution, Vol. 44, No. 1/2/3/4, pp.32–42. DOI: 10.1504/IJEP.2011.038400

PART C –HEALTH RISKS

C1. Have you records of the population mortality/morbidity?

□ **No**   □ **Hospital data** □ **Research studies**   □ **Other**

According to questionnaire results, 33.3 % of respondents answered no while 22.2 % of respondents didn't answer the question. In addition, 22.2 % of respondents answered research studies, 11.1 % of respondents answered hospital data & other (National register) and the other 11.1 % of respondents answered other. In particular, mortality and morbidity are recorded by the Veneto Tumor Registry, a regional public service of the Veneto Region.

C2. When you are identifying and quantifying risks to human health in your work, which exposures do you consider (list in decreasing order of significance)?

The majority of respondents (66.7 %) didn't answer the question or pointed out that it is outside the competencies of organization. Furthermore, 11.1 % of respondents answered: (1) Indoor air quality, (2) Ambient air quality, (3) Environmental noise and (4) Croceries (chemicals,

microbes etc). In addition, 11.1 % of respondents answered (1) children, (2) elderly and (3) people who work in a harsh environment. The remainder of respondents (11.1 %) answered: (1) Swallowing, (2) inhalation and (3) skin contact.

C3. How do you quantify or measure the importance of the risks (describe for the three most significant exposures)?

The majority of respondents (77.8 %) didn't answer the question or pointed out that it is outside the competencies of organization. The remainder of respondents (22.2 %) gave only one answer. In particular, 11.1 % of respondents answered the quantification will be performed with compare monitoring results to reference values while the other 11.1 % of respondents answered direct health impact.

C4. Are you happy with the information available to you to do the risk assessment(s) or do you see some possibilities for improvements coming from the tools developed in LIFE Index-Air project? □ Yes □ No

If Yes, what improvements would you like to highlight?

According to questionnaire results, 44.4 % answered yes while 33.3 % of respondents answered no. The other 22.2 % of respondents didn't answer the question. The respondents stated that would like to apply the tool for the assessment of air quality risk of various target population (citizens, students) with different pattern exposure and, possibly, also for scenario analysis. Finally, they pointed out that there is a lack of communication and collaboration with health professionals

C5. Have you used in risk characterization any of these (if yes, how)

□ Exposure limit values   □ Concentration limit values
□ Quantitative risk (probability of risk)   □ Acceptable risk
□ Number of subjects exposed   □Number of attributed cases
□ Burden of disease   □ Other (please specify)

The respondents gave more than one answer. In particular, 22.2 % answered exposure & concentration limit values, 22.2 % of respondents answered only concentration limit values, 11.1 % of respondents answered concentration limit values & number of subject exposed and the other 11.1 % answered exposure limit values & concentration limit values & number of subjects exposed & burden of disease. The remainder of respondents (33.3 %) didn't answer the question.

C6. If it was possible to compare various risks (e.g. those that you listed in question CError! Reference source not found.) would you find such information useful?

According to questionnaire results, 44.4 % of respondents didn't answer the question while 11.1 % answered no. The remainder of respondents (44.4 %) answered yes. In particular, comparison of different risks is important, when assessing the possible measures for action.

PART D – LIFE INDEX-AIR MANAGEMENT TOOL

LIFE Index-Air Management Tool scopes to support policy development and decision making with respect to PM air pollution control and protection of public health. In this section, respondents were asked their opinion about the issues which need to be addressed in the LIFE Index-Air Management Tool.

D1. Possibility for the Stakeholders to introduce new data (e.g. emission data, PM concentration values) in the Tool

□ Very Important □ Important □ Less important

According to questionnaire results, 44.4 % of respondents answered important, 33.3 % of respondents answered very important and 22.2 % of respondents answered less important.

D2. Visualization of air quality data

□ Very Important □ Important □ Less important

According to questionnaire results, 44.4 % of respondents answered very important and the other 44.4 % of respondents answered important. The remainder of respondents (11.1 %) answered less important.

D3. Visualization of indoor air quality data

□ Very Important □ Important □ Less important

Only 22.2 % of respondents answered less important while 33.3 % of respondents answered very important. The remainder of respondents (44.4 %) answered important.

D4. Visualization of emission data (e.g. sectors, values) and their extraction from the user

□ Very Important □ Important □ Less important

The majority of respondents (55.6 %) answered important. The remainder of respondents (44.4 %) answered very important.

D5. Visualization of population exposure in specific time intervals

□ Very Important □ Important □ Less important

The majority of respondents (77.8 %) answered very important while 11.1 % of respondents answered less important. The other 11.1 % answered important.

D6. Visualization of spatial distribution of population exposure

□ Very Important □ Important □ Less important

All of the respondents (100 %) answered very important.

D7. Visualization of population dose data

□ Very Important □ Important □ Less important

The majority of respondents (55.6 %) answered very important while only 11.1 % of respondents answered less important. The remainder of respondents (33.3 %) answered important.

D8. Visualization of data of burden of disease in your urban area / population / children

□ Very Important □ Important □ Less important

The majority of respondents (66.7 %) answered very important while 33.3 % of respondents answered important.

D9. Possibility to construct scenarios for PM emission reductions

□ Very Important □ Important □ Less important

The majority of respondents (88.9 %) answered very important while only 11.1 % of respondents answered important.

D10. Forecast PM emission changes based on policy scenarios

□ Very Important □ Important □ Less important

The majority of respondents (66.7 %) answered very important while 11.1 % of respondents didn't answer the question. The remainder of respondents (22.2 %) answered important.

D11. Forecast PM concentration changes based on policy scenarios

All of the respondents (100 %) answered very important.

D12. Forecast PM exposure changes based on policy scenarios

All of the respondents (100 %) answered very important.

D13. Forecast PM dose changes based on policy scenarios

Only 11.1 % of respondents answered less important while 55.6 % of respondents answered very important. The remainder of respondents (33.3 %) answered important.

D14. Forecast PM burden disease changes based on policy scenarios

The majority of respondents (66.7 %) answered very important while 33.3 % of respondents answered important.

According to questionnaire results (Figure 18), the issues which need to be addressed in the LIFE Index-Air Management Tool and are very important are the following:

- Visualization of population exposure in specific time intervals
- Visualization of spatial distribution of population exposure
- Visualization of population dose data
- Visualization of data of burden of disease in your urban area / population / children
- Possibility to construct scenarios for PM emission reductions
- Forecast PM emission changes based on policy scenarios
- Forecast PM concentration changes based on policy scenarios
- Forecast PM exposure changes based on policy scenarios
- Forecast PM dose changes based on policy scenarios
- Forecast PM burden disease changes based on policy scenarios
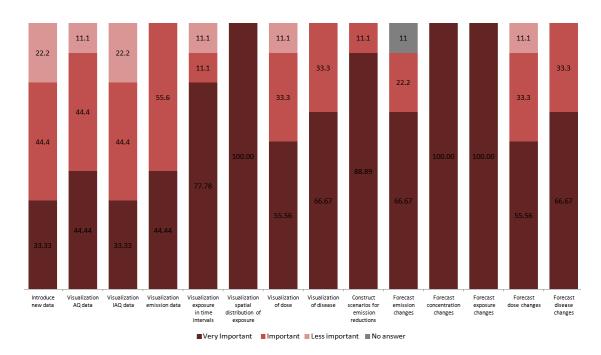
Figure 18– Questionnaire results according to stakeholders' feedback.

Finally, the questionnaire results are presented as pie charts in Annex 3.

Stakeholders Consultation - Portugal

LIFE INDEX-AIR – Development of an Integrated Exposure – Dose Management Tool for Reduction of Particulate Matter in Air

LIFE15 ENV/PT/000674
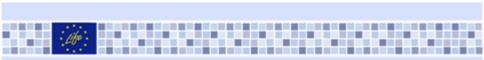
Overview of the project

Marta Almeida, Marina Almeida-Silva, Tiago Faria, IST
https://www.facebook.com/LIFEIndexAir/

December/January 2017
Lisbon, Portugal

OBJECTIVE

LIFE Index-Air project aims to **develop a policy tool** that will support authorities in the **identification of action plans** that effectively **reduce air pollutants concentrations**, exposure, dose and health effects.

The implementation of the tool in EU cities will demonstrate its suitableness to:
1) calculate population exposure and dose to PM chemical compounds,
2) quantify the health impacts of chemical exposures associated with particles,
3) evaluate the impact of sources on exposure,
4) evaluate exposure reductions apportioned to changes in every accounted source,
5) quantitatively evaluate the impacts of policies on specific human exposure levels as well as plan new ones.

LIFE PROGRAM

LIFE is the EU's financial instrument supporting environmental, nature conservation and climate action projects throughout the EU.

LIFE Index-Air Project - LIFE15 ENV/PT/000674
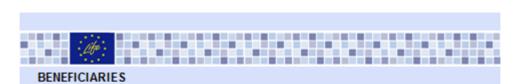
Total budget: 1,369,071 Euros
EU contribution: 792,401 Euros (Co-financing rate: 58.6%)

Start date: 1st of October 2016
End date: 31st of March 2020
Duration: 3,5 years

Sector: Environment and Health

BENEFICIARIES

Instituto Superior Técnico, Portugal

National Centre for Scientific Research "Demokritos"

National Institute for Health and Welfare

Technical University of Crete

Universidade de Aveiro
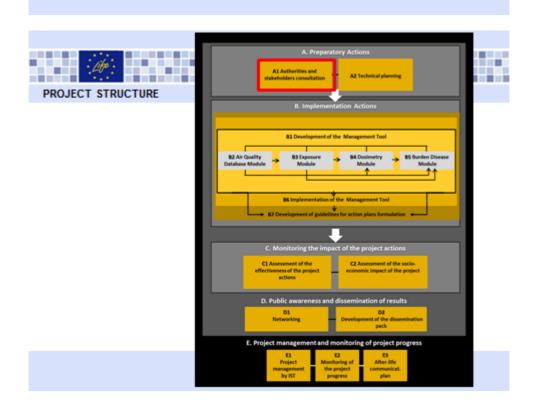
ADVISORY BOARD (Support letter)

Country	Institution
Portugal	• Portuguese Environment Agency • Portuguese Health General Directorate • Lisbon Regional Coordination and Development Comission
Finland	• City of Kuopio
Greece	• Association for Sustainable Development of Cities • Greek Ministry of Health
Italy	• Regional Agency for Environmental Protection and Prevention of the Venice

STAKEHOLDERS (Support letter)

Country	Institution
Portugal	• North Regional Coordination and Development Comission
Greece	• Greek Ministry of Environment and Energy, Department of Air Quality

PROJECT STRUCTURE

Questionnaire to the stakeholders

PROJECT STRUCTURE

DATABASE MODULE   IN LISBON

Time Activity Pattern   Concentrations of PM measured outdoor and indoor

4000 Children

https://goo.gl/forms/rV4n3IcYU7R0NJDg1

PM2.5 + PM10 + Elements (As + Cd + Ni, Pb) + PAHs (BaP) + EC/OC

DATABASE

PROJECT STRUCTURE

EXPOSURE MODULE

PROJECT STRUCTURE

DOSIMETRY MODULE

PROJECT STRUCTURE
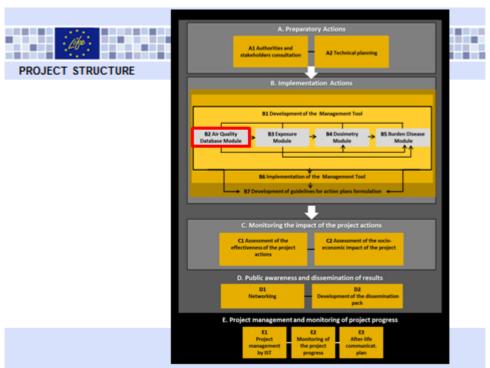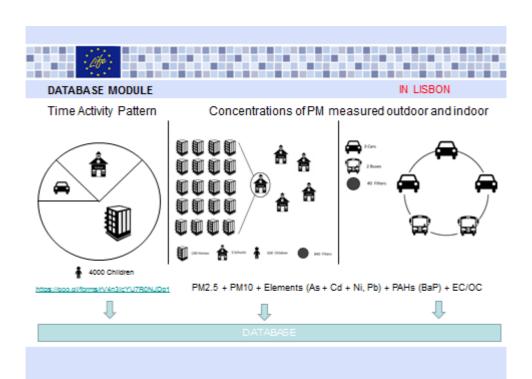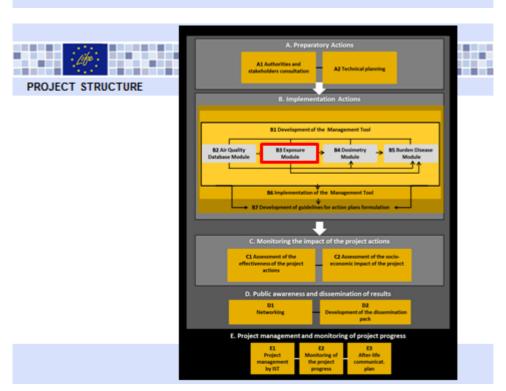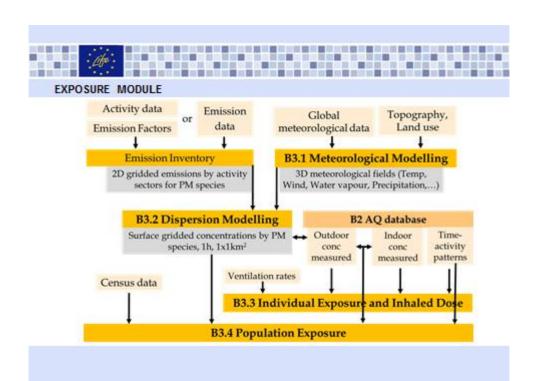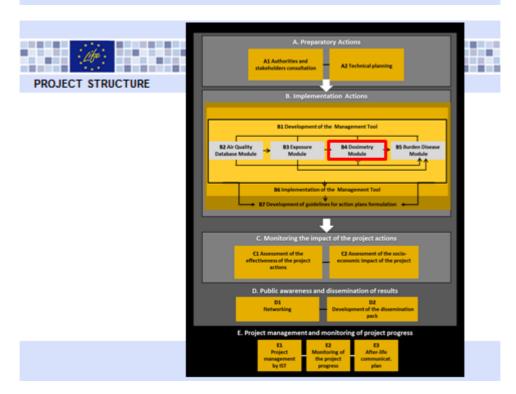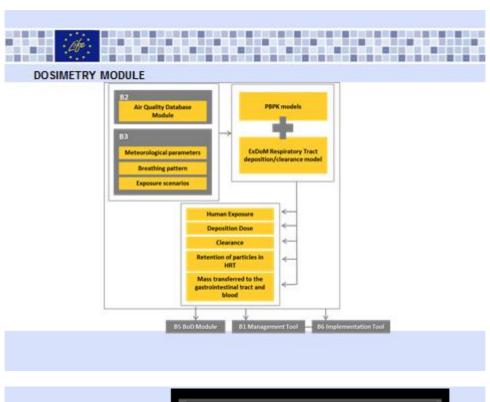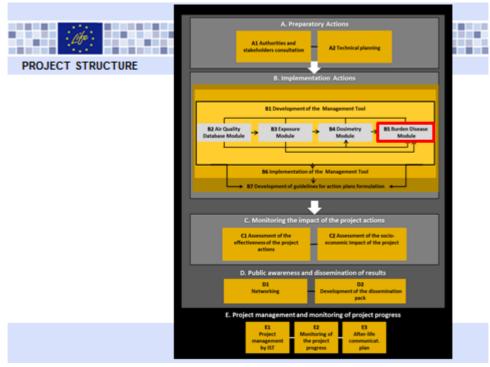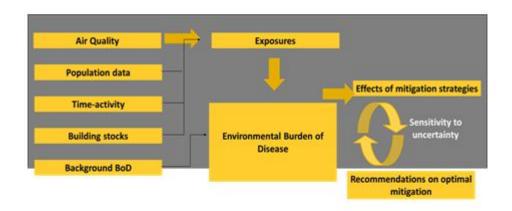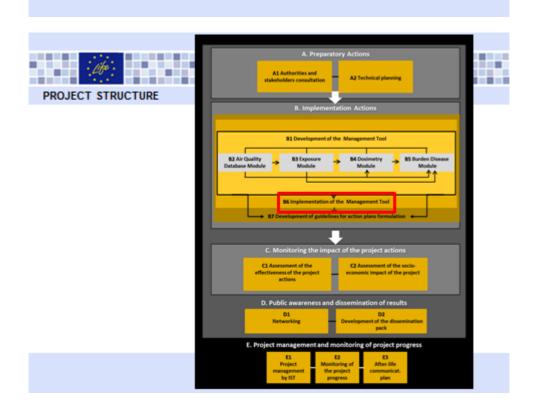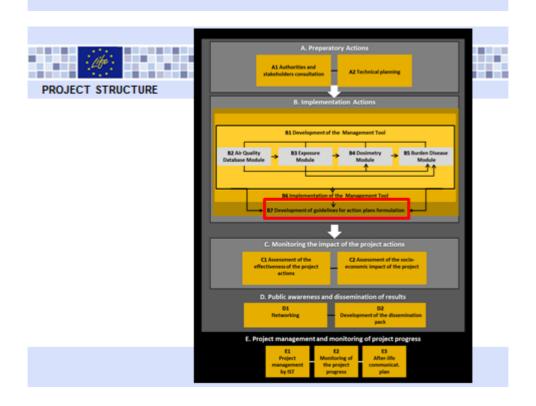
**IMPLEMENTATION OF THE MANAGEMENT TOOL &
DEVELOPMENT OF GUIDELINES FOR ACTION PLANS FORMULATION**
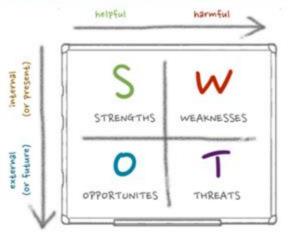
PROJECT STRUCTURE

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SWOT ANALYSIS of the project LIFE Index-Air

LIFE INDEX-AIR – Development of an Integrated Exposure – Dose Management Tool for Reduction of Particulate Matter in Air

LIFE15 ENV/PT/000674

Overview of the project

TÉCNICO LISBOA   universidade de aveiro   NATIONAL INSTITUTE FOR HEALTH AND WELFARE

Marta Almeida, Marina Almeida-Silva, Tiago Faria, IST
https://www.facebook.com/LIFEIndexAir/

December 2016
Lisbon, Portugal

TÉCNICO LISBOA   universidade de aveiro   Technical University of crete   DEMOKRITOS NATIONAL CENTRE FOR SCIENTIFIC RESEARCH   NATIONAL INSTITUTE FOR HEALTH AND WELFARE   WWW.LIFEINDEXAIR.NET

EU LIFE+ Project
INDEX Air – Case Kuopio

Otto Hänninen, PhD, Adj.prof.

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?	Municipalities Lila	Joana Ana	Thomas Otto	Kostas Marta	Vassilis Marina	MoH MoH	Mihalis

2016-09-24   Hänninen, O: Environmental burden and cancer   2

Marta Mihalis   Kostas Vassilis Lila   Thomas   Otto   Ana Joana

Kick-off, Athens 2016-10

- Coordinated by Marta Almeida
  INSTITUTO SUPERIOR TÉCNICO, Lisbon
- National Centre for Scientific Research "Demokritos"
- National Institute for Health and Welfare
- Technical University of Crete
- Universidade de Aveiro

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2016-09-24   Hänninen, O: Environmental burden and cancer   3

Programme

13h00   Welcome
        Erkki Pärjälä, Environmental Office, City of Kuopio

13h05   Introduction
        Otto Hänninen, THL
13h10   Previous collaboration URGHENCE and overview of EBD
        Arja Asikainen, THL
13h15   Health impacts of air pollution in Finland, focus on children
        Heli Lehtomäki, THL
13h25   Geographical Information System datasets and tools
        Antti Korhonen, THL
13h30   Epidemiological studies (MATEX)
        Isabell Rumrich, UEF
13h35   LIFE INDEX Air project
        Otto Hänninen, THL

14h15   Stakeholder questionnaire and involvement, Discussion/all
        - Case study AQ and assessment of policies in Kuopio
        - School involvement

15h15   Closing

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2016-09-24   Hänninen, O: Environmental burden and cancer   4

Overall Aim of National Institute for Health and Welfare

RELIABLE INFORMATION
for use in decision-making and work in the field of social and health care

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Why quantitative risk assessment is needed?

Perceived and actual risks

Susanna Hertrich, 2008 : "Reality Checking Device"

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2016-09-24   Hänninen, O: Environmental burden and cancer   6

BoD from indoor air exposures in Finland in 2010

Suomi

Häkä, 3 %
Tupakansavu, 2 %
Kosteusvauriot, 3 %
Radon, 16 %
VOC sisältä, 2 %
VOC ulkoa, 1 %
Siitepöly ym., 7 %

PM2.5 ulkoa, 50 %
PM2.5 sisältä, 16 %

13k DALY/a

Diskontatu (3%) ja ikäpainotettu

Hänninen & Asikainen, 2013
Pdf: http://urn.fi/URN:ISBN:978-952-245-822-3

2015-06-30   Hänninen, O   7
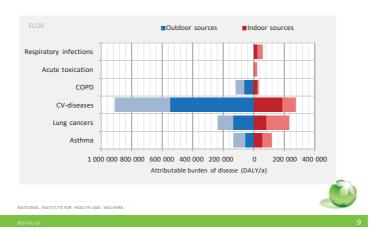
Healthvent estimate
BoD from indoor exposures in Finland

By disease

Total 13 000 DALY/a

Lung cancer, 24 %
Asthma, 15 %
COPD, 6 %
Respiratory infections
Toxications
CV, 50 %

Finland

Source: Hänninen & Asikainen 2013

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2017-01-10   Sisäilman kansanterveysvaikutukset/Otto Hänninen   8

Baseline burden (2010) and reducible component in EU26

EU26

■ Outdoor sources   ■ Indoor sources

Respiratory infections
Acute toxication
COPD
CV-diseases
Lung cancers
Asthma

1 000 000   800 000   600 000   400 000   200 000   0   200 000   400 000

Attributable burden of disease (DALY/a)

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2017-01-10   9

EBoDE: Magnitude of public health impact vs. uncertainties
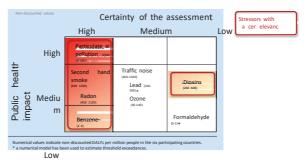
Figure 2. Contribution of the nine selected environmental stressor risk factors to the burden of disease (DALY/M) as population weighted average over the six countries.

Hänninen & Knol, 2011
Hänninen et al. 2014

Disability adjusted lifeyears (DALY)

Adopted from Guus de Hollander et al., 1999
Hänninen et al. 2016

Projects

- EBODE (European), SETURI (National)
- HEALTHVENT (EU)
- TRANSPHORM (EU FP7)
- PM SIZEx (Academy of Finland)
- TEKAISU, ISTE (Ministry of Social Affairs and Health, M. Env.)

- BATMAN (Academy), REDBAT (-)
- Nordic WelfAir (Nordforsk)
- MATEX

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THL team

Heli Lehtomäki
B.Sc.
M.Sc.(est. 2016)

Antti Korhonen
B.Eng., B.Sc.
M.Sc.(est. 2016)

Hanna de Ruyter
MD

Kairong Xiang

Isabell Rumrich
M.Sc.

Riikka Sorjomaa
PhD, Aerosol modeling

Otto Hänninen
PhD, docent

Prof. Viluksela, Tuomisto, Salonen, prof. Lanki

Arja Asikainen
PhD, EBD modeling

... UTE FOR HEALTH AND WELFARE, FINLAND

2016-09-24   Hänninen, O: Environmental burden and cancer   13

Nordic WelfAir

2016-10-11   Hänninen, O: Symposium HEAP, Utrecht   14

BATMAN Subprojects 1-3

Figure 1. Linkage of sub projects, models and datasets as used in the project.

MATEX Register epi infra concept
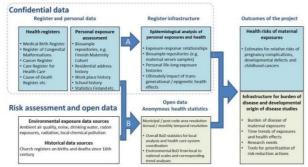
Figure 3. Development of infrastructure for the linkage of confidential personal database (A) and open data interface with spatial and temporal dimensions (B) for BoD assessments.

Contacts

- Environmental Office, Erkki Pärjälä, Mikko Sokura

- Santtu Laitinen
- Tanja Karpasto

- International Coordinator Raija Kovanen

- Leena Auvinen, Head of School office

Planned:
Primary Schools, Kuopio

- February 2017 - 1 seminar for primary education teachers, children and children families (presentation of the project).

- March 2019 – Awareness campaign in 3 schools.
- February 2020 – 1 seminar for primary education teachers, children and children families (presentation of the project results).

Kuopio, Finland

Environmental Health
Kuopio, Finland

URGENCHE
and
EBD in Finland

Arja Asikainen

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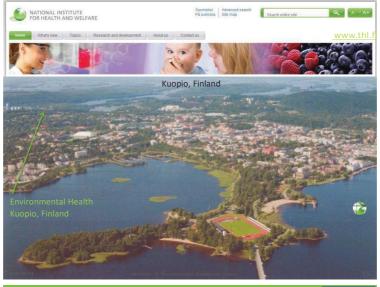
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URGENCHE scenarios

- Urban Reduction of Greenhouse Gas Emissions in China and Europe: How local green house gas abatement strategies in Kuopio effect on air pollutant emissions and on health

- Scenarios in Kuopio:
  - Production of heating energy
    - Increased use of biomass in CHP-plant
    - Increased use of biomass in small scale combustion
  - Energy consumption of buildings
    - Better insulation of houses (renovated and new ones)
  - Traffic
    - Increased use of biofuels in traffic

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URGENCHE PM2.5 data

- FMI provided PM2.5 concentration maps based on dispersion modeling for 2010 baseline and 2020 BAU and implementation scenarios
- Sources were traffic, Haapaniemi CHP-plant and separate heating of residences
- Dispersion data was used to calculate annual average ambient exposures

Source	2010 Baseline	2020 BAU	2020 CO$_2$ interventions	2020 CO$_2$ interventions - no wood
Traffic	0.47	0.35	0.21	0.21
Haapaniemi CHP-plant	0.003	0.003	0.001	0.001
Small scale combustion	0.25	0.22	0.32	0.20
Total*	6.86	6.71	6.67	6.54
% of intervention sources	11 %	9 %	8 %	6 %

URGENCHE PM2.5 data

- Following source fractions were estimated, variations between suburbs:
  – Traffic: 6% (0.4 – 38%)
  – Haapaniemi CHP-plat: 0.04% (0 – 0.2%)
  – Separate heating of residences: 3% (0.4 – 7%)
  – Background and other sources: 91% (58 – 99%)
- GIS data was used for suburb division and also for analysis of exposures by buildings

EBD IN FINLAND
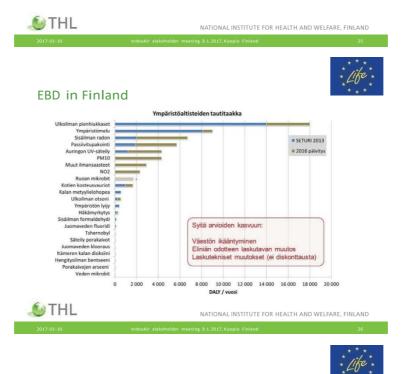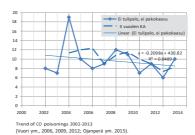
SETURI and TEKAISU

- Purpose is to prioritize environmental risk factors based on their health effects and evaluate impacts of abatement measures
- Funded by STM
- Incidence estimations done 2011, first EBD estimations 2013 and partly updated 2016

EBD in Finland

EBD in Finland: CO poisonings

Trend of CO poisonings 2002-2013
(Vuori ym., 2006, 2009, 2012; Ojanperä ym. 2015).

=> Air quality portal to estimate trends in population level outdoor exposures
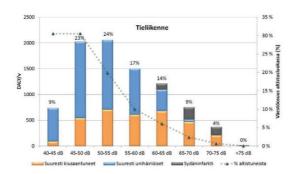
EBD in Finland: Road traffic

INDEX AIR stakeholder meeting 9.1.2017

Health impacts of air pollution in Finland – focus on children

Heli Lehtomäki

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Outline

• Recent ISTE publication: Ympäristö ja terveys 8/2016

• Analysis of uncertainties in $PM_{2.5}$ health impact estimates

• INDEX Air: Health effects of air pollution in school children

Health impacts of air pollution (ISTE) - project
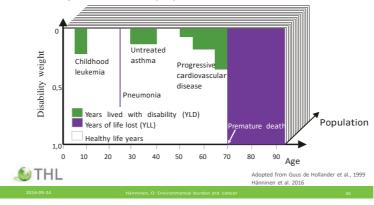
- The aim of the ISTE –project was to estimate the exposure levels and health impacts of air pollutants in Finland

- Focus on legislated outdoor air pollutants (14 pollutants)

- Spatial coverage: Finland and baseline year 2013

- Funded by Ministries of Environment and Social Affairs

- Conducted in 2015

SOSIAALI- JA TERVEYSMINISTERIÖ

Ympäristöministeriö
Miljöministeriet
Ministry of the Environment

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ISTE reports and publications

Tautitaakan laskenta
Lehtomäki ym. 2015

Yhteenvetoraportti
Hänninen ym. 2016

Lehtomäki, Korhonen, Asikainen, & Hänninen. (2016). Ulkoilman saasteiden aiheuttamat terveyshaitat Suomessa.

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Altistumisen arviointi
Korhonen ym. 2015

Disability adjusted lifeyears (DALY)

- Disease burden (BoD) = morbidity (YLD) + years of life lost due to premature deaths (YLL)

Adopted from Guus de Hollander et al., 1999
Hänninen et al. 2016

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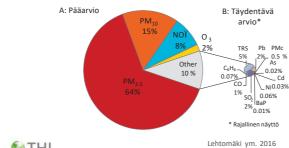
Health impacts of air pollution

- The disease burden of air pollution was 28 000 DALY/a
- 1500 premature deaths
- Years of life lost due to premature mortality (YLL) 75%

A: Pääarvio

B: Täydentävä arvio*

PM$_{10}$ 15%

NO$_2$ 8%

O$_3$ 2%

Other 10 %

PM$_{2.5}$ 64%

TRS 5%

Pb 2%

PMc 0.5 %

As 0.02%

Cd 0.03%

Ni 0.06%

C$_6$H$_6$ 0.07%

CO 1%

SO$_2$ 2%

BaP 0.01%

* Rajallinen näyttö

Lehtomäki ym. 2016
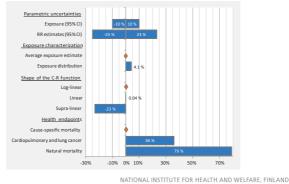
MSc thesis: Uncertainties in the disease burden estimates of PM$_{2.5}$

- The aim was to (i) identify the uncertainty sources and (ii) quantify the selected uncertainties in the ISTE-estimate for PM$_{2.5}$ disease burden

- The selected uncertainties were related to
  - Uncertainties in the relative risk and exposure estimates
  - Exposure characterization
  - Shape of the concentration response relationship
  - Selection of health endpoints

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MSc thesis: The main results

- The differences caused by uncertainties were analysed in relation to the ISTE-estimate for PM$_{2.5}$ disease burden

Parametric uncertainties
Exposure (95% CI) -10 % 10 %
RR estimates (95% CI) -25 % 23 %
Exposure characterization
Average exposure estimate
Exposure distribution 4.1 %
Shape of the C-R function
Log-linear
Linear 0.04 %
Supra-linear -23 %
Health endpoints
Cause-spesific mortality
Cardiopulmonary and lung cancer 36 %
Natural mortality 79 %

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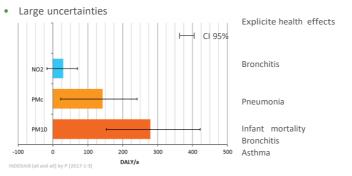
Children and impacts of air pollution

- Children are among the most vulnerable to air pollution
- Health impacts in children can last far to future

- Elementary school children selected as a special target group in INDEX Air project
  - BoD module needs to consider separately YLL and children

- Childen's (0-14 yr) share of the total disease burden in Finland is 3% and from the total morbidity 5%

Children's explicit burden due to air pollution

- Total 450 DALY/a (est. 3300 DALD in Kuopio)
- Large uncertainties

INDEXAIR (all and all) by P (2017-1-3)

Children's disease burden due to air pollution divided into YLL/YLD

- Children (0-14 yr) mortality 3 deaths
- Morbidity component higher (YLL 54%) than in all ages (75%)

INDEXAIR (all and all) by P (2017-1-3)

Conclusions

- Updated ISTE estimate for air pollution health impacts in Finland estimated as 28 000 DALY/a
  - Mainly associated with $PM_{2.5}$ (64%)

- Children's share of all morbidity in Finland is 5%
  - Children's disease burden due to air pollution about 450 DALY/a

- ISTE estimates children's disease burden is focus a lot more on morbidity than adults' (only few deaths on children's age group)

- To be investigated in more detail in 2018

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2016-01-09   Heli Lehtomäki / INDEXAIR   42

Thank you for listening!

Heli.Lehtomaki@thl.fi

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2016-01-09   Heli Lehtomäki / INDEXAIR   43

Health outcomes in the main analysis

Altiste	Terveysvaste	Ikäryhmä	Tyyppi	Riskifunktio (CI 95 %)	ID*
$PM_{2.5}$	Luonnollinen kuolleisuus[1]	Yli 30 v	RR	1,062 (1,040–1,083)	1
PM_{10}	Varhaiskuolleisuus	1–12 kk	RR	1,04 (1,02–1,07)	23
PM_{10}	Lasten bronkiitti	6–12 v	RR	1,08 (0,98–1,19)	24
PM_{10}	Aikuisten bronkiitti	Yli 18 v	RR	1,117 (1,040–1,189)	25
PM_{10}	Astmaoireet astmaatikko lapsilla	5–19 v	RR	1,028 (1,006–1,051)	22
NO_2	Luonnollinen kuolleisuus	Kaikki	RR	1,0027 (1,0016–1,0038)	64
NO_2	Bronkiittioireet astmaatikko lapsilla	5–14 v	RR	1,021 (0,990–1,060)	63
NO_2	Hengitystiesairaudet (sairaalaotot)	Kaikki	RR	1,0180 (1,0115–1,0245)	66
O_3	Luonnollinen kuolleisuus	Kaikki	RR	1,0029 (1,0014–1,0043)	82
O_3	Lievä oirepäivä (MRAD)	18–64 v	UR	0,0115 (0,004–0,020)	96

*ID on koodi, jonka avulla löytää funktiosta lisätietoja sekä lähdeviitteen Lehtomäki ym. 2015 raportista
[1] Luonnollisen kuolleisuuden funktiota on sovellettu syy-spesifin kuolleisuuden laskemiseen ottaen huomioon sydän- ja verisuonisairaudet, hengitystiesairaudet ja -infektiot sekä keuhkosyövät.

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Health outcomes in the additional analysis
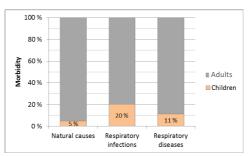
Altiste	Terveysvaste	Ikäryhmä	Tyyppi	Riskifunktio (CI 95 %)	ID*
As	Keuhkosyöpä	Kaikki	UR	1.5E-04	44
BaP	Keuhkosyöpä	Kaikki	UR	8.7E-05 (1.0E-05–1.0E-04)	45
C_6H_6	Leukemia	Kaikki	UR	4.5E-06 (2.2E-06–7.8E-06)	126
Cd	Keuhkosyöpä	Kaikki	UR	0,0018 (0,001–0,0018)	40
CO	Sydämen vajaatoiminta	Kaikki	UR	5.6E-07	120
Ni	Keuhkosyöpä	Kaikki	UR	2.4E-04 (1.1E-05–2.4E-04)	43
Pb	Sydän- ja verisuonisairaudet	Yli 39 v	RR	1,2 (0,93–1,55)	55
Pb	Verenpainetauti naisilla	Kaikki	OR	1,32 (1,14–1,52)	49
Pb	Verenpainetauti miehillä	Kaikki	OR	1,04 (0,93–1,16)	50
PMc	Keuhkokuume	0-3 v	OR	1,24 (1,03–1,5)	37
SO_2	Sydän- ja verisuonisairaudet	Kaikki	RR	1,008 (1,002–1,012)	109
SO_2	Hengitystiesairaudet ja -infektiot	Kaikki	RR	1,010 (1,006–1,014)	111
SO_2	Keuhkosyöpä	Kaikki	RR	1,148 (1,010–1,303)	112
SO_2	Päänsärky (muu kuin migreeni)	20–60 v	OR	1,01 (0,98–1,002)	117
SO_2	Migreeni	20–60 v	OR	1,03 (1.005–1,005)	115
SO_2	Hermostuneisuus	20–60 v	OR	1,01 (0,965–1,002)	118
TRS	Päänsärky	yli 15 v	OR	1,7 (1,05–2,73)	128

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Children's share of the total background disease burden (morbidity)

• Children's (0-14 yo) share of the total morbidity

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2016-01-09   Heli Lehtomäki / INDEXAIR   46
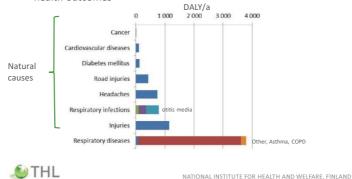
Children's disease burden due to selected health outcomes

• Disease burden of 5-14 years old children due to selected health outcomes

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2016-01-09   Heli Lehtomäki / INDEXAIR   47

Geographical Information System datasets and tools

Kuopio 9.1.2017

Antti Korhonen

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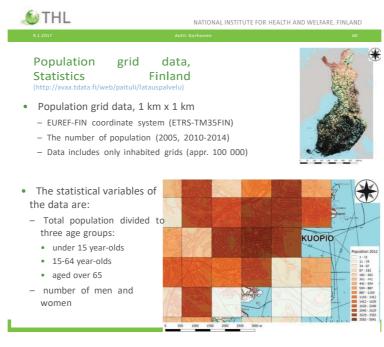
Outline

- Population grid data and addresses of buildings data
- SILAM data used in APTA study
- SILAM grid vs. population grid data

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9.1.2017   Antti Korhonen   60

Population grid data, Statistics Finland
(http://avaa.tdata.fi/web/paituli/latauspalvelu)

- Population grid data, 1 km x 1 km
  - EUREF-FIN coordinate system (ETRS-TM35FIN)
  - The number of population (2005, 2010-2014)
  - Data includes only inhabited grids (appr. 100 000)

- The statistical variables of the data are:
  - Total population divided to three age groups:
    - under 15 year-olds
    - 15-64 year-olds
    - aged over 65
  - number of men and women

Addresses of buildings 2016, Population Register Centre
(http://avaa.tdata.fi/web/paituli/latauspalvelu)

- Shape-format dataset includes data from population register

- EUREF-FIN coordinate system (ETRS-TM35FIN)

- The dataset includes all buildings (3,5 million) for which coordinates are known, and which have at least post code as address

- For each building is given:
  - building ID
  - planned usage (residential-/commercial or industrial/other)
  - municipality and county
  - coordinates and address

9.1.2017

SILAM data and APTA study
http://www.oulu.fi/apta-en/

SILAM = System for Integrated modeLling of Atmospheric coMposition

- SILAM data is stored in Network Common Data Form (NetCDF) –format
  - file format is used widely in atmospheric research and is used for storing multidimensional scientific data (variables) such as temperature, humidity, pressure and concentrations of air pollutants

- The Influence of Air Pollution, Pollen, and Ambient Temperature on Asthma and Allergies in Changing Climate (APTA), funded by Academy of Finland

  - SILAM data in APTA study included concentrations of 40 air pollutants (kg/m^3)
    - $PM_{2.5}$ and PM_{10}
    - 8 particulate matter components
      (SO4, NH415SO4, NH4NO3, seasalt, mineral dust, NO3, EC, OC)
    - 30 gaseous components:
      (ALD2,C2O3,C5H8,CO,CRES,CRO,ETH,H2O2,HCHO,HNO3,HO2,HONO,MGLY,N2O5,NH3,NO,NO2,NO3,O3,OH,OLE,OPEN,PAN,PAR,PNA,SO2,TO2,TOL,XO2,XYL)

  - APTA-nordic grid (0.1x0.1 degree ~ 10x10km, rotated-pole)

SILAM grid vs. Population grid

- SILAM air pollutant concentration data:
  - Lat-lon grid (0.1x0.1 degree, ~10x10km)

- Statistics Finland population data
  - 1x1 km grid
  - EUREF-FIN coordinate system (ETRS-TM35FIN)

- SILAM lat-lon grid, 0.1x0.1 degree Æ 1x1 km grid, ETRS-TM35FIN

- Tools for processing data
  - R software, QGIS, python?...

THL
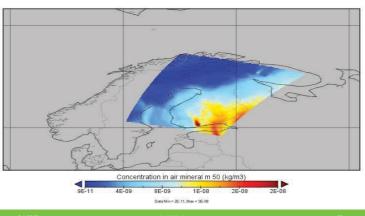
NATIONAL INSTITUTE FOR HEALTH AND WELFARE, FINLAND

APTA – Concentration of $PM_{2.5}$ in January 30, 2013
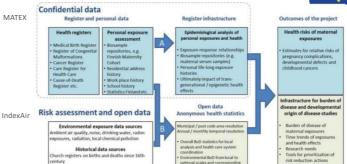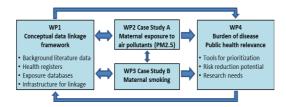
PM2.5 concentration in air

Concentration in air mineral m 50 (kg/m3)
9E-11   4E-09   8E-09   1E-08   2E-08   2E-08
Data Min = 2E-11, Max = 3E-08

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Maternal exposure and health in the offspring
MATEX project

Isabell Rumrich

Index Air stakeholder meeting

9th January 2017

City of Kuopio

THL

2017-01-10   66

Infrastructure development for Health Impact Assessment

Development of infrastructure for the linkage of confidential personal database (A) and open data interface with spatial and temporal dimensions (B) for BoD assessments.

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10/01/2017   MATEX for Index Air / Isabell Rumrich   67

REGBOD project structure

Project implementation and work packages. The conceptual framework established in WP1 will be used for Case Studies A and B (WPs 2 and 3), and their outcome is further analyzed in WP4.

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10/01/2017   MATEX for Index Air / Isabell Rumrich   68

Finnish Register

Register	Available since	Cases	Holder
Medical Birth Register	1987	1.6M	THL Finnish
Maternity Cohort	1983	1.6M	THL Register of
Congenital Malformations	1963	0.04M	THL Register of Induced
Abortions	1983	0.3M	THL Care Register for Health Care
(HILMO)*	1994*	32M	THL Register of Primary Health Care Visits
(avoHILMO)^	2011^		THL Care Register for Social Welfare
THL Register of Vaccination	2012		THL
Cancer Register	1953	0.65M	THL¤
Cause of Death Register	1969		Statistics Finland
Population Register	1971		Population Register
KELA entitlements to medical reimbursement			KELA

* 1969-1993 Hospital Discharge Register
^ pilot phase with some outpatient units since 2008
¤ Data request requires THL permission, but request needs to be sent to the Cancer Registry directly
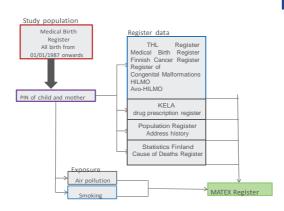
THL

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Data compilation

Study population
- Medical Birth Register — All birth from 01/01/1987 onwards
- PIN of child and mother

Register data
- THL Register — Medical Birth Register, Finnish Cancer Register, Register of Congenital Malformations, HILMO, Avo-HILMO
- KELA drug prescription register
- Population Register — Address history
- Statistics Finland — Cause of Deaths Register

Exposure
- Air pollution
- Smoking

MATEX Register

THL

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Study description

Study population
- All newborns recorded in the Medical Birth Register
  - Established in 1987
  - About 1.7 million birth recorded since then

Follow-up of child
- 20 years of age or diagnosis, whichever comes first

Prenatal exposures
- Air pollution (Case Study A)
- Maternal smoking (Case Study B)

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Health endpoints

- Pregnancy outcomes
  - Preterm birth
  - Low birth weight
  - Small for gestational age
  - Small head circumference
  - Pre-eclampsia
  - Gestational diabetes
  - Gestational hypertension
- Childhood cancer
- Birth malformations
- Sudden Infant Death Syndrome
- Asthma

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Exposure assessment: Air pollution (Case study A)

- Modelled pollutant concentration at home address at mother throughout pregnancy

  - Different exposure time windows:
    - Each trimester (mean and cumulative exposure)
    - Last days of pregnancy
  - Different pollutant measures
    - Particle size
    - Particle number
    - Exposure to pollutant mixtures

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Exposure assessment: Smoking (Case study B)

- Register data cross-validated by cotinine measurements in serum samples from Finnish Maternity Cohort

  - Medical Birth Register:
    - Information collected at first visit
    - 1-10, 11-20, >20 CPD (1987-1991); after that yes/no

  - Finnish Maternity Cohort: voluntary serum sample from pregnant women; established 1987; 18000 samples analyzed for cotinine concentrations

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ANNEX 3: Stakeholders' questionnaires

LIFE INDEX-AIR project

LIFE Index-Air is a LIFE project on the "Development of an integrated exposure – dose management tool for reduction of particulate matter in air". The objective of the LIFE Index-Air project is to provide to national and regional authorities of EU Member States a policy tool to quantitatively evaluate the impacts of policies on specific human exposure levels to PM chemical compounds, as well as plan new ones.

Authorities and stakeholders consultation is an essential component of good environment governance. This is a project's priority towards the fulfilment of the main objective of the project which is the implementation of the management tool by the authorities. This action is fundamental to promote the involvement of the stakeholders from the beginning and to make them part of the project. Their input will be essential for an efficient implementation of the actions.

Therefore, in this context it is necessary to consult the stakeholders, to present the project, to seek their views and to obtain their support for its implementation. Gaps and needs emerging from previous practices will be collected and systematized. The purpose is to gain a better perspective about the more important questions that still need to be addressed and to focus on the policymakers' priorities, envisaging the development of a tool that will really support the preparation of air quality plans and mitigation measures.

Why should I participate?

For developing the necessary guidelines for reducing the concentration of particulate matter in air it is necessary to develop an effective management tool which will incorporate the more recent information on air quality data and effective measures adopted in different European countries. Therefore, we seek views of all stakeholders on the proposed project that will produce practical recommendations to support the implementation actions and make the tool useful to all potential users. The analysis using the management tool will be used to develop and adopt appropriate measures and strategies to meet the limit values set by the EU Directive 2008/50/EC, to reduce exposure to PM2.5 and PM10 chemical compounds and to improve the health of EU citizens.

You are kindly requested to fill in the questionnaire, providing information for your country/region/city.

IDENTIFICATION

1. **Institution:** APA - Portuguese Environmental Agency - PORTUGAL

2. **Type:**

   ☐ **Research / Higher Education**

        ☐ **Applied research**   ☐ **Fundamental/basic/pure research**

   ☐ **Private company**

   X Government Agency/Institution/Administration

   ☐ **Non-Governmental Organization**

3. **Web site:** https://www.apambiente.pt/

4. **Contact person**

First name: Dília

Last name: Jardim

e-mail: dilia.jardim@apambiente.pt

Address: Rua da Murgueira, 9/9A - Zambujal Ap. 7585, 2610-124 Amadora

Telephone: +351 21 472 82 00

City: Lisbon

Country: Portugal

5. What type of assessment tools would help you to better include health and health risks in your work? In this moment the tools to properly evaluate the relation between different scenarios and risk are inexistent. The LIFE Index Air tool will be very useful for the definition of contingency plans.

How important would you consider availability of such tools is? 5

Scale 1-5 (not important - essential)

PART A – MONITORING AND ASSESSMENT

A1. How extensive data set of PM chemical speciation measurements is available?

Available data also from research projects may be included. Please specify:

— **Number of sampling stations:** 2 samplings stations in Portugal

— **Location:** Alfragide, Lisbon and Monte Velho, Alentejo

— **Techniques:**

— **Sampling/measurement frequency:** every 15 days

— **Sampling/measurement duration:** 24 hours

— **Other information:**

Table 1: Pollutants measured in the monitoring stations with PM chemical speciation

Alfragide - Lisbon - Urban Background			Monte Velho - Alentejo - Rural Background		
Pollutant	From	To	Pollutant	From	To
NH4+	31-01-2012		NH4+	30-01-2012	
Mg++	31-12-2012		Mg++	30-01-2012	
Na+	31-01-2012		Na+	30-01-2012	
Cr	31-01-2012		Cr	30-01-2012	
gamma-HCH	31-01-2012		gamma-HCH	30-01-2012	
PCB_128	31-01-2012		PCB_128	30-01-2012	
PCB_180	31-01-2012		PCB_180	30-01-2012	
PCB_28	31-01-2012		PCB_28	30-01-2012	
PCB_52	31-01-2012		PCB_52	30-01-2012	
Hg	01-01-2014		Hg	30-01-2012	
BaP	01-01-2014		BaP	30-01-2012	
Dibenzo(ah)anthracene	01-01-2014		Dibenzo(ah)anthracene	30-01-2012	
Cl-	31-01-2012		Cl-	30-01-2012	
PCB_101	31-01-2012		PCB_101	30-01-2012	
PCB_153	31-01-2012		PCB_153	30-01-2012	
Pb in PM10	01-01-1997		Pb in PM10	01-01-2009	
Ni in PM10	01-01-1997		Ni in PM10	01-01-2015	
Cd in PM10	01-01-1997		Cd in PM10	01-01-2015	
As in PM10	01-01-1997		As in PM10	01-01-2015	
HCHO	01-01-1997	31-12-2010	BaP in PM10	01-01-2009	01-01-2015
BaP in PM10	01-01-1997		Benzo(a)anthracene	30-01-2012	
Benzo(a)anthracene	01-01-2014		Benzo(b)fluoranthene	30-01-2012	
Benzo(b)fluoranthene	01-01-2014		Benzo(k)fluoranthene	30-01-2012	
Benzo(k)fluoranthene	01-01-2014		SO4 2- in PM10	01-01-2009	
SO4 2- in PM10	01-01-1997	31-12-2010	CL- in PM10	01-01-2009	
CL- in PM10	01-01-1997	31-12-2010	Ca2+ in PM10	01-01-2009	
Mg2+ in PM10	01-01-1997	31-12-2010	K+ in PM10	01-01-2009	
Na+ in PM10	01-01-1997	31-12-2010	Mg2+ in PM10	01-01-2009	
NO	01-01-1998		Na+ in PM10	01-01-2009	
NO2	01-01-1998		NO	12-03-2014	
NOx	01-01-1998		NO	01-01-1987	20-08-2010
O3	01-01-1998		NO2	12-03-2014	

Parameter	Start	End	Parameter	Start	End
SO2	01-01-1998		NO2	01-01-1987	20-08-2010
PM10	01-01-1999		NOx	01-01-1987	20-08-2010
C6H6	23-12-2009		NOx	12-03-2014	
C6H6	01-01-1997	22-12-2009	O3	01-01-1987	01-06-1998
PM2.5	01-01-1999		O3	12-03-2014	
CO	01-01-2000		SO2	01-01-1987	
Cd	01-01-2014		PM10	01-01-2015	
Ni	01-01-2014		PM10	15-02-2005	
Indeno_123cd_pyrene	01-01-2014		TSP	01-01-1983	01-01-1996
Benzo(ghi)perylene	31-01-2012		PM2.5	01-01-2009	
NH4+ in PM2.5	01-01-1997		PM2.5	15-02-2005	
NO3- in PM2.5	01-01-1997		CO	16-01-2009	
SO4 2- in PM2.5	01-01-1997		Cd	30-01-2012	
CL- in PM2.5	01-01-1997		Ni	30-01-2012	
EC in PM2.5	01-01-1997		Indeno_123cd_pyrene	30-01-2012	
OC in PM2.5	01-01-1997		Benzo(ghi)perylene	30-01-2012	
NH4+ in PM10	01-01-1997	31-12-2010	NH4+ in PM10	01-01-2009	
NO3- in PM10	01-01-1997	31-12-2010	NO3- in PM10	01-01-2009	
Benzo(j)fluoranthene precip+deposition	01-01-2010	31-12-2012	PCB_31	30-01-2012	
PCB_31	31-01-2012		Aldrin	30-01-2012	
Aldrin	31-01-2012		Chrysene	30-01-2012	
Chrysene	31-01-2012		Endrin	30-01-2012	
Endrin	31-01-2012		Anthracene	30-01-2012	
Anthracene	31-01-2012		Dieldrin	30-01-2012	
Dieldrin	31-01-2012		Fluoranthene	30-01-2012	
Fluoranthene	31-01-2012		Heptachlor Epoxide	30-01-2012	
Heptachlor Epoxide	31-01-2012		Benzo(k)fluoranthene in PM10	01-01-2009	
Benzo(k)fluoranthene in PM10	01-01-2010		Benzo(k)fluoranthene in PM10	01-01-2009	
Benzo(b)fluoranthene in PM10	01-01-2009		Dibenz(ah)anthracene precip+deposition	01-01-2010	30-01-2012
Dibenz(ah)anthracene precip+deposition	01-01-2010	31-12-2012	Pb precip+deposition	01-01-2010	30-01-2012
Pb precip+deposition	01-01-2010	31-12-2012	Benzo(a)anthracene in PM10	01-01-2009	
Benzo(a)anthracene in PM10	01-01-2010		As precip+deposition	01-01-2010	30-01-2012
Mg2+ in PM2.5	01-01-2011		Cd precip+deposition	01-01-2010	30-01-2012
Ca2+ in PM2.5	01-01-2011		Ni precip+deposition	01-01-2010	30-01-2012
K+ in PM2.5	01-01-2011		Benzo(b)fluoranthene precip+deposition	01-01-2010	30-01-2012
Na+ in PM2.5	01-01-2011		Benzo(k)fluoranthene precip+deposition	01-01-2010	30-01-2012
As precip+deposition	01-01-2010	31-12-2012	Benzo(a)pyrene precip+deposition	01-01-2010	30-01-2012
Cd precip+deposition	01-01-2010	31-12-2012	As	30-01-2012	
Ni precip+deposition	01-01-2010	31-12-2012	Pb	30-01-2012	
Benzo(b)fluoranthene precip+deposition	01-01-2010	31-12-2012	Indeno_123cd_pyrene in PM10	01-01-2009	
Benzo(k)fluoranthene precip+deposition	01-01-2010	31-12-2012	Dibenzo(ah)anthracene in PM10	01-01-2009	
Benzo(a)pyrene precip+deposition	01-01-2010	31-12-2012	Hg precip+deposition	01-01-2010	30-01-2012
As	01-01-2014		Benzo(a)anthracene precip+deposition	01-01-2010	30-01-2012
Pb	31-01-2012		Indeno-(1 2 3-cd)pyrene precip+deposition	01-01-2010	30-01-2012
Indeno_123cd_pyrene in PM10	01-01-2009		NO3-	30-01-2012	
Dibenzo(ah)anthracene in PM10	01-01-2010		Ca++	30-01-2012	
Hg precip+deposition	01-01-2010	31-12-2012	K+	30-01-2012	
Benzo(a)anthracene precip+deposition	01-01-2010	31-12-2012	Cu	30-01-2012	
Indeno-(1 2 3-cd)pyrene precip+deposition	01-01-2010	31-12-2012	Zn	30-01-2012	
NO3-	31-01-2012		SO4 2-	30-01-2012	
Ca++	31-01-2012		Phenanthrene	30-01-2012	
K+	31-01-2012		Pyrene	30-01-2012	
Cu	31-01-2012		Heptachlor	30-01-2012	
Zn	31-01-2012		HCB	30-01-2012	
SO4 2-	31-01-2012		Alpha_HCH	30-01-2012	
Phenanthrene	31-01-2012		EC in PM10	01-01-2009	
Pyrene	31-01-2012		OC in PM10	01-01-2009	
Heptachlor	31-01-2012				
HCB	31-01-2012				
Alpha_HCH	31-01-2012				

A2. What are the main concerns considering the PM measurements?

    X **Exceedances**

    X **Health Impact**

    ☐ **Other:**

The National strategy for the Air 2020 (ENAR), aims to improve the air quality to protect the human health, the quality of life of citizens and the preservation of ecosystems. ENAR focus not only the accomplishment of the limit values stablished by the European and National legislation for air pollutants, but also outline the way to achieve in the long term the air quality recommendations from the WHO.

A3. Is there any regulation about Indoor Air Quality (IAQ)?   X **Yes**   ☐ **No**

Is the IAQ in schools/homes evaluated in a systematic way? What are the main concerns about IAQ in schools/homes?

- Portaria n.º 353-A/2013 establishes the minimum values of fresh air flow per space, as well as the thresholds and reference conditions for indoor air pollutants in service buildings. Schools are included in this legislation but there is no legislation for IAQ in homes.
- IAQ is not evaluated systematically. IGAMAOT (General inspection of sea, agriculture, environment and spatial planning) intervenes in situations of complaint.
- The main concern is the health effects of the IAQ.
- It would be important to develop binding guides for schools that identify simple and low-cost measures to improve air quality.

A4. Environmental risks can be represented as a chain of events as below; please mark by circles and arrows which associations along the chain have been assessed in your city:

emission sources <=> environmental contamination - population exposures - health effects - economic costs of pollution

Comments:

A6.   Do you have data/information about time activity patterns for the population in your city? If Yes, please clarify.

APA don't have information about time activity patterns.

A7. What do you see as future research needs/air quality monitoring issues in your area?

The National strategy for the Air 2020 points out the need of research projects that support the development of new policies for the protection of air quality:

- Assessment of emissions from sectors with insufficient, disjointed and/or inconclusive information e.g. maritime transport and harbors;
- Development of methodologies that optimize air quality management with the best cost-benefit ratio;
- Quantification of the effects of air pollution on human health in Portugal;
- Assessment of the effects of air pollution on ecosystems in Portugal.

PART B – ACTION PLANS

B1. Have you developed an action/air quality plan in case of exceedances in air quality?

X Yes
☐ No
    Give Link/document please.

     https://www.apambiente.pt/index.php?ref=16&subref=82&sub2ref=1174

B2. Can you provide us with some details for the action plan?

The National strategy for the Air 2020 (ENAR 2020) aims to improve air quality to protect human health, citizens' quality of life and ecosystems and it is based on three axes: Evaluate, Anticipate and Act.

The measures envisaged in ENAR 2020 are intended to achieve the air quality objectives proposed in the Clean Air Program for Europe and to contribute to the Green Growth Commitment, in line with national climate policy instruments.

ENAR 2020 is also intended as a reference framework for drawing up air quality improvement plans under the responsibility of the CCDRs, thus enabling effective integration of local, regional and national measures.

B3. Have you implemented in the past action plans and when?

B4-What emission sector(s) are you addressing with your air pollution mitigation measures?

X **SNAP1-combustion in energy and transformation industries**

X **SNAP2-non-industrial combustion plants**

X **SNAP3-combustion in manufacturing industry**

X **SNAP4-production processes**

☐ **SNAP5-extraction and distribution of fossil fuels and geothermal energy**

☐ **SNAP6-solvent and other product use**

X **SNAP7-road transport**

☐ **SNAP8-other mobile sources and machinery**

☐ **SNAP9-waste treatment and disposal**

X **SNAP10-agriculture**

☐ **SNAP11-other sources and sinks**

☐ **Other:** _____

B5. Which specific measures for the improvement of air quality and especially for the reduction of particulate pollution are currently being used?

X Strategies to reduce PM emissions from traffic, e.g. promotion of low emission vehicles

X Strategies to reduce PM emissions from heating and energy production

X Zoning as a strategy to reduce PM emissions

X Strategies to reduce air pollution emissions from local sources, e.g. traffic or domestic combustion

X Strategies to reduce fugitive dust emissions, e.g. road dust

☐ Strategies to react on air pollution episodes

☐ _____

☐ _____

☐

_____

_____

B6. How and how frequent do you evaluate the effect of measures?

ENAR 2020 will be evaluated in 2019.

B7. Should further mitigation measures be considered?

B8. What are the most effective measures for PM compliance in your opinion for European urban environments?

☐ **Street washing**

☐ **Application of dust suppressants**

X **Vehicular traffic regulation**

X **Wood burning regulation**

☐ **Others:** _____

_____

B9. Please, provide reference for your activity (reports, papers, etc.)

-   National strategy for the Air 2020 (ENAR 2020), available in
    https://www.apambiente.pt/index.php?ref=16&subref=82&sub2ref=1174
-   Environment Status Reports, available in
    https://www.apambiente.pt/index.php?ref=19&subref=139&sub2ref=460

PART C –HEALTH RISKS

C1. Have you records of the population mortality/morbidity?

X No

☐ Hospital data

☐ Research studies

☐ Other _____

It is outside the competencies of APA

C2. When you are identifying and quantifying risks to human health in your work, which exposures do you consider (list in decreasing order of significance)?

1_____

2_____

3_____

4_____

5_____

6_____

7_____

8_____

9_____

It is outside the competencies of APA

C3. How do you quantify or measure the importance of the risks (describe for the three most significant exposures)?

1_____

2_____

3_____

4_____

5_____

6_____

7_____

8_____

9_____

It is outside the competencies of APA

C4. Are you happy with the information available to you to do the risk assessment(s) or do you see some possibilities for improvements coming from the tools developed in INDEX Air project?

☐ **No**   **X** **Yes.**

If Yes, what improvements would you like to highlight?

The population is more aware of the health risks associated with air quality but the risk assessment is not properly known in Portugal.

_____

_____

_____

_____

_____

C5. Have you used in risk characterization any of these (if yes, how)

X Exposure limit values

X Concentration limit values

☐ Quantitative risk (probability of risk)

☐ Acceptable risk

☐ Number of subjects exposed

☐ Number of attributed cases

☐ Burden of disease

☐ Other (please specify)

C6. If it was possible to compare various risks (e.g. those that you listed in question C Error! Reference source not found.**) would you find such information useful?**

☐ No **X** Yes.

If Yes, why?

_____

_____

_____

_____

_____

_____

PART D – LIFE INDEX-AIR MANAGEMENT TOOL

INDEX-AIR Management Tool scopes to support policy development and decision making with respect to PM air pollution control and protection of public health.

This section aims to receive your opinion about the issues which need to be addressed in the Tool.

D1. Possibility for the Stakeholders to introduce new data (e.g. emission data, PM concentration values) in the Tool.

☐ Very Important

☐ Important

X Less important

D2. Visualization of air quality data

☐ Very Important

X Important

☐ Less important

D3. Visualization of indoor air quality data

X Very Important

☐ Important

☐ Less important

D4. Visualization of emission data (e.g. sectors, values) and their extraction from the user

☐ Very Important

X Important

☐ Less important

D5. Visualization of population exposure in specific time intervals

☐ Very Important

☐ Important

X Less important

D6. Visualization of spatial distribution of population exposure

X Very Important

☐ Important

☐ Less important

D7. Visualization of population dose data

☐ Very Important

☐ Important

X Less important

D8. Visualization of data of burden of disease in your urban area / population / children

X Very Important

☐ Important

☐ Less important

D9. Possibility to construct scenarios for PM emission reductions

X Very Important

☐ Important

☐ Less important

D10. Forecast PM emission changes based on policy scenarios

X Very Important

☐ Important

☐ Less important

D11. Forecast PM concentration changes based on policy scenarios

X Very Important

☐ Important

☐ Less important

D12. Forecast PM exposure changes based on policy scenarios

X Very Important

☐ Important

☐ Less important

D13. Forecast PM dose changes based on policy scenarios

☐ Very Important

☐ Important

X Less important

D14. Forecast PM burden disease changes based on policy scenarios

X Very Important

☐ Important

☐ Less important

Thank You!

IDENTIFICATION

3. **Institution:** CCDR-LVT - PORTUGAL

4. **Type:**

    ☐ **Research / Higher Education**

        ☐ **Applied research**   ☐ **Fundamental/basic/pure research**

    ☐ **Private company**

    X Government Agency/Institution/Administration

    ☐ **Non-Governmental Organization**

3. Web site: http://www.ccdr-lvt.pt

4. Contact person

First name: Luisa

Last name: Nogueira

e-mail: luisa.nogueira@ccdr-lvt.pt

Address: Rua Alexandre Herculano, nº 37; 1250-009; Lisbon

Telephone: +351 213 837 100

City: Lisbon

Country: Portugal

5. What type of assessment tools would help you to better include health and health risks in your work? _____

How important would you consider availability of such tools is? _____

Scale 1-5 (not important - essential)

PART A – MONITORING AND ASSESSMENT

A1. How extensive data set of PM chemical speciation measurements is available?

Available data also from research projects may be included. Please specify:

— **Number of sampling stations:** 23 stations

— **Location:** 13 station in Lisbon Metropolitan Area – North; 5 stations in Lisbon Metropolitan Area – South; 2 stations in Setúbal; 3 stations in West, Tagus Valley and Setúbal Península. More detail in table 1.

— **Techniques:** PM10 and PM2.5 are measured continuously through Beta Attenuation Instruments and, more rarely, with Tapered Element Oscillating Microbalance. Chemical analysis of particles is not performed in these monitoring stations.

— **Sampling/measurement frequency:** Systematically and continuously.

— **Sampling/measurement duration:** Hourly

— **Other information:** Data is reported in Qualar website. http://qualar.apambiente.pt/.

Table 1: Sampling stations managed by CCDR-LVT

Zone	Tipology	Municipality	Station	PM10	PM2.5
AML Norte (a)	Urban background	Amadora	Reboleira	β atenuation	
		Lisboa	Beato		
			Restelo	TEOM	
			Olivais	β atenuation	β atenuation
		Oeiras	Quinta do Marquês	β atenuation	
		Loures	Loures-Centro	β atenuation	
		Sintra	Mem Martins	β atenuation	β atenuation
		Vila Franca de Xira	Alverca	β atenuation	
	Urban traffic	Cascais	Cascais-Escola da Cidadela (1)	β atenuation	
		Lisboa	Avenida da Liberdade	β atenuation	
			Santa Cruz de Benfica	TEOM	
			Entrecampos	β atenuation	β atenuation
		Odivelas	Odivelas-Ramada	β atenuation	
AML Sul (a)	sub-urban industrial	Seixal	Paio Pires	TEOM	
	Urban background	Almada	Laranjeiro	β atenuation	β atenuation
	Urban industrial	Barreiro	Escavadeira	β atenuation	
	Urban background		Fidalguinhos	β atenuation	
	Urban industrial		Lavradio	β atenuation	
Setúbal (a)	Urban background	Setúbal	Arcos	β atenuation	

	Urban traffic		Quebedo	β atenuation	
Oeste, Vale do Tejo e Península de Setúbal	Rural background	Chamusca	Chamusca	β atenuation	β atenuation
		Lourinhã	Lourinhã	β atenuation	β atenuation
		Palmela	Fernando Pó	β atenuation	β atenuation

A2. What are the main concerns considering the PM measurements?

X **Exceedances**

☐ **Health Impact**

☐ **Other:**

The limit values established by the legislation consider the human health protection, therefore health impacts are also considered indirectly.

A3. Is there any regulation about Indoor Air Quality (IAQ)?   X Yes   ☐ No

Is the IAQ in schools/homes evaluated in a systematic way? What are the main concerns about IAQ in schools/homes?

− Portaria n.º 353-A/2013 establishes the minimum values of fresh air flow per space, as well as the thresholds and reference conditions for indoor air pollutants in service buildings. Schools are included in this legislation but there is no legislation for IAQ in homes.

− IAQ is not included in the competencies of CCDR-LVT.

− IAQ is not evaluated systematically.

− The main concern is the health effects of the IAQ.

A4. Environmental risks can be represented as a chain of events as below; please mark by circles and arrows which associations along the chain have been assessed in your city:

emission sources <=> environmental contamination - population exposures - health effects - economic costs of pollution

Comments:

A6.   Do you have data/information about time activity patterns for the population in your city? If Yes, please clarify.

CCDR-LVT don't have information about time activity patterns.

A7. What do you see as future research needs/air quality monitoring issues in your area?

PART B – ACTION PLANS

B1. Have you developed an action/air quality plan in case of exceedances in air quality?

X Yes

☐ No

Give Link/document please.

B2. Can you provide us with some details for the action plan?

The European legislation in force since 1996 on air quality assessment and management states that Member States in zones and agglomerations where the levels of one or more pollutants exceed the limit values (plus a margin of tolerance, if applicable) shall draw up and implement air quality improvement plans to ensure compliance with the limit value within the time limit.

In compliance with this obligation, in 2005 CCDR-LVT elaborated the Air Quality Improvement Plan for the Lisbon and Vale do Tejo Region (PMQA-LVT) for the evaluation period 2001-2004, which was approved by Portaria n.º 715/2008, of August 6. This plan, which applies to the agglomerations of the Metropolitan Area of Lisbon Norte, Metropolitan Area of Lisbon South and Setúbal (areas where PM10 particles and nitrogen dioxide levels were higher than the limit values, plus their margin of tolerance), was designed to evaluate and to propose a set of measures, to be implemented in the short-medium term, to enforce the limit values in these zones, in accordance with the provisions of Decreto-Lei n.º 276/99, of July 23, amended by Decreto-Lei n.º 279/2007, of August 6.

B3. Have you implemented in the past action plans and when?

The PMQA-LVT was the basis for the elaboration of its Implementation Program, which was approved by Despacho Conjunto n.º 20763, published on September 16, 2009. This program was developed by an inter-sectorial team, which brought together those responsible for environment, transport, industry, civil protection and also local administration.

In the PMQA-LVT Implementation Program (PExec PMQA-LVT), the PMQA-LVT measures to be adopted were selected. For each measure, the actions to be carried out for its implementation and the respective timing were defined, which entities are responsible for carrying out these actions, as well as the indicators to evaluate their effectiveness.

PExec PMQA-LVT measures fall into two categories, depending on the entities responsible for their development and implementation:

• Municipal scope, concretized to a large extent by the local administration;

• Supra municipal scope, involving the implementation of the measure by more than a municipality and often by the central government entities.

Most of the measures, in particular those that depend on local administration, were formalized through the signing of collaboration protocols between the municipalities involved and the CCDR-LVT, according with the legislation in force.

Taking into account that the timetable for implementing the measures contained in the PExec PMQA-LVT covered the period 2005-2012, in the year 2013 the final evaluation of this process was carried out, based on the annual monitoring of the implementation of the measures adopted.

B4-What emission sector(s) are you addressing with your air pollution mitigation measures?

☐ **SNAP1-combustion in energy and transformation industries**

☐ **SNAP2-non-industrial combustion plants**

☐ **SNAP3-combustion in manufacturing industry**

☐ **SNAP4-production processes**

☐ **SNAP5-extraction and distribution of fossil fuels and geothermal energy**

☐ **SNAP6-solvent and other product use**

X **SNAP7-road transport**

☐ **SNAP8-other mobile sources and machinery**

☐ **SNAP9-waste treatment and disposal**

☐ **SNAP10-agriculture**

☐ **SNAP11-other sources and sinks**

☐ **Other:** _____

B5. Which specific measures for the improvement of air quality and especially for the reduction of particulate pollution are currently being used?

X Strategies to reduce PM emissions from traffic, e.g. promotion of low emission vehicles

☐ Strategies to reduce PM emissions from heating and energy production

X Zoning as a strategy to reduce PM emissions

X Strategies to reduce air pollution emissions from local sources, e.g. traffic or domestic combustion

X Strategies to reduce fugitive dust emissions, e.g. road dust

☐ Strategies to react on air pollution episodes

☐ _____

☐ _____

☐ _____

B6. How and how frequent do you evaluate the effect of measures?

B7. Should further mitigation measures be considered?

B8. What are the most effective measures for PM compliance in your opinion for European urban environments?

☐ **Street washing**

☐ **Application of dust suppressants**

X **Vehicular traffic regulation**

X **Wood burning regulation**

☐   **Others:**   _____

_____

_____

_____

_____

_____

B9. Please, provide reference for your activity (reports, papers, etc.)

− "Plans and Programs for the Improvement of Air Quality in the Lisbon and Tagus Valley Region"

− "Program for the Implementation of the Air Quality Improvement Plan in the Lisbon and Tagus Valley Region"

− "Air Quality Protocols"

− "Environmental Air Quality Assessment Report in the Lisbon and Tagus Valley Region for the Period 2001-2013"

− "Assessment of the impact on Inhalable particles resulting from the washing on Avenida da Liberdade"

− "Atmospheric Emissions Inventory of the Lisbon and Tagus Valley Region"

These documents are available in http://www.ccdr-lvt.pt/pt/qualidade-do-ar/1265.htm

PART C –HEALTH RISKS

C1. Have you records of the population mortality/morbidity?

X No

☐ Hospital data

☐ Research studies

☐ Other   _____

It is outside the competencies of CCDR-LVT

C2. When you are identifying and quantifying risks to human health in your work, which exposures do you consider (list in decreasing order of significance)?

1_____

2_____

3_____

4_____

5_____

6_____

7_____

8_____

9_____

It is outside the competencies of CCDR-LVT

C3. How do you quantify or measure the importance of the risks (describe for the three most significant exposures)?

1_____

2_____

3_____

4_____

5_____

6_____

7_____

8_____

9_____

It is outside the competencies of CCDR-LVT

C4. Are you happy with the information available to you to do the risk assessment(s) or do you see some possibilities for improvements coming from the tools developed in INDEX Air project?

☐ **No**   **X** Yes.

If Yes, what improvements would you like to highlight?

The risk assessment information is important to develop the measures and to inform citizens about the importance of the implementation of the measures for health effects. This information can be very useful to population engagement. _____

_____

_____

_____

_____

_____

C5. Have you used in risk characterization any of these (if yes, how)

X Exposure limit values

X Concentration limit values

☐ Quantitative risk (probability of risk)

☐ Acceptable risk

☐ Number of subjects exposed

☐ Number of attributed cases

☐ Burden of disease

☐ Other (please specify)

C6. If it was possible to compare various risks (e.g. those that you listed in question C Error! Reference source not found.**) would you find such information useful?**

☐ No   X Yes.

If Yes, why?

_____

_____

_____

PART D – LIFE INDEX-AIR MANAGEMENT TOOL

INDEX-AIR Management Tool scopes to support policy development and decision making with respect to PM air pollution control and protection of public health.

This section aims to receive your opinion about the issues which need to be addressed in the Tool.

D1. Possibility for the Stakeholders to introduce new data (e.g. emission data, PM concentration values) in the Tool.

☐ Very Important

X Important

☐ Less important

D2. Visualization of air quality data

☐ Very Important

X Important

☐ Less important

D3. Visualization of indoor air quality data

☐ Very Important

X Important

☐ Less important

D4. Visualization of emission data (e.g. sectors, values) and their extraction from the user

☐ Very Important

X Important

☐ Less important

D5. Visualization of population exposure in specific time intervals

X Very Important

☐ Important

☐ Less important

D6. Visualization of spatial distribution of population exposure

X Very Important

☐ Important

☐ Less important

D7. Visualization of population dose data

☐ Very Important

X Important

☐ Less important

D8. Visualization of data of burden of disease in your urban area / population / children

☐ Very Important

X Important

☐ Less important

D9. Possibility to construct scenarios for PM emission reductions

X Very Important

☐ Important

☐ Less important

D10. Forecast PM emission changes based on policy scenarios

X Very Important

☐ Important

☐ Less important

D11. Forecast PM concentration changes based on policy scenarios

X Very Important

☐ Important

☐ Less important

D12. Forecast PM exposure changes based on policy scenarios

X Very Important

☐ Important

☐ Less important

D13. Forecast PM dose changes based on policy scenarios

☐ Very Important

X Important

☐ Less important

D14. Forecast PM burden disease changes based on policy scenarios

X Very Important

☐ Important

☐ Less important

Thank You!

IDENTIFICATION

5. **Institution:** <mark>CCDR-N Comissão de Coordenação e Desenvolvimento Regional do Norte - PORTUGAL</mark>

6. **Type:**

   ☐ **Research / Higher Education**

       ☐ **Applied research**   ☐ **Fundamental/basic/pure research**

   ☐ **Private company**

   X **Government Agency/Institution/Administration**

   ☐ **Non-Governmental Organization**

   ☐ **Municipality**

   ☐   **Other:**

   _____

3. Web site: _http://www.ccdrn.pt

4. Contact person

First name: ___Vitor_____

Last name: Monteiro_____

e-mail:vitor.Monteiro@ccdr-n.pt_____

Address: ___Rua Rainha D. Estefânia, n. ° 251, 4150-304, Porto_____

Telephone: __+351 226 086 300_____

City: ____Porto_____

Country: Portugal_____

5. What type of assessment tools would help you to better include health and health risks in your work? __monitoring and modelling__

How important would you consider availability of such tools is? __5_____

Scale 1-5 (not important - essential)

PART A – MONITORING AND ASSESSMENT

A1. How extensive data set of PM chemical speciation measurements is available?

Available data also from research projects may be included. **Please specify:**

⸺ **Number of sampling stations:** _7 (1 rural background, 3 urban background and 3 urban traffic)_____

⸺ **Location**: _Air quality monitoring stations: Santo Tirso, Centro de Lacticínios, Ermesinde, Lamas de Olo, Matosinhos, Circular Sul and Antas_____

⸺ **Techniques**: _gravimetric sampling of PM10 following Norma EN 12341, subsequent chemical analysis_____

⸺ **Sampling/measurement frequency:** _a 24h sampling every two days_____

⸺ **Sampling/measurement duration:** _30 days in Winter and 30 days in Summer in each one of the locations _____

⸺ **Other information:** Measurement of As, Cd, Ni, BaP on PM10_____

__Preliminary campaigns in 2008 evidenced exceedances to the threshold values of Ni and BaP in 3 locations. In 2009, the measurements were repeated in these locations.

A2. What are the main concerns considering the PM measurements?

       X Exceedances

       X Health Impact

       ☐ **Other:** _____

A3. Is there any regulation about Indoor Air Quality (IAQ)?   X Yes   ☐ **No**

Is the IAQ in schools/homes evaluated in a systematic way? What are the main concerns about IAQ in schools/homes?

There is no systematic evaluation of IAQ in schools/homes. There is no general interest on that, although CCDRN finds it important and essential, not only in schools and homes but also in working places.

A4. Environmental risks can be represented as a chain of events as below; please mark by circles and arrows which associations along the chain have been assessed in your city:

<u>emission sources</u> - <u>environmental contamination</u> - <u>population exposures</u> - health effects - <u>economic costs of pollution</u>

Comments: The underlined events have been addressed for the Northern Region of Portugal, but for different purposes and not as a chain of events. Emission sources are addressed for emission inventories reporting, environmental contamination - population exposures are addressed in the scope of air quality monitoring and assessment for the evaluation of legislation compliance.

For the development of air quality plans, the events environmental contamination - population exposures - economic costs of pollution have been considered in an integrated way.

A5.   Have you records of the population mortality/morbidity? If Yes, please clarify.

No we do not have mortality/morbidity records but we would like to have access to this information. That would be very useful to complement the air quality assessment and management in the region.

A6.   Do you have data/information about time activity patterns for the population in your city? If Yes, please clarify.

No_____

_____

A7. What do you see as future research needs/air quality monitoring issues in your area?

CCDRN identifies the need to establish a closer link between environment and health, since the respective governmental institutions, currently, have no direct collaboration. A bigger effort should be made to work on common interests and research goals.

It is important to implement measures to reduce emissions from residential combustion, however, without regulation it is difficult to define a strategy.

PART B – ACTION PLANS

B1. Have you developed an action/air quality plan in case of exceedances in air quality?

X Yes

☐ No

Give Link/document please.

Ozone   -

http://www.ccdrn.pt/sites/default/files/ficheiros_ccdrn/ambiente/plano_qualidade_ar_rn_ozono.pdf.

Date: Dec 2014

NO2   -

http://www.ccdrn.pt/sites/default/files/ficheiros_ccdrn/ambiente/plano_qualidade_ar_rn_no2.pdf.

Date: Sep 2014

http://www.ccdrn.pt/sites/default/files/ficheiros_ccdrn/ambiente/medidas_programa_no2.pdf.

Date: Sep 2012

Note: The Implementation Program for the Braga agglomeration was not implemented due to the time gap between the date of the program design and development and the date of publication. At the time of publication, there had been no exceedances for the past 3 years.

B2. Can you provide us with some details for the action plan?

Exceedances of the PM10 limit values at four agglomerations namely, Porto Litoral, Braga, Vale do Sousa and Vale do Ave promoted the development of a strategy to mitigate emissions of this pollutant. This strategy was consolidated through the Plan to Improve Air Quality in the Northern Region which presented a set of measures to be implemented in Porto Litoral, Braga, Vale do Sousa and Vale do Ave agglomerations, identified as those in which the problems of air quality would justify an intervention and the adoption of measures. This plan was published in the Portuguese Decree 716/2008. Consequently, the PERN was elaborated (PERN–Execution Programme of the Plan to Improve Air Quality in the Northern Region, and approved through the Decree 20762/2009.

The air quality plan and action plan for NO2 highlights the traffic as the main sector contributing to the exceedances to the annual and daily limit value. The action plan for PM10 also contributes to the reduction of NOx emissions with measures for the transport sector. Since most NO2 exceedances occur in traffic monitoring stations, measures should be implemented at local/municipal level.

Regarding the O3 air quality plan, it was found that the main cause of ozone exceedances is related to background concentration levels, and thus, a regional/national based strategy is required. Moreover, measures focusing on transport and residential combustion sectors were proposed, aiming to decrease emissions of ozone precursors.

B3. Have you implemented in the past action plans and when?

Action plans have been implemented for PM10 and for NO2. Para PM10, iniciou-se a implementação das medidas previstas no Programa de Execução no biénio 2009-2011. No caso do NO2, o respetivo Programa de Execução ainda está em curso, terminando o prazo no final deste ano

B4-What emission sector(s) are you addressing with your air pollution mitigation measures?

☐ **SNAP1-combustion in energy and transformation industries**

☐ **SNAP2-non-industrial combustion plants**

☐ **SNAP3-combustion in manufacturing industry**

☐ **SNAP4-production processes**

☐ **SNAP5-extraction and distribution of fossil fuels and geothermal energy**

☐ **SNAP6-solvent and other product use**

X **SNAP7-road transport**

☐ **SNAP8-other mobile sources and machinery**

☐ **SNAP9-waste treatment and disposal**

☐ **SNAP10-agriculture**

☐ **SNAP11-other sources and sinks**

☐ **Other: _____**

B5. Which specific measures for the improvement of air quality and especially for the reduction of particulate pollution are currently being used?

☐ Strategies to reduce PM emissions from traffic, e.g. promotion of low emission vehicles
☐ Strategies to reduce PM emissions from heating and energy production
☐ Zoning as a strategy to reduce PM emissions
X Strategies to reduce air pollution emissions from local sources, e.g. traffic or domestic combustion
☐ Strategies to reduce fugitive dust emissions, e.g. road dust
☐ Strategies to react on air pollution episodes
☐ _____
☐ _____
☐ _____
_____
_____

B6. How and how frequent do you evaluate the effect of measures?

_____
_____

_____

_____

_____

_____

_____

B7. Should further mitigation measures be considered?

Yes, measures at national level are required namely to reduce emission from the residential combustion sector.

B8. What are the most effective measures for PM compliance in your opinion for European urban environments?

☐ **Street washing**

☐ **Application of dust suppressants**

X **Vehicular traffic regulation**

X **Wood burning regulation**

☐   **Others:**   **_____**

_____

B9. Please, provide reference for your activity (reports, papers, etc.)

_____

_____

_____

_____

PART C –HEALTH RISKS

C1. Have you records of the population mortality/morbidity?

X No

☐ Hospital data

☐ Research studies

☐ Other _____

Health risks are out of CCDRN scope and mission

C2. When you are identifying and quantifying risks to human health in your work, which exposures do you consider (list in decreasing order of significance)?

1_____

2_____

3_____

4_____

5_____

6_____

7_____

8_____

9_____

C3. How do you quantify or measure the importance of the risks (describe for the three most significant exposures)?

1_____

2_____

3_____

4_____

5_____

6_____

7_____

8_____

9_____

C4. Are you happy with the information available to you to do the risk assessment(s) or do you see some possibilities for improvements coming from the tools developed in INDEX Air project?

X No   ☐ Yes.

If Yes, what improvements would you like to highlight?

There is a lack of communication and collaboration with health professionals

C5. Have you used in risk characterization any of these (if yes, how)

☐ Exposure limit values

X Concentration limit values

☐ Quantitative risk (probability of risk)

☐ Acceptable risk

☐ Number of subjects exposed

☐ Number of attributed cases

☐ Burden of disease

☐ Other (please specify)

C6. If it was possible to compare various risks (e.g. those that you listed in question C Error! Reference source not found.**) would you find such information useful?**

☐ No   ☐ Yes.

If Yes, why?

_____

_____

PART D – LIFE INDEX-AIR MANAGEMENT TOOL

INDEX-AIR Management Tool scopes to support policy development and decision making with respect to PM air pollution control and protection of public health.

This section aims to receive your opinion about the issues which need to be addressed in the Tool.

D1. Possibility for the Stakeholders to introduce new data (e.g. emission data, PM concentration values) in the Tool.

X Very Important

☐ Important

☐ Less important

D2. Visualization of air quality data

X Very Important

☐ Important

☐ Less important

D3. Visualization of indoor air quality data

X Very Important

☐ Important

☐ Less important

D4. Visualization of emission data (e.g. sectors, values) and their extraction from the user

X Very Important

☐ Important

☐ Less important

D5. Visualization of population exposure in specific time intervals

X Very Important

☐ Important

☐ Less important

D6. Visualization of spatial distribution of population exposure

X Very Important

☐ Important

☐ Less important

D7. Visualization of population dose data

X Very Important

☐ Important

☐ Less important

D8. Visualization of data of burden of disease in your urban area / population / children

X Very Important

☐ Important

☐ Less important

D9. Possibility to construct scenarios for PM emission reductions

X Very Important

☐ Important

☐ Less important

D10. Forecast PM emission changes based on policy scenarios

X Very Important

☐ Important

☐ Less important

D11. Forecast PM concentration changes based on policy scenarios

X Very Important

☐ Important

☐ Less important

D12. Forecast PM exposure changes based on policy scenarios

X Very Important

☐ Important

☐ Less important

D13. Forecast PM dose changes based on policy scenarios

X Very Important

☐ Important

☐ Less important

D14. Forecast PM burden disease changes based on policy scenarios

X Very Important

☐ Important

☐ Less important

Thank You!

IDENTIFICATION

7. **Institution:** City of Kuopio _____

8. **Type:**

☐ **Research / Higher Education**

☐ **Applied research**   ☐ **Fundamental/basic/pure research**

☐ **Private company**

X **Government Agency/Institution/Administration**

☐ **Non-Governmental Organization**

3. **Web site: www.kuopio.fi**

4. **Contact person**

First name: Erkki

Last name: Pärjäläe-mail: erkki.parjala@kuopio.fi_____

Address: _____PL 1097, 70111 Kuopio, FINLAND_____

Telephone: +358447182142_____

City: Kuopio_____

Country: Finland_____

5. **What type of assessment tools would help you to better include health and health risks in your work?** _Simplified models which relate environmental quality to health effects at local scale_____

How important would you consider availability of such tools is? __4_____

Scale 1-5 (not important - essential)

PART A – MONITORING AND ASSESSMENT

A1. How extensive data set of PM chemical speciation measurements is available?

Available data also from research projects may be included. **Please specify:**

⎯ **Number of sampling stations: 2-3_____**

⎯ **Location: Background in the city center and dwelling areas outside city center** ___

⎯ **Techniques: PM10 sampling and laboratory analyzes** _____

⎯ **Sampling/measurement frequency: __Typically 3 days**

⎯ **Sampling/measurement duration: __½ year – one year**

⎯ **Other information: ___Chemical speciation of PM has focused on some heavy metals and PAH-compounds. Analyzes have been done from PM10-samples (24 hour). _Some old data exists which include also other chemical speciation (sulfate, nitrate, ammonium etc.)**_____

_____

A2. What are the main concerns considering the PM measurements?

☐ **Exceedances**

X **Health Impact**

☐ **Other: _____Need to monitor the general PM concentrations in different parts of the city and the changes in the concentration levels. Street dust episodes during the spring and autumn time.**_____

_____

_____

_____

_____

A3. Is there any regulation about Indoor Air Quality (IAQ)?   x Yes   ☐ No

Is the IAQ in schools/homes evaluated in a systematic way? What are the main concerns about IAQ in schools/homes?

__Not evaluated in a systematic way. The main concern in indoor air are molds and microbes in general._____

_____

_____

_____

_____

A4. Environmental risks can be represented as a chain of events as below; please mark by circles and arrows which associations along the chain have been assessed in your city:

~~emission sources - environmental contamination - population exposures - health effects - economic costs of pollution~~

Comments: ___Emissions and emission sources and contamination (concentrations in the atmosphere) are monitored regularly. Population exposure and health effects have been assesses in some studies (URGENCHE …). Population exposure has been assessed in general level also based on dispersion model calculations. THL has made some studies of indoor air quality on schools in Kuopio.

A5.   Have you records of the population mortality/morbidity? If Yes, please clarify.

Yes. National and local database.

A6.   Do you have data/information about time activity patterns for the population in your city? If Yes, please clarify.

Only   some   results   from   some   scientific   studies   (THL).

_____

_____

_____

A7. What do you see as future research needs/air quality monitoring issues in your area?

Air quality impacts of domestic wood combustion. Source apportionment ___of different PM fractions. Odour problems (waste water drains, waste treatment plants etc.) in dwelling areas.

_____

_____

PART B – ACTION PLANS

B1. Have you developed an action/air quality plan in case of exceedances in air quality?

☐ Yes

X No

   Give Link/document please.

B2. Can you provide us with some details for the action plan?

_____

_____

B3. Have you implemented in the past action plans and when?

_____

_____

B4-What emission sector(s) are you addressing with your air pollution mitigation measures?

☐ **SNAP1-combustion in energy and transformation industries**

☐ **SNAP2-non-industrial combustion plants**

☐ **SNAP3-combustion in manufacturing industry**

☐ **SNAP4-production processes**

☐ **SNAP5-extraction and distribution of fossil fuels and geothermal energy**

☐ **SNAP6-solvent and other product use**

X **SNAP7-road transport**

☐ **SNAP8-other mobile sources and machinery**

X **SNAP9-waste treatment and disposal**

☐ **SNAP10-agriculture**

☐ **SNAP11-other sources and sinks**

X Other: __domestic heating

B5. Which specific measures for the improvement of air quality and especially for the reduction of particulate pollution are currently being used?

X Strategies to reduce PM emissions from traffic, e.g. promotion of low emission vehicles

X Strategies to reduce PM emissions from heating and energy production

☐ Zoning as a strategy to reduce PM emissions

X Strategies to reduce air pollution emissions from local sources, e.g. traffic or domestic combustion

X Strategies to reduce fugitive dust emissions, e.g. road dust

X Strategies to react on air pollution episodes

☐ _____

☐ _____

☐ _____

B6. How and how frequent do you evaluate the effect of measures?

Continuously (mainly yearly basis)

_____

_____

B7. Should further mitigation measures be considered?

Only   at   small   (limited)   scale

_____

_____

B8. What are the most effective measures for PM compliance in your opinion for European urban environments?

X Street washing

☐ **Application of dust suppressants**

X Vehicular traffic regulation

X Wood burning regulation

☐   **Others:**   _____

_____

_____

B9. Please, provide reference for your activity (reports, papers, etc.)

_____

_____

_____

_____

PART C –HEALTH RISKS

C1. Have you records of the population mortality/morbidity?

☐ No

X Hospital data

☐ Research studies

X Other   National register _____

C2. When you are identifying and quantifying risks to human health in your work, which exposures do you consider (list in decreasing order of significance)?

1 Indoor air quality _____

2 Ambient air quality _____

3 Environmental noise _____

4 Croceries (chemicals, microbes …) _____

5_____

6_____

7_____

8_____

9_____

C3. How do you quantify or measure the importance of the risks (describe for the three most significant exposures)?

1 Compare monitoring results to reference values _____

2 Compare monitoring results to reference values _____

3 Compare monitoring results to reference values _____

4_____

5_____

6_____

7_____

8_____

9_____

C4. Are you happy with the information available to you to do the risk assessment(s) or do you see some possibilities for improvements coming from the tools developed in INDEX Air project?

X No   ☐ Yes.

If Yes, what improvements would you like to highlight? _____More detailed health assessment and possibility to compare health risks of different exposures. _____

_____

_____

_____

_____

_____

_____

C5. Have you used in risk characterization any of these (if yes, how)

X Exposure limit values   In some scientific studies (URGENCHE)

X Concentration limit values   Juts to compare monitoring results to limit values
to show, if major health effects exist

☐ Quantitative risk (probability of risk)

☐ Acceptable risk

X Number of subjects exposed   In some studies and in indoor air assessment in general

☐ Number of attributed cases

X Burden of disease   In some scientific studies (URGENCHE)

☐ Other (please specify)

C6. If it was possible to compare various risks (e.g. those that you listed in question C Error! Reference source not found.**) would you find such information useful?**

☐ No   x Yes.

If Yes, why? _____Comparison of different risks is important, when assessing the possible
measures   for   action.
_____

_____

_____

_____

_____

_____

PART D – LIFE INDEX-AIR MANAGEMENT TOOL

INDEX-AIR Management Tool scopes to support policy development and decision making with respect to PM air pollution control and protection of public health.

This section aims to receive your opinion about the issues which need to be addressed in the Tool.

D1. Possibility for the Stakeholders to introduce new data (e.g. emission data, PM concentration values) in the Tool.

☐ Very Important

☐ Important

X Less important

D2. Visualization of air quality data

☐ Very Important

X Important

☐ Less important

D3. Visualization of indoor air quality data

☐ Very Important

X Important

☐ Less important

D4. Visualization of emission data (e.g. sectors, values) and their extraction from the user

☐ Very Important

X Important

☐ Less important

D5. Visualization of population exposure in specific time intervals

X Very Important

☐ Important

☐ Less important

D6. Visualization of spatial distribution of population exposure

X Very Important

☐ Important

☐ Less important

D7. Visualization of population dose data

☐ Very Important

X Important

☐ Less important

D8. Visualization of data of burden of disease in your urban area / population / children

☐ Very Important

X Important

☐ Less important

D9. Possibility to construct scenarios for PM emission reductions

☐ Very Important

X Important

☐ Less important

D10. Forecast PM emission changes based on policy scenarios

☐ Very Important

X Important

☐ Less important

D11. Forecast PM concentration changes based on policy scenarios

X Very Important

☐ Important

☐ Less important

D12. Forecast PM exposure changes based on policy scenarios

X Very Important

☐ Important

☐ Less important

D13. Forecast PM dose changes based on policy scenarios

☐ Very Important

X Important

☐ Less important

D14. Forecast PM burden disease changes based on policy scenarios

☐ Very Important

X Important

☐ Less important

Thank You!

IDENTIFICATION

1. **Institution:** <mark>ARPAV: Environmental Protection Agency of Veneto Region</mark>

2. **Type:**

   ☐ **Research / Higher Education**

   ☐ **Applied research**   ☐ **Fundamental/basic/pure research**

   ☐ **Private company**

   X **Government Agency/Institution/Administration**

   ☐ **Non-Governmental Organization**

3. **Web site:** www.arpa.veneto.it

4. **Contact person**

First name: Francesca

Last name: Liguori

Office: Regional Air Observatory, Inventory and Modelling Office

e-mail: francesca.liguori@arpa.veneto.it

Address: Via Lissa, 6 3017, Mestre- Venice

Telephone: +390415445609

City: Venice

Country: Italy

5. What type of assessment tools would help you to better include health and health risks in your work? An assessment tool that would allow to quantify the health related risk to population exposure to different concentration levels of macro air pollutants (PM10, PM2.5, NO2, CO, O3, benzene) and micro pollutants (IPA, B(a)P, PCDD/F, PCB, …). The population exposure should be assessed both considering long term exposure (annual or multiannual timeframe) and short term exposure (exposure to high concentrations peaks, hourly or daily accordingly to the different pollutant behavior). It would be important to be able to apply the assessment tool both to real data (concentration levels taken from measurements) or estimations coming from scenario analysis, forecasting data for new plants or emission sources or mitigation and action plans.

How important would you consider availability of such tools is? 4

Scale 1-5 (not important - essential)

PART A – MONITORING AND ASSESSMENT

A1. How extensive data set of PM chemical speciation measurements is available?

The regional air monitoring network operated by ARPAV on the whole Veneto Region (area extent of about 18264 km2 and population almost 5 millions), there are 32 sampling stations with PMx (PM10 and PM2.5) monitors. The 32 PMx monitors are located all around the region: 21 background stations (of which 13 urban sites, 1 suburban site and 7 rural sites); 8 urban traffic sites and 3 industrial sites.

On the whole regional air monitoring network PM chemical speciation data are available only very rarely for short period during specific monitoring projects (for example in Venice in 2011 during the international MED-APICE project www.apice-project.eu)

The latest PM chemical speciation campaign concluded was done in Padova at a urban background station (Mandria) in 2014. This campaign lasted from the 28 January to 16 March

with measurements of ammonium, nitrates, sulphates, Ca, Cl, Mg, K, Na. Moreover B(a)P, Pb, Cd, As, Ni are measured every 2/3 days along the whole year. Following details refer to this campaign.

[Please specify] Details of the 2014 campaign in Mandria, Padova:

— **Number of sampling stations:** 1

— **Location:** urban background site in Padova

— **Techniques:**

  ▪ PM10 and PM2.5 are measured with standard gravimetric methods.
  ▪ Metals (Pb, As, Cd, Ni) are measured on PM10 aerosol, microwave digestion of the samples and analysis by inductively coupled plasma (quadrupole) mass spectrometry.
  ▪ IPA and B(a)P with high-performance liquid chromatography-fluorescence detection.
  ▪ Water-soluble ions by ion chromatography

— **Sampling/measurement frequency:** daily (only during the campaign)

— **Sampling/measurement duration:** From 28 January to 16 March 2014

Other information:

A more extensive PM chemical speciation campaign is planned for the same Padova site for 2017 year, in parallel with other measurements all around Italy in the framework of a Italian scientific project under the scientific coordination of CNR, the Italian Research Council. For this project ions and EC/OC will be detected on PM10 and PM2.5 fractions during, at least 2 weeks campaigns for each cold and hot seasons. IPA will be detected for at least 5 weeks all along the year.

A2. What are the main concerns considering the PM measurements?

X **Exceedances**

☐ **Health Impact**

☐ **Other:** _____

A3. Is there any regulation about Indoor Air Quality (IAQ)?   ☐ **Yes**   X **No**

Is the IAQ in schools/homes evaluated in a systematic way? What are the main concerns about IAQ in schools/homes?

IAQ are not evaluated in a systematic way.

A4. Environmental risks can be represented as a chain of events as below; please mark by circles and arrows which associations along the chain have been assessed in your city:

emission sources - environmental contamination - population exposures - health effects - economic costs of pollution

Comments: 1. Emissions 2. environmental contamination and population exposures 3. Health effects 4. Economic cost of pollution

A6.   Do you have data/information about time activity patterns for the population in your city? If Yes, please clarify.

We don't have specific information. Common patterns of population behavior could be reconstructed with a general information about city characteristic (commuters, students, office time, etc).

A7. What do you see as future research needs/air quality monitoring issues in your area?

Micropolluntants (mostly organic as benzo(a)pirene and other IPA, tracers of biomass burning, PCDD-F near specific industrial plants), gas precursors for ozone, UF particles, PMx.

PART B – ACTION PLANS

B1. Have you developed an action/air quality plan in case of exceedances in air quality?

X Yes

☐ No

Give Link/document please.

http://www.arpa.veneto.it/temi-ambientali/aria/informazione-al-pubblico-sui-livelli-di-pm10

B2. Can you provide us with some details for the action plan?

The Veneto Region action plan foresees different critical levels and correspondent information and actions for PM10 exceedences of the daily limit to be act by the Municipalities under a common coordination of the Veneto Region Authority.
The critical level 0 means no exceedence of the PM10 daily limit of 50 µg/m^3.
The critical level 1 means that in a zone or agglomeration the PM10 concentrations have been exceeding the daily limit (50 µg/m^3) for 7 days.
The critical level 2 means in a zone or agglomeration the PM10 concentrations have been exceeding twice the daily limit (100 µg/m^3) for 3 days.
Main actions that the Municipalities adopts are public alert by website news and press releases, road traffic limitations and domestic heating limitations (mainly biomass burning devices).

B3. Have you implemented in the past action plans and when?

The described PM10 action plans is in force since last January 2016.
During 2016 only critical level 1 was reached in Veneto region: the city of Vicenza recorded 23 consecutive days of exceedence of the daily limit, Treviso 8 days, while Padova and Venice 7.
In this first part of 2017 year the PM10 concentrations have been very and so both critical level 1 and 2 have been reached in many cities and zones: in particular 7 agglomerations and 1 rural area have reached the critical level 2 with 3 days over 100 µg/m^3.

B4-What emission sector(s) are you addressing with your air pollution mitigation measures?

☐ **SNAP1-combustion in energy and transformation industries**

X **SNAP2-non-industrial combustion plants**

☐ **SNAP3-combustion in manufacturing industry**

☐ **SNAP4-production processes**

☐ **SNAP5-extraction and distribution of fossil fuels and geothermal energy**

☐ **SNAP6-solvent and other product use**

X **SNAP7-road transport (**

☐ **SNAP8-other mobile sources and machinery**

☐ **SNAP9-waste treatment and disposal**

X **SNAP10-agriculture** (no open fires or burning of agriculture and forest crop, yard trimmings, lawn moving)

☐ **SNAP11-other sources and sinks**

☐ **Other:**

See the Veneto Region act: http://www.arpa.veneto.it/temi-ambientali/aria/file-e-allegati/DGR1909_2016_Linee%20Guida.pdf

B5. Which specific measures for the improvement of air quality and especially for the reduction of particulate pollution are currently being used?

X Strategies to reduce PM emissions from traffic, e.g. promotion of low emission vehicles

☐ Strategies to reduce PM emissions from heating and energy production

X Zoning as a strategy to reduce PM emissions

X Strategies to reduce air pollution emissions from local sources, e.g. traffic or domestic combustion (for road traffic: ban of pre-Euro 1, also known as Euro 0, and Euro 1 gasoline vehicles and pre-Euro 1, Euro 1 and Euro 2 diesel vehicles circulation from 9 to 12 and from 15 to 18 in weekly days; for domestic heating: lowering ambient temperature to 18°C in office and industry premises and to 19°C in houses;

☐ Strategies to reduce fugitive dust emissions, e.g. road dust

X Strategies to react on air pollution episodes

X Strategies to lowering open fire emissions from agriculture and forest maintenance plans

☐ _____

☐ _____

B6. How and how frequent do you evaluate the effect of measures?

It's very difficult to evaluate the effect of measures. Qualitative assessment is reported annually for the National Ministry

B7. Should further mitigation measures be considered?

_____

B8. What are the most effective measures for PM compliance in your opinion for European urban environments?

☐ **Street washing**

☐ **Application of dust suppressants**

☐ **Vehicular traffic regulation**

X **Wood burning regulation**

☐ **Others:**

Structural actions on urban mobility and urban planning in order to lowering the private use of fossil vehicles and shifting public behavior towards low carbon emissions mobility, public transport and sharing mobility.

B9. Please, provide reference for your activity (reports, papers, etc.)

Italian languages
Regional Air Quality network operated by ARPAV, description:
http://www.arpa.veneto.it/temi-ambientali/aria/qualita-dellaria/la-rete-di-monitoraggio

Most recent annual report on air quality measurements recorded by the regional air quality network:
http://www.arpa.veneto.it/temi-ambientali/aria/file-e-allegati/documenti/relazioni-regionali-della-qualita-dellaria/Relazione%20Annuale%20Qualita%20dellaria%202015.pdf

Previous air quality annual reports:
http://www.arpa.veneto.it/temi-ambientali/aria/riferimenti/documenti

On a specific study on strategies and local actions for the mitigation of Port, Industries and Cities Emissions (MED-APICE project, http://www.apice-project.eu/)

F. Liguori, A.Latella, S.Pillon , E.Elvini, S.Patti, P.Prati, C.Bove, P.Brotto, F.Cassola, E.Cuccia, N.Marchand, A.Detournay, D.Salameh, A.Armengaud, D.Piga, J.Pey, N.Perez, X.Querol, A.Poupkou, D.Melas, G.J.Bartzis, K.Filiou, D.Saraga, E.I.Tolis, T. Quaglia , M.T.Zanetti, M. Parra, P.Ferrnández, C. Perez, E.Repa (2012). *Approcci di Source Apportionment a confronto nel progetto MED-APICE.* PM2012 5^ Convegno Nazionale Società Italiana Aerosol - 16-18 May 2012, Perugia. http://www.pm2012.it/sitoweb/contributi.pdf, http://www.pm2012.it/sitoweb/presentazioni/Liguori.pdf

F. Liguori (2012). *Il progetto MED-APICE*, capitolo del *Focus su PORTI, AEROPORTI E INTERPORTI. VIII Rapporto Qualità dell'ambiente urbano*. Edizione 2012. ISPRA – Istituto Superiore per la Protezione e la Ricerca Ambientale, Roma, Settembre 2012. ISBN 978-88-448- 0562-3. http://www.isprambiente.gov.it/it/pubblicazioni/stato-dellambiente/focus-su-porti-aeroporti-e-interporti/

Contributo alla pubblicazione Gissi, E., Quaglia, T. (a cura di) (2012), Qualità dell'aria nella laguna di Venezia. APICE: verso la riduzione dell'inquinamento atmosferico, Franco Angeli, Milano, ISBN 978-88-204-1983-7.

AA,VV (2013). Reducing atmospheric pollution in the Mediterranean Port Cities - The results of APICE project. ARPAV febbraio 2012, Padova ISBN 978-88-7504-166-3. http://www.apice-project.eu/img_web/pagine/files/Publication/Final%20Publication.pdf

On a specific study on exposure of population to air pollution due to ship emissions: (MED-CAIMANS project, http://www.medmaritimeprojects.eu/section/caimans)

F. Liguori, S. Pillon, S. Patti (2016). Progetto MED-CAIMANs. L'esposizione della popolazione agli inquinanti atmosferici dovuti alle navi crociera a Venezia: confronto tra scenario attuale e scenari futuri di sviluppo e di mitigazione, capitolo del *Focus su Inquinamento atmosferico nelle aree urbane ed effetti sulla salute. XII Rapporto Qualità dell'ambiente urbano*. Edizione 2016. ISPRA – Istituto Superiore per la Protezione e la Ricerca Ambientale, Roma, Dicembre 2016. ISBN 978-88-448-0794-8.

http://www.isprambiente.gov.it/files/pubblicazioni/statoambiente/FOCUS_RAU_2016_COMPLETO.pdf/view

English languages

On a specific study on cruise and passenger ship iir quality impact mitigation actions (MED-CAIMANS project, http://www.medmaritimeprojects.eu/section/caimans)

AA,VV (2015). Air Quality Impact and Green House Gases Assessment for Cruise and Passenger Ships. Results of the first step of CAIMANs project.
http://www.medmaritimeprojects.eu/download/ProjectCaimans/output/CAIMANs_Final_Report_partA.pdf

On a specific study on strategies and local actions for the mitigation of Port, Industries and Cities Emissions:
http://www.apice-project.eu/
http://www.apice-project.eu/img_web/pagine/files/Publication/Final%20Publication.pdf

Saraga D.E., E.I. Tolis, K.F. Filiou, J. Pey, P. Fernandez, C. Brescianini, M.T. Zannetti,P. Prati, A. Armengaud, D. Piga, D. Melas, A. Poupkou, A. Latella, F. Liguori, S. Patti and J.G. Bartzis (2012). THE AIR QUALITY STATUS OF FIVE EUROPEAN PORT-CITIES: AN OVERVIEW FOCUSED ON PM10. *8th International Conference on Air Quality - Science and Application*. 19-23 March 2012, ISBN: 978-1-907396-80-9 http://www.airqualityconference.org/f/d/Toc_AbstractBook-AQ2012.pdf

A. Detournay, D. Salameh, J.L. Jaffrezo, J. Cozic, J.Pey, N. Perez, X. Querol, P. Prati, M.C. Bove, E. Cuccia, D. Massabo, J. Bartzis, D. Saraga, E. Tolis, K. Filiou, A. Latella, F. Liguori, S. Patti, A. Armengaud, D. Piga and N. Marchand (2012). *Intercomparison of source apportionment approaches within the EU-MED APICE project*. European Aerosol Conference,2-7 September 2012 Granada (Spain). http://www.eac2012.com/; http://www.eac2012.com/EAC2012Book/files/1106.pdf.

Salameh, D., et alt. (2015). PM2.5 chemical composition in five European Mediterranean cities: A 1-year study. Atmospheric Research VOL - 155, pp 102-117, 2015/3/15.

On PM source apportionment:

Silvia Pillon, Fabio Dalan, Francesca Liguori and Giuseppe Maffeis (2008), *PM SOURCE APPORTIONMENT ANALYSIS IN THE VENETIAN AREA*. 12th conference on Harmonisation within Atmospheric Dispersion Modelling for Regulatory Purposes. Cavtat, Croatia, October 6-9, 2008.

Elena Vescovo, Fabio Dalan, Silvia Pillon and Francesca Liguori (2009), *SOURCE APPORTIONMENT STUDY OF TROPOSPHERIC OZONE IN NORTH-EAST OF ITALY, USING A PHOTOCHEMICAL MODELLING APPROACH*, 7th International Conference on Air Quality – Science and Application (formerly Urban Air Quality Conference), Istanbul 24-27 March 2009.

Silvia Pillon; Francesca Liguori; Fabio Dalan; Giuseppe Maffeis (2011) 'PM source apportionment analysis in the Venetian area', Int. J. of Environment and Pollution, Vol.47, No.1/2/3/4 , pp.134-148. DOI: 10.1504/IJEP.2011.047330.

On air quality modeling (dispersion and chemical transport modeling):

Silvia Pillon, Fabio Dalan, Francesca Liguori and Giuseppe Maffeis (2009), *MODELLING OF ORGANIC AND INORGANIC MICROPOLLUTANTS ON THE LAGOON OF VENICE*, 7th International Conference on Air Quality – Science and Application (formerly Urban Air Quality Conference), Istanbul 24-27 March 2009.

Bressan, Elvini, Liguori, Pillon (2010). *Making the right choice: trade-offs among operational issues and modelling constraints. A case study for a cement plant located in a complex terrain domain (Calpuff vs Adms)*. 13th International Conference on Harmonisation within Atmospheric Dispersion Modelling for Regulatory Purposes, Paris June 1-4 2010.

Elvini E., Pillon S., Liguori F., Lorenzet K., Silibello C., Radice P., Piersanti A. (2010). *Eulerian modelling application for a highway air quality impact assessment.* 13th International Conference on Harmonisation within Atmospheric Dispersion Modelling for Regulatory Purposes, Paris June 1-4 2010.

M. Bressan, E.Elvini, F.Liguori, S. Pillon, M. Rosa (2011), *Atmospheric dispersion modelling of pollutants emitted from a cement plant*, Ingegneria Ambientale vol. XL n. 2, marzo-aprile 2011.

Benassi, A., Dalan, F., Gnocchi, A., Maffeis, G., Malvasi, G., Liguori, F., Pernigotti, D., Pillon, S., Sansone, M. and Susanetti, L. (2011) 'A one-year application of the Veneto air quality modelling system: regional concentrations and deposition on Venice lagoon', Int. J. Environment and Pollution, Vol. 44, No. 1/2/3/4, pp.32–42. DOI: 10.1504/IJEP.2011.038400

PART C –HEALTH RISKS

C1. Have you records of the population mortality/morbidity?

☐ No

☐ Hospital data

☐ Research studies

X Other: mortality and morbidity are recorded by the Veneto Tumor Registry, a regional public service of the Veneto Region.

C2. When you are identifying and quantifying risks to human health in your work, which exposures do you consider (list in decreasing order of significance)?

This is not an task of the work of the Regional Air Observatory.

1_____

2_____

3_____

4_____

5_____

6_____

7_____

8_____

9_____

C3. How do you quantify or measure the importance of the risks (describe for the three most significant exposures)?

1_____

2_____

3_____

4_____

5_____

6_____

7_____

8_____

9_____

C4. Are you happy with the information available to you to do the risk assessment(s) or do you see some possibilities for improvements coming from the tools developed in INDEX Air project?

☐ No   X Yes.

If Yes, what improvements would you like to highlight?

We'd like to apply the tool for the assessment of air quality risk of various target population (citizens, students, …) with different pattern exposure and, possibly, also for scenario analysis

C5. Have you used in risk characterization any of these (if yes, how)

☐ Exposure limit value

X Concentration limit values

☐ Quantitative risk (probability of risk)

☐ Acceptable risk

X Number of subjects exposed   over concentration limit values

☐ Number of attributed cases

☐ Burden of disease

☐ Other (please specify)

C6. If it was possible to compare various risks (e.g. those that you listed in question CError! Reference source not found.) would you find such information useful?

☐ No   ☐ Yes.

If Yes, why? _____

_____

_____

_____

PART D – LIFE INDEX-AIR MANAGEMENT TOOL

INDEX-AIR Management Tool scopes to support policy development and decision making with respect to PM air pollution control and protection of public health.

This section aims to receive your opinion about the issues which need to be addressed in the Tool.

D1. Possibility for the Stakeholders to introduce new data (e.g. emission data, PM concentration values) in the Tool.

☐ Very Important
X Important
☐ Less important

D2. Visualization of air quality data

☐ Very Important
X Important
☐ Less important

D3. Visualization of indoor air quality data

☐ Very Important
☐ Important
X Less important

D4. Visualization of emission data (e.g. sectors, values) and their extraction from the user

☐ Very Important
X Important
☐ Less important

D5. Visualization of population exposure in specific time intervals

☐ Very Important
X Important
☐ Less important

D6. Visualization of spatial distribution of population exposure

X Very Important
☐ Important
☐ Less important

D7. Visualization of population dose data

X Very Important

☐ Important

☐ Less important

D8. Visualization of data of burden of disease in your urban area / population / children

X Very Important

☐ Important

☐ Less important

D9. Possibility to construct scenarios for PM emission reductions

X Very Important

☐ Important

☐ Less important

D10. Forecast PM emission changes based on policy scenarios

☐Very Important

X Important

☐ Less important

D11. Forecast PM concentration changes based on policy scenarios

X Very Important

☐ Important

☐ Less important

D12. Forecast PM exposure changes based on policy scenarios

X Very Important

☐ Important

☐ Less important

D13. Forecast PM dose changes based on policy scenarios

X Very Important

☐ Important

☐ Less important

D14. Forecast PM burden disease changes based on policy scenarios

X Very Important
☐ Important
☐ Less important

Thank You!

Σας παρακαλούμε να συμπληρώσετε το ερωτηματολόγιο, παρέχοντας πληροφορίες για τη Χώρα/Περιφέρεια/Πόλη σας.

Βασικά Στοιχεία

9. **Φορέας:** __<mark>Γραφείο Αστικής Ανθεκτικότητας και Βιωσιμότητας, Δήμος</mark>

   Αθηναίων_____

10. **Κατηγορία Φορέα:**

    ☐ **Ερευνητικό Κέντρο/ Πανεπιστήμιο**

      ☐ **Εφαρμοσμένη έρευνα**   ☐ **Θεμελιώδης/Βασική Έρευνα**

    ☐ **Ιδιωτική Εταιρεία**

    ☒ **Δημόσιος Τομέας (Κεντρική Κυβέρνηση/ Αποκεντρωμένη Διοίκηση)**

    ☐ **Μη Κυβερνητική Οργάνωση**

3. Ιστοσελίδα:_____ https://www.cityofathens.gr/_____

4. Πρόσωπο Επικοινωνίας

Όνομα:_____Αναστασία_____

_

Επώνυμο: ___Γκίκα_____ _____

e-mail:____gkikatasia@gmail.com_____

Διεύθυνση:_____Δημαρχιακό Μέγαρο_____

Τηλέφωνο:____210__3722331_____

_____
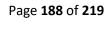
Πόλη:__Αθήνα_____

_

Χώρα:

__Ελλάδα_____

5. Τι είδους εργαλεία αξιολόγησης θα σας βοηθούσαν για να συμπεριλάβετε τον τομέα της δημόσιας υγείας και τους αντίστοιχους παράγοντες επικινδυνότητας, στο πλαίσιο της εργασία σας;

Υπολογιστικά εργαλεία αξιολόγησης των επιπτώσεων της αυξημένης συγκέντρωσης των ΑΣ στην ατμόσφαιρα (και συσχέτιση με την συγκέντρωση των ΑΣ στους εσωτερικούς χώρους όπως σχολεία, γραφεία, νοσοκομεία κτλ.) στην ανθρώπινη υγεία που θα βοηθούσαν στην ποσοστικοποίηση και τη λήψη των κατάλληλων και απαραίτητων μέτρων (βραχυπρόθεσμα και μαρκοπρόθεσμα) από τον δημόσιο φορέα για την προστασία της δημόσιας υγείας, τη βελτίωση της ποιότητας του άερα και επόμενως, τη βελτίωσης της ποιότητας ζωής στα αστικά κέντρα. Η ποσοτικοποίηση των μέτρων αυτών με τη βοήθεια των υπολογιστικών εργαλείων αυξάνει τις πιθανότητες εφαρμογής των μέτρων και της ευρύτερης υιοθέτησης αυτών από τους αρμόδιους φορείς**. _____**

Computational tools for the evaluation of the impact of the increased concentration of PMs in the atmosphere (and correlation with the concentration of PMs in Indoor environments such as in hospitals, schools, offices etc) to the human health that could lead to the quantification of the most appropriate future measures (short- and long-term) at municipal/regional level in order to protect public health and improve life in urban cities. The quantification of these measures by computational tools will empower the city with evidence and will result in the commitment of policy-makers to apply the measures.

Πόσο σημαντική θεωρείται τη διαθεσιμότητα αυτών των εργαλείων;   ___5_____

Κλίμακα 1-5 (όχι σημαντικό -απαραίτητο)

<u>**Μέρος Α – Παρακολούθηση και Αξιολόγηση**</u>

A1. Πόσο εκτενής είναι η διαθέσιμη βάση δεδομένων από μετρήσεις χημικής σύστασης των ΑΣ;

Διαθέσιμα δεδομένα από ερευνητικά προγράμματα μπορούν να συμπεριληφθούν.
Παρακαλώ προσδιορίστε:

— **Αριθμός σταθμών δειγματοληψίας:** ____Αριθμός σταθμών ΥΠΕΚΑ_____

— **Τοποθεσία:**___Στο Δήμο Αθηναίων και λοιπούς δήμους (εξωτερικούς χώρους)_____

— **Τεχνικές:**_____ΥΠΕΚΑ (απορρόφηση β ακτινοβολίας)_____

— **Συχνότητα   Δειγματοληψίας/Μετρήσεων:** ____ωριαία_____

— **Διάρκεια   Δειγματοληψίας/ Μετρήσεων:**_____Ημερήσια_____

— **Λοιπές πληροφορίες:**_____

Υπάρχουν 2 μελέτες δημοσιευμένες:

"Characterization of lead, cadmium, arsenic and nickel in PM2:5 particles in the Athens atmosphere,Greece_____

_____

_____ "Oxidative potential and chemical composition of PM2.5 in office buildings across Europe – The OFFICAIR study"

_____

_____

_____

_____

A2. Ποια είναι τα βασικά ζητήματα με βάση τις μετρήσεις των ΑΣ;

☐ **Υπερβάσεις**

☒ **Επιπτώσεις στην υγεία**

☐ **Άλλο:**

_____

_____

_____

_____

_____

_____

_____

_____

Α3. Υπάρχει κάποιος κανονισμός σχετικά με την ποιότητα του αέρα εσωτερικών χώρων;

☐ **Ναι** ☒ **Όχι**

Αξιολογείται η ποιότητα του αέρα εσωτερικών χώρων σχολείων ή κατοικιών με συστηματικό τρόπο; Ποια είναι τα βασικά ζητήματα σχετικά με την ποιότητα του αέρα εσωτερικών χώρων σχολείων ή κατοικιών;

_____

___Η ποιότητα του αέρα δεν αξιολογείται με συστημάτικό τρόπο παρά μόνο υπάρχουν κάποιες δημοσιευμένες μελέτες που περιλαμβάνουν μετρήσεις της συγκέντρωσης των ΑΣ στην ατμόσφαιρα και συσχέτιση με τη συγκέντρωση των ΑΣ στον εσωτερικό χώρο. Οι μελέτες αυτές αφορούν σχολεία, νοσοκομεία και γραφεία (χώροι με ευπαθής ομάδες και με πολλές παραμέτρους, όπως αριθμός ατόμων, εμβαδό χώρου, κάπνισμα, συσκευές κτλ. που πρέπει να ληφθούν υπόψη).

Air quality is not systematically being evaluated in school buildings or hospitals but there are a few peer reviewed journal papers that have performed measurements occasionally in schools, hospitals and offices in Athens and have correlated the outdoor with the indoor air quality by measuring the concentrations of PMs and have developed tools that can estimate the impact in human health.

_____

_____

_____

_____

Α4. Οι περιβαλλοντικοί κίνδυνοι μπορούν να αναπαρασταθούν σαν μια αλυσίδα γεγονότων όπως τα παρακάτω. Παρακαλούμε σημειώστε με κύκλους και βέλη ποιες συσχετίσεις αυτής της αλυσίδας έχουν αξιολογηθεί στην πόλη σας:

πηγές εκπομπών - μόλυνση του περιβάλλοντος - έκθεση του πληθυσμού - επιπτώσεις στην υγεία - οικονομικό κόστος της ρύπανσης

Σχόλια: _____

_____Πηγές   εκπομπών   –   Ρύπανση   του   περιβάλλοντος

_____

_____

_____

_____

_____

Α5.   Έχετε στοιχεία για την θνησιμότητα/ νοσηρότητα του πληθυσμού; Εάν ναι, παρακαλώ προσδιορίστε:

_____

__Υπάρχει μια δημοσιευμένη μελέτη του προγράμματος APHECOM για την πόλη της Αθήνας στην οποία συσχετίζεται το ποσοστό θνησιμότητας και νοσηρότητας (σε συγκεκριμένες παθήσεις) με τη συγκέντρωση των αιωρούμενων σωματιδίων στην ατμόσφαιρα (PM2.5 και PM10) και έχει αναπτύξει ένα μοντέλο εκτίμησης των επιπτώσεων στην δημόσια υγεία αν ληφθούν μέτρα (βραχυπρόθεσμα και μακρυπρόθεσμα) τα οποία θα στοχεύουν   στην   μείωση   της   συγκέντρωσης   των   ΑΣ.

_____

___The aims of the Aphekom project was to estimate, using standardised methodology, the benefit to human health by reductions in the air pollution levels under different scenarios. Mortality and air pollution data (PM10, PM2.5 and ozone) from 2004 to 2006 were used for the city of Athens. Decreasing PM10 daily average concentrations by 5μg/m3 and to

20μg/m3 could save 85 and 371 premature annual deaths, respectively. A decrease in long-term average PM2.5 concentrations by 5μg/m3, and to 10μg/m3 could reduce attributable cardiovascular mortality by 33 and 118 annual cases per 100,000. A 5μg/m3 reduction in ozone daily mean levels is related to 44 avoidable annual deaths. Aphekom has applied innovative HIA methods to take into account the additional long-term impact on the development of chronic diseases from living near busy roads and has also evaluated the monetary costs associated with this impact.

_   http://aphekom.org/c/document_library/get_file?uuid=7f3e524d-85cd-49ed-98d7-112e336330b3&groupId=10347

_____

A6.   Έχετε δεδομένα /πληροφορίες σχετικά με τη χώρο-χρονική δραστηριότητα του πληθυσμού της πόλη σας; Εάν ναι, παρακαλώ προσδιορίστε:

_____

___Δυστυχώς δεν υπάρχουν τέτοιου είδους δεδομένα για την Αθήνα.

No, unfortunately such data do not exist.

_____

_____

_____

_____

_____

A7. Ποιες θεωρείτε ότι θα είναι οι μελλοντικές ερευνητικές ανάγκες / τομείς δράσεις, σε σχέση με την παρακολούθηση της ποιότητας της ατμόσφαιρας στην περιοχή σας;

_____

___ - Συστηματική μέτρηση της συγκέντρωσης των αιωρούμενων σωματιδίων σε εσωτερικούς χώρους με ευπαθής ομάδες

_____

_____

_____

_____

_____

_____

Μέρος Β – Σχέδια Δράσης

Β1. Έχετε αναπτύξει ένα σχέδιο δράσης σχετικά με την ποιότητα της ατμόσφαιρας σε περίπτωση υπερβάσεων;

☐ Ναι

☒ Όχι

Παρακαλώ προσκομίστε τα σχετικά έγγραφα ή σύνδεσμο

Το ΥΠΕΚΑ έχει υποχρέωσει να ενημερώνει τους πολίτες για τη λήψη των απαραίτητων μέτρων προστασίας τους.

Β2. Μπορείτε να μας δώσετε περισσότερες λεπτομέρειες σχετικά με το σχέδιο δράσης;

_____
_____
_____
_____
_____
_____
_____

Β3. Έχετε εφαρμόσει στο παρελθόν σχέδια δράσης και πότε;

_____
_____Όχι_____
_____
_____
_____

_____

_____

B4- Ποιους τομείς εκπομπών αντιμετωπίζετε με τα μέτρα περιορισμού της ατμοσφαιρικής ρύπανσης;

☐ **SNAP1- καύση σε βιομηχανίες παραγωγής και μετασχηματισμού ενέργειας**

☐ **SNAP2- μη βιομηχανικές μονάδες καύσης (περιλαμβάνει τη θέρμανση κτιρίων)**

☐ **SNAP3- καύση στη μεταποιητική βιομηχανία**

☐ **SNAP4- διεργασίες παραγωγής**

☐ **SNAP5- εξόρυξη και διακίνηση ορυκτών καυσίμων και γεωθερμικής ενέργειας**

☐ **SNAP6- χρήση διαλυτών και άλλων προϊόντων**

☒ **SNAP7- οδικές μεταφορές**

☐ **SNAP8- άλλες κινητές πηγές και μηχανήματα**

☒ **SNAP9- επεξεργασία και διάθεση απορριμμάτων**

☐ **SNAP10- γεωργία**

☐ **SNAP11-άλλες πηγές και καταβόθρες**

☐ **Άλλο: _____**

B5. Ποια συγκεκριμένα μέτρα για τη βελτίωση της ποιότητας του αέρα, και ιδιαίτερα για τη μείωση της ρύπανσης από αιωρούμενα σωματίδια, εφαρμόζονται σήμερα;

☒ Στρατηγικές για τη μείωση των εκπομπών σωματιδίων από την κυκλοφορία, π.χ. προώθηση οχημάτων χαμηλών εκπομπών

☐ Στρατηγικές για τη μείωση των εκπομπών σωματιδίων από τη θέρμανση και την παραγωγή ενέργειας

☒ Οριοθέτηση περιοχών (zoning) ως μια στρατηγική για τη μείωση των εκπομπών ΑΣ

☐ Στρατηγικές για τη μείωση των εκπομπών ατμοσφαιρικής ρύπανσης από τις τοπικές πηγές, π.χ. κυκλοφορία ή οικιακή καύση

☐ Στρατηγικές για τη μείωση των διάχυτων εκπομπών σκόνης, π.χ. σκόνη δρόμου

☐ Στρατηγικές άμεσης αντίδρασης σε επεισόδια ατμοσφαιρικής ρύπανσης

☐

_____

☐

_____

☐

_____

_____

_____

_____

B6. Με ποιο τρόπο και πόσο συχνά αξιολογείτε την επίδραση των μέτρων;

_____

_____

_____

_____

_____

_____

_____

B7. Θα έπρεπε να εξεταστούν περαιτέρω μέτρα περιορισμού της ατμοσφαιρικής ρύπανσης;

_____

_____Ναι_____

_____

_____

_____

_____

B8. Ποια θεωρείτε ότι είναι τα πιο αποτελεσματικά μέτρα για να επιτευχθεί συμμόρφωση με τα πρότυπα ποιότητας για τα ΑΣ, στο αστικό περιβάλλον της Ευρώπης;

☐ **Πλύσιμο δρόμων**

☐ **Εφαρμογή κατασταλτικών σκόνης**

☒ **Ρύθμιση της κυκλοφορίας των οχημάτων**

☐ **Ρύθμιση της καύσης ξύλου**

☐ **Άλλο:** _____

____Αυστηρότερες προδιαγραφές για τις εκομπές ρύπων στην αυτοκινητοβιομηχανία και τη

ναυτιλία_____

_____

_____

B9. Παρακαλώ, παραθέστε αναφορές για τη δραστηριότητά σας (εκθέσεις, άρθρα, κτλ.)

_____

_____

_____

_____

Μέρος Γ – Κίνδυνοι για την Υγεία

C1. Διαθέτετε αρχεία για τη θνησιμότητα/ νοσηρότητα του πληθυσμού;

☐ Όχι

☐ Νοσοκομειακά δεδομένα

☐ Ερευνητικές μελέτες

☐ Άλλο ____Μελέτη APHECOM_____

C2. Όταν αναγνωρίζετε και ποσοτικοποιείτε τους κινδύνους για την ανθρώπινη υγεία, ποιους τύπους έκθεσης του ανθρώπου λαμβάνετε υπόψη (Λίστα κατά φθίνουσα σειρά σημασίας);

1_____

2_____

3_____

4_____

5_____

6_____

7_____

8_____

9_____

C3. Πώς ποσοτικοποιείτε ή αξιολογείτε τη σπουδαιότητα των κινδύνων (περιγράψτε για τους τρεις σημαντικότερους τύπους έκθεσης);

1_____

2_____

3_____

4_____

5_____

6_____

7_____

8_____

9_____

C4. Είστε ευχαριστημένοι με τις πληροφορίες που είναι στη διάθεσή σας για να κάνετε την αξιολόγηση των κινδύνων ή βλέπετε κάποιες δυνατότητες για βελτιώσεις που προέρχονται από τα εργαλεία που θα αναπτυχθούν στο έργο INDEX Air;

☐ Όχι ☐ Ναι.

Εάν Ναι, σε ποιες βελτιώσεις θα θέλατε να δώσετε έμφαση;_____

__Τα εργαλεία που θα αναπτυχθούν στο έργο INDEX Air είναι πολύ σημαντικά αλλά θα πρέπει να υπάρχουν και τα κατάλληλα δεδομένα από μετρήσεις.

_____

_____

_____

_____

_____

C5. Κατά τον χαρακτηρισμό των κινδύνων, έχετε χρησιμοποιήσει κάποιο από τα ακόλουθα κριτήρια (εάν ναι, πως);

☐ Οριακές τιμές έκθεσης

_____

☒ Οριακές τιμές συγκέντρωσης _(περιγράφονται στην έκθεση του ΥΠΕΚΑ μονο για τα ΑΣ στην ατμόσφαιρα)_____

☐ Ποσοτικοποίηση της επικινδυνότητας (πιθανότητα κινδύνου)_____

☐ Αποδεκτός κίνδυνος _____

☐ Αριθμός εκτεθειμένων ατόμων _____

☐ Αριθμός καταγεγραμμένων περιπτώσεων_____

☐ Επιβάρυνση της υγείας (burden of disease)_____

☐ Άλλο (παρακαλώ διευκρινίστε) _____

C6. Εάν μπορούσατε να συγκρίνετε τους διάφορους κινδύνους (π.χ. αυτούς που παραθέσατε στην ερώτηση C1) θα σας ήταν μια χρήσιμη πληροφορία;

☐ Όχι ☐ Ναι.

Εάν ναι, γιατί;

_____

Μέρος Δ – Εργαλείο διαχείρισης LIFE INDEX-AIR

Το εργαλείο διαχείρισης INDEX-AIR αποσκοπεί στην υποστήριξη της ανάπτυξης πολιτικής και της λήψης αποφάσεων σχετικά με τον έλεγχο της ατμοσφαιρικής ρύπανσης από ΑΣ και της προστασίας της ανθρώπινης υγείας.

Αυτό το μέρος στοχεύει στο να καταγράψει την άποψή σας σχετικά με ζητήματα που πρέπει να ληφθούν υπόψη κατά την ανάπτυξη του εργαλείου.

Δ1. Δυνατότητα για τους ενδιαφερόμενους φορείς να εισάγουν νέα πληροφορία (π.χ. δεδομένα εκπομπών, τιμές συγκέντρωσης ΑΣ) στο εργαλείο

☒ Πολύ σημαντικό

☐ Σημαντικό

☐ Λίγο σημαντικό

Δ2. Απεικόνιση δεδομένων της ποιότητας του αέρα

☐ Πολύ σημαντικό

☐ Σημαντικό

☒ Λίγο σημαντικό

Δ3. Απεικόνιση δεδομένων της ποιότητας του αέρα εσωτερικών χώρων

☐ Πολύ σημαντικό

☐ Σημαντικό

☒ Λίγο σημαντικό

Δ4. Απεικόνιση δεδομένων εκπομπών (π.χ. τομείς, επίπεδα εκπομπής) και δυνατότητα εξαγωγής τους από το χρήστη

☐ Πολύ σημαντικό

☒ Σημαντικό

☐ Λίγο σημαντικό

Δ5. Απεικόνιση της έκθεσης του πληθυσμού σε συγκεκριμένα χρονικά διαστήματα

☒ Πολύ σημαντικό

☐ Σημαντικό

☐ Λίγο σημαντικό

Δ6. Απεικόνιση της χωρικής κατανομής της έκθεσης του πληθυσμού

☒ Πολύ σημαντικό

☐ Σημαντικό

☐ Λίγο σημαντικό

Δ7. Απεικόνιση της δόσης ΑΣ που εναποτίθεται στον ανθρώπινο οργανισμό

☐ Πολύ σημαντικό

☒ Σημαντικό

☐ Λίγο σημαντικό

Δ8. Απεικόνιση των δεδομένων της επιβάρυνσης της υγείας από την έκθεση σε ΑΣ στην αστική περιοχή σας/στο συνολικό πληθυσμό/ στα παιδιά

☒ Πολύ σημαντικό

☐ Σημαντικό

☐ Λίγο σημαντικό

Δ9. Δυνατότητα δημιουργίας σεναρίων για τη μείωση των εκπομπών ΑΣ

☒ Πολύ σημαντικό

☐ Σημαντικό

☐ Λίγο σημαντικό

Δ10. Πρόβλεψη των μεταβολών στις εκπομπές των ΑΣ, βάσει συγκεκριμένων σεναρίων περιβαλλοντικής πολιτικής

☐ Πολύ σημαντικό

☐ Σημαντικό

☐ Λίγο σημαντικό

Δ11. Πρόβλεψη των μεταβολών στις συγκεντρώσεις των ΑΣ, βάσει συγκεκριμένων σεναρίων περιβαλλοντικής πολιτικής

☒ Πολύ σημαντικό

☐ Σημαντικό

☐ Λίγο σημαντικό

Δ12. Πρόβλεψη των μεταβολών στην έκθεση του πληθυσμού σε ΑΣ, βάσει συγκεκριμένων σεναρίων περιβαλλοντικής πολιτικής

☒ Πολύ σημαντικό

☐ Σημαντικό

☐ Λίγο σημαντικό

Δ13. Πρόβλεψη των μεταβολών στη δόση των ΑΣ που εναποτίθεται στον ανθρώπινο οργανισμό, βάσει συγκεκριμένων σεναρίων περιβαλλοντικής πολιτικής

☒ Πολύ σημαντικό

☐ Σημαντικό

☐ Λίγο σημαντικό

Δ14. Πρόβλεψη των μεταβολών στην επιβάρυνση της υγείας από την έκθεση σε ΑΣ, βάσει συγκεκριμένων σεναρίων περιβαλλοντικής πολιτικής

☐ Πολύ σημαντικό

☒ Σημαντικό

☐ Λίγο σημαντικό

Σας ευχαριστούμε!

2.Type of institution

- Research / Higher Education
- Private company
- Government Agency/Institution/Administration
- Non-Governmental Organization

5.How important would you consider availability of such tools is?
Scale 1-5 (not important - essential)

- 1 (not important)
- 2
- 3
- 4
- 5 (essential)
- No answer

A2. What are the main concerns considering the PM measurements?

Exceedances
33.3%

No answer
11.1%

Exceedances & Health impact
33.3%

Health Impact
22.2%

■ Exceedances ■ Health Impact □ Other ■ Exceedances & Health impact ■ No answer

A3.1. Is there any regulation about Indoor Air Quality (IAQ)?

No answer
22.2%

Yes
44.4%

No
33.3%

■ Yes ■ No ■ No answer

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A3.2. Is the IAQ in schools/homes evaluated in a systematic way?

No answer
22.2%

No
77.8%

■ Yes ■ No ■ No answer

A4. Environmental risks can be represented as a chain of events as below; please mark by circles and arrows which associations along the chain have been assessed in your city

No answer
22.2%

emission sources -
environmental
contamination
44.4%

emission sources -
environmental
contamination - population
exposures - economic
costs of pollution
11.1%

emission sources -
environmental
contamination - population
exposures - health effects -
economic costs of pollution
11.1%

emission sources -
environmental
contamination - population
exposures - health effects
11.1%

■ emission sources

■ emission sources - environmental
contamination

■ emission sources - environmental
contamination - population exposures

■ emission sources - environmental
contamination - population exposures -
health effects

■ emission sources - environmental
contamination - population exposures -
health effects - economic costs of pollution

■ emission sources - environmental
contamination - population exposures -
economic costs of pollution

■ No answer

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A5. Have you records of the population mortality/morbidity?

Yes
22.2%

No
33.3%

No answer
44.4%

■Yes ■No ■No answer

A6. Do you have data/information about time activity patterns for the population in your city?

Yes
11.1%

No answer
22.2%

No
66.7%

■Yes ■No ■No answer

B1. Have you developed an action/air quality plan in case of exceedances in air quality?

No answer
11.1%

No
22.2%

Yes
66.7%

■ Yes ■ No ■ No answer

B3. Have you implemented in the past action plans?

No answer
33.3%

Yes
55.6%

No
11.1%

■ Yes ■ No ■ No answer

B4. What emission sector(s) are you addressing with your air pollution mitigation measures?

Legend:
- SNAP1-combustion in energy and transformation industries
- SNAP2-non-industrial combustion plants
- SNAP2-non-industrial combustion plants
- SNAP4-production processes
- SNAP5-extraction and distribution of fossil fuels and geothermal energy
- SNAP6-solvent and other product use
- SNAP7-road transport
- SNAP8-other mobile sources and machinery
- SNAP9-waste treatment and disposal
- SNAP10-agriculture
- SNAP11-other sources and sinks
- Other
- SNAP2&SNAP7&SNAP10
- SNAP1&SNAP2&SNAP3&SNAP4&SNAP7&SNAP10
- SNAP7&SNAP9&Other
- SNAP1&SNAP2&SNAP6&SNAP7&SNAP8
- SNAP7&SNAP9
- No answer

Pie chart values:
- SNAP7-road transport 22.2%
- No answer 22.2%
- SNAP7&SNAP9 11.1%
- SNAP1&SNAP2&SNAP6&SNAP7&SNAP8 11.1%
- SNAP7&SNAP9&Other 11.1%
- SNAP1&SNAP2&SNAP3&SNAP4&SNAP7&SNAP10 11.1%
- SNAP2&SNAP7&SNAP10 11.1%

B5. Which specific measures for the improvement of air quality and especially for the reduction of particulate pollution are currently being used?

Legend:
- ANS1-Strategies to reduce PM emissions from traffic
- ANS2-Strategies to reduce PM emissions from heating and energy production
- ANS3-Zoning as a strategy to reduce PM emissions
- ANS4-Strategies to reduce air pollution emissions from local sources
- ANS5-Strategies to reduce fugitive dust emissions
- ANS6-Strategies to react on air pollution episodes
- ANS1&ANS2&ANS3&ANS4&ANS5
- ANS1&ANS3&ANS4&ANS5
- ANS1&ANS3&ANS4&ANS6&Other
- ANS1&ANS2&ANS4&ANS5&ANS6
- ANS1&ANS3
- ANS1&ANS2&ANS3&ANS4&ANS6
- No answer

Pie chart values:
- ANS4-Strategies to reduce air pollution emissions from local sources 11.1%
- ANS1&ANS2&ANS3&ANS4&ANS5 11.1%
- ANS1&ANS3&ANS4&ANS5 11.1%
- ANS1&ANS3&ANS4&ANS6&Other 11.1%
- ANS1&ANS2&ANS4&ANS5&ANS6 11.1%
- ANS1&ANS3 11.1%
- ANS1&ANS2&ANS3&ANS4&ANS6 11.1%
- No answer 22.2%

B7. Should further mitigation measures be considered?

Yes
44.4%

No answer
55.6%

■ Yes ■ No ■ No answer

B8. What are the most effective measures for PM compliance in your opinion for European urban environments?

Wood burning regulation
11.1%

No answer
11.1%

Vehicular traffic regulation & Others
11.1%

Street washing & Vehicular traffic & Wood burning regulation
22.2%

Vehicular traffic & Wood burning regulation
44.4%

■ Street washing
■ Application of dust suppressants
■ Vehicular traffic regulation
■ Wood burning regulation
■ Others
■ Vehicular traffic & Wood burning regulation
■ Street washing & Vehicular traffic & Wood burning regulation
■ Vehicular traffic regulation & Others
■ No answer

C1. Have you records of the population mortality/morbidity?

Legend: No, Hospital data, Research studies, Other, Hospital data & Other (National register), No answer

- No 33.3%
- No answer 22.2%
- Hospital data & Other (National register) 11.1%
- Other 11.1%
- Research studies 22.2%

C4. Are you happy with the information available to you to do the risk assessment(s) or do you see some possibilities for improvements coming from the tools developed in INDEX Air project?
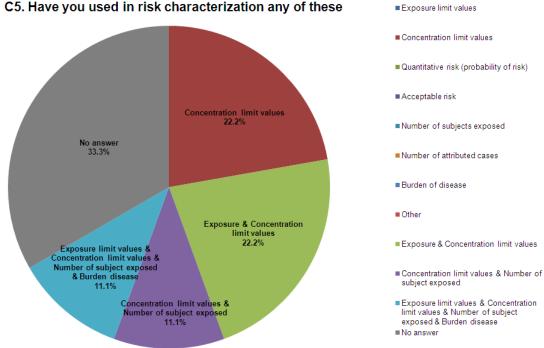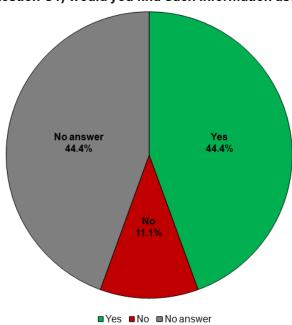

Legend: Yes, No, No answer

- Yes 44.4%
- No 33.3%
- No answer 22.2%

C5. Have you used in risk characterization any of these

Legend:
- Exposure limit values
- Concentration limit values
- Quantitative risk (probability of risk)
- Acceptable risk
- Number of subjects exposed
- Number of attributed cases
- Burden of disease
- Other
- Exposure & Concentration limit values
- Concentration limit values & Number of subject exposed
- Exposure limit values & Concentration limit values & Number of subject exposed & Burden disease
- No answer

Pie chart labels:
- Concentration limit values 22.2%
- No answer 33.3%
- Exposure limit values & Concentration limit values & Number of subject exposed & Burden disease 11.1%
- Concentration limit values & Number of subject exposed 11.1%
- Exposure & Concentration limit values 22.2%

C6. If it was possible to compare various risks (e.g. those that you listed in question C1) would you find such information useful?

Pie chart labels:
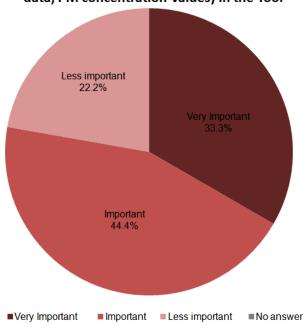- No answer 44.4%
- Yes 44.4%
- No 11.1%

Legend: Yes ■ No ■ No answer

D1. Possibility for the Stakeholders to introduce new data (e.g. emission data, PM concentration values) in the Tool

Very Important 33.3%
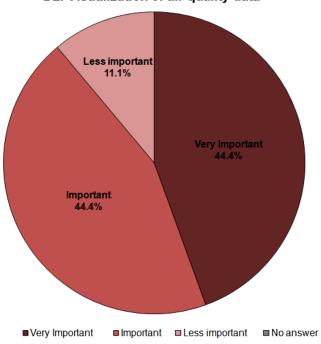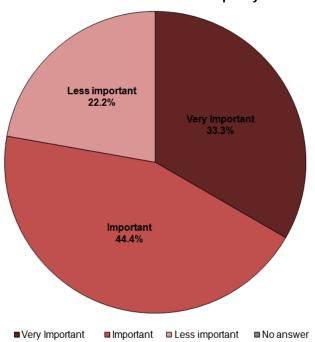Important 44.4%
Less important 22.2%

■Very Important ■Important ■Less important ■No answer

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D2. Visualization of air quality data

Very Important
44.4%

Important
44.4%

Less important
11.1%

■ Very Important ■ Important □ Less important ■ No answer

D3. Visualization of indoor air quality data

Very Important
33.3%

Important
44.4%

Less important
22.2%

■ Very Important ■ Important □ Less important ■ No answer

D4. Visualization of emission data (e.g. sectors, values) and their extraction from the user

Very Important
44.4%

Important
55.6%

■ Very Important ■ Important □ Less important ■ No answer

D5. Visualization of population exposure in specific time intervals

Less important
11.1%

Important
11.1%

Very Important
77.8%

■ Very Important ■ Important □ Less important ■ No answer

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D6. Visualization of spatial distribution of population exposure

Very Important
100%

■ Very Important ■ Important ■ Less important ■ No answer

D7. Visualization of population dose data

Less important
11.1%

Important
33.3%

Very Important
55.6%

■ Very Important ■ Important ■ Less important ■ No answer

D8. Visualization of data of burden of disease in your urban area / population / children

Important
33.3%

Very Important
66.7%

■ Very Important ■ Important ▫ Less important ▫ No answer

D9. Possibility to construct scenarios for PM emission reductions

Important
11.1%

Very Important
88.9%

■ Very Important ■ Important ▫ Less important ▫ No answer

D10. Forecast PM emission changes based on policy scenarios

No answer
11.1%

Important
22.2%

Very Important
66.7%

■ Very Important ■ Important ■ Less important ■ No answer

D11. Forecast PM concentration changes based on policy scenarios

Very Important
100.0%

■ Very Important ■ Important ■ Less important ■ No answer

D12. Forecast PM exposure changes based on policy scenarios

Very Important
100.0%

■ Very Important ■ Important □ Less important ■ No answer

D13. Forecast PM dose changes based on policy scenarios

Less important
11.1%

Important
33.3%

Very Important
55.6%

■ Very Important ■ Important □ Less important ■ No answer

D14. Forecast PM burden disease changes based on policy scenarios

Important
33.3%

Very Important
66.7%

■ Very Important ■ Important ■ Less important ■ No answer