**Horizon 2020**

**Societal Challenge: Improving the air quality and reducing the carbon footprint of European cities**

**Project: 690105 – ICARUS**

Full project title:

**Integrated Climate forcing and Air pollution Reduction in Urban Systems**

# D5.1 Report on process evaluation plan

**WP 5 Integrated assessment for short to medium term policies and measures**

Lead beneficiary: AUTH

Date: 6/2017

Nature: Report

Dissemination level: Public

# TABLE OF CONTENTS


1 EXECUTIVE SUMMARY ..... 5

2 INTRODUCTION ..... 7

3 CONCEPT AND AIMS OF PROCESS EVALUATION ..... 8

4 MAIN SETS OF ACTIVITIES IN THE FRAMEWORK OF PROCESS EVALUATION ..... 10

5 TABLE OF CONTENTS OF SPECIFIC WP WORKING PLANS ..... 12

5.1 WP2 ..... 12

5.2 WP3 ..... 15

5.3 WP4 ..... 16

5.4 WP5 ..... 17

6 ASSESSING MEASURES/POLICIES FEASIBILITY - COMMUNICATION WITH THE CITIES ..... 21

7 APPENDIX 1: PROCESS EVALUATION REPORTING FORM ..... 22

7.1 Part A. General administrative information ..... 23

7.2 Part B. General content information ..... 24

7.3 Part C. Content information for this reporting period ..... 26

7.4 Part D. Any other comment ..... 32

8 APPENDIX 2: MEASURE/POLICY ASSESSMENT QUESTIONNAIRE ..... 33

8.1 1 - Potential for success ..... 33

8.2 2 - Development process, scope ..... 35

8.3 3 - Situation and scenarios ..... 35

8.4 4 - Common vision ..... 36

**8.5 5 - Priorities and targets ..... 36**

**8.6 6 – Measure/policy specific questions ..... 36**

**8.7 7 - Responsibilities & funding ..... 39**

**8.8 8 - Monitoring & assessment ..... 39**

**8.9 9 - Adopt measure/policies ..... 40**

**9 REFERENCES ..... 41**

## Document Information

| | | | |
|---|---|---|---|
| **Grant Agreement Number** | 690105 | **Acronym** | ICARUS |
| **Full title** | Integrated Climate forcing and Air pollution Reduction in Urban Systems | | |
| **Project URL** | | | |
| **Project Officer** | Mirjam Witschke - Mirjam.WITSCHKE@ec.europa.eu | | |

| | | | | |
|---|---|---|---|---|
| **Delivery date** | **Contractual** | May 2017 | **Actual** | July 2017 |
| **Status** | Draft □ | | Final √ | |
| **Nature** | Demonstrator □ Report √ Prototype □ Other □ | | | |
| **Dissemination level** | Confidential □ Public √ | | | |

| | | | | |
|---|---|---|---|---|
| **Responsible Author (Partners)** | AUTH | | | |
| **Responsible Author** | D. Sarigiannis | | **Email** | denis@eng.auth,gr |
| | **Partner** | AUTH | **Phone** | +302310994562 |
| **Other partners (Institution)** | JSI | | | |

## Document History

| Name (Institution) | Date | Version |
|---|---|---|
| AUTH | April 2017 | 1st draft |
| JSI | June 2017 | 2nd draft |
| AUTH | July 2017 | Final |
| | | |

# 1 Executive Summary

This report outlines a procedure for technical follow-up of project implementation. The procedure is named Process Evaluation. On the project level, it is a tool for technical support of project management (WP9) activities. The core of the procedure is quality assurance approach in terms of ensuring that the project produces and delivers results that are expected as final project outcome. It uses a concept of "fit for purpose".

Process evaluation will be performed according to this Process Evaluation Plan (PEP). Figure 1 preliminary shows links and information flow among the WPs throughout the project.

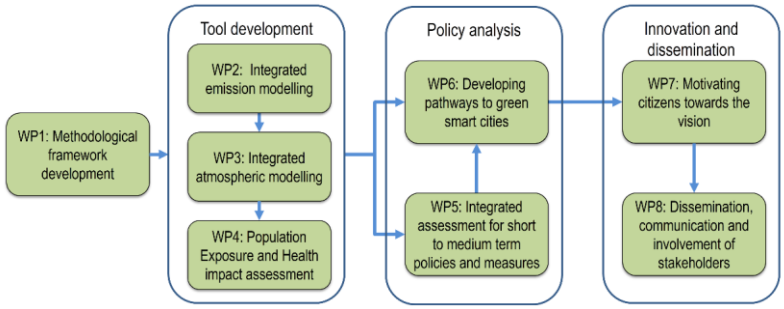


Figure 1: Schematic overview of the main project flow

The PEP requires that WPs work planning starts with the understanding of WP5 needs; the leader of WP5 needs to specify which information/data are required from WP2, WP3 and WP4 to successfully perform the work allocated to WP5 (initially this is a "backwards approach", which later on transforms into "looping and integrative approach"). In this context the WP leaders specify their work considering the needs of the subsequent WPs and taking into account strong communication with the cities:

- WP5: Integrated assessment for short to medium term policies and measures; i.e. endpoints in terms of air pollution reduction, climate change forcing reduction, costs, public health impacts, and feasibility (barriers and drivers) of the policies and measures:
- WP5: endpoints in terms of measuring the success of the project (together with WP9)
- WP5: Timing (phases of the work, i.e., when inputs/outputs are expected from WP3, WP2, and partners in WP4);
- WP5: Input information about policies and measures which are expected/needed from the cities;
- WP5: Ways of communication between WP leaders as to achieve synchronized and effective work;
- WP4: Population exposure and health impact assessment; i.e. endpoints in terms of parameters, their measurement units and expected role in the interpretation of the final results, qualitatively and quantitatively;
- WP4: Input parameters/results which are expected/needed from WP3;
- WP4: Input parameters/results which are expected/needed from the partners involved in WP4 specifying their role in the specific task of the overall WP4 work;

- WP3: Input parameters/results which are expected/needed from WP2;
- WP3: Input parameters/results which are expected/needed from the partners involved in WP3 specifying their role in the specific task of the overall WP3 work;
- WP2: Input parameters/data which are expected/needed from the cities
- WP2: Input parameters/results which are expected/needed from the partners involved in WP2 specifying their role in the specific task of the overall WP3 work;

Timing and endpoints are important to match the overall needs. After consolidation of the understanding of the expected final result of the project the PEP will be produced after common work among WP2, WP3, WP4 and WP5. Note: Relations to WP6 and WP7 will be specified according to general understanding of the PEP and agreement with the coordinator (i.e. WP9).

# 2 Introduction

The ICARUS will study the linkages between selected environmental contaminants, air pollution, climate change and human health. The scientific work in ICARUS is separated into work packages (WPs). WP2 (Integrated emission modelling) will aid in estimating the changes in emissions following proposed measures. WP3 (Integrated atmospheric modelling) will conduct a study of linking pressures to the environment with the observed air pollution and GHGs concentrations at regional and urban areas. WP4 (Population exposures and health impact assessment) will use ambient air pollutant and GHGs concentrations to estimate exposure profiles for individuals and population (sub)groups and then will apply concentration-response functions to estimate the adverse health effects to provide a context for changes in the exposure and health outcomes that might be expected after the selected policies/measures are implemented. Finally, WP5 (Integrated assessment for short- to medium-term policies and measures) will integrate the scientific findings from WP2, WP3 and WP4 to provide an integrated assessment of policy/measure combinations.

To ensure effective, targeted, synchronized, consistent and consolidated work – i.e. fit for purpose – the process evaluation methodology will be applied. Process evaluation in ICARUS will be done in the frame of WP5 supervised and in coordination with WP9 (management).

# 3 Concept and aims of Process Evaluation

Process evaluation is primarily aimed at:

- ensuring good quality (completeness, clarity, consistency) of expected project outcomes;
- avoiding/mitigating obstacles during project work;
- ensuring clear insight into reasons for not performing the project work as expected, if such situations occur.

Through process evaluation a better insight is given into three working steps: planning, implementation, delivering and interpretation of output/results. Process evaluation can provide insights regarding the main factors that have influenced the implementation of the work of specific WP, illuminating in particular reasons for deviation or under-achievement or even cancellation regarding the objectives set. It helps to identify critical issues and risks that appear in particular WP or are common to all WPs. The process evaluation exercise therefore serves to identify typical barriers (and drivers) that affect the implementation of the ICARUS project at both project and city level, especially in terms of formulating, developing and implementing the measures/policies – see Table 1 for some categories of barriers and drivers, while a detailed list of these is available in Appendix 1. PEP also provides substance for the formulation of technical/scientific recommendations regarding future similar research and related policy interventions for public good. In this relation pragmatic process evaluation is scheduled, focusing especially on the identification of barriers (negative influence on implementation) and actions taken to deal with these barriers, as well as drivers (positive influence on implementation). The mid-term assessment evaluation will be performed to evaluate project status and performance and to intervene, if needed.

*Table 1: Some categories of barriers and drivers*

| **Category** | **Subcategory** | **Interpretation as barrier** | **Interpretation as driver** |
|---|---|---|---|
| Planning | Technical | Insufficient technical planning and analysis to determine requirements for successful WP work | Accurate or visionary technical planning and analysis to determine requirements for successful WP work |
| | Financial | Insufficient financial planning to determine requirements for successful WP work | Accurate financial planning to determine requirements for successful WP work |
| | User/City assessment | Lack of city needs analysis; Limited understanding of user requirements | Thorough user/city needs analysis; Good understanding of user requirements |
| Cooperation | Partnership and involvement | Failed or insufficient partnership arrangements and | Constructive partnership arrangements and open involvement of key |

| Category | Subcategory | Interpretation as barrier | Interpretation as driver |
|---|---|---|---|
| | | limited involvement of key actors and/or other stakeholders | actors and/or other stakeholders |
| | Key individuals | Lack of leadership, individual motivation or know-how of key persons | Motivating actors and catalyzing the work process |
| Institutions | Legislation & Regulation | Hampering laws, rules, regulations, city decrees, spatial plans and their application | Facilitating laws, rules, regulations, city decrees, spatial plans and their application |
| Exchange/Mutual Learning | | Relative isolation of the particular WP work and lack of exchange with other WPs | Exchange with other WPs on work development, barriers and drivers, experiences and lessons learned |

The building four components of the Process Evaluation concept are:

- Final result: pathways to green, smart and healthy cities built on the evaluation of impacts on health and climate change;
- Exposure scenarios development and health impact evaluation: the scenarios development assumes transparent demonstration/presentation of the assessment context (the purpose, the assessment end points, the time frames) together with the exposure assessment philosophy; the impact will be appraised as a difference in health risks simulating difference in exposures to selected substances on one hand, and evaluation of the contribution to GHG and other climate change reduction on the other after implementing policies/measures;
- Effective parameters values: based on a robust, efficient, sensitivity analysis performed commonly by WPs 2, 3, and 4, the effective parameters will be identified in terms of evaluating differences in health risks and climate change. The values of these parameters will perform a basis for policy evaluation/recommendations in WP5, and the overall success of the project;
- Reasoning behind the interpretation of ultimate results: cities' long-term development goals and visions (green, healthy urban areas desired to live in).

# 4 Main sets of activities in the framework of process evaluation

In terms of process evaluation two components are vital for the overall project management, i.e., WP9:

- The first is performance assessment designed as a continuous/regular evaluation of the conduct of the work plans of each WP (e.g., whether data collection has been performed on time and completely, whether progress of the modelling is visible and fit for purpose, how historic data are interpreted, etc.). This will be done during regular project partners meetings.

- The second is integral work progress evaluation designed as continuous/regular monitoring of factors of success and unexpected barriers in the four WPs 2 to 5; in parallel inputs for policy/measure recommendations for the cities will be followed up. In turn, the cities are expected to provide information about their willingness, capability, and determination to implement certain measures/policies recommended by ICARUS; responses from the cities will also be collected based on the interviews/questionnaires as provided in Appendices 1 and 2.

In terms of project outputs, process evaluation will also help in supporting the assessment of the feasibility of the proposed measures/policies in the partner cities, as indicated in Figure 2.

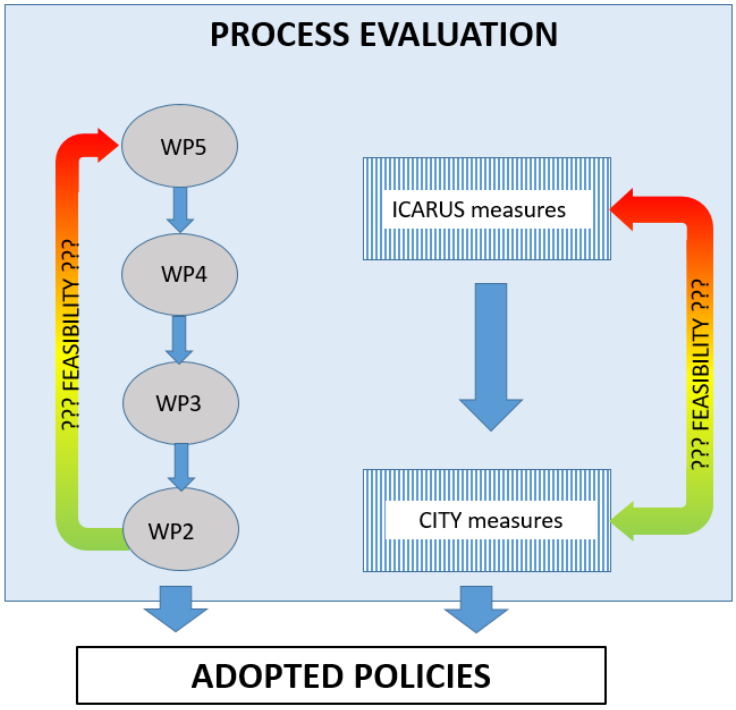


Figure 2: Schematic view of the PEP's role in the measures/policies feasibility evaluation

The following sets of activities are envisaged in the framework of the process evaluation:

1. Mid-term assessment of the work of WP2, WP3, WP4, and WP5 based on the specifications in the process evaluation plan in the form of workshops (for each WP or jointly). This will give insight into the overall work progress and should enable partners to make revision, re-direction, synchronization, adaptation, or collection of additional information, if needed.

2. Evaluation of the project results will be performed before concluding the work in WP2, WP3, WP4, and WP5. The primary aim is to assess the defined framework of the overall synthesis of results and to ensure that clear messages can be extracted from the project work. WP5 will collect results in cooperation with WP2, WP3, and WP4. Based on this WP5 will prepare a preliminary synthesis report which will be discussed by all consortium participants at a workshop/conference. In the DoW due date for the synthesis report is project month M36 (specified as D5.4). Afterwards, in M42, a report on green strategy and implementation plan in each of the cities will be produced (D5.5).

Summary on the activities is in Table 3.

Table 3: Sets of deliverables in the framework of process evaluation

| **Activity/Item/Event** | **Timing** | **Needs and expected outcomes** |
|---|---|---|
| D5.1: Preparation of Process Evaluation Plan | M 12 | tbd |
| D5.2: Two databases of a) policies and b) measures towards integrated win-win solutions on the urban scale | M18 | tbd |
| D5.3: Methodology report on the relationship between policies and measures | M24 | tbd |
| D5.4: Final report on integrated assessment of policies | M36 | tbd |
| D5.5: Report on green strategy and implementation plan in each of the cities | M42 | tbd |

| | | |
|---|---|---|
| Mid-term assessment | Conduct by WP5 and WP9 | Internal review/audit (Performance Assessment) of the work done by project month 24 (joint workshop or other form). Proposals and agreements on eventual revisions of past and adaptations of future work. |
| Pre-synthesis evaluation | Workshop prior to finalization of D5.4 (M36) | Assuring that results of WPs 2, 3, and 4 are useful in the overall assessment context and framework of the synthesis (fit for purpose). |

# 5 Table of contents of specific WP Working Plans

Introductory note: This Table of contents is a conceptual overview of the workplan specifications. It is organized in sequence fromWP2 to WP4. However, preparation of specific working plans requires the following approach:

- The WPs work planning should start with WP4; the Leader of WP4 needs to specify which information/data are required from the cities as well as from WP3 to successfully perform the work specified for WP4;
- The WP4 Lead should specify:
  - health risk/impact assessment endpoints in terms of parameters, their measurement units and expected role in the interpretation of the final results, qualitatively and quantitatively;
  - input parameters for the work which are expected/needed from WP3 (specifying format, measurement units and expected role in the specific tasks of their work);
  - input parameters for their work which are expected/needed from the partners involved in WP4 specifying format, measurement units and expected role in the specific tasks of their work;
  - input data from the cities (in agreement/concordance with other WPs);
  - timing (phases of the work, i.e., when inputs/outputs are expected to WP4/from WP3, WP2), and partners in WP4); links to WP5 should be ensured:
  - ways (and conditions?) of communication between WP Leaders to achieve synchronized and effective work; links to WP5 should be ensured:
- Similar approach should be applied through the entire hierarchy of the project: WP3 and WP2 are (partially and mutually) dependent, therefore they need to specify expectations from each other. Timing and endpoints are important to match the overall needs (consultations with WP5);
- All WP Leads should agree about consideration of uncertainties associated with the assessment, i.e. with the work in WPs 2, 3 and 4.

## 5.1 WP2

The description of WP2 work in the DoW starts with a list of objectives given below:

1. To develop activity-emission factor matrices as a tool for developing emission scenarios for Europe including all European cities.
2. To develop activity-emission factor matrices for the participating cities in ICARUS as a tool for developing urban emission scenarios.
3. To generate life cycle emission factors and integration of the factors into the activity-emission matrices.

In this WP, tools for generating emission scenarios will be developed. The tools generate emissions for the whole of Europe (task 2.1), for the participating cities (task 2.2) taking into account life cycle

emissions (task 2.3). Emissions are generated here for a business as usual scenario, the tool will then be used in WP 5 to estimate the changes in emissions, if policies are implemented (policy formulation and assessment). The reference case is defined as the development of activities and emission factors for future years, where the currently implemented policies for emission reduction and already decided policies to be used in the future are implemented.

Based on this, the WP2 detailed planning considers the following:

- selection of air polluting substances (pollutants);
- selection, description, and justification of indicators (parameters) which will serve as a basis for following the impact of emission change of these selected substances after implementing ICARUS measures/policies to climate change and public health;
- data availability (parameter values), their sources, trustworthiness, method and frequency of collection, applicability for ICARUS, level of uncertainty;
- definition of the needs, form, scope and timing of inputs from the cities as to properly/accordingly organize own work
- definition of the form, scope and timing of results of the WP2 work to be delivered to WPs 3 as to match their needs and to enable them to properly/accordingly organize their work;
- description of the approach/method of self-evaluation in terms of achievement of objectives and quantifiable targets in the context of ICARUS ("fit for purpose" approach);
- description of the approach/method for the evaluation of research achievements

*Table 1. Details of the WP2 workplan – a concept*

| **Details of the WP2 workplan – a concept (to be applied for all WPs)** | |
|---|---|
| Modelling endpoints; most relevant emissions/high emission factors | 1. To develop activity-emission factor matrices as a tool for developing emission scenarios for Europe including all European cities;<br>2. To develop activity-emission factor matrices for the participating cities in ICARUS as tools for developing urban emission scenarios.<br>3. To generate life cycle emission factors and integration of the factors into the activity-emission matrices.<br><br>**Based on these outputs the framework of measures/policies for effective reduction of air pollution based on emission factor matrices will be provided (and discussed with WP5, WP4 and WP3, as well as with the cities)**<br><br>*(Guidance: provide a list of endpoints in terms of evaluating emissions. The selection should take into account relevant exposures of the populations for which health impact/risk will be evaluated – see WP4. The selection should* |

| | |
|---|---|
| | *also consider endpoints of the WP3 work – integrated atmospheric modeling.)* |
| Scope of modelling | Emission-activity matrix for Europe:<br>Emission-activity matrix for partner cities:<br>Life cycle emissions and carbon footprint estimation:<br>ICARUS "fit for purpose" approach:<br>Emissions: should be provided to WP2 - 5. Transparent estimation of influencing factors on the emissions should be made.<br>*(Guidance: provide specification of the items above together with consistent description of approaches on how knowledge gaps associated with air pollution in ICARUS following the concept of "fit for purpose")* |
| Need from WP3 | Topic:<br>*(Guidance:* Define the scope and form of the results expected from WP3 and WP4*)* |
| | Timing:<br>• Date:<br>• Project month:<br>• Deliverable:<br>*(Guidance: timing should be defined as dates (calendar month and year) as well as project months when specific inputs are expected from WP3 and WP4 (please specify these inputs to avoid any misunderstanding))* |
| Need from WP4 | Topic:<br>• Endpoints of the evaluation of health impact/risk<br>• Exposure pathway/route<br>• Exposure mode<br>• Selected areas and populations for the evaluation<br>• Timeframes of the evaluation<br>*(Guidance: coordinative and integrative work between WP2, 3 and 4 is expected for the purpose of establishing successful work of WP2 in terms of modelling trustworthy air emissions. Specific definition of the items given above should be provided in "Details of WP4 working plan")* |
| | Timing:<br>• Date:<br>• Project month:<br>• Deliverable:<br>*(Guidance: timing should be defined as dates (calendar month and year) as well as project months when specific inputs are expected from WP4 (if different than stated above, please specify these inputs to avoid any misunderstanding!).* |
| Need from WP5 | Topic: |

| | |
|---|---|
| | • measures/policies for air pollution reduction<br>• short term measures that can be implemented in the immediate future<br>• medium-term measures that include changes of infrastructure or a certain time for market penetration and are thus fully effective only after 2020.<br>• the experience and knowledge of the ICARUS participating cities about effectiveness of measures/policies (M5)<br>• overview/assessment of effective measures/policies<br>• results of the 1st phase feasibility analysis of the measures.<br><br>*(Guidance: coordinated and integrative work between WP2 and 5 is expected)* |
| Need from WP2 partners | Topic:<br>Partner:<br>*(Guidance: WP lead should specify contributions which are expected from each partner involved in WP2 work. Define the scope and form of these contributions)* |
| | Timing:<br>• Date:<br>• Project month:<br>*(Guidance: timing should be defined as dates (calendar month and year) as well as project months when specific contributions are expected from partners involved in WP2 work).* |
| Evaluation of research achievements | *(Guidance: a description of the approach/method for the evaluation of research achievement should be provided; emphasis should be given to the evaluation in terms of achievement of objectives and quantifiable targets in the context of ICARUS. Potential barriers for successful performance of work should be identified and contingency actions adopted.* |

## 5.2 WP3

The description of WP3 work in the DoW starts with a list of objectives given below:

- To estimate tropospheric concentration fields at the ground level of air pollutants and greenhouse gases for the participating cities and the whole Europe
- To develop and validate different data fusion, pattern recognition and image processing methods for extracting optimal pollutants concentration fields from multi-source data.
- To develop an approach for directly linking changes in emissions of local sources to concentrations using source apportionment.

Taking into account directions for preparing working plans already outlined above the plan includes:

- Deriving tropospheric concentrations of air pollutants and greenhouse gases for the whole of Europe and for the participating cities. Anthropogenic emissions will be translated into urban and regional air quality estimates by coupling different modelling approaches.
- Using source apportionment methods and measurements of concentrations of trace constituents in the atmosphere to further evaluate model results and develop an approach for estimating changes in concentrations caused by changes in emissions of certain sources (e.g. heating - wood combustion, road transport) without the necessity to use atmospheric transport modeling.
- Provide all the climate data and information required to the impact assessments and analyses that will be performed within the project.
- Selection, description, and justification of indicators (parameters) which will serve as a basis for comparing the air pollution for selected areas in Europe;
- Definition of the needs, form, scope and timing of inputs/requirements from cities, WP 2 so as to properly/accordingly organise own work.
- Definition of the form, scope and timing of results of the WP3 work to be delivered to WP 4 as to match needs and to enable WP4 involved partners to properly/accordingly organise their work;
- Description of the approach/method of self-evaluation in terms of achievement of objectives and quantifiable targets in the context of ICARUS ("fit for purpose" approach).
- Description of the approach/method for the evaluation of research achievements.

## 5.3 WP4

The description of WP4 work in the DoW starts with a list of objectives given below:

- To develop a framework of modelling tools for estimating exposure of individuals and selected population groups
- To collect human exposure data for the ICARUS participating cities
- To adequately account for socio-economic status (SES) differences in exposure assessments

As a first step, suitable candidate sensor technologies to be used by volunteers will be selected based on the reviews undertaken in WP1 and preliminary trials of instrument reliability and utility. At the same time a data collection tool will be developed in order to store and manage all data coming from different devices. As a next step, agent-based modelling (ABM) will be used, informed from the collected multi-sensor data to capture individual spatio-temporal behaviours and to model individual exposure. It is also important to investigate the evidence of

relationships between socio-economic status (SES) and exposure to pollutants. As people spend most of the time indoors, indoor concentrations will be estimated by taking into account outdoor pollutants penetrating into the room as well as important indoor sources including wood stoves and cooking with gas. Particle deposition in the pulmonary system will also be modelled so as to provide a biological metric to estimate adverse health effect. Taking into account individual exposure profiles and using the concentration-response functions established by WHO in the HRAPIE project, health impact can be assessed for a series of air pollutants in each city participating in ICARUS.

Taking into account directions for preparing working plans already stressed above the plan should include as a minimum:

- Selection, description, and justification of indicators (parameters, variables) which will serve as a basis for exposure and health risk assessments
- A list of parameters for making a conclusion that AQ and climate variations/change seem to be a primary cause for specific illnesses (respiratory tract diseases, allergies, etc) for most exposed groups at different sites in Europe;
- Definition of the needs, form, scope and timing of inputs to WPs 2 and 3 as to enable them to properly/accordingly organise their work;
- Definition of the needs, form, scope and timing of inputs from cities and 3 as to properly/accordingly organize own work;
- Definition of the form, scope and timing of results of the WP4 work to be delivered to WP 5 as to match overall needs and to enable ICARUS level synthesis and integration;
- Description of the approach/method of self-evaluation in terms of achievement of objectives and quantifiable targets in the context of ICARUS ("fit for purpose" approach);
- Description of the approach/method for the evaluation of research achievements
- A list of recommendations for environmental health policy development in the context of ICARUS

## 5.4 WP5

The summary description of WP5 work in the DoW is given below:

The ultimate aim of WP5 work as specified in T5.4 is the identification of the potential (willingness, affordability, agreement among city stakeholders) to implement the most appropriate strategies, as defined in Tasks 5.1-5.3, in each particular city. The exercise will be demonstrated across the 9 participating cities.

Once general measures for air pollution reduction, climate change mitigation and public health improvement from interventions in sectors such as transport at the city level are known and have been proven successful, for example a change of modal split towards increased walking, cycling and

public transport, or increased share of low emission vehicles (hybrid, electric, Euro6) in public fleet, etc. the question remains whether these measures are going to be implemented in a particular city and at what total societal costs. The latter include political and economic justification among all involved stakeholders, as well as changes in the urbanization of the cities, refurbishment of existing and construction of new infrastructure, changes in mode of goods transport, etc. New urban plans will require citizen engagement and participation; this will eventually allow us to understand which set of measures will be perceived and accepted as the most effective and eventually acceptable by the civic society. Similarly, consideration of changes in other activities/sectors in the city, for example industry, energy provision, and other services towards lower pollution and energy consumption will constitute alternative strategies for long-term environment and health improvements. The comparative evaluation of alternatives in WP5 will deliver a basis for developing the strategies/options that are the most appropriate for a particular city. These strategies will then be the subject of final integrated modelling and assessment. The core of the evaluation is to get insight on the drivers and barriers during the preparation, implementation and operation of the measures considered in the project at the city level. This knowledge will enable the development of approaches and strategies towards providing efficient support to drivers and avoidance of barriers at both the city level and in the wider context. The latter include assessment of the transferability potential of the policies from one city to another and to a region/EU level, as appropriate.

Following the approach given above the following working and evaluation steps are envisaged:

1. The first step is to identify possible options (policy/measure combinations/individual measures) for reducing air pollution in cities, reducing GHG emissions, improve satisfaction of citizens in terms of living and working in particular urban areas. Both technical (e.g. changing emission factors due to improved technologies in transport, industry, etc.) and non-technical measures (that influence the citizens behaviour) will be covered. The following types of measures will be distinguished:

    - short term measures that can be implemented in the near future (e.g. traffic restrictions, expansion of bus lanes network, use of bicydes, change of fuel shares, penetration of renewable energy sources)
    - medium-term measures that include changes of infrastructure or a certain time for market penetration and are thus fully effective after 2020.

Based on Table 2 – possible measures/policies across sectors, that motivate or force emission source operators and others responsible for improvements to implement technological and non-technological measures will be analysed (in close cooperation with WP2, 3, 4, 6).

In a screening process, a set of policy/measure options will be identified as seemingly (potentially) effective, based on the inputs from WP4↔WP3↔WP2. In Table 2 a number of exemplary measures are listed in order to provide a basis for "brainstorming" sessions. Most of the measures listed are already implemented in one or several of the partner cities, thus providing an empirical basis for the estimation of their effectiveness.

Table 2: Possible technological and non-technological measures to be considered in ICARUS

| | *TECHNOLOGICAL MEASURES* | *NON TECHNOLOGICAL MEASURES* |
|---|---|---|
| TRANSPORT | Retrofitting conventional vehicles | Access limitations zone to city centres |

| | *TECHNOLOGICAL MEASURES* | *NON TECHNOLOGICAL MEASURES* |
|---|---|---|
| | Penetration of bio-fuel | Increased parking spaces |
| | Penetration of electric cars | Expansion of bus lanes network |
| | Withdrawal of old cars | Use of bicycles |
| | Introduction of underground railways and trams | Taxation based on emissions, increased car sharing |
| | Enhancement of electricity-based public transportation (e.g. trolley buses) | Intelligent Air Pollution Defense for mitigating exposure; replace air with rail transport |
| | | Intelligent traffic management systems |
| URBAN PLANNING | | Low emission zones |
| | | Introduction of bicycle lanes |
| | | Improved design of and creation of additional green spaces and outdoor fitness spaces |
| RESIDENTIAL | Different shares of space heating technologies (light heating oil, natural gas, heat pumps, biomass burning) | Public awareness about energy conservation |
| | Specifications in energy conservation requirements | |
| | Introduction of green roofs | |
| | Energy efficient design of buildings | |
| ENERGY PRODUCTION | Change of fuel shares away from coal | |
| | Penetration of renewable energy sources and biofuels | |
| | Rational waste management with material recycling and energy recovery | |
| INDUSTRY | Natural gas penetration Environmental taxes | Environmental taxes |
| | End-of-pipe industrial measures | |
| | Regular maintenance of heavy oil burners | |
| | Intense monitoring of environmental standards | |
| | Improved practices for fugitive emissions | |
| | Structural change in industry following socioeconomic | |
| | changes in central and eastern Europe and the EU financial crisis | |

| | *TECHNOLOGICAL MEASURES* | *NON TECHNOLOGICAL MEASURES* |
|---|---|---|
| | Substitution of industrial processes (e.g. use of electricity-based processes) | |
| AGRICULTURE | | Optimized fertilizer use to reduce $N_2O$ and $NH_3$ emissions |
| | | Reduced $CH_4$ from animal breeding |
| | | Structural change in the agricultural sector (following the socioeconomic changes in central and eastern Europe and the current financial crisis) |
| | | Changes of demand for agricultural products (e.g. less meat) |

2. Gather and analyse the experience and knowledge of the ICARUS participating cities about effectiveness of the measures/policies; close communication with the cities is envisaged
   2.1 What has been implemented in partner cities in the past – lessons learned; experiences with policies they have implemented and policies they have tested but has then assessed as not feasible/rationale.
   2.2 What is currently planned to be implemented (plans, programmes, policies in the participating cities)

3. Overview/assessment of effective measures/policies implemented in the EU (literature research):
   3.1 Related EU projects: EVIDENCE, Civitas, Citi-Sense, etc.
   3.2 Strategies and plans of institutions such as the European Commission, national authorities and transport and energy providers (e.g. ERTICO, CONCAWE, etc.).

   The overview should focus on the potential for reduction of air pollution emissions and/or greenhouse gases without incurring extraordinarily high costs. The societal acceptability shall also be considered.

4. Organise a workshop with ICARUS partners (topics and date to be determined by WP2 and WP5 leaders) to discuss/determine the initial selection of measures

   The key criteria in the assessment process of the options will be: the extent to which these options bring improvements in (1) compliance of both AQ values and WHO health-based guidelines, and (2) reduction in long-lived GHG and short-lived climate relevant pollutant (SLCP) emissions.

5. Provide results of the 1st phase of feasibility analysis for the selected measures; evaluation of measures to clarify how good, effective, acceptable/implementable, and practicable they are in the context of the needs and affordability (financial, spatial, political, etc.) of a particular city. Also, a practical dimension of the measures' implementation will be included (e.g., requirements/needs for land-use changes in a particular city, agreement between neighboring municipalities about common infrastructure, elections at the municipality level, etc.).

# 6 Assessing measures/policies feasibility - communication with the cities

In parallel to supporting high performance within the project, the process evaluation will help identifying the barriers and drivers in planning and implementing the measures/policies for increasing air quality and reduce carbon footprint in ICARUS cities/Europe. One of the main tasks in this regard will be to guide the communication with city representatives in order to obtain the information about the status and development of the city policies and measures beyond ICARUS, as well as to gain insights into assessing the feasibility of the measures/policies developed and recommended within ICARUS.

The initial communication will consider the questionnaire as presented in Appendix 2. It builds on a SUMP Self-Assessment Tool developed in CH4LLENGE (European Platform on Sustainable Urban Mobility Plans) and is based on a set of questions that follow sequential steps in the measure/policy preparation and adoption process. The questionnaire considers both possible technological and non-technological measures according to Table 2. It is important to note here that it is not just about YES/NO answers to the most of the questions but rather about getting effective information about measures/policies as a condition for successful ICARUS work.

It has to be noted herein that the two Appendices outlined in this process evaluation plan are designed as comprehensive information gathering tools aimed at (a) project partners and (b) policy-makers and other relevant stakeholders in the ICARUS case study cities. These tools will be adapted as necessary to render them operational in each case study city taking into account local specificities and end-user needs. The process evaluation plan will start being implemented after month 18 in the project timeplan. It will be regularly revisited (on the occasion of the project mid-term milestone and on annual basis thereafter) in order to reflect the actual level of process efficiency established in the course of the project implementation. Our objective with this plan is not to set up a bureaucratic procedure for project implementation, but rather to create a tool that would serve as a transparent management instrument ensuring the objective-oriented character of ICARUS. Simplifications or further specifications in particular parts of the process evaluation plan will be provided as per the requests of the project partners and the policy-relevant stakeholders in the cities participating in ICARUS.

# 7 Appendix 1: Process Evaluation Reporting Form

## 7.1 Part A. General administrative information

- *Please fill in the answers in the boxes with the question marks.*
- *If there are no changes compared with the previous period the information can be copied from the previous reporting period.*
- ***reporting is requested every 6 months, starting with 18 project month. In the case of sudden and concern-raising (strong) barrier to the work implementation and WP performance the reporting should be more frequent, i.e. immediately after such a barrier occurs.***

| | |
|---|---|
| **WP Title** | ???????? |
| | |
| **Reporting period** | From ??-??-???? To ??-??-????<br>*Fill as: dd-mm-yyyy To dd-mm-yyyy* |
| | |
| **WP leader coordinates** | |
| Name | ???????? |
| Telephone | + ?? ????????? |
| Fax | + ?? ????????? |
| E-mail | ???????? |
| | |
| **Compiler of the report**<br>*Only to be filled in if this is someone other than the WP Leader* | |
| Name | ???????? |
| Telephone | + ?? ????????? |
| Fax | + ?? ????????? |
| E-mail | ???????? |

## 7.2 Part B. General content information

**B1.**

**What are the objectives of the WP?**

- *Three levels are distinguished: Strategic level, High (Project) level and WP level.*
- *Please fill in the answers in the boxes with the question marks.*

| | |
|---|---|
| **Strategic level**<br>*Please describe the strategic objective of the measure/policy in one or two sentences. An example is 'to contribute to health and environmental risk reduction in Madrid/Spain/Europe due to climate change'* | ???????? |
| | |
| **High level / Project level**<br>*Please describe the project level objective of the measure in one or two sentences. This refers to the way of achieving the strategic level objective. An example is 'to contribute to the investigation on where, when and how the population in Madrid may be mostly exposed to selected pollutants in the situation of reduced emissions'* | ???????? |
| | |
| **WP level**<br>*Please describe the WP level objective in one or two sentences. This refers to the contribution to achieving the strategic objective. An example is 'to model concentrations of selected substances in air 20 years from now'* | ???????? |

**B2.**

**Who are the WP partners and what is their level of activity in the WP?**

- *Please fill in one table for each partner.*
- *Please give the name of the partner in the box with the question marks.*
- *Where there are predefined answers please put a 'X' in the open box before the number.*
- *Only one answer is possible for each item.*
- *If there are no changes compared with the previous reporting period, the answers can be copied from the previous reporting period.*

| **WP partner 1** | | | | | |
|---|---|---|---|---|---|
| Name | ????? | | | | |
| Type of organisation | | | Level of activity | | |
| | 1 | Knowledge institution (e.g. university) | | 1 | Leading role |
| | 2 | Research institution | | 2 | Principle participant |
| | 3 | Private company | | 3 | Occasional participant (e.g. city stakeholder) |
| | 4 | Other, *please describe* | | | |
| | | | | | |
| | | | | | |

| **WP partner 2** | | | | | |
|---|---|---|---|---|---|
| Name | ????? | | | | |
| Type of organisation | | | Level of activity | | |
| | 1 | Knowledge institution (e.g. university) | | 1 | Leading role |
| | 2 | Research institution | | 2 | Principle participant |
| | 3 | Private company | | 3 | Occasional participant (e.g. city stakeholder) |
| | 4 | Other, *please describe* | | | |
| | | | | | |
| | | | | | |

| **WP partner 3** | | | | | |
|---|---|---|---|---|---|
| Name | ????? | | | | |
| Type of organisation | | | Level of activity | | |
| | 1 | Knowledge institution (e.g. university) | | 1 | Leading role |
| | 2 | Research institution | | 2 | Principle participant |
| | 3 | Private company | | 3 | Occasional participant (e.g. city stakeholder) |
| | 4 | Other, *please describe* | | | |
| | | | | | |
| | | | | | |

| **WP partner 4** | | | | | |
|---|---|---|---|---|---|
| Name | ????? | | | | |
| Type of organisation | | | Level of activity | | |
| | 1 | Knowledge institution (e.g. university) | | 1 | Leading role |
| | 2 | Research institution | | 2 | Principle participant |
| | 3 | Private company | | 3 | Occasional participant (e.g. city stakeholder) |

| | | | |
|---|---|---|---|
| | 4 | Other, *please describe* | |
| | | | |
| | | | |

| **WP partner 5** | | | | | |
|---|---|---|---|---|---|
| Name | ????? | | | | |
| Type of organisation | | | Level of activity | | |
| | 1 | Knowledge institution (e.g. university) | | 1 | Leading role |
| | 2 | Research institution | | 2 | Principle participant |
| | 3 | Private company | | 3 | Occasional participant (e.g. city stakeholder) |
| | 4 | Other, *please describe* | | | |
| | | | | | |
| | | | | | |

## 7.3 Part C. Content information for this reporting period

**C1.**

**What was the phase of the WP work during the reporting period?**

- *There are predefined answers.*
  - ✓ *Preparation phase: the WP working plan is developed in detail and design work is conducted. At the end of this phase all planning details are fixed, including all decisions that are a pre-condition for starting the implementation phase.*
  - ✓ *Implementation phase: specific parts of the WP work are under implementation, e.g. collection of model input data, finalization of the questionnaires, etc. At the end of this phase the WP work is ready to start.*
  - ✓ *Operation phase: the WP work is on-going.*
- *Please put a 'X' in the open box before the number.*
- *More than one answer is possible.*

| | | |
|---|---|---|
| | 1 | Preparation phase |
| | 2 | Implementation phase |
| | 3 | Operation phase |
| | 4 | Transition from preparation phase to implementation phase |
| | 5 | Transition from implementation phase to operation phase |

C2.

Process barriers are events or overlapping conditions that hampers the process to obtain strategic/project/WP objectives (goals). In the checklist below you will find a number of barrier fields and examples of barriers which might have been encountered during the reporting period in trying to reach the objectives as given in question B1.

Barrier fields and examples of possible barriers

| NR | Barrier field | Examples of barriers |
|---|---|---|
| 1 | **Political / strategic** | Opposition of key actors/stakeholders based on political and/or strategic motives regarding dealing with climate change, lack of sustainable development agenda or vision, conflict |

| | | |
|---|---|---|
| | | between partners due to diverging beliefs in directions of solution for problems |
| | | |
| **2** | **Institutional** | Impeding administrative structures, procedures and routines; impeding laws, rules, regulations, city decrees and their application; hierarchical structure of organizations which disables creative work in the specific area of ICARUS |
| | | |
| **3** | **Cultural** | Impeding cultural circumstances and behavioral patterns |
| | | |
| **4** | **Problem related** | Complexity of the problem(s) to be solved, lack of shared sense of urgency among key partners, problem of self-estimation and high valuation of own work |
| | | |
| **5** | **Involvement, communication** | Insufficient involvement or awareness of partners, insufficient consultation, insufficient partnership arrangements |
| | | |
| **6** | **Positional** | Relative isolation of the key individuals, lack of exchange with other co-workers |
| | | |
| **7** | **Planning** | Insufficient technical planning and analysis to determine requirements for successful WP work, limited understanding and response to "fit for purpose" approach, lack of user/city needs analysis: limited understanding of user/city requirements, lack of commitment to integral planning of ICARUS work |
| | | |
| **8** | **Organizational** | Failed or insufficient partnership arrangements, lack of leadership of WP leads, lack of leadership of ICARUS coordinator and manager, lack of individual motivation or know-how of key persons (WP leads, coordinator, project manager) |
| | | |
| **9** | **Financial** | Insufficient financial planning to determine requirements for successful WP work |
| | | |
| **10** | **Technological** | Additional technological requirements for performing modelling |
| | | |
| **11** | **Spatial** | No permission for data collection at particular location |
| | | |
| **12** | **Other** | |

**What are the three most important barriers encountered <u>during the reporting period?</u>**

- *Please fill in the number of the barrier field from the checklist above in the open box according to importance, and specify the barrier*

| NR | Specification of barrier (make it clear and descriptive) | | |
|---|---|---|---|
| | | 1 | Most important barrier |
| | | 2 | Second most important barrier |
| | | 3 | Third most important barrier |

Please answer in an understandable "cause-effect" manner:

- ✓ Why are these (clusters of) process barriers experienced as barriers to reach the objectives described in B1?
- ✓ What was the impact of these barriers on further work/events that occurred in the way it/they occurred?

C3.

Process drivers are events or overlapping conditions that stimulates the process to obtain objectives/goals. In the checklist below you will find a number of driver fields and examples of possible

drivers which might have been encountered during the reporting period in trying to reach the objectives as given in question B1.

Driver fields and examples of possible drivers

| NR | Driver field | Examples of drivers |
|---|---|---|
| 1 | **Political / strategic** | Commitment of key actors based on political and/or strategic motives regarding dimate change, presence of sustainable development agenda or vision, coalition between partners due to converging beliefs in directions of solution for problems |
| | | |
| 2 | **Institutional** | Facilitating administrative structures, procedures and routines; facilitating laws, rules, regulations, city decrees and their application; facilitating structure of organizations and programs |
| | | |
| 3 | **Cultural** | Facilitating cultural circumstances and behavioral patterns |
| | | |
| 4 | **Problem related** | Pressure of the problem(s) causes great priority, shared sense of urgency among partners |
| | | |
| 5 | **Involvement, communication** | Constructive and open involvement of partners, constructive and open consultation, good partnership arrangements |
| | | |
| 6 | **Positional** | Communication/openess of the key individuals, presence of exchange with other co-workers |
| | | |
| 7 | **Planning** | Accurate technical planning and analysis to determine requirements of individual WP work and WPs integration, thorough user/city needs analysis and good understanding of user/city requirements, dedication to "fit for purpose" approach, commitment to achieving good common results |
| | | |
| 8 | **Organizational** | Constructive partnership arrangements, strong and clear leadership, highly motivated key persons (WP leads, coordinator, manager) |
| | | |
| 9 | **Financial** | Accurate financial planning for successful WP work, sufficient budget to overcome barriers |
| | | |
| 10 | **Technological** | Technology available to overcome technical barriers |
| | | |
| 11 | **Spatial** | Availability of data for all zones |
| | | |
| 12 | **Other** | |

**What are the three most important drivers encountered during the reporting period?**

- *Please fill in the number of the driver field from the checklist above in the open box according to importance, and specify the driver*

| NR | Specification of driver (make it clear and descriptive) | | |
|---|---|---|---|
| | | 1 | Most important driver |
| | | 2 | Second most important driver |
| | | 3 | Third most important driver |

Please answer in an understandable "cause-effect" manner:

- ✓ Why are these (clusters of) process drivers experienced as drivers to reach the objectives described in B1?
- ✓ What was the impact of these drivers on further work/events that occurred in the way it/they occurred?

C4.

Activities are actions taken by one or more partners to handle the barriers and/or to make use of the drivers to reach the strategic/project/WP objectives. In the checklist below you will find a number activity fields and examples of possible activities taken during the reporting period to overcome the barriers or to make use of the drivers

Checklist of activity fields and examples of possible activities

| NR | Activity field | Examples of activities |
|---|---|---|
| 1 | **Political / strategic** | (Co-)development and influencing co-development of common vision on climate change |
| | | |
| 2 | **Institutional** | Analysis of and/or proposals to change impeding rules, structures, legislation, organisational structures etc. |
| | | |
| 3 | **Cultural** | Facilitating cultural circumstances and behavioral patterns |
| | | |
| 4 | **Problem related** | Thoroughly analyzing problems towards their solution, activities to explain the pressure of the problem, all activities towards sharing the sense of urgency among partners |
| | | |
| 5 | **Involvement, communication** | Consultation by different modes of communication, re-definition of partnerhip arrangements |
| | | |
| 6 | **Positional** | Support of collaboration on the basis of equality of partners |
| | | |
| 7 | **Planning** | Raising or attempting to raise additional 'time budget', (re)conduct the technical planning as well as analysis to determine requirements of WP implementation, thoroughly analyzing user/city needs to better understand the user/city requirements |
| | | |
| 8 | **Organizational** | Activities to raise the competences of the WP/project partners (for example special discussions on uncertainties of modelling, process evaluation, etc), activities to raise the motivation and responsibility of the measure evaluation partners (for example extra meetings on "fit for purpose" approach, CBA analysis, feasibility, etc.) |
| | | |
| 9 | **Financial** | Raising or attempting to raise additional financial budget for the WP, developing a context which is attractive to the business community to contribute financially |
| | | |
| 10 | **Technological** | Raising or attempting to raise additional technical resources for the modelling, all kind of actions to solve technological problems |
| | | |
| 11 | **Spatial** | (Attempts) creating of long-term data availability for zones |
| | | |
| 12 | **Other** | |

**What are the three most important activities taken during the reporting period?**

- *Please fill in the number of the activity field from the checklist above in the open box according to importance, and specify the activity taken*

| NR | Specification of the activity | | |
|---|---|---|---|
| | | 1 | Most important activity |
| | | 2 | Second most important activity |
| | | 3 | Third most important activity |

- *Please describe the actions taken to handle the barriers and to make use of the drivers in trying to reach the objectives as given in question B1, and why they were taken.*
- *Please describe the impact of the actions on events that occurred in the way they occurred*
- *Please describe the impact of these actions on the objectives to reach as described in B1*

| |
|---|
| |

C5.

**Regarding the barriers, drivers and activities undertaken how do you estimate the risk to reaching the objectives (question B1) on the strategic, project and WP levels at this moment?**
*There are predefined answers. Please put a 'X' in the open space before the number. Only one answer for each level is possible.*

| | | | |
|---|---|---|---|
| Strategic level | | 1 | Very low risk |
| | | 2 | Low risk |
| | | 3 | Moderate risk |
| | | 4 | High risk |
| | | 5 | Very high risk |
| | | | |
| Projcet level | | 1 | Very low risk |
| | | 2 | Low risk |
| | | 3 | Moderate risk |
| | | 4 | High risk |
| | | 5 | Very high risk |
| | | | |
| Measure/Policy level | | 1 | Very low risk |
| | | 2 | Low risk |
| | | 3 | Moderate risk |
| | | 4 | High risk |
| | | 5 | Very high risk |

C6.

**What were the lessons learned during the reporting period?**

- *Please describe which of the actions can be regarded as a success and which as a failure and why?*
- *Please describe what is learned and what are the do's and don'ts in terms of the process and actions?*

| |
|---|
| |

C7.

**Is the WP at this stage of insight on a good way to achieve objectives?**

| |
|---|
| |

## 7.4 Part D. Any other comment

*If you have any other comment you can note this in the box below. Do not forget to mention/describe any special circumstance which was not covered above but is important for your work in the ICARUS.*

**THANK YOU VERY MUCH FOR YOUR COOPERATION**

# 8 Appendix 2: Measure/policy assessment questionnaire

## 8.1 1 - Potential for success

1. Has the responsible planning authority made a formal commitment to make air quality and/or carbon footprint the underlying basis for the policy?

2. Has the city council reinforced its commitment to air quality by signing a covenant (e.g. the Covenant of Mayors) or joining a network (e.g. the ICARUS forum)?

3. Have you reviewed relevant regulations and plans from the European, national and regional level that have implications for the measure/policy in question?

4. Have you reflected on the strengths and weaknesses of your existing local planning practices with regard to developing the measure/policy?

5. Have you undertaken a gap analysis of qualifications and skills within the planning authority in order to identify capacity building needs?

6. Have you assessed the sources for funding the process of developing the measure/policy?

7. Have you examined how the measure/policy preparation timeframe could be aligned with the development and implementation of other existing policies and strategies (e.g. the land use plan)?

8. Have you defined a timeframe for the preparation and implementation of the measure/policy?

9. Have you identified relevant stakeholders, their impact and role early on in the measure/policy preparation process?

10. Have you carried out an analysis of stakeholder constellations (e.g. incorporating assessments of stakeholders' objectives, power, capacity and planning resources)?

11. Have you involved stakeholders within the "vulnerable users" group in the measure/policy planning process?

12. Are citizens involved/informed in the measure/policy preparation process? And if yes, how?

## 8.2 2 - Development process, scope

1. Does the measure/policy cover the 'functional city' (i.e. an area defined by main commuter flows) that goes beyond administrative boundaries?
2. Has a cooperation process been established with all neighbouring authorities on the spatial coverage of the measure/policy in question?
3. Have you and neighbouring authorities agreed on roles and responsibilities for measure/policy development?
4. Does the measure/policy refer to policies and plans, which already exist or are being developed on the local level?
5. Have you regularly involved institutions representing policy areas closely related to air quality (e.g. environment, health, land-use, industry…)?
6. Have you developed a participation strategy suggesting a mix of involvement formats for the measure/policy development process?
7. Have you created a measure/policy development team driving the preparation and monitoring of the measure/policy development process?

## 8.3 3 - Situation and scenarios

1. Have you conducted a diagnosis of the main air quality related problems?
2. Have you prioritised the identified problems?
3. Have you conducted an analysis of air quality and noise pollution, including identification of hotspots?
4. Does the measure/policy describe a business-as-usual scenario?
5. Does the measure/policy explore alternative policy scenarios to understand the likely effects of different combinations of measure/policys and policies?
6. Have you used qualitative analysis techniques, (e.g. through expert judgement) to support scenario development and appraisal?
7. Have you used appropriate quantitative and transport modelling analysis techniques to support scenario development and appraisal?
8. Have you discussed the different policy scenarios and their impacts with a group of key stakeholders and invited them to provide feedback?

## 8.4 4 - Common vision

1. Does the measure/policy contain a long-term vision of air quality in the city?
2. Have you developed the long-term vision in cooperation with a representative group of key stakeholders?
3. Does the measure/policy explain, which scenario serves the vision in the most efficient and effective way and why?
4. Have you involved stakeholders and citizens in the process of building a vision?

## 8.5 5 - Priorities and targets

1. Does the measure/policy clearly set out overall objectives?
2. Have you developed/assessed the overall objectives and targets of the measure/policy together with a group of key stakeholders?
3. Have you informed stakeholders and citizens about the overall objectives of the measure/policy and invited them to provide feedback?
4. Does the measure/policy describe a set of SMART targets?
5. Do the targets allow monitoring of progress towards the achievement of objectives and assessment of the efficiency and effectiveness of the measure/policys?

## 8.6 6 – Measure/policy specific questions

1. Does the measure/policy make clear how it will contribute to the achievement of the agreed vision, objectives and targets?
2. Have you enabled stakeholders and citizens to get actively involved in discussing the measure/policy in question?
3. Have you contacted or visited other cities to exchange information about the planning and implementation of one or more measure/policys considered for inclusion in your measure/policy?
4. Have you appraised the proposed measure/policy for their costs and related benefits (cost-benefit-analysis)?
5. Does the measure/policy suggest combining certain policy measure/policys, i.e. proposing integrated packages of measure/policys to achieve better results?
6. Does the measure/policy allow other measure/policys to be implemented in partnership with organisations from other sectors?

TRANSPORT

7. Public transport: Does the measure/policy suggest how to enhance the quality, integration and accessibility of public transport services (infrastructure, rolling stock, and services)?
8. Public transport: Does the measure/policy lay out how public transport should be addressed as an integral element of all relevant transport modes in the urban area?
9. Non-motorised transport: Does the measure/policy incorporate construction of additional infrastructure to raise the attractiveness of walking and cycling?
10. Non-motorised transport: Are infrastructure measure/policy complemented by regulatory and organisational as well as soft measures?
11. Motorised transport: Does the measure/policy include the incentives for increased car pooling and/or organisation of car sharing scheme?
12. Motorised transport: Does the measure/policy include retrofitting conventional vehicles to reduce pollution?
13. Motorised transport: Does the measure/policy include promotion of bio-fuelled vehicles?
14. Motorised transport: Does the measure/policy include promotion of electric vehicles (cars, buses)?
15. Motorised transport: Does the measure/policy include withdrawal of old cars?
16. Motorised transport: Does the measure/policy limits the access to the city centre?
17. Motorised transport: Does the measure/policy include taxation based on emissions?
18. Road transport (flowing + stationary): Does the measure/policy aim at optimising the use of existing road infrastructure?
19. Road transport (flowing + stationary): Does the measure/policy explore the potential for reallocating road space to other modes of transport or other public functions?
20. Urban logistics: Does the measure/policy present means to improve the efficiency of urban logistics and freight delivery, while reducing related externalities (e.g. greenhouse gas emissions, pollutants and noise)?
21. Mobility management: Is the measure/policy in line with the Sustainable Urban Mobility Plan (SUMP) for the city?
22. Mobility management: Does the measure/policy include mobility management actions to foster a change towards more sustainable mobility patterns (reflecting the needs of e.g. citizens, employers or schools)?
23. Mobility management: Does the measure/policy foresee educational, awareness-raising and promotion activities for sustainable travel behaviour for identified target groups?

24. Intelligent Transport Systems: Does the measure/policy include Intelligent Transport Systems (ITS)?

URBAN PLANNING

25. Are the locations of residential areas planned in a way to limit the need for commuting (motorised traffic) and to increase the use of public transport and non-motorised means of transport (walking, cycling…)?
26. Are the locations of residential areas planned in a way to reduce exposure in highly polluted areas (industry, transport…)?
27. Does the plan consider the establishment of low emission zones?
28. Does the plan consider the creation of additional green spaces and outdoor fitness spaces
29. Is the plan oriented towards achieving different shares of space heating technologies (light heating oil, natural gas, heat pumps, biomass burning)?
30. Does the plan include the introduction of green roofs?
31. Does the plan foresee energy efficient design of buildings?
32. Does the measure/policy lay out specifications in energy conservation requirements?
33. Does the measure/policy raise public awareness about energy conservation?

ENERGY PRODUCTION

34. Does the measure/policy foresee the change of fuel shares away from coal?
35. Does the measure/policy incorporates the promotion of renewable energy sources and biofuels?
36. Does the measure/policy address rational waste management with material recycling and energy recovery?

INDUSTRY

37. Is the end-of-pipe principle applied in the measure/policy?
38. Does the measure/policy address regular maintenance of heavy oil burners?
39. Intense monitoring of environmental standards
40. Does the measure/policy introduce improved practices for fugitive emissions?
41. Does the measure/policy address structural changes in industry following socioeconomic changes in central and eastern Europe and the EU financial crisis

AGRICULTURE

42. Does the measure/policy optimise fertilizer use to reduce $N_2O$ and $NH_3$ emissions?
43. Does the measure/policy reduce $CH_4$ from animal breeding?
44. Does the measure/policy address the transport of soil dust into the air in the residential areas?
45. Does the measure/policy address structural changes in the agricultural sector (following the socioeconomic changes in central and eastern Europe and the current financial crisis)?

## 8.7 7 - Responsibilities & funding

1. Have you prepared an action plan, outlining e.g. implementation priorities, responsibilities, schedules, risks and contingency actions?
2. Have you involved key stakeholders in the assignment of responsibilities and resources?
3. Have you prepared a budget plan, setting out funding requirements and sources?
4. Was a formal agreement reached by decision makers and key stakeholders on the action and budget plan?

## 8.8 8 - Monitoring & assessment

1. Does the measure/policy foresee a regular monitoring and performance-based revision process (e.g. every 3 to 7 years)?
2. Have you performed a data audit to account for availability and quality of data and possible gaps?
3. Have you developed a data collection monitoring and evaluation plan?
4. Have you selected a subset of indicators for monitoring purposes linked to measure/policy targets and objectives?
5. Have you considered both the planning process and measure/policy implementation for monitoring and evaluation?
6. Have you developed a monitoring and evaluation scheme that includes qualitative and quantitative indicators?
7. Have you discussed arrangements for measure/policy monitoring and evaluation with a group of key stakeholders?
8. Have you foreseen mechanisms for the interactive engagement of stakeholders and citizens during measure/policy monitoring and evaluation?

## 8.9 9 - Adopt measure/policies

1. Have you asked a group of key stakeholders to review and provide comments on the draft version of the measure/policy/policy?
2. Does the measure/policy/policy demonstrate compliance with the EU Strategic Environmental Assessment (SEA) Directive (2001/42/EC) and EU Habitats Directive (92/43/EEC)?
3. Have you discussed the proposed measure/policy with the city council or its equivalent committee?
4. Was the measure/policy formally adopted by the city council or its equivalent committee?
5. Was the measure/policy formally approved or adopted by the elected representatives of neighboring authorities that fall within the 'functioning area' of the city?
6. Have you 'celebrated' the adoption of the measure/policy with stakeholders and citizens (e.g. in the form of a public event)?

# 9 References