SEVENTH FRAMEWORK PROGRAMME
THEME 6: Environment (including climate change)

Contract for: **Collaborative Project**

D.1.1
Project Management Plan

Project acronym:	**BRIDGE**
Project full title:	sustainaBle uRban plannIng Decision support accountinG for urban mEtabolism
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1.0	28/2/2009	N. Chrysoulakis	Version 1.0 delivered to EC

Table of Contents

1. Introduction

1.1 Purpose of the document

This document is the Project Management Plan of the BRIDGE (sustainaBle uRban plannIng Decision support accountinG for urban mEtabolism) Project. It contains information required for the management of the project identifying and addressing essential technical and managerial processes necessary to satisfy the project requirements, quality and timely delivery.

1.2 Definitions and acronyms

Acronyms

4DVAR	Four Dimensional VARiational data assimilation system
AC	Advisory Committee
BRIDGE	sustainaBle uRban plannIng Decision support accountinG for urban mEtabolism
CA	Cellular Automata
CoP	Community of Practice
DSS	Decision Support System
GIS	Geographical Information Systems
IPR	Intellectual Property Right
IPRC	Intellectual Property Right Committee
MB	Management Board
NetSyMoD	Network Analysis – Creative System Modelling – Decision Support
PBL	Planetary Boundary Layer
PC	Project Coordinator
PDCA	Plan Do Check Act
QA	Quality Assurance
RID	Review Item Discrepancy
SERA	Small Environmental Research Aircrafts
SC	Steering Committee
SW	Software
WP	Work Package

1.3 Document references

[R1] BRIDGE Grant Agreement Annex I (Description of Work), Issue 6.0, 25/09/2008
[R2] BRIDGE Grant Agreement, n. 211345, 14/11/2008
[R3] BRIDGE Consortium Agreement, Issue 4.0, 17/10/2008

2. Project Overview

BRIDGE (sustaina**B**le u**R**ban plann**I**ng **D**ecision support accountin**G** for urban m**E**tabolism) is a joint effort of 14 European Organizations aiming at incorporating sustainability aspects in urban planning processes, accounting for some well recognised relations between **urban metabolism** and **urban structure**. BRIDGE also aims at devising of innovative **planning strategies** for urban planning and design in Europe. More specifically the objectives of BRIDGE are:

- Bridge the gap between bio-physical sciences and urban planners.
- Illustrate the economic advantages of accounting for environmental issues on a routine basis in urban planning decisions.
- Provide the means to quantitatively estimate the various components of the urban metabolism from local to regional scales.
- Provide the means to quantitatively estimate the environmental impacts of the above components.
- Provide the means to translate the above impacts to socio-economic costs.
- Support the development of sustainable planning strategies to decouple resource use and economic development.
- Provide the means to optimise resources in urban planning.
- Involve local and regional stakeholders in validation of project's achievements.
- Support the implementation of EU policy on urban environment.

BRIDGE will provide the means to close the gap between bio-physical sciences and urban planners and to illustrate the advantages of accounting for urban metabolism issues on a routine basis in design decisions. The "**urban metabolism**" is considered as the exchange and transformation of energy and matter between a city and its environment. The city is considered as a system and the physical flows between this system and its environment will be quantitatively estimated in the framework of the project. BRIDGE will focus on the following components of urban metabolism:

- **Energy**.
- **Water**.
- **Carbon and pollutants** (SO_2, NO_x, CO, O_3, PM_{10}, $PM_{2.5}$).

The **challenges** of the sustainable urban planning with regards to the above components are the following:

- Energy.
  - ✓ Optimise energy efficiency of the urban structure.
  - ✓ Minimise energy demand of building groups.
  - ✓ Maximise efficient use of energy through building services and energy supply.
  - ✓ Maximise share of renewable energy sources.
  - ✓ Maximise the use of eco-friendly and healthy building materials
- Water.
  - ✓ Minimise primary water consumption.
  - ✓ Minimise impairment of the natural water cycle.
- Carbon and pollutants.
  - ✓ Minimise the emissions to the atmosphere.
  - ✓ Maximize pollutants sinks.

BRIDGE will exploit the advances in bio-physical sciences to develop a Decision Support System (**DSS**) which will be used to support the decision making needed to achieve the above challenges by proposing quantitative measures and guidelines for sustainable use of energy and materials in urban planning. This DSS will reflect the multidimensionality nature of the urban metabolism, as operationalised in intelligible and

transferable **indicators** easily understood by a non-scientific public. Decision making means selecting between **alternatives**. A DSS is a computer based information system that assists decision making by providing a structured presentation of alternatives and mechanisms for the comparative analysis, ranking, and selection among them. The problem is that some options may be good according to some criteria whereas other options will do better against differing **criteria**. Choosing one of the alternatives over the others means that the **priorities** must have been set in such a way that accomplishing some goals would sacrifice others. The objectives are usually conflicting, and therefore, the solution is highly dependent upon the preferences of the decision-makers (users). The main function of a DSS will therefore be to present, or design and generate alternatives, and provide the tools for their selection, given the users objectives, criteria, and preferences. The development of this DSS will be based on an analytical and a design component linking the bio-physical processes in urban environment with socio-economic parameters in order to estimate the environmental impacts and the socio-economic costs of urban metabolism components.

The fluxes of each of the above urban metabolism components will be measured and modelled in BRIDGE case studies, in order to calculate the net-fluxes into or out of the city environment. **Small Environmental Research Aircrafts** with capabilities to measure turbulent fluxes of energy and scalars will be used to study mass and energy flows out of urban and suburban areas. Airborne **eddy covariance techniques**, which were complemented by further development of methodologies based on the Convective Boundary Layer mass budget concept, will be applied to study the exchange of energy and material. Ground based **lidars** and **flux towers** will monitor the daily evolution of the Planetary Boundary Layer and provide the necessary information to close the budgets. In addition to the observational data sets corresponding to direct (airborne or ground) measurements, **satellite** derived information will be used for land use/cover characterization and for estimation of spatial distribution of physical parameters related to energy and material flows. Sophisticated **numerical techniques** will be also used to incorporate observational data produced partially in the field experiments in BRIDGE case studies. Advanced **assimilation** techniques (4DVAR and Ensemble Kalman Filter) will be used in BRIDGE to optimise the results of the different scenarios to be included in the data base as part of the DSS. The actual computer platforms allow the simulation of micro-environments at **settlement level**, considering that mass and energy fluxes from building and other surface types. In addition, meteorological and air quality models will be applied at **regional scale**, therefore landfills, power production plants and other structures will be considered in terms of atmospheric emissions. The measured and simulated datasets will be integrated in the DSS and the environmental and socio-economic impacts of the respective physical flows will be assessed. The DSS will provide several urban planning **scenarios**, which will be evaluated by the end users. In this way sustainable planning strategies will be proposed based on quantitative assessments of urban metabolism components.

Five European cities have been selected as BRIDGE **case studies**: a high latitude with rapid urbanization city that requires a substantial amount of energy for heating (**Helsinki**, Finland); a low latitude Mediterranean city that requires a substantial amount of energy for cooling (**Athens**, Greece); a representative European megacity (**London**, United Kingdom); a representative European old city with substantial cultural heritage (**Firenze**, Italy) and a representative Eastern European city with dynamic planning process reflecting the economical, social, and political changes held within last two decades (**Gliwice**, Poland). In order to develop a method that will be welcomed by local governments, it is important to involve them in the project from the beginning. The project will use a **Community of Practice** (CoP) approach, which means that in the **case studies**, local stakeholders and scientists of the BRIDGE project will meet on a regular basis in order to learn from each other. The CoP will make clear what aspects are important for the future users of the BRIDGE products. It also provides network contacts for collecting datasets for each case study (land use, infrastructure networks, socio-economic data etc.). This approach will also be used to create an “umbrella” CoP across the participating cities to exchange ideas and experience of BRIDGE on a European level.

3. Project Organization

3.1 Organizational structure

Consortium organization.
BRIDGE is bringing together the critical mass of scientific leading institutions in the field of urban planning, urban climatology, socio-economics, environmental science, impact assessment, numerical modelling, remote sensing, land use – land cover, GIS and decision support systems. The consortium is formed by 14 scientific beneficiaries from 11 countries. Five stakeholders from five European cities are also included. Five European cities have been selected as BRIDGE application areas (Helsinki, Athens, London, Firenze and Gliwice). The research beneficiaries are experienced in academic research and European, national or regional consultancy work. They cover the required expertise for carrying out a project in the addressed research field. The relevance and use of the envisaged research results will be guaranteed and increased by the integration of the five stakeholders. FORTH acts as Prime Contractor towards the Contracting Authority with all the other Partners as Beneficiaries or Subcontractors. The table below provides a list of the Beneficiaries.

#	Beneficiary name	Short name	Country
1	Foundation for Research and Technology - Hellas	FORTH	Greece
2	King's College London	KCL	United Kingdom
3	Consiglio Nazionale delle Ricerche	CNR	Italy
4	Instytut Ekologii Terenów Uprzemysłowionych	IETU	Poland
5	Technical University of Madrid	UPM	Spain
6	University of Aveiro	UAVR	Portugal
7	University of Basel	UBAS	Switzerland
8	Trinity College Dublin	TCD	Ireland
9	University of Helsinki	UHEL	Finland
10	National and Kapodistrian University of Athens	NKUA	Greece
11	Centro Euro-Mediterraneo per i Cambiamenti Climatici S.c.a.r.l.	CMCC	Italy
12	Météo France CNRM	CNRM	France
13	Alterra B.V.	ALTERRA	The Netherlands
14	University of Southampton	SOTON	United Kingdom

The following figure shows the structure of the Consortium, while, a description of the responsibility assignment among the Beneficiaries, is provided in section 7.6.

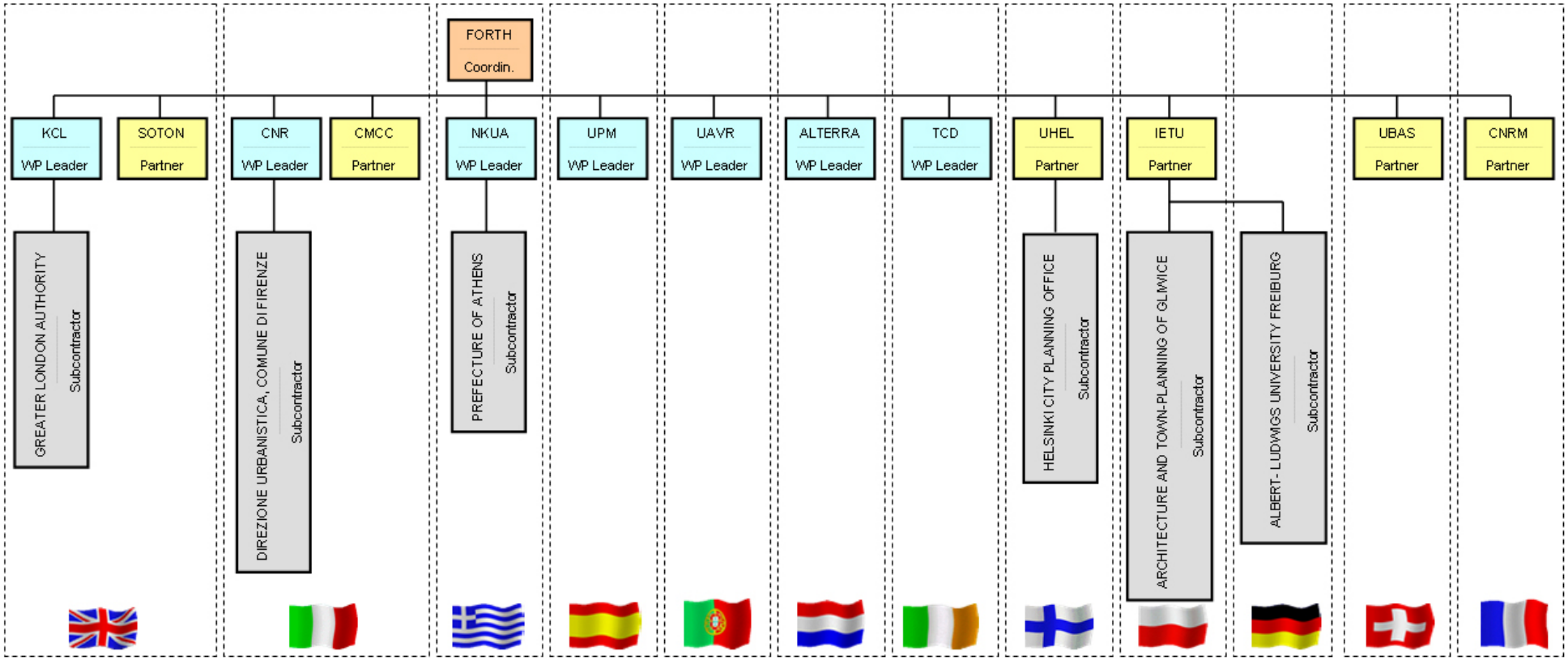

Figure 1. *The Consortium structure.*

Project organization.

The structure and organisation of project activities are presented in Figure 2. A matrix organisation has been adopted in order to provide more flexibility and adaptability in changing conditions. The matrix organisation takes advantage of the benefits of a pure-project organisation while maintaining the advantages of the functional organisations. The BRIDGE organisational structure is composed of eight WPs (WPs 2 to 9). An additional WP (WP1) is especially dedicated to the project management, thus ensuring that BRIDGE has a solid management and flexible structure adapted to its ambitious context.

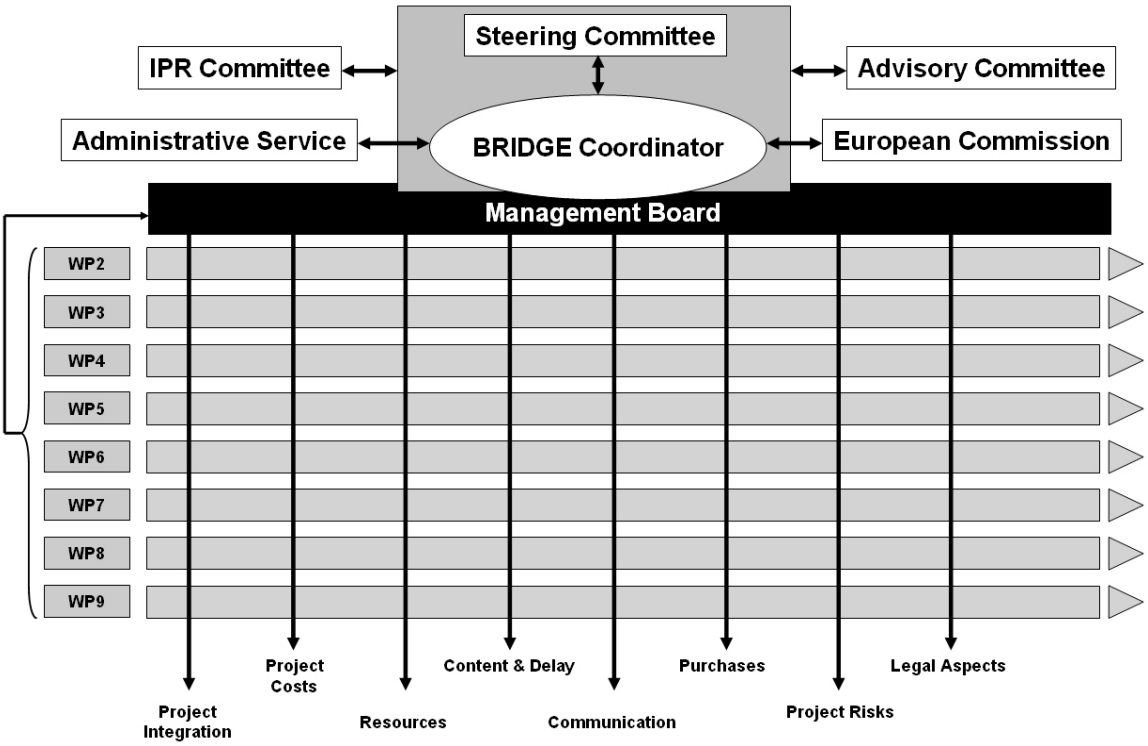

Figure 2. *The Management structure and organization.*

The strategic management level includes the main decision-making role: The Steering Committee (SC), the Management Board (MB) and the Project Coordinator (PC). The coordinator will be assisted by the Advisory Committee (AC) and by Intellectual Property Right Committee (IPRC), as defined in the Consortium Agreement. The MB represents the operational decision level within the BRIDGE management organisation. According to the strategy decided by the SC, the MB makes decisions regarding the management and the project's coordination. More precisely, the operational level within the BRIDGE management organisation is performed by the PC and the WP Leaders. These persons make decisions regarding the technical and management issues including implementing the overall project strategy fixed by the SC (e.g. project re-organisation, contractual matters, IPR, dissemination and exploitation). The MB will meet at least once every six months or more often when required under the chairing of the PC. The MB will inform the SC on the progress of the BRIDGE project. The MB is the structure through which the day-to-day operational management of the different management processes is implemented. The MB is responsible for deploying the necessary procedures and the planning, monitoring and controlling the necessary actions to make sure that the different WPs are well consolidated. The MB will monitor and manage the project according to all requirements given to the project, including ethical, gender, and other social related issues.

3.2 Organisational boundaries and interfaces

In the following sections the point of contact of all the actors involved in the BRIDGE project are defined.

European Commission - Contracting Authority

All communications concerning contractual and legal matters will be addressed to:

European Commission
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4. Managerial Process

4.1 Management objectives and priorities

The objectives of the project management will be mainly addressed to the coordination aspects among all the actors involved in the project frame, and to the monitoring of the project objectives achievement during the overall project life cycle. The management structure is split into three levels: The strategic management, the integrative management and the WP management. All levels of decision and action, including management of WPs follow the continuous process improvement principle towards Excellence represented by the PDCA (Plan Do Check Act) wheel. The MB, consisting of the WP Leaders, will implement and deploy the necessary management procedures (costs, people, facilities, communication, knowledge, purchase, legal aspects and IPR, risks).

Special emphasis will be given to the identification and handling of the potential problems that can occur during the execution of the project. In order to reach this objective well proven monitoring and control procedures as well as risk management techniques shall be applied.

4.2 Assumptions, dependencies and constraints

Further to the rules and procedures identified in this document, other aspects of the cooperation among the Beneficiaries during and beyond the project lifecycle is ruled by the BRIDGE Consortium Agreement. The document deals with topics like responsibilities of the Beneficiaries, governance structure, financial provisions, access rights, IPR etc.

4.3 Risk Management

Risk management objectives

The Risk Management includes:

- the risk assessment for:
  - ✓ risk identification, in terms of list of risks;
  - ✓ risk analysis, in terms of evaluation of drawbacks and impacts;
  - ✓ risk classification, based on the probability of occurrence and impacts;
- the risk control for:
  - ✓ identification of actions for risk avoidance or reduction;
  - ✓ planning and implementation of risk avoidance/reduction actions;
  - ✓ risk monitoring with reporting and re-assessment of risks.

The risk identification activity is not bounded at the beginning of the project. Each time a new risk is detected it shall be managed. Nevertheless, the biggest effort has to be put at the beginning in order to anticipate, as far as possible, the monitoring of possible risk and plan, if the case, mitigation actions. The responsibility of managing project risks relies with the Coordinator. Identified risks will be tackled by the Coordinator and alerts will be raised in case any of the identified risks increases its priority.

Risk assessment and control

The risk identification process consists in imagining possible events that can jeopardise the planned project evolution. As an example, here below are listed typical risks of complex project:

- **Schedule slippage and slow progress in general.** This risk is handled by the periodic progress status assessments performed by the Coordinator reported to all the Beneficiaries. Relevant indicators will be defined to cater for trends in progress achievement, showing the average actual schedule slippage of each

task with respect to the original planning. Possible problems in indicators values and trends will be discusses with the Beneficiaries aiming at finding the best solution in the shortest time.

- **Underestimation of the required effort.** This risk is handled by monitoring the planned versus actual effort required by each task. Indicators and statistics will be identified and managed by the Coordinator.
- **Turn over of key-personnel.** This risk is managed by standardising the way of working across the various teams and by defining a backup policy, so that in case of unexpected leave, remaining personnel can temporarily compensate for the absent ones, while waiting for a permanent substitution. The backup policy will not be limited to the key-personnel only but will applied as far as possible to all the resources.

4.4 Monitoring and project reporting

Every three months, each Beneficiary will submit to the PC a consolidated report on the progress of the different WP aspects. The reporting will include information about the technical progress, results obtained (e.g. deliverables), the compliance with the work programme and all the relevant information at management level (resources, costs, delays...). The PC will synthesise the overall project status and planning. For the attention of the EC, the following reports will be prepared by the MB and officially supplied by the PC:

- **Quarterly Progress Reports**: These reports will contain a concise description of all activities undertaken with respect the objectives, action and work plan envisaged in the project.
- **Mid-term Report**: This report will be released in M18. It will contain a detailed account of the activities undertaken with respect the objectives, actions and work plan envisaged in the project during the first 18 months. A financial summary will also be included with respect the budget available for the project. For the mid-term assessment report presentation, the PC will organise a review meeting (Mid-term Project Review) with all beneficiaries and the Commission's representative. The purpose of this meeting will be to report on the progress to date and to redefine if necessary the programme for the remaining part of the Grant Agreement.
- **Final Report**: This report will contain a summary of the main achievements and results of the project; a detailed account of the activities undertaken with respect the objectives, actions and work plan envisaged in the project. It will be released at the end of the project.

The FP7 project periodic Report and Project Final Report Reporting Templates will be used for the preparation of the above reports.

4.5 Action Item management

Action generation shall be traced into the relevant Minutes of Meeting. Each action should include the following information:

- action identifier;
- action responsible;
- action deadline.

Actions can have three different states which depend on the current level of accomplishment:

- an action is OPEN if it is not yet managed;
- an action is CLOSED if there is evidence that somebody accomplished the action;
- an action is DELETED if not yet closed and no longer valid.

The PC is in charge of managing the project action item list. This list shall be produced and presented during MB meetings where delays in action closure shall be discussed.

5. Technical Process

5.1 Methods, Tools and Techniques

This section gives an overview of the tools used for supporting the various project activities.

Documentation, and other support activities
The standard Microsoft Office™ package shall be used:

- Word (text processing)
- PowerPoint (drawing tool)
- Excel (spread sheet)
- Access (database)

Planning
The tool used by PC for monitoring the progress of the project is Microsoft Project™.

Specification/Design
Several tools have been considered as candidates for supporting the specification and design activities. Decisions for which tools shall be used will be taken in the early stages of the project.

Configuration Management
The configuration control of all the SW developed shall be under the FORTH responsibility.

5.2 Documentation

Document identification
All documents issued in the framework of BRIDGE will be identified by a reference identifier, an issue number and a description.

The reference identifier will be defined as follows:
211345_<Number>_< DocType >_<BeneficiaryCode>
where:

- **211345** identifies the project: it is the Grant Agreement number of BRIDGE;
- **<Number>** is a progressive number identifying each document inside its <DocType>. It is a three digit number filled with zero (e.g. the first document is 001) and is maintained by FORTH for all the documents produced within the project.
- **<DocType>** is one of the following:

<DocType>	Explanation
PL	Plan: Project Management Plan, Dissemination and Use Plan…
CD	Consortium Document: Consortium Agreement….
DD	Design Document: DSS Design, ….
DM	Dissemination Material: Newsletter, ….
MM	Minutes of Meeting
PR	Project Report: Mid-term Report, Final Report…
TR	Technical Report: Indicators Definition Report, DSS demonstration Report, ….
PT	Protocol: BRIDGE observation Protocol….
TN	Technical Note
MN	Management Note
OT	Other documents

- **<BeneficiaryCode>** identify the project Beneficiary responsible of the document issue. It can have one of the following values:

<BeneficiaryCode>
FORTH
KCL
CNR
IETU
UPM
UAVR
UBAS
TCD
UHEL
NKUA
CMCC
CNRM
ALTERRA
SOTON

The issue number applies only to documents that undergo an evolution process. In fact, it makes the traceability of the document evolution possible. The issue number has the following format:
<edition>_<revision>

where:

- **<edition>** is a progressive number starting from 0. The edition 0 identify a document in draft status. The edition 1 identify the first issue of the document.
- **<revision>** is a progressive number starting from 0. It can be applied also to documents with edition 0.

The names of the files containing the project documents shall follow the convention:
211345_<Number>_< DocType >_<BeneficiaryCode>_<edition>_<revision>_<description>.doc

where **<description>** is:

- the deliverable number and a short description for all the deliverable documents (i.e. the deliverable document D.1.1, Project Management Plan, will become D11_PM_Plan);
- a short description (max 20 characters) for all the other documents.

Document Production

All the documents shall be produced according to the standards defined in Section 4. Each Beneficiary will be in charge of defining its own production environment. FORTH will archive and maintain the configuration of all the project official documents. In order to allow an easy way for document exchanging between the project Partners, FORTH has developed a ftp server. To provide a secure and user friendly environment a password protected graphical user interface was installed in FORTH ftp server (http://www.iacm.forth.gr/egroupware), as shown in Figure 3. All the Partners shall be allowed to connect to this server for reading, uploading and downloading files. Uploading shall be allowed only on specific directories. Documents reading and downloading shall be allowed on a documentation tree structure. Documents produced within the project shall be stored under directories whose name is the name of the WP they pertain to. There are also dedicated directories for all Deliverables. Each of such directories will be internally structured in sub-directories to facilitate the access to the information contained. The initial organisation is shown in Figure 3. For each event/meeting a directory will be created named as the meeting itself, where all the documentation related to it shall be stored. The position of this directory in the

documentation tree structure will depend on the nature of the correspondent event/meeting. Daily back-up of this tree will be made.

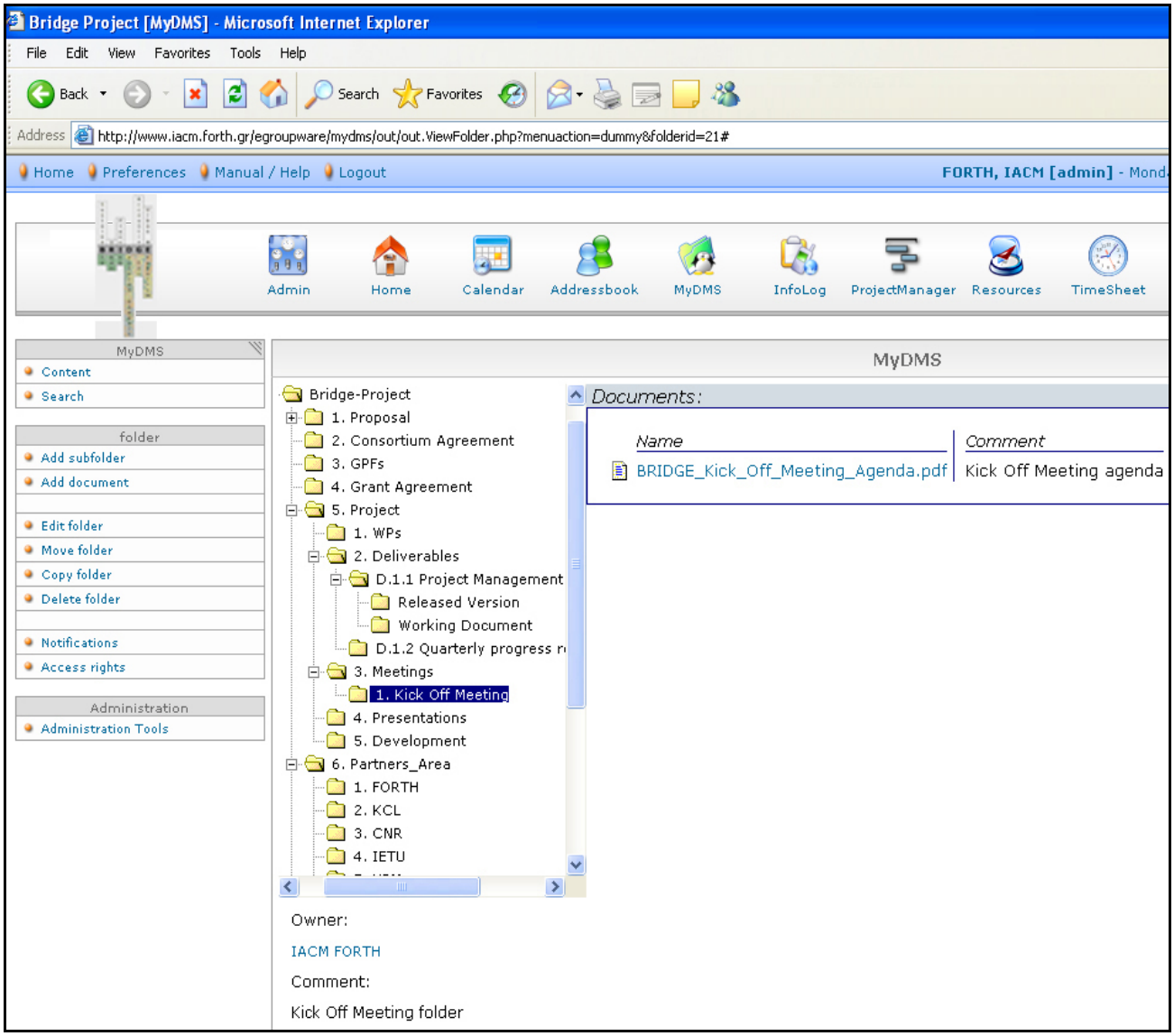

Figure 3. *The ftp-based graphical user interface of BRIDGE.*

Document Evaluation

All deliverable documents will undergo a review process before the formal delivery to the EC, according to the procedure described below. For each review a Review Team will be appointed. The review purpose and rules shall be notified to the Review Team members at least a week before the document issuing for review. Each member will be provided with a copy of the document to be reviewed, and will produce a RID (see the template in Annex) for each problem found. The RIDs produced shall be sent to the Book Captain and to the PC. All the RIDs produced shall be taken into account by the author in producing the final version of the document. If the document author disagrees with a RID or the solution proposed, he will provide a clear explanation of the reasons to the RID author and to the PC. Depending on the importance of the deliverable, a meeting can be called at the end of the review process to discuss the results and decide about possible open items.

Document Modification
The document modification involves the activities due to approved RIDs. The document author shall trace within the Document Status Sheet (see page 2 of the present document) all the modifications applied and shall properly update the issue and revision number. All the parts of the document modified with respect to the previous issue/revision will be being highlighted.

Document issuing
The following rules will be applied on the documentation issuing process:

- All the documents will be issued to EC directly by FORTH.
- The Book Captain will send the document to FORTH for review and approval.
- The documents sent to FORTH will be complete in every part.
- The deadline for issuing the document to FORTH will vary from one week up to four-five weeks depending on the document importance and complexity.
- One or more drafts are foreseen also with incremental approach.

Documentation Standards
The standard Word Processor used within BRIDGE is Microsoft Word. To increase the level of standardization in the documentation editing and review, the following templates have been defined up to now:

- BRIDGE_doc.dot: Word template for documents;
- BRIDGE_min.dot: Word template for Minutes of Meeting;
- BRIDGE_RID.dot: Word template for RIDs.

These templates will be stored in a dedicated directory in the FTP server described before in order to allow all the Partners to easily download them, if necessary. The templates for Minutes and RIDs are also attached to the present document in Annex. The template for documents is not attached because the present document itself represents an application of it.

6. Quality Assurance & Control

6.1 Quality assurance tasks and responsibilities

The PC is responsible for the project quality and is supported by the SC in the definition of the Quality Assurance (QA) items applied to the project, and in the execution of the control activities planned or considered useful during the project, according to what is defined in the following paragraphs.

6.2 Standards and practices

Documentation standards.
Documentation shall be produced according to the guidelines provided in §5.2.

Coding standards.
Specific rules to be applied during code design and development shall be specified into a technical note issued, in advance with their application, by the Lead Beneficiary to all the Beneficiaries involved in the development activity. The usage of coding standards shall be respected to assure a uniform and coherent software (SW) production from different developers. As general statement, the rules provided shall be as general as possible and shall deal mainly with design methodology selection, naming conventions and layout aspects. The Lead Beneficiary will be in charge of verifying the correct application of the rules defined.

Testing standards and practices.
DSS testing standards and practices shall be defined within the test plans foreseen by the project deliverables (D.7.2 Case Studies – DSS application, D.8.1 DSS demonstration report). The Lead Beneficiary will be in charge of checking the compliance of the testing approach with what defined in the applicable documents.

6.3 Review and audit

Review.
Reviews mainly deal with the evaluation and approval of Management and Technical documents to be delivered to the EC in the frame of the BRIDGE project. In the scope of the review process, the PC is in charge of organising the reading cycles, the review team and the final verification of the copies to be issued. He is also in charge of collecting all the RIDs produced in each review in order to trace their application in the final document.

Audit.
An internal audit may be requested by the PC in order to check project activity versus project development standards. The PC will organise and conduct the internal audit according to an Audit Organisation Note that will be delivered to all the involved people. This Note shall describe the audit purpose, the audit procedure and the audit agenda. An Internal Audit Report shall be filled with audit results and possible corrective actions, and will be notified to the SC.

6.4 Problem reporting and corrective action

All the problems found throughout the project activities will be managed and traced. The problems can be divided in two different categories:

- Documentation problem: it is related to the contents of a document and shall be reported using RID forms (see template in annex A).
- SW problem: it is a difference between the expected result and the actual one. It shall be reported using an appropriate form (not yet defined).

The Lead Beneficiary is in charge of verifying the tracing of the above mentioned problems and carrying out the follow-up of the relevant corrective actions.

6.5 Code control

All the SW developed in the frame of the BRIDGE project shall be delivered to EC by FORTH. FORTH will be also responsible for the configuration management of all the SW developed. Tools, SW control rules and other practices applicable to SW configuration management shall be defined in a specific Technical Note issued by the Lead Beneficiary to all the Beneficiaries involved in code development. The Lead Beneficiary will verify the correct application of the Configuration Management procedures defined.

6.6 Media control

Each media will be identified by a proper label providing information on its content. At least it will contain:

- Project name (i.e. BRIDGE).
- Media identifier.
- Date.
- Content description.

The media identifier is defined as follows: **21345-<Number>-< MediaType >-<BeneficiaryCode>**
where <MediaType> can be CD, DVD ROM, etc.
<Number> have the same meaning described in §5.2.1.
<BeneficiaryCode> have the same meaning described in §5.2.1.

The date written on the medium label is the medium creation date. The content description will include the issue/revision number and the Deliverable Number (e.g. D.3.1.1), if any. Media will be archived by the PC who is responsible for their security and safety. He will also verify the correct labelling of media used for formal delivery.

7. Project Workplan

7.1 Process model

This section describes the development approach adopted by the BRIDGE project in order to achieve its objectives. The overall BRIDGE approach is shown in Figure 4. The impacts of urban metabolism will be assessed by quantitative estimating the relevant physical flows (energy, water, carbon and pollutants). State-of the art observation methodologies and models will be used to identify the spatio-temporal distribution of each flow and to assess its behaviour in the urban fabric. State-of the art impact assessment methodologies and indicators will be used to assess the environmental and socio-economic impacts of these flows addressing the economic, institutional and regulatory factors. Consequently, the BRIDGE DSS will integrate the observational data, the models and/or the models results and the impact assessment methodologies in order to device planning alternatives in which the use of energy and material will be optimised from the environmental and socio-economic point of view. Thus, this tool will be used to design new planning strategies based on sustainability principles. These strategies will be based on land use planning scenarios devised by the BRIGE DSS. The environmental and socio-economic impacts of urban metabolism will be taken into account in these scenarios.

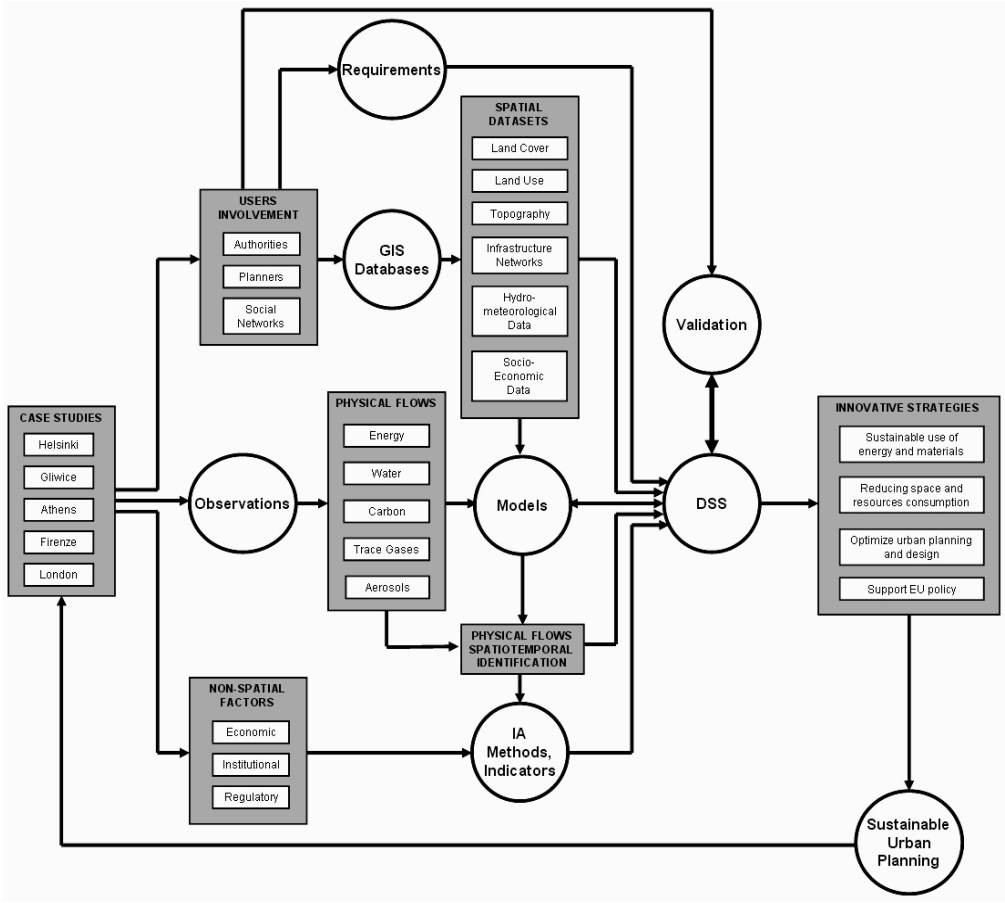

Figure 4. *Flowchart of the BRIDGE methodology.*

The DSS will be validated by end users in BRIDGE case studies who will provide their requirements during its design phase, therefore the DSS will be developed in an iterative procedure. One of the main purposes of the Community of Practice (CoP) is to acknowledge into the DSS development the different stakeholders' perceptions. The end users are strongly involved in urban planning, since most of them work in city planning

organizations in BRIDGE case studies. Urban planners in these organizations, who are aware of human reactions and behaviours in reply to urban planning policies, will provide their requirements for the DSS development they will evaluate the DSS prototype and collaborate on the surveys supporting future scenario analysis and selection.

The work to be carried in BRIDGE has been broken down into 9 Work Packages (WPs) following the logical phases of the implementation of the project:

- **WP1**: Project Management.
- **WP2**: Methodology Specification. It will ensure that new research and policy tools developed build on current knowledge and make best use of the available resources from a scientific and policy perspective.
- **WP3**: Data Collection and Analysis. It represents a unique attempt to collect and to analyse an integrated database suitable for the development and validation of models and methodologies for the analysis of fluxes between the city and its environment.
- **WP4**: Physical Flows Modelling. It will provide the required modelling of physical flows.
- **WP5**: Environmental and Socio-economic Impact Assessment Methods. It will develop an integrated set of indicators to quantify the socio-economic and environmental impacts of urban metabolism. It will provide the tools that enable planner to review the potential environmental impacts of spatial planning and to explore alternatives.
- **WP6**: DSS Development. It will integrate inputs from WPs 2, 3, 4, 5 and 7 to develop a DSS, which will be used to support the decision making by proposing quantitative measures and guidelines for sustainable use of energy and materials in urban planning.
- **WP7**: DSS Application. It will cover application of the DSS for a set of cities with different typologies and several scenarios, providing information for coherent decision making process and developing guidelines for sustainable planning strategies.
- **WP8**: Demonstration. It includes two events to demonstrate the First DSS Prototype and the Final DSS Prototype.
- **WP9**: Dissemination - Exploitation. It will cover activities related to dissemination and exploitation, such as the establishment of a network community, the provision of publishable deliverables and the setting up of workshops, ect.

There are 2 horizontal WPs (Management and Dissemination - Exploitation) and 7 thematic WPs. The framework of CoP's will also run across the WPs. They will first be established for each city in WP2, but they will come back in WP5, WP7 and finally as an umbrella CoP to integrate the experience between cities in WP8. WP1 interacts with all the other WPs since it coordinates and monitors project implementation. WP2 to WP8 provide information to WP9. This information is related to the progress and achievements of the project and will be disseminated and used to support exploitation of the BRIDGE methodology and DSS. WP2 specifies the all scientific and technical issues therefore it provide guidelines to WPs 3 to 7. All observations related to physical flows will be performed in the framework of WP3. The datasets which will be provided by WP3 will be used in WP4 to model the behaviour of the complex urban system in relation to its metabolism of energy and matter. These datasets will be used for model calibration and validation. Modelling results will be also integrated in the DSS, however some type of models will be also integrated for on-line use. In WP5 the environmental and socio-economic impact assessment methods and indicators will be devised using inputs from WPs 2 and 3. These methods will be also integrated in the DSS (WP6). As it is shown in Figure 6, WPs 2 to 8 provide inputs to WP6. These inputs will be used for the DSS development. WP7 will provide the strategic scenarios required for the DSS implementation. These scenarios will be also used by "off-line" models (WP4). The validation of the system will be based on these scenarios for BRIDGE case studies. Since the system is validated it will be used to device guidelines for sustainable planning strategies. These tasks are included in WP7. Selected application scenarios will be used in WP8 for the DSS demonstration.

7.2 Project Deliverables

Del. no.[1]	Deliverable name	WP no.	Lead Beneficiary	*Estimated indicative person-months*	*Nature*[2]	Dissemi-nation level[3]	Delivery date[4]
D.1.1	Project Management Plan.	WP1	FORTH	2	R	CO	M3
D.1.2.i	Quarterly progress reports.	WP1	FORTH	18	R	CO	Quarterly
D.9.1	Dissemination and Use Plan.	WP9	NKUA	4	R	RE	M6
D.9.2	BRIDGE Web Site.	WP9	NKUA	7	O	PU	M6
D.2.1	Inventory of current state of empirical and modelling knowledge of energy, water and carbon sinks, sources and fluxes.	WP2	KCL	14	R	PU	M12
D.2.2	Protocol to assess differences between knowledge supply and knowledge needs in the field.	WP2	NKUA	14	R	RE	M12
D.2.3	Protocol to develop CoP for BRIDGE.	WP2	ALTERRA	5	R	RE	M12
D.3.1.1	Datasets of air quality, energy, water, carbon and pollutants fluxes/concentrations.	WP3	CNR	16	O	CO	M12
D.3.2.1	GIS data and maps of energy and water fluxes, pollution concentrations, land cover and vegetation.	WP3	CMCC	11	O	CO	M12
D.3.3.1	GIS data and maps on spatial, socio-economic development and impact indicators.	WP3	IETU	3	O	CO	M12
D.4.1	Model Selection Report.	WP4	UPM	8	R	PU	M12
D.6.1	DSS Design Report.	WP6	FORTH	12	R	RE	M12
D.9.3.i	BRIDGE Published material.	WP9	NKUA	7	R	PU	Periodically
D.5.1	Socio-economic – environmental workshops report.	WP5	TCD	15	R	RE	M18
D.1.3	Mid-term Report	WP1	FORTH	4	R	RE	M18

1 Deliverable numbers in order of delivery dates: D1 – Dn

2 Please indicate the nature of the deliverable using one of the following codes:
R = Report, **P** = Prototype, **D** = Demonstrator, **O** = Other

3 Please indicate the dissemination level using one of the following codes:
PU = Public
PP = Restricted to other programme participants (including the Commission Services)
RE = Restricted to a group specified by the consortium (including the Commission Services)
CO = Confidential, only for members of the consortium (including the Commission Services)

4 Month in which the deliverables will be available. Month 1 marking the start date of the project, and all delivery dates being relative to this start date.

D.3.1.2	Datasets of air quality, energy, water, carbon and pollutants fluxes/concentrations (1st update).	WP3	CNR	16	O	CO	M24
D.3.2.2	GIS data and maps of energy and water fluxes, pollution concentrations, land cover and vegetation (1st update).	WP3	CMCC	11	O	CO	M24
D.3.3.2	GIS data and maps on spatial, socio-economic development and impact indicators (1st update).	WP3	IETU	3	O	CO	M24
D.5.2	Report on the impacts assessment model for urban metabolism.	WP5	TCD	15	R	PU	M24
D.5.3	Indicators definition report.	WP5	CMCC	12	R	PU	M24
D.6.2	First DSS Prototype.	WP6	FORTH	30	P	RE	M25
D.7.1	Strategic scenario analysis.	WP7	UAVR	10	R	PU	M25
D.3.1.3	Datasets of air quality, energy, water, carbon and pollutants fluxes/concentrations (2nd update).	WP3	CNR	16	O	CO	M30
D.3.2.3	GIS data and maps of energy and water fluxes, pollution concentrations, land cover and vegetation (2nd update).	WP3	CMCC	11	O	CO	M30
D.3.3.3	GIS data and maps on spatial, socio-economic development and impact indicators (2nd update).	WP3	IETU	3	O	CO	M30
D.3.4	BRIDGE observations report.	WP3	CNR	4	R	PU	M30
D.3.5	BRIDGE observations protocol.	WP3	CNR	2	R	PU	M30
D.4.2	Model Implementation Report.	WP4	UPM	39	R	RE	M30
D.4.3	QA/QC Report.	WP4	UPM	7	R	RE	M30
D.7.2	Case studies – DSS application.	WP7	KCL	18	R	PU	M30
D.8.1	DSS demonstration report.	WP8	ALTERRA	18	R	RE	M30
D.6.3	Final DSS Prototype.	WP6	FORTH	13	P	PP	M33
D.7.3	Guidelines for sustainable planning strategies.	WP7	UAVR	10	R	PU	M35
D.8.2	Demonstration proceedings.	WP8	ALTERRA	12	R	PU	M36
D.1.4	Final Report.	WP1	FORTH	2	R	RE	M36
TOTAL				**392**			

7.3 Work Packages list and Project Milestones

The table below lists the Project WPs.

WP No	WP Title	Type of activity	Lead Beneficiary	Person Months	Start Month	End Month
WP1	Project Management	MGT	B1	26	1	36
WP2	Methodology Specification	RTD	B2	33	1	12
WP3	Data Collection and Analysis	RTD	B3	96	4	30
WP4	Physical Flows Modelling	RTD	B5	54	8	30
WP5	Environmental and Socio-economic Impact	RTD	B8	42	6	24
WP6	DSS Development	RTD	B1	55	10	33
WP7	DSS Application	RTD	B6	38	18	35
WP8	Demonstration	DEM	B13	30	18	36
WP9	Dissemination - Exploitation	OTHER	B10	18	5	36
	TOTAL			**392**		

The following milestones have been identified for the project:

No.	Milestone name	Related WPs	Date
M.1	Kick-off meeting.	WP1	M1
M.2	Project management structure fully implemented and validated by Steering Committee.	WPs 1, 2	M3
M.3	Web site operation.	All	M6
M.4	1st socio-economic and environmental workshop.	WPs 1, 2, 3, 5, 9	M6
M.5	1st progress meeting.	All	M6
M.6	Inventories.	WPs 1, 2, 3, 4, 5, 9	M12
M.7	Communities of Practice.	WPs 1, 2, 3, 5, 6, 7, 8, 9	M12
M.8	Observation datasets release.	WPs 1, 3, 4, 5, 9	M12
M.9	Model selection.	WPs 1, 2, 3, 4, 6, 9	M12
M.10	2nd socio-economic and environmental workshop.	WPs 1, 3, 5, 9	M12
M.11	1st newsletter.	All	M12
M.12	2nd progress meeting.	All	M12
M.13	Model implementation.	WPs 1, 3, 4, 6, 9	M18
M.14	Join WP4 – WP5 – WP6 workshop.	WPs 1, 4, 5, 6, 9	M18
M.15	Mid-term Project Review Meeting	All	M18
M.16	Observation datasets 1st update.	WPs 1, 3, 4, 5, 6, 9	M24
M.17	Scenarios selection.	WPs 1, 2, 5, 6, 7, 8, 9	M24
M.18	4th progress meeting.	All	M24
M.19	First DSS prototype release.	All	M25
M.20	1st demonstration event – Umbrella CoP 1.	WPs 1, 6, 7, 8, 9	M26
M.21	Observation datasets 2nd update.	WPs 1, 3, 4, 5, 6, 7, 8, 9	M30
M.22	Application results.	WPs 1, 4, 5, 6, 7, 8, 9	M30
M.23	5th progress meeting.	All	M30
M.24	Final DSS prototype release.	WPs 1, 4, 6, 7, 8, 9	M33
M.25	2nd demonstration event - Umbrella CoP 2	WPs 1, 6, 7, 8, 9	M36
M.26	Final review.	All	M36

7.4 Project Planning and Time table

The following chart shows the intended Project Schedule in Gantt format:

- Work Packages.
- Milestones.
- Meetings.

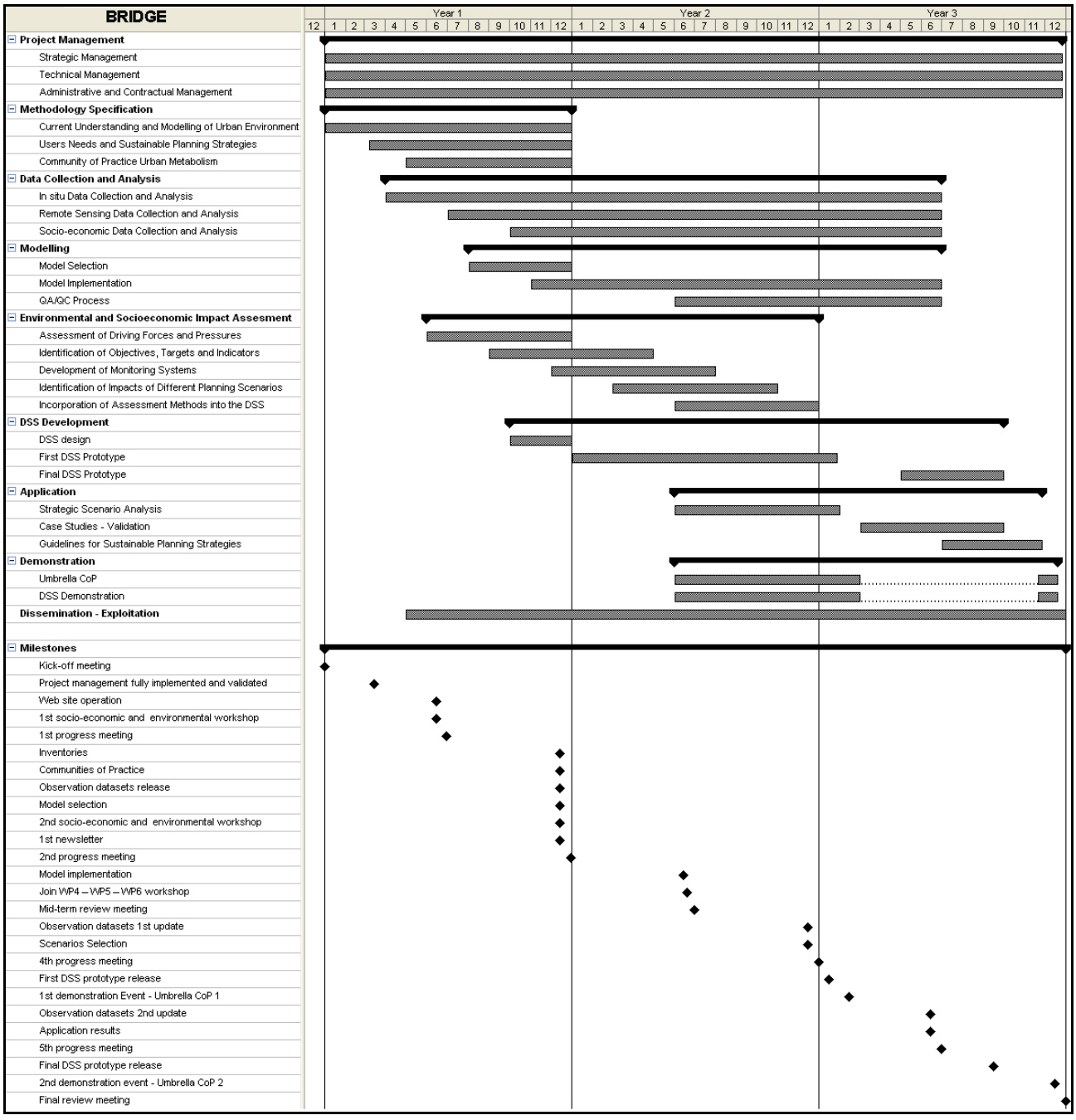

Figure 5. *Gantt chart presented the work schedule and the project milestones*

7.5 Work Package descriptions

In this section the Work Breakdown Structure and the detailed Work Package Description is given. The following figure depicts the project WBS and the WP interdependencies.

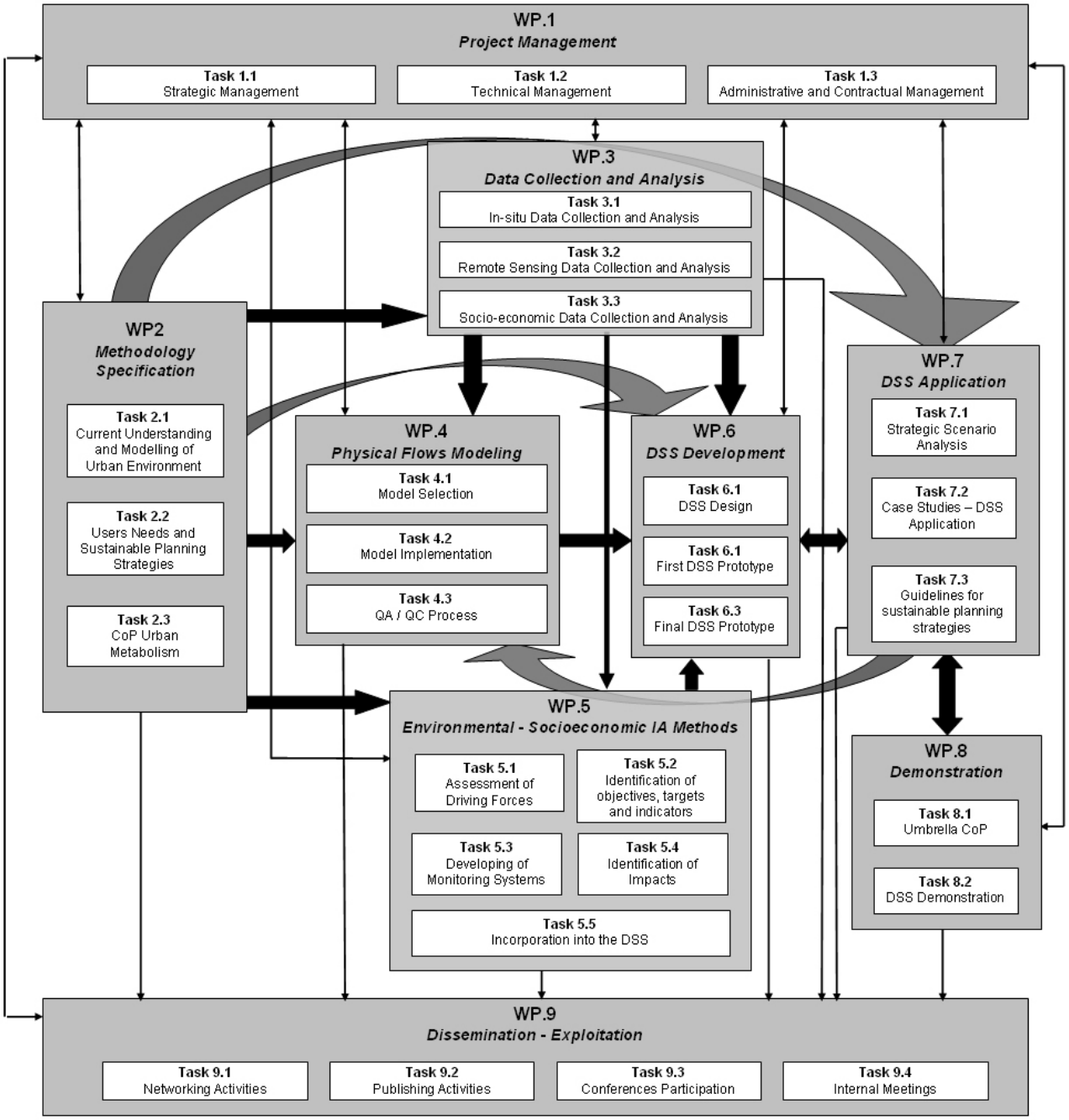

Figure 6. Graphical *representation of the WP components showing their interdependencies.*

In the following, a detailed WP description is given. When more then one Beneficiaries contributes to the same WP the responsible one is indicated in bold. The starting date of each WP has been defined in months after the project kick-off.

Work package number	**WP1**	**Start date or starting event:**					**M1**
Work package title	**Project Management**						
Activity Type	**MGT**						
Participant	**FORTH**	KCL	CNR	UPM	UAVR	TCD	NKUA	ALTERRA
Person-months per beneficiary:	**19**	1	1	1	1	1	1	1

Objectives

FORTH will coordinate the project and will be responsible for ensuring that the correct procedures are applied and deadlines and obligations are met. Appropriate management processes will be implemented according to the **ISO 10006 project management standard.** The first 3 months will be strategic for implementing the whole project management structure. FORTH will lead WP1 with the assistance of the other WP Leaders (**Management Boards**). Outputs of this WP will be the different project management reports, progress and activity reports, funding and efforts consumption reports, documents for the project reviews, and other project fact sheet as required in FP7 projects.

Description of work

WP 1 is subdivided in the following Tasks:
Task 1.1 Strategic Management.
Task 1.2 Technical Management.
Task 1.3 Administrative and Contractual Management.

Task 1.1 will cover the following activities:

- Elaborate a Project Management Plan, giving the main decision-making rules and the main procedures regarding the smooth functioning of the project (FORTH).
- Define performance measurement baselines (all).
- Checking the project progress against the planned schedule and take any corrective action if necessary (FORTH).
- Identify the risk management baselines (FORTH).
- Ensure that milestones are met and deliverables produced are of high quality (FORTH).
- Organize the information flow throughout the project between all participants (FORTH).
- Coordinate the BRIDGE Management Board (FORTH).
- Coordinate the project reviews conducted every year (FORTH).
- Produce strategic documents (e.g. major changes in the project) for the Steering Committee (FORTH).
- Coordinate the interactions with the EU (FORTH).

The work to be carried within **Task 1.2** is related to **both** management levels: **Integrative management and WP management.** Integrative management activities are related to the advancement of the project, including the organization of meetings needed for a proper project monitoring and the production of deliverables. At the level of WP, **WP Leaders** will be responsible for the progress and for the deliverables. They will monitor the technical management of the WP by performing the following activities:

- Management of project integration. This process contains the project management plan, the management of interfaces, the analysis of advancement and the conclusion of the project (FORTH).

- Management of the content. It comprises the conception and definition of the content, the definition of research activities and the control of evolutions (FORTH, KCL, CNR, UPM, UAVR, TCD, NKUA, ALTERRA).
- Technical coordination of Tasks execution (FORTH, KCL, CNR, UPM, UAVR, TCD, NKUA, ALTERRA).
- Supervision of preparation of reports, cost statements, publications (FORTH).
- Keeping an effective communication with other WPs (FORTH, KCL, CNR, UPM, UAVR, TCD, NKUA, ALTERRA).
- Identification and resolution of potential conflicts, linked for instance to knowledge access rights (FORTH, KCL, CNR, UPM, UAVR, TCD, NKUA, ALTERRA).
- Organization of internal technical meetings (FORTH, KCL, CNR, UPM, UAVR, TCD, NKUA, ALTERRA).

The work to be carried within **Task 1.3** is related to i**ntegrative management** level and consists in setting up the management processes needed to perform the following activities:

- Process costs estimates, define coherent schedules and assign responsibilities (FORTH).
- Control manpower consumption with respect to the reports submitted by beneficiaries (FORTH).
- Management of delay in relation to activities, duration estimation, planning, and delay management (FORTH).
- Management of costs comprising cost estimation, budget, and cost (FORTH).
- Management of resources including planning, assignment, and control processes (FORTH).
- Management of communication including communication plan, organisation, and control of interfaces (FORTH).
- Management of purchases including the planning and control of purchases (FORTH).
- Management of risks with identification, evaluation and control of risks (FORTH).
- Management of legal aspects for the consortium agreement, beneficiary contracts (FORTH).

Task 1.3 also includes the periodic update of the project documents related to the different processes (progress reports, work-plan, cost statements, communication reports) and the supervision of the preparation of the different deliverables and technical reports from the different WPs. Finally, it also includes organization meetings (FORTH, KCL, CNR, UPM, UAVR, TCD, NKUA, ALTERRA).

Deliverables

D.1.1 Project Management Plan. It will give the main decision-making rules and the main procedures regarding the smooth functioning of the project. It will be delivered in **M3**.

D.1.2.i Quarterly Progress Reports. They will describe the progress of the project. They will be delivered quarterly.

D.1.3 Mid-term Report. It will describe the mid-term progress of the projects including financial status. It will also present the results of the mid-term review. It will be delivered at the end of the **M18**.

D.1.4 Final Report. It will describe the achievements of the project as well as its progress and financial status. It will be delivered in **M36**.

Work package number	**WP2**	**Start date or starting event:**				**M1**
Work package title	**Methodology Specification**					
Activity Type	**RTD**					
Participant	**KCL**	FORTH	UBAS	NKUA	CMCC	ALTERRA
Person-months per beneficiary:	**9**	3	10	3	5	3

Objectives

The objective of WP2 is to identify current understanding, users needs, and the presence/absence of policy of urban metabolism and resource optimisation in the urban fabric. . To achieve this the framework of **CoP** will be used. One of the main deliverables will be a summary of **current knowledge and needs**. Existing data sets and models will be identified (within and beyond Europe). Processes will be studied end-to-end in a number of environments (the case studies) influenced by different policy and resource availability.

Description of work

This WP will be organised into three main tasks:

Task 2.1 Documentation of current understanding and modelling capability for energy, water and carbon flows and resources in urban environments.

Task 2.2 Documentation of the needs of users and demands of the planning community in the context of sustainable deign.

Task 2.3 Initiation of first stages of a participatory methodology for stakeholder involvement for each of the case studies.

The links between urbanisation and urban metabolism and resource use are complex. Urban environments alter the exchanges of energy, water, carbon and pollutants both as a consequence of changes in the built environment (increased impervious/built fraction, decreased vegetative cover) and the behaviours of the urban residents in terms of demands of resource use, emissions, and production of waste. Moreover, the clearing of lands for cities and roads, and the demands for resources and goods by urban residents, both historically and today, are also major drivers of regional change. On the other hand, cities are focal points for changing behaviours and can induce transformations in consumptive behaviour and spur technological innovation and development.

Task 2.1 concerns the documentation of current understanding and modelling capability for energy, water and carbon flows and resources in urban environments: **UBAS** will lead on energy supported by FORTH; **KCL** on water; **CMCC** on carbon. Particular attention will be directed to:

- Measurement and Observations – both of (1) fluxes and (2) budgets and inventories
- Patterns, Variability and Modelling - with emphasis on (1) spatial and temporal patterns and variability of fluxes, sources and sinks and their controls; and (2) modelling strategies at multiple scales and levels of complexity.
- Mitigation Opportunities, Constraints and Challenges - evaluation of existing management strategies that explicitly or implicitly have an impact on energy, water and carbon flows and emissions, with particular attention to the factors explaining success, constraints and challenges.

Task 2.2 concerns the study of sustainable planning strategies and the status of their implementation in various areas (**NKUA** will lead). The study of sustainable planning strategies and requirements will be

evaluated on the basis of the social and economic characteristics and the potential of each area as well as other parameters of relevance

- Current understanding of the process will be reviewed in terms of both empirical data and modelling capability (NKUA, UBAS, CMCC).
- Consideration will be given to the inputs, use and transformations, and outputs of resources from the urban area. Careful consideration will be given to identifying what processes are currently well understood from a science, policy and decision making perspective, and those for which insight is lacking (NKUA, UBAS, CMCC).
- Data needs and outputs will be identified, and a protocol will be provided to connect theoretical needs with actual needs and perceptions in the field for each case study. This process will firstly benefit from any existing local platform (such as Agenda 21 fora), and then will be implemented by initiating a participatory approach (UBAS, NKUA).
- A careful actor's identification will be performed (ALTERRA, FORTH, CMCC). These preliminary phases will set the ground for:
  - ✓ the establishment of a sound **CoP** in each of the case studies,
  - ✓ the requirements of the end users of the **DSS** (input to **WP6)**,
  - ✓ the requirements of the impact assessment participatory model in **WP5**.

Task 2.3 involves the development of a CoP Urban Metabolism (**ALTERRA** will lead): To support the tasks above, a method will be developed to involve stakeholders in the process of development of the DSS. The stakeholder analysis will involve setting up a **CoP** framework for each case study. Particular attention will be directed to the principles and procedures of a CoP for the BRIDGE project (ALTERRA, KCL, UBAS, CMCC).

Deliverables

D.2.1 Inventory of current state of empirical and modelling knowledge of energy, water and carbon sinks, sources and fluxes. It will be delivered in **M12**.

D.2.2 Protocol to assess differences between knowledge supply and knowledge needs in the field. It will be delivered in **M12**.

D.2.3 Protocol to develop CoP for BRIDGE. It will be delivered in **M12**.

Work package number	**WP3**		**Start date or starting event:**				**M4**	
Work package title	**Data Collection and Analysis**							
Activity Type	**RTD**							
Participant	**CNR**	FORTH	KCL	IETU	UHEL	NKUA	CMCC	SOTON
Person-months per beneficiary:	**32**	3	16	8	9	5	13	10

Objectives

The objective of WP3 is to provide valuable datasets to describe over time the different physical flows characterising urban metabolism of BRIDGE case studies, which have been selected along NS and EW transects - influenced by different policy and resource availability. Socio-economic data for all case studies will be also collected. The deliverables will be constituted by a series of datasets to be used for the development and validation of simulation models, of environmental and socio-economic impact analysis methods and of the BRIDGE DSS. These data will be also used for comparative studies between different cities.

Description of work

WP3 is subdivided in the following Tasks:

Task 3.1 In situ data collection and analysis - will be implemented by CNR, KCL, IETU, CMCC, UHEL, NKUA and SOTON.

Task 3.2 Remote Sensing Data Collection and Analysis - will be implemented by CNR, FORTH, KCL, NKUA, CMCC, and SOTON.

Task 3.3 Socio-economic data collection and analysis - will be implemented by CNR, KCL, IETU, UHEL, NKUA and CMCC.

Energy and mass (water, carbon and pollutants) are exchanged by urban environments and fluxes are modulated by human activities (heating and air conditioning, vehicular traffic, changes in vegetative cover, waste production etc). On the other hand, land use change due to construction of buildings, roads and factories, determine major changes at the regional scale. WP3 systematically monitor the main fluxes, using in-situ, remote sensing and/or socio-economic observations in Helsinki, Athens, London, Firenze and Gliwice. These cities were selected as European cities representative of different climates, sizes and socio-economic conditions and will be investigated for the above described drivers and flows.

Task 3.1 aims at:

- Undertaking campaigns to provide spatially extensive data sets of air quality and surface fluxes (KCL, CNR, IETU, UHEL, NKUA, CMCC).
- Addressing surface-atmosphere interactions and its effect on the distribution of trace gas and particle concentrations (CNR, IETU, UHEL, SOTON, CMCC).
- Monitoring gas exchange of urban vegetation in relation to soil properties (SOTON, CNR, UHEL).
- Documenting the heat island characteristics and the increase of the energy demand of buildings for cooling (NKUA, IETU, CNR).
- Investigate the influence of urban pollution problems on indoor environmental quality (NKUA, CMCC).

Surface fluxes (sensible (KCL) and latent heat (CNR), momentum (KCL), Net Urban Carbon Exchange (CNR, UHEL), aerosols fluxes (CNR, UHEL) will be measured eddy covariance/large aperture scintillometry (KCL) on a continuous basis and by research aircrafts on the basis of repeated seasonal campaigns. Air quality will be assessed by existing networks (KCL), a new network of biosensors used as bio-accumulators and Lidars (CNR, NKUA, IETU); traffic data (KCL); soil and vegetation status (SOTON) and activity by eddy covariance, soil moisture and sapflow gauges (UHEL); energy exchange and air quality

of buildings by surveys using the BEP (Billing Energy Protocol) monitoring protocol, surface temperature indoor pollutants and PM's concentrations, using a new instrumentation the EOLO (Eddy cOvariance-based upLift Observation system) based on eddy covariance approach (CMCC). Surface-atmosphere interactions and the distribution of trace gas will be simulated using the Advanced Canopy Atmosphere Soil Algorithm (ACASA) (CMCC), and the results will be compared with in situ measurements (CNR, IETU, UHEL, NKUA).

Tasks 3.2 aims at:

- Document spatial variability in fluxes and verify selected aspects (heat (KCL), phytoremediation (SOTON), etc.)
- Test the utility of Fourier Transform Infrared spectrometer (FTIR) for roadside measurements of traffic related pollutants and compare to traffic flow (KCL).
- Map and classify major urban vegetation forms (FORTH, NKUA, SOTON, UHEL).
- Link flux monitoring with spatial variation of vegetation properties (SOTON).
- Provide spatial information via remote sensing on urban land cover types, albedo, emissivity, and sensible heat flux (FORTH, KCL, NKUA, CMCC).
- Determine the utility of portable FTIR measurements for assessing in situ urban emissivities (KCL).

Satellite, airborne and ground-based remote sensing data and methodologies will be used to provide the required spatio-temporal distributions and maps of physical parameters, as well as to produce suitable derived indices, such as NDVI and PRI. The land cover/use dynamics will be also estimated and mapped in BRIDGE case studies. ACASA to simulate the mass and energy exchanges coupled with the regional scale model MM5 and in conjunction with remotely sensed data will be used to provide constraints on the land surface types.

Task 3.3 aims at:

- The determination of anthropogenic energy (KCL, UHEL) and water fluxes (IETU, CNR).
- The determination of the effects of: land use and land cover change (IETU, NKUA); and interventions such as the congestion charge (KCL).
- The determination of migration, consumption, socio-economic development (CMCC, UHEL).
- Estimate the main dimensions of social and economic impact generated by urban metabolism (IETU, CMCC).

Data will be collected - and organized in GIS – concerning space; mobility; heat and water demand; land use types coverage and intensity; land prices; building volumes; socio-economic status; quantitative and qualitative indicators; population density; unemployment rate; education level. Spatial analysis techniques will be employed to analyse and to harmonize these datasets.

Deliverables

D.3.1 **Datasets of air quality, energy, water, carbon and pollutants fluxes/concentrations**. These datasets will be delivered in **M12**, but they will be updated on **M24** and in **M30**.

D.3.2 **GIS data and maps of energy and water fluxes, pollution concentrations, land cover and vegetation.** These GIS products will be produced using the appropriate spatio-temporal analysis techniques on the above datasets. A subset of first products will be delivered in **M12**, and these will be added to and updated in **M24** and in **M30**.

D.3.3 **GIS data and maps on spatial, socio-economic development and impact indicators.** These GIS products will be produced using the appropriate spatio-temporal analysis techniques on the collected socio-economic data. A subset of first products will be delivered in **M12**, and these will be added to and updated in **M24** and in **M30**.

D.3.4 **BRIDGE observations report**. It will summarize the overall data collection and analysis activity in the framework of the BRIDGE project. It will be delivered in **M30**.

D.3.5 **BRIDGE observations protocol**. It will provide guidelines for an optimised data collection to support any further implementation of the DSS in planning practice of other cities. It will be

delivered in **M30**.

Work package number	**WP4**		**Start date or starting event:**				**M8**	
Work package title	**Physical Flows Modelling**							
Activity Type	**RTD**							
Participant	**UPM**	FORTH	KCL	UAVHR	UHEL	NKUA	CNRM	ALTERRA
Person-months per beneficiary:	**18**	2	4	7	8	4	7	4

Objectives

Datasets collected in WP3 will be ingested into the selected modelling tools following the methodology and specification stated in WP2. Relations, parameterisations and numerical tools will be used to assimilate the data and produce an energy and matter flow exchange. The results will be integrated into a database included in the DSS (WP6).

Description of work

WP4 is subdivided in three different Tasks:

Task 4.1 Model selection – will be done by UPM, UAVR, KCL, UHEL, NKUA, CNRM, ALTERRA and FORTH.

Task 4.2 Model implementation – will be done by UPM, UAVR, KCL, UHEL, NKUA, CNRM and ALTERRA.

Task 4.3 Quality Assurance / Quality Control Process – UPM, UAVR, KCL, UHEL, NKUA, CNRM, ALTERRA and FORTH.

In this WP4 we are covering five different areas:

a) Micro-numerical air pollution simulations On a local scale perspective, urban air quality will be evaluated through the simulation of urban airflow patterns and air pollutants dispersion applying a models' cascade that incorporates road traffic emissions models and CFD (Computational Fluids Dynamics) models based on the RANS (Reynolds Averaged Numerical Simulation) approach as the MICROSYS (UPM) and SCANDIS (UAVR) models. Input data can be obtained from measurements or downscaled from the meso-scale models. Air pollution fluxes at urban scale will be quantified by using these detailed CFD codes, which receive boundary and initial conditions from meso-scale air quality models or from the data collected in WP3. Emissions, in particular, will be estimated by using a detailed road-traffic emission model as CAMO (UPM) and TREM. The interpretation of modelling results allows to obtain air quality reference values at the simulated area, addressing the importance of emissions, meteorological conditions, street-canyon configuration and green areas (UPM, UAVR). The selected numerical tools will be applied to the field cases in Helsinki, Gliwice, Athens, Firenze and London and the data will be assimilated into the DSS. Different scenarios will be run according to the proposed strategies received from WP7 (UPM, UHEL).

b) Urban Heat Island research. The proved substantial differences in air temperature in the urban environ will be model by using different techniques: numerical and neural networks. The spatial variability of the surface temperature will be estimated by using these techniques and compared with those data observed in standard meteorological stations (NKUA, CNRM).

c) Exchange of energy, momentum and water vapour between the urban surface and the atmosphere. For this particular application we will use the TEB (Town Energy Balance) and LUMPS or other

appropriate urban land surface models (KCL, CNRM). They are dedicated to neighbourhood or larger scales. They can be coupled to meso-scale atmospheric model or used offline forced by observations for example. The models have been evaluated against different field data sets in Mexico, Vancouver, Marseille and Toulouse. In addition, carbon fluxes at city level will be modelled together with the population growth for future scenarios (CNRM).

d) Global and meso-scale climate models. The selection and analysis of different Global Climate Models (GCM) outputs for different climate scenarios constitutes de first task. The use of the climate outputs from several GCM (ex. HadAM, CCM3, COSMOS, GISS) considering different climate scenarios (SRES scenarios) helps to understand the uncertainty on future projections derived from climate data (UPM, UAVR). The dynamical downscaling from the GCM outputs to the MM5 model will allow increasing the spatial and temporal resolution of the projected climate scenarios (UPM, UAVR). The air quality modelling systems will be applied to a 5 year period for each climate scenario based on the different GCM outputs. The analysed time frame will consider three selected periods 2030, 2050 and 2100 (UAVR). In order to study the impact of climate scenarios on pollutants concentration dynamical downscaling over the megacity will be performed using air quality numerical modelling. These applications will be directly connected to the WP7 scenario selection. Global climate model outputs will be dynamically downscaled to mesoscale models, allowing the increase of the spatial and temporal resolution of meteorological data. The results of the mesoscale meteorological modelling will be used as input to the air quality model(s). The base-line representation of each case-study will be modified according to the scenarios defined in WP7, taking into account land-use and emission changes. The results from the mesoscale air quality modeling will provide boundary and initial conditions for the micro-scale modelling (UPM, UAVR, CNRM).

e) The water cycle in urban areas. The water cycle in urban area's will be investigated using the urban water balance module from the integrated water system model SIMGRO (Veldhuizen, A.A., P.E.V. van Walsum, A. Lourens, P.E. Dik. 2006. *Flexible integrated modeling of groundwater, soil water and surface water.* Proceedings of MODFLOW 2006 (p. 94 -98). IGWMC, Colorado) (ALTERRA). The strengths of this model are the simple approach of the urban water system and the connections with the river basin water system. The urban model is easy to adapt. Based on the same cascade approach a water quality model will be developed. On base of the simulation results meta functions will be derived. These meta functions will be used in the decision support system and therefore the CoP's will define which meta functions are essential. The urban cycle in two cities will be described (ALTERRA, UPM). Complexity and detail will depend on both the availability of data and the stakeholder scenario's resulting from the CoP's. The selection of these cities depends on the availability of data needed for feeding and verification of the model. The data currently needed for the model: time series of precipitation and evaporation, (detailed) elevation model, soil type (including infiltration capacity), geo-hydrological parameters, urban cover types, pipe drainage, sewage system (including structure, "urban sub-catchments" and properties like inhabitants, sewage production per head, storage capacities, pump capacities, etc.), surface water system (including structure, sub-catchments, weirs, pumps, etc,). We assume these data to be available and directly usable for the selected cities.

The **Task 4.1** will perform the selection of the different models according to the different characteristics and the required adaptation of them to produce an integrated final result according to the objectives of the proposal. The computer capabilities, the characteristics and principles of the different modelling tools, the type of results and the derived work of the interpretation of the results will be taken into account for Task 4.1. Two different type of models will be considered: a) On-line models and b) Off-line models. On-line models are those which can be implemented into the DSS and the user can require them to be run "at request". Off-line models are those that – due to their complexity and computer demand – cannot be run from the DSS "at request" and they should be run "off-line", simulating the different scenarios proposed by WP7 and storing the results in the DSS Data Base. Off-line models have the advantage of a greater credibility than on-line models but, on the contrary, the on-line models can provide quick answers to user requirements with a lower accuracy and sophistication. A proper combination of both approaches – as in

BRIDGE – produces the best optimal results for a final product. In this action, we should consider all details received from WP3 for data assimilation.

In **Task 4.2** the different models will be run according to the characteristics derived in Action 4.1 and by the model experts. The models will run for the specific scenarios and characteristics received from **WP7** and **WP2**. Consequently, the models will have to be adapted to cover the above requirements. The hardware and software capabilities will be considered. The "off-line" models have to be designed and exported according to the functional characteristics received from WP6. The "off-line" models should be adapted to the information received from **WP3**.

In **Task 4.3**, all beneficiaries will follow a strict quality assurance and quality control procedure to guarantee the quality of the whole modelling process. In this action we should define the limitations and the uncertainty of the results. This task will include also the export of model results (off-line models) to DSS.

Deliverables

D.4.1 Model Selection Report. It will describe the model selection procedure according to the needs of the simulation of physical flows of the components energy, water, carbon and pollutants of urban metabolism. It will be delivered in **M12**.

D.4.2 Model Implementation Report. It will describe how the selected models will be implemented, how the on-line models will be integrated to the DSS and how the results of the off-line models will be exploited by the DSS. An analysis of the models results will be also included. It will be delivered in **M30**.

D.4.3 QA/QC Report. It will describe the **quality assurance** and **quality control** procedure which will be followed to guarantee the quality of the whole modelling process. It will be delivered in **M30**.

Work package number	**WP5**	**Start date or starting event:**			**M6**
Work package title	**Environmental and Socio-economic Impact Assessment Methods**				
Activity Type	**RTD**				
Participant	**TCD**	FORTH	UAVR	CMCC	ALTERRA
Person-months per beneficiary:	**15**	2	10	12	3

Objectives

Identify the main driving forces and pressures of the urban environment on environmental and socio-economic systems. Development of environmental, socio-economic and sustainability indicators for a range of European scenarios through the use of a range of tools including, SEA, SIA and SA to quantify urban metabolism and resource optimization in the urban fabric. Define with the NetSyMod participatory approach the main dimensions of impact affecting the urban environmental and socio-economic systems using different planning scenarios.

Description of work

WP 5 is subdivided in the following Tasks:
Task 5.1 Assessment of driving forces and pressures on environmental and socio-economic systems in urban environments - will be implemented by TCD, UAVR, CMCC and ALTERRA.
Task 5.2 Identification of objectives, targets and indicators- will be implemented by TCD, UAVR, CMCC and ALTERRA.
Task 5.3 Development of monitoring systems - will be implemented by TCD, UAVR and CMCC.
Task 5.4 Identification of the environmental and socio-economic impacts on the urban systems of different planning scenarios- will be implemented by TCD, UAVR and CMCC.
Task 5.5 Incorporation of assessment methods into the DSS - will be implemented by TCD and FORTH.

Task 5.1 will assess the driving forces and pressures on environmental and socio-economic systems in urban environments. The outputs from **WP2**, **WP3** and **WP4** will be used to drive this assessment. Through the use of the **DPSIR** conceptual framework we propose to identify the Drivers, quantify the consequent Pressures, measure the State, assess the Impacts of urban metabolism and identify a range of potential Responses. This identification was supported by a literature review and the **NetSyMoD** Creative System Modelling (**CSM**) workshops were specifically dedicated to the conceptualization of the problem in a DPSIR framework.

Task 5.2 will identify objectives, targets and indicators. The objectives will be identified in cooperation with local stakeholders. This will involve setting up and monitoring a CoP in every case study with special emphasis on the user scenarios. This will allow a link between the workshops in Task 5.4 to the already running central CoP from **WP2** Objectives, targets and indicators are the tools through which the environmental and socio-economic impacts on the urban infrastructure can be assessed. This approach will allow us to identify indicators which can be used to quantify the sustainability of the urban fabric.

Task 5.3 will develop monitoring systems within the case studies and will be used to evaluate the utility of the indicators.

In **Task 5.4** the NetSyMoD participatory approach will be implemented according to the outcomes produced by previous tasks and on the basis of the analysis of urban fluxes by **WP4.** Different visions (experts, decision makers, citizens) of the urban system's dynamics will be integrated and the main dimensions of

impact be identified.

Task 5.5 will incorporate the assessment methods into the DSS. This approach will allow urban planners through the DSS in **WP6** to make informed decisions on how best to develop the urban fabric in a sustainable manner while optimising resources.

An internal WP5 technical meeting will be organized to establish the most appropriate impact assessment tools to be used in the project and to identify the main drivers and pressures of the urban fabric on environmental and socio-economic systems through reviewing existing literature. A team of experts and stakeholders including end-users will be assembled. The NetSyMod participatory approach will be implemented to reach a shared consensus among the different stakeholders involved (scientific experts, decision makers, citizens, private and public institutions, etc.). Relevant impacts to be assessed will be agreed upon during **CSM** workshops in each case study, which involves participation of participants in the project, professional planners and end users. Most of the input is expected to come from case study sites and the location for the workshops will preferably be at these sites. We anticipate three workshops which will progressively develop the objectives, as follows:

- **Workshop 1**: Assembling the team, setting the framework and establish relevant impacts to be identified and a preliminary list of valuation criteria and indicators. Workshop 1 is also an umbrella workshop including the CSM workshops in BRIDGE case studies. They will be held in **M6** (TCD, UAVR, CMCC, ALTERRA).
- **Workshop 2:** Testing the usability of the criteria and indicators set on the European case studies with the data provided by **WP3**. It will be held in **M12** (TCD, UAVR, CMCC, ALTERRA).
- **Workshop 3:** Joint workshop with **WP4** and **WP6** to assess the compatibility of the indicators with the DSS process. It will be held in **M18** (TCD, UAVR, CMCC, FORTH).

Deliverables

D.5.1 **Socio-economic – environmental workshops report.** It will summarise the achievements in the series of WP5 workshops with all stakeholders to establish a methodology which leads to the identification of a preliminary of potential indicators. A draft will be delivered in **M12** and a final version in **M18**.

D.5.2 **Report on the impacts assessment model for urban metabolism.** It will describe the development of an impact assessment model for urban metabolism. It will be delivered in **M24**.

D.5.3 **Indicators definition report**. It will describe the definition of the set of indicators of environmental, socio-economic and sustainability impacts. It will also describe how these indicators were tested and validated in case studies, as well as how they will be integrated in the DSS. It will be delivered in **M24**.

Work package number	WP6	Start date or starting event:					M10
Work package title	DSS Development						
Activity Type	RTD						
Participant	**FORTH**	IETU	UPM	UAVR	CMCC	CNRM	SOTON
Person-months per beneficiary:	**19**	8	7	5	8	5	3

Objectives

WP 6 aims at developing a GIS-based DSS able to integrate the data, the models and/or models results and the impact assessment methodologies needed to estimate the socio-economic and environmental impacts of urban metabolism. It will serves as a tool for a more sustainable use of energy and material in urban planning. It will permit the definition of scenarios for the evolution of the land use in BRIDGE case studies and to perform long term simulations based on these scenarios. The DSS will provide the means for resource optimisation in urban fabric.

Description of work

WP 6 is subdivided in the following Tasks:
Task 6.1 DSS Design - will be implemented by FORTH, CMCC, CNRM, UAVR and SOTON.
Task 6.2 First DSS Prototype - will be implemented by FORTH, IETU, UPM, UAVR and CMCC.
Task 6.3 Final DSS Prototype - will be implemented by FORTH, IETU, UPM, UAVR and CMCC.

Task 6.1 includes the conceptual and technical design of the DSS. It includes the following activities:

- Analysis of the user requirements (**WP2**) and provide specifications for the DSS design (FORTH, CMCC, UAVR, CNRM).
- Select of which of several technologies will be adopted (open source, commercial GIS, etc.) taking into account the above specifications and the specifications of the models to be integrated (FORTH, CNRM).
- Conceptual design of the DSS architecture based on the above steps (FORTH, CMCC, UAVR).
- Technical design of data storage and flow modules, communication interfaces, calculation modules, visualization modules and GUI (FORTH, IETU, CMCC, SOTON).

In **Task 6.2** a first prototype of the DSS will be developed base on the outputs of Task 6.1. This prototype will be evaluated (**WP7**) and demonstrated (**WP8**). Evaluation will provide feedback from end users which will be used for DSS optimisation. Task 6.2 includes the following activities:

- **Database development**. This database will store all spatial datasets provided by end users in case studies and the physical flows measurements provided by **WP3**, as well as numerical models' results provided by **WP4**. It will be also used to store all the scenario parameters (**WP7**), as well as the results of the different scenarios application (**WP7**). The database will be developed by **IETU** and FORTH.
- **Development of interfaces** which are needed for the communication of the various modules. Model encoders and decoders will be developed. The former will use the spatial datasets to prepare model input files, whereas the latter will use the model outputs to provide spatio-temporal distributions of the simulated parameters and visualizations needed in decision making. This includes the integration of a database to store of the results produced by models and particularly those coming from those models which cannot be integrated "on-line" into the DSS. The interfaces will be developed by **FORTH**.
- **Integration** of the various components of the DSS: i) The GIS that is used to integrate all datasets provided by **WP3**, analyse the various spatial entities, prepare the data for models, store the results and then visualize them; ii) numerical models results and flux models (provided by **WP4**); iii) evaluation

criteria (provided by **WP5**) for assessing the impact of the simulated scenarios (provided by **WP7**); iv) decision rules which compare the impact on the basis of these criteria and can assist decision makers on the preferred actions to be taken, v) the MCA and CA modules which will have the role of middleware between the analytical and the design components and vi) the GUI, which integrates all other components in one integrated system and hides the intricacies of the system for the user. The integration will be leaded by **FORTH** and supported by all WP6 participants (IETU, UPM, UAVR, CMCC, CNRM, SOTON). The MCA and CA module will be developed by **UAVR** and **CMCC**, whereas the GUI will be developed by **FORTH**.

In **Task 6.3** a refinement of the DSS will be done based on the evaluation which will be provided by the end users (**WP7**). It will lead to the final release of the DSS which will be demonstrated in case studies (**WP8**). The refinement of the DSS will be lead by **FORTH** and supported by IETU, UPM, UAVR and CMCC). The following activities are included in this Task:

- Refinement of the developed interfaces (FORTH, UPM, UAVR, CMCC).
- Refinement of decision rules (FORTH, UAVR, CMCC).
- Refinement of the visualization tools (FORTH).
- Refinement of the GUI (FORTH).

Deliverables

D.6.1 DSS Design Report. It will describe the DSS design procedure, the selection of the appropriate GIS platforms and tools and the integration of the several modules. It will be delivered in **M12**.

D.6.2 First DSS Prototype. It is the first DSS prototype to be validated by the end users. It will be delivered in **M25** and demonstrated in **M26**

D.6.3 Final DSS Prototype. It is the final DSS prototype. It will be delivered in **M33** and demonstrated in **M36** after the evaluation of its functionality by the end users.

Work package number	**WP7**	**Start date or starting event:**						**M18**		
Work package title	**DSS Application**									
Activity Type	**RTD**									
Participant	**UAVR**	FORTH	KCL	CNR	IETU	UPM	TCD	UHEL	NKUA	ALTERRA
Person-months per beneficiary:	**14**	3	2	3	4	4	2	2	1	3

Objectives

Validation of methods, models and data developed and acquired in previous WPs through the application to a set of selected case studies. Evaluation of DSS performance and architecture integration, within strategic scenarios based on different sustainability indicators.

Description of work

WP7 is subdivided in the following Tasks:
Task 7.1 Strategic scenario analysis - will be implemented by UAVR, UPM, TCD and ALTERRA.
Task 7.2 Case Studies – DSS application - will be implemented by UAVR, FORTH, KCL, CNR, UHEL, NKUA, IETU, UPM and ALTERRA.
Task 7.3 Guidelines for sustainable planning strategies - will be implemented by UAVR, FORTH, TCD and ALTERRA.

Task 7.1 concerns a foresight exercise, with the analysis and definition of scenarios. It includes the following activities:

- **Dimensions definition**: The first step is to define the key issues concerning environmental and socio-economic issues studied in BRIDGE. These dimensions must correspond to exogenous variables (not determined by the local agents), but that are determinant in the elaboration of planning policies that seek sustainable urban development, such as climate change and energy. The different IPCC base line and extreme scenarios will be evaluated according to their driving forces: population, economic and social development, energy and technology, agriculture and land use emissions, other gas emissions and policies. This action will be implemented in close collaboration with **WP5**. These scenario parameters will be stored in the DSS, according to **WP6,** Task 6.2 (UAVR, UPM, TCD).
- **Dimensions assessment**: After the selection of key issues/dimensions and corresponding variables, these have to be interpreted by local agents and applied to the situation at hand. In this activity the experts will learn what the more abstract dimensions will mean in detail and in practice; and the local agents will learn to translate the expert knowledge to their situation. This will again be done using the CoP (see also **WP2** and **WP5**) structure (UAVR, TCD, ALTERRA).
- **Scenarios development**: Definition of a set of strategic scenarios based on different variations of the dimensions chosen, for baseline and extreme situations. The scenarios will represent future situations that present challenges to the cities, taking into account both the relevant impacts of urban metabolism identified within **WP5** and other key issues such as: climate change, mobility, energy, and land use change (UAVR).
- **Scenario analysis**: Analysis of the scenarios defined previously by an expert workshop, involving scientists, planners and city council. This exercise will also include Delphi surveys, in order to support analysis and selection of the 2-3 most interesting scenarios to be used within **Task 7.2**. In these workshops participants are asked to indicate the measures that should be taken in the present to face the

future scenarios. The analysis of the several measures proposed results in the identification of the ones that should be adopted in all of the scenarios (robust measures). Challenges specific to each city can be answered through changes in urban policies related to mobility and land use change, among other issues. The process will analyse if the selected scenarios are plausible, internally coherent and consistent, constructed with rigor, detail and creativity and meet the goals of the project. The defined scenarios will be communicated to **WP4**, where the models with characteristics that determine their off-line application will be run (UAVR, UPM).

Task 7.2 concerns the DSS application to the selected case-studies, including validation and future scenarios. It includes the following activities:

- **CoP**. Start-up of the CoP, defined in WP2, with the local case studies authorities/representatives, as a platform for communication between DSS developers and users, with the objective of aiding the DSS application to the case-studies (ALTERRA, KCL, CNR, IETU, UHEL, NKUA).
- **DSS application for the current situation – validation**. The DSS will be applied according to data provided by WP3. This action will provide feedback to the evaluation of the DSS prototype, in order to proceed to the refinement of the DSS (Task 6.3) (FORTH, UAVR, KCL, CNR, IETU, UHEL, NKUA).
- **DSS application to the scenarios.** The DSS will be applied to the scenarios defined in Task 7.1. The Case studies will consider the characteristics of the designed DSS by integrating the models, the visualization tools, the databases and the decision analysis (trade-off analysis, linear programming, etc). These results will be stored in the DSS (FORTH, UAVR, KCL, UPM).
- **Analysis of application results** taking into account the different typologies of cities considered in the North-South European transect (FORTH, UAVR, UPM, IETU).

Task 7.3 concerns the development of guidelines for sustainable planning strategies, including the following actions:

- **Workshop on CoP method for** urban metabolism. It will be held in **M30** (ALTERRA, UAVR).
- **Development of guidelines** for sustainable planning strategies based on the outcomes from the DSS application and on the outcomes from the expert team analysis of the scenarios results (Task 7.2), Guidelines and strategies for sustainable planning will be further assessed in terms of their potential for implementation and the required modifications to the existing urban policy within the EU. Also, the guidelines and the strategy will be provided in modular format so as to allow their implementation to different types of cities (ALTERRA, UAVR, TCD, FORTH).

Deliverables

D.7.1 Strategic scenario analysis. It will report the results of the expert workshop which will be organized to analyse the defined scenarios. It will be delivered in **M25**.

D.7.2 Case studies – DSS application. It will describe the DSS application in BRIDGE Case Studies, analysing and summarising the evaluation and the feedback from the end users. It will be delivered in **M30**.

D.7.3 Guidelines for sustainable planning strategies. It will summarise the guidelines for sustainable planning strategies to be devised within WP7. It will be delivered in **M35**.

Work package number	**WP8**	**Start date or starting event:**						**M18**	
Work package title	**Demonstration**								
Activity Type	**DEM**								
Participant	**ALTERRA**	FORTH	KCL	CNR	IETU	UBAS	UHEL	NKUA	CNRM
Person-months per beneficiary:	**7**	2	1	3	3	5	3	2	4

Objectives

Demonstration of the applicability, usefulness and potential impact of the BRIDGE **DSS** prototype including a **feedback** by the end-users.

Description of work

WP8 is subdivided in the following Tasks:

Task 8.1: Establishing an umbrella CoP to integrate and exchange experiences and learning processes covering the transect of different cities - will be implemented by ALTERRA, KCL, CNR, IETU, UHEL and NKUA.

Task 8.2: Setting up and executing the demonstrations of the BRIDGE DSS during the CoP's and for hands-on experience - will be implemented by UBAS, FORTH, CNRM and ALTERRA.

The work will be focused around two major events:

- The first event will take place in **M26**. During this event the first prototype of the DSS will be demonstrated. Also city specific views will be exchanged on possible scenarios for which the DSS may be used (feedback to and from **WP7**). This will be done within the framework of an umbrella CoP. This umbrella CoP integrates participants of the local CoP's as defined in **WP's 2, 5** and **7**.
- The second event will take place at the end of the project (**M36**) also using the setting of the umbrella CoP. During this event the final prototype version of the DSS will be demonstrated. During this event also the learning process within the CoP's will be demonstrated and experiences with the development of the DSS will be exchanged.

Specific care will be taken for ensuring that the same line of work will be followed during these events, so that a "demonstration proceedings" can be produced as the result of each event.

Between the first and the second event specific feedback will be obtained by organising hands-on demonstrations in individual cities for specific end users. The feedback obtained from these targeted end users will be analysed and summarized for improvement of the DSS prototype (feedback to WP6).

Task 8.1 concerns the organization of an umbrella CoP with representatives of the local CoP's. The umbrella CoP will be used to share lessons learnt, and exchange experiences with the different versions of the DSS.

Task 8.2 concerns the application of the two versions of the prototype BRIDGE DSS for different cities that will be used for the demonstration events. Besides the demonstration of the prototypes at the umbrella CoP's, the prototypes will also be demonstrated in each individual city for hands-on experience.

Deliverables

D 8.1 DSS demonstration report. This report will present an evaluation of the applicability of the first BRIDGE DSS prototype. It will be delivered in **M30**.

D 8.2 Demonstration proceedings. This report will summarize the proceedings of the demonstrations and the working process of the development of the DSS. It will be delivered in **M36**.

Work package number	WP9		Start date or starting event:				M5	
Work package title	Dissemination - Exploitation							
Activity Type	OTHER							
Participant	NKUA	FORTH	KCL	CNR	UPM	UAVR	TCD	ALTERRA
Person-months per beneficiary:	8	3	1	2	1	1	1	1

Objectives

- Ensure effective dissemination of BRIDGE results in order to efficiently use and share technical information among end users. All the dissemination activities should aim at different levels of research communities, but also at regional, national and European levels.
- Ensure high level outreach within the global scientific community of the achievements of the project, including the lessons learned, and maintain strong collaborative arrangements between all the project beneficiaries of the participating countries.
- Prepare an Exploitation Plan with the cooperation of all beneficiaries that will define the promotion and exploitation strategy for the utilisation of project results.

Description of work

All **WP Leaders** (NKUA, FORTH, KCL, CNR, UPM, UAVR, TCD and ALTERRA) participate in all WP9 Tasks. The basic activities that will determine the success of the exploitation and dissemination of results will be:

Task 9.1: Networking activities. The network program aims to establish effective communication and collaboration within the consortium. The network will be dedicated to provide comprehensive, up-to-date information and news and will connect individuals and organizations through a wide range of communications technologies. Networking is a very important need for emerging scientific capacity in the area of interest. . The fundaments of the networking acitivities will be made in the framework of the CoP's (**WP2, 5, 7** and **8**). The development and establishment of a **Web site** will serve three main functions:

- To disseminate ideas and information within the BRIDGE consortium. Password protected consortium information will include project details, progress reports, meeting information, a technical discussion forum and links to the BRIDGE Database.
- To provide a source of information. The general public Information aimed at the public will include simplified explanations of the strategy, the programme of activities and the results of BRIDGE.
- To provide an entry point for information for researchers not participating in the consortium. This will be primarily via a link to the public sections of the BRIDGE website.

Task 9.2: Publishing activities. Much of the findings will go to publications in order to upgrade of physical, numerical, energy and matter flow models and identify mechanisms that link various processes in the urban environment. Members of each relevant WP will undertake to prepare articles for publication in **scientific journals.** This is a good way to both learn the topic deeply and bring one up to date. Another way to achieve diffusion of information is to produce and distribute an electronic **newsletter** with news, current events and products description related to the programme activities. Digital versions of the newsletter will be archived in BRIDGE Web-site and made accessible to users for download.

Task 9.3: Conference participations and contributions. We intend to launch a serious campaign for disseminating the scientific results of BRIDGE. This requires intense participation in relevant **international symposia** and other scientific meetings.

Task 9.4: Internal BRIDGE meetings. Biannual progress meetings will be arranged to secure the highest

level of information exchange among beneficiaries. Short reports of these meetings will be made available to the coordinator and then to the other beneficiaries either by email or posted on the BRIDGE web site.

Deliverables

D.9.1 Dissemination and Use Plan. It will describe BRIDGE dissemination and exploitation strategy. It will be delivered in **M6**.

D.9.2 BRIDGE Web Site. It will be the main detailed information source. It will be start operating in **M6**.

D.9.3.i BRIDGE Published material. They are scientific papers, review articles, newsletters. They will be published periodically starting from **M12**.

7.6 Responsibility assignment

The following table summarises Beneficiaries main responsibility assignment within the BRIDGE project life cycle. The allocation lists the main area of involvement on which Beneficiaries shall provide their contribution according to the estimated effort reported in Section 7.5. Bold means responsibility at WP / task level.

FORTH	**WP1: PROJECT MANAGEMENT** **Task 1.1 Strategic Management** **Task 1.2 Technical Management** **Task 1.3 Administrative and Contractual Management** WP2: METHODOLOGY SPECIFICATION Task 2.1 Documentation of current understanding and modelling capability for energy, water and carbon flows and resources in urban environments ✓ Energy Task 2.2 Documentation of the needs of users and demands of the planning community in the context of sustainable design ✓ **Data needs and outputs identification Stakeholders' analysis** WP3: DATA COLLECTION AND ANALYSIS Task 3.2 Remote Sensing Data Collection and Analysis ✓ **Map and classify major urban vegetation forms** ✓ **Provide spatial information via remote sensing on urban land cover types, albedo, emissivity, and sensible heat flux** WP4: PHYSICAL FLOWS MODELLING Task 4.1 Model Selection ✓ Heat island Task 4.3 Quality Assurance / Quality Control Process WP5: ENVIRONMENTAL AND SOCIO-ECONOMIC IMPACT ASSESMENT METHODS Task 5.5 Incorporation of assessment methods into the DSS **WP6: DSS DEVELOPMENT** **Task 6.1 DSS Design** ✓ **Analysis of the user requirements and provision of DSS specifications** ✓ **Select of the technology to be adopted** ✓ **Conceptual design of the DSS architecture** ✓ **Technical design of data storage and flow modules, communication interfaces, calculation modules, visualization modules and GUI** **Task 6.2 First DSS Prototype** ✓ **Database development** ✓ **Development of interfaces** ✓ **Integration** **Task 6.3 Final DSS Prototype** ✓ **Refinement of the developed interfaces** ✓ **Refinement of decision rules** ✓ **Refinement of the visualization tools** ✓ **Refinement of the GUI**

	WP7: DSS APPLICATION Task 7.2 Case Studies – DSS application ✓ **DSS application for the current situation – validation** ✓ DSS application to the scenarios ✓ Analysis of application results Task 7.3 Guidelines for sustainable planning strategies ✓ Development of guidelines for sustainable planning strategies WP8: DEMONSTRATION Task 8.2: Setting up and executing the demonstrations of the BRIDGE DSS PW9: DISSEMINATION - EXPLOITATION Task 9.1: Networking activities Task 9.2: Publishing activities Task 9.3: Conference participations and contributions **Task 9.4: Internal BRIDGE meetings (MB)**

KCL

WP1: PROJECT MANAGEMENT
- Task 1.2 Technical Management
- Task 1.3 Administrative and Contractual Management

WP2: METHODOLOGY SPECIFICATION
- **Task 2.1 Documentation of current understanding and modelling capability for energy, water and carbon flows and resources in urban environments**
  - ✓ **Water**
- Task 2.3 Initiation of first stages of a participatory methodology for stakeholder involvement for each of the case studies

WP3: DATA COLLECTION AND ANALYSIS
- Task 3.1 In situ data collection and analysis
  - ✓ Campaigns to provide data sets of air quality and surface fluxes
- Task 3.2 Remote Sensing Data Collection and Analysis
  - ✓ Document spatial variability in fluxes and verify selected aspects
  - ✓ **FTIR for roadside measurements of traffic related pollutants and traffic flow**
  - ✓ Provide spatial information via remote sensing on urban land cover types, albedo, emissivity, and sensible heat flux
  - ✓ **Portable FTIR measurements for assessing in situ urban emissivities**
- Task 3.3 Socio-economic data collection and analysis
  - ✓ **Determination of anthropogenic energy and water fluxes**
  - ✓ Determination of the effects of: land use and land cover change and interventions such as the congestion charge

WP4: PHYSICAL FLOWS MODELLING
- Task 4.1 Model Selection
  - ✓ **Exchange of energy, momentum and water vapour between surface and atmosphere**
- Task 4.2 Model Implementation
  - ✓ **Exchange of energy, momentum and water vapour between surface and atmosphere**
- Task 4.3 Quality Assurance / Quality Control Process

WP7: DSS APPLICATION
- **Task 7.2 Case Studies – DSS application**
  - ✓ CoP
  - ✓ DSS application for the current situation – validation
  - ✓ DSS application to the scenarios

WP8: DEMONSTRATION
- Task 8.1: Establishing an umbrella CoP

PW9: DISSEMINATION - EXPLOITATION
- Task 9.1: Networking activities
- Task 9.2: Publishing activities
- Task 9.3: Conference participations and contributions
- Task 9.4: Internal BRIDGE meetings (MB)

CNR

WP1: PROJECT MANAGEMENT
- Task 1.2 Technical Management
- Task 1.3 Administrative and Contractual Management

WP3: DATA COLLECTION AND ANALYSIS
- **Task 3.1 In situ data collection and analysis**
  - ✓ **Campaigns to provide data sets of air quality and surface fluxes**
  - ✓ **Surface-atmosphere interactions and effect on trace gases and particles**
  - ✓ Monitoring gas exchange of urban vegetation in relation to soil properties
  - ✓ Heat island and the increase of the energy demand of buildings for cooling
- **Task 3.2 Remote Sensing Data Collection and Analysis**
  - ✓ **Document spatial variability in fluxes and verify selected aspects**
- Task 3.3 Socio-economic data collection and analysis
  - ✓ Determination of anthropogenic energy and water fluxes

WP7: DSS APPLICATION
- Task 7.2 Case Studies – DSS application
  - ✓ CoP
  - ✓ DSS application for the current situation – validation

WP8: DEMONSTRATION
- Task 8.1: Establishing an umbrella CoP

PW9: DISSEMINATION - EXPLOITATION
- Task 9.1: Networking activities
- Task 9.2: Publishing activities
- Task 9.3: Conference participations and contributions
- Task 9.4: Internal BRIDGE meetings (MB)

IETU	WP3: DATA COLLECTION AND ANALYSIS Task 3.1 In situ data collection and analysis ✓ Campaigns to provide data sets of air quality and surface fluxes ✓ Surface-atmosphere interactions and effect on trace gases and particles ✓ Heat island and the increase of the energy demand of buildings for cooling **Task 3.3 Socio-economic data collection and analysis** ✓ Determination of anthropogenic energy and water fluxes ✓ **Determination of the effects of land use and land cover change and interventions such as the congestion charge** ✓ **Main dimensions of social and economic impact generated by urban metabolism** WP6: DSS DEVELOPMENT Task 6.1 DSS Design ✓ Technical design of data storage and flow modules, communication interfaces, calculation modules, visualization modules and GUI Task 6.2 First DSS Prototype ✓ Database development ✓ Integration Task 6.3 Final DSS Prototype ✓ Refinement of the developed interfaces WP7: DSS APPLICATION Task 7.2 Case Studies – DSS application ✓ CoP ✓ DSS application for the current situation – validation ✓ Analysis of application results WP8: DEMONSTRATION Task 8.1: Establishing an umbrella CoP

UPM

WP1: PROJECT MANAGEMENT
- Task 1.2 Technical Management
- Task 1.3 Administrative and Contractual Management

WP4: PHYSICAL FLOWS MODELLING

Task 4.1 Model Selection
- ✓ **Micro-numerical air pollution simulations**
- ✓ **Global and meso-scale climate models**
- ✓ Urban water cycle models

Task 4.2 Model Implementation
- ✓ **Micro-numerical air pollution simulations**
- ✓ **Global and meso-scale climate models**
- ✓ Urban water cycle models

Task 4.3 Quality Assurance / Quality Control Process

WP6: DSS DEVELOPMENT

Task 6.2 First DSS Prototype
- ✓ Integration

Task 6.3 Final DSS Prototype
- ✓ Refinement of the developed interfaces

WP7: DSS APPLICATION

Task 7.1 Strategic scenario analysis
- ✓ **Dimensions definition**
- ✓ Scenario analysis

Task 7.2 Case Studies – DSS application
- ✓ DSS application to the scenarios
- ✓ Analysis of application results

PW9: DISSEMINATION - EXPLOITATION
- Task 9.1: Networking activities
- Task 9.2: Publishing activities
- Task 9.3: Conference participations and contributions
- Task 9.4: Internal BRIDGE meetings (MB)

UAVR

WP1: PROJECT MANAGEMENT
Task 1.2 Technical Management
Task 1.3 Administrative and Contractual Management

WP4: PHYSICAL FLOWS MODELLING
Task 4.1 Model Selection
- ✓ Micro-numerical air pollution simulations
- ✓ Global and meso-scale climate models

Task 4.2 Model Implementation
- ✓ Micro-numerical air pollution simulations
- ✓ Global and meso-scale climate models

Task 4.3 Quality Assurance / Quality Control Process

WP5: ENVIRONMENTAL AND SOCIO-ECONOMIC IMPACT ASSESMENT METHODS
Task 5.1 Assessment of driving forces and pressures on environmental and socio-economic systems in urban environments
Task 5.2 Identification of objectives, targets and indicators
Task 5.3 Development of monitoring systems
Task 5.4 Identification of the environmental and socio-economic impacts on the urban systems of different planning scenarios

WP6: DSS DEVELOPMENT
Task 6.1 DSS Design
- ✓ Analysis of the user requirements and provision of DSS specifications
- ✓ Conceptual design of the DSS architecture

Task 6.2 First DSS Prototype
- ✓ Integration

Task 6.3 Final DSS Prototype
- ✓ Refinement of the developed interfaces
- ✓ Refinement of decision rules

WP7: DSS APPLICATION
Task 7.1 Strategic scenario analysis
- ✓ Dimensions definition
- ✓ **Dimensions assessment**
- ✓ **Scenarios development**
- ✓ **Scenario analysis**

Task 7.2 Case Studies – DSS application
- ✓ DSS application for the current situation – validation
- ✓ **DSS application to the scenarios**
- ✓ **Analysis of application results**

Task 7.3 Guidelines for sustainable planning strategies
- ✓ Workshop on CoP method for urban metabolism
- ✓ **Development of guidelines for sustainable planning strategies**

PW9: DISSEMINATION - EXPLOITATION
Task 9.1: Networking activities
Task 9.2: Publishing activities
Task 9.3: Conference participations and contributions
Task 9.4: Internal BRIDGE meetings (MB)

UBAS

WP2: METHODOLOGY SPECIFICATION

Task 2.1 Documentation of current understanding and modelling capability for energy, water and carbon flows and resources in urban environments

- ✓ **Energy**

Task 2.2 Documentation of the needs of users and demands of the planning community in the context of sustainable design

- ✓ Review of the current understanding of the process
- ✓ **Inputs, use and transformations, and outputs of resources from the urban area**
- ✓ Data needs and outputs identification Stakeholders' analysis

Task 2.3 Initiation of first stages of a participatory methodology for stakeholder involvement for each of the case studies

WP8: DEMONSTRATION

Task 8.2: Setting up and executing the demonstrations of the BRIDGE DSS

TCD

WP1: PROJECT MANAGEMENT

Task 1.2 Technical Management

Task 1.3 Administrative and Contractual Management

WP5: ENVIRONMENTAL, SOCIO-ECONOMIC IMPACT ASSESMENT METHODS

Task 5.1 Assessment of driving forces and pressures on environmental and socio-economic systems in urban environments

Task 5.2 Identification of objectives, targets and indicators

Task 5.3 Development of monitoring systems

Task 5.4 Identification of the environmental and socio-economic impacts on the urban systems of different planning scenarios

Task 5.5 Incorporation of assessment methods into the DSS

WP7: DSS APPLICATION

Task 7.1 Strategic scenario analysis

- ✓ Dimensions definition
- ✓ Dimensions assessment

Task 7.3 Guidelines for sustainable planning strategies

- ✓ Development of guidelines for sustainable planning strategies

PW9: DISSEMINATION - EXPLOITATION

Task 9.1: Networking activities

Task 9.2: Publishing activities

Task 9.3: Conference participations and contributions

Task 9.4: Internal BRIDGE meetings (MB)

UHEL	WP3: DATA COLLECTION AND ANALYSIS Task 3.1 In situ data collection and analysis ✓ Campaigns to provide data sets of air quality and surface fluxes ✓ Surface-atmosphere interactions and effect on trace gases and particles Task 3.3 Socio-economic data collection and analysis ✓ Determination of anthropogenic energy and water fluxes ✓ The determination of migration, consumption, socio-economic development WP4: PHYSICAL FLOWS MODELLING Task 4.1 Model Selection ✓ Micro-numerical air pollution simulations Task 4.2 Model Implementation ✓ Micro-numerical air pollution simulations Task 4.3 Quality Assurance / Quality Control Process WP7: DSS APPLICATION Task 7.2 Case Studies – DSS application ✓ CoP ✓ DSS application for the current situation – validation WP8: DEMONSTRATION Task 8.1: Establishing an umbrella CoP

NKUA

WP1: PROJECT MANAGEMENT
Task 1.2 Technical Management
Task 1.3 Administrative and Contractual Management

WP2: METHODOLOGY SPECIFICATION
Task 2.2 Documentation of the needs of users and demands of the planning community in the context of sustainable design
- ✓ **Review of the current understanding of the process**
- ✓ Inputs, use and transformations, and outputs of resources from the urban area
- ✓ Data needs and outputs identification Stakeholders' analysis

WP3: DATA COLLECTION AND ANALYSIS
Task 3.1 In situ data collection and analysis
- ✓ Campaigns to provide data sets of air quality and surface fluxes
- ✓ **Heat island and the increase of the energy demand of buildings for cooling**
- ✓ **Investigate the influence of pollution problems on indoor environmental quality**

Task 3.2 Remote Sensing Data Collection and Analysis
- ✓ Map and classify major urban vegetation forms
- ✓ Provide spatial information via remote sensing on urban land cover types, albedo, emissivity, and sensible heat flux

Task 3.3 Socio-economic data collection and analysis
- ✓ Determination of the effects of land use and land cover change and interventions such as the congestion charge

WP4: PHYSICAL FLOWS MODELLING
Task 4.1 Model Selection
- ✓ **Heat island**

Task 4.2 Model Implementation
- ✓ **Heat island**

Task 4.3 Quality Assurance / Quality Control Process

WP7: DSS APPLICATION
Task 7.2 Case Studies – DSS application
- ✓ CoP
- ✓ DSS application for the current situation – validation

WP8: DEMONSTRATION
Task 8.1: Establishing an umbrella CoP

PW9: DISSEMINATION - EXPLOITATION
Task 9.1: Networking activities
Task 9.2: Publishing activities
Task 9.3: Conference participations and contributions
Task 9.4: Internal BRIDGE meetings (MB)

CMCC

WP2: METHODOLOGY SPECIFICATION

Task 2.1 Documentation of current understanding and modelling capability for energy, water and carbon flows and resources in urban environments

- ✓ **Carbon**

Task 2.2 Documentation of the needs of users and demands of the planning community in the context of sustainable design

- ✓ Review of the current understanding of the process
- ✓ Inputs, use and transformations, and outputs of resources from the urban area
- ✓ Data needs and outputs identification Stakeholders' analysis

Task 2.3 Initiation of first stages of a participatory methodology for stakeholder involvement for each of the case studies

WP3: DATA COLLECTION AND ANALYSIS

Task 3.1 In situ data collection and analysis

- ✓ Campaigns to provide data sets of air quality and surface fluxes
- ✓ Surface-atmosphere interactions and effect on trace gases and particles
- ✓ Investigate the influence of pollution problems on indoor environmental quality

Task 3.2 Remote Sensing Data Collection and Analysis

- ✓ Provide spatial information via remote sensing on urban land cover types, albedo, emissivity, and sensible heat flux

Task 3.3 Socio-economic data collection and analysis

- ✓ **The determination of migration, consumption, socio-economic development**
- ✓ Main dimensions of social and economic impact generated by urban metabolism

WP5: ENVIRONMENTAL AND SOCIO-ECONOMIC IMPACT ASSESMENT METHODS

Task 5.1 Assessment of driving forces and pressures on environmental and socio-economic systems in urban environments

Task 5.2 Identification of objectives, targets and indicators

Task 5.3 Development of monitoring systems

Task 5.4 Identification of the environmental and socio-economic impacts on the urban systems of different planning scenarios

WP6: DSS DEVELOPMENT

Task 6.1 DSS Design

- ✓ Analysis of the user requirements and provision of DSS specifications
- ✓ Conceptual design of the DSS architecture
- ✓ Technical design of data storage and flow modules, communication interfaces, calculation modules, visualization modules and GUI

Task 6.2 First DSS Prototype

- ✓ Integration

Task 6.3 Final DSS Prototype

- ✓ Refinement of the developed interfaces
- ✓ Refinement of decision rules

CNRM	WP4: PHYSICAL FLOWS MODELLING Task 4.1 Model Selection ✓ Urban heat island research ✓ Exchange of energy, momentum and water vapour between surface and atmosphere ✓ Global and meso-scale climate models Task 4.2 Model Implementation ✓ Urban heat island research ✓ Exchange of energy, momentum and water vapour between surface and atmosphere ✓ Global and meso-scale climate models Task 4.3 Quality Assurance / Quality Control Process WP6: DSS DEVELOPMENT Task 6.1 DSS Design ✓ Analysis of the user requirements and provision of DSS specifications ✓ Select of the technology to be adopted Task 6.2 First DSS Prototype ✓ Integration WP8: DEMONSTRATION Task 8.2: Setting up and executing the demonstrations of the BRIDGE DSS

ALTERRA

WP1: PROJECT MANAGEMENT
Task 1.2 Technical Management
Task 1.3 Administrative and Contractual Management

WP2: METHODOLOGY SPECIFICATION
Task 2.2 Documentation of the needs of users and demands of the planning community in the context of sustainable design
- ✓ Data needs and outputs identification Stakeholders' analysis

Task 2.3 Initiation of first stages of a participatory methodology for stakeholder involvement for each of the case studies

WP4: PHYSICAL FLOWS MODELLING
Task 4.1 Model Selection
- ✓ **Urban water cycle models**

Task 4.2 Model Implementation
- ✓ **Urban water cycle models**

Task 4.3 Quality Assurance / Quality Control Process

WP5: ENVIRONMENTAL AND SOCIO-ECONOMIC IMPACT ASSESMENT METHODS
Task 5.1 Assessment of driving forces and pressures on environmental and socio-economic systems in urban environments
Task 5.2 Identification of objectives, targets and indicators

WP7: DSS APPLICATION
Task 7.1 Strategic scenario analysis
- ✓ Dimensions assessment

Task 7.2 Case Studies – DSS application
- ✓ **CoP**

Task 7.3 Guidelines for sustainable planning strategies
- ✓ **Workshop on CoP method for urban metabolism**
- ✓ Development of guidelines for sustainable planning strategies

WP8: DEMONSTRATION
Task 8.1: Establishing an umbrella CoP
Task 8.2: Setting up and executing the demonstrations of the BRIDGE DSS

PW9: DISSEMINATION - EXPLOITATION
Task 9.1: Networking activities
Task 9.2: Publishing activities
Task 9.3: Conference participations and contributions
Task 9.4: Internal BRIDGE meetings (MB)

SOTON	WP3: DATA COLLECTION AND ANALYSIS Task 3.1 In situ data collection and analysis ✓ Surface-atmosphere interactions and effect on trace gases and particles ✓ **Monitoring gas exchange of urban vegetation in relation to soil properties** Task 3.2 Remote Sensing Data Collection and Analysis ✓ Document spatial variability in fluxes and verify selected aspects ✓ Map and classify major urban vegetation forms ✓ **Link flux monitoring with spatial variation of vegetation properties** WP6: DSS DEVELOPMENT Task 6.1 DSS Design ✓ Technical design of data storage and flow modules, communication interfaces, calculation modules, visualization modules and GUI Task 6.2 First DSS Prototype ✓ Integration

It should be noted that the above responsibility assignment can be subject to changes during the course of the project, taking into account specific technical needs, provided that the effort related to redefined activities will be equivalent for the Beneficiaries.

According to the above responsibility assignment, each Beneficiary shall provide contribution to:

- Project deliverables production.
- Technical internal documents.
- Integration sessions.
- Demonstration & Dissemination Activities.
- Reporting documentation for the European Commission.

Concerning the interaction with users (Helsinki City Planning Office, Prefecture of Athens, Greater London Authority - Transport for London, Direzione Urbanistica, Comune di Firenze, Department of Architecture and Town-planning of Gliwice), **UHEL** will be in charge of the Finish side, **NKUA** will be in charge of the Greek side, **KCL** will be in charge of the English side, **CNR** will be in charge of the Italian side, **IETU** will be in charge of the Polish side, whereas **ALTERRA** will have the responsibility to lead the CoP in each city.

Furthermore each Beneficiary shall ensure its participation to Progress Meetings, Technical Meetings and CoP Workshops.

All the activities shall be performed according to the internal standard procedures to be agreed among the Beneficiaries.

The table below contains Beneficiary's responsibility concerned deliverable production.

Del. no.	Deliverable name	Responsible	Envisaged main contributions
D.1.1	Project Management Plan.	FORTH	WP Leaders
D.1.2.i	Quarterly progress reports.	FORTH	All
D.9.1	Dissemination and Use Plan.	NKUA	FORTH, KCL, CNR, UPM, UAVR, TCD, ALTERRA
D.9.2	BRIDGE Web Site.	NKUA	All
D.2.1	Inventory of current state of empirical and modelling knowledge of energy, water and carbon sinks, sources and fluxes.	KCL	FORTH, UBAS, CMCC
D.2.2	Protocol to assess differences between knowledge supply and knowledge needs in the field.	NKUA	UBAS, CMCC, ALTERRA
D.2.3	Protocol to develop CoP for BRIDGE.	ALTERRA	KCL, UBAS, CMCC
D.3.1.1	Datasets of air quality, energy, water, carbon and pollutants fluxes/concentrations.	CNR	KCL, IETU, UHEL, NKUA, CMCC, SOTON
D.3.2.1	GIS data and maps of energy and water fluxes, pollution concentrations, land cover and vegetation.	CMCC	FORTH, KCL, CNR, NKUA, SOTON
D.3.3.1	GIS data and maps on spatial, socio-economic development and impact indicators.	IETU	KCL, CNR, UHEL, NKUA, CMCC
D.4.1	Model Selection Report.	UPM	FORTH, KCL, UAVR, UHEL, NKUA, CNRM, ALTERRA
D.6.1	DSS Design Report.	FORTH	UAVR, CMCC, CNRM, SOTON
D.1.3.1	1st Annual Report.	FORTH	All
D.9.3.i	BRIDGE Published material.	NKUA	All
D.5.1	Socio-economic – environmental workshops report.	TCD	UAVR, CMCC, ALTERRA
D.3.1.2	Datasets of air quality, energy, water, carbon and pollutants fluxes/concentrations (1st update).	CNR	KCL, IETU, UHEL, NKUA, CMCC, SOTON
D.3.2.2	GIS data and maps of energy and water fluxes, pollution concentrations, land cover and vegetation (1st update).	CMCC	FORTH, KCL, CNR, NKUA, SOTON
D.3.3.2	GIS data and maps on spatial, socio-economic development and impact indicators (1st update).	IETU	KCL, CNR, UHEL, NKUA, CMCC
D.5.2	Report on the impacts assessment model for urban metabolism.	TCD	UAVR, CMCC
D.5.3	Indicators definition report.	CMCC	FORTH, UAVR, TCD
D.1.3.1	2nd Annual Report.	FORTH	All
D.6.2	First DSS Prototype.	FORTH	IETU, UPM, UAVR, CMCC, CNRM, SOTON
D.7.1	Strategic scenario analysis.	UAVR	UPM, TCD, ALTERRA

Del. no.	Deliverable name	Responsible	Envisaged main contributions
D.3.1.3	Datasets of air quality, energy, water, carbon and pollutants fluxes/concentrations (2nd update).	CNR	KCL, IETU, UHEL, NKUA, CMCC, SOTON
D.3.2.3	GIS data and maps of energy and water fluxes, pollution concentrations, land cover and vegetation (2nd update).	CMCC	FORTH, KCL, CNR, NKUA, SOTON
D.3.3.3	GIS data and maps on spatial, socio-economic development and impact indicators (2nd update).	IETU	KCL, CNR, UHEL, NKUA, CMCC
D.3.4	BRIDGE observations report.	CNR	KCL, CMCC, IETU, SOTON
D.3.5	BRIDGE observations protocol.	CNR	CMCC, IETU
D.4.2	Model Implementation Report.	UPM	KCL, UAVR, UHEL, NKUA, CNRM, ALTERRA
D.4.3	QA/QC Report.	UPM	FORTH, KCL, UAVR, UHEL, NKUA, CNRM, ALTERRA
D.7.2	Case studies – DSS application.	KCL	FORTH, CNR, IETU, UPM, UAVR, UHEL, NKUA, ALTERRA
D.8.1	DSS demonstration report.	ALTERRA	KCL, CNR, IETU, UHEL, NKUA
D.6.3	Final DSS Prototype.	FORTH	IETU, UPM, UAVR, CMCC
D.7.3	Guidelines for sustainable planning strategies.	UAVR	FORTH, TCD, ALTERRA
D.8.2	Demonstration proceedings.	ALTERRA	FORTH, UBAS, CNRM
D.1.4	Final Report.	FORTH	All

7.7 Resource requirements

Each beneficiary will be in charge to procure all the equipment needed to perform tasks that fall under its own responsibilities. Each Beneficiary will also contribute making available to the project all basic infrastructures needed for the execution and management of the work and not eligible for funding from the Commission. A summary of the effort for each of the WP is provided in the table below. The workload is defined in person months (PM).

	B1	B2	B3	B4	B5	B6	B7	B8	B9	B10	B11	B12	B13	B14	
	FORTH	KCL	CNR	IETU	UPM	UAVR	UBAS	TCD	UHEL	NKUA	CMCC	CNRM	ALTERA	SOTON	TOTAL PM
WP1	**19**	1	1		1	1		1		1			1		**26**
WP2	3	**9**					10			3	5		3		**33**
WP3	3	16	**32**	8					9	5	13			10	**96**
WP4	2	4			**18**	7			8	4		7	4		**54**
WP5	2					10		**15**			12		3		**42**
WP6	**19**			8	7	5					8	5		3	**55**
WP7	3	2	3	4	4	**14**		2	2	1			3		**38**
WP8	2	1	3	3			5		3	2		4	**7**		**30**
WP9	3	1	2		1	1		1		**8**			1		**18**
MNGMENT	**19**	**1**	**1**		**1**	**1**		**1**		**1**			**1**		**26**
RTD	**32**	**31**	**35**	**20**	**29**	**36**	**10**	**17**	**19**	**13**	**38**	**12**	**13**	**13**	**318**
DEMO	**2**	**1**	**3**	**3**			**5**		**3**	**2**		**4**	**7**		**30**
OTHER	**3**	**1**	**2**		**1**	**1**		**1**		**8**			**1**		**18**
TOTAL MM	**56**	**34**	**41**	**23**	**31**	**38**	**15**	**19**	**22**	**24**	**38**	**16**	**22**	**13**	**392**

A detailed estimation of the effort for each of the WP is provided in the table below. It shows the distribution of workload between the BRIDGE Beneficiaries. The workload is defined in PM.

B1 – FORTH

WP		Task	Responsible	PM
1	1.1	**Strategic Management**	**FORTH**	3
	1.2	**Technical Management**	**FORTH**	8
	1.3	**Administrative and Contractual Management**	**FORTH**	8
2	2.1	**Documentation of current understanding and modelling capability for energy, water and carbon flows and resources in urban environments.**	**KCL**	
		Energy	UBAS	1
		Water	KCL	
		Carbon	CMCC	
	2.2	**Documentation of the needs of users and demands of the planning community in the context of sustainable deign**	**NKUA**	
		Review of the current understanding of the process	NKUA	
		Inputs, use and transformations, and outputs of resources from the urban area	UBAS	
		Data needs and outputs identification Stakeholders' analysis	FORTH	2
	2.3	**Initiation of first stages of a participatory methodology for stakeholder involvement for each of the case studies**	**ALTERRA**	
3	3.1	**In situ data collection and analysis**	**CNR**	
		Campaigns to provide data sets of air quality and surface fluxes	CNR	
		Surface-atmosphere interactions and effect on trace gases and particles	CNR	
		Monitoring gas exchange of urban vegetation in relation to soil properties	SOTON	
		Heat island and the increase of the energy demand of buildings for cooling	NKUA	
		Investigate the influence of urban pollution problems on indoor environmental quality	NKUA	
	3.2	**Remote Sensing Data Collection and Analysis**	**CNR**	
		Document spatial variability in fluxes and verify selected aspects	CNR	
		FTIR for roadside measurements of traffic related pollutants and traffic flow	KCL	
		Map and classify major urban vegetation forms	FORTH	1.5
		Link flux monitoring with spatial variation of vegetation properties	SOTON	
		Provide spatial information via remote sensing on urban land cover types, albedo, emissivity, and sensible heat flux	FORTH	1.5
		Portable FTIR measurements for assessing in situ urban emissivities	KCL	
	3.3	**Socio-economic data collection and analysis**	**IETU**	
		Determination of anthropogenic energy and water fluxes	KCL	
		Determination of the effects of: land use and land cover change and interventions such as the congestion charge	IETU	
		The determination of migration, consumption, socio-economic development	CMCC	
		Main dimensions of social and economic impact generated by urban metabolism	IETU	

WP	Task		Responsible	PM
4	4.1	**Model Selection**	**UPM**	
		Micro-numerical air pollution simulations	UPM	
		Heat island	NKUA	1
		Exchange of energy, momentum and water vapour between surface and atmosphere	KCL	
		Global and meso-scale climate models	UPM	
		Urban water cycle models	ALTERRA	
	4.2	**Model Implementation**	**UPM**	
		Micro-numerical air pollution simulations	UPM	
		Heat island	NKUA	
		Exchange of energy, momentum and water vapour between surface and atmosphere	KCL	
		Global and meso-scale climate models	UPM	
		Urban water cycle models	ALTERRA	
	4.3	**Quality Assurance / Quality Control Process**	**UPM**	1
5	5.1	**Assessment of driving forces and pressures on environmental and socio-economic systems in urban environments**	**TCD**	
	5.2	**Identification of objectives, targets and indicators**	**CMCC**	
	5.3	**Development of monitoring systems**	**TCD**	
	5.4	**Identification of the environmental and socio-economic impacts on the urban systems of different planning scenarios**	**CMCC**	
	5.5	**Incorporation of assessment methods into the DSS**	**TCD**	2
6	6.1	**DSS Design**	**FORTH**	0.5
		Analysis of the user requirements and provision of DSS specifications	FORTH	1
		Select of the technology to be adopted	FORTH	1
		Conceptual design of the DSS architecture	FORTH	2
		Technical design of data storage and flow modules, communication interfaces, calculation modules, visualization modules and GUI	FORTH	2
	6.2	**First DSS Prototype**	**FORTH**	0.5
		Database development	FORTH	1.5
		Development of interfaces	FORTH	3
		Integration	FORTH	3
	6.3	**Final DSS Prototype**	**FORTH**	0.5
		Refinement of the developed interfaces	FORTH	1
		Refinement of decision rules	FORTH	1
		Refinement of the visualization tools	FORTH	1
		Refinement of the GUI	FORTH	1

WP	Task		Responsible	PM
7	7.1	**Strategic scenario analysis**	**UAVR**	
		Dimensions definition	UPM	
		Dimensions assessment	UAVR	
		Scenarios development	UAVR	
		Scenario analysis	UAVR	
	7.2	**Case Studies – DSS application**	**KCL**	
		CoP	ALTERRA	
		DSS application for the current situation – validation	FORTH	1
		DSS application to the scenarios	UAVR	1
		Analysis of application results	UAVR	0.5
	7.3	**Guidelines for sustainable planning strategies**	**UAVR**	
		Workshop on CoP method for urban metabolism	ALTERRA	
		Development of guidelines for sustainable planning strategies	UAVR	0.5
8	8.1	**Establishing an umbrella CoP**	**ALTERRA**	
	8.2	**Setting up and executing the demonstrations of the BRIDGE DSS**	**UBAS**	2
9	9.1	**Networking activities**	**NKUA**	0.5
	9.2	**Publishing activities**	**NKUA**	1
	9.3	**Conference participations and contributions**	**NKUA**	1
	9.4	**Internal BRIDGE meetings**	**FORTH**	0.5
			TOTAL	**56**

B2 – KCL

WP		Task	Responsible	PM
1	1.1	**Strategic Management**	**FORTH**	
	1.2	**Technical Management**	**FORTH**	0.5
	1.3	**Administrative and Contractual Management**	**FORTH**	0.5
2	2.1	**Documentation of current understanding and modelling capability for energy, water and carbon flows and resources in urban environments.**	**KCL**	0.5
		Energy	UBAS	
		Water	KCL	7
		Carbon	CMCC	
	2.2	**Documentation of the needs of users and demands of the planning community in the context of sustainable deign**	**NKUA**	
		Review of the current understanding of the process	NKUA	
		Inputs, use and transformations, and outputs of resources from the urban area	UBAS	
		Data needs and outputs identification Stakeholders' analysis	FORTH	
	2.3	**Initiation of first stages of a participatory methodology for stakeholder involvement for each of the case studies**	**ALTERRA**	1.5
3	3.1	**In situ data collection and analysis**	**CNR**	
		Campaigns to provide data sets of air quality and surface fluxes	CNR	5
		Surface-atmosphere interactions and effect on trace gases and particles	CNR	
		Monitoring gas exchange of urban vegetation in relation to soil properties	SOTON	
		Heat island and the increase of the energy demand of buildings for cooling	NKUA	
		Investigate the influence of urban pollution problems on indoor environmental quality	NKUA	
	3.2	**Remote Sensing Data Collection and Analysis**	**CNR**	
		Document spatial variability in fluxes and verify selected aspects	CNR	2
		FTIR for roadside measurements of traffic related pollutants and traffic flow	KCL	2
		Map and classify major urban vegetation forms	FORTH	
		Link flux monitoring with spatial variation of vegetation properties	SOTON	
		Provide spatial information via remote sensing on urban land cover types, albedo, emissivity, and sensible heat flux	FORTH	2
		Portable FTIR measurements for assessing in situ urban emissivities	KCL	2
	3.3	**Socio-economic data collection and analysis**	**IETU**	
		Determination of anthropogenic energy and water fluxes	KCL	2
		Determination of the effects of land use and land cover change and interventions such as the congestion charge	IETU	1
		The determination of migration, consumption, socio-economic development	CMCC	
		Main dimensions of social and economic impact generated by urban metabolism	IETU	

WP	Task		Responsible	PM
4	4.1	**Model Selection**	**UPM**	
		Micro-numerical air pollution simulations	UPM	
		Heat island	NKUA	
		Exchange of energy, momentum and water vapour between surface and atmosphere	KCL	1
		Global and meso-scale climate models	UPM	
		Urban water cycle models	ALTERRA	
	4.2	**Model Implementation**	**UPM**	
		Micro-numerical air pollution simulations	UPM	
		Heat island	NKUA	
		Exchange of energy, momentum and water vapour between surface and atmosphere	KCL	2
		Global and meso-scale climate models	UPM	
		Urban water cycle models	ALTERRA	
	4.3	**Quality Assurance / Quality Control Process**	**UPM**	1
5	5.1	**Assessment of driving forces and pressures on environmental and socio-economic systems in urban environments**	**TCD**	
	5.2	**Identification of objectives, targets and indicators**	**CMCC**	
	5.3	**Development of monitoring systems**	**TCD**	
	5.4	**Identification of the environmental and socio-economic impacts on the urban systems of different planning scenarios**	**CMCC**	
	5.5	**Incorporation of assessment methods into the DSS**	**TCD**	
6	6.1	**DSS Design**	**FORTH**	
		Analysis of the user requirements and provision of DSS specifications	FORTH	
		Select of the technology to be adopted	FORTH	
		Conceptual design of the DSS architecture	FORTH	
		Technical design of data storage and flow modules, communication interfaces, calculation modules, visualization modules and GUI	FORTH	
	6.2	**First DSS Prototype**	**FORTH**	
		Database development	FORTH	
		Development of interfaces	FORTH	
		Integration	FORTH	
	6.3	**Final DSS Prototype**	**FORTH**	
		Refinement of the developed interfaces	FORTH	
		Refinement of decision rules	FORTH	
		Refinement of the visualization tools	FORTH	
		Refinement of the GUI	FORTH	

WP	Task		Responsible	PM
7	7.1	**Strategic scenario analysis**	**UAVR**	
		Dimensions definition	UPM	
		Dimensions assessment	UAVR	
		Scenarios development	UAVR	
		Scenario analysis	UAVR	
	7.2	**Case Studies – DSS application**	**KCL**	0.5
		CoP	ALTERRA	0.5
		DSS application for the current situation – validation	FORTH	0.5
		DSS application to the scenarios	UAVR	0.5
		Analysis of application results	UAVR	
	7.3	**Guidelines for sustainable planning strategies**	**UAVR**	
		Workshop on CoP method for urban metabolism	ALTERRA	
		Development of guidelines for sustainable planning strategies	UAVR	
8	8.1	**Establishing an umbrella CoP**	**ALTERRA**	1
	8.2	**Setting up and executing the demonstrations of the BRIDGE DSS**	**UBAS**	
9	9.1	**Networking activities**	**NKUA**	0.25
	9.2	**Publishing activities**	**NKUA**	0.25
	9.3	**Conference participations and contributions**	**NKUA**	0.25
	9.4	**Internal BRIDGE meetings**	**FORTH**	0.25
			TOTAL	**34**

B3 – CNR

WP		Task	Responsible	PM
1	1.1	**Strategic Management**	**FORTH**	
	1.2	**Technical Management**	**FORTH**	0.5
	1.3	**Administrative and Contractual Management**	**FORTH**	0.5
2	2.1	**Documentation of current understanding and modelling capability for energy, water and carbon flows and resources in urban environments.**	**KCL**	
		Energy	UBAS	
		Water	KCL	
		Carbon	CMCC	
	2.2	**Documentation of the needs of users and demands of the planning community in the context of sustainable deign**	**NKUA**	
		Review of the current understanding of the process	NKUA	
		Inputs, use and transformations, and outputs of resources from the urban area	UBAS	
		Data needs and outputs identification Stakeholders' analysis	FORTH	
	2.3	**Initiation of first stages of a participatory methodology for stakeholder involvement for each of the case studies**	**ALTERRA**	
3	3.1	**In situ data collection and analysis**	**CNR**	0.5
		Campaigns to provide data sets of air quality and surface fluxes	CNR	11
		Surface-atmosphere interactions and effect on trace gases and particles	CNR	6
		Monitoring gas exchange of urban vegetation in relation to soil properties	SOTON	2
		Heat island and the increase of the energy demand of buildings for cooling	NKUA	3
		Investigate the influence of urban pollution problems on indoor environmental quality	NKUA	
	3.2	**Remote Sensing Data Collection and Analysis**	**CNR**	0.5
		Document spatial variability in fluxes and verify selected aspects	CNR	6
		FTIR for roadside measurements of traffic related pollutants and traffic flow	KCL	
		Map and classify major urban vegetation forms	FORTH	
		Link flux monitoring with spatial variation of vegetation properties	SOTON	
		Provide spatial information via remote sensing on urban land cover types, albedo, emissivity, and sensible heat flux	FORTH	
		Portable FTIR measurements for assessing in situ urban emissivities	KCL	
	3.3	**Socio-economic data collection and analysis**	**IETU**	
		Determination of anthropogenic energy and water fluxes	KCL	3
		Determination of the effects of land use and land cover change and interventions such as the congestion charge	IETU	
		The determination of migration, consumption, socio-economic development	CMCC	
		Main dimensions of social and economic impact generated by urban metabolism	IETU	

WP	Task		Responsible	PM
4	4.1	**Model Selection**	**UPM**	
		Micro-numerical air pollution simulations	UPM	
		Heat island	NKUA	
		Exchange of energy, momentum and water vapour between surface and atmosphere	KCL	
		Global and meso-scale climate models	UPM	
		Urban water cycle models	ALTERRA	
	4.2	**Model Implementation**	**UPM**	
		Micro-numerical air pollution simulations	UPM	
		Heat island	NKUA	
		Exchange of energy, momentum and water vapour between surface and atmosphere	KCL	
		Global and meso-scale climate models	UPM	
		Urban water cycle models	ALTERRA	
	4.3	**Quality Assurance / Quality Control Process**	**UPM**	
5	5.1	**Assessment of driving forces and pressures on environmental and socio-economic systems in urban environments**	**TCD**	
	5.2	**Identification of objectives, targets and indicators**	**CMCC**	
	5.3	**Development of monitoring systems**	**TCD**	
	5.4	**Identification of the environmental and socio-economic impacts on the urban systems of different planning scenarios**	**CMCC**	
	5.5	**Incorporation of assessment methods into the DSS**	**TCD**	
6	6.1	**DSS Design**	**FORTH**	
		Analysis of the user requirements and provision of DSS specifications	FORTH	
		Select of the technology to be adopted	FORTH	
		Conceptual design of the DSS architecture	FORTH	
		Technical design of data storage and flow modules, communication interfaces, calculation modules, visualization modules and GUI	FORTH	
	6.2	**First DSS Prototype**	**FORTH**	
		Database development	FORTH	
		Development of interfaces	FORTH	
		Integration	FORTH	
	6.3	**Final DSS Prototype**	**FORTH**	
		Refinement of the developed interfaces	FORTH	
		Refinement of decision rules	FORTH	
		Refinement of the visualization tools	FORTH	
		Refinement of the GUI	FORTH	

WP	Task		Responsible	PM
7	7.1	**Strategic scenario analysis**	**UAVR**	
		Dimensions definition	UPM	
		Dimensions assessment	UAVR	
		Scenarios development	UAVR	
		Scenario analysis	UAVR	
	7.2	**Case Studies – DSS application**	**KCL**	
		CoP	ALTERRA	1.5
		DSS application for the current situation – validation	FORTH	1.5
		DSS application to the scenarios	UAVR	
		Analysis of application results	UAVR	
	7.3	**Guidelines for sustainable planning strategies**	**UAVR**	
		Workshop on CoP method for urban metabolism	ALTERRA	
		Development of guidelines for sustainable planning strategies	UAVR	
8	8.1	**Establishing an umbrella CoP**	**ALTERRA**	3
	8.2	**Setting up and executing the demonstrations of the BRIDGE DSS**	**UBAS**	
9	9.1	**Networking activities**	**NKUA**	0.5
	9.2	**Publishing activities**	**NKUA**	0.5
	9.3	**Conference participations and contributions**	**NKUA**	0.5
	9.4	**Internal BRIDGE meetings**	**FORTH**	0.5
			TOTAL	**41**

B4 – IETU

WP		Task	Responsible	PM
1	1.1	**Strategic Management**	**FORTH**	
	1.2	**Technical Management**	**FORTH**	
	1.3	**Administrative and Contractual Management**	**FORTH**	
2	2.1	**Documentation of current understanding and modelling capability for energy, water and carbon flows and resources in urban environments.**	**KCL**	
		Energy	UBAS	
		Water	KCL	
		Carbon	CMCC	
	2.2	**Documentation of the needs of users and demands of the planning community in the context of sustainable deign**	**NKUA**	
		Review of the current understanding of the process	NKUA	
		Inputs, use and transformations, and outputs of resources from the urban area	UBAS	
		Data needs and outputs identification Stakeholders' analysis	FORTH	
	2.3	**Initiation of first stages of a participatory methodology for stakeholder involvement for each of the case studies**	**ALTERRA**	
3	3.1	**In situ data collection and analysis**	**CNR**	
		Campaigns to provide data sets of air quality and surface fluxes	CNR	2
		Surface-atmosphere interactions and effect on trace gases and particles	CNR	1
		Monitoring gas exchange of urban vegetation in relation to soil properties	SOTON	
		Heat island and the increase of the energy demand of buildings for cooling	NKUA	1
		Investigate the influence of urban pollution problems on indoor environmental quality	NKUA	
	3.2	**Remote Sensing Data Collection and Analysis**	**CNR**	
		Document spatial variability in fluxes and verify selected aspects	CNR	
		FTIR for roadside measurements of traffic related pollutants and traffic flow	KCL	
		Map and classify major urban vegetation forms	FORTH	
		Link flux monitoring with spatial variation of vegetation properties	SOTON	
		Provide spatial information via remote sensing on urban land cover types, albedo, emissivity, and sensible heat flux	FORTH	
		Portable FTIR measurements for assessing in situ urban emissivities	KCL	
	3.3	**Socio-economic data collection and analysis**	**IETU**	0.5
		Determination of anthropogenic energy and water fluxes	KCL	1.5
		Determination of the effects of land use and land cover change and interventions such as the congestion charge	IETU	1
		The determination of migration, consumption, socio-economic development	CMCC	
		Main dimensions of social and economic impact generated by urban metabolism	IETU	1

WP	Task		Responsible	PM
4	4.1	**Model Selection**	**UPM**	
		Micro-numerical air pollution simulations	UPM	
		Heat island	NKUA	
		Exchange of energy, momentum and water vapour between surface and atmosphere	KCL	
		Global and meso-scale climate models	UPM	
		Urban water cycle models	ALTERRA	
	4.2	**Model Implementation**	**UPM**	
		Micro-numerical air pollution simulations	UPM	
		Heat island	NKUA	
		Exchange of energy, momentum and water vapour between surface and atmosphere	KCL	
		Global and meso-scale climate models	UPM	
		Urban water cycle models	ALTERRA	
	4.3	**Quality Assurance / Quality Control Process**	**UPM**	
5	5.1	**Assessment of driving forces and pressures on environmental and socio-economic systems in urban environments**	**TCD**	
	5.2	**Identification of objectives, targets and indicators**	**CMCC**	
	5.3	**Development of monitoring systems**	**TCD**	
	5.4	**Identification of the environmental and socio-economic impacts on the urban systems of different planning scenarios**	**CMCC**	
	5.5	**Incorporation of assessment methods into the DSS**	**TCD**	
6	6.1	**DSS Design**	**FORTH**	
		Analysis of the user requirements and provision of DSS specifications	FORTH	
		Select of the technology to be adopted	FORTH	
		Conceptual design of the DSS architecture	FORTH	
		Technical design of data storage and flow modules, communication interfaces, calculation modules, visualization modules and GUI	FORTH	2
	6.2	**First DSS Prototype**	**FORTH**	
		Database development	FORTH	2.5
		Development of interfaces	FORTH	
		Integration	FORTH	2.5
	6.3	**Final DSS Prototype**	**FORTH**	
		Refinement of the developed interfaces	FORTH	1
		Refinement of decision rules	FORTH	
		Refinement of the visualization tools	FORTH	
		Refinement of the GUI	FORTH	

WP	Task		Responsible	PM
7	7.1	**Strategic scenario analysis**	**UAVR**	
		Dimensions definition	UPM	
		Dimensions assessment	UAVR	
		Scenarios development	UAVR	
		Scenario analysis	UAVR	
	7.2	**Case Studies – DSS application**	**KCL**	
		CoP	ALTERRA	1
		DSS application for the current situation – validation	FORTH	1.5
		DSS application to the scenarios	UAVR	
		Analysis of application results	UAVR	1.5
	7.3	**Guidelines for sustainable planning strategies**	**UAVR**	
		Workshop on CoP method for urban metabolism	ALTERRA	
		Development of guidelines for sustainable planning strategies	UAVR	
8	8.1	**Establishing an umbrella CoP**	**ALTERRA**	3
	8.2	**Setting up and executing the demonstrations of the BRIDGE DSS**	**UBAS**	
9	9.1	**Networking activities**	**NKUA**	
	9.2	**Publishing activities**	**NKUA**	
	9.3	**Conference participations and contributions**	**NKUA**	
	9.4	**Internal BRIDGE meetings**	**FORTH**	
			TOTAL	**23**

B5 – UPM

WP	Task		Responsible	PM
1	1.1	**Strategic Management**	**FORTH**	
	1.2	**Technical Management**	**FORTH**	0.5
	1.3	**Administrative and Contractual Management**	**FORTH**	0.5
2	2.1	**Documentation of current understanding and modelling capability for energy, water and carbon flows and resources in urban environments.**	**KCL**	
		Energy	UBAS	
		Water	KCL	
		Carbon	CMCC	
	2.2	**Documentation of the needs of users and demands of the planning community in the context of sustainable deign**	**NKUA**	
		Review of the current understanding of the process	NKUA	
		Inputs, use and transformations, and outputs of resources from the urban area	UBAS	
		Data needs and outputs identification Stakeholders' analysis	FORTH	
	2.3	**Initiation of first stages of a participatory methodology for stakeholder involvement for each of the case studies**	**ALTERRA**	
3	3.1	**In situ data collection and analysis**	**CNR**	
		Campaigns to provide data sets of air quality and surface fluxes	CNR	
		Surface-atmosphere interactions and effect on trace gases and particles	CNR	
		Monitoring gas exchange of urban vegetation in relation to soil properties	SOTON	
		Heat island and the increase of the energy demand of buildings for cooling	NKUA	
		Investigate the influence of urban pollution problems on indoor environmental quality	NKUA	
	3.2	**Remote Sensing Data Collection and Analysis**	**CNR**	
		Document spatial variability in fluxes and verify selected aspects	CNR	
		FTIR for roadside measurements of traffic related pollutants and traffic flow	KCL	
		Map and classify major urban vegetation forms	FORTH	
		Link flux monitoring with spatial variation of vegetation properties	SOTON	
		Provide spatial information via remote sensing on urban land cover types, albedo, emissivity, and sensible heat flux	FORTH	
		Portable FTIR measurements for assessing in situ urban emissivities	KCL	
	3.3	**Socio-economic data collection and analysis**	**IETU**	
		Determination of anthropogenic energy and water fluxes	KCL	
		Determination of the effects of land use and land cover change and interventions such as the congestion charge	IETU	
		The determination of migration, consumption, socio-economic development	CMCC	
		Main dimensions of social and economic impact generated by urban metabolism	IETU	

WP	Task		Responsible	PM
4	4.1	**Model Selection**	**UPM**	0.5
		Micro-numerical air pollution simulations	UPM	0.5
		Heat island	NKUA	
		Exchange of energy, momentum and water vapour between surface and atmosphere	KCL	
		Global and meso-scale climate models	UPM	0.5
		Urban water cycle models	ALTERRA	0.5
	4.2	**Model Implementation**	**UPM**	0.5
		Micro-numerical air pollution simulations	UPM	5
		Heat island	NKUA	
		Exchange of energy, momentum and water vapour between surface and atmosphere	KCL	
		Global and meso-scale climate models	UPM	5
		Urban water cycle models	ALTERRA	3
	4.3	**Quality Assurance / Quality Control Process**	**UPM**	2.5
5	5.1	**Assessment of driving forces and pressures on environmental and socio-economic systems in urban environments**	**TCD**	
	5.2	**Identification of objectives, targets and indicators**	**CMCC**	
	5.3	**Development of monitoring systems**	**TCD**	
	5.4	**Identification of the environmental and socio-economic impacts on the urban systems of different planning scenarios**	**CMCC**	
	5.5	**Incorporation of assessment methods into the DSS**	**TCD**	
6	6.1	**DSS Design**	**FORTH**	
		Analysis of the user requirements and provision of DSS specifications	FORTH	
		Select of the technology to be adopted	FORTH	
		Conceptual design of the DSS architecture	FORTH	1
		Technical design of data storage and flow modules, communication interfaces, calculation modules, visualization modules and GUI	FORTH	1
	6.2	**First DSS Prototype**	**FORTH**	
		Database development	FORTH	
		Development of interfaces	FORTH	
		Integration	FORTH	3
	6.3	**Final DSS Prototype**	**FORTH**	
		Refinement of the developed interfaces	FORTH	2
		Refinement of decision rules	FORTH	
		Refinement of the visualization tools	FORTH	
		Refinement of the GUI	FORTH	

WP	Task		Responsible	PM
7	7.1	**Strategic scenario analysis**	**UAVR**	
		Dimensions definition	UPM	1
		Dimensions assessment	UAVR	
		Scenarios development	UAVR	
		Scenario analysis	UAVR	1
	7.2	**Case Studies – DSS application**	**KCL**	
		CoP	ALTERRA	
		DSS application for the current situation – validation	FORTH	
		DSS application to the scenarios	UAVR	1
		Analysis of application results	UAVR	1
	7.3	**Guidelines for sustainable planning strategies**	**UAVR**	
		Workshop on CoP method for urban metabolism	ALTERRA	
		Development of guidelines for sustainable planning strategies	UAVR	
8	8.1	**Establishing an umbrella CoP**	**ALTERRA**	
	8.2	**Setting up and executing the demonstrations of the BRIDGE DSS**	**UBAS**	
9	9.1	**Networking activities**	**NKUA**	0.25
	9.2	**Publishing activities**	**NKUA**	0.25
	9.3	**Conference participations and contributions**	**NKUA**	0.25
	9.4	**Internal BRIDGE meetings**	**FORTH**	0.25
			TOTAL	**31**

B6 – UAVR

WP		Task	Responsible	PM
1	1.1	**Strategic Management**	**FORTH**	
	1.2	**Technical Management**	**FORTH**	0.5
	1.3	**Administrative and Contractual Management**	**FORTH**	0.5
2	2.1	**Documentation of current understanding and modelling capability for energy, water and carbon flows and resources in urban environments.**	**KCL**	
		Energy	UBAS	
		Water	KCL	
		Carbon	CMCC	
	2.2	**Documentation of the needs of users and demands of the planning community in the context of sustainable deign**	**NKUA**	
		Review of the current understanding of the process	NKUA	
		Inputs, use and transformations, and outputs of resources from the urban area	UBAS	
		Data needs and outputs identification Stakeholders' analysis	FORTH	
	2.3	**Initiation of first stages of a participatory methodology for stakeholder involvement for each of the case studies**	**ALTERRA**	
3	3.1	**In situ data collection and analysis**	**CNR**	
		Campaigns to provide data sets of air quality and surface fluxes	CNR	
		Surface-atmosphere interactions and effect on trace gases and particles	CNR	
		Monitoring gas exchange of urban vegetation in relation to soil properties	SOTON	
		Heat island and the increase of the energy demand of buildings for cooling	NKUA	
		Investigate the influence of urban pollution problems on indoor environmental quality	NKUA	
	3.2	**Remote Sensing Data Collection and Analysis**	**CNR**	
		Document spatial variability in fluxes and verify selected aspects	CNR	
		FTIR for roadside measurements of traffic related pollutants and traffic flow	KCL	
		Map and classify major urban vegetation forms	FORTH	
		Link flux monitoring with spatial variation of vegetation properties	SOTON	
		Provide spatial information via remote sensing on urban land cover types, albedo, emissivity, and sensible heat flux	FORTH	
		Portable FTIR measurements for assessing in situ urban emissivities	KCL	
	3.3	**Socio-economic data collection and analysis**	**IETU**	
		Determination of anthropogenic energy and water fluxes	KCL	
		Determination of the effects of land use and land cover change and interventions such as the congestion charge	IETU	
		The determination of migration, consumption, socio-economic development	CMCC	
		Main dimensions of social and economic impact generated by urban metabolism	IETU	

WP	Task		Responsible	PM
4	4.1	**Model Selection**	**UPM**	
		Micro-numerical air pollution simulations	UPM	0.5
		Heat island	NKUA	
		Exchange of energy, momentum and water vapour between surface and atmosphere	KCL	
		Global and meso-scale climate models	UPM	0.5
		Urban water cycle models	ALTERRA	
	4.2	**Model Implementation**	**UPM**	
		Micro-numerical air pollution simulations	UPM	2.5
		Heat island	NKUA	
		Exchange of energy, momentum and water vapour between surface and atmosphere	KCL	
		Global and meso-scale climate models	UPM	2.5
		Urban water cycle models	ALTERRA	
	4.3	**Quality Assurance / Quality Control Process**	**UPM**	1
5	5.1	**Assessment of driving forces and pressures on environmental and socio-economic systems in urban environments**	**TCD**	2.5
	5.2	**Identification of objectives, targets and indicators**	**CMCC**	2.5
	5.3	**Development of monitoring systems**	**TCD**	2.5
	5.4	**Identification of the environmental and socio-economic impacts on the urban systems of different planning scenarios**	**CMCC**	2.5
	5.5	**Incorporation of assessment methods into the DSS**	**TCD**	
6	6.1	**DSS Design**	**FORTH**	
		Analysis of the user requirements and provision of DSS specifications	FORTH	0.5
		Select of the technology to be adopted	FORTH	
		Conceptual design of the DSS architecture	FORTH	1
		Technical design of data storage and flow modules, communication interfaces, calculation modules, visualization modules and GUI	FORTH	1
	6.2	**First DSS Prototype**	**FORTH**	
		Database development	FORTH	
		Development of interfaces	FORTH	
		Integration	FORTH	1
	6.3	**Final DSS Prototype**	**FORTH**	
		Refinement of the developed interfaces	FORTH	0.5
		Refinement of decision rules	FORTH	1
		Refinement of the visualization tools	FORTH	
		Refinement of the GUI	FORTH	

WP	Task		Responsible	PM
7	7.1	**Strategic scenario analysis**	**UAVR**	0.5
		Dimensions definition	UPM	0.5
		Dimensions assessment	UAVR	1
		Scenarios development	UAVR	1
		Scenario analysis	UAVR	1
	7.2	**Case Studies – DSS application**	**KCL**	
		CoP	ALTERRA	
		DSS application for the current situation – validation	FORTH	1
		DSS application to the scenarios	UAVR	3
		Analysis of application results	UAVR	2
	7.3	**Guidelines for sustainable planning strategies**	**UAVR**	0.5
		Workshop on CoP method for urban metabolism	ALTERRA	0.5
		Development of guidelines for sustainable planning strategies	UAVR	3
8	8.1	**Establishing an umbrella CoP**	**ALTERRA**	
	8.2	**Setting up and executing the demonstrations of the BRIDGE DSS**	**UBAS**	
9	9.1	**Networking activities**	**NKUA**	0.25
	9.2	**Publishing activities**	**NKUA**	0.25
	9.3	**Conference participations and contributions**	**NKUA**	0.25
	9.4	**Internal BRIDGE meetings**	**FORTH**	0.25
			TOTAL	**38**

B7 – UBAS

WP		Task	Responsible	PM
1	1.1	**Strategic Management**	**FORTH**	
	1.2	**Technical Management**	**FORTH**	
	1.3	**Administrative and Contractual Management**	**FORTH**	
2	2.1	**Documentation of current understanding and modelling capability for energy, water and carbon flows and resources in urban environments.**	**KCL**	
		Energy	UBAS	6
		Water	KCL	
		Carbon	CMCC	
	2.2	**Documentation of the needs of users and demands of the planning community in the context of sustainable deign**	**NKUA**	
		Review of the current understanding of the process	NKUA	1
		Inputs, use and transformations, and outputs of resources from the urban area	UBAS	1
		Data needs and outputs identification Stakeholders' analysis	FORTH	1
	2.3	**Initiation of first stages of a participatory methodology for stakeholder involvement for each of the case studies**	**ALTERRA**	1
3	3.1	**In situ data collection and analysis**	**CNR**	
		Campaigns to provide data sets of air quality and surface fluxes	CNR	
		Surface-atmosphere interactions and effect on trace gases and particles	CNR	
		Monitoring gas exchange of urban vegetation in relation to soil properties	SOTON	
		Heat island and the increase of the energy demand of buildings for cooling	NKUA	
		Investigate the influence of urban pollution problems on indoor environmental quality	NKUA	
	3.2	**Remote Sensing Data Collection and Analysis**	**CNR**	
		Document spatial variability in fluxes and verify selected aspects	CNR	
		FTIR for roadside measurements of traffic related pollutants and traffic flow	KCL	
		Map and classify major urban vegetation forms	FORTH	
		Link flux monitoring with spatial variation of vegetation properties	SOTON	
		Provide spatial information via remote sensing on urban land cover types, albedo, emissivity, and sensible heat flux	FORTH	
		Portable FTIR measurements for assessing in situ urban emissivities	KCL	
	3.3	**Socio-economic data collection and analysis**	**IETU**	
		Determination of anthropogenic energy and water fluxes	KCL	
		Determination of the effects of land use and land cover change and interventions such as the congestion charge	IETU	
		The determination of migration, consumption, socio-economic development	CMCC	
		Main dimensions of social and economic impact generated by urban metabolism	IETU	

WP	Task		Responsible	PM
4	4.1	**Model Selection**	**UPM**	
		Micro-numerical air pollution simulations	UPM	
		Heat island	NKUA	
		Exchange of energy, momentum and water vapour between surface and atmosphere	KCL	
		Global and meso-scale climate models	UPM	
		Urban water cycle models	ALTERRA	
	4.2	**Model Implementation**	**UPM**	
		Micro-numerical air pollution simulations	UPM	
		Heat island	NKUA	
		Exchange of energy, momentum and water vapour between surface and atmosphere	KCL	
		Global and meso-scale climate models	UPM	
		Urban water cycle models	ALTERRA	
	4.3	**Quality Assurance / Quality Control Process**	**UPM**	
5	5.1	**Assessment of driving forces and pressures on environmental and socio-economic systems in urban environments**	**TCD**	
	5.2	**Identification of objectives, targets and indicators**	**CMCC**	
	5.3	**Development of monitoring systems**	**TCD**	
	5.4	**Identification of the environmental and socio-economic impacts on the urban systems of different planning scenarios**	**CMCC**	
	5.5	**Incorporation of assessment methods into the DSS**	**TCD**	
6	6.1	**DSS Design**	**FORTH**	
		Analysis of the user requirements and provision of DSS specifications	FORTH	
		Select of the technology to be adopted	FORTH	
		Conceptual design of the DSS architecture	FORTH	
		Technical design of data storage and flow modules, communication interfaces, calculation modules, visualization modules and GUI	FORTH	
	6.2	**First DSS Prototype**	**FORTH**	
		Database development	FORTH	
		Development of interfaces	FORTH	
		Integration	FORTH	
	6.3	**Final DSS Prototype**	**FORTH**	
		Refinement of the developed interfaces	FORTH	
		Refinement of decision rules	FORTH	
		Refinement of the visualization tools	FORTH	
		Refinement of the GUI	FORTH	

WP	Task		Responsible	PM
7	7.1	**Strategic scenario analysis**	**UAVR**	
		Dimensions definition	UPM	
		Dimensions assessment	UAVR	
		Scenarios development	UAVR	
		Scenario analysis	UAVR	
	7.2	**Case Studies – DSS application**	**KCL**	
		CoP	ALTERRA	
		DSS application for the current situation – validation	FORTH	
		DSS application to the scenarios	UAVR	
		Analysis of application results	UAVR	
	7.3	**Guidelines for sustainable planning strategies**	**UAVR**	
		Workshop on CoP method for urban metabolism	ALTERRA	
		Development of guidelines for sustainable planning strategies	UAVR	
8	8.1	**Establishing an umbrella CoP**	**ALTERRA**	
	8.2	**Setting up and executing the demonstrations of the BRIDGE DSS**	**UBAS**	5
9	9.1	**Networking activities**	**NKUA**	
	9.2	**Publishing activities**	**NKUA**	
	9.3	**Conference participations and contributions**	**NKUA**	
	9.4	**Internal BRIDGE meetings**	**FORTH**	
			TOTAL	**15**

B8 – TCD

WP		Task	Responsible	PM
1	1.1	**Strategic Management**	**FORTH**	
	1.2	**Technical Management**	**FORTH**	0.5
	1.3	**Administrative and Contractual Management**	**FORTH**	0.5
2	2.1	**Documentation of current understanding and modelling capability for energy, water and carbon flows and resources in urban environments.**	**KCL**	
		Energy	UBAS	
		Water	KCL	
		Carbon	CMCC	
	2.2	**Documentation of the needs of users and demands of the planning community in the context of sustainable deign**	**NKUA**	
		Review of the current understanding of the process	NKUA	
		Inputs, use and transformations, and outputs of resources from the urban area	UBAS	
		Data needs and outputs identification Stakeholders' analysis	FORTH	
	2.3	**Initiation of first stages of a participatory methodology for stakeholder involvement for each of the case studies**	**ALTERRA**	
3	3.1	**In situ data collection and analysis**	**CNR**	
		Campaigns to provide data sets of air quality and surface fluxes	CNR	
		Surface-atmosphere interactions and effect on trace gases and particles	CNR	
		Monitoring gas exchange of urban vegetation in relation to soil properties	SOTON	
		Heat island and the increase of the energy demand of buildings for cooling	NKUA	
		Investigate the influence of urban pollution problems on indoor environmental quality	NKUA	
	3.2	**Remote Sensing Data Collection and Analysis**	**CNR**	
		Document spatial variability in fluxes and verify selected aspects	CNR	
		FTIR for roadside measurements of traffic related pollutants and traffic flow	KCL	
		Map and classify major urban vegetation forms	FORTH	
		Link flux monitoring with spatial variation of vegetation properties	SOTON	
		Provide spatial information via remote sensing on urban land cover types, albedo, emissivity, and sensible heat flux	FORTH	
		Portable FTIR measurements for assessing in situ urban emissivities	KCL	
	3.3	**Socio-economic data collection and analysis**	**IETU**	
		Determination of anthropogenic energy and water fluxes	KCL	
		Determination of the effects of land use and land cover change and interventions such as the congestion charge	IETU	
		The determination of migration, consumption, socio-economic development	CMCC	
		Main dimensions of social and economic impact generated by urban metabolism	IETU	

WP	Task		Responsible	PM
4	4.1	**Model Selection**	**UPM**	
		Micro-numerical air pollution simulations	UPM	
		Heat island	NKUA	
		Exchange of energy, momentum and water vapour between surface and atmosphere	KCL	
		Global and meso-scale climate models	UPM	
		Urban water cycle models	ALTERRA	
	4.2	**Model Implementation**	**UPM**	
		Micro-numerical air pollution simulations	UPM	
		Heat island	NKUA	
		Exchange of energy, momentum and water vapour between surface and atmosphere	KCL	
		Global and meso-scale climate models	UPM	
		Urban water cycle models	ALTERRA	
	4.3	**Quality Assurance / Quality Control Process**	**UPM**	
5	5.1	**Assessment of driving forces and pressures on environmental and socio-economic systems in urban environments**	**TCD**	3
	5.2	**Identification of objectives, targets and indicators**	**CMCC**	2.5
	5.3	**Development of monitoring systems**	**TCD**	3.5
	5.4	**Identification of the environmental and socio-economic impacts on the urban systems of different planning scenarios**	**CMCC**	3
	5.5	**Incorporation of assessment methods into the DSS**	**TCD**	3
6	6.1	**DSS Design**	**FORTH**	
		Analysis of the user requirements and provision of DSS specifications	FORTH	
		Select of the technology to be adopted	FORTH	
		Conceptual design of the DSS architecture	FORTH	
		Technical design of data storage and flow modules, communication interfaces, calculation modules, visualization modules and GUI	FORTH	
	6.2	**First DSS Prototype**	**FORTH**	
		Database development	FORTH	
		Development of interfaces	FORTH	
		Integration	FORTH	
	6.3	**Final DSS Prototype**	**FORTH**	
		Refinement of the developed interfaces	FORTH	
		Refinement of decision rules	FORTH	
		Refinement of the visualization tools	FORTH	
		Refinement of the GUI	FORTH	

WP	Task		Responsible	PM
7	7.1	**Strategic scenario analysis**	**UAVR**	
		Dimensions definition	UPM	0.5
		Dimensions assessment	UAVR	0.5
		Scenarios development	UAVR	
		Scenario analysis	UAVR	
	7.2	**Case Studies – DSS application**	**KCL**	
		CoP	ALTERRA	
		DSS application for the current situation – validation	FORTH	
		DSS application to the scenarios	UAVR	
		Analysis of application results	UAVR	
	7.3	**Guidelines for sustainable planning strategies**	**UAVR**	
		Workshop on CoP method for urban metabolism	ALTERRA	
		Development of guidelines for sustainable planning strategies	UAVR	1
8	8.1	**Establishing an umbrella CoP**	**ALTERRA**	
	8.2	**Setting up and executing the demonstrations of the BRIDGE DSS**	**UBAS**	
9	9.1	**Networking activities**	**NKUA**	0.25
	9.2	**Publishing activities**	**NKUA**	0.25
	9.3	**Conference participations and contributions**	**NKUA**	0.25
	9.4	**Internal BRIDGE meetings**	**FORTH**	0.25
			TOTAL	**19**

B9 – UHEL

WP		Task	Responsible	PM
1	1.1	**Strategic Management**	**FORTH**	
	1.2	**Technical Management**	**FORTH**	
	1.3	**Administrative and Contractual Management**	**FORTH**	
2	2.1	**Documentation of current understanding and modelling capability for energy, water and carbon flows and resources in urban environments.**	**KCL**	
		Energy	UBAS	
		Water	KCL	
		Carbon	CMCC	
	2.2	**Documentation of the needs of users and demands of the planning community in the context of sustainable deign**	**NKUA**	
		Review of the current understanding of the process	NKUA	
		Inputs, use and transformations, and outputs of resources from the urban area	UBAS	
		Data needs and outputs identification Stakeholders' analysis	FORTH	
	2.3	**Initiation of first stages of a participatory methodology for stakeholder involvement for each of the case studies**	**ALTERRA**	
3	3.1	**In situ data collection and analysis**	**CNR**	
		Campaigns to provide data sets of air quality and surface fluxes	CNR	3
		Surface-atmosphere interactions and effect on trace gases and particles	CNR	2
		Monitoring gas exchange of urban vegetation in relation to soil properties	SOTON	0.5
		Heat island and the increase of the energy demand of buildings for cooling	NKUA	
		Investigate the influence of urban pollution problems on indoor environmental quality	NKUA	
	3.2	**Remote Sensing Data Collection and Analysis**	**CNR**	
		Document spatial variability in fluxes and verify selected aspects	CNR	
		FTIR for roadside measurements of traffic related pollutants and traffic flow	KCL	
		Map and classify major urban vegetation forms	FORTH	0.5
		Link flux monitoring with spatial variation of vegetation properties	SOTON	
		Provide spatial information via remote sensing on urban land cover types, albedo, emissivity, and sensible heat flux	FORTH	
		Portable FTIR measurements for assessing in situ urban emissivities	KCL	
	3.3	**Socio-economic data collection and analysis**	**IETU**	
		Determination of anthropogenic energy and water fluxes	KCL	1.5
		Determination of the effects of land use and land cover change and interventions such as the congestion charge	IETU	
		The determination of migration, consumption, socio-economic development	CMCC	1.5
		Main dimensions of social and economic impact generated by urban metabolism	IETU	

WP	Task		Responsible	PM
4	4.1	**Model Selection**	**UPM**	
		Micro-numerical air pollution simulations	UPM	1
		Heat island	NKUA	
		Exchange of energy, momentum and water vapour between surface and atmosphere	KCL	
		Global and meso-scale climate models	UPM	
		Urban water cycle models	ALTERRA	
	4.2	**Model Implementation**	**UPM**	
		Micro-numerical air pollution simulations	UPM	6
		Heat island	NKUA	
		Exchange of energy, momentum and water vapour between surface and atmosphere	KCL	
		Global and meso-scale climate models	UPM	
		Urban water cycle models	ALTERRA	
	4.3	**Quality Assurance / Quality Control Process**	**UPM**	1
5	5.1	**Assessment of driving forces and pressures on environmental and socio-economic systems in urban environments**	**TCD**	
	5.2	**Identification of objectives, targets and indicators**	**CMCC**	
	5.3	**Development of monitoring systems**	**TCD**	
	5.4	**Identification of the environmental and socio-economic impacts on the urban systems of different planning scenarios**	**CMCC**	
	5.5	**Incorporation of assessment methods into the DSS**	**TCD**	
6	6.1	**DSS Design**	**FORTH**	
		Analysis of the user requirements and provision of DSS specifications	FORTH	
		Select of the technology to be adopted	FORTH	
		Conceptual design of the DSS architecture	FORTH	
		Technical design of data storage and flow modules, communication interfaces, calculation modules, visualization modules and GUI	FORTH	
	6.2	**First DSS Prototype**	**FORTH**	
		Database development	FORTH	
		Development of interfaces	FORTH	
		Integration	FORTH	
	6.3	**Final DSS Prototype**	**FORTH**	
		Refinement of the developed interfaces	FORTH	
		Refinement of decision rules	FORTH	
		Refinement of the visualization tools	FORTH	
		Refinement of the GUI	FORTH	

WP	Task		Responsible	PM
7	7.1	**Strategic scenario analysis**	**UAVR**	
		Dimensions definition	UPM	
		Dimensions assessment	UAVR	
		Scenarios development	UAVR	
		Scenario analysis	UAVR	
	7.2	**Case Studies – DSS application**	**KCL**	
		CoP	ALTERRA	1
		DSS application for the current situation – validation	FORTH	1
		DSS application to the scenarios	UAVR	
		Analysis of application results	UAVR	
	7.3	**Guidelines for sustainable planning strategies**	**UAVR**	
		Workshop on CoP method for urban metabolism	ALTERRA	
		Development of guidelines for sustainable planning strategies	UAVR	
8	8.1	**Establishing an umbrella CoP**	**ALTERRA**	3
	8.2	**Setting up and executing the demonstrations of the BRIDGE DSS**	**UBAS**	
9	9.1	**Networking activities**	**NKUA**	
	9.2	**Publishing activities**	**NKUA**	
	9.3	**Conference participations and contributions**	**NKUA**	
	9.4	**Internal BRIDGE meetings**	**FORTH**	
			TOTAL	**22**

B10 – NKUA

WP		Task	Responsible	PM
1	1.1	**Strategic Management**	**FORTH**	
	1.2	**Technical Management**	**FORTH**	0.5
	1.3	**Administrative and Contractual Management**	**FORTH**	0.5
2	2.1	**Documentation of current understanding and modelling capability for energy, water and carbon flows and resources in urban environments.**	**KCL**	
		Energy	UBAS	
		Water	KCL	
		Carbon	CMCC	
	2.2	**Documentation of the needs of users and demands of the planning community in the context of sustainable deign**	**NKUA**	0.5
		Review of the current understanding of the process	NKUA	1
		Inputs, use and transformations, and outputs of resources from the urban area	UBAS	1
		Data needs and outputs identification Stakeholders' analysis	FORTH	0.5
	2.3	**Initiation of first stages of a participatory methodology for stakeholder involvement for each of the case studies**	**ALTERRA**	
3	3.1	**In situ data collection and analysis**	**CNR**	
		Campaigns to provide data sets of air quality and surface fluxes	CNR	1.5
		Surface-atmosphere interactions and effect on trace gases and particles	CNR	
		Monitoring gas exchange of urban vegetation in relation to soil properties	SOTON	
		Heat island and the increase of the energy demand of buildings for cooling	NKUA	1
		Investigate the influence of urban pollution problems on indoor environmental quality	NKUA	1
	3.2	**Remote Sensing Data Collection and Analysis**	**CNR**	
		Document spatial variability in fluxes and verify selected aspects	CNR	
		FTIR for roadside measurements of traffic related pollutants and traffic flow	KCL	
		Map and classify major urban vegetation forms	FORTH	0.5
		Link flux monitoring with spatial variation of vegetation properties	SOTON	
		Provide spatial information via remote sensing on urban land cover types, albedo, emissivity, and sensible heat flux	FORTH	0.5
		Portable FTIR measurements for assessing in situ urban emissivities	KCL	
	3.3	**Socio-economic data collection and analysis**	**IETU**	
		Determination of anthropogenic energy and water fluxes	KCL	
		Determination of the effects of land use and land cover change and interventions such as the congestion charge	IETU	0.5
		The determination of migration, consumption, socio-economic development	CMCC	
		Main dimensions of social and economic impact generated by urban metabolism	IETU	

WP	Task		Responsible	PM
4	4.1	**Model Selection**	**UPM**	
		Micro-numerical air pollution simulations	UPM	
		Heat island	NKUA	1
		Exchange of energy, momentum and water vapour between surface and atmosphere	KCL	
		Global and meso-scale climate models	UPM	
		Urban water cycle models	ALTERRA	
	4.2	**Model Implementation**	**UPM**	
		Micro-numerical air pollution simulations	UPM	
		Heat island	NKUA	2
		Exchange of energy, momentum and water vapour between surface and atmosphere	KCL	
		Global and meso-scale climate models	UPM	
		Urban water cycle models	ALTERRA	
	4.3	**Quality Assurance / Quality Control Process**	**UPM**	1
5	5.1	**Assessment of driving forces and pressures on environmental and socio-economic systems in urban environments**	**TCD**	
	5.2	**Identification of objectives, targets and indicators**	**CMCC**	
	5.3	**Development of monitoring systems**	**TCD**	
	5.4	**Identification of the environmental and socio-economic impacts on the urban systems of different planning scenarios**	**CMCC**	
	5.5	**Incorporation of assessment methods into the DSS**	**TCD**	
6	6.1	**DSS Design**	**FORTH**	
		Analysis of the user requirements and provision of DSS specifications	FORTH	
		Select of the technology to be adopted	FORTH	
		Conceptual design of the DSS architecture	FORTH	
		Technical design of data storage and flow modules, communication interfaces, calculation modules, visualization modules and GUI	FORTH	
	6.2	**First DSS Prototype**	**FORTH**	
		Database development	FORTH	
		Development of interfaces	FORTH	
		Integration	FORTH	
	6.3	**Final DSS Prototype**	**FORTH**	
		Refinement of the developed interfaces	FORTH	
		Refinement of decision rules	FORTH	
		Refinement of the visualization tools	FORTH	
		Refinement of the GUI	FORTH	

WP	Task		Responsible	PM
7	7.1	**Strategic scenario analysis**	**UAVR**	
		Dimensions definition	UPM	
		Dimensions assessment	UAVR	
		Scenarios development	UAVR	
		Scenario analysis	UAVR	
	7.2	**Case Studies – DSS application**	**KCL**	
		CoP	ALTERRA	0.5
		DSS application for the current situation – validation	FORTH	0.5
		DSS application to the scenarios	UAVR	
		Analysis of application results	UAVR	
	7.3	**Guidelines for sustainable planning strategies**	**UAVR**	
		Workshop on CoP method for urban metabolism	ALTERRA	
		Development of guidelines for sustainable planning strategies	UAVR	
8	8.1	**Establishing an umbrella CoP**	**ALTERRA**	2
	8.2	**Setting up and executing the demonstrations of the BRIDGE DSS**	**UBAS**	
9	9.1	**Networking activities**	**NKUA**	2
	9.2	**Publishing activities**	**NKUA**	2.5
	9.3	**Conference participations and contributions**	**NKUA**	2.5
	9.4	**Internal BRIDGE meetings**	**FORTH**	1
			TOTAL	**24**

B11 – CMCC

WP		Task	Responsible	PM
1	1.1	**Strategic Management**	**FORTH**	
	1.2	**Technical Management**	**FORTH**	
	1.3	**Administrative and Contractual Management**	**FORTH**	
2	2.1	**Documentation of current understanding and modelling capability for energy, water and carbon flows and resources in urban environments.**	**KCL**	
		Energy	UBAS	
		Water	KCL	
		Carbon	CMCC	2
	2.2	**Documentation of the needs of users and demands of the planning community in the context of sustainable deign**	**NKUA**	
		Review of the current understanding of the process	NKUA	0.5
		Inputs, use and transformations, and outputs of resources from the urban area	UBAS	0.5
		Data needs and outputs identification Stakeholders' analysis	FORTH	1
	2.3	**Initiation of first stages of a participatory methodology for stakeholder involvement for each of the case studies**	**ALTERRA**	1
3	3.1	**In situ data collection and analysis**	**CNR**	
		Campaigns to provide data sets of air quality and surface fluxes	CNR	3
		Surface-atmosphere interactions and effect on trace gases and particles	CNR	4
		Monitoring gas exchange of urban vegetation in relation to soil properties	SOTON	
		Heat island and the increase of the energy demand of buildings for cooling	NKUA	
		Investigate the influence of urban pollution problems on indoor environmental quality	NKUA	1
	3.2	**Remote Sensing Data Collection and Analysis**	**CNR**	
		Document spatial variability in fluxes and verify selected aspects	CNR	
		FTIR for roadside measurements of traffic related pollutants and traffic flow	KCL	
		Map and classify major urban vegetation forms	FORTH	
		Link flux monitoring with spatial variation of vegetation properties	SOTON	
		Provide spatial information via remote sensing on urban land cover types, albedo, emissivity, and sensible heat flux	FORTH	2
		Portable FTIR measurements for assessing in situ urban emissivities	KCL	
	3.3	**Socio-economic data collection and analysis**	**IETU**	
		Determination of anthropogenic energy and water fluxes	KCL	
		Determination of the effects of land use and land cover change and interventions such as the congestion charge	IETU	
		The determination of migration, consumption, socio-economic development	CMCC	1
		Main dimensions of social and economic impact generated by urban metabolism	IETU	2

WP	Task		Responsible	PM
4	4.1	**Model Selection**	**UPM**	
		Micro-numerical air pollution simulations	UPM	
		Heat island	NKUA	
		Exchange of energy, momentum and water vapour between surface and atmosphere	KCL	
		Global and meso-scale climate models	UPM	
		Urban water cycle models	ALTERRA	
	4.2	**Model Implementation**	**UPM**	
		Micro-numerical air pollution simulations	UPM	
		Heat island	NKUA	
		Exchange of energy, momentum and water vapour between surface and atmosphere	KCL	
		Global and meso-scale climate models	UPM	
		Urban water cycle models	ALTERRA	
	4.3	**Quality Assurance / Quality Control Process**	**UPM**	
5	5.1	**Assessment of driving forces and pressures on environmental and socio-economic systems in urban environments**	**TCD**	2.5
	5.2	**Identification of objectives, targets and indicators**	**CMCC**	3
	5.3	**Development of monitoring systems**	**TCD**	2.5
	5.4	**Identification of the environmental and socio-economic impacts on the urban systems of different planning scenarios**	**CMCC**	4
	5.5	**Incorporation of assessment methods into the DSS**	**TCD**	
6	6.1	**DSS Design**	**FORTH**	
		Analysis of the user requirements and provision of DSS specifications	FORTH	0.5
		Select of the technology to be adopted	FORTH	
		Conceptual design of the DSS architecture	FORTH	1
		Technical design of data storage and flow modules, communication interfaces, calculation modules, visualization modules and GUI	FORTH	1
	6.2	**First DSS Prototype**	**FORTH**	
		Database development	FORTH	
		Development of interfaces	FORTH	
		Integration	FORTH	3.5
	6.3	**Final DSS Prototype**	**FORTH**	
		Refinement of the developed interfaces	FORTH	1
		Refinement of decision rules	FORTH	1
		Refinement of the visualization tools	FORTH	
		Refinement of the GUI	FORTH	

WP	Task		Responsible	PM
7	7.1	**Strategic scenario analysis**	**UAVR**	
		Dimensions definition	UPM	
		Dimensions assessment	UAVR	
		Scenarios development	UAVR	
		Scenario analysis	UAVR	
	7.2	**Case Studies – DSS application**	**KCL**	
		CoP	ALTERRA	
		DSS application for the current situation – validation	FORTH	
		DSS application to the scenarios	UAVR	
		Analysis of application results	UAVR	
	7.3	**Guidelines for sustainable planning strategies**	**UAVR**	
		Workshop on CoP method for urban metabolism	ALTERRA	
		Development of guidelines for sustainable planning strategies	UAVR	
8	8.1	**Establishing an umbrella CoP**	**ALTERRA**	
	8.2	**Setting up and executing the demonstrations of the BRIDGE DSS**	**UBAS**	
9	9.1	**Networking activities**	**NKUA**	
	9.2	**Publishing activities**	**NKUA**	
	9.3	**Conference participations and contributions**	**NKUA**	
	9.4	**Internal BRIDGE meetings**	**FORTH**	
			TOTAL	**38**

B12 – CNRM

WP	Task		Responsible	PM
1	1.1	**Strategic Management**	**FORTH**	
	1.2	**Technical Management**	**FORTH**	
	1.3	**Administrative and Contractual Management**	**FORTH**	
2	2.1	**Documentation of current understanding and modelling capability for energy, water and carbon flows and resources in urban environments.**	**KCL**	
		Energy	UBAS	
		Water	KCL	
		Carbon	CMCC	
	2.2	**Documentation of the needs of users and demands of the planning community in the context of sustainable deign**	**NKUA**	
		Review of the current understanding of the process	NKUA	
		Inputs, use and transformations, and outputs of resources from the urban area	UBAS	
		Data needs and outputs identification Stakeholders' analysis	FORTH	
	2.3	**Initiation of first stages of a participatory methodology for stakeholder involvement for each of the case studies**	**ALTERRA**	
3	3.1	**In situ data collection and analysis**	**CNR**	
		Campaigns to provide data sets of air quality and surface fluxes	CNR	
		Surface-atmosphere interactions and effect on trace gases and particles	CNR	
		Monitoring gas exchange of urban vegetation in relation to soil properties	SOTON	
		Heat island and the increase of the energy demand of buildings for cooling	NKUA	
		Investigate the influence of urban pollution problems on indoor environmental quality	NKUA	
	3.2	**Remote Sensing Data Collection and Analysis**	**CNR**	
		Document spatial variability in fluxes and verify selected aspects	CNR	
		FTIR for roadside measurements of traffic related pollutants and traffic flow	KCL	
		Map and classify major urban vegetation forms	FORTH	
		Link flux monitoring with spatial variation of vegetation properties	SOTON	
		Provide spatial information via remote sensing on urban land cover types, albedo, emissivity, and sensible heat flux	FORTH	
		Portable FTIR measurements for assessing in situ urban emissivities	KCL	
	3.3	**Socio-economic data collection and analysis**	**IETU**	
		Determination of anthropogenic energy and water fluxes	KCL	
		Determination of the effects of land use and land cover change and interventions such as the congestion charge	IETU	
		The determination of migration, consumption, socio-economic development	CMCC	
		Main dimensions of social and economic impact generated by urban metabolism	IETU	

WP	Task		Responsible	PM
4	4.1	**Model Selection**	**UPM**	
		Micro-numerical air pollution simulations	UPM	
		Heat island	NKUA	0.5
		Exchange of energy, momentum and water vapour between surface and atmosphere	KCL	0.5
		Global and meso-scale climate models	UPM	0.5
		Urban water cycle models	ALTERRA	
	4.2	**Model Implementation**	**UPM**	
		Micro-numerical air pollution simulations	UPM	
		Heat island	NKUA	2
		Exchange of energy, momentum and water vapour between surface and atmosphere	KCL	2
		Global and meso-scale climate models	UPM	1
		Urban water cycle models	ALTERRA	
	4.3	**Quality Assurance / Quality Control Process**	**UPM**	0.5
5	5.1	**Assessment of driving forces and pressures on environmental and socio-economic systems in urban environments**	**TCD**	
	5.2	**Identification of objectives, targets and indicators**	**CMCC**	
	5.3	**Development of monitoring systems**	**TCD**	
	5.4	**Identification of the environmental and socio-economic impacts on the urban systems of different planning scenarios**	**CMCC**	
	5.5	**Incorporation of assessment methods into the DSS**	**TCD**	
6	6.1	**DSS Design**	**FORTH**	
		Analysis of the user requirements and provision of DSS specifications	FORTH	1
		Select of the technology to be adopted	FORTH	1
		Conceptual design of the DSS architecture	FORTH	1
		Technical design of data storage and flow modules, communication interfaces, calculation modules, visualization modules and GUI	FORTH	
	6.2	**First DSS Prototype**	**FORTH**	
		Database development	FORTH	
		Development of interfaces	FORTH	
		Integration	FORTH	2
	6.3	**Final DSS Prototype**	**FORTH**	
		Refinement of the developed interfaces	FORTH	
		Refinement of decision rules	FORTH	
		Refinement of the visualization tools	FORTH	
		Refinement of the GUI	FORTH	

WP	Task		Responsible	PM
7	7.1	**Strategic scenario analysis**	**UAVR**	
		Dimensions definition	UPM	
		Dimensions assessment	UAVR	
		Scenarios development	UAVR	
		Scenario analysis	UAVR	
	7.2	**Case Studies – DSS application**	**KCL**	
		CoP	ALTERRA	
		DSS application for the current situation – validation	FORTH	
		DSS application to the scenarios	UAVR	
		Analysis of application results	UAVR	
	7.3	**Guidelines for sustainable planning strategies**	**UAVR**	
		Workshop on CoP method for urban metabolism	ALTERRA	
		Development of guidelines for sustainable planning strategies	UAVR	
8	8.1	**Establishing an umbrella CoP**	**ALTERRA**	
	8.2	**Setting up and executing the demonstrations of the BRIDGE DSS**	**UBAS**	4
9	9.1	**Networking activities**	**NKUA**	
	9.2	**Publishing activities**	**NKUA**	
	9.3	**Conference participations and contributions**	**NKUA**	
	9.4	**Internal BRIDGE meetings**	**FORTH**	
			TOTAL	**16**

B13 – ALTERRA

WP		Task	Responsible	PM
1	1.1	**Strategic Management**	**FORTH**	
	1.2	**Technical Management**	**FORTH**	0.5
	1.3	**Administrative and Contractual Management**	**FORTH**	0.5
2	2.1	**Documentation of current understanding and modelling capability for energy, water and carbon flows and resources in urban environments.**	**KCL**	
		Energy	UBAS	
		Water	KCL	
		Carbon	CMCC	
	2.2	**Documentation of the needs of users and demands of the planning community in the context of sustainable deign**	**NKUA**	
		Review of the current understanding of the process	NKUA	
		Inputs, use and transformations, and outputs of resources from the urban area	UBAS	
		Data needs and outputs identification Stakeholders' analysis	FORTH	1
	2.3	**Initiation of first stages of a participatory methodology for stakeholder involvement for each of the case studies**	**ALTERRA**	2
3	3.1	**In situ data collection and analysis**	**CNR**	
		Campaigns to provide data sets of air quality and surface fluxes	CNR	
		Surface-atmosphere interactions and effect on trace gases and particles	CNR	
		Monitoring gas exchange of urban vegetation in relation to soil properties	SOTON	
		Heat island and the increase of the energy demand of buildings for cooling	NKUA	
		Investigate the influence of urban pollution problems on indoor environmental quality	NKUA	
	3.2	**Remote Sensing Data Collection and Analysis**	**CNR**	
		Document spatial variability in fluxes and verify selected aspects	CNR	
		FTIR for roadside measurements of traffic related pollutants and traffic flow	KCL	
		Map and classify major urban vegetation forms	FORTH	
		Link flux monitoring with spatial variation of vegetation properties	SOTON	
		Provide spatial information via remote sensing on urban land cover types, albedo, emissivity, and sensible heat flux	FORTH	
		Portable FTIR measurements for assessing in situ urban emissivities	KCL	
	3.3	**Socio-economic data collection and analysis**	**IETU**	
		Determination of anthropogenic energy and water fluxes	KCL	
		Determination of the effects of land use and land cover change and interventions such as the congestion charge	IETU	
		The determination of migration, consumption, socio-economic development	CMCC	
		Main dimensions of social and economic impact generated by urban metabolism	IETU	

WP	Task		Responsible	PM
4	4.1	**Model Selection**	**UPM**	
		Micro-numerical air pollution simulations	UPM	
		Heat island	NKUA	
		Exchange of energy, momentum and water vapour between surface and atmosphere	KCL	
		Global and meso-scale climate models	UPM	
		Urban water cycle models	ALTERRA	1
	4.2	**Model Implementation**	**UPM**	
		Micro-numerical air pollution simulations	UPM	
		Heat island	NKUA	
		Exchange of energy, momentum and water vapour between surface and atmosphere	KCL	
		Global and meso-scale climate models	UPM	
		Urban water cycle models	ALTERRA	2
	4.3	**Quality Assurance / Quality Control Process**	**UPM**	1
5	5.1	**Assessment of driving forces and pressures on environmental and socio-economic systems in urban environments**	**TCD**	1.5
	5.2	**Identification of objectives, targets and indicators**	**CMCC**	1.5
	5.3	**Development of monitoring systems**	**TCD**	
	5.4	**Identification of the environmental and socio-economic impacts on the urban systems of different planning scenarios**	**CMCC**	
	5.5	**Incorporation of assessment methods into the DSS**	**TCD**	
6	6.1	**DSS Design**	**FORTH**	
		Analysis of the user requirements and provision of DSS specifications	FORTH	
		Select of the technology to be adopted	FORTH	
		Conceptual design of the DSS architecture	FORTH	
		Technical design of data storage and flow modules, communication interfaces, calculation modules, visualization modules and GUI	FORTH	
	6.2	**First DSS Prototype**	**FORTH**	
		Database development	FORTH	
		Development of interfaces	FORTH	
		Integration	FORTH	
	6.3	**Final DSS Prototype**	**FORTH**	
		Refinement of the developed interfaces	FORTH	
		Refinement of decision rules	FORTH	
		Refinement of the visualization tools	FORTH	
		Refinement of the GUI	FORTH	

WP	Task		Responsible	PM
7	7.1	**Strategic scenario analysis**	**UAVR**	
		Dimensions definition	UPM	
		Dimensions assessment	UAVR	0.5
		Scenarios development	UAVR	
		Scenario analysis	UAVR	
	7.2	**Case Studies – DSS application**	**KCL**	
		CoP	ALTERRA	1
		DSS application for the current situation – validation	FORTH	
		DSS application to the scenarios	UAVR	
		Analysis of application results	UAVR	
	7.3	**Guidelines for sustainable planning strategies**	**UAVR**	
		Workshop on CoP method for urban metabolism	ALTERRA	1
		Development of guidelines for sustainable planning strategies	UAVR	0.5
8	8.1	**Establishing an umbrella CoP**	**ALTERRA**	4.5
	8.2	**Setting up and executing the demonstrations of the BRIDGE DSS**	**UBAS**	2.5
9	9.1	**Networking activities**	**NKUA**	0.25
	9.2	**Publishing activities**	**NKUA**	0.25
	9.3	**Conference participations and contributions**	**NKUA**	0.25
	9.4	**Internal BRIDGE meetings**	**FORTH**	0.25
			TOTAL	**22**

B14 – SOTON

WP		Task	Responsible	PM
1	1.1	**Strategic Management**	**FORTH**	
	1.2	**Technical Management**	**FORTH**	
	1.3	**Administrative and Contractual Management**	**FORTH**	
2	2.1	**Documentation of current understanding and modelling capability for energy, water and carbon flows and resources in urban environments.**	**KCL**	
		Energy	UBAS	
		Water	KCL	
		Carbon	CMCC	
	2.2	**Documentation of the needs of users and demands of the planning community in the context of sustainable deign**	**NKUA**	
		Review of the current understanding of the process	NKUA	
		Inputs, use and transformations, and outputs of resources from the urban area	UBAS	
		Data needs and outputs identification Stakeholders' analysis	FORTH	
	2.3	**Initiation of first stages of a participatory methodology for stakeholder involvement for each of the case studies**	**ALTERRA**	
3	3.1	**In situ data collection and analysis**	**CNR**	
		Campaigns to provide data sets of air quality and surface fluxes	CNR	
		Surface-atmosphere interactions and effect on trace gases and particles	CNR	
		Monitoring gas exchange of urban vegetation in relation to soil properties	SOTON	6
		Heat island and the increase of the energy demand of buildings for cooling	NKUA	
		Investigate the influence of urban pollution problems on indoor environmental quality	NKUA	
	3.2	**Remote Sensing Data Collection and Analysis**	**CNR**	
		Document spatial variability in fluxes and verify selected aspects	CNR	
		FTIR for roadside measurements of traffic related pollutants and traffic flow	KCL	
		Map and classify major urban vegetation forms	FORTH	2
		Link flux monitoring with spatial variation of vegetation properties	SOTON	2
		Provide spatial information via remote sensing on urban land cover types, albedo, emissivity, and sensible heat flux	FORTH	
		Portable FTIR measurements for assessing in situ urban emissivities	KCL	
	3.3	**Socio-economic data collection and analysis**	**IETU**	
		Determination of anthropogenic energy and water fluxes	KCL	
		Determination of the effects of land use and land cover change and interventions such as the congestion charge	IETU	
		The determination of migration, consumption, socio-economic development	CMCC	
		Main dimensions of social and economic impact generated by urban metabolism	IETU	

WP	Task		Responsible	PM
4	4.1	**Model Selection**	**UPM**	
		Micro-numerical air pollution simulations	UPM	
		Heat island	NKUA	
		Exchange of energy, momentum and water vapour between surface and atmosphere	KCL	
		Global and meso-scale climate models	UPM	
		Urban water cycle models	ALTERRA	
	4.2	**Model Implementation**	**UPM**	
		Micro-numerical air pollution simulations	UPM	
		Heat island	NKUA	
		Exchange of energy, momentum and water vapour between surface and atmosphere	KCL	
		Global and meso-scale climate models	UPM	
		Urban water cycle models	ALTERRA	
	4.3	**Quality Assurance / Quality Control Process**	**UPM**	
5	5.1	**Assessment of driving forces and pressures on environmental and socio-economic systems in urban environments**	**TCD**	
	5.2	**Identification of objectives, targets and indicators**	**CMCC**	
	5.3	**Development of monitoring systems**	**TCD**	
	5.4	**Identification of the environmental and socio-economic impacts on the urban systems of different planning scenarios**	**CMCC**	
	5.5	**Incorporation of assessment methods into the DSS**	**TCD**	
6	6.1	**DSS Design**	**FORTH**	
		Analysis of the user requirements and provision of DSS specifications	FORTH	
		Select of the technology to be adopted	FORTH	
		Conceptual design of the DSS architecture	FORTH	
		Technical design of data storage and flow modules, communication interfaces, calculation modules, visualization modules and GUI	FORTH	
	6.2	**First DSS Prototype**	**FORTH**	
		Database development	FORTH	
		Development of interfaces	FORTH	
		Integration	FORTH	3
	6.3	**Final DSS Prototype**	**FORTH**	
		Refinement of the developed interfaces	FORTH	
		Refinement of decision rules	FORTH	
		Refinement of the visualization tools	FORTH	
		Refinement of the GUI	FORTH	

WP	Task		Responsible	PM
7	7.1	**Strategic scenario analysis**	**UAVR**	
		Dimensions definition	UPM	
		Dimensions assessment	UAVR	
		Scenarios development	UAVR	
		Scenario analysis	UAVR	
	7.2	**Case Studies – DSS application**	**KCL**	
		CoP	ALTERRA	
		DSS application for the current situation – validation	FORTH	
		DSS application to the scenarios	UAVR	
		Analysis of application results	UAVR	
	7.3	**Guidelines for sustainable planning strategies**	**UAVR**	
		Workshop on CoP method for urban metabolism	ALTERRA	
		Development of guidelines for sustainable planning strategies	UAVR	
8	8.1	**Establishing an umbrella CoP**	**ALTERRA**	
	8.2	**Setting up and executing the demonstrations of the BRIDGE DSS**	**UBAS**	
9	9.1	**Networking activities**	**NKUA**	
	9.2	**Publishing activities**	**NKUA**	
	9.3	**Conference participations and contributions**	**NKUA**	
	9.4	**Internal BRIDGE meetings**	**FORTH**	
			TOTAL	**13**

ANNEX: TEMPLATES

- Minutes of Meeting
- RID
- Periodic Report

	*Minutes of Meeting*	BRIDGE
Reference: xxxxx-xxx-MM-FORTH		Page: 1/4

SUBJECT: <subject>		Place: Date: <dd-mm-yyyy>	
Participants:	Company	Signature	Written by:
<Participant 1> <Participant 2> …….. <Participant n>			Distribution List :

AGENDA OF THE MEETING:

	Minutes of Meeting	BRIDGE
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ITEM	TEXT	ACTION
	<text, text, text>	

	Minutes of Meeting	BRIDGE
Reference: xxxxx-xxx-MM-FORTH		Page: 3/4

SUMMARY OF ACTIONS

ACTION	DESCRIPTION	RESPONSIBLE	DATE

	Minutes of Meeting	BRIDGE
Reference: xxxxx-xxx-MM-FORTH		Page: 4/4

LIST OF ANNEXES (TOTAL PGES:)

	Review Item Discrepancy	**BRIDGE**
RID no.:	Date:	Page: 1/1

RID Title:	
Originator:	
Document Ref.: **Document Title:**	**Issue:**
Problem Description	
Severity: ☐ **High** ☐ **Medium** ☐ **Low**	
Recommended Solution	
Review Decisions: ☐ **Accepted** ☐ **Rejected** ☐ **Deferred**	**RID Status:** ☐ **Open** ☐ **Closed**

PERIODIC REPORT TEMPLATE

PROJECT PERIODIC REPORT

Grant Agreement number:

Project acronym:

Project title:

Funding Scheme:

Date of latest version of Annex I against which the assessment will be made:

Periodic report: **1st** ☐ **2nd** ☐ **3rd** ☐ **4th** ☐

Period covered: **from** **to**

Name, title and organisation of the scientific representative of the project's coordinator[1]:

Tel:

Fax:

E-mail:

Project website[2] address:

[1] Usually the contact person of the coordinator as specified in Art. 8.1. of the grant agreement

[2] The home page of the website should contain the generic European flag and the FP7 logo which are available in electronic format at the Europa website (logo of the European flag: http://europa.eu/abc/symbols/emblem/index_en.htm ; logo of the 7th FP: http://ec.europa.eu/research/fp7/index_en.cfm?pg=logos). The area of activity of the project should also be mentioned.

Declaration by the scientific representative of the project coordinator[1]

I, as scientific representative of the coordinator[1] of this project and in line with the obligations as stated in Article II.2.3 of the Grant Agreement declare that:

- The attached periodic report represents an accurate description of the work carried out in this project for this reporting period;
- The project (tick as appropriate):

  ☐ has fully achieved its objectives and technical goals for the period;

  ☐ has achieved most of its objectives and technical goals for the period with relatively minor deviations[7];

  ☐ has failed to achieve critical objectives and/or is not at all on schedule[8].

- The public website is up to date, if applicable.
- To my best knowledge, the financial statements which are being submitted as part of this report are in line with the actual work carried out and are consistent with the report on the resources used for the project (section 3.6) and if applicable with the certificate on financial statement.
- All beneficiaries, in particular non-profit public bodies, secondary and higher education establishments, research organisations and SMEs, have declared to have verified their legal status. Any changes have been reported under section 5 (Project Management) in accordance with Article II.3.f of the Grant Agreement.

Name of scientific representative of the Coordinator[1]: .....

Date: ...../ ...../ .....

Signature of scientific representative of the Coordinator[1]: .....

7 If either of these boxes is ticked, the report should reflect these and any remedial actions taken.

8 If either of these boxes is ticked, the report should reflect these and any remedial actions taken.

1. Publishable summary

This section should be of suitable quality to enable direct publication by the Commission. Please ensure that it is set out and formatted so that it can be printed as a stand-alone paper document not exceeding four pages. It shall also reflect the website of the project (if applicable).

Please include a summary description of the project objectives, a description of the work performed since the beginning of the project, a description of the main results achieved so far, the expected final results and their potential impact and use (including the socio-economic impact and the wider societal implications of the project so far). You should update this publishable summary at the end of each reporting period.

Please include also, as appropriate, diagrams or photographs illustrating and promoting the work of the project, the project logo and relevant contact details.

The address of the project public website should also be indicated, if applicable.

2. Project objectives for the period

Please provide an overview of the project objectives for the reporting period in question, as included in Annex I of the Grant Agreement. These objectives are required so that this report is a stand-alone document.

Please include a summary of the recommendations from the previous reviews (if any) and indicate how these have been taken into account.

3. Work progress and achievements during the period

Please provide a concise overview of the progress of the work in line with the structure of Annex I of the Grant Agreement.

For each work package *-- except project management, which will be reported in section 3.5-- please provide the following information:*

- *A summary of progress towards objectives and details for each task;*
- *Highlight clearly significant results;*
- *If applicable, explain the reasons for deviations from Annex I and their impact on other tasks as well as on available resources and planning;*
- *If applicable, explain the reasons for failing to achieve critical objectives and/or not being on schedule and explain the impact on other tasks as well as on available resources and planning (the explanations should be coherent with the declaration by the project coordinator) ;*
- *a statement on the use of resources, in particular highlighting and explaining deviations between actual and planned person-months per work package and per beneficiary in Annex 1 (Description of Work)*
- *If applicable, propose corrective actions.*

4. Deliverables and milestones tables

Deliverables (excluding the periodic and final reports)

Please list all the deliverables due in this reporting period, as indicated in Annex I of the Grant Agreement.
Deliverables that are of a nature other than written "reports", such as "prototypes", "demonstrators" or "others", should also be accompanied by a short report, so that the European Commission has a record of their existence.
If a deliverable has been cancelled or regrouped with another one, please indicate this in the column "Comments".
If a new deliverable is proposed, please indicate this in the column "Comments".

This table is cumulative, that is, it should always show all deliverables from the beginning of the project.

TABLE 1. DELIVERABLES[9]

Del. no.	Deliverable name	WP no.	Lead beneficiary	Nature	Dissemination level	Delivery date from Annex I (proj month)	Delivered Yes/No	Actual / Forecast delivery date	Comments

9 For Security Projects the template for the deliverables list in Annex A1 has to be used.

Milestones

Please complete this table if milestones are specified in Annex I of the Grant Agreement.
Milestones will be assessed against the specific criteria and performance indicators as defined in Annex I.

TABLE 2. MILESTONES							
Milestone no.	**Milestone name**	**Work package no**	**Lead beneficiary**	**Delivery date from Annex I**	**Achieved Yes/No**	**Actual / Forecast achievement date**	**Comments**

5. Project management

Please use this section to summarise management of the consortium activities during the period. Management tasks are indicated in Articles II.2.3 and Article II.16.5 of the Grant Agreement.

Amongst others, this section should include the following:

- *Consortium management tasks and achievements;*
- *Problems which have occurred and how they were solved or envisaged solutions;*
- *Changes in the consortium, if any;*
- *List of project meetings, dates and venues;*
- *Project planning and status;*
- *Impact of possible deviations from the planned milestones and deliverables, if any;*
- *Any changes to the legal status of any of the beneficiaries, in particular non-profit public bodies, secondary and higher education establishments, research organisations and SMEs;*
- *Development of the Project website, if applicable;*
- *Use of foreground and dissemination activities during this period (if applicable).*

The section should also provide short comments and information on co-ordination activities during the period in question, such as communication between beneficiaries, possible co-operation with other projects/programmes etc.

For Grant Agreements related to infrastructures (Annex III of the Grant Agreement), the access provider shall include a section in the periodic reports on the access activity, indicating the membership of the selection panel as well as the amount of access provided to the user groups, with the description of their work, and the names and home institutions of users.

6. Explanation of the use of the resources

Please provide an explanation of personnel costs, subcontracting and any major direct costs incurred by each beneficiary, such as the purchase of important equipment, travel costs, large consumable items, etc. linking them to work packages.

There is no standard definition of "major direct cost items". Beneficiaries may specify these, according to the relative importance of the item compared to the total budget of the beneficiary, or as regards the individual value of the item.

These can be listed in the following tables (one table by participant):

TABLE 3.1 PERSONNEL, SUBCONTRACTING AND OTHER MAJOR DIRECT COST ITEMS FOR BENEFICIARY 1 FOR THE PERIOD

Work Package	Item description	Amount	Explanations
Ex: 2,5, 8, 11, 17	Personnel costs	*235000 €**	*Salaries of 2 postdoctoral students and one lab technician for 18 months each**
5	Subcontracting	*11000 €**	*Maintenance of the web site and printing of brochure**
8, 17	Major cost item 'X'	*75000 €**	*NMR spectrometer**
11	Major cost item 'Y' ……..	*27000€**	*Expensive chemicals xyz for experiment abc**
	Remaining direct costs	*15000€**	
	TOTAL DIRECT COSTS[10]	*363000€**	

* *The entries in italics are examples and purely for illustration*

TABLE 3.2 PERSONNEL, SUBCONTRACTING AND OTHER MAJOR DIRECT COST ITEMS FOR BENEFICIARY 2 FOR THE PERIOD

Work Package	Item description	Amount	Explanations
	Personnel costs		
	Subcontracting		
	Major cost item 'X'		
	Major cost item 'Y' ……..		
	Remaining direct costs		
	TOTAL DIRECT COSTS[10]		

[10] Total direct costs have to be coherent with the directs costs claimed in Form C

7. Financial statements – Form C and Summary financial report

Please submit a separate financial statement from each beneficiary together with a summary financial report which consolidates the claimed Community contribution of all the beneficiaries in an aggregate form, based on the information provided in Form C (Annex VI) by each beneficiary. When applicable, certificates on financial statements shall be submitted by the concerned beneficiaries according to Article II.4.4 of the Grant Agreement.

FP7 - Grant Agreement - Annex VI - Collaborative Project

Form C - Financial Statement (to be filled in by Third Party) Only applicable if special clause nr 10 is used

Project nr	nnnnnn	Funding scheme	Collaborative Project
Project Acronym	xxxxxxxxxxxxxxxxxxxx		
Period from To	dd/mm/aa dd/mm/aa	Is this an adjustment to a previous statement ?	Yes/No
3rd party legal Name			
3rd party Organisation short Name		Working for beneficiary nr	nn
Funding % for RTD activities (A)		If flat rate for indirect costs, specify %	%

1- Declaration of eligible costs/lump sum/flate-rate/scale of unit (in €)

	Type of Activity				
	RTD (A)	Demonstration (B)	Management (C)	Other (D)	TOTAL (A+B+C+D)
Personnel costs					
Subcontracting					
Other direct costs					
Indirect costs					
Lump sums/flat-rate/scale of unit declared					
Total					
Maximum EC contribution					
Requested EC contribution					

2- Declaration of receipts

Did you receive any financial transfers or contributions in kind, free of charge from third parties or did the project generate any income which could be considered a receipt according to Art.II.17 of the grant agreement ? Yes/No

If yes, please mention the amount (in €)

3- Declaration of interest yielded by the pre-financing *(to be completed only by the coordinator)*

Did the pre-financing you received generate any interest according to Art. II.19 ? Yes/No

If yes, please mention the amount (in €)

4. Certificate on the methodology

Do you declare average personnel costs according to Art. II.14.1 ? Yes/No

Is there a certificate on the methodology provided by an independent auditor and accepted by the Commission according to Art. II.4.4 ? Yes/No

Name of the auditor		Cost of the certificate (in €), if charged under this project	

5- Certificate on the financial statements

Is there a certificate on the financial statements provided by an independent auditor attached to this financial statement according to Art.II.4.4 ? Yes/No

Name of the auditor		Cost of the certificate (in €)	

6- Beneficiary's declaration on its honour

We declare on our honour that:

- the costs declared above are directly related to the resources used to attain the objectives of the project and fall within the definition of eligible costs specified in Articles II.14 and II.15 of the grant agreement, and, if relevant, Annex III and Article 7 (special clauses) of the grant agreement;

- the receipts declared above are the only financial transfers or contributions in kind, free of charge, from third parties and the only income generated by the project which could be considered as receipts according to Art. II.17 of the grant agreement;

- the interest declared above is the only interest yielded by the pre-financing which falls within the definition of Art. II.19 of the grant agreement ;

- there is full supporting documentation to justify the information hereby declared. It will be made available at the request of the Commission and in the event of an audit by the Commission and/or by the Court of Auditors and/or their authorised representatives.

Beneficiary's Stamp	Name of the Person(s) Authorised to sign this Financial Statement
	Date & signature

FP7 - Grant Agreement - Annex VI - Collaborative Project

Summary Financial Report - Collaborative Project- to be filled in by the coordinator

Project acronym	xxxxxxxxxxxxxxxxxxxxxxxxx	Project nr	nnnnnn	Reporting period from	dd/mm/aa	to:	dd/mm/aa	Page	1/1

Funding scheme	CP

Beneficiary n°	If 3rd Party, linked to beneficiary	Adjustment (Yes/No)	Organisation Short Name	Type of activity: RTD (A) Total	RTD (A) Max EC Contribution	Demonstration (B) Total	Demonstration (B) Max EC Contribution	Management (C) Total	Management (C) Max EC Contribution	Other (D) Total	Other (D) Max EC Contribution	Total (A)+(B)+(C)+(D) Total	Total (A)+(B)+(C)+(D) Max EC Contribution	Receipts	Interest
1															
2															
3															
4															
5															
6															
7															
8															
9															
10															
11															
12															
13															
14															
15															
16															
17															
18															
19															
20															
21															
22															
23															
24															
25															
TOTAL															

Requested EC contribution for the reporting period (in €)	

8. Certificates

List of Certificates which are due for this period, in accordance with Article II.4.4 of the Grant Agreement.

Beneficiary	Organisation short name	Certificate on the financial statements provided? yes / no	Any useful comment, in particular if a certificate is not provided
1		Yes	
2		no	
		no	Expenditure threshold not reached
Etc.			

A copy of each duly signed certificate on the financial statements (Form C) or on the methodology should be included in this section, according to the table above (signed originals to be sent in parallel by post).