

## WHO IS INVOLVED IN THE PROGRAMME

BRIDGE is supported by a consortium of 14 partners coming from Greece, Finland, France, Ireland, Italy, the Netherlands, Poland, Portugal, Spain, Switzerland and the United Kingdom. The project is funded by the European Commission within the 7th Framework Programme of the European Union. It is coordinated by the Institute of Applied and Computational Mathematics of the Foundation for Research and Technology Hellas (IACM-FORTH) in Greece.

## BRIDGE PARTNERS:

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 Uprzemysłowych (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), France \_13. Alterra B.V., The Netherlands \_14. University of Southampton (SOTON), United Kingdom

## CONTACT:

BRIDGE project coordinator: Dr. Nektarios Chrysoulakis

Tel.: +30 2810 391762 Fax: +30 2810 391761 E-mail: [zedd2@iacm.forth.gr](mailto:zedd2@iacm.forth.gr) Foundation for Research and Technology - Hellas (FORTH) N. Plastira 100 Vassilika Vouton, P.O. Box 1385 GR-71110, Heraklion, Crete, Greece

Case study leader Helsinki: Timo Vesala,

Tel. +358405779008 Fax +358919150717 [Timo.vesala@helsinki.fi](mailto:Timo.vesala@helsinki.fi) Department of Physics POBox 64 FI-00014 University of Helsinki Finland

Coordinator Community of Practice Helsinki: Kimmo Kurunmäki,

[Kimmo.kurunmaki@helsinki.fi](mailto:Kimmo.kurunmaki@helsinki.fi), Tel. +358504417337\_Network for Urban Studies, Department of Social Policy, Box 18, FI-00014 University of Helsinki



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# BRIDGE

SUSTAINABLE URBAN PLANNING DECISION SUPPORT ACCOUNTING FOR URBAN METABOLISM



## THE PROGRAMME

THE BRIDGE PROGRAMME WAS LAUNCHED IN 2008  
TO ASSIST URBAN PLANNERS TO DESIGN, GENERATE OR  
PRESENT ALTERNATIVES TOWARDS A SUSTAINABLE CITY.

## THE BRIDGE MISSION

- \_To define urban metabolism by means of energy, water, carbon and pollutant fluxes.
- \_To examine the role of land use and resources use in saving energy, in minimising impairment of the natural water cycle and in removing air pollutants.
- \_To develop indicators to quantify the environmental and socioeconomic impacts of the above components of urban metabolism.
- \_To develop a Decision Support System (DSS) based on these indicators.
- \_To use a DSS as a tool for estimating the economic benefits of alternative land and resource use.
- \_To design sustainable planning strategies based on these estimations.

The innovation of BRIDGE is the development of a Decision Support System (DSS). A DSS is a computer-based information system that may assist urban planners in decision-making by providing a structured presentation of alternatives and mechanisms regarding urban metabolism components (energy, water, carbon and pollutants).

The BRIDGE project will use Communities of Practice as an approach to organize the interaction between professionals in the field of urban planning and urban research scientists. The intention is to launch BRIDGE Communities of Practice in five case study cities i.e., Athens, London, Firenze, Helsinki and Gliwice. The Communities of Practice will create a learning environment for professionals and researchers in the field of city planning.

## OBJECTIVES

- Provide the means to:
  - \_quantitatively estimate the various components of the urban metabolism;
  - \_quantitatively estimate their environmental impacts;
  - \_translate the above impacts to socio-economic costs;
  - \_optimise resources in urban planning.
- Bridge the gap between bio-physical sciences and urban planners by providing the DSS tool.
- Support the development of planning strategies to decouple resource use and economic development.
- Involve local and regional stakeholders.
- Demonstrate the potential of science to support political decision making.

## WHAT IS A SUSTAINABLE CITY?

The city is a dynamic system, therefore it is important to understand trends in energy and material flows over time. Urban metabolism is considered as the exchange and transformation of energy and matter between a city and its environment.

BRIDGE will focus on the following components of urban metabolism:

### ENERGY

Optimise energy efficiency of the urban structure.

Minimise energy demand of settlements.

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.

Stabilize and manage contaminated land.

## FIVE CITIES - FIVE «ROAD MAPS» TOWARDS SUSTAINABILITY

Cities in the European Union host 70% of the population and they tend to gather more inhabitants. Dependless their size, all cities face environmental problems which degrade the quality of life and influence development plans. Their target is the “sustainable city”. How can this be achieved? BRIDGE examines five European cities of varying size and character so as to develop tailor made «road maps» towards sustainability. Through this effort, the potential of science to support political decision making will be also demonstrated.



Athens has enjoyed a positive transformation due to the Olympic Games which took place in 2004. However the city still needs to improve air quality, to ameliorate the urban heat island and to increase free and green spaces. At the administrative level, the city needs to entrust science in its development plans so as to comply to local needs rather than to local demands.



London a metropolitan centre with the characteristics of a mega-city, faces modifications in its urban microclimate (increased temperature in the city centre, hotter summers, air quality problems) which need to be faced through a solid plan towards urban sustainability. In addition, London will host the Olympic Games 2012, a fact which further increases the potential for measures towards sustainability.



Gliwice is satellite city with an Old Town in the central part and residential districts around the centre. Its challenges towards sustainability include the definition of land use plans, the improvement of buildings through technical and energy efficiency measures, the management of the quantity and quality of water, the protection of the water resources and the improvement in the traffic patterns.



Firenze a medium size city with strong historic character, needs to improve urban mobility as well as to limit emissions of air pollutants, to improve energy efficiency of public and private buildings, to decrease waste production and to raise awareness on environmental responsibility. Answers to local needs are to be defined with the use of recently installed micromet monitoring system capable to record urban mass and energy fluxes.



Helsinki (and its Metropolitan Area) needs to considerably reduce greenhouse gas emissions, to increase the share of renewable energy sources in the production of district heating and electricity, to improve the energy-efficiency of the building stock, to extend the regional public rail transport network, to improve eco-efficiency in construction and service delivery and decrease waste production.