



Sustainable Urban Planning in Gliwice

Report of the 1st COP meeting

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City Hall Gliwice, Zwycięstwa 21 St., Poland



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This report is a working document prepared in the context of the BRIDGE project

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1 Introduction

The BRIDGE project focuses on development of a Decision Support System (DSS), which will assist urban planners in decision making taking into account sustainability aspects of urban metabolism like: energy, water, carbon and pollutants. The BRIDGE kick-off CoP in Gliwice consisted of 26 participants including: urban planners, city development experts, spatial information system specialists, environmentalist, air pollution and modeling experts, toxicologist, EIA and SEA practitioners and researchers (annex 2).

The objectives of the meeting, reflecting in programme (annex 3), were following:

- beginning regularly contact between urban practitioners and researchers in the field of urban metabolism,
- distinguish current practice urban planning in Gliwice in relation to priorities, objectives and sustainability of environmental and socio-economic indicators.

Achieving an objectives defined as current urban planning practices in Gliwice was realised by walking tour to Old City Hall on Main Square in Gliwice.

Developed by BRIDGE researchers DSS will be technical assistance taking into account priorities, objectives and sustainability of environmental and socio-economic indicators, which meets requirements of urban planning and decision making in the field of urban metabolism, especially in relation to water, energy, carbon and pollutants.

This report summarizes the discussions concerning the project, priorities, objectives and indicators with the conclusions and the choice of the test site in Gliwice case study as the follow up of the meeting.

2 Summary of morning session

2.1 *Welcome – Anicenta Bubak*

She presented the reasons of choosing the city of Gliwice as one of case study. She informed about other UE project lead by IETU like PREPARED concerning impact of climate changes on water supply and sanitation and 2-FUN related to health outcomes caused by environmental soil exposure where Gliwice is case study or part of regional case study. The next example was project entitled Friendly Kłodnica River, which flows within the Polytechnic District - test site in Gliwice chosen during the afternoon session.

2.2 *BRIDGE Project – Nektarios Chrysoulakis*

He introduced the urban metabolism as the following approaches:

- top-down that assess the inputs and outputs of food, water, energy, and pollutants from a city,
- bottom-up which based on estimates of urban metabolism at local to regional scales, He underlined that urban development modifies the land use and the resource use within a city by the environmental impacts of Energy storage, water cycle, air pollution.

He described the BRIDGE project objectives:

- to define urban metabolism in local scale,
- to examine how the change of land use affects on urban metabolism,
- to develop environmental indicators of the impacts,
- to develop a DSS based on these indicators,
- to use this DSS to evaluate planning alternatives in several case studies.

He set of planning alternatives, decision making and the BRIGE methodology forth and explained the role of:

- the involvement of users, including case studies;
- the physical flows observations;
- the physical flows modelling;
- the impact assessment methods;
- the DSS.

2.3 CoP Meeting Objectives – Ainhua Gonzales Del Campo, Annemarie Groot

Ainhua Gonzales Del Campo clarified how to establish objectives & indicators for urban sustainability in Gliwice by:

- gathering local knowledge on key urban planning priorities, issues and challenges;
- gathering local views and perceptions on sustainability objectives and associated indicators;
- determining a case study for testing the BRIDGE approach and the DSS tool.

She emphasized the key BRIDGE aspects (water, carbon & pollutants, energy) and inter-relationship with the urban system components (social development, economy, urban structure, transport, infrastructure). She referred to the context of SEA Directive (EC/42/2001) in BRIDGE urban metabolism:

- population and human health (human well-being)
- water;
- air and climate;
- material assets.

She informed about steps of the framework and stages of interaction for the development of objectives, criteria and indicators.

Annemarie Groot presented the ideas of creation Community of Practice: group of people who share a concern or a passion for something they do;

- practice oriented;
- members of CoP jointly develop e.g, tools, procedures, concepts to improve their practice;
- support of BRIDGE researchers to CoP in Gliwice through specific knowledge, models, DSS;
- equal innovation mainstreaming: example of a CoP in Poland.

2.4 Decision Support System (DSS) – Eduardo Castro

He described the purposes and scheme of DSS taking into account multi criteria analysis of negative and positive socio-economic and environmental impacts on all case studies. He explain the way of calculation of the net benefit (NB), considering the cost investment.

2.5 Sustainable urban development of Gliwice – Katarzyna Kobierska

focused on sustainable urban development of Gliwice. She presented socio economic background of the city and its role at the crossroads of European transportation routes. She sketched out sustainable development of Gliwice as searching for cohesion and balance in the following aspects:

- spatial – development of all city districts;
- social – creating development opportunities for the entire local community;
- communication – incorporation of the city into external transport system and elimination of barriers in internal communication system;
- functional – integration of functions performed in the city;
- eco-development – elimination of conflicts between economy, settlement and environment.

She described main development processes in the city:

- positive
 - development of labour market;
 - raising the attractiveness of the city for potential investors;
 - use of EU funds for financing local investments;
 - improvement of the esthetic image of the city;
 - improvement of living standards;
 - strengthening the position of the city;
 - increase of social activity and development of non-governmental organizations;
 - better city management.
- negative
 - growing problems connected with road traffic and insufficient progress in the modernization of road infrastructure;
 - functional regress of the city center and limited possibilities for development of new functions in the city;
 - demographic regress;
 - nuisance of ecological threats (Kłodnica, low ecological awareness among inhabitants);
 - improper functioning of social services.

2.6 Urban Planning in Gliwice – Małgorzata Knebloch

She concentrated on spatial planning in Gliwice demonstrating the following current planning documents:

- study of physical conditions and spatial development plan (SPCSDP);
 - Gliwice has current SPCSDP, approved by City Council –resolution nr X/162/2003 dated 10th July 2003;
 - resolution concerning elaboration of the new SPCSDP has been taken the 22nd December 2005;
 - the first stage of adjustment and co-ordination of this Document with suitable institutions and bodies has been finished the 23rd September 2009;
 - SPCSDP and its environmental forecast was presented in public (term of public presentation was: from the 1st October to 30th October);
 - the date of public discussion related to proposed in this document solutions was the 22nd October 2009.
 - time for submission of amendments and comments to SPCSDP is determined for the minimum 21 days (from 31st October to 20th November 2009)
 - planned date of presentation and passage of the aforesaid document -January 2010
- current status of local land use plans:
 - number of current plans – 53;
 - surface covered by current plans approx. 7 630,50ha (56,5% surface of the city);
 - 12 plans in the course of elaboration - 4 837,00 ha (36 % surface of the city);
 - areas non covered by legal proceedings - mostly forests and agriculture areas 932,5 ha – (7,5 % surface of the city).

She annotate problems, which have been defined based on the environmental forecast for spatial arrangement of the Gliwice city:

- negative factors:
 - inefficiency of existing transport system,
 - high level of urban structure (dwelling housing, commercial areas, industrial areas),
 - urban sprawl,
 - land subsidence (effects of mining);
- positive factors:
 - future use of new segments of highway (A1) and regional throughway (DTS),
 - natural areas surface's preservation,

- increasing of the environmental protected areas and its preservation against the investment processes (especially those areas with high natural value),
- preservation of environmental corridors' continuity,
- sewage systems construction,
- rebuilding of district heating system according to the energy efficiency.

2.7 Meteorological conditions and air quality in Gliwice – Tomasz Misztal

He described weather conditions and air pollution as measurement results of:

- precipitation and air humidity from an automatic container station in Gliwice;
- wind direction and wind speed in Gliwice;
- wind rose for Gliwice,
- temperature (TP) in Zabrze;
- concentrations of 4 primary pollutants (NO_x, SO_x, benzene and PM10).

He pointed that quantity of exceed permissible concentrations of PM10 in a 2007 amounts 60. He listed key industrial pollution sources in Gliwice responsible for emissions to the air: point emissions, based on gas and dust emission permits, emissions from communal and domestic sources. He characterized current works of Department of Environment on “Air protection program for Silesia Agglomeration and for Gliwice”, which output will be a numeric map of pollutants, which will be developed based on information on emission sources.

2.8 Municipal Spatial Information System in Gliwice – Paweł Filipiak

He presented basic information, objectives and the role of Municipal Spatial Information System in Gliwice. The objectives of portal consists of three components: citizen, investor and city clerk are listed below:

- improvement of resource management efficiency;
- improvement of decision process efficiency;
- increasing the efficiency of services for citizens by ensuring the access to information resources;
- speedup of investment processes realised in Gliwice;
- promotion of the town.

The city clerk portal has the following useful for BRIDGE project options:

- technical GIS coverages;
- extracts and map retrieval;

- access to inventory data.

2.9 Effectiveness of distribution electric energy in Gliwice – Marcin Smołka

He showed how distribution efficiency of electric energy by Vattenfall can impact on the environment in Gliwice. He listed the number of HV/MV stations, MV transformer stations, transformers, HV, MV and LV installations, MV and LV wires, MWh - transmission of electric energy and customers. He described the investment programs related to the development or modernization of substations, modernization of LV lines on consoles, elimination of LV mains on consoles in residential buildings, modernization of non-insulated overhead MV line, modernization of lines in forest areas using PAS technology, replacement of used and damaged insulators and automation of grid nodes, replacement of MV wires of high vulnerability ratio, replacement of wires of high vulnerability and wires of insufficient transmission capacity, replacement of MV/LV transformer stations, elimination of basement and underground stations, replacement of tower stations by container or pillar stations, replacement of worn-out equipment.

He indicated environmental protection actions in Gliwice:

2001-2008 – all HV/MV and MV/LV transformers were tested for PCBs in mineral oils – no PCBs were found,

2009 - testing MV switches for PCBs in oils,

2008 – liquidation of a fire-protection umbrella roof covered with asbestos cardboards in Kozłowska transformer/switching station,

2009 – planned liquidation of fire-protection umbrella roof covered with asbestos cardboards in Myśliwska transformer/switching station,

2002 – analysis of soil and water contamination in all HV/MV stations,

2006 – completion of contaminated soil reclamation in Łabędy, Trynek and Myśliwska transformer/switching stations,

2008 – start-up of contaminated soil reclamation using a biological method in Sośnica transformer/switching station (end of 2012),

2004 – 2008 - investments to protect the environment in Trynek, Kozłowska and Łabędy transformer/switching stations,

2009 – starting the investment to protect 2 stands for operating transformers and 12 stands for spare transformers in Sośnica transformer/switching station.

3 Walking tour: Current urban planning practices in Gliwice

Walking tour to Old City Hall on Main Square in Gliwice gave the participants possibility to get one mutual idea of current urban planning practices in Gliwice from a sustainability point of view.

Study of physical conditions and spatial development plan and its environmental forecast were presented in public while the BRIDGE researchers and Gliwice experts kick-off meeting was taking place. Małgorzata Knebloch showed on maps which parts of the city are within the procedure of elaboration of the new study of physical conditions and spatial development plan. She presented two districts – Kopernik (housing district) and the Polytechnic District, which maybe useful as a the test site in Gliwice case study.

Ainhoa Gonzales Del Campo asked about procedural context and possible alternatives for proposed districts. Nektarios Chrysoulakis and Eduardo Castro considered that it would be possible to apply BRIDGE project DSS base on both districts. Participants discussion focused on probable future scenarios for both districts. It was concluded that Polytechnic District seems more suitable for BRIDGE project taking into account creation of future scenarios, availability of data for this area and benefits for the city of Gliwice.



4 Summary of afternoon session

Based on the morning presentations, key planning priorities were proposed, and consequently discussed and agreed by participants. These include: transport and mobility (particularly due to congestion as a result of the limited capacity of the current road network, but also due to the construction of a number of new roads and motorways and the associated increase on private car use, CO₂ emissions and noise issues), air quality (despite the general improvement in the area, mine-related emissions such as NO_x, SO_x, benzene and dust – PM₁₀, in particular, are still an issue), energy (due to the significant heat loss in old buildings, the increasing rates of energy consumption and the associated CO₂ emissions), expanding urban areas (issues associated with uncontrolled development), and water management (due to poor quality of surface waters, in the river running through Gliwice, and flooding areas).

The afternoon session included a focused group discussion among participants, to discuss and determine the sustainability objectives and indicators associated with each the planning priority. The objectives can be summarized as follows:

- **Improve mobility:** improve road infrastructure; minimize through-traffic in the city centre; reduce private-car dependency; improve public transport (i.e. railway); and provide alternative means (e.g. cycle-ways).
- **Improve air quality:** minimize emissions to comply with air quality standards, particularly for dust (PM₁₀ and PM_{2.5}) and CO₂.
- **Improve energy efficiency:** reduce consumption; improve insulation in old buildings (to minimize energy loss); improve insulation in the central heating infrastructure (i.e. pre-insulated pipes; and extend urban central heating and gas piping systems (to cater for detached houses and blocks of flats).
- **Controlled expansion of urban areas:** through local land use plans; provide better access to the city centre; improvement of local services; diversify the city centre functions; and enhancement of the public open space.
- **Improve water management:** through water permission requests for sustainable water use; maintain and improve the water quality; identify investments/projects that have the potential to negatively impact on water resources; and control development on floodplains/flooding areas.

These objectives will be used to determine sustainability targets (mainly based on European Directives and requirements) and indicators.

4.1 Preliminary Indicators

The overview of participants discussions leading to selection preliminary indicators is presented in annex 1. Note that the below indicators are preliminary only. These will be further discussed at the second Community of Practice meeting. The availability of data for the proposed indicators were not explored due to time constraints.

Sustainability Objective	Indicators
Improve Mobility	<ul style="list-style-type: none"> • Car ownership. • Public transport use (%). • Number of new roads built. • Number of cycle-ways provided.
Improve Air Quality	<ul style="list-style-type: none"> • Concentration of pollutants (PM₁₀, CO₂, NO_x, SO_x, CO, etc.). • Contribution of 'low emissions' to the total emissions. • Energy consumption for low emission stoves (% change)
Improve Energy Efficiency	<ul style="list-style-type: none"> • Energy losses (GJ/MW/kWh tonnes/m³/y/). • Number (%) or modernized/insulated old buildings. • Number or surface area of buildings in relation to total urban area. • Length of newly built heating systems/year. • Number of newly adjoined beneficent/year.
Controlled Expansion of Urban Areas	<ul style="list-style-type: none"> • Number of newly elaborated land use plans. • % of surface covered by land use plans. • Daily travel time to/back from the city centre. • Number of services in the city centre. • Increases on taxation.
Improve Water Management	<ul style="list-style-type: none"> • Water use by sector. • % of population connected to waste water treatment.

4.2 Alternatives

The case study in Gliwice will look at the effects of land use change on the parameters analyzed by BRIDE (i.e. air, water and energy). The Gliwice Town Development Plan is currently under consultation and, therefore, it is not a suitable case study. However, the town planner indicated that a number of areas will have more detailed planning (i.e. will be subject to local area planning). These areas include the Kopernik housing District and the Polytechnic District.

The Polytechnic District presents the most suitable real life project to be assessed by BRIDGE, as a number of studies have already been undertaken and, consequently, relevant information for the area is available. The Land Use Plan for the Polytechnic District will be probably changed according to BRIDGE DSS tool. A number of layout alternatives are being considered.

5 Annex 1. Working groups technical script

Group I. Transport

Issue:

- Improvement of road infrastructure
- Transit traffic out of the city centre
- Issue:
- Reducing the contribution of motor transport

Methods:

- Building of bypasses
- Hold on unpaid using of motorway
- Methods:
- Alternative transport (railway infrastructure – modernization)
- Building of system of bicycle pathways along internal communication chain

Group II. Priority – Air Quality

Issue:

- Fulfil air quality standards

Way:

- Shutdown of “low-emission”

Method:

- Measurements of: PM10, PM2,5

Indicators:

- Contribution of low emission in total emission
- Estimation of energy consumption for low emission stoves – changes expressed in %

Group III. Priority – Energy Efficiency (old buildings)

Issue:

- Elimination of energy loss (sending)
- Modernisation of energy infrastructure e.g. pre-insulated pipes in central heating system
- Thermomodernisation of buildings and internal installations
- Extending of urban central heating and gas piping systems, including individuals (detached houses and block of flats)

Indicators:

- Loss of applied power (GJ, MW, kWh, m³/y/tonne)
- Length of modernised system (m, %)
- Number or surface area of buildings in relation to total
- Length of newly built systems/year number of newly adjoined beneficiaries/year

Group IV. Priority – Expanding Urban Areas

Issue: Urban Sprawl

- Local land use plans
- Better access to the city centre
- Improvement of local services
- Diversification of the city centre functions
- Improvement of attractiveness of public space

Indicators:

- Number of newly elaborated land use plans
- % of surface covered by land use plans
- Daily travel time to/back centre
- Number of SME
- Taxes increase

Group V. Priority – Water Management

Issue:

- Water permissions – for sustainable water use
- Localisation of investments, which can have negative impact on water
- Maintain or improve water quality
- Flooding areas – controlled areas

Indicators:

- Water use by sector
- % of population connected to waste water treatment

6 Annex 2. Participant list

Participant list

Lp.	Imię	Nazwisko	Instytucja
1.	Nektarios	Chrysoulakis	FORTH – Hellas
2.	Ainhoa	Gonzales Del Campo	TCD
3.	Annemarie	Groot	Alterra B.V.
4.	Eduardo	Castro	University of Aveiro
5.	Katarzyna	Kobierska	City Development Bureau, City Hall Gliwice
6.	Marcin	Czyż	City Development Bureau, City Hall Gliwice
7.	Małgorzata	Knebloch	Department of Urban Planning, City Hall Gliwice
8.	Tomasz	Misztal	Department of Environment, City Hall Gliwice
9.	Anna	Szeląg	Department of Environment, City Hall Gliwice
10.	Paweł	Filipiak	Independent Department of Municipal Spatial Information System, City Hall Gliwice
11.	Marcin	Smółka	Specialist for Net Planning, Vattenfall, Gliwice
12.	Krzysztof	Straszak	Silesian Voivodeship Inspectorate of Environmental Protection in Katowice
13.	Jolanta	Szymańska	Śląski Wojewódzki Inspektorat Sanitarny w Katowicach
14.	Zofia	Cioch	Powiatowy Inspektorat Sanitarny w Gliwicach
15.	Aneta	Skoczeń	Company of Thermal Power in Gliwice
16.	Dariusz	Chabiński	Company of Thermal Power in Gliwice
17.	Ryszard	Hubar	Gasworks in Zabrze
18.	Joachim	Bronder	GIS Department, Instytut Ekologii Terenów Uprzemysłowionych, Katowice
19.	Marek	Korcz	GIS Department, Instytut Ekologii Terenów Uprzemysłowionych, Katowice
20.	Justyna	Gorgoń	Ecological Policy Department, Instytut Ekologii Terenów Uprzemysłowionych, Katowice
21.	Joanna	Piasecka	Ecological Policy Department, Instytut Ekologii Terenów Uprzemysłowionych, Katowice
22.	Janusz	Krupanek	Ecological Policy Department, Instytut Ekologii Terenów Uprzemysłowionych, Katowice
23.	Czesław	Kliś	Atmospheric Research Department, Instytut Ekologii Terenów Uprzemysłowionych, Katowice
24.	Piotr	Kubiesa	Integrated Monitoring Department, Instytut Ekologii Terenów Uprzemysłowionych, Katowice
25.	Tomasz	Staszewski	Integrated Monitoring Department, Instytut Ekologii Terenów Uprzemysłowionych, Katowice
26.	Anicenta	Bubak	Environmental Risk Analysis Department, Instytut Ekologii Terenów Uprzemysłowionych, Katowice

7 Annex 3. Programme

Sustainable Urban Planning in Gliwice

Meeting of the BRIDGE researchers and Gliwice experts

Community of Practice, CoP

City Hall Gliwice, Zwycięstwa 21 St., room 136, floor II, time 9:00-16:00

Programme

- 09.00 - 09.05: Welcome (Anicenta Bubak, Institute for Ecology of Industrial Areas, Gliwice CoP coordinator)
- 09:05 - 09:15: Introduction
- 09.15 - 09.30: BRIDGE Project (Nektarios Chrysoulakis, FORTH – Hellas; koordynator projektu BRIDGE)
- 09:30 - 09:45: CoP Meeting Objectives - Ainhoa Gonzales Del Campo, TCD, Annemarie Groot, Alterra B.V.
- 09.45 – 10.00 Decision Support System (DSS) – Eduardo Castro, University of Aveiro
- 10.00 - 10.15: Sustainable urban development of Gliwice (Katarzyna Kobierska, Head of Bureau of City Development, City Hall Gliwice).
- 10.15 - 10.30: Urban Planning in Gliwice (Małgorzata Knebloch, Department of Urban Planning, City Hall Gliwice)
- 10.30 - 11.00: Coffee break
- 11.00 - 11.15: Meteorological conditions and air quality in Gliwice (Tomasz Misztal, Department of Environment, City Hall Gliwice)
- 11.15 - 12.00: Municipal Spatial Information System in Gliwice (Paweł Filipiak, Independent Department of Municipal Spatial Information System, City Hall Gliwice)
- 12.00 - 12.15: Effectiveness of distribution electric energy in Gliwice (Marcin Smółka, Specjalista ds. Planowania Sieci, Vattenfall).
- 12.15 - 13.00: Current urban planning practices in Gliwice: Walking tour to Old City Hall on Main Square in Gliwice
- 13.00 – 13.30 Lunch
- 13.30 - 14.10: Sustainable urban planning: specific topic (water/energy/carbon /pollutants) - Ainhoa Gonzales Del Campo, TCD
- 14:10 - 15:00: The city's planning priorities, planning objectives and indicators- Ainhoa Gonzales Del Campo, TCD
- 15:00 – 15:30: Follow-up