



## Sustainable Urban Planning in Gliwice

Report of the 2<sup>nd</sup> COP meeting

28<sup>th</sup> of January 2010

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 second CoP meeting was arranged on January 28<sup>th</sup> 2010 in the City Hall of Gliwice. The sessions were subdivided in two parts. The first one was the more general illustrating the objectives and principles of BRIGDE, especially for those of stakeholders who had not participated in the first meeting. The second session was dedicated to the case study and the definition of indicators in relation to the goals and objectives determined during the first meeting.



## 2 Summary of morning session

### 2.1 *Progress in BRIDGE activities in Gliwice – Tomasz Staszewski*

During the first session, **Tomasz Staszewski** informed CoP participants and project partners about progress in BRIDGE activities related to Gliwice case study. He summarised gathered GIS data, maps and indicator data collected in relation to the Gliwice case study.

### 2.2 *Sustainable urban planning in Gliwice – Annemarie Groot*

She presented the objectives of the meeting in the context of sustainable urban planning in Gliwice:

- to continue the sharing of experience on sustainable urban planning in Gliwice between urban planners and researchers in the field of urban metabolism;
- to familiarize with the planned intervention ‘Polytechnic District’; underlying challenges, planning alternatives and collected indicators;
- to further discuss the sustainable urban planning objectives and correlating environmental and socio-economic indicators in relation to the planned intervention ‘Polytechnic District’.

These indicators can be used to assess the planning alternatives for the Polytechnic District from a sustainability point of view.

### 2.3 *Description of investigation site - Polytechnic District – Joachim Bronder*

He showed description of investigation site - Polytechnic District in relation to possibilities of using in DSS. He presented graphical version of the Multicriteria Decision Support System scheme. He presented an overview on the Bridge activities in Gliwice, illustrating data collected up to this date and the GIS data available from different sources as:

- the national Geoportal,
- the GIS coverages from Municipal Spatial Information System,
- the GIS coverages from Department of Geodesy and Cartography of Gliwice City Hall,
- the GIS resources (coverages and data) from IETU spatial information system.

Furthermore, he presented the case study area and illustrated the coverage of data and plans for this area.

Decision making situations occur at least ever four years when land use plans are revised, the procedure normally followed is the one described in the SEA directive and law, no further instruments like multi-criteria decision analysis (MCDA) are used up to now.

## ***2.4 Characteristic of scenarios for Polytechnic District providing for sustainable urban planning objectives – Justyna Gorgoń***

The partners from the local authorities proposed the area of the Polytechnic District to be used for the demonstration of the DSS in the Gliwice Case study. The area, situated north from the city centre, is actually characterized by residential and university uses and conserves some open space next to the river. The experimental application of the DSS tool will be used to examine different alternatives for transformation of existing or new land uses consisting of construction of new roads, a multifunctional centre for sports-events, including car-park facilities replacing and extending the existing stadium, the construction of new university institutes and combinations of these single options.

### **A) Alternative 1 – “Minimum”**

the minimum alternative refers to the actual municipal development plan, which foresees a new highway to improve access to the Polytechnic area from the region of Silesia.

### **B) Alternative 2- “Sport Hall”**

the “sport-hall” alternative foresees, further to the highway, the construction of a new, bigger stadium in place of the existing one, creating a multifunctional building for big sports- and music-events and the relative parking places, as already under discussion in the municipality. As the plans for the highway, also the project for a building for sports- and Music events apparently is already in an advanced planning phase (plans are exposed in the City-hall); it will have a surface of approx. 70.000 square meters or 510.000 cube meters and will be able to host between 14.000 and 15.000 spectators for the events. 800 parking places will be required.

### **C) Alternative 3 - Centre of New Technologies**

the “new technologies” consists of a project for a centre for new technologies as part of an extension of existing university institutes. The building is supposed to be projected according to the most advanced concepts for intelligent building with low emissions, with a surface of 65.000 m<sup>3</sup> and 14.000 m<sup>2</sup> usable space.

### **D) Alternative 4**

the last of the alternatives to be considered foresees the realisation of all projects considered singularly under the precedent alternatives, leading to a full load of the district, and will add the creation of a pedestrian road in the area of the university.

It was underlined that all above-mentioned changes will have impacts on the environment and on the socio-economic context of the district and entire city.

(-) negative aspects mainly related to:

- increase of environmental charges,
- increase of energy and water consumption as well as sewage generation,
- increase of traffic generated and demand for parking, as well as
- increase of noise and garbage – (related to the Sport Hall activities);

(+) positive aspects related to:

- improvement of quality of public spaces and architectural solutions,
- the increase of workplaces,
- the increase of tax-income for the municipality,
- the use of innovative and energy-saving solutions (the intervention will not or not significantly increase the energy demand).

**The impact in terms of additional tax income and working places will be difficult to be quantified.**

**Arkadiusz Dunaszewski** stated that during the planning process for roads (eg. Eastern road) cumulation of impacts with other elements which influence on environment in urban area were not assessed. In the case of DTŚ (Drogowa Trasa Średnicowa S.A. Katowice – Cross-Regional Highway Katowice – Gliwice) they try to take these cumulated effects in consideration. It should be current practice in urban planning and also in land use planning as a general rule.

**Justyna Gorgoń** answered that not now, but maybe in the future.

## ***2.5 Five years of EC measurements of CO<sub>2</sub> fluxes in Basel – Roland Vogt***

The plans for measurements related to urban metabolism for the Gliwice case study were presented. They consist of measurements of eddy covariance (EC) of CO<sub>2</sub> fluxes which are used for the determination of the CO<sub>2</sub> balance. Measurements of CO<sub>2</sub> fluxes depend on area, wind direction and height of the mast above ground level, as well as on atmospheric stability and time of a day. Depending on these parameters, measurements of CO<sub>2</sub> fluxes can be made for a range of 500-800 m around the measurement station. The measurement tower to be installed will provide measurements for the Polytechnic District, integrating existing measurement stations on the ground.

In order to illustrate the potential results of these measurements, he presented results of five years of eddy covariance (EC) measurements of CO<sub>2</sub> fluxes in Basel. The mean emission CO<sub>2</sub> in the Basel was 145 kg/m<sup>2</sup>/a and exceeded only a few times the mean world value. The amount of CO<sub>2</sub> has been decreased since 2006 due to a series of warm summers. Seasonal variations and differences between outliers and the centre were noticed. There were no differences during the weekend because lack of changes related to car traffic. Maximum measurements of CO<sub>2</sub> fluxes were found on 5-6 am before sunrises. The mean value of CO<sub>2</sub>

concentrations estimated from road transport was estimated in a range from 10-30 kg kg/m<sup>2</sup>/a. Modelled EC data has been compared to modeled data based on inventory and traffic counts.

It was underlined that up to now, measurements do not allow for the determination of sources of CO<sub>2</sub>, nevertheless this kind of analysis will be possible in the future. On the contrary, differentiation of emissions from other cities, external background, or other pollutants would be possible, although not precisely.

## ***2.6 Presentation of the collected indicators for Polytechnic***

### ***District – Anicenta Bubak, Joanna Piasecka***

**Anicenta Bubak** presented collected indicators for Polytechnic District. A further group of data came from other than GIS data sources as statistical data from service providers and data from the national GIS portal. Two kind of BRIGDE data were presented socio-economic and environmental indicators. In the first group, demographic data (e.g. number of inhabitants, population density, birth rate, mean salary) as well as number of building applications and permits were listed. The next bigger group was related to environmental factors:

- water quality, supply, demand and sewage system (indicators from Water Supply and Sewage Company in Gliwice and Poviast Sanitary Inspectorate in Gliwice),
- energy from central heating systems and from individual coal stoves, electricity and gas (data from Company of Thermal Power in Gliwice),
- air quality expressed as a number of days where air quality exceeds national guidance levels (PM<sub>10</sub>, SO<sub>2</sub>, NO<sub>2</sub>); source of data – reports of Regional Inspectorate of Environmental Protection in Katowice.

The concentration of PM<sub>10</sub> which is connected to the pollution from “low emission”, that is land based emissions from individual coal stoves used for heating by private households (11.000 apartments/16.500 local boiler rooms). It was stated that this type of emission accounts to 59% of air pollution in terms of PM<sub>10</sub>.

It was underlined by **Tomasz Misztal**, that further potentially useful air quality data for BRIDGE project is available in Department of Environment of City Hall Gliwice.

Regarding socio-economic issues it was explained that the municipal planning department uses the indicators to the number of newly elaborated land use plans for monitoring the need of updating their planning documents.

### 3 Summary of afternoon session

The second part of the meeting was dedicated to the discussion and choice of environmental and socio-economic indicators to be used for assessing the sustainability of the Polytechnic District planning alternatives discussed in the first session.

The discussion started from a revision of sustainability objectives and planning goals discussed during the first CoP meeting in Gliwice:

Sustainability Objective	Indicators
<b>ENVIRONMENTAL</b>	
<b>Improve Mobility</b>	<ul style="list-style-type: none"> <li>• Car ownership.</li> <li>• Public transport use (%).</li> <li>• Number of new roads built.</li> <li>• Number of cycle-ways provided.</li> </ul>
<b>Improve Air Quality</b>	<ul style="list-style-type: none"> <li>• Concentration of pollutants (PM<sub>10</sub>, CO<sub>2</sub>, NO<sub>x</sub>, SO<sub>x</sub>, CO, etc.).</li> <li>• Contribution of 'low emissions' to the total emissions.</li> <li>• Energy consumption for low emission stoves (% change)</li> </ul>
<b>Improve Energy Efficiency</b>	<ul style="list-style-type: none"> <li>• Energy loses (GJ/MW/kWh tonnes/m<sup>3</sup>/y/).</li> <li>• Number (%) or modernized/insulated old buildings.</li> <li>• Number or surface area of buildings in relation to total urban area.</li> <li>• Length of newly built heating systems/year.</li> <li>• Number of newly adjoined beneficent/year.</li> </ul>
<b>Improve Water Management</b>	<ul style="list-style-type: none"> <li>• Water use by sector.</li> <li>• % of population connected to waste water treatment.</li> </ul>
<b>SOCIO-ECONOMIC</b>	
<b>Improve Mobility</b>	<ul style="list-style-type: none"> <li>• Car ownership.</li> <li>• Public transport use (%).</li> <li>• Number of new roads built.</li> <li>• Number of cycle-ways provided.</li> </ul>
<b>Controlled Expansion of Urban Areas</b>	<ul style="list-style-type: none"> <li>• Number of newly elaborated land use plans.</li> <li>• % of surface covered by land use plans.</li> <li>• Daily travel time to/back from the city centre.</li> <li>• Number of services in the city centre.</li> <li>• Increases on taxation.</li> </ul>

These sustainability objectives were checked against the goals, impacts and concerns related to new developments under discussion. The main goals connected to the projects were found to consist of those connected to the improvement of mobility, the increase of occupation expected from new economic activities and increased attraction excerpted by the city. The negative impacts expected regard an increase in environmental impacts due to rising energy demand and consumption and traffic volumes.

In relation to the sustainability objectives defined during the first meeting, both projects, the sports-hall and the extension of the university support, albeit in different directions, the aim of local economic development, either in improving Gliwice's position in the inter-communal concurrence of attraction capacity creating a place for prestigious events, or relying on the development options connected to the presence of the university.

ENVIRONMENTAL		
Sust. Objectives	Indicators	Priority
<b>Improve Air Quality</b>	<ul style="list-style-type: none"> <li>• Distribution of pollutants (PM<sub>10</sub>, PM<sub>2.5</sub>, NO<sub>x</sub>, SO<sub>x</sub>, CO, CO<sub>2</sub>)</li> <li>• Contribution of ‘low emissions’ (from single boilers located in the low residential dwellings) to the total emissions</li> <li>• Total emissions (% change)</li> <li>• Relation between pollutant concentrations and wind direction</li> </ul>	1
<b>Improve Energy Efficiency</b>	<ul style="list-style-type: none"> <li>• Energy demand (kW/h/m<sup>2</sup> or % change)</li> <li>• Heating demand (kW/h/m<sup>2</sup> or % change)</li> <li>• % and structure of thermo-insulation</li> </ul>	1
<b>Improve Water Management</b>	<u>Water quality and quantity</u> <ul style="list-style-type: none"> <li>• Urban water use</li> <li>• Urban water supply</li> <li>• % of waste water treated</li> <li>• River capacity (both quality – BOD, and quantity - volume)</li> <li>• WFD quality values</li> </ul> <u>Flooding</u> <ul style="list-style-type: none"> <li>• % of “solid” area (and % of change)</li> <li>• Flooding zones</li> </ul> <u>Infrastructure</u> <ul style="list-style-type: none"> <li>• Sewage capacity (volume)</li> <li>• % of houses connected to the WWT</li> <li>• Volume of discharge</li> </ul>	      1   1
SOCIO-ECONOMIC		
Sust. Objectives	Indicators	Priority
<b>Improve Mobility</b>	<ul style="list-style-type: none"> <li>• Number of pedestrian streets (Km)</li> <li>• Public transport use (%)</li> <li>• Length of new roads built (Km)</li> <li>• Length of cycle-ways provided (Km)</li> <li>• Number of parking places built up</li> </ul>	1
<b>Controlled Expansion of Urban Areas</b>	<ul style="list-style-type: none"> <li>• Number of administrative decisions</li> <li>• Accessibility of district from Silesia metropolitan area (hours to/from)</li> <li>• Number of specific services in the district</li> <li>• % of new public space</li> <li>• Increase on incomes</li> </ul>	2 1 4 4 3

Further to the emissions from motorways, no relevant additional pollution in terms of  $PM_{10}$  is to be expected from the new developments.

Subsequently the indicators, discussed and defined during the first meeting, have been discussed and revised by the participants, who split up into smaller thematic groups.

(see also document “Revised Planning priorities and Indicators Gliwice.doc”)



## 4 Conclusions

The participants, working in subgroups, defined policy objectives in terms of environmental, social and economic concerns, connected to the planning alternatives under exam and the indicators which are able to measure progress towards these goals. They concluded that new technologies conducting to energy saving would solve problems connected to air pollution. Decision makers took into consideration traffic in the city and the issues connected to the management of traffic/transport. The major problem is probably connected to the compliance with the objectives of the Water Framework Directive, which will be more difficult in presence of expansions of Urban Areas.



## 5 Walking tour

According to programme (annex 2) Gliwice site seeing tour to New Gliwice in Polytechnic District was planned. Gliwice site seeing tour was cancelled because of long and fruitful discussion.

The few participants very interested in eddy covariance methodology, air pollution and modelling went to Polytechnic District. This group looked for the best localisation for the mast taking into account meteorological conditions. It was concluded that mast would be mounted on one of faculties of Silesian Technical University Gliwice.



## 6 Annex 1. Participant list

### Participant list

Lp.	Imię	Nazwisko	Instytucja
1.	Annemarie	Groot	Alterra B.V.
2.	Ainhoa	Gonzales Del Campo	TCD
3.	Margaretha	Breil	Fondazione Eni Enrico Mattei
4.	Roland	Vogt	Institut für Meteorologie, Klimatologie und Fernerkundung
5.	Christian	Feigenwinter	Institut für Meteorologie, Klimatologie und Fernerkundung
6.	Eduardo	Castro	University of Aveiro
7.	Katarzyna	Kobierska	Bureau of City Development, City Hall Gliwice
8.	Marcin	Czyż	Bureau of City Development, City Hall Gliwice
9.	Małgorzata	Knebloch	Department of Urban Planning, City Hall Gliwice
10.	Tomasz	Misztal	Department of Environment, City Hall Gliwice
11.	Paweł	Filipiak	Independent Department of Municipal Spatial Information System, City Hall Gliwice
12.	Marcin	Smołka	Specialist for Net Planning, Vattenfall, Gliwice
13.	Jolanta	Szymańska	Silesian Voivodeship Sanitary Inspectorate in Katowice
14.	Zofia	Cioch	Powiat Sanitary Inspectorate in Gliwice
15.	Artur	Wójcik	Regional Office of Water Management in Gliwice
16.	Ryszard	Hubar	Gasworks in Zabrze
17.	Arkadiusz	Dunaszewski	Drogowa Trasa Średnicowa S.A. Katowice Cross-Regional Highway Katowice – Gliwice
18.	Jan	Gregorowicz	INKOM S.C. Katowice
19.	Józef	Pastuszka	Silesian Technical University Gliwice
20.	Walter	Mucha	Silesian Technical University Gliwice
21.	Joachim	Bronder	GIS Department, Institute for Ecology of Industrial Areas, Katowice
22.	Justyna	Gorgoń	Ecological Policy Department, Institute for Ecology of Industrial Areas, Katowice
23.	Czesław	Kliś	Atmospheric Research Department, Institute for Ecology of Industrial Areas, Katowice
24.	Piotr	Kubiesa	Integrated Monitoring Department, Institute for Ecology of Industrial Areas, Katowice
25.	Tomasz	Staszewski	Integrated Monitoring Department, Institute for Ecology of Industrial Areas, Katowice
26.	Anicenta	Bubak	Environmental Risk Analysis Department, Institute for Ecology of Industrial Areas, Katowice

## **7 Annex 2. Programme**

### **Sustainable Urban Planning in Gliwice**

Second Meeting of the Bridge researchers and Gliwice experts

Community of Practice, CoP

**Agenda of Second CoP meeting in Gliwice**

**28<sup>th</sup> of January 2010**

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

### **Programme**

- |               |  |
|---------------|--|
| 09.00 – 09.15 | Progress in BRIDGE activities in Gliwice – Tomasz Staszewski   |
| 09.15 – 09.25 | Sustainable urban planning in Gliwice – Annemarie Groot  |
| 09.25 – 09.45 | Description of investigation site - Polytechnic District – possibilities of using in DSS – Joachim Bronder   |
| 09.45 – 10.15 | Characteristic of scenarios for Polytechnic District providing for sustainable urban planning objectives – Justyna Gorgoń  |
| 10.15 – 10.45 | Five years of EC measurements of CO <sub>2</sub> fluxes in Basel – Roland Vogt   |
| 10.45 – 11.15 | Coffee break   |
| 11.15 – 11.30 | Presentation of the collected indicators for Polytechnic District – Anicenta Bubak, Joanna Piasecka  |
| 11.30 - 13.30 | Environmental and socio-economic indicators for assessing the sustainability of Polytechnic District planning alternatives – Ainhoa González Del Campo, Margaretha Breil |
| 13.30 - 14.30 | Lunch  |
| 14.30 - 15.30 | Gliwice site seeing tour (New Gliwice, Polytechnic District)   |