INTEGRATION OF THE BUILDING TYPOLOGY AND THE DECISION SUPPORT SYSTEM IN THE ENERGYCITY PROJECT

Urban Energy Conference, EnergyCity Mid-term Conference

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1. Thermo-mapping and decision support system

A major output of the EnergyCity project will be the spatial decision support system (SDSS or DSS):

Who will use it?
Urban energy planners and decision makers of municipalities, housing associations, regional and national authorities.

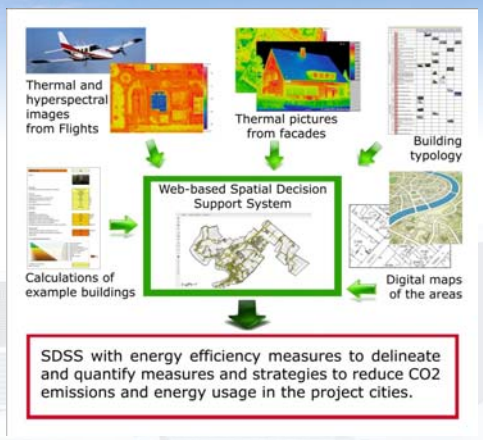
How?
It will be a web-based, online cartographic tool available for all potential users free of charge.

For what?
The google-maps-like application will contain energy-related information about every individual building that can be found on the digital map.

2. Technical information of building units

1. Average roof temperature and roof heat loss
2. Building type
3. Available energy sources on the building site
4. Results of a thermographic ground survey
5. Real consumption data of sample buildings based on energy bills
6. Energy certificates of sample buildings
7. Photos of sample buildings
8. Rough geometric data (volume of the building, total surface area, glazed ratio) for sample buildings.

Energy-related data integration of the SDSS



3. Area selection and typology - Budapest

The selected area in Budapest:

- The selected area is appr. 40 km^2

- 2 km wide, 20 km long strip crossing the heart of the city from South-West Buda to North-East Pest

- It covers parts of 9 districts including most of the typical building types of Budapest (family buildings, historic buildings, courtyard buildings typical for the 19th century, housing estates of buildings made with industrialized technology in the 70s and buildings from the period between the two wars)

Flight mission area in Budapest

4. The structure of the typology

The basic objective of establishing a typology: providing additional information for the SDSS in order to model the energy performance of the building stock in the city of Budapest.

Construction period: the approximate year of the construction is an essential data to estimate the building materials and structures

Building function (residential/public buildings): an important information to estimate the net demands of the users (daily water demand, fresh air demand, etc.)

Building technology: traditional and industrial technologies are separated (which can't be defined by the year of construction)

Building geometry: the size, the geometry and the connection to the surrounding buildings: this information can give a good approximation from the rate of the volume and cooling surface.

Building typology overview residental buildings, Budapest

			before 1945	1946-1966	1967-1980	1981-1990	1991-2006	after 2006
			A	B	C	D	E	F
RESIDENTIAL BUILDINGS	SINGLE FAMILY HOUSES	1	linear layout					
		2	cubic type house					
		3	two storey house					
		4	row houses					
	MULTI RESIDENTIAL BUILDINGS WITH TRADITIONAL TECHN.	5	freestanding multi-flat building, small					
		6	freestanding multi-flat building, medium					
		7	freestanding multi-flat building, large					
		8	downtown multi-flat building in city blocks, small					
		9	downtown multi-flat building in city blocks, medium					
		10	downtown multi-flat building in city blocks, large					
	MULTI RESIDENTIAL BUILDINGS WITH INDUSTRIAL TECHN.	11	4-5 storey building, built with prefabricated sandwich panels					
		12	10-11 storey buildingbuilt with prefabricated sandwich panels, linear-type					
		13	10-15 storey buildingbuilt with prefabricated sandwich panels, tower-type					

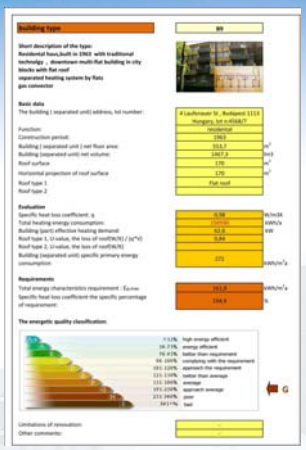
Building typology overview public buildings, Budapest

			before 1945	1946-1966	1967-1980	1981-1990	1991-2006	after 2006
			A	B	C	D	E	F
PUBLIC BUILDINGS	OFFICE BUILDINGS	14	office buildings, small					
		15	office buildings, medium					
		16	office buildings, large					
	CULTURAL BUILDINGS	17	museum, theatre, cinema					
		18	church, high monuments					
	PUBLIC HEALTH BUILDINGS	19	leisure centers					
		20	medical centers, hospitals					
	EDUCATIONAL BUILDINGS	21	educational buildings, medium					
		22	educational buildings, large					
	COMMERCIAL BUILDINGS	23	banks, hotels,shopping centers, medium					
		24	banks, hotels,shopping centers, large					
		25	industrial buildings, medium					
		26	industrial buildings, large					

For making the model more realistic showcase examples from as many building types as possible have to be defined

We use a template (3 pages) which is based on a detailed energy survey and calculation of different type of buildings

The first page of the template: includes the main data of the energy evaluations (in Hungarian national context) and basic data (especially concentrated of the roof type and geometry)



Verification of the model

- We have heating consumption data for all the buildings in Munich
- Correlation analysis possible

5. Conclusions

- Different data sources
- Different time and resource demand
- Different application possibilities
- Different accuracy of results