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# Wilhelm-Ostwald- Gymnasium -

**1st municipal passivhouse of the City of Leipzig  
in the focus of the EU-project EnerCitEE/ EEMTE**



## Background - I

### **Participating in the EEA (resolution of the City council 19th March 2008)**

start of process of the European Energy Award (EEA) in december 2009

successful audit in autumn 2011

continuation with ambitious aims (upgrade to gold award)

### **Binding targets from communal climate alliances 1994, 2008 and 2010**

climate protection concept 2005, updated climate protection concept 2011:

climate program is in progress to realise measures from the concept

## Background - II

### Energy guideline, last updated (resolution of the City council 19th April 2011)

To be applied with new construction and modernization of communal buildings:

Reduction of CO<sub>2</sub> (50 %\*)+ energy consumpt. (45 %\*), more of renewable energies

Recommendations for technical realization (f.e. priority for district heating)

\*) 2005 - 2020

### Purchase of renewable energies in energy supply for municipality

from 2012 for 2 years (1 year option) purchase of 50% of power from ren. energies

from June 2012 for 2 years (1 year option) purchase of 3% of biogas share in gas

## Background - III

### Resolution on passive houses (city council) 19th March 2008

Standard of passive houses for city owned and municipally used buildings

If the realisation is economical, then in city owned and municipally used buildings the standard of passive houses is to be applied as the priority construction method (at least energy saving regulations (EnEV) -30%)

Application of passive house components in case of renovations

Aiming to apply passive house standard during renovations, too

Aiming to apply passive house standard for rented buildings and for the LWB, too



## Examples for refurbishment and new buildings

- Conversion into passive house: Wilhelm-Ostwald-Schule
  - refurbishment of house II completed in october 2011
  - primary energy demand: 59,26 kWh/m<sup>2</sup>a\*) planning as passive house
  - primary energy demand: 213,92 kWh/m<sup>2</sup>a\*) as requested by EnEV 2009
  - \*) design numbers
  
- more municipal passive houses actually planned and in realization:
  - New building of the Pablo-Neruda-Schule
  - New building of the Erich-Kästner-Schule
  - New building of the 3. Schule
  - New building of 3 fire stations

## Wilhelm-Ostwald-Gymnasium

- was built in 1972: 2 almost identical type buildings connected by a smaller new building (entry and auditorium – not passive house)
  - Building envelope:
    - insulation of outer wall 25 cm ( WLG\*) 035)
    - walls touching the ground: perimeter insulation 25 cm ( WLG\*) 040)
    - roof insulation 33 cm bis 58 cm tapered insulation (WLG\*) 035)
    - bottom plate (concrete subbase) on 14 cm perimeter insulation (WLG\*) 040)
    - + 8 cm (WLG 040) thermal insulation in cellar bottom
    - replacement of all windows:  $U_w=0,8 \text{ W/Km}^2$
  - additional heating: district heating of Stadtwerke Leipzig,  $PEF=0,31$  (291 KW)
  - central ventilation system at 3 levels depending on time schedule and presence, heat recovery of ventilation appliance up to 90 %
  - energy saving lighting, in classrooms steered by presence detectors
  - shading, steered by light and presence detectors
- \*) thermal conductivity class (TCC)

## Energy efficient buildings = Energy saving?

- enormous changes on buildings because of increasing legal requirements and self-imposed obligations and regulations regarding the energy efficiency of buildings of the municipality of Leipzig (e.g. passive house)
  - New problem areas concerning the consumption of heating and the behaviour regarding the ventilation as well as hot weather during summer
- it is not possible anymore to trust traditional knowledge and behavior
- energy efficiency of communal buildings has to become accessible, too through the exertion of influence on the user's behavior as well as by influencing the actions of the operators

## → Part of our work in EnerCitEE



Partners: Poland (LeadPartner), 2x France, Sweden

Subprojekt EEMTE:

**E**nergy **E**fficiency in **M**unicipality - **T**raining and **E**xchange of experience

## Focus of the work in Leipzig

- Targeted area of activity: energy efficient schools, focus: passive house)
- Target groups: janitors / facility managers, educational and administrative staff of schools
- Different versions for information, further education and training for the users of passive house schools (example Wilhelm-Oswald-School) are being developed and tried
- Praxis-relevant materials for information is currently produced

## Pilot seminars

- training concept for different target groups of civil servants:  
Janitors, facility managers, personnel of schools and the municipality
  - subject of the 4 pilot seminars: “Passive houses - principles and particularities from the execution of building work to its final use” -  
on the example of the first passive house school in Leipzig  
- the Wilhelm-Ostwald-Gymnasium
- consumption of heating and the behavior regarding the ventilation as well as hot weather during summer
- backgrounds and objectives concerning the energy policies of the City of Leipzig
- adapted specifically to the target groups regarding their content and complemented with chances for discussions and practical parts (guided tour through the school building, conduction of a Blower-Door-Test etc.)



Pilot-seminar (for janitors) – demonstration of a Blower-Door-Test 18<sup>th</sup> Nov 2011



Pilot-seminar for the teachers of the Wilhelm-Ostwald-Gymnasium 11<sup>th</sup> Sept 2012

## Site visits

- exchange of experience with other public institutions regarding the topic of the energy efficient operation of buildings
- led to
  - University of Leipzig - campus (Focus: energy management)
  - HTWK (Leipzig University of Applied Sciences, Faculty of Mechanical and Energy Engineering ( Focus: actual situation and the key aspects of teaching and research)
  - first Saxon passive house school in Grimma (Focus: experiences during the period of commissioning and with the inclusion of the administrative staff)
  - visit of the Passive house exhibition of the Saxon Energy Agency (SAENA), connected with an additional expert seminar for employees in the building department in cooperation with the SAENA



Site-visit to the newly built campus of the University of Leipzig 14<sup>th</sup> Dec 2011



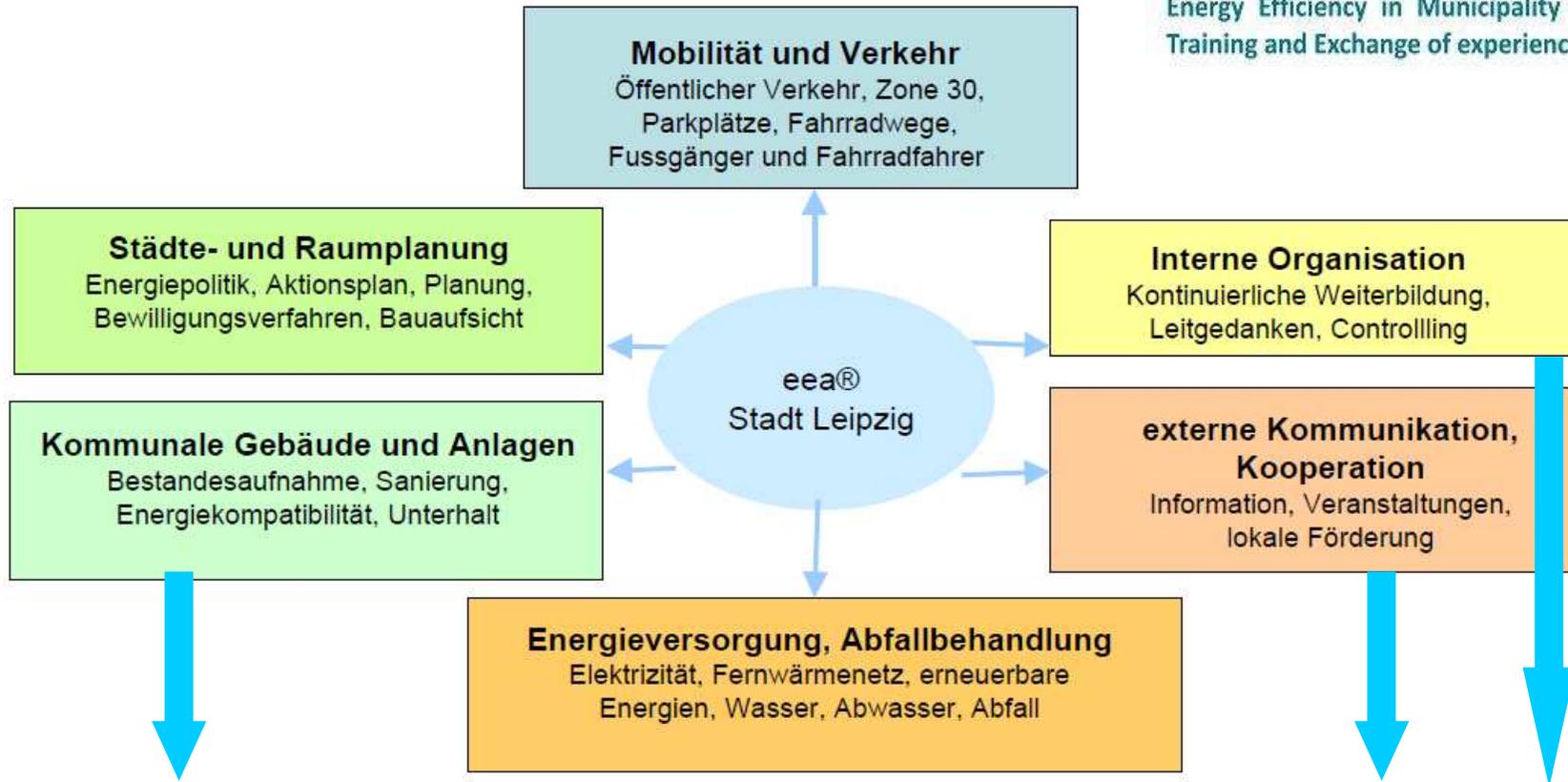
Site visit to the 1st passive house school in Saxony – “Waldschule Grimma”  
(Refurbishment 2006-2007) 9<sup>th</sup> July 2012

## Informationsmaterial

- passive house-training-concept for different target groups in municipalities
- online-module: on the training platform “Energy efficiency in Saxony”, managed by SAENA to support the civil servants with the consolidation and reactivation of the gained basic knowledge
- Main document will finished in 2012:
  - user manual for passive house school on the example of the Wilhelm-Ostwald-Gymnasium
  - flyer with short summary of the main content of the user handbook

## How the pilot-measures can be consolidated

- Important conditions for the long-term effectiveness of the started activities are
  - The approving of community politics regarding the acceptance of basic training for employers, for them to recognize possibilities of influence on energy efficiency in their work and its implementation in all management levels
  - Future networking of educational programs with further processes concerning energy efficiency and technical matters such as the European Energy Award, the implementation of the climate protection concept, the implementation of the passive house regulations and the planned monitoring of passive house schools
  - The design of long-lasting instruments for the consolidation of the knowledge base and for reference like the user manual for passive-house-schools developed for the Ostwald-Gymnasium, which needs to be adapted and further developed for new or renovated buildings



**Tasks of the building department in the EEA**

- establishment of relevant energetic building benchmarks  
(Usage of heating, electricity, water, Shares in EE)
- Optimization of operations, planning of renovation,
- Training of janitors and maintenance staff

**Possibilities through EnerCitEE for the EEA**

- Training, information, events, e.g. seminars
- regional and trans-regional communication and  
exchange of experiences

Image source: SAENA, 22.10.2009

## Placement into the project on monitoring Leipzig's passive house schools

- Pablo-Neruda-School (new building), Erich-Kästner-School (new building), 3th School (new building), **Wilhelm-Ostwald-School** (retrofit)
- Planning, construction and utilization phases (first two years)
- Establishment of technical (real energy consumption, quality of air in rooms) and **social (training of users, behaviour, satisfaction) Parameters**
- Targeted partners: BmVBS, SAENA, HTWK, **EnerCitEE (EEMTE)**
- planned start in the end of 2012

Vielen Dank für  
Ihre  
Aufmerksamkeit!

