MEETINGS

Alicante Meeting

The 6th meeting of the working phase of Annex 56 took place in Alicante, Spain, on March 10th, 11th and 12th 2014. The 20 participants from 9 countries, were updated about the developments of the subtasks, in particularly the first deliverables of subtask A — methodology, generic calculations, LCIA and co-benefits, and subtask C — Case studies. Those deliverables (methodology report, and shining examples brochure) were concluded and send to the IEA ExCO reviewers for final revision and approval.

Brno Meeting

On the 15th, 16th and 17th September 2014, the 7th meeting of the working phase of Annex 56 took place in Brno, Czech Republic, and counted 25 participants, some of which were new in the project.

A status of the project was made, focusing on the upcoming deliverables of the different subtasks, and the necessary developments to achieve those outcomes, in particular the Renovation Guidebook. The methodology report and the shining example brochure were approved by the IEA ExCO, making these documents the first deliverables to be finished. Both documents are available for download on the project’s website.

A set of reports regarding different work packages conclusions are being prepared and will allow to have a deeper understanding of the results achieved in the project. As usual in these meetings a technical visit on energy renovated buildings took place, focusing particularly a school and a residential building in Brno-Nový Lískovec.

The Methodology Report is a very important document to be used by the European Commission in the context of preparing the EU Member States National Renovation Plans.

There was also the opportunity to visit a energy renovated neighbourhood, in the outskirts of Alicante.

EBC graphic guidelines

In the current year, and following the change from ECBCS to EBC, there was the need to redesign all the graphic contents regarding EBC projects, where Annex 56 is included.

In further consequence all produced outcomes have to follow those guidelines, including the website, newsletters, reports and all written information.

This is the first newsletter reflecting those changes, whilst the project website and documents were already changed.
IEA EBC INDUSTRY WORKSHOP

Annex 56 Industry Workshop: September 16th 2014
Brno-Nový Lískovec

The Annex 56 Industry Workshop took place in a Meeting room of borough office Brno-Nový Lískovec. Besides the participants of the Annex 56 meeting there were representatives of municipality, companies dealing with sustainable building and colleagues from Brno University of Technology.

The workshop followed immediately after the visit of two Czech shining examples (elementary school Kamínky 5 and block-of-flats Koniklecová 4), therefore the presentations and subsequent discussions were focused on sharing of knowledge and experience related to efficient, especially between the representatives of borough office and Annex 56 participants. Main topics of discussion were:

- Standard vs. Energy-efficient renovations
- Necessity of cooperation between investors, designers and contractors
- Higher renovation costs vs. lower operating costs
- Experience with energy management after renovation

Program

Welcome notes
- Jana Drápalová, mayor of Brno-Nový Lískovec

EBC Annex 56 overview
- Manuela Almeida

Results from parametric calculations
- Roman Bollinger

Case studies of Annex 56
- Kirsten Engelund Thomsen

Case studies of Annex 56
- Jiří Sedlák

Renovation from the view of sustainable buildings
- Zuzana Svobodová
Shining examples brochure

Within Annex 56, the gathering of case studies is one of the activities undertaken to reach the overall project objectives because it is a recognized fact that the process of decision-making has to be strongly supported by success stories from real life and experiences and lessons learned from practice.

The specific mission of the case study activity of the Annex 56 project is to provide significant feedback from practice (realised, ongoing or intended renovation projects) on a scientific basis. The main objectives of this work are:

- To understand barriers and constraints for high performance renovations by a thorough analysis of the case studies and feedback from practice in order to identify and show measures to overcome them;
- To align the methodology under development in Annex 56 with practical experiences;
- To support decision-makers and experts with profound, scientific based information (as result of thoroughly analysed case-studies) for their future decisions;
- To show successful renovation projects in order to motivate decision-makers and stimulate the market.

The brochure presents the Shining Examples collected so far in a fixed format showing for each demonstration project pictures and easily comprehensible graphics, highlighting the added value of the renovation process. The brochure presents 9 Shining Examples from 6 countries. The gathering of shining examples continues through the entire lifetime of Annex 56 and all examples will be presented in a final document at the end of the project. At the end of the project is expected to have 18 Shining Examples from 9 countries.

The “Shining Examples” are gathered mainly for motivation and stimulation purposes, highlighting the advantages of the energy and carbon emissions cost optimized renovation. The focus is to highlight advantages and innovative (but feasible) solutions and strategies. A cross-section analysis of the projects has also been carried out to identify similarities, differences and general findings. The results of this analysis are presented in 5 sections covering: barriers/solutions, anyway measures, rational use of energy/renewable energy supply (RUE/RES) balance of measures, co-benefits and country/climate specific measures.

As mentioned before, the shining example brochure as well as each individual example, are available for download: http://iea-annex56.org/index.aspx?MenuID=4&SubMenuID=17

Each partner was asked to provide additional case studies, in order to increase the range of building renovations compiled in the brochure.

Co-benefits

Some preliminary results regarding co-benefits identified in a building renovated in Oporto, Portugal were presented in the meeting, and allowed to have a better understanding of the additional benefits (apart from energy and CO₂ emissions) perceived by the tenants, when a building is renovated.

The evaluation of building renovation measures normally considers only the energy savings and the costs, disregarding other relevant benefits and thus, significantly underestimating the full value of improvement and re-use of buildings. These benefits can be felt at the building level (like increased user comfort, fewer problems with building physics, improved aesthetics), but also at the society level (like health benefits, job creation, energy security, impact on climate change).

It is a main goal of Annex 56 to give guidance to building owners and promoters to integrate co-benefits in their cost/benefit assessment and subsequent decision making for energy related building renovation and to policy makers to highlight the relevance of considering the broader impact of energy policies in several other areas of policy making.
Building Renovation Examples

On each meeting it is common to have a site visit, where some examples of refurbished buildings are shown to the participants. This allows to have a wider understanding towards building renovation, because it is possible to see different strategies and approaches, depending on the country / city that hosts the meeting. This particular newsletter compiles two site visits, the one that took place in Alicante, Spain as well as Brno, Czech Republic.

Additional and detailed information about those examples are available in the following pages.

Alicante, Spain

- Site: San Juan XXIII neighborhood Alicante, Spain
- Altitude: 83 m
- Heating degree days: 856 (base temp 18°C)
- Owner: Municipality of Alicante
- Architect: IVE—Instituto Valenciano de la Edificación
- Energy concept: IVE—Instituto Valenciano de la Edificación

Project Summary

- San Juan XXIII is a social housing neighbourhood located in Alicante, a city in eastern Spain, which has a south Mediterranean climate: mild temperatures in winter and very hot summers.
- The neighbourhood has high social problems and several signs of decay. There are high proportions of low-income people and a high proportion of immigrant population. Moreover, it is disconnected from the rest of the city, in an area of difficult access.
- The case study involves 324 dwellings built in 1967. It was built in order to respond to a high demand in housing.
- The neighbourhood typology are low-rise isolated buildings with low quality.
Description of building

The main goal of the project was the renovation of facades and roofs to improve the quality, comfort and energy efficiency of buildings.

The study developed by IVE was to provide an environmental assessment of the buildings in their current state and in their final state, after the energy efficiency improvements. The study considered different options for saving energy in terms of making the project as cost-effective as possible.

<table>
<thead>
<tr>
<th>Element</th>
<th>U-Value before renovation W/m²K</th>
<th>U-Value after renovation W/m²K</th>
</tr>
</thead>
<tbody>
<tr>
<td>Façade</td>
<td>1.64</td>
<td>0.47—0.83</td>
</tr>
<tr>
<td>Roof</td>
<td>1.61</td>
<td>0.59</td>
</tr>
<tr>
<td>Windows</td>
<td>5.70</td>
<td>3.54</td>
</tr>
</tbody>
</table>
Project summary
Energy concept—renovation to low-energy standards.
Intention for the renovation:
- Modernization of aging school building
- Improvement of inner conditions
- Reduction of overall energy consumption to comply with low-energy standards

Site: Kamínky 368/5
634 00 Brno-Nový Liskovec
Czech Republic

Altitude: 312 m
Heating degree days: 3712 (base temp 13°C)
Cooling degree days: 0

Owner: Statutory City Brno
Architect: MENHIR project s.r.o.
Energy concept: MENHIR project s.r.o.
Building envelope before the renovation

The construction of the building corresponds with the period of origin – superstructure is made of prefabricated reinforced concrete frame MS-OB with basic length module 6.0 m. Walls are made mostly of 300 mm thick, hollow core ceramic panels. Part of the walls is built using aerated concrete blocks.

All buildings have flat roof. Superstructure of the roof is made of timber or steel trusses and reinforced concrete panels. The roof was insulated by 50 mm of EPS on a sloping layer of gravel. Bituminous sheets with mineral granules (and Ti-Zn flashing) were used as a covering and waterproofing layer of the roof.

Doors and windows were wooden, steel or aluminum, using single or double glazing.

The most heat was lost by the buildings envelope due to the low thermal resistance (U-values) of the structures and bad air tightness (especially around windows).

<table>
<thead>
<tr>
<th>Element</th>
<th>Area, m²</th>
<th>U-Value before renovation, W/m²K</th>
<th>U-Value after renovation, W/m²K</th>
</tr>
</thead>
<tbody>
<tr>
<td>Façade</td>
<td>3873</td>
<td>1.06</td>
<td>0.20</td>
</tr>
<tr>
<td>Ceiling</td>
<td>5325</td>
<td>0.97</td>
<td>0.15</td>
</tr>
<tr>
<td>Windows, doors</td>
<td>2505</td>
<td>1.50 - 5.65</td>
<td>1.05 - 1.70</td>
</tr>
<tr>
<td>Roof</td>
<td>5325</td>
<td>0.58 - 0.86</td>
<td>0.15 - 0.16</td>
</tr>
</tbody>
</table>

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Heating, ventilation, cooling and lighting systems before renovation

Heating and DHW systems are supplied by district heating from a nearby (gas burning) heating plant to central (water-water) heat exchanger. No cooling system is installed in the school.

Most of the school uses natural ventilation by windows. Individual ventilators were installed in store rooms, toilets and bathrooms. Only block B had mechanical ventilation.

Bulbs and fluorescent tubes were used for lighting.

Description of building before renovation (building situation, building system, renovation needs and renovation options.

The buildings of Elementary School Kamínky 5 were constructed in 1987. The school consist of 3 blocks connected via multi-storey corridors. The main block (A) where the classrooms and offices are located, kitchen and cafeteria block (B) and gymnasium (C). The capacity of the school is approx. 380 students and 44 staff members. Total net heated area of school buildings is 7296 m².

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Overall Energy Saving Concept

Main goal of the renovation was to improve the user comfort and energy performance of the school buildings.

After a debate it was decided that the school's envelope, heating, DHW and mechanical ventilation systems will be renovated according to low-energy standards.

It was decided to install a photovoltaic power plant on the roof to improve the environmental impacts of the building's use.

Building

Additional thermal insulation (ETICS) made of expanded (EPS) or extruded (XPS) polystyrene or mineral wool was installed on the walls and roof. Also new waterproofing was installed on the roof. New U-values of the building's envelope vary between ≤ 0.16 W/m²K (roof) and ≤ 0.20 W/m²K (walls).

Most of the doors and windows in the building's envelope were replaced. New doors and windows have plastic or aluminum frames with double and triple glazing, with U-value ≤ 1.70 W/m²K. Also a new exterior shading system was installed on classrooms’ windows to improve the user's (students and staff) comfort during sunny weather.

Calculated energy savings:

Thanks to improved thermal properties of the school buildings' envelope and renovation of the heating system the heating energy consumption was reduced by almost 69 %. Losses in the distribution networks are not included in the assessment.

Retrofitting of heating and DHW system lead to 11 % savings of energy required for DHW production and distribution.

Energy production:

Photovoltaic power plant installed on the roof of the school’s block A has maximum calculated output 66.42 kWp.

Between September 2009 (installation) and February 2014 the power plant produced 334.39 MWh of electricity.

Building Services

Heating: New compact heat exchanger station is located on the ground floor of the main school building (block A). The school is heated using 276 (112 original) cast-iron radiators and 8 steel-stone heating desks. The radiators are fitted with thermostatic valves and heads. Steel pipes with equithermal regulation are used to supply the radiators. The temperature gradient in the heating system is 75/55°C. Heating system’s efficiency is 95 %

Ventilation: During the renovation the original mechanical ventilation system in block B was removed and replaced by new one (with heat recovery). System’s maximum output is 15000 m³/h of fresh air. Ventilation of storerooms in the basement of block B uses separate ventilation (500 m³/h). The boiler room in block A is ventilated by an overpressure system (500 m³/h). All toilets and bathrooms are ventilated using manually operated ventilators with timers. Storage rooms in the school (except block B) can be ventilated naturally by windows or by new manually operated supplementary ventilators (also manually operated with timers). All ducts are made of galvanized steel and have rubber silencers to reduce the noise (< 50 dB).

Photovoltaic: A photovoltaic power plant was built on the part of the A block’s roof during the renovation. 324 PV panels (415.53 m²) with output of 205 Wp per panel were installed. The calculated peak output is 66.42 kWp. The panels are installed at optimum 30° incline and are oriented to the south.