

## Report

<b>Event</b>	<b>2<sup>nd</sup> Train the Trainers' event</b>
<b>Project</b>	<b>"From Estonia till Croatia: Intelligent Energy saving measures for municipal housing in Central and Eastern European Countries"(INTENSE)</b>
<b>Time and place</b>	August 24 - 26, 2010, Tallinn, Estonia
<b>Reporter</b>	Sandra Oisalu (Baltic Environmental Forum Estonia)

---

This report equals to Deliverable 5.5.

### Training background and objectives

The 2<sup>nd</sup> Train the Trainers' event was organized by Baltic Environmental Forum Estonia in cooperation with German experts from "e.u.[z.]" and "Auraplan" in the frame of the project "From Estonia till Croatia: Intelligent Energy Saving Measures for Municipal housing in Central and Eastern European Countries (INTENSE)", which is financed by Intelligent Energy – Europe program. 28 partners - multiplier organizations, municipalities and project experts - carry out the project in 11 Central and Eastern European countries and in Germany. The main objective of the project is to influence building developments at legislative, technical, planning and consumer behavior level.

The training was implemented as a part of the INTENSE work package – Stakeholders' Training Program. The goal of the work package is to train those stakeholder groups who are responsible for implementing the concept or parts of it developed in INTENSE work package related to holistic planning of housing for energy optimized municipalities. This does not only involve the immediate decision-makers on municipal level, but also the executing stakeholders, such as architects, engineers or craftsmen who will need to implement specific measures at site.

In frame of the work package a training program for stakeholders will be elaborated. The training program includes following modules:

1. Legislation
2. Quality control
3. Settlement planning and design principles
4. Energy carriers and renewable energy sources
5. Ecological materials
6. Cost-benefit assessment
7. Building physics
  - a. Avoiding mould
  - b. Thermal bridges
  - c. Vapour transfer
  - d. Airtightness
  - e. Inside insulation
8. Construction of elements
9. Systems engineering
  - a. Heating and domestic hot water
  - b. Cooling
  - c. Ventilation

In order to familiarize future national trainers – subcontracted training institutions (for technical modules) and country coordinating organizations (for “soft” modules) from target countries - with the INTENSE training program topics and give input to following national trainings in target countries two Train the Trainers events have been carried out in order to discuss topics to be addressed with the training program.

Objective of the training program is to find out and present to the target groups specific issues about new buildings and refurbishment under the focus of current and prospective standards of the EU and national requirements in an holistic way. Main target groups of the training program are engineers, architects and craftsmen.

Objective of the 2<sup>nd</sup> Train the Trainers’ event was to have discussions among the future trainers related to training program modules: systems engineering, energy carriers and renewable energy sources, cost benefit assessment and settlement planning and design principles. Additionally the best practice criteria developed in the frame of INTENSE project, awareness raising strategies and adaptation to climate change were introduced. Separate part of the 2<sup>nd</sup> Train the Trainers’ event concentrated on addressing craftsmen, which is one of the main target groups of the training program and INTENSE project.

On the event were participating 40 people including representatives from subcontracted training institutions and INTENSE country coordinating organizations from 11 countries and German experts as trainers.

## Proceedings

### Plenary session

**Ingrida Bremere** from Baltic Environmental Forum Latvia opened the 2<sup>nd</sup> Train the Trainers’ event by welcoming all participants and shortly introduced the INTENSE project and the training program.

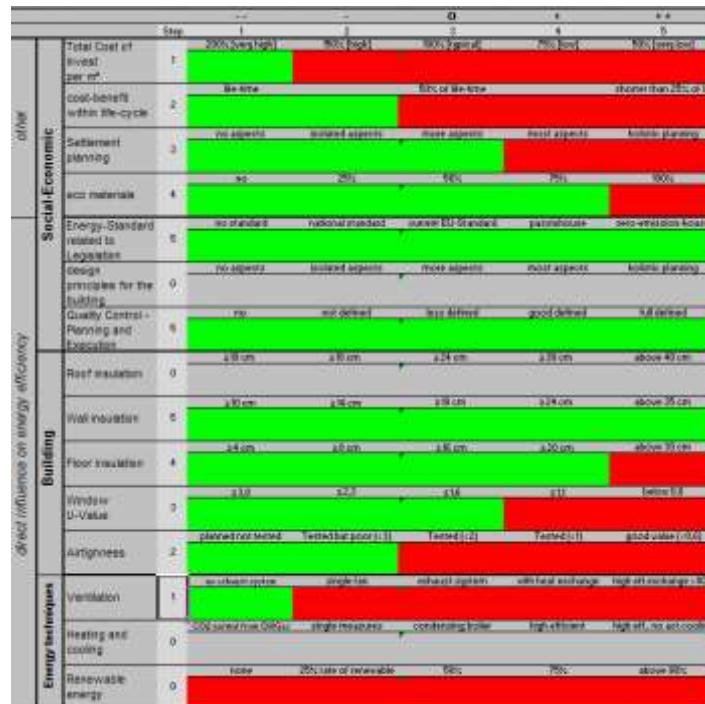
**Jörg Faltin** from architecture bureau “Auraplan” introduced the best practice criteria developed in the frame of INTENSE project. More detailed information about the criteria can be found from - ([http://www.intense-energy.eu/uploads/tx\\_triedownloads/WP3\\_D32Selection\\_criteria\\_FINAL.pdf](http://www.intense-energy.eu/uploads/tx_triedownloads/WP3_D32Selection_criteria_FINAL.pdf)).

The INTENSE criteria chart is an excel file for simple use. It is based on the three columns of sustainability – ecological, economic and social aspects.

The INTENSE best practice criteria list consists of following 15 aspects:

- Social economic criteria
  1. Total cost of investment per m<sup>2</sup>
  2. Cost-benefit within life cycle
  3. Settlement planning
  4. Ecomaterials
  5. Energy standard related to legislation
  6. Design principles for the building
  7. Quality control
- Building
  8. Roof insulation
  9. Wall insulation
  10. Floor insulation
  11. Window U-value
  12. Airtightness
- Technical equipment
  13. Ventilation
  14. Heating and cooling
  15. Renewable energy

With his presentation Mr. Faltin explained how to use the chart and estimate/calculate different aspects.



During the following discussion the audience made several suggestions to the best practice criteria.

- It was suggested that in case of building criteria not to talk about wall/roof insulation in centimeters but rather about performance kWh/m<sup>2</sup>/year (with calculation program). Mr. Faltin explained that at the moment centimeters are better as they are more understandable but after a few years maybe - when energy audits are more common.
- Quality of internal environment is missing from the ecological criteria but it is also important for a livable building. Mr. Faltin responded that it is not currently in our list but could be considered as single criteria (maybe related to ecological materials). It was also added that there is a project PERFECTION (<http://www.ca-perfection.eu/>) about indoor environment that should be linked to INTENSE.
- Investments from bank are not deep enough – dynamic payback period would be more relevant. Mr. Faltin commented that loan givers should get to know about life cycle, he also brought an example from Switzerland where one bank had their own certification system – in that case ecology and economy got together.
- Water is also an important aspect so it should be included – water usage connected to buildings.

Regarding the time needed to fill in the table properly Mr. Faltin explained that for him it takes 2-3 days for 5 houses but in principle it depends on availability of data.

Mr. Faltin summarized the discussion by emphasizing that our criteria list is not final, that adjustments can be made and they will think about the suggestions given during the discussion.

**Jörg Faltin** (“Auraplan”), **Friedemann Stelzer** (engineering expert) and **Wilfried Walther** (“e.u.[z.]”) introduced following energy calculation with PHPP (Passive House Planning Package) program – both theoretically and also practically.

PHPP is a clearly structured design tool that can be used directly by architects and designers. It is available in following languages: English, German, Polish, Hungarian, Slovakian, Czech, Russian, French, Dutch, Italian and Sweden. The 2010 English edition of the software costs ~ 125 eur and it includes the English handbook.

The presenters concluded that PHPP program is:

1. A software for planning very low energy building and professionals can learn it in an easy way. The software makes calculating easy (easy to change numbers) and due to that it is suitable for students => they are able to use it, just need explanations.
2. Understanding numbers is important. It should be known what are the limits of the program and what stands behind the numbers (that should be told to trainees). It is important to show that the program works with real numbers.
3. Very reliable program compared to other calculation tools (it is based on testing => very exact numbers are provided).

### **Working group session I**

Following the training participants were separated into parallel working groups. One working group was concentrating on technical topics and other group on “soft” topics.

In the working groups were discussed following modules:

- Technical group: systems engineering (heating and domestic hot water, cooling, ventilation)
- “Soft” group: energy carriers and renewable energy sources, awareness raising (climate protection concepts, how to make people act)

In this report the detailed discussions in the working groups will not be described but the results of both working groups – key slides – will be presented to give a short overview of discussion topics.



## **Train-the-trainers Course II**

### **Key slides**

**Heating/Domestic hot water/Cooling**

**Ventilation**

**Tallinn, 24-26 August 2010**

## General

- Relation between heating/cooling/ventilation!
- Criteria of indoor comfort
- Holistic view – architectural design
- How to reach people at municipalities?



24/08/2010

Tallinn | Train-the-trainer II

2

## Heating/Domestic hot water

- Efficiency
- List of heating systems
  - conventional
  - low temperature
- SWOT analysis for each system
- Decision making strategy
  - Primary energy + emissions (sustainability aspects)
  - technical aspects
  - costs
    - investment
    - life cycle
- Best practice examples
- Technologies for the future



## Cooling

- City planning & cooling
- Use of passive possibilities
- List of well chosen technical solutions
- How to minimize the cooling load?
- How to use and maintain systems properly?



## Ventilation

- Why we need fresh air and ventilation?
- Natural ventilation
- Artificial ventilation
- Standards – EU (mandatory), national (voluntary), PH
- Types of ventilation systems
- Types of heat exchangers
- Design principles (noise, odour, filters, pressure drop)





## Train-the-trainers Course II Key slides

### Energy carriers/RES

Tallinn, 24-26 August 2010

### I. Energy carriers / RES

- Transition – we need to find out and discuss what is the best way to switch from fossils to renewables
- Energy security
- Social awareness – it is not sufficient if only a minority is acting
- Balance between economic, social, and ecological effects
- Stress the regional added value of producing energy locally
- Sustainability
- Pros and cons of the best 'energy mix' and dimension are every country specific and should be discussed





## Train-the-trainers Course II Key slides

### Awareness raising

Tallinn, 24-26 August 2010

### I. Awareness raising

- Just a campaign is not enough! – You should seek for feedback (e.g. energy bill based on actual consumption)
- Present examples of other measures – there is no need to newly invent the wheel
- The message should be 'digestible' and constant
- Cooperation with multipliers (NGO and media)
- Vision as a motivator and competition makes people move
- Speak about costs, resources, and payback periods



## **Plenary session**

**Wilfried Walther** from “e.u.[z.]” talked about cost-benefit assessment, which is a way of systematic thinking in order to make cost-benefit decisions and it is commonly applied to analyze and evaluate different strategies. The essential steps include:

1. Identification of relevant costs and benefits
2. Measurement of costs and benefits during the lifetime
3. Comparison of costs and benefit
4. Strategy selection

From practical point of view Mr. Walther introduced the excel tool “Pay-back Coach” for building envelope, which was developed in the frame of INTENSE project. The worksheets allow a structured calculation and comparison of two different measures in the building envelope – need of energy, costs, payback time etc.

**Christiane von Knorre** continued the plenary session with tackling settlement planning and design principles. She started by saying that “settlement planning is the art to find compromises” (Fritz Schumacher, 1869-1947, German architect). Ms. Von Knorre brought several examples of town plans, energy optimized settlement planning and pointed out the main aspects of settlement planning:

- Compactness of settlement/mixed uses
- Short ways to public transport
- Social balance
- Rainwater and waste management
- Reuse of land
- Compactness of buildings - relation A/V
- Maximizing passive solar gains
- Maximizing active solar gains
- Soil management
- Efficient energy supply – use of renewables

In the second part of her presentation she concentrated on design principles and emphasized the main aspect of that (some of the aspects are same with settlement planning aspects):

- Compactness of buildings - relation A/V
- Daylight orientation
- Flexible floor plans for flexible usage
- Integrated planning
- Shadow/heat protection
- Maximizing passive solar gains
- Maximizing active solar gains
- Zoning

Ms. Von Knorre finalized her presentation by making introduction to the next working group session concentrating on settlement planning and design principles.

## **Working group session II**

In the second working group session participants of the training were divided into 5 working groups based on the countries they were coming from: one group of northern countries, two groups of middle and two groups of southern countries.

Situation:

The municipality X is planning to develop a living quarter with well-organized private and public spaces on ca. 6 hectares. The municipality owns the land. The new quarter should be a visible and good example for energy optimization in the region and harm to environment should be minimized as much as possible.

The aim of the working groups was to have competition to elaborate scenarios for a new energy optimized settlement to be built in near future - next 5 years

Following the results of the working groups are presented.

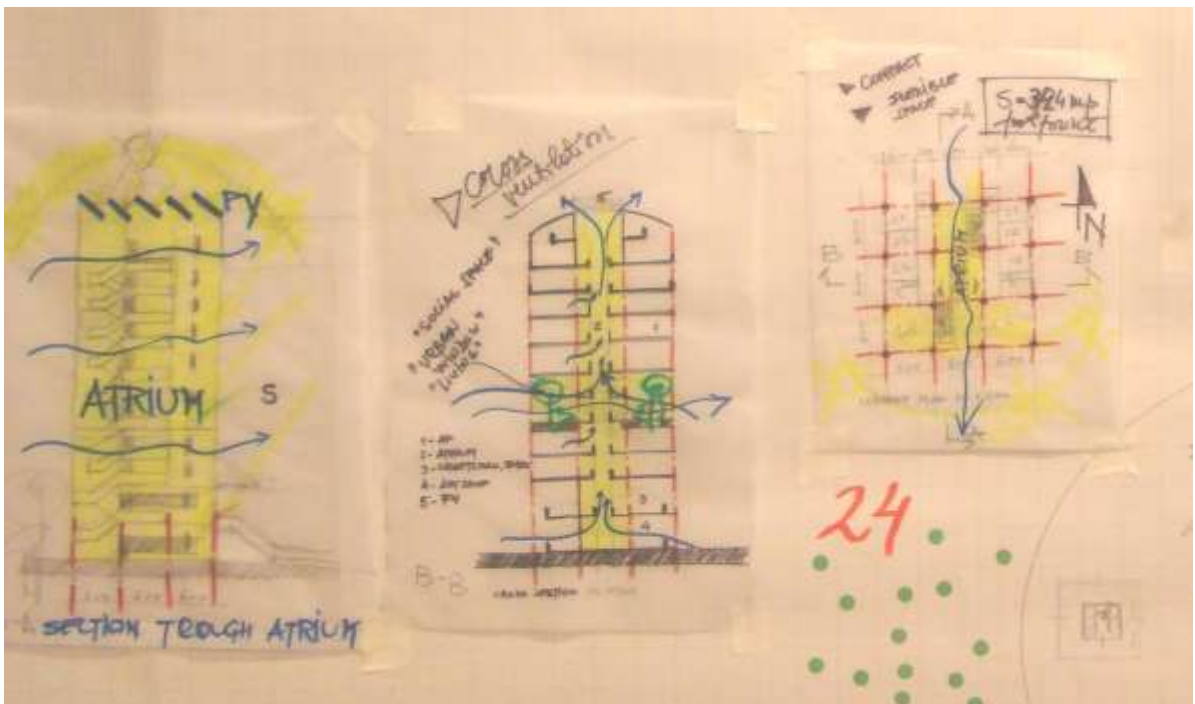
**Group 1 - "0 energy, 0 waste"**



**Group 2 - "Passive green village"**



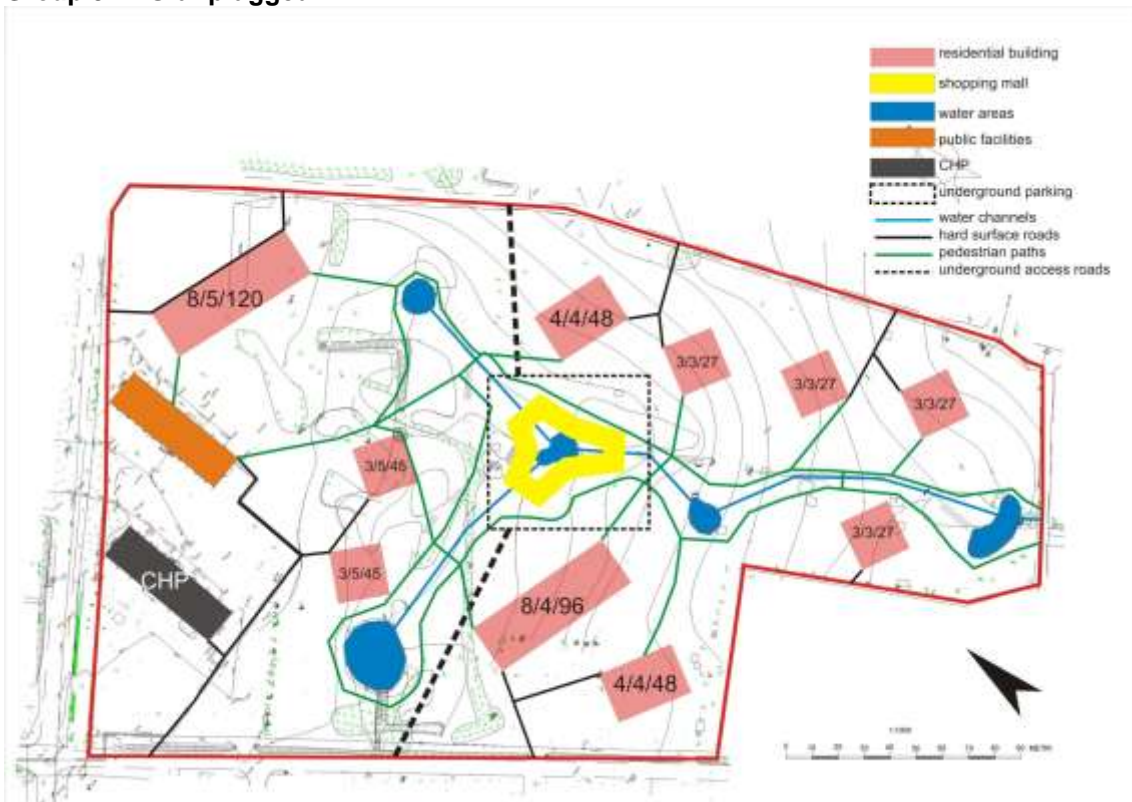
Group 3 – “CO housing”



Group 4 – “Baltic Belt”



Group 5 – “S-unplugged”



Evaluation of the working group results:

- There were two types of projects elaborated in general – block houses version (2-4 storeys) and flats in towers
- Public area and pedestrian ways were covered in all works
- Biodiversity was resolved in a very good way in all projects (green zones, lakes, etc.). Connection between building and environment should be kept in mind when planning
- All project connected water – that was a nice surprise

All projects were holistic set ups but with different special focus in all works so it would have been difficult to choose the winner of the competition in a real competition, which is also often the situation in real life.

In case of the training all participants had possibility to mark two of their favorite projects and based on that the winner was chosen – project nr. 3 - “CO housing”.

### **Plenary session**

**Wilfried Walther** described shortly the handbook for the future trainers. The handbook will include all the 9 modules of the training program and it will be available in two ways:

- Printed version (ca 100 pages) in English and national languages with most important slides
- Extended electronic version

It was agreed that the draft electronic version will be available from mid of October in order to give time for future trainers to prepare for international test trainings.

The final part of the plenary session concentrated on craftsmen issues.

**Dirk Schröder-Brandi** from “e.u.[z.]” talked about the conditions for trainings for craftsmen. He emphasized that when addressing craftsmen the main questions to tackle should be:

- What are the problems during building process?
- How do the craftsmen react to these problems?
- What could be an adequate solution?

In his presentation Mr. Schröder-Brandi brought out several examples of situations where something had gone wrong in the process and described for each example what the actual solution for craftsmen was and what the better solution for the situation could be.

He concluded his presentation by bringing out what we need in different fields:

Financing

- Long term calculation (life time calculation) – energy consultancy
- Intelligent financing system (e.g. “intracting”/ “contracting”)
- Contract conditions between buyer and bidder (craftsmen)
- Adequate payment

Planning

- Installation-friendly planning (architect/ engineer)
- Integrated view on the planning and building process
- User friendly installation system(s) > designer/ manufacturer
- Negotiation between buyer, planner and craftsmen

Presentation

- Marketing platform (e.g. Web) for bidder
- Hand out material

Qualification

- (Cross over) qualification for craftsmen
- Certifications for all building partners

**Ervins Krauklis**, a Latvian certified passive house designer, presented a five-day craftsmen training course at Ērgļi Vocational School in Latvia.

He started by giving a short overview of the history of Ērgļi and then described the situation with Ērgļi Vocational School. It is a vocational school established in 1960, most of the school buildings were built during 1965-1972 and currently there are studying 200-230 students.

The main problems are that the school is in urgent need for refurbishment – buildings are in poor condition, which results in high energy bills, bad air quality, leaking roofs and unstable (often 14-16°C) room temperatures during cold Latvian winters and overheating in summers.

The current “energy efficient” solutions are that heating in two upper storeys (1500m<sup>2</sup>) of dormitory building was switched off last year and workshops (2000m<sup>2</sup>) are not heated at all. School can not pay full bill for its present energy demand.

So they decided to do something about that situation and their vision was following:

1. to reach the aims of CCFI in cutting greenhouse gas emissions to get financing (CCFI - Climate Change Financing Instrument of Latvian Government, Ministry of Environment – refurbishment and technology program to cut greenhouse emission gases. Competition program for Vocational education institutions was announced in the beginning of 2010).
2. realize refurbishment of school buildings as an PHI “EnerPHit” pilot project to comply with aims of EU: nearly zero-energy standard starting from 2020. A feasibility study on refurbishment of the dormitory building was made in autumn of 2009.
3. reach high comfort level and standards of working and learning environment with energy consumption as low as possible.
4. develop a competence center of low-energy refurbishment with environmentally friendly methods in cold Baltic climate.

As a first step in elaborating the craftsmen course of energy efficient refurbishment with eco-construction methods they carried out a craftsmen pilot course in order to try out their ideas, to share ideas, to try out themselves, to work together, to spread experience and to gain like-minded fellows and publicity.

The pilot course had both theoretical and practical parts:

- lectures about energy efficiency, passive house concept, building physics, green building, ecology of materials
- practice about airtightness, blower door and thermography practice
- lectures about windows and window installation, Fibrolite, glass wool (Isover) by representatives of material/component production companies
- special practical course for building with straw course
- demonstration wall practice (special part of the dormitory wall was used for that purpose)
- cellulose insulation demonstration

In the pilot course were attending 13 participants => 1 architect, 2 civil engineers from design companies, 1 student engineer, 2 civil engineers from construction companies, 3 craftsmen and 1 energy consultant. The fee of the course was 450 eur per participant (including accommodation, meals etc.) and most of the materials that were used during the course were for free.

In the future they plan to have 2-day theoretical courses for those who want to participate in the Climate Change Financing Instrument program and as the ministry is now interested in the course then future participants will probably get a more serious certificate. Additionally they see the demand for the same course in the same place for builders which means that they will continue the wall already hopefully in spring but then in one classroom as the dormitory will be renovated in the spring.

The wall will also be used for practical work for the students of the vocational school. He also brought out that the course was a pilot course to develop a real program for schools.

Mr. Krauklis summed up that if training has practical exercises then a group of 10-15 participants is the best, more people would be already too much. Also separation of different target groups is not necessary => that assures integration and holistic way as people start to communicate on same level (architect <=> engineer <=> craftsman). In case of addressing municipalities it is essential to show or demonstrate practically – blower door test, thermography, tapes (i.e. how strong they are), etc.

### Summary of the training

The final part of the train the trainers' event concentrated on the next steps and feedback.

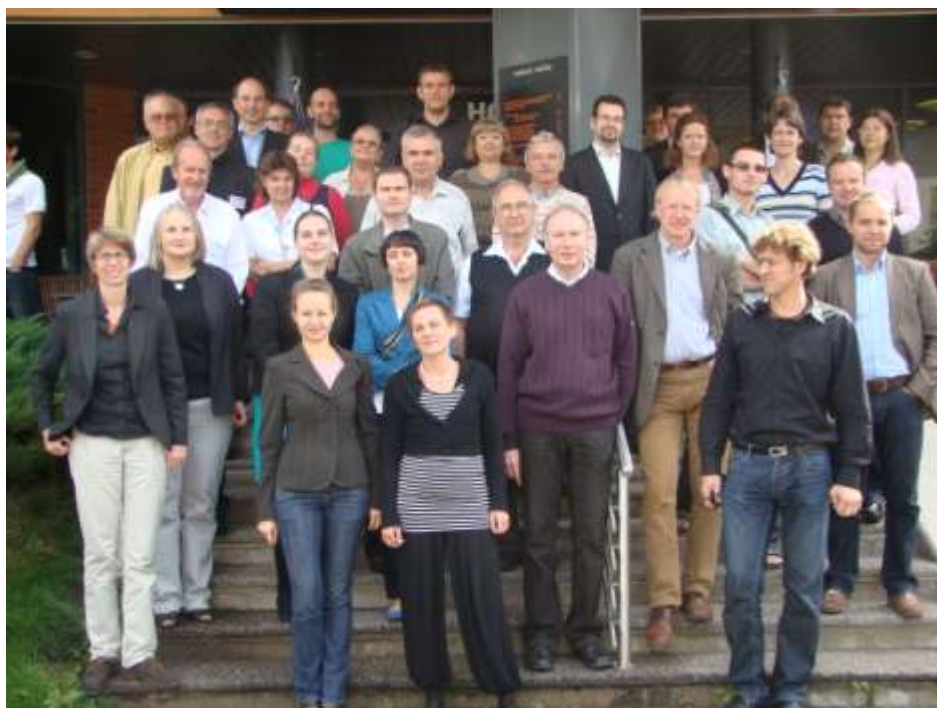
**Sandra Oisalu**, the WP5 leader from Baltic Environmental Forum Estonia, informed about the international test trainings to be performed during November-December in 3 locations – Romania for Romania, Bulgaria, Slovenia, Croatia; Czech Republic for Czech Republic, Poland, Slovakia, Hungary and Latvia for Estonia, Latvia, Lithuania. The trainers of these events would be the subcontracted training institutions and country coordinators, the trainees will be partner municipality representatives.

Ms. Oisalu also shortly talked about the national trainings to be carried out in each partner country in the first half of 2011.

### **Feedback**

All participants were asked to give feedback to the 2<sup>nd</sup> train the trainers event and also to the train the trainers concept and topics discussed. In general the feedback was positive and the trainings assessed to be valuable and useful. However some specific aspects were discussed:

- It was brought out that some topics were not discussed but it was also emphasized that in such short time not all could be covered. As additional topics following were named:
  - \* some technologies that are good and innovative (i.e. hydrogen technologies)
  - \* energy management/planning => obligation now for municipalities
  - \* relationships between heat supplier/owner of the building/inhabitants/municipality
  - \* performance monitoring (important for municipalities and owners)
  - \* ESCO's, PPP's, etc.
- Networking with twin projects was suggested
- E-learning => good to exchange, in Hungary there is a methodology and experience
- Teaching methodology could have been tackled more => changing information about new methodologies of teaching
- Inter-linkages between work packages in order to incorporate subcontracted training institutions to other work packages



*Photo of the training program team – German experts and future trainers (by Karin Malken)*

The report incorporates 2 annexes:

- Annex 1. Agenda
- Annex 2. Signature list

**INTENSE - WP5: Stakeholders' Training Program**  
**2<sup>nd</sup> Train the Trainers event**  
*August 24-26, 2010, Tallinn, Estonia*

**AGENDA**

**Monday, August 23, 2010**

- Arrival of participants in the afternoon/evening
- Individual dinner

**Day 1 - Tuesday, August 24, 2010**

Chair: Ingrida Bremere, project manager, BEF Latvia

<i>TIME</i>	<i>TOPIC</i>	<i>PRESENTER/FACILITATOR</i>
08:30 - 09:00	- Registration of participants	Venue: Oru hotel
<b>WELCOME &amp; WARM UP</b>		
09:00 - 10:30	- Welcome and opening - Best practice criteria	Ingrida Bremere Jörg Faltin
<i>10:30-11:00</i>	<i>Coffee break</i>	
<b>PLENARY SESSION I</b>		
11:00 - 12:30	- Energy Calculation with PHPP Adaption to regional climate	Friedemann Stelzer Jörg Faltin
<i>12:30-13:30</i>	<i>Lunch</i>	
<b>WORKING GROUP SESSION I (mixed groups/parallel work)</b>		
13:30 - 15:00	- Group 1: Heating/Domestic hot water/Cooling - Group 2: Energy carriers	Friedemann Stelzer Jörg Faltin
<i>15.00- 15:30</i>	<i>Coffee break</i>	
<b>WORKING GROUP SESSION I continues</b>		
15:30 – 17:00	- Group 1: Heating/ Domestic hot water/Cooling - Group 2: Renewable energy sources	Friedemann Stelzer Jörg Faltin
<b>PLENARY SESSION II</b>		
17:00 – 18:00	- Reflection from WG session I topics that have been discussed topics that should be additionally discussed	P. Engewald/S. Oisalu Ingrida Bremere
<i>18.30 – 20.00</i>	<i>Joint dinner</i>	Place: Hotel restaurant
20.00 – 22.00	Movie: The 4. Revolution <a href="http://www.energyautonomy.org">http://www.energyautonomy.org</a>	Place: Plenary room

## Day 2 - Wednesday, August 25, 2010

<i>TIME</i>	<i>TOPIC</i>	<i>FACILITATOR</i>
<b>WORKING GROUP SESSION II</b> (mixed groups / parallel work)		
09:00 – 10:30	Opening of the day Group 1: Ventilation Group 2: Climate protection concepts How to make people act	Friedemann Stelzer Dirk Schröder-Brandi Matthias Grätz
<b>10:30-11:00</b>	<b><i>Coffee break</i></b>	
11:00 - 12:30	Reflection from WG session II Cost-benefit assessment	Philipp Engewald/Sandra Oisalu Wilfried Walther
<b>12:30 - 13:30</b>	<b><i>Lunch</i></b>	
<b>MIXED GROUP SESSION PART I</b>		
13:30 - 16:00	Settlement planning and design principles - WG A: Baltic countries - WG B: Central countries - WG C: Southern countries	Christiane von Knorre and all speakers for questions
<b>16.00- 16:30</b>	<b><i>Coffee break</i></b>	
<b>MIXED GROUP SESSION PART II</b>		
16.30-18:00	Settlement planning and design principles - Continues work in groups	Christiane von Knorre and all speakers for questions
18.00 -	Individual dinner	

## Day 3 - Thursday, August 26, 2010

<i>TIME</i>	<i>TOPIC</i>	<i>PRESENTER/FACILITATOR</i>
<b>PLENARY SESSION III</b>		
08:30 – 09:30	Settlement planning and design principles - Presenting working group results	Christiane von Knorre Reporter from each group
09:30 – 10:00	Introduction of the handbook	Wilfried Walther
<b>10:00 – 10.30</b>	<b><i>Coffee break</i></b>	
10:30 – 12.00	Conditions/example of training craftsmen	D.Schröder-Brandi/ E. Krauklis
12.00 – 12.30	Next steps – test trainings	Sandra Oisalu
<b>12:30 -</b>	<b><i>Lunch</i></b>	

Close of workshop and departure of participants