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## Deliverable 3.1

### Short courses

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# 1. SHORT COURSES IN PARTNER COUNTRIES

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## 1.1 Finland

### 1.1.1 Target group and marketing

The target groups were the urban planners in four organization types such as the city planning offices, the 17 regional councils, the planning consultants and the universities.

We advertised the course using Aalto PRO's CRM system from which we selected a special target group that would fit into our criteria. Also Aalto Centre for Urban and Regional Studies has its own alumni network which was used. Finnish NSG members used their own contact lists to market the training. Also direct emails were used. See one example of marketing material: <http://aalto2.aalto.fi/tiedotteet/2011/2011-04-07-upres.html>.

Moreover, newspaper articles were submitted to the local newspapers two weeks prior to each venue, but by the end March none of them was published. The English translation of one of the press announcements is attached as well as the list of newspapers and their reporters to whom the announcement was sent two weeks prior to the particular short course. I still think that it would be good to show your effort so if you have the name of the newspaper you sent them and the text please send it to me. I will also send it to Heiko to incorporate it to WP6.

### 1.1.2 Dates and places

Finnish short courses were organised in five different cities during February and March. The cities and dates were:

Kuopio 7.2.2011

Espoo 11.2.2011

Oulu 25.2.2011

Turku 3.3.2011

Tampere 10.3.2011

Altogether 113 persons registered to these seminars and about 90 participated.

There will be two more seminars in Jyväskylä 5.5.2011 and Seinäjoki 3.5.2011 with about 40 participants expected in total. So in Finland we have been able to have about 150 registered participants of which about 90 % participated. This will be 50 participants more than 90 as presented in Annex 1.

### 1.1.3 Program structure

The seminar program was the following (local contents varied)

- 8.30 Breakfast
- 9.00 Welcome to the seminar, Anna-Maija Ahonen, Aalto PRO
- 9.15-9.30 Jan Vapaavuori, Finnish Minister of Housing (podcast)
- 9.30-10.00 Sustainable communities – perspectives from the international discussion, PhD Ulla Heinonen, Aalto PRO
- 10.00-12.00 Urban and regional planning and energy supply facing climate change, PhD Arto Nuorkivi, Aalto University (incl. break)
- 12.00-12.45 Lunch
- 12.45-13.45 Case Skaftkärr – impact of zoning to emissions and energy use, Eero Löytönen/Maija-Riitta Kontio, City of Porvoo

- 13.45-14.00 Coffee break
- 14.00-15.00 What about us? Perspectives from local actors (several speakers)
- 15.00-15.30 Conclusions and information about the forthcoming training

The morning program of the short course was always the same, but the afternoon was site specific: introduction of local practices, comments on the morning presentations, development ideas, etc.

#### **1.1.4 Feedback**

In all the sessions we collected feedback on the seminar and also suggestions/ideas for the long course. The overall feedback was positive: participants felt the program contained all the main issues related to the topic that can be covered during one day seminar but also felt that there is clear need to go deeper into the questions we raised in the long term training. There was also really fruitful discussion: in the audience there were both urban and regional planning and energy experts. Having these two groups together and share their thoughts was one objective of the seminars. Participants also felt that it was good the seminars were organized locally, not only in the capital area.

The ranking made by the participants was high: 4/5. The courses were considered actual, the presentations being with high quality and well-focused. The approach of the course was praised as a practical but, not a theory oriented one.

One of the statements learned in the course linked energy to urban planning development in the way as follows: "In 70'ies the social impact assessment was incorporated to urban planning; in 90'ies the environmental impact assessment was incorporated to urban planning; and, in 2010'ies the energy impact assessment will be incorporated to urban planning. All three assessments have become to stay as normal practise in urban planning. Therefore, we have to introduce the latest one without delay."

Transportation was not initially in the training plan. Nevertheless, due to several comments having had emphasized its importance both in urban planning and emissions, there will be one training module in the 9 month course focusing on transportation related energy issues.

Two core questions among the participants seemed to be: (i) Is comfortable living in contrast with low carbon policies? (ii) How comfortability and low carbon can be we combined if possible? The long-term course has to keep these two questions in mind at all times and provide answers.

#### **1.1.5 Deviations and challenges**

One of the eight courses (Rovaniemi) had to be cancelled at the last moment, because the number of participants appeared to remain very low. There happened to have been another course regarding sustainable recreation centers a few days back, and people were just not willing to travel to Rovaniemi any more so soon. Rovaniemi is located in the scarcely populated northern Finland with long and time consuming distances between the communities.

One day short courses were not suited to create workshops to initiate urban development plans. Therefore, a large variety of interesting best practice cases were identified per city to be used in pilot training in autumn. The best practice cases of the cities are briefly as follows:

- Kuopio – Ground water based natural cooling of a computer center and use of the released waste heat to heat up the surrounding office building;
- Helsinki capital region – Large scale absorption heat pumps and sea water as sources of district cooling;
- Oulu – An isolated small house area where heat and power are supplied by a wood chip driven CHP plant without any connection to the national grid;
- Tampere – Delegation of sustainability and energy efficiency management to the entire city organization;
- Turku – Waste heat recovery from the regional sewage pipes to district heating by means of compressor driven heat pumps
- Seinäjoki – to be defined in May 3
- Jyväskylä – to be defined in May 5

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In Finland, the original plan of having 3x3 day short courses was changed to 8x1 day short courses and one summary day. The number of course days would have had been the same but the coverage would be higher. It came obvious in January 2011 that several companies and organizations prefer one-day courses, because the spring time is busy. The number of short courses higher than stated in Annex 1 in a scarcely populated country with long distances was considered justified.

### **1.1.6 Future plans**

The remaining two courses will be organized in the cities of Seinäjoki (May 3) and Jyväskylä (May 5). The invitations to participants have been issued and some of the lecturers are chosen.

The summary day, the 9th and last short course day, is programmed to take place on June 16 as a combined meeting of the short course student representatives and the NSG. In the meeting the lessons learned from the short courses as well as the planned arrangements of the 9 month lasting pilot course will be discussed.

## **1.2 UK short course report**

### **1.2.1 Target group and marketing**

The main target groups in the UK are the planners already in post within Local Authorities, including the policy development personnel and the case workers (also known as management control). It is these two very different planning teams within an authority which have the most influence on the integration of renewable energy and in particular any community scale heating schemes.

In addition, we are also targeting the support teams that input into these planners including "Sustainability Officers", "Climate Change Officers", "Energy managers", Design specialists". There is no standardised convention of naming positions or requiring specialisms within an authority and so the definition of "supporting personnel" has been used within the programme literature. Renewable energy/district energy systems have a very low penetration within the UK. Consequently, it is essential that other potential actors are also invited including commercial design teams, engineers, architects and developers.

Although the UK is not running the long courses, during those project deliverables that have involved making contact with universities there has been enthusiasm for making use of the materials that will be produced. During the discussions it was realised a great opportunity to target relevant professionals of the future would be to deliver short courses (2) at the Universities. Both students and lecturers have expressed interest, and additionally at one of the courses local authority personnel will be also be invited to attend.

Local Authority planners are short of time and difficult to engage for three days out of the office. In particular, all Local Authorities are now required to find large "efficiency savings" meaning pressure to be in the office and delivering very large workloads has never been greater. In recognition of these concerns the UK course has been developed as a three day course aimed primarily at policy planners (who would potentially have more time to attend such a course) with the first day focussed on providing the majority of the knowledge that management control personnel would need in order to better integrate community scale heating into their case work. The change in Government has inflicted big financial cuts on these departments, with substantial redundancies a consequence, and this has put pressure on their ability to host and attend courses.

Flyers have been developed and sent out to all BRE Local Authority contacts, and through the Carbon Trust Energy Manager networks. Contacts have been made with known active organisations and we have announced the events to RTPI and other related networks connected that have active groups on LinkedIn.

A webpage has been set up – [www.bre.co.uk/upres](http://www.bre.co.uk/upres) where all the events in the series and further information on the programme can be found.

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### 1.2.2 Dates and places

Events are now booked in for the following:

1. 16-18 May – Coventry (East Midlands)
2. 23-25 May – Bournemouth (South East)
3. 7-9 June – University College London (London – planning students)
4. 13 -15 June – Swansea (Wales)
5. 22-24 June – Cornwall (South West)
6. 27-29 June – Watford (East of England)
7. 12-15 September – Watford (East of England)
8. 5-7 October – Brunel University (London – planning students)
9. 7-9 November – Watford (East of England)

In addition we have some provisional dates where we are in discussion with the authorities concerned and the dates are not yet confirmed:

1. 20-22 June – Manchester (North West)
2. 13-15 July – Peterborough (East of England)
3. Tbc – Guildford (South East)
4. Tbc – Glasgow (Scotland)

Further to this BRE has had discussions with the London Development Agency with the recommendation of staging two of the events in London, targeting respectively boroughs in North and South London. We are also in contact with officials in Newcastle, Birmingham, Southampton, Stoke-on-Trent and Leeds.

BRE is aiming for between 15 and 25 delegates at each event. We are offering host organisations 5 free places on the course with all other delegates being asked to pay £150 (plus UK VAT) to attend all three days. This nominal charge should cover the costs of our guest speakers and the travel, subsistence and catering costs incurred.

### 1.2.3 Programme structure

The programme structure is still flexible to accommodate the guest speakers' diaries. However, the content of the course and the agenda below will be covered with the second day afternoon and the third day morning being interchangeable.

Feedback

As no courses have been run yet, the only feedback received has been from those wishing to book courses. However, this feedback can be summarised as:

- It is proving very difficult to get planners to attend a three day course – this is borne out by the very low take up on the events at present
- The £150 cost is difficult to justify with all authorities looking for efficiencies
- Authorities are keen to offer their venue and provide the 5 free places (although even these free
- places are proving difficult to fill) so that they can avoid the £150 costs
- Local authorities see the value in the training and believe that they have a gap in knowledge which this course can fill.

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 Planning information/District Heating Technical Information/External

<b>DAY 1:</b>	
9.00	Registration and coffee
9.30	Introduction and Welcome – why you are here? WORKSHOP
9.45	Why do we need a transition to an alternative energy system?
9.55	Environmental Impacts of buildings
10.10	EU and UK energy policy drivers and incentives for renewable and GHG mitigation
10.25	Environmental standards in the building sector
10.45	Q&A/discussion
<b>10.55</b>	<b>BREAK</b>
11.10	Reducing Heating and Cooling Demands
11.20	Decarbonising energy supply for heating and cooling buildings
11.35	Introduction to District Heating – what is it
11.50	Your experience of it? WORKSHOP
12.05	Introduction to District Heating – why to do it
12.20	Introduction to District Heating – where to apply it
12.35	Introduction to District Heating –who has done it
<b>13.00</b>	<b>LUNCH</b>
14.00	Planning for DH for new build developments– what is needed
14.35	Planning for DH across a LA
14.45	How to identify potential sites WORKSHOP
<b>15.15</b>	<b>BREAK</b>
15.45	Summary of District Energy issues?
16.00	Liasing with developers - Interactive workshop – development of scenario
16.20	Q&A/ discussion
<b>17.00</b>	<b>END</b>

<b>DAY 2</b>	
8.45	Registration and Coffee
9.15	Recap on heating cooling demands
9.30	Why is your LA interested in developing policy – WORKSHOP
	What is your LA already doing? – WORKSHOP
9.50	Sustainable Urban energy Planning – introduction
10.05	Integrating SUEP into planning policy
<b>10.30</b>	<b>BREAK</b>
11.00	Creating an evidence base for SUEP
11.20	Examples of policies in other LA / London Plan
11.40	Developing energy planning policies
12.10	Assessing the energy aspects of planning applications
12.25	
<b>13.00</b>	<b>LUNCH</b>

14.00	How do these policies affect/help Renewable Heat and District Heating – discuss? – WORKSHOP What to look for in energy statements, how will developer demonstrate
15.00	Liaising with developer (2)
15.15	BREAK
15.45	Implementing SUEP in your LA – an approach MK/MS
16.05	Role of LA in enabling low carbon urbanism MK/MS
	Possible pitfalls in implementation of DH and how to overcome barriers (interactive?) MK/MS
16.40	Q&A/discussion
17.00	END

<b>DAY 3</b>	
8.45	Registration and Coffee
9.15	Recap of policy and its importance for development, remainder of SUEP
9.30	Using the right energy options –making use of lower temperature sources
10.00	Heat sources for DH – planning implications
10.30	BREAK
11.00	Integration of heat sources and district energy
11.15	Identifying heat sources, addressing planning issues and discussion WORKSHOP
12.00	Experiences of integrating renewable into district energy networks – case studies
12.15	Practical examples of how a district energy network can evolve from fossil fuels to renewable energy sources
12.30	LUNCH
13.30	Workshop session incorporating lessons learned and case study
15.00	Q&A
16.00	CLOSE

### 1.2.4 Deviations and challenges

#### Deviations

BRE is starting the UK courses later than originally planned and also request to be able to run the short courses beyond the date set in the contract, to allow courses to run up to the end of the 2011 calendar year.

Due to other partners structuring their courses differently according to their countries' specific needs it would have been difficult to obtain useful feedback for incorporating knowledge into their planning process, so this feedback element has been moved and incorporated as an exercise in the long courses. The process has, of course, been maintained for the UK where it is embedded within the course structure.

BRE has also changed the process for the UK where instead of the original 2 day seminar and 1 day workshop, the workshop sessions are now distributed throughout the 3 days.



### 1.2.5 Challenges

The Localism agenda of the new government is still to be fully developed as a policy and the regional spatial strategies that helped support planners at a local level have all now been removed by the new Government. This has left a gap in delivery and support at the local level and a lack of clarity over how to meet the localism requirements. This is being monitored by the programme team who will adjust the training to address these issues as they become better understood.

The new government has also abolished regional authorities who would have been a key target for this project.

The UK is now focussed on addressing its financial deficit and all Local Authorities are being asked to find “efficiency savings” often through the loss of jobs and services. In this atmosphere of job insecurity, policy unknowns and “localism” many Local Authority personnel are finding it increasingly difficult to find time and resource to attend training. They are often struggling to meet the minimum legal requirements set for planning decisions.

With all sectors of the UK economy now feeling the effect of the reduced public sector spending it is proving difficult to secure matched funding. Efforts are continuing to obtain small scale sponsors on an event by event basis, but this has proved time consuming.

### 1.2.6 Future plans

Further mailings will take place over May. It has been difficult to engage authorities over the last month or two with the uncertainties already stated and the long Easter and Royal Wedding weekend breaks. Once everyone is back from these extended holidays we will re issue the press releases and flyers and start a telephone campaign to raise the numbers of delegates attending each of the already booked in courses. Once these are looking healthy (regarding numbers) we will look to increase the numbers of events taking place in September, October and November. There are a number of Local Authorities that have expressed real interest in hosting further events.

## 1.3 German short courses

In Germany there were some changes as well. The German partners organised two day courses instead of three day courses: to convince a municipality or urban administration to send employees for three days to a seminar was seen as a barrier by AGFW advertising the short courses. So AGFW decided to offer more attractive two day seminars which are cheaper and mean less working time loose for employers. Even these changes took place it was finally difficult to fill the courses in Dresden and Frankfurt. Additionally the time frame of the second short course was covered by a local election period in Hessen which explains the lower number of participants.

### 1.3.1 Program structure, Dresden

„Energy efficient cities of the future – interaction of urban planning, energy supply and climate protection“

Monday, 21st of March 2011:

09:30 Salutation, snack

10:00 Political framework, Dr. Heiko Huther, AGFW e.V., Frankfurt am Main

10:20 Urban development concept Sachsen 2020, Michael Köppl, head of division, Ministry of the Interior, Sachsen

10:40 Concepts for energy efficient urban planning in municipalities, Dipl.-Wirt.-Ing. Harald Rapp  
AGFW e.V., Frankfurt am Main

11:10 „Concept of energy supply“, using the example of DREWAG, Swen-Sören Börner, DREWAG – municipal energy supplier Dresden

11:40 Basic techniques of district heating, Dipl.-Ing. Frank Espig, AGFW e.V., Frankfurt am Main

12:30 Lunch break

13:15 Renewable energies in the municipal supply, Dr. Heiko Huther, AGFW e.V., Frankfurt am Main

14:00 „Energy supply concept“ – From heat demand to the concept, Dr.-Ing. Markus Blesl, IER, Institute for energy economy and rational energy appliance, University of Stuttgart

15:30 Coffee break

16:00 Discussion

16:30 End of the seminar

Tuesday, 22nd of March 2011:

09:00 Urban planning and urban development concept, Dipl.-Ing. Sven Koritkowsky, Technical University of Brandenburg (BTU), Cottbus

10:30 Coffee break

11:00 Tools for an efficient combination of energy and urban planning, Dipl.-Ing. Johannes Dorfner, Institute for Energy Economy and Application Technology, Technische Universität München

12:00 Lunch break

13:00 Combination and integration of energy supply concept and urban planning – interfaces, deficits, implementation and solution approaches

Discussion with active participation of the present stakeholders (results below)

14:30 Presentation of results and discussion

15:00 End of short course

### **1.3.2 Feedback and conclusions on Dresden short course**

- protection of ancient monuments is seen as a widespread issue
- aid programs mostly exist only for small and middle sized companies which are not able to initiate large measures
- because of the variety of action fields, influencing parameters and actors, the topic of energy efficiency has a high level of complexity
- cities often lack data concerning districts, while measures for data acquisition don't qualify for subsidies
- very often the urban planning of a city is in conflict with economic interests of the local housing industry
- mostly the city can't be a moderator as it owns not enough decisive power
- there is a trend of a financial and personal weakening process of the municipalities, so that informal planning will gain more importance. Municipalities are planning too many things, implementation can often not be guaranteed. Above all under time pressure.
- municipalities should concentrate on the essentials and let other actors "air to breathe"
- integrated approaches of urban development like Insek (integrated urban development concept) or Seko (concept for urban development) possess a high theoretical pretension but practically this pretension is hardly fulfilled
- deficit: exchange and share of information/data between urban planners and energy suppliers
- participation of municipal energy supplier is seen as the "crux of the matter"
- the way of thinking of urban planners and suppliers is completely different: territorial versus economic
- an active positioning of the supply side is urgently necessary
- an early enough coordination between a city's administration, urban planning and energy supplier is fundamental

- tools: energy data for district level would be very interesting; big question mark: how to collect basic data
- energy aspects respectively planning aspects were not part of the education of the attendant planners and engineers
- professional training in energy issues is rarely offered

Cities need comprehensible data material from the local energy supplier to have a base for decision processes.

Urban planning is often failing for economic interests of local housing industries.

### 1.3.3 Program structure, Frankfurt

„Energy efficient cities of the future – interaction of urban planning, energy supply and climate protection“

Monday, 28th of march 2011:

09:30 Salutation, snack

10:00 Political framework Dr. Heiko Huther, AGFW e.V., Frankfurt am Main

10:20 Concepts for energy efficient urban planning in municipalities, Dipl.-Wirt.-Ing. Harald Rapp, AGFW e.V., Frankfurt am Main

10:50 „Concept of energy supply“, using the example of Mainova AG, Michael Gersch, NRM Grid services Rhein-Main GmbH, Frankfurt am Main

11:20 Basic techniques of district heating, Dipl.-Ing. Frank Espig, AGFW e.V., Frankfurt am Main

12:10 Lunch break

13:15 Renewable energies in the municipal supply, Dr. Heiko Huther, AGFW e.V., Frankfurt am Main

14:00 „Energy supply concept“ – From heat demand to the concept, Dr.-Ing. Markus Blesl, IER, Institute for energy economy and rational energy appliance, University of Stuttgart

15:30 Coffee break

16:00 Discussion

16:30 End of seminar

Tuesday, 29th of March 2011:

09:00 Urban planning and urban development concept, Dipl.-Ing. Sven Koritkowsky, Technical University of Brandenburg (BTU), Cottbus

10:30 Coffee break

11:00 Tools for an efficient combination of energy and urban planning, Dipl.-Ing. Johannes Dorfner, Institute for Energy Economy and Application Technology, Technische Universität München

12:00 Lunch break

13:00 Combination and integration of energy supply concept and urban planning – interfaces, deficits, implementation and solution approaches

Discussion with active participation of the present stakeholders (results below)

14:30 Presentation of results and discussion

15:00 End of short course

### 1.3.4 Feedback and conclusions on Frankfurt short course

- There is a lack of communication between cities and suppliers: it is seen necessary to find the right moment for a getting together. Above all it seems to be reasonable for suppliers to actively approach the city with an own conception if a new housing area is evicted.
- Data protection might be a barrier of interinstitutional information exchange
- Problem of technological progress and changing political framework: all supply systems based on pipes that have a long durability face this problem. New standards, amendments to energy acts etc. complicate planning even for the next 20 years.
- Compulsory connection to main services versus profitability: suppliers demand a forced connection of a district to guarantee economic viability. Municipalities try to avoid these constraints. But: Single household solutions cannot be as energy efficient as complete solutions for a whole district are.
- Consumers change their mind: there is a raising awareness for ecological topics, very often combined with the willingness to pay more for ecological and efficient energy
- Knowledge about flexible grid solutions is low
- Urban planners are said to show a lack of understanding for technical solutions

Urban planning without grid planning is not working anymore - otherwise efficiency is left behind.

### 1.3.5 Future plans

In Germany the expected number of participants was lower. So far, the official aim of 30 participants per course could unfortunately not be reached. Many interested urban planners seemed to face difficulties to spend two days on an external seminar out of the office. The German partners intend to organise a third seminar in Munich in June. In case the final number of participants does not reach the original objective, a fourth seminar will be organised in Hamburg.

## 1.4 Hungarian short courses

Till the date of the delivery of the Technical Progress report the Debrecen University (in the followings UD) completed two courses, the third will be run mid-May

In the case of the first course the UD made use of an opportunity. Some of the local authorities and the utilities of the capital intended to organise a retraining of their staff members. The background of this intention was that the energy certification of existing buildings will become compulsory from 2012. Many of the staff members, appointed for re-training work in administrative positions, others have very good skills in a narrower subject area (gas supply, hydraulic regime of district heating networks) – the goal of the retraining was to provide a wide overview of the energy issues. They contacted the Centre of Environmental Studies which provided a good logistic background for the course but did not dispose at the necessary teaching material and lecturers. A cooperation has been established resulting in a course of 62 contact hours from which 38 have been delivered by the UD. (Certainly the rest of the lectures have been delivered on building and energy issues, too, focussing on energy conscious retrofit and software, the lecturers were well proven colleagues who worked together with us several times.) The venue of the course was the City Hall of Budapest, the dates were 21, 25 February, 2, 11, 18, 25 March 1, 8, 15, 29 April, the number of participants 21-22. Actually the students are completing some homework defined by their employers; the evaluation of these works will be carried out by the staff members of the UD.

The second course has been run in Debrecen, the venue was the Faculty building, the dates 25, 26 March, in total 16 contact hours. In this case the disclaimers of the Department were the base of the announcement of the course: several emails have been sent first of all to the former students of the UD who graduated at the Faculty of Engineering or participated at some of its numerous training course or conferences. 35 participants have been enlisted. A special added value of this course was the active participation of the Technical University of Kossice which earlier formally expressed its interest in the accreditation of long course on urban energy issues but proved to be interested in launching short intensive courses as well. Their representatives participated at this short course in Debrecen, two of its associated professors, who speak Hungarian delivered three lectures on the first

day. Certainly the parties exchanged their views on the form and content of this type of retraining and discussed the possibilities of a similar joint action in Kossice.

In both cases the students received the pdf files of the lectures (a collection is attached to the report) plus an electronic hypertext (encompassing the relevant regulations) and interactive shadow mask calculator software (it can be used for the analysis of solar access of buildings, collector and PV arrays).

#### 1.4.1 Future plans

The third course will be held mid-May, in this case the cooperation with the Chamber of Engineers is the way of marketing. The fact that the participation will be acknowledged by credits of the Chamber will hopefully be an "appetizer". Till 21 April 17 individuals and 4 local authorities expressed their interest in the participation at the third course although the formal announcement will be issued only in May. The venue will be Debrecen, too.

## 1.5 Spanish short courses

Spanish short courses will be delivered in May and June. The courses will not be full, multi-day seminars, but evening classes distributed to several days. This way courses will attract more students as it will easily combine work to studies. The contents of the short courses will be same as in the long courses but as an introduction to the topics.

Short course contents:

- SUSTAINABILITY CONCEPTS IN REGIONAL AND URBAN PLANNING: A HOLISTIC VISION
  - Existing regional and urban planning mechanism - integration of sustainability aspects - ecological foot-print: territory / material / energy / water - multifunctionality
- ENERGY. FORMS - TRANSFORMATION - MARKET OUTLOOK
  - Endenergy and primary energy - environmental impacte - energy transformation technologies: heat / cold / electricity / cogeneration / heat activated cooling - market prices and outlook
- ENERGY DEMAND REDUCTION STRATEGIES: POTENTIAL IN URBAN PLANNING
  - Influence of the urban model on energy consumption - heat island - reduction mechanisms
- ENERGY DEMAND REDUCTION STRATEGIES: POTENTIAL IN NEW BUILDINGS AND REFURBISHMENT
  - Building's embodied energy - thermal inertia - insulation - solar control - ventilation - lighting - energy efficient installations - the challenge of renovation
- ENERGY RESOURCES AND RENEWABLE ENERGY TECNOLOGIES
  - Solar photovoltaics and solar thermal energy - geothermal - biomass / solid urban waste - wind - hydro
- ENERGY DISTRIBUTION: DISTRICT HEATING AND COOLING
  - Main aspects of district energy - advantatges and limitations - local and European experiencies
- THE RIGHT SCALE FOR EVERY ENERGY CONCEPT: HEAT AND COOL DENSITY (DEMAND SIDE), POTENTIAL ON SUPPLY SIDE
  - Between grid connected and autonomous / individual and collective: Energy concepts on the right level: building - houses - neighbourhood - district - city - metropolitan area
- NEW MANAGEMENT CONCEPTS IN THE ENERGY MARKET
  - Legal and contractual aspects of energy networks - Energy Service Companies - Smart Grids

- ENERGY PLANNING
- GIS (Geographic Information System) based applications for regional and urban energy planning
- NEW TRANSPORT MODELS AND URBAN AND INTERURBAN MOBILITY
  - Energy consumption and reduction potential - from car-sharing to electric cars - goods logistic / urban distribution - connectivity to the region

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## **2. LESSONS LEARNT AND FEEDBACK TO LONG TERM PROGRAMS**

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(to be finished once short courses have been delivered)