Project IEE/09/841/SI2.558360 Start: 01/09/2010

# Deliverable 2.1

## Competence and Training Needs Analysis for RES H/C integration in urban planning, results of comparative studies and survey

**Due date :** **2011-03-31 (m07)**

**Actual submission date :** **2011-03-31**

**Lead participant :** **Sabaté & Associats (SaAS) – Spain**

**Partners :**

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Building Research Establishment Ltd (BRE), United Kingdom
Debreceni Egyetem (UD), Hungary
Technische Universität München (TUM), Germany
Universität Augsburg (UA), Germany
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| Dissemination level | | |
|---|---|---|
| PU | Public | |
| CO | Confidential, only for members of the consortium (including the Commission Services) | X |

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# 1. EXECUTIVE SUMMARY

The Competence and Training Needs Analysis – CTNA - is the first deliverable of the UP-RES project, aimed at defining the current knowledge and further needs of urban planners in renewable energy skills, with an emphasis on DHC (District Heating and Cooling) and CHP (Combined Heat and Power). The purpose is to find out the level of technical knowledge the planners have on these issues and to map possible competence gaps, ascertain their interest and needs. This will help determine the student potential and profile for the UP-RES program, as well as highlight the important issues to be included in the training.

CTNA consists of:

- an on-line questionnaire survey on the competence and training needs of planners on sustainable energy production and supply which has been distributed to more than 2700 persons, with a successful return number of 313, (25% more results than estimated contract 250), and analyse of the results
- a series of interviews with heads of urban planning entities from each partner country (18 in total), and 18 District Heating directors in Finland, and summary / analysis of main issues

This extensive scoping study describes the current scene and permits to draw conclusions as to what would potential students expect and need, along with defining what they actually know about sustainable energy production and supply.

The potential students profile is mostly architects (32.5%) and urban planners (31%, of which ¼ have an architecture degree as well), and Engineers (11.3%). The educational level is high, and general attitude towards inclusion of Renewables, DHC and CHP in urban planning is overall positive, although general knowledge on these issues is not developed amongst planners (except for solar energy in Spain and Germany), as for the time being the habit is of consulting experts on energy issues.

As UP-RES will be a professional training for mostly practitioners, outputs of CTNA recommend that the courses must be very practical, providing useful, competent and realizable skills, with real examples and interventions from specialists from urban planning and energy companies. There is a strong demand for practical guidelines, implementable concepts, checklists, for unified documentation to aid planners in tackling the energy related issues rather than having various guidance documents. The Certification aspect is also asked for, but is seen more as a attendance certificate than a National standardized degree.

As for the contents and competences to develop in WP3 and WP4 (long and short course programs), the CTNA points out a series of interests and necessities, such as the need for persons trained to coordination and net working between urban planning and energy planning, the consideration of heritage and patrimonial complexity, of RES and DHC integration in urban renovation, the control on costs (investments, operation, returns, balance investment/returns), and on long term management, interest in RES (solar, systems, biomass, geothermal energy) and CHP before DHC, and the need for new tools for analysis.

# 2. INTRODUCTION

## 2.1 Purpose and target group

The Competence and Training Needs Analysis – CTNA - is aimed at defining the current knowledge and further needs of urban planners in renewable energy skills, with an emphasis on DHC (District Heating and Cooling), and CHP (Combined Heat and Power). The purpose is to find out the level of technical knowledge the planners have on these issues and to map possible competence gaps, ascertain their interest and needs. This will help determine the student potential and profile for the UP-RES program, as well as highlight the important issues to be included in the training.

This scoping part of the study consists of an on-line questionnaire survey on the competence and training needs of planners on sustainable energy production and supply which has been distributed to more than 2700 persons and a series of interviews with heads of urban planning entities (5 in each country).

In each of the 5 partner countries the target group is primarily municipal and regional planners, but also private urban planning practitioners or other public structures, depending on national configuration. The interviews identify the issues faced by current actors in urban planning and energy fields, and specific needs the UP-RES should provide to form competent and adapted specialists.

## 2.2 Contributions of partners

WP2 leader SaAS initiated and coordinated activities and summarized the results.

The same activities were carried out in each partner country. All partners' responsibilities were as follows:

- offering respondent contact information for the CTNA (list of addressees for the questionnaire survey, interviews)
- commenting and providing national elements to the CTNA questions
- conducting 5 interviews with selected groups/persons (target representatives of professional associations) to complement the survey and to frame the problem setting of the questionnaire, and write a brief summary of discarded issues to be taken into account.
- translate the survey instructions and questionnaires to their own language and the survey results back to English
- evaluating the CTNA analysis under common criteria

## 2.3 Relations to other activities in the project

The WP2 is a 6 month work package with 5 deliverables all due month 07 of the project.

The 2.1 deliverable is the CTNA (Competence and Training Needs Analysis), based on an individual and face-to-face approach, to describe the current scene and draw conclusions as to what would potential students expect and need, along with defining what they actually know about sustainable energy production and supply.

The outputs and lessons learned will be summarized and completed with outputs from other WP2 deliverables in deliverable D2.5.

The contacts established through the interviews and the questionnaire survey will serve as a dissemination basis for the marketing of the short and long courses (WP3 and WP4).

# 3. QUESTIONNAIRE SURVEY

## 3.1 Preparation and survey organization (m1-5)

### 3.1.1 General organization

General organization was defined on the Helsinki kick off meeting, under initiative of WP2 leader SaAS. The following procedure has been followed:

- M1: Number of entries to be collected by country was distributed among the partner countries according to the countries' population (minimum total for all countries: 250 according to the contract; see chapter 3.3 for details).
- M2: SaAS prepared a first draft of questions to be commented and completed by all partners. Based on the hypothesis of a 25% return rate, each partner prepared their contact lists of addressees: municipal planners, professional associations, etc.
- M2-3: SaAS and Debrecen University coordinate the EvaSys online questionnaire design.
- M3: Aalto PRO as coordinator determined the final questionnaire version (*see 3.2.2*), with proof reading by their sociological specialists to validate the communication aspects
- M3: Each partner provided the questionnaire's translation in their own language
- M4: Debrecen University executed the on-line management of the multilanguage questionnaire with the EvaSys program, including entering a version of each language, and automatic dissemination to partner's mailing lists of addressees. EvaSys provided general results with graphics and percentages, and also detailed results by countries and degrees*. (see results in 7.Appendices).*
- M4-5: The survey was opened for 4 weeks (Dec 9th 2010- Jan 3rd 2011), and then extended for five more weeks (until Feb. 15th 2011) as the number of response had not been satisfactory. Contact lists have been extended and personalized follow up has been needed to motivate people to answer (direct mails and phone calls from national partners to reach and motivate the addressees directly). New results in EvaSys.
- M6: As some questions were open answers for which replying persons wrote down their experience or comments, a new round of translations was organized and centralized by leader SaAS.
- M7: The analysis *(see 3.4)* was executed by SaAS, completed and commented by all partners. A first analysis of 184 answers was presented to partner on the second general meeting in Frankfurt on January 27-28th, and completed with the new entries and the final analysis for this deliverable in month 7.

### 3.1.2 The questionnaire structure

The questionnaire is structured in 2 parts

Part 1: general information to identify the profile and knowledge of the person who answers, including:

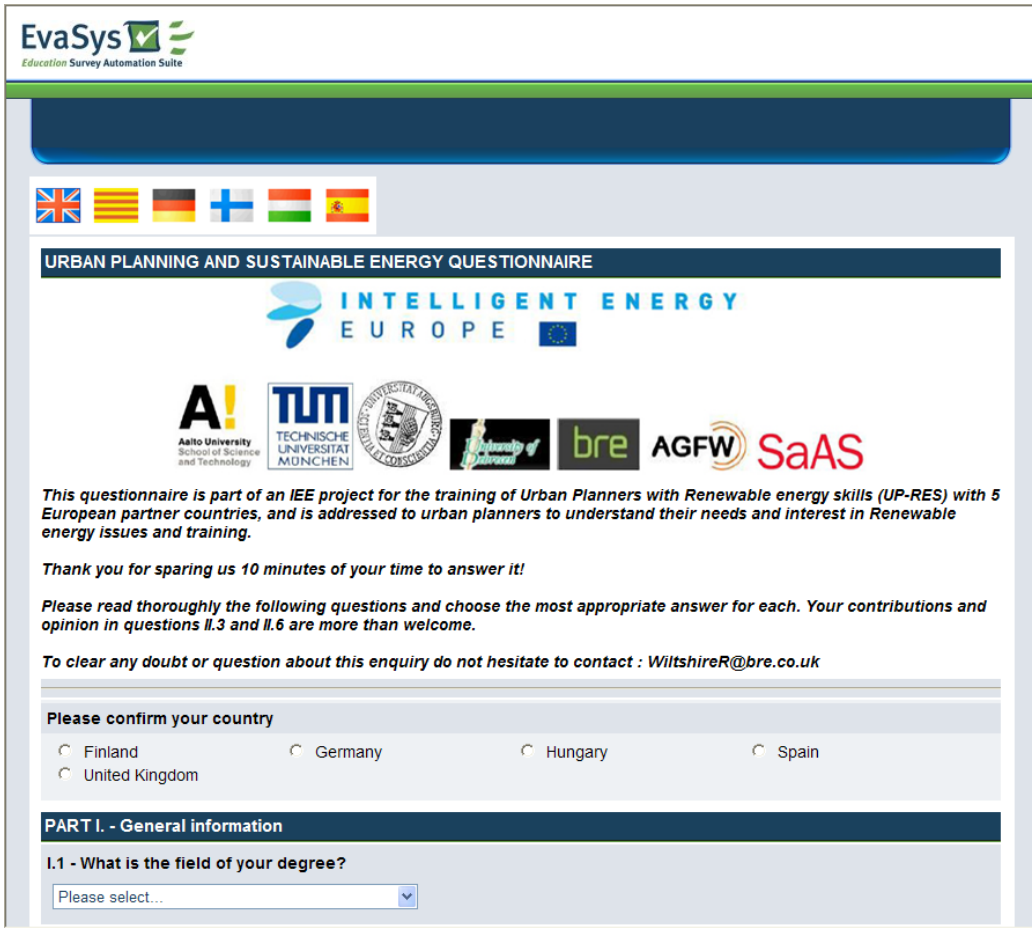
- Field of degree,
- Scale of planning and frequency,
- Tasks/responsibilities,
- Environmental issues in practice / needs

Part 2: Energy and urban planning information, to identify the scale of interest and knowledge in specific UP-RES issues, as well as information sources and what type of formation needs to be provided:

- Energy issues in degree, post-degree training and information sources used normally
- Situation (=knowledge, opinion, needs) towards a list of energy efficient supply and/or renewable energy systems (DHC, CHP, Solar thermal and photovoltaic, biomass, wind energy, micro and conventional hydro power, geothermal energy)
- Obstacles for the establishment of RES
- Suggestions on training

The complete questionnaire is attached in chapter 7.Appendices.

Below is a view of the EvaSys webpage of the on-line questionnaire coordinated by Debrecen University:




## 3.2 Questionnaire results (m6)

| | Number of persons in Contact list | Required number of submitted questionnaires | Final number of submitted questionnaires |
|---|---|---|---|
| Germany | 390 | 100 | 126 |
| Finland | 200 | 25 | 29 |
| Hungary | 200 | 25 | 37 |
| Spain | 1250 | 50 | 59 |
| United Kingdom | 660 | 50 | 52 |

**Total number of submitted questionnaires: 313** (10 did not precise their country), 25% more than the required minimum number of 250. Separate results are available in the Optima intranet by country (with list of open answers) and by degrees. In the following the overall results of the questionnaire are shown:

Report Creator Z.A., UP_RES_ALL_without_openq

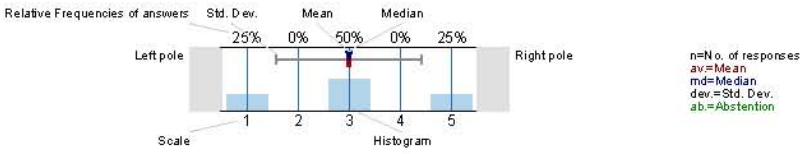
## UP_RES_ALL_without_openq

Válaszadók száma = 313

### Survey Results

Legend

Question text




### 1. URBAN PLANNING AND SUSTAINABLE ENERGY QUESTIONNAIRE

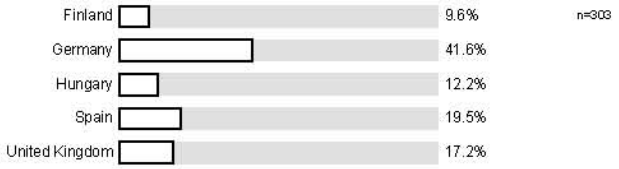
*This questionnaire is part of an IEE project for the training of Urban Planners with Renewable energy skills (UP-RES) with 5 European partner countries, and is addressed to urban planners to understand their needs and interest in Renewable energy issues and training.*

*Thank you for sparing us 10 minutes of your time to answer it!*

*Please read thoroughly the following questions and choose the most appropriate answer for each. Your contributions and opinion in questions II.3 and II.6 are more than welcome.*

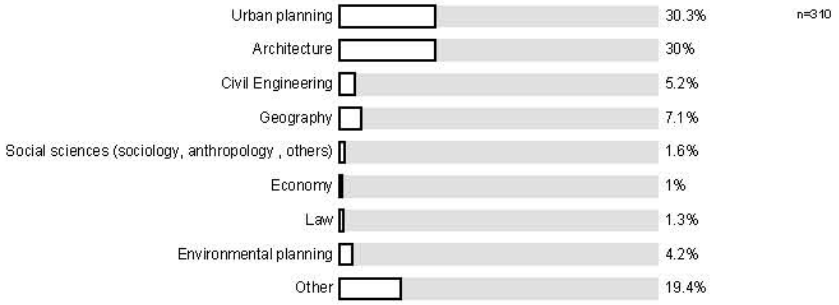
*To clear any doubt or question about this enquiry do not hesitate to contact : WiltshireR@bre.co.uk*

1.1) Please confirm your country



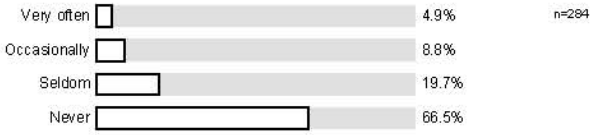

### 2. PART I. - General information

2.1) I.1 - What is the field of your degree?




### 3. I.2 - Specify the scale of planning you work on and the frequency of such planning

3.1) National scale

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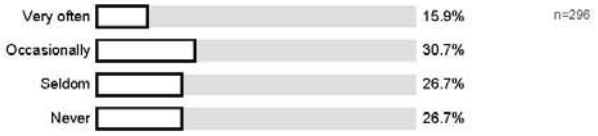
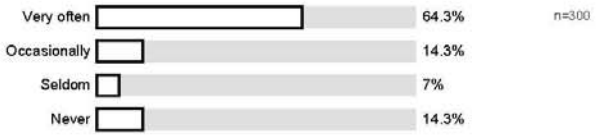
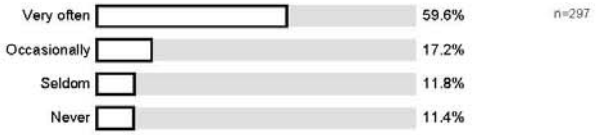
3.2) **Regional/territory scale**



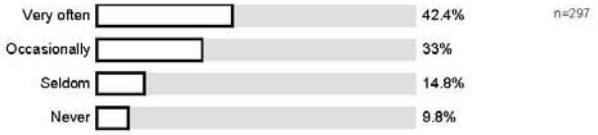

3.3) **Municipality scale**



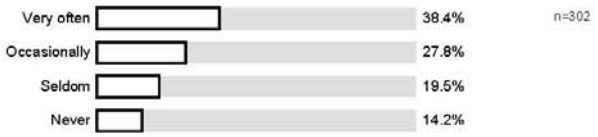

3.4) **City district scale**




3.5) **Neighbourhood scale**



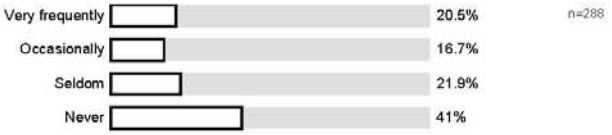

3.6) **Individual Building scale**



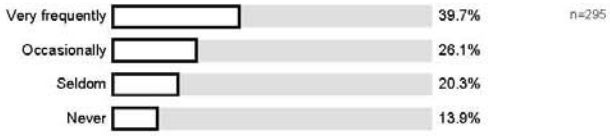

## 4. I.3 - Specify your planning tasks/responsibilities and their frequency

4.1) **Research, evaluation and assessments**

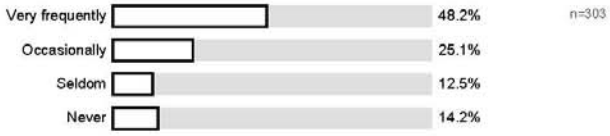

4.2) **Preparation of laws and regulations**



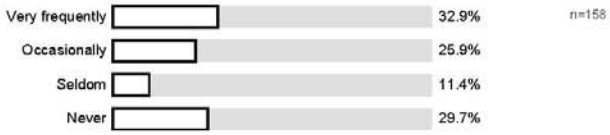
4.3) **Planning and zoning**




4.4) **Architecture and urban design**

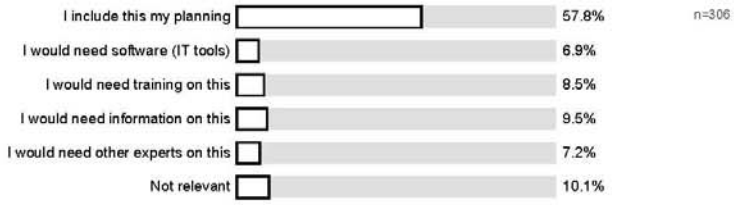



4.5) **Other**

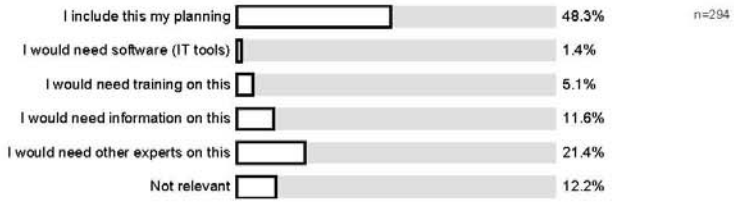



5. I.4 - For each environmental issue below, specify which ones you include in your planning and if you have certain needs with respect to them.

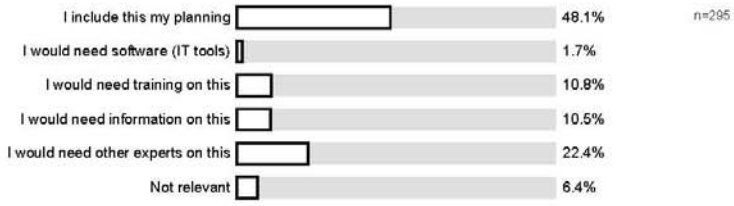
5.1) **Passive aspects (orientation, shading, density, etc.)**



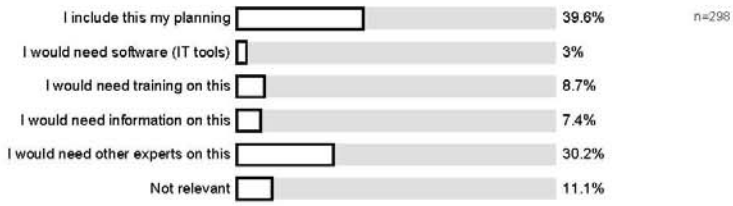

5.2) **Transport**



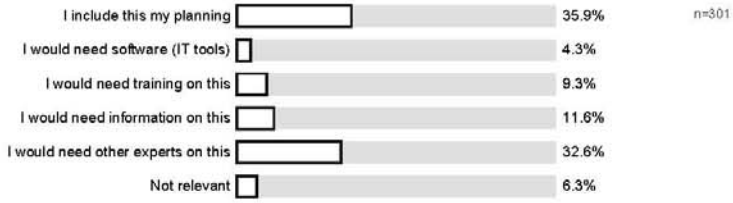

5.3) **Preservation of soils and ecosystems**



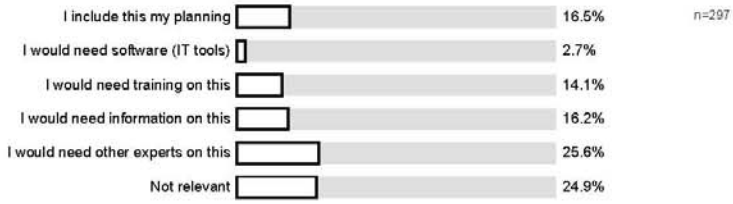
5.4) Water management



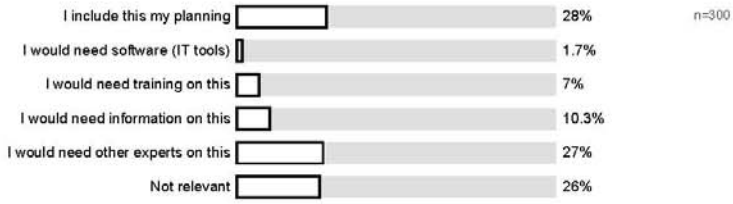

5.5) Energy sources, production and networks




5.6) Energy deriving from construction materials, extraction, transport, disposal




5.7) Waste management

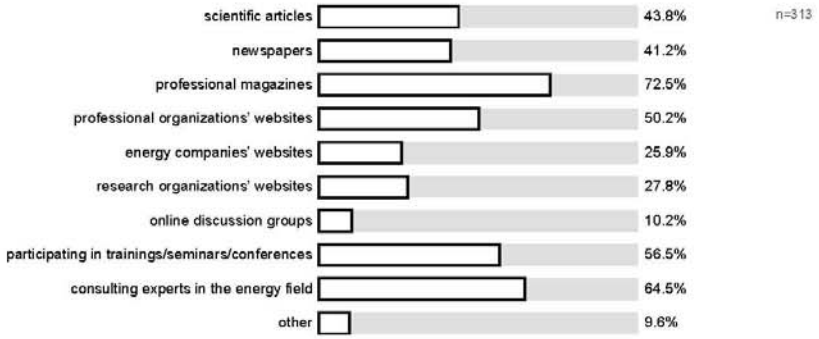



## 6. PART II. - Energy and urban planning information

6.1) II.1 - Were energy issues included in your degree curriculum?

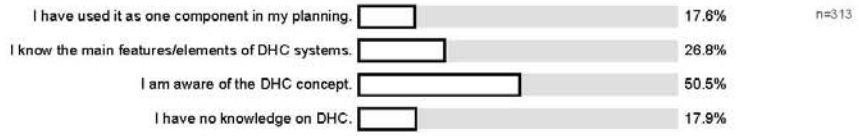

6.2) II.2 - Have you studied energy and urban planning after your graduation?*(supplementary/continuing education)*

6.3) **II.3 - Which information sources do you mainly use to keep up to date with energy issues?**
*(you can choose more than one answer)*




## 8. District heating and cooling (DHC)

8.1) **Your expertise**



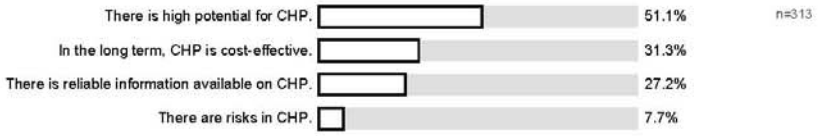

8.2) **Your impression**


8.3) **Your needs**


## 9. Cogeneration of heat and power (CHP)

9.1) **Your expertise**


9.2) **Your impression**



9.3) **Your needs**

| | | |
|---|---|---|
| I need software (IT-tools) to assess CHP implementation. | 9.3% | n=313 |
| I need training on CHP. | 24.9% | |
| I need information on CHP. | 42.8% | |
| No needs | 32.9% | |

## 10. Solar thermal energy systems.

10.1) **Your expertise**

| | | |
|---|---|---|
| I have used it as one component in my planning. | 33.5% | n=313 |
| I know the main features/elements of solar thermal energy systems. | 39.9% | |
| I am aware of the concept. | 37.4% | |
| I have no knowledge on solar thermal energy systems. | 7% | |

10.2) **Your impression**

| | | |
|---|---|---|
| There is high potential in solar thermal energy systems. | 59.1% | n=313 |
| In the long term, solar thermal energy systems are cost-effective. | 35.5% | |
| There is reliable information available on solar thermal energy systems. | 29.7% | |
| There are risks in solar thermal energy systems. | 5.1% | |

10.3) **Your needs**

| | | |
|---|---|---|
| I need software (IT-tools) for solar thermal energy systems implementation. | 15.3% | n=313 |
| I need training on solar thermal energy systems | 23.6% | |
| I need information on solar thermal energy systems. | 34.2% | |
| No needs | 37.4% | |

## 11. Solar photovoltaic energy systems.

11.1) **Your expertise**

| | | |
|---|---|---|
| I have used it as one component in my planning. | 30% | n=313 |
| I know the main features/elements of solar photovoltaic energy systems. | 40.9% | |
| I am aware of the concept. | 38.7% | |
| I have no knowledge on solar photovoltaic energy systems. | 9.9% | |

11.2) **Your impression**

| | | |
|---|---|---|
| There is high potential in solar photovoltaic energy systems. | 50.5% | n=313 |
| In the long term, solar photovoltaic energy systems are cost-effective. | 34.2% | |
| There is reliable information available on solar photovoltaic energy systems | 29.7% | |
| There are risks in solar photovoltaic energy systems. | 10.2% | |

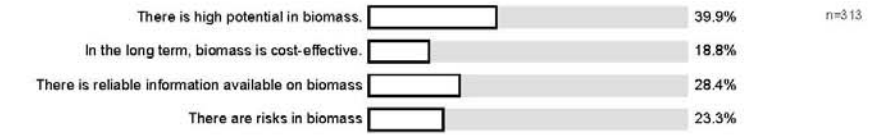
11.3) **Your needs**

| | | |
|---|---|---|
| I need software (IT-tools) for solar photovoltaic energy systems implementation. | 14.1% | n=313 |
| I need training on solar photovoltaic energy systems. | 23% | |
| I need information on solar photovoltaic energy systems. | 36.7% | |
| No needs | 39.6% | |

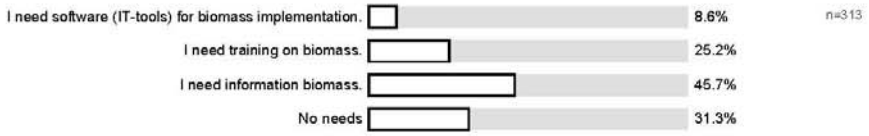
## 12. Biomass.

### 12.1) Your expertise


### 12.2) Your impression

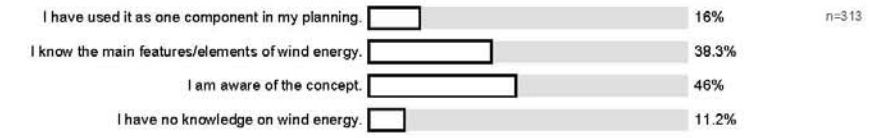



### 12.3) Your needs




## 13. Wind energy.

### 13.1) Your expertise




### 13.2) Your impression


### 13.3) Your needs


## 14. Micro and conventional hydropower.

Report Creator Z.A., UP_RES_ALL_without_openq

14.1) **Your expertise**

| | | n=313 |
|---|---|---|
| I have used it as one component in my planning. | 3.2% | |
| I know the main features/elements of micro and conventional hydropower. | 16.3% | |
| I am aware of the concept. | 50.2% | |
| I have no knowledge on micro and conventional hydropower. | 36.4% | |

14.2) **Your impression**

| | | n=313 |
|---|---|---|
| There is high potential in micro and conventional hydropower. | 29.4% | |
| In the long term, micro and conventional hydropower is cost-effective. | 27.2% | |
| There is reliable information available on micro and conventional hydropower | 29.7% | |
| There are risks in micro and conventional hydropower. | 9.9% | |

14.3) **Your needs**

| | | n=313 |
|---|---|---|
| I need software (IT-tools) for micro and conventional hydropower implementation. | 6.7% | |
| I need training for micro and conventional hydropower implementation. | 15.3% | |
| I need information micro and conventional hydropower | 40.3% | |
| No needs | 44.1% | |

## 15. Geothermal energy

15.1) **Your expertise**

| | | n=313 |
|---|---|---|
| I have used it as one component in my planning. | 16.9% | |
| I know the main features/elements of geothermal energy. | 28.8% | |
| I am aware of the concept. | 55.9% | |
| I have no knowledge on geothermal energy. | 13.4% | |

15.2) **Your impression**

| | | n=313 |
|---|---|---|
| There is high potential in geothermal energy. | 47.6% | |
| In the long term geothermal energy is cost-effective. | 26.8% | |
| There is reliable information available on geothermal energy | 22.7% | |
| There are risks in geothermal energy. | 17.6% | |

15.3) **Your needs**

| | | n=313 |
|---|---|---|
| I need software (IT-tools) for geothermal energy implementation. | 12.8% | |
| I need training for geothermal energy implementation. | 22.7% | |
| I need information on geothermal energy | 43.5% | |
| No needs | 33.9% | |

## 16. Part II – Energy and urban planning information [Continue]

16.1) **II.5 - What do you consider as the major obstacle for the establishment of Renewable Energy Systems in actual Urban Planning?**

| | | n=307 |
|---|---|---|
| Legislation, rules and regulations | 16.9% | |
| Energy lobbies | 14% | |
| Lack of knowledge | 24.8% | |
| Costs and taxes | 34.5% | |
| Others | 9.8% | |

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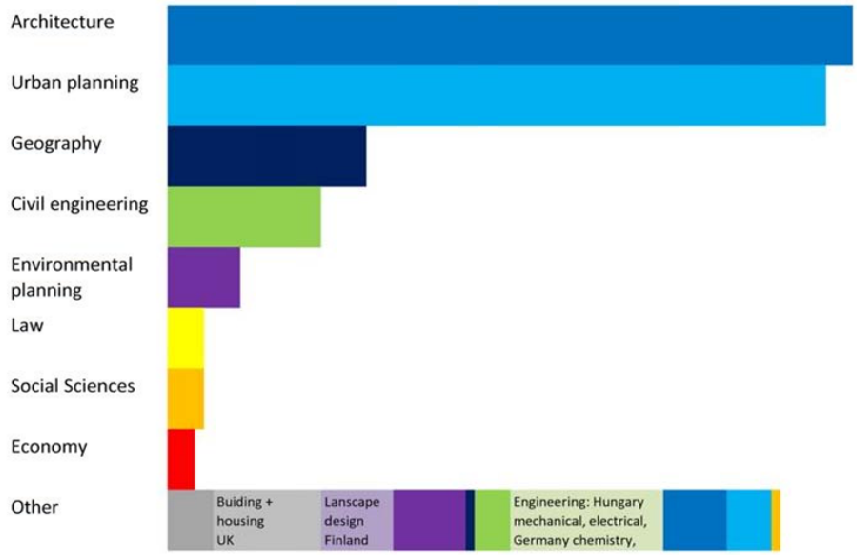
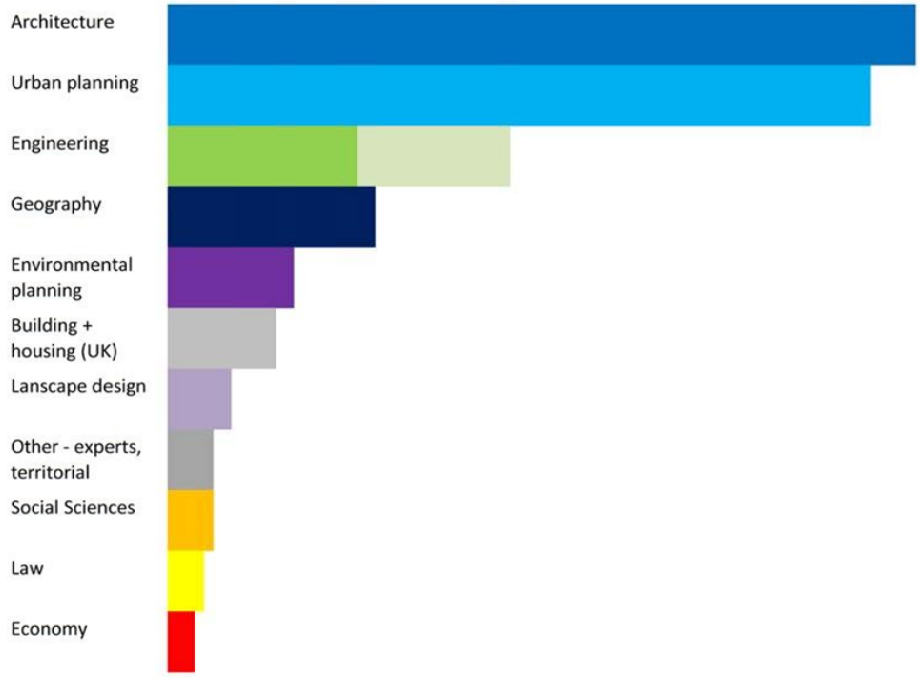
## 3.3 Questionnaire results analysis

### Part I- General Information

**I.1 What is the field of your degree?**




19.4% of the results answered "other", for which the responding persons then wrote their degree. This permits to organize the results as follows:




32.5% architects
31% urban planners
11.3% engineering - not only Civil, but mechanical & electrical (Hungary) chemistry & biology (Germany)
6.7% geography (Germany)
5% environmental planning

New fields issued from survey:
3.8% Building + housing services (UK)
2.6% Landscape design (Fin.+ Spain +Ger)
1.6 % Others (experts, territorial managers)

### I.2 Specify the scale of planning you work on and the frequency of such planning

Predominance of "middle" scale :
Municipality, City district and Neighborhood

| | |
|---|---|
| •National scale : | 66.5% never |
| •Regional/territory scale : | 30.7% occasionally – 26.7% seldom – 26.7% never |
| •Municipality scale : | 64.3% very often |
| •City district scale : | 59.6% very often |
| •Neighborhood scale : | 42.4 % very often, 33 % occasionally |
| •Individual building scale : | 38.4 % very often, 27.8 % occasionally |

National specificities:

•UK + Hungary > 50% individual scale

•Finland, Germany, Spain > 70% city district and municipality scale

### I.3 Specify your planning tasks/responsibilities and their frequency

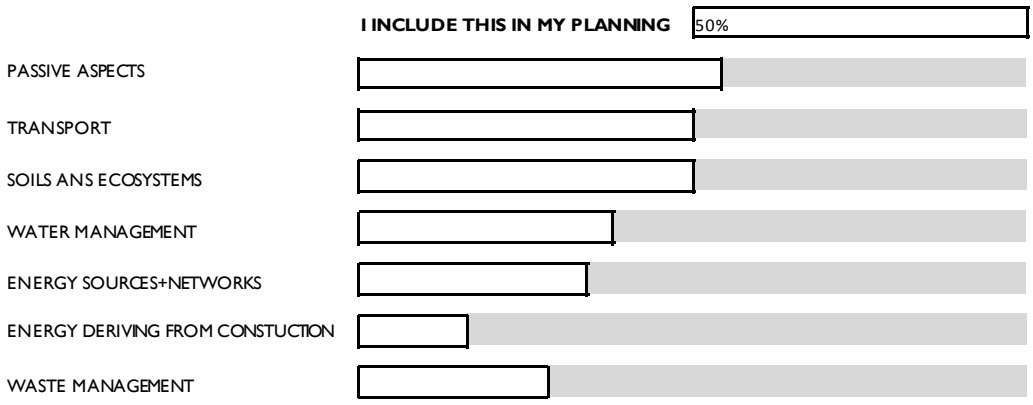
I.3 PLANNING TASKS AND FREQUENCY
Predominance of architecture and urban design:

| | |
|---|---|
| 1. Architecture and urban design : | 48.2% very frequently, 25.1% occasionally |
| 2. Planning and zoning : | 39.7% very frequently, 26.1% occasionally |
| 3. Research, evaluation and assessments : | 22.8% very frequently, 30% occasionally |
| 4. Preparation of laws and regulations : | 4.1% never |

Other tasks : (32.9% very frequently 25.9% occasionally)

| | | | |
|---|---|---|---|
| Transport planning | Landscaping | Heritage | |
| Teaching | Energy efficiency | Energy planning | |
| Engineering | Maintenance | Contractor | Public projects coordinator |

### I.4 For each environmental issue below, specify which ones you include in your planning and if you have certain needs in respect to them



I.4 ENVIRONMENTAL ISSUES
National specificities :

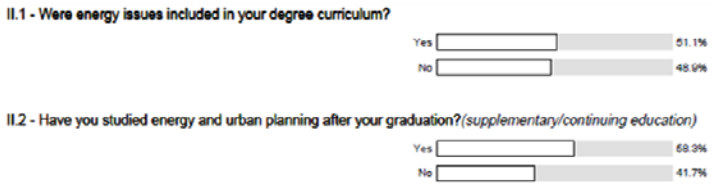
| | |
|---|---|
| Finland : | need for other experts > 40% |
| Spain : | need for training > 20% |
| Germany: | included in planning >60% for passive aspects, transports and preservation of soils.<br>included in planning >40% for water management and energy sources.<br>41.3% not relevant for waste management |
| UK and Hungary: | similar to general figures |

# Part II – Energy and urban planning information

**II.1 Were energy issues includes in your training?**

**II.2 Have you studied energy and urban planning after your graduation?**

Supplementary education: 58% have studied energy and urban planning after their graduation




**II.3 Which information sources do you mainly use to keep up to date with energy issues?**

II.3 INFORMATION SOURCES
Ranking of information sources on energy issues:

| | | |
|---|---|---|
| 1. | Professional magazines | 72.5% |
| 2. | Consulting experts | 64.5% |
| 3. | Participation in trainings/seminars/conferences | 56.5% |
| 4. | Professional organizations' websites | 50.2% |
| 5. | Scientific articles | 43.8% |
| 6. | Newspapers | 41.2% |

Other sources mentioned in free entries - 10% :
**Information material from public authorities,**
**Governmental websites, work colleagues, exhibitions**

II.4 Below is a list of Energy Efficient Supply and/or Renewable Energy Systems. For each specify which of the statement best describes your situation for : 1.Your expertise, 2.Your impression, 3.Your needs.

## DHC and CPH

| | | |
|---|---|---|
| Scarce expertise : | awareness | 50% |
| Positive attitude : | high potential | 43% DHK 51%CPH |
| Need of information : | | 40% |

Scarce Expertise :
Used it in planning: DHC 17.6% CHP 12.8%
No knowledge: 17-19%

Impression :
Cost effective in the long term : 31.3%
Consider there are Risks < 15%

Needs :
Software – IT tools <10%
Training 25%
No needs 32-37%

National Specificities :
**In Germany NO needs 62%DHC**
**NO needs 53% CPH**
**In Spain NO needs > 50%**

## SOLAR ENERGY – thermal and photovoltaic

| | | |
|---|---|---|
| Good Knowledge : | main elements | 40% |
| Positive attitude : | high potential | 52-61% |
| Need of information : | | 32% |

Expertise :
Have used it in planning: thermal 33%
Photovoltaic 30%

Impression :
Cost effective in the long term : 35%
Reliable information 30%

Needs :
Software – IT tools 15%
Training 23%
No needs 37-39%

National Specificities :
**In Hungary Training needs 59.5%**
**In UK Training needs 33%**
**In Germany NO needs 60%**
**In Finland No need of software**
**In Spain Software needs 35%**

## BIOMASS

| | | |
|---|---|---|
| Scarce expertise : | awareness | 50% |
| Skeptical attitude : | high potential | 38%, risks 23 % |
| Need of information : | 45% | |

Scarce Expertise :
Used it in planning: 11.4%
No knowledge: 18%

Impression :
Cost effective in the long term : 19%
Reliable information 28%

Needs :
Software – IT tools 8.6%
Training 25.2%
No needs 31.3%

National Specificities :
**In Hungary Training needs 54.1%**
**In UK Risks 42.3%**
**In Germany No needs 51.6% and reliable information 33%**

## WIND ENERGY

Scarce expertise : awareness 46%
Mixed attitude : high potential 44%, risks 18.2 %
Need of information : 37%, No needs 44%

Expertise :
Used it in planning : 16%
Know main features : 38.3%

Impression :
Cost effective in the long term : 25.9%
Reliable information 30.7%

Needs :
Software – IT tools 11.2%
Training 16.3%

National Specificities :
In Hungary Have used it in planning 0%
In UK know main features 56%, Risks 38.5%
In Germany reliable information 42%, No needs 72%
In Finland information need 65.5%

## MICRO AND CONVENTIONAL HYDROPOWER

Scarce knowledge : awareness 50.2% no knowledge :36.4%
Skeptical attitude : high potential 29.4%, reliable 29%
Need of information : 40.3%, No needs 44.1%

Scarce Expertise :
Used it in planning : 3.2%
Know main features : 16.3%

Impression :
Cost effective in the long term : 27.2%
Reliable information : 27%

Needs :
Software – IT tools 6.7%
Training 15.3%

National Specificities :
In Hungary No Knowledge 62.2%
In UK have used it 0%
In Germany Training + software needs <4%, have used it 0%

## GEOTHERMAL ENERGY

Scarce expertise : awareness 55.9%,
Positive attitude : high potential 46.7%
Need of information : 43.5%, Need of IT-tools 12.8%

Expertise :
Used it in planning : 16.9%
Know main features : 28.8%
No knowledge : 13.4%

Impression :
Cost effective in the long term : 27%
Risks: 17.6%

Needs :
Training 22.7%
No needs 33.9%

National Specificities :
In Hungary High potential 78 %
In Hungary Training needs 60%
In Germany No knowledge 3%
In Germany No needs 52.4%
In Finland No need of software
In Spain No knowledge 40%

## PRINCIPAL KNOWLEDGE, IMPRESSION AND NEEDS RESULTS for II.4

| | | |
|---|---|---|
| Scarce expertise : | awareness | 40-50%, |
| Positive attitude : | high potential | 40-50% |
| Needs : | preferably information | 40% |
| | no needs | >30% |

### EXPERIENCE RANKING :

1. Solar thermal energy systems
2. Solar photovoltaic energy systems
3. Wind energy
4. District heating and cooling – DHC
5. Geothermal energy
6. Cogeneration of heat and power - CHP
7. Biomass
8. Micro and conventional hydropower



### BEST IMPRESSION – HIGH POTENTIAL RANKING :

| | | |
|---|---|---|
| 1. | Solar thermal energy systems | 59.1% |
| 2. | Cogeneration of heat and power - CHP | 51.1% |
| 3. | Solar photovoltaic energy systems | 50.5% |
| 4. | Geothermal energy | 47.6% |
| 5. | Wind energy | 47.0% |
| 6. | District heating and cooling – DHC | 42.8% |
| 7. | Biomass | 39.9% |
| 8. | Micro and conventional hydropower | 29.4% |



- Biomass is usually controversial because of the associated emissions to the atmosphere.
- Hydropower is disdained surely because it is not associated with urban planning, but with territorial infrastructures such as dams, etc.

### TRAINING AND INFORMATION NEEDS RANKING:

1. Biomass
2. Geothermal energy
3. Cogeneration of heat and power – CHP
4. District heating and cooling – DHC
5. Solar photovoltaic energy systems
6. Solar thermal energy systems
7. Micro and conventional hydropower
8. Wind energy



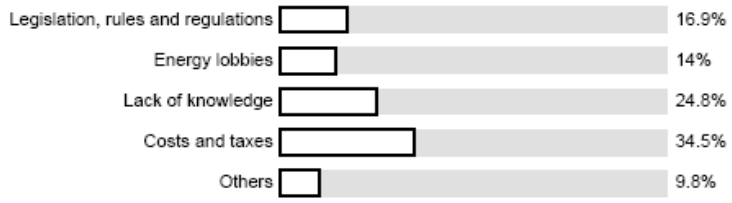
- People are skeptical about biomass but want to know more !
- For solar energies we can assume people know enough
- Interest in geothermal higher than in DHC/CHP
- Less interest in hydropower and wind energy, surely associated with infrastructure scale.

### "NO TRAINING NEEDS" RANKING:

| | | |
|---|---|---|
| 1. | Wind energy | 44.4 % |
| 2. | Micro and conventional hydropower | 44.1 % |
| 3. | Solar photovoltaic energy systems | 39.6 % |
| 4. | Solar thermal energy systems | 37.4% |
| 5. | District heating and cooling – DHC | 37.4 % |
| 6. | Geothermal energy | 33.9 % |
| 7. | Cogeneration of heat and power - CHP | 32.9 % |
| 8. | Biomass | 31.3 % |



**II.5 What do you consider as the major obstacle for the establishment of Renewable Energy Systems in actual Urban Planning ?**




***Other obstacles mentioned in free entries:***

Lack of political support

Unreliability and non viability of systems (UK very skeptical)

Conflicts with public acceptance of renewable energies, heritage, image (German example: problematic exterior insulation integration)

**II.6 If you participated in a training about energy in urban and regional planning, what would you want that training to be like?**

This was an open answer question for which 141 answers were collected (45% of submitted surveys).

In detail: 13 entries for Finland

53 entries for Germany

25 entries for Hungary

26 entries for Spain

24 entries for the UK

## 3.4 Analysis conclusions

### 3.4.1 Student profiles and potential

- Degrees: Two large groups dominate the public that submitted the survey: **architects** (32.5%) and **urban planners** (31%). Other considerable groups are engineers (11.3%, mostly Hungary), geographers (6.7%) and environmental planners (5%). Emerging groups are from Building and Housing services (UK) and landscape planners. Overall education level is quite high (supplementary education 58.5%), and so is information level on energy issues (for example 56.6% participate in training/seminars/conferences), These persons will be interested in very specialized professional training that can actually improve their work. If we consider the questionnaire results by degrees, we can see that architects are evenly represented in all countries, while urban planners are mostly German (60%) and Spanish (23%).
- The planning tasks and frequency reflect the **architecture** (48.2%) and **urban planning** (39.7%) leadership, but to a lesser extent, as 22.8% work very frequently on research, evaluation and assessments (in the UK 47.8%). Other fields (32.9% very frequently) remind us of existing issues to be mentioned / included in the UPRES training beyond energy urban planning :
    - Heritage
    - Maintenance
    - Transport planning – mobility
    - Landscaping and environmental planning
- **Predominance of "middle scale" planning experience**: Municipality, City district and Neighborhood. As it corresponds to the scale at which DHC and CPH are implemented, it means most addressees are or will be faced with RES and DHC/CPH integration challenges.

  These results vary depending on countries: Among all the received entries from Finland, Germany and Spain more than 70% work very often on municipal and city district scale, in UK and Hungary more than 50% work very often on individual building scale. In Hungary, more than half of the replying persons are engineers working on individual building scale that would be interested in an urban scale formation. In UK, 40% of replying persons are architects and 20% from building or social housing services, more involved with individual building scale (only 21% of urban planners and 24.4% work very frequently on planning and zoning).
- **Potential**: 141 persons (45% of submitted questionnaires) have expressed their ideas on training about energy in urban and regional planning. This can be considered as a minimum potential of motivated students.

### 3.4.2 Competences and needs

- **Environmental issues:** this chapter is useful to see what environmental knowledge is assimilated and what issues would need to be more developed and under which form.

  It stands out that **bioclimatic design or passive aspects** of environmental urban planning (orientation, shading, density, etc) are the best assimilated in planning practice (57.8 % include it in their planning, almost no need of experts is requested), especially in Germany, Spain and UK, so the course should provide a quick and efficient reminder of these principles, with links to the current regulations and guidelines. In Hungary, 35% "would need training on this", and in Finland only 33% "include this in their planning" so more emphasis should be put on this issue, and students could benefit from other partners' guidelines.

  Many are also familiar with two other traditional environmental issues: **transport, preservation of soils and ecosystems**, but the need for experts on these issues reaches 20%. They should be approached mainly from the energy aspect (especially transport).

  For other issues more than 30% prefer to rely on experts (especially in Finland, here 40%), with two similar patterns: **water management** and **energy sources, production and networks** are included in planning with 40% and 36% respectively, with a 30% need for

experts, and **Life cycle** issues are disregarded (energy deriving from construction materials, extractions, transport, disposal and waste management: less than 28% include it in their planning, 25% consider it not relevant). So there is a challenge for the UP-RES to teach water and energy management and life cycle analysis at urban planning level.

In general, the need for software – IT tools to plan these issues is not expressed.

In Spain, the expressed need for training reaches 20% in comparison with the average 10%.

The habit of consulting experts on energy issues is also reflected in the information sources answers, where 64.5% confirm that they consult experts to keep up to date.

- **Energy efficiency supply and/or Renewable Energy systems conclusions -** the following points can be expressed from the results previously detailed.

  First of all the German influence on the “no needs” statistic has to be pointed out, as German answers are more than 40% of total, and for all issues the Germans filled in “no needs”, over 53% (CHP) and up to 72% (wind energy)! These entries have influenced the overall results, but must be analyzed as a national specificity: widespread "being-already-well-informed"-attitude due to the steady coverage of renewable energy topics in media, and also very specialized professionals who consider these issues are not part of their field of work.

- General attitude towards RES, DHC and CHP is overall positive (high potential 40-50%), it is consensus that urban planning can benefit from these issues. Advanced knowledge and confidence in the solar energy systems (solar thermal and photovoltaic), with needs expressed for software and trainings on solar systems.
- The general knowledge is of awareness rather than expertise; few planners have had a chance to use RES or DHC/CHP in their planning, except for solar systems.
- Interest is expressed in information (40%) rather than in training,
- If we look at the results by degrees for the architects and urban planners, the information need is quite strong, more than 40% average, a figure that can foresee interest and a positive attitude towards the UP-RES project.
- Urban planners are not used to working with IT tools. The benefits and planning possibilities of IT-tools will have to be strongly argued, with simple to use and useful tools.
- Uncertainty about cost-effectiveness in the long term that will have to be argued in the courses showing best practices with a long range to be able to evaluate real results and cost effectiveness.
- Besides solar system, interest in biomass, geothermal energy and CHP is expressed.
- Disdain in wind energy and micro and conventional hydropower, probably because they are considered as engineering infrastructures, emphasis must be made in the UP-RES to show their integration in urban planning.
- DHC is not very well rated. The course marketing presentation must include a description of DHC results, efficiency and sustainability.

### 3.4.3 Training suggestions

The main recommendations for training are:

- Very practical courses, with real examples, and professional specialists from urban planning and energy companies
- Useful, competent and realizable skills
- Interactive (workshops, site visits of best practices, etc.)
- Strong demand for practical guidelines applicable within the current rules and regulations – implementable concepts, checklists. (recurrent issue for Germany + Spain)

- Concern with cost, performance, convincing and economic arguments for implementation such as benefits/risks. Also mentioned underperformance, results analysis, and maintenance issues.(especially in the UK)
- Include renovation in training program: using renewable energies in existing buildings/districts
- Demand for a certification that proves learning success during participation

Furthermore, the answers show specific profiles and training needs by countries:

- Finland + UK mention the type of training: preferably seminars or short 1-2 days courses for information.
- Spain interested in complete (long) and technical courses, including tools to pre-dimension and implement energy systems.
- Finland + UK are concerned by the wind energy issue.
- Finland and Germany show interest in a holistic approach.
- Germany is concerned about cooperation with energy planners and suppliers/other energy companies and overview on related laws.

# 4. INTERVIEWS

## 4.1 Preparation, choice of 5 targets, and interview template

Interviews on selected groups/persons have been pursued to complete the survey and to frame the problem settings to be proposed in the questionnaire. The interviews target representatives of professional organization and number 4 or 5 in each country. In some cases the interviews served as a stepping stone to contact Steering Committee Members, ensure the survey diffusion through the interviewed structures (e.g. mailing lists from professional associations), provide possible students for the UP-RES short and long term training from their staff.

The interview template was defined by WP2 leader SaAS in month 2:

- Presentation of UP-RES
- opinion on the energy issue in urban planning,
- historical context, existing laws + regulations / local context
- experiences (detailed in case that there is experience in DHC projects)
- relations with the energy companies if representatives from local administrations
- collaboration with energy specialists
- needs for new tools
- needs for training

The minutes of the interviews were written in national language and are available in the Optima intranet. Each partner then wrote an executive summary of the national interviews. SaAS collected the interviews and did the general analysis, corrected and approved by other partners.

## 4.2 Interview Executive summary and analysis by country (m2-4)

### 4.2.1 Finland

In Finland, as an exception, a different approach was followed: the interviews were addressed to directors of District Heating Plants, in form of a questionnaire, to find out what they consider as missing links between urban planning and energy. Out of the 150 persons contacted, 18 replied, with the following questionnaire results:

1- Have you studied urban planning or land use in your basic graduation studies?

| | | |
|---|---|---|
| a- | Yes - | 1 a little |
| b- | No | 17 |

2- Have you studies urban planning and land use in parallel to your work?

| | | |
|---|---|---|
| a- | Yes | 0 |
| b- | No | 18 |

3- Which of the below listed issues you consider to be the highest barriers when taking energy into account in urban planning?

| | | |
|---|---|---|
| a- | Laws, regulations, planning guidelines and rules - | 3 |
| b- | Attitudes of planners - | 5 |
| c- | Lack of knowledge - | 12 |
| d- | Lack of methodology, tools and normal practices - | 7 |
| e- | Costs and taxes - | 2 |
| f- | Others, what? – | 1 reply: Energy is not a priority in urban planning |

4- When you need information on development of your city, what do you usually need in particular?

| | |
|---|---|
| About measures/plans of the city to improve energy efficiency | 6 |
| About measures/plans of the district to improve energy efficiency | 1 |
| About measures/plans of individual buildings to improve energy efficiency | 1 |
| About city expansion plans | 16 |
| About district expansion plans | 10 |
| About increase of size of individual buildings (additional floors) | 1 |

5- What should the urban planner know about energy and emission issues?

| | |
|---|---|
| Investment costs of DH networks | 14 |
| Operation costs of networks | 6 |
| Heat and water losses of networks | 6 |
| Basics of DH network planning | 12 |
| Emissions of combustion of various fuels | 7 |
| Logistics of various fuels | 7 |
| Prices of various fuels | 4 |
| Consumer substations of DH | 3 |
| Indoor heating systems | 1 |
| Indoor electricty distribution systems | 0 |
| Temperature regulation of rooms | 1 |
| Temperature regulation of domestic hot water | 1 |
| Benefits of DH and CHP | 14 |
| Solar heating | 4 |
| Air heat pumps | 2 |
| Ground water heat pumps | 6 |
| Wind power | 4 |
| Location of buildings relative to networks | 14 |

**Summary on missing links between urban planning and energy :**

Lack of knowledge on both sides. As District Heating directors have not studied urban planning in their degree and have not found the need to study it after their degree, they consider it the responsibility of urban planners to coordinate optimised integration of District Heating and cooling in urban planning.

District Heating directors require the following competences from Urban planners:

- Implication : to recognize the benefits of DH and CHP and to be able to communicate them
- Economy : knowledge on investment and operational costs of DH networks
- Capacities : knowledge on Basics of DH network planning
- Technical knowledge on various RES, their operation and costs : Emissions of combustion of various fuels, Logistics of various fuels, Ground water heat pumps, Heat and water losses of networks

### 4.2.2 Germany

**List of interviewed:**

3 municipal urban planners

- Björn Dietrich, Director of environmental department, Würzburg
- Ramón Arndt, responsable for implementing local agenda 21, München
- Christine Schneider, energy consultant, (member of urban planning staff, Offenbach

1 University lecturer

- Volker Zepf, Department of resource strategy, Universität Augsburg

**Summary of main themes and topics:**

***Reference to the planning discipline***

All interviewed persons possess a direct or indirect reference to the urban planning discipline. They are working in urban development units, urban planning units, environment offices and universities.

***Today's state of renewable energies in urban planning***

Particularly due to the discussion about climate change renewable energies found an entry into urban planning. Nevertheless, impulses for practical implementation mainly come from external players like municipal energy suppliers.

In general, the need for a higher consideration of renewable energies in education systems is seen by the interviewed persons.

A language barrier still exists between engineers of municipal energy suppliers and urban planners.

***Obstacles***

A great obstacle for the integration of renewable energies in urban planning is the lack of interdisciplinary cooperation and networking of the different departments. The completely different approach of planners with different professional background is identified as a basic problem. Consequence is a mutual lack of understanding.

For energy topics this means that not only technical aspects have to be considered preparing sustainable energy conceptions.

A further problem is the integration of various guidelines of different domains like environmental protection, safety, quality of living space, urban shape, urban planning code, urban construction code etc. The mentioned guidelines contain energy only as one single topic beyond a mass of other topics which is in danger to be ignored in case of conflict.

House owners perceive a jungle of competences and fear exhausting administrative formalities to reach requested authorizations. Even if a house owner shows certain willingness to an energetic renovation of his house, this fear has a retarding effect.

Furthermore, the interviewed persons express some concern about conservation of historical monuments. The protection of monuments by law is seen as a big obstacle.

***Planning tools***

Concerning planning tools, the interviewed persons did not make a lot of comments on the application of this kind of tools; their distribution seems to be little.

Just the program ECORegion of the Ecospeed Company is mentioned, which allows the creation of an energy and greenhouse gas emission balance for cities and municipalities.

***Proposals for course topics***

- Provide a „feeling“ for the energy concept („how much is one kWh?“), differences and similarities of energy sources (above all heat and power); percentage of the total energy consumption
- Give an overview about technologies to reduce the energy demand of buildings (passive + active): refurbishment of buildings, insulation
- Show that reasonable energetic measures do not have to be opposed to an attractive appearance of a building.
- Create consciousness for the complexity of energetic optimization.

### 4.2.3 Hungary

**List of interviewed:**

2 persons in charge of energy services or associations

- Tamás Simon, Energy Centre Non-profit Limited Company Energy Efficiency, Environment and Energy Information Agency
- Sándor Hámori. Regional chairman of the Hungarian Chamber of Engineers, association of Building Service Engineers

2 university lecturers:

- Mihály Baumann, director of BAUSOFT Company, invited lecturer of the University Pécs
- Ladislaus Böszörményi, MSc, lecturer, Kossice, Slovak Republic

1 national deputy of state

- Péter Olajos, deputy secretary of state, Ministry of National Development, department of Green Economy Development and Climate Policy

**Summary of main themes and topics:**

During the consultations with staff members of Ministry and members of the Chamber of Engineers it has been agreed that the UP-RES approach cannot be found in the ongoing higher technical education and the development of a course material and the accreditation of a new course may bridge a gap.

Actually in Hungary three universities (Budapest, Pécs, Debrecen) offer training for architects as well as for mechanical engineers with specialization on Heating and Ventilation. As far as architects are concerned, their curricula includes the fundamentals of building physics and HVAC systems, however more detailed studies on renewables is not part of the compulsory core material. Some elective disciplines make up the lack for those who join the course – obviously only on the scale of individual buildings.

The mechanical engineers become familiar with the technical details of heating and air conditioning systems, including the district heating, however their knowledge is restricted to the thermal and hydraulic sizing of pipe lines, heat exchangers, and emitters with no emphasis on environmental and urban issues. As far as renewables are concerned boilers for biomass, collectors and heat pumps appear in the teaching material as technical equipment, however integration with building and adaptation on urban scale is not analyzed.

Solar photovoltaic systems seem to be a strange topic since the fundamentals of electrical engineering are taught only sporadically for architects and mechanical engineers.

Besides of the above, the University of Miskolc is to be mentioned, where gas supply is included in the curriculum, restricted to the utilities.

The overview of the ongoing curricula shows that there are deficiencies in the teaching of renewables even if individual buildings are spoken of whilst the application of renewables on urban scale together with the related environmental impact are absent. This is why both the Ministry and the Chamber of Engineers support the accreditation of the postgraduate training course.

### 4.2.4 Spain

**List of interviewed:**

1 association of urban planners:

- Sebastiá Jornet, president of AAUC (Agrupació d'Arquitectes i Urbanistes de Catalunya)

2 directors of urban planning:

- Jaume Barnada: Barcelona Municipal Institute of Urban Planning
- Ferran Casanova: INCASOL: Catalan Land Institute

2 technical directors of municipal urban planning with DHC and/or renewable energy integration projects:

- Francesc Figueras : Cerdanyola Centre directive consortium
- Enric Serra del Castillo: Viladecans Urban planning

**Summary of main themes and topics:**

- All interviewed decision-makers are very interested by the multinational aspect of the UP-RES team, and eager to be informed on sustainable urban planning practice abroad, to learn from other countries where energy savings and environmental conscience is more developed than in Spain.

- Specificity of the Spanish context:
  - There is no tradition of energy planning in urban planning,
  - Energy demand is much less than in Northern countries, although lately cooling demand is in permanent increase.
  - The energy market is a free market in Spain; the national companies have been privatized from 1985 on. Under current regulations it is not possible to impose an energy provider to anyone. In some specific cases like the Parc de l'Alba Development in Cerdanyola, it has been possible to force developers constructing on public-owned land (75% of total planned area) to connect their buildings to DHC (for the first 5 years of exploitation). Nevertheless, the private apartment buyer at the end of the process has the right to refuse DHC for example and install an individual gas boiler in his apartment.
  - As a consequence of their privatization the energy and communication lobbies are very strong, and versatile. Urban Planners are often faced with refusals from companies to connect a new neighborhood because their network extension would not be rentable, or changes in providers and prices, or refusals in investment for new plants.
  - Government initiatives encourage renewable energy plants, but not necessarily integrated in urban context.
  - There is no tradition of private implication of users though associations, capital participation etc. in energetic systems.

- A rising problematic issue of renewable energies is post-planning: management and maintenance of various sustainable energy systems and consumer's habits.

- The importance of financially sustainable projects is stressed (for example the municipality finances and installs the pipeline network, but they have economic return by DHC companies on exploitation income)

- None have had the occasion to work directly with IT-tools, but have seen some analysis. They would be interested in new tools that can help analyze, measure and compare solutions when designing.

- When asked about the training program, the general opinion is that the UP-RES should be a professional training, as the issues treated are very specific. Due to the actual housing crisis in Spain, there is more immediate need for renewable energy skills in renovation programs than in new developments. Another topic is the consideration of passive aspects (shading, density, cooling by green areas, etc.), as the Spanish climate permits great comfort improvement and energy savings with bioclimatic design.

### 4.2.5 United Kingdom

**List of interviewed:**

Senior planners:
- Sheffield city council
- Nottingham city council
- Southampton city council

Development control planner:
- Birmingham city council

**Summary of interviews responses:**

- All the respondents showed great interest towards the UP-RES programme.

- The interviewed persons gave mixed opinions regarding the energy issues in urban planning. Urban planners have little experience in terms of renewable energy and integrating it within planning and none of them has taken part in large scale renewable schemes. Planners found the existing energy documents highly technical and offer little during the early stages of development. Even though the latest developments in the councils have to meet the energy targets, the lack of knowledge and experience make it difficult for the planners to achieve.

- The planning department expressed their concern that many of the planners found it confusing to work in accordance with BRE Environmental Assessment Method (BREEAM) or Code of Sustainable Homes (CSH) as they have no guidance or knowledge in these areas. The planners also accept that one unified document will aid them in tackling the energy related issues rather than having various guidance documents.

- In general, councils have a separate sustainability team or private company collaboration to deal with the energy related issues. The main reason for lack of collaboration with other energy specialists or forming partnerships is the stringent budget set within the city councils.

- All the respondents from various councils were undoubted regarding the need for new tools that will assist and guide them to integrate renewable energy systems.

- All the respondents from various councils insisted the need for training to increase the knowledge base among local authority planners in particular around the viability of district heating and small scale micro-renewables. Nevertheless, cost can prove to be major obstacle in terms of attending the course.

## 4.3 General interviews analysis

The interviews with representatives of professional organization confirmed that there is consciousness of climate change and fossil resources depletion, and that urban planners must consider RES, DHC and CPH integration.

In all countries the gap for the UP-RES training exists according to the interviewed stakeholders, in order to integrate energy issues at very early stage in urban planning and to assure a competent coordination with energy experts - engineers or energy planners.

The idea of a training parting from a multinational basis is often most welcome, as all countries do not have the same experience in all issues and can benefit from the others.

Following is a list of recommendations on competence needs and training content that emerged during the interviews, and should be taken into account when designing the UP-RES course:

- Consciousness and implication of urban planners: to recognize the benefits of RES, DHC and CHP and to be able to communicate them
- The importance of preparing one unified document to aid planners in tackling the energy related issues rather than having various guidance documents (UK)
- Show detailed examples of planning from other countries (Spain, Hungary)
- Consider the heritage and patrimonial complexity, show examples of energy saving at building and urban scale that respect and preserve architectural heritage (Germany)
- Consider the post-planning issues: management and maintenance of various sustainable energy systems and consumer's habits (Spain)
- Consider the building scale, energy efficiency in individual buildings, as it is the basis of urban energy savings. How can municipal legislation and regulations get improved in this aspect for each country.
- Consider bio-climatic design for urban planning (Spain): density, shading, green spaces, winds, etc
- Need of persons trained to coordinate and do net working between urban planning and energy planning, on the technical but also economic and regulatory level (Germany)
- Provide detailed training of RES and/or DHC/CHP in urban renovation/regeneration programs (small scale micro-renewables) as well as in new developments (Spain and UK),
- Economic control: knowledge on investment and operational costs
- Need of economic and financially sustainable projects: balance between investment and return (Spain)
- Need for new tools that will assist and guide planners to integrate renewable energy systems (UK)

For some recommendations we have specified which country originated them, nevertheless they should be applied to UP-RES courses in all partner countries.

# 5. CONCLUSIONS

## 5.1 Main conclusions

The Competence and Training Needs Analysis, consisting of a survey of 313 questionnaires to urban planners, and 25 interviews with decision-makers of urban planning in partner countries, as well as a survey of 18 questionnaires to DH directors in Finland, has led to the following conclusions:

- Student potential : background and profile

  - Architects (32.5%), Urban planners (31%) and Engineers (11.3% - civil engineers, mechanical and electrical engineers, environment engineers)
  - Experience: Predominance of "middle scale" planning experience (municipality, city district, and neighbourhood scale)
  - Practise and tasks: architecture (48.2%) and urban planning (39.7%)
  - High educational and information level (58% trained with supplementary education on planning and/or energy)
  - Habit of consulting with experts on energy issues
  - Integration of environmental issues in planning practise is not very developed, best assimilated are bioclimatic design or passive aspects (57.8%)
  - Majority do not use software – tools for planning
  - General attitude towards RES, DHC and CHP is overall positive (high potential 40-50%), it is agreed that urban planning can benefit from these issues. Advanced knowledge and confidence in the solar energy systems (solar thermal and photovoltaic), with needs expressed for software and trainings on solar systems.
  - The general knowledge is of awareness rather than of expertise; few planners have had a chance to use RES or DHC/CHP in their planning, except for solar systems.

- Information needs and training recommendations

  - Consciousness and implication of urban planners: to recognize the benefits of RES, DHC and CHP and to be able to communicate them
  - The importance of preparing one unified document to aid planners in tackling the energy related issues rather than having various guidance documents
  - Show detailed examples of planning from other countries
  - Very practical courses, with real examples, and professional specialists from urban planning and energy companies
  - Useful, competent and realizable skills
  - Interactive (workshops, site visits of best practices, etc.)
  - Strong demand for practical guidelines applicable within the current rules and regulations – implementable concepts, checklists.
  - Covering of various scales of planning
  - Providing a certification that proves learning success during participation

- Practises and challenges:

  - Consider the heritage and patrimonial complexity, show examples of energy saving at building and urban scale that respect and preserve architectural heritage
  - Consider the post-planning issues : management and maintenance of various sustainable energy systems and consumer's habits
  - Consider the building scale, energy efficiency in individual buildings, as it is the basis of urban energy savings.

- Consider bio-climatic design for urban planning: density, shadings, green spaces, winds, etc
- Concerned about cost, performance, convincing economic arguments for implementation such as benefits/risks. Also mentioned underperformance, results analysis, and maintenance issues.
- Include renovation in training program: planning DHC and renewable energies in existing districts/ buildings (small scale micro-renewables).

- Competences to develop:

  - Need of persons trained to coordinate and do net working between urban planning and energy planning, on the technical but also economic and regulatory level (Germany)
  - Provide detailed training of RES and/or DHC/CHP in urban renovation/regeneration programs as well as in new developments (Spain)
  - Economic control : knowledge on investment costs and operation costs at long range
  - Need of economical and financially sustainable projects: balance between investment and returns (Spain)
  - Besides solar system, interest in biomass, geothermal energy and CHP.
  - Disdain in wind energy and micro and conventional hydropower, probably because they are considered as engineering infrastructures, emphasis must be made in the UP-RES to show their integration in urban planning.
  - Need for new tools

## 5.2 Impacts to other WPs and Tasks

All the items listed above (information needs and training recommendations, practises and challenges, and competences to develop) serve as a basis for the elaboration of the WP3 and WP4 long course that will be developed in Deliverable 2.3.

The conclusions listed in point 5.1 above can also help partners to focus their marketing plan for the courses (WP6), to stand out which issues are more “attractive”.

- For instance, information interest in various RES and CHP are more expressed than for DHC.
- IT tools: GIS are not perceived as useful for urban planners, so UP-RES should provide simple and effective tools like excel-based calculations that will assist and guide planners to integrate renewable energy systems as well as tools for demand analysis (energy and greenhouse gas balance of a city, estimation of heat demand of residential buildings for different countries, based on climate data, building geometry and surface properties, as developed in this workpackage).
- Mention the economic control and maintenance issues
- Urban planning integrating RES in refurbished neighbourhoods

# 6. APPENDICES

**Appendix 1:** English version of Questionnaire (other national versions are available in the Optima intranet).

## URBAN PLANNING AND SUSTAINABLE ENERGY QUESTIONNAIRE

This questionnaire is part of an IEE project for the training of Urban Planners with Renewable energy skills (UP-RES) with 5 European partner countries, and is addressed to urban planners to understand their needs and interest in Renewable energy issues and training.

Thank you for sparing us 10 minutes of your time to answer it!

Please read thoroughly the following questions and choose the most appropriate answer for each. Your contributions and opinion in questions II.3 and II.6 are more than welcome.

To clear any doubt or question about this enquiry do not hesitate to contact: WiltshireR@bre.co.uk

**Part I – General information**

**I.1- What is the field of your degree?**

a- Urban planning
b- Architecture
c- Civil Engineering
d- Geography
e- Social sciences (sociology, anthropology , others)
f- Economy
g- Law
h- Environmental planning
i- Other,

If you selected the "other" answer, please specify_____

**I.2- Specify the scale of planning you work on and the frequency of such planning**

| | Very often | Occasionally | Seldom | Never |
|---|---|---|---|---|
| National scale | | | | |
| Regional/territory scale | | | | |
| Municipality scale | | | | |
| City district scale | | | | |
| Neighbourhood scale | | | | |
| Individual Building scale | | | | |

**I.3- Specify your planning tasks/responsibilities and their frequency**

| | Very frequently | Occasionally | Seldom | Never |
|---|---|---|---|---|
| Research, evaluation and assessments | | | | |
| Preparation of laws and regulations | | | | |
| Planning and zoning | | | | |
| Architecture and urban design | | | | |

Other, please specify_____

**I.4- For each environmental issue below, specify which ones you include in your planning and if you have certain needs with respect to them.**

| | I include this my planning | I would need soft ware (IT tools) | I would need training on this | I would need information on this | I would need other experts on this | Not relevant |
|---|---|---|---|---|---|---|
| Passive aspects (orientation, shading, density, etc.) | | | | | | |
| Transport | | | | | | |
| Preservation of soils and ecosystems | | | | | | |
| Water management | | | | | | |
| Energy sources, production and networks | | | | | | |
| Energy deriving from construction materials, extraction, transport, disposal | | | | | | |
| Waste management | | | | | | |

**Part II – Energy and urban planning information**

**II.1- Were energy issues included in your degree curriculum?**

a- Yes
b- No

**II. 2- Have you studied energy and urban planning after your graduation?**(supplementary/continuing education)

a- Yes
b- No

**II.3- Which information sources do you mainly use to keep up to date with energy issues?**

a-scientific articles
b- newspapers
c- professional magazines
c- professional organizations' websites
d- energy companies' websites
e- research organizations' websites
f- online discussion groups
g- participating in trainings/seminars/conferences
h- consulting experts in the energy field
i- other,

If you selected the "other" answer, please specify_____

**II.4- Below is a list of Energy Efficient Supply and/or Renewable Energy Systems. For each specify which of the statement best describes your situation.**

| | District heating and cooling (DHC) | | | |
|---|---|---|---|---|
| Your expertise | I have used it as one component in my planning. | I know the main features/elements of DHC systems. | I am aware of the DHC concept. | I have no knowledge on DHC |
| Your impression | There is high potential for DHC. | In the long term, DHC is cost-effective. | There is reliable information available on DHC. | There are risks in DHC. |
| Your needs | I need software (IT-tools) to assess DHC implementation. | I need training on DHC. | I need information on DHC. | No needs |

| | Cogeneration of heat and power (CHP) | | | |
|---|---|---|---|---|
| Your expertise | I have used it as one component in my planning. | I know the main features/elements of CHP | I am aware of the concept. | I have no knowledge on CHP. |
| Your impression | There is high potential for CHP. | In the long term, CHP is cost-effective. | There is reliable information available on CHP. | There are risks in CHP |
| Your needs | I need software (IT-tools) to assess CHP implementation. | I need training on CHP. | I need information on CHP. | No needs |

| | Solar thermal energy systems. | | | |
|---|---|---|---|---|
| Your expertise | I have used it as one component in my planning. | I know the main features/elements of solar thermal energy systems. | I am aware of the concept. | I have no knowledge on solar thermal energy systems. |
| Your impression | There is high potential in solar thermal energy systems. | In the long term, solar thermal energy systems are cost-effective. | There is reliable information available on solar thermal energy systems. | There are risks in solar thermal energy systems. |
| Your needs | I need software (IT-tools) for solar thermal energy systems implementation. | I need training on solar thermal energy systems | I need information on solar thermal energy systems. | No needs |

| | Solar photovoltaic energy systems. | | | |
|---|---|---|---|---|
| Your expertise | I have used it as one component in my planning. | I know the main features/elements of solar photovoltaic energy systems. | I am aware of the concept. | I have no knowledge on solar photovoltaic energy systems. |
| Your impression | There is high potential in solar photovoltaic energy systems. | In the long term, solar photovoltaic energy systems are cost-effective | There is reliable information available on solar photovoltaic energy systems | There are risks in solar photovoltaic energy systems. |
| Your needs | I need software (IT-tools) for solar photovoltaic energy systems implementation. | I need training on solar photovoltaic energy systems. | I need information on solar photovoltaic energy systems. | No needs |

| | Biomass. | | | |
|---|---|---|---|---|
| Your expertise | I have used it as one component in my planning. | I know the main features/elements of biomass. | I am aware of the concept. | I have no knowledge on biomass. |
| Your impression | There is high potential in biomass. | In the long term, biomass is cost-effective. | There is reliable information available on biomass | There are risks in biomass. |
| Your needs | I need software (IT-tools) for biomass implementation. | I need training on biomass. | I need information biomass. | No needs |

| | Wind energy. | | | |
|---|---|---|---|---|
| Your expertise | I have used it as one component in my planning | I know the main features/elements of wind energy. | I am aware of the concept. | I have no knowledge on wind energy. |
| Your impression | There is high potential in wind energy. | In the long term, wind energy is cost-effective | There is reliable information available on wind energy | There are risks in wind energy. |
| Your needs | I need software (IT-tools) for wind energy implementation. | I need training on wind energy. | I need information wind energy. | No needs. |

| | Micro and conventional hydropower. | | | |
|---|---|---|---|---|
| Your expertise | I have used it as one component in my planning. | I know the main features/elements of micro and conventional hydropower. | I am aware of the concept | I have no knowledge on micro and conventional hydropower. |
| Your impression | There is high potential in micro and conventional hydropower. | In the long term, micro and conventional hydropower is cost-effective. | There is reliable information available on micro and conventional hydropower | There are risks in micro and conventional hydropower. |
| Your needs | I need software (IT-tools) for micro and conventional hydropower implementation. | I need training for micro and conventional hydropower implementation. | I need information micro and conventional hydropower | No needs |

| | Geothermal energy | | | |
|---|---|---|---|---|
| Your expertise | I have used it as one component in my planning. | I know the main features/elements of geothermal energy. | I am aware of the concept | I have no knowledge on geothermal energy. |
| Your impression | There is high potential in geothermal energy. | In the long term geothermal energy is cost-effective | There is reliable information available on geothermal energy | There are risks in geothermal energy. |
| Your needs | I need software (IT-tools) for geothermal energy implementation. | I need training for geothermal energy implementation. | I need information on geothermal energy | No needs |

**II.5- What do you consider to be the major obstacle for the establishment of Renewable Energy Systems in actual Urban Planning?**

a- Legislation, rules and regulations
b- Energy lobbies
c- Lack of knowledge
d- Costs and taxes
j- Other

If you selected the "other" answer, please specify_____

**II.6- If you could participate in training about renewable energy in urban and regional planning, what would you want that training to be like?**