UP-RES
Urban Planners with Renewable Energy Skills

Supported by INTELLIGENT ENERGY EUROPE

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

Deliverable 7.3
Outline for extended certification at European level

Due date : **2012-08-30 (m24)**
Actual submission date : **2013-02-28**
Lead participant : **AGFW - Germany**

Partners :
Aalto University Professional Development, Aalto PRO - Coordinator
Building Research Establishment Ltd (BRE), United Kingdom
Debreceni Egyetem (UD), Hungary
Technische Universität München (TUM), Germany
Sabaté associats Arquitectura I Sostenibilitat (SaAS), Spain
Universität Augsburg (UA), Germany
AGFW-Projektgesellschaft für Rationalisierung, Informtion und Standardisierung mbH (AGFW), Germany

Dissemination level		
PU	Public	X
CO	Confidential, only for members of the consortium (including the Commission Services)	

Table of contents

CERTIFICATION EXPERIENCE AND SUGGESTED APPROACH

1. Challenge of Certification

Urban planning has been carried out under different structure in the five partner countries with a great variation of the background qualification required. It is not an uniform concept in Europe but each country has its own approach. For instance:

- In Finland, 17 regional councils and the city planning offices do the county and city level planning respectively. Private consulting companies participate the planning by providing supporting studies and plans;
- In Germany, the professional title “Stadtplaner” (urban planner) is protected by law. Only those who are listed in the register of the responsible chamber shall have the right to conduct the legally protected professional title "urban planner";
- In Spain, urban planners and building sector developer do planning together;
- In UK, the strategic land planning and infrastructure planning is carried out by Local Planning Authorities (LPAs) which can range in scale from small unitary authorities to city scale and larger to the county scale. The LPAs are also responsible for the planning approvals process in response to planning applications within their jurisdiction. However, LPA staff are not required to have any formal urban or energy planning knowledge; and,
- In Hungary, no such diploma in this profession with the title urban planner is issued. Urban design is dealt with architects, specialised in this subject area.

As the practises vary so much in the five partner countries already, one may assume there are more permutations when the entire EU is concerned. Therefore, there can hardly be any integral approach for certifying urban planners with RES skills.

The awareness and establishment level of various RES components in the five countries is different as illustrated in Table below:

Table 1: Extent of various types of RES in the partner countries.

RES	Initial	Scarce	Dense	Established
Solar	FI	HU, UK	DE, ES	
Wind	FI	HU	UK	DE, ES
Biomass	ES, UK	HU	DE	FI
Waste heat	ES, UK	FI, HU	DE	
District heating	ES , UK	HU	DE	FI
District cooling	HU, UK	FI, DE, ES		
	⇩	⇩	⇩	⇩
Focus of training:	Raising Awareness	Providing Knowledge	Developing Competence	Promoting Good Professional Practices

In Table above DH and DC is considered as a means to distribute the products of RES in large scale and giving potential to CHP to use renewable fuels at highest efficiency possible.

In terms of solar power, Finland, U.K. and Hungary are in a very initial stage with close to zero share of electricity production, according to IEA 2009 statistics, whereas Germany (1% of electricity production) and Spain (2%) are much more developed.

Regarding wind power, Finland and Hungary are in a very initial stage with 0,4% and 0,9% of electricity production, according to IEA 2009 statistics, respectively, whereas Germany and Spain are highly developed, 7% and 13%, respectively. In U.K., wind power share is 2,5%, thus being in the middle of five partner countries.

Use of biomass in power and heat production is well established in Finland and rather well in Germany and Hungary with 25%, 10% and 5% of the total production of heat and power, respectively. In both U.K. and Spain, the biomass is a rather little used resource, according to IEA 2009.

Waste heat is used most in Germany with 10% of heat production, whereas about 3% in Finland and Hungary. Waste heat recovery is rather irrelevant to Spain and U.K. due to missing DHC systems.

DH is in a very initial stage in U.K. and Spain and still rather scarce in Hungary. In Germany DH is already (14% of population connected) densely used and well established in Finland (49%), according to the District Heating and Cooling Country by Country Survey 2011 of Euroheat&Power.

District cooling is fast growing, but the statistics is still incomplete. There are large cities with growing DC systems in Spain (Barcelona), Germany (Munich[1], Chemnitz[2]) and Finland (Helsinki[3]) already, but they are still rather individual examples with low national coverage.

As conclusion, DH for instance, is a well established practice in Finland, but neither in U.K. nor Spain. On the other hand, solar and wind power are largely used in Spain and Germany, but are still at a very initial stage in Finland. Therefore, the technological focus per country had to be adjusted according to the potentials and needs.

More than the technological differences, the training needs are caused by the numerous links prevailing between the living habits – the existing and desired urban structures – the energy consumption – the types of energy sources used now or being possible in the future – the economy – the energy related emissions - other environmental impacts . This shows that the training need is complex and requires a comprehensive training approach.

Based on the training needs analysis carried out in the five countries, the conclusions were as follows:

- requirements of various types of RES set to urban and regional planning in terms of spatial needs was considered vital. Such requirements relate to location of sources, storages, distribution piping and roads, sizing and *facing* orientation of buildings;

- objective information about economy and ecology of various energy sources is needed, as there is a lot of subjective advertisement on the market that is often contradictory to each other and causes confusion;

- definition of terms: density of communities, renewable and non renewable energy, primary energy factors, energy efficiency indicators;

- life-cycle impacts of energy consumption and construction materials on economy and Climate Change;

- understanding of the causes and processes to emissions in different types of energy systems: power-alone production, various heating and cooling applications in either decentralized or centralized solutions, means of transportation;

- and, feasible measures either in new construction or rehabilitation of existing building infrastructure in terms of strengthening RES use and EE achievements.

[1] Munich: http://www.swm.de/geschaeftskunden/m-fernwaerme/m-fernkaelte.html

[2] Chemnitz: http://www.eins-energie.de/ueber-eins/netze/fernkaelte/

[3] Helsinki: www.helen.fi/en

2. Outline for European Level Certification

The certification and eligible training even though being an EU level concept should be flexible enough to be adapted to the local conditions. Designing and implementing the training contents and certification requirements depends on the local circumstances, and should therefore be adjusted to the local needs and conditions.

Certification

On European level a certification should be allowed if you comply a minimum set of requirements or if you have accomplished a minimum set of fields of RES / DHC inputs. The UP-RES project consortium recommends the following minimum requirements for people, who would like to get a certification as Urban Planner with Renewable Energy Skills, based on the experiences of the pilot training and different national certification processes.

For a certification as Urban Planner with Renewable Energy Skills, people should have a sufficient background education as the basis for further continued education:

- Successfully completed university studies with a total standard period of study of at least three years in architecture, urban planning or engineering at an European university, college of art or advanced technical college.

Applicants for the title “Urban Planners with Renewable Energy Skills” should at least have two years of professional practice in urban planning. During this two years at least one of the following areas should be covered:

- designing, technical, economical, social and ecological urban and spatial planning, in particular the development of urban development plans,
- coordination, guidance, steering of planning and the implementation of projects, planning and processes,
- consulting, support and representation of the contractor in all matters relating planning and the implementation of projects.

In addition to a basic background education and professional practice, applicants should participate in further continuing education based on the model of the UP-RES training program. Ideally they attend in an accredited continuing training (see following paragraph).

Accreditation

Organizers of training courses, which should provide a basis for the certification as Urban Planner with Renewable Energy Skills, should include at least eight modules, out of ten modules developed in the UP-RES project, in continued education or university courses (see table 2).

Table 2: Ten training modules for urban planners to educate for RES and EE.

M1	**SUSTAINABILITY CONCEPTS IN REGIONAL AND URBAN PLANNING: A HOLISTIC VISION** The share of urbanization is expected to rise to 70% by year 2050 from the actual of some 50%. Use of fossil fuels to cover the growing energy needs tends to expand. Countries have set targets to reduce primary energy consumption and to increase the share of RES. To materialize this, urban planning is in a key role.
M2	**ENERGY. FORMS - TRANSFORMATION - MARKET OUTLOOK** Energy is available in various forms such as fuels, electricity, heat, cooling, mechanical energy. Some energies are “good” due to low emissions and low primary energy factor but some others are “bad” for opposite reasons. How to assess various types of energy and how to convert from one to another? Calculation examples are given as well as simple tools are offered for public use.

M3	**ENERGY DEMAND REDUCTION STRATEGIES: POTENTIAL IN URBAN PLANNING** Reduction strategies of energy consumption are presented from two cases, Freiburg and Porvoo. In both cities, urban planning including energy and emission issues has provided sustainable results in terms of reduced primary energy consumption, reduced emissions and even with increased overall economy.
M4	**ENERGY DEMAND REDUCTION STRATEGIES: POTENTIAL IN NEW BUILDINGS AND REFURBISHMENT** Building as the major consumer of heating, cooling and electricity is a vital to point focus on. Construction of new EE buildings is often less challenging than retrofitting existing ones, but the latter one is dominant while influencing the energy consumption on the building level. What means zero-energy building and how they can be built or the existing buildings can be refurbished to become such?
M5	**ENERGY RESOURCES AND RENEWABLE ENERGY TECHNOLOGIES** Solar panels (electricity) and collectors (heat) require solar radiation to function. Heat pumps can convert waste heat to useful energy (heating, cooling), biomass can be used to produce heat and power. The main applications are presented to give an idea of the opportunities offered and requirements set to urban planning.
M6	**ENERGY DISTRIBUTION: DISTRICT HEATING AND COOLING** DHC as a means to distribute heating and cooling and CHP and heat pumps to produce such products at high efficiency. Thanks to CHP and DH in Finland, for instance, some 700 kg/capita of coal equivalent could be saved in 2010 and 1600 kg/capita less CO_2 emitted to the atmosphere. An existing DHC is a precondition to CHP, that is the most efficient way to produce electric and heat energy at the efficiency as high as about 95%. The DHC system, in order to economically viable, requires compact urban structures.
M7	**THE RIGHT SCALE FOR EVERY ENERGY CONCEPT: HEAT AND COOL DENSITY (DEMAND SIDE), POTENTIAL ON SUPPLY SIDE** Some types of energy are mobile, whereas some are steady. Some energy conversions require large scale to be economic, whereas some others can be economic in small scale as well. In urban planning, one has to be aware of the main features of the types of energy in order to improve sustainability of communities.
M8	**NEW MANAGEMENT CONCEPTS IN THE ENERGY MARKET** In order the RES concepts to materialize, a few financing/organizing ways exist such delivery and performance contracting, for instance. For dissemination of RES and EE information, energy agencies have been established.
M9	**ENERGY PLANNING** Energy planning starts from the demand analysis and forecast. Various concepts can be considered to meet the demand at lowest cost, primary energy consumption and emissions. Adoptability of many concepts, however, depends on the urban structure.

M10	**NEW TRANSPORT MODELS AND URBAN AND INTERURBAN MOBILITY** Transportation covers about a quarter (27% in 2010) of primary energy consumption. Ways to reduce transportation need through urban regional planning, comparison of various transportation media in terms of energy consumption and emissions, availability and future of renewable fuels for transportation have been discussed. Many cities such as Freiburg, Germany, for instance have been successful in developing public transportation and biking practice in a sustainable way already.

Learning outcome of an accredited training program should be the knowledge about:

- requirements of various types of RES in terms of spatial needs,
- economy and ecology of various energy,
- definition of energy related terms,
- life-cycle impacts of energy consumption and construction materials on economy and Climate Change,
- causes and processes to emissions in different types of energy systems.

3. Possible Entity for Implementation (Recommendation)

European level certification of urban planners still lies in the future. However, the AESOP Expert Pool (AESOP EP[4]) is a recently established instrument of AESOP supporting quality policy. AESOP EP consists of a number of experts from various parts of Europe and various areas of planning.

In principle AESOP EP will not issue certificates or quality marks as according to AESOP the urban planning sector is too diverse. At present, the planning schools may have their focus either on design, engineering, social, sciences, or political economy, for instance. This principle of not issuing certificates and quality marks on specific trainings is applied to UPRES training programs as well.

Instead of certificates, AESOP EP will issue reports with recommendations about how teaching of urban and regional planning in general could be organized, how the scope could be improved and how the quality could be controlled.

We suggest that RES issues should become one of the topics which the AESOP EP should include in their working scope while evaluating training scope and contents. AESOP EP should also provide guidance to their member schools. This could be the most realistic and systemic way to include RES in the education of existing and new urban planners in Europe.

4. Certified Energy Managers

The energy manager certification in Europe and beyond can be considered an option for RES skilled urban planner as well. The procedure is briefly described in the following.

Certification of Energy managers has been initiated by the German Chamber of Commerce some five years ago. EU funding has been used to launch the training in two consecutive periods [4].

At present, the training has expanded to 20 countries, including China and Egypt, for instance. Altogether 3.000 Energy Managers have been trained and certified, some 2.000 of them in Germany alone and some 35 in Finland, for instance.

[4] . http://www.aesop-planning.eu/uploads/experts-pool/aesop-experts-pool-report-final-web.pdf

In the training courses the set of students is restricted to 20 at most in order to facilitate interactive discussions.

The criteria of certification have been defined in the project, as follows:

- The duration of the course 13 days of attendance at minimum
- The project work completed and presented by the student
- Attendance more than xx% of the lectures by the student
- Examination successfully past as at least 50% of questions correctly answered