

**PROJECT DOCUMENT**

Status: PUBLIC

**final report**

**Workshop:  
European Software for Building Energy Performance  
29<sup>th</sup> of June, 2009  
CEN Meeting Centre / Brussels**

***Towards Pan-European Software for Building Energy  
Performance?***

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**CENSE\_WP6.4.8\_N04**

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**IEE-CENSE**

***Leading the CEN Standards on Energy performance of buildings to practice  
Towards effective support of the EPBD implementation and acceleration  
in the EU Member States***

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### Disclaimer:

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The content of this document reflects the authors view. The author(s) and the European Commission are not liable for any use that may be made of the information contained therein.

Moreover, if this is an interim report: the results are only preliminary and may change in the course of the project based on further feedback from the contributors, additional collected information and/or increased insight.

## 1 Executive summary

### 1.1 The CENSE project

The objective of the IEE CENSE project (2007-2010) is to accelerate the adoption and improved effectiveness of EPBD related building energy performance standards from CEN in the EU Member States.

The IEE CENSE project initiates a number of international/regional workshops:

- to present their work plan and the interim results on information on the CEN standards
- to get feedback from the Member States or other target groups on possible obstacles to use of the standards and on good practice examples
- to identify together the ways for an increased convergence

### 1.2 Aim and programme of the workshop

#### Objectives of the workshop

The purpose of this workshop is to explore these issues further, in the context of:

- software companies considering the regulatory market as an extension to existing design tools or e.g. as part of building stock maintenance tools,
- Member States, especially those who have not yet fully implemented the EPBD.

The objectives of the workshop are:

- to **inform** about the present legal situation and the use of such software in Europe
- to **exchange** views and opinions (interest on a common European method, linking regulation and design)
- to **discuss** and **identify common actions** to push forward the development and

application of a European energy calculation.

The main objective is to identify if there is an interest of a unified framework and, if this is the case, how to organise to reach this target.

#### Agenda of the workshop

##### Opening the workshop

*Gordon SUTHERLAND*

Executive Agency for Competitiveness and Innovation (EACI) – European Commission,  
Project Officer

##### Information

- Directives (EPBD, Energy Service Directive, Energy using Product Directive)
- Review of what the EPBD calls for in the way of calculation procedures
- Standardisation (CEN mandate 343; ISO), Structure of CEN standards
- Member States regulations

Overview of the different ways how Member States interpreted EPBD requirements on calculation procedures, technically and organisationally (multiple acceptable methods, accreditation)

*Johann ZIRNGIBL* CSTB, France, Convenor CEN/TC 228/WG4, ISO/TC 205/WG9

Jaap HOGELING ISSO, Netherlands, Chair CEN/BT/TC 371

Roger HITCHIN CENSE project, United Kingdom

Laurent SOCAL CENSE project, Italy

**Documentation:**

- The use of CEN standards to support the EPBD in the Member States  
CENSE Info Paper P90 ([www.iee-cense.eu](http://www.iee-cense.eu))
- Implementation of the Energy Performance of Buildings Directive:  
Country reports 2008 ([www.buildup.eu](http://www.buildup.eu))
- How to integrate CEN standards in national building regulations?  
The use of EN 15603. CENSE Info Paper P87 ([www.iee-cense.eu](http://www.iee-cense.eu))

**Exchanging experiences, views and opinions**

Fears (concentration of companies), possibilities (EU software), market transparency

Discussion of pros and cons of a unified framework

Which tool (simplified – detailed), tool integration, interoperability

Free issue software and commercial interfaces, open source codes

Performance benchmarking of software, early avoidance of future market barriers

**Discuss and identify common actions**

How to participate to standards development

Creating a European Network?

**1.3 Main discussion and results**

All the following points were discussed:

- Information about EPBD
- Exchanging experiences, views and opinions
  - o Pros and cons on a unified framework (EPBD purposes)
  - o Which tool (simplified – detailed)?
  - o Databases
  - o Free issue software / commercial interfaces
  - o Accreditation of software tools
- Identification of common actions
  - o Public domain: standardisation – Why? How to participate?
  - o Private domain: commercial interfaces, regional implementation, databases, training
- Practical follow ups – opportunities
  - o Keep in touch
  - o Work in standardisation
  - o Practical applications: CEN package to National building regulation
- Action list (resume of decision)

**1.4 Conclusions and recommendations**

The set of the following actions has been decided:

**- Keep in touch**

- Create a "software community" on Internet
- Prepare a company profile template to facilitate the business contacts between the software community

**- Work in standardisation (revision EN 12831)**

- Declaration of interest to the workshop convenor. Indicate preference for direct participation or creating of a mirror group
- Creating of mirror group "EN 12831" within the software community

**- Practical application (CEN – national regulations)**

declare interest in practical application to the convenor of the workshop:

- Experts having experiences in the application of the CEN package to national building regulations;
- Software companies developing tools based on EN standards.

## 2 The CENSE project

The aim of the CENSE project (2007-2010) is to support the EU Member States (MS) and other target groups in achieving better awareness and more effective use of the European (CEN) standards that are related to the EPBD.

The main activities in the project are:

- 1) to communicate the role, status and content of these standards as widely as possible, and to provide guidance on their implementation;
- 2) to collect comments and examples of good practice from the MS, so as to remove obstacles to implementation, and to collect and secure results from relevant SAVE and FP6 projects;
- 3) to prepare recommendations to CEN.

As part of the second type of activities, the IEE CENSE project initiates a number of international/regional workshops.

More information on the project can be found in the Information Paper P86, *The CENSE project. Leading the CEN Standards on Energy performance of buildings to practice. A project (2007-2010) under the Intelligent Energy Europe programme*, one of a series of Information Papers that can be downloaded from the website ([www.iee-cense.eu](http://www.iee-cense.eu)).

## 3 Aim and programme of the workshop

### 3.1 Main topic and objectives

The workshop is organized with the support of CEN BT TC 371 Project Committee on the EPBD. One of the aims of the meeting is to strengthen the cooperation between standard writers and software developers. Responsibilities of the CEN EPBD standard package are participating: Jaap Hogeling – chair CEN BT TC 371, Johann Zirngibl - chair CEN TC 228/WG4 and ISO TC 205/WG9, Dick van Dijk - chair ISO TC 163/WG3.

After the presentation of the CENSE project, the context and objectives of the workshop are recalled. The objectives of the workshop are to inform, to exchange and to identify common actions in order to reach a European procedure.

### 3.2 Programme of the workshop

The full programme is given in **annex A**.

## 4 Content of the workshop

### 4.1 Presentations

Johann Zirngibl, chaired the meeting.

Gordon Sutherland, Project Officer from the Executive Agency for Competitiveness and Innovation (EACI), opened the meeting with a presentation titled "Why support energy efficiency in buildings".

Jaap Hogeling, Chair CEN BT TC 371, gave an overview about the EPBD CEN standards.

Paul Davidson, Director Sustainable Energy in BRE, presented the context of EPBD Energy Calculation Procedures and the UK experience.

Laurent Socal, Edilclima, explained how to deal with the CEN Package in building regulation and software. He pointed out the difficulties encountered in the national transposition of the CEN package in Italy.

See also **annex B**: Copy of the presentations

## 4.2 Profile of participants

42 participants coming from 17 countries. The majority of the participants are representing software companies. Energy experts, industrials, energy suppliers, standard writers and authorities (European, national, regional level) are also attending the meeting.

See also **annex C**: List of participants

## 5 Main discussion and results

### 5.1 Welcome and opening the workshop

Johann Zirngibl, as convenor, welcomed the 42 participants coming from 17 countries. The majority of the participants are representing software companies. Energy experts, industrials, energy suppliers, standard writers and authorities (European, national, regional level) are also attending the meeting.

The workshop is organized with the support of CEN BT TC 371 Project Committee on the EPBD. One of the aims of the meeting is to strengthen the cooperation between standard writers and software developers. Responsibles of the CEN EPBD standard package are participating: Jaap Hogeling – chair CEN BT TC 371, Johann Zirngibl - chair CEN TC 228/WG4 and ISO TC 205/WG9, Dick van Dijk - chair ISO TC 163/WG3.

After the presentation of the CENSE project, the context and objectives of the workshop are recalled. The objectives of the workshop are to inform, to exchange and to identify common actions in order to reach a European procedure.

The draft agenda was presented and approved.

Gordon Sutherland, Project Officer from the Executive Agency for Competitiveness and Innovation (EACI), opened the meeting with a presentation titled "Why support energy efficiency in buildings".

### 5.2 Information session

Jaap Hogeling, Chair CEN BT TC 371, gave an overview about the EPBD CEN standards.

Paul Davidson, Director Sustainable Energy in BRE, presented the context of EPBD Energy Calculation Procedures and the UK experience.

Laurent Socal, Edilclima, explained how to deal with the CEN Package in building regulation and software. He pointed out the difficulties encountered in the national transposition of the CEN package in Italy.

In the exchanges the following points are underlined:

- different tools will provide different answers,
- the question of hourly or monthly method seems to be a wrong debate, compared to the capacities of the calculation engines,
- the user interfaces are more important,
- each piece of standard should be a software model,
- boundaries conditions could be used to select detailed or simplified models,
- low energy houses require better calculation models and software,

The importance of the software developers, as the linking element between the standard writers and the standard users (designers, installers, certifiers) in the field of energy performance of buildings is recognized. Mainly the software developers will read the standards and apply them in software tools for the building professionals.

The cooperation between standard writers and software companies should be developed. The content of the standards should be "software friendly" and "software proof".

### 5.3 Exchanging experiences, views and opinions

The discussion is structured according to the comments received from the participants in preparation to the meeting.

#### 5.3.1 Pros and cons on a unified framework (EPBD purposes)

The participants reported that often they have to struggle with low quality public software, developed with limited budgets.

They are in favour of a common procedure <sup>1)</sup> (method with a modular structure) in order to reach higher quality workflows and to avoid duplication of effort by international cooperation. The common method could be tailored to individual country requirements in national annexes (i.e. national weather data).

A view was expressed that there should be enough flexibility to allow each country to respond and comply EPBD in their own way to suit their existing custom and practices. This includes the facility for designers to use the same software for design and compliance and avoid duplication of data input.

Some participants drew the attention to the risk, that if there will be one software tool there could be less stimulation for the future development.

The question raises who, and on what basis, will choose one method for calculation when CEN standards provide a lot of options. The answer could be the Italian approach – set the boundaries conditions at national level on when to use the detailed or simplified method. For the software it is not problem to include all the options provided by CEN standards.

Countries have already their own software(s) and procedures – it will be difficult to overcome this obstacle.

The idea of using the EN standards in the Member State regulations should be the target. Even if it looks like the beginning of a 5 years story, we should all work in this direction. It is the right time to start.

#### 5.3.2 Which tool (simplified – detailed)

It was pointed out that especially low energy houses (a priority in the road map of the Commission) needs reliable calculation tools for design and asset rating.

A dynamic approach (or a simplified dynamic approach) based on hourly calculation seems to be the most appropriate method, especially for cooling. It is mentioned that the calculations could be the same (dynamic approach), just the results shown could be presented differently.

Other contributions underline that the priorities are not the same across Europe. For example in southern countries the summer comfort has a higher priority than heating.

The different needs for the users (designer, installer, certicator) are also mentioned.

The combination or connections between different design programmes (such as Autocad), building stock maintenance tools and the regulatory market (EPBD, minimum requirements, certification and inspection) would facilitate and higher the quality of design of energy efficient buildings. These tools can only be elaborated in a big market (European?). Actually very often the certificates are established with low quality tools, developed with limited budget.

The overall structure should allow different levels (simplified, detailed) and be modular. Given the power of calculation engines today, perhaps the simplification could be only the use of simplified input (default values, precalculation).

#### 5.3.3 Databases

It is reported that very often the databases are linked to the national calculation methods (e.g. UK, France). The result is a patchwork of databases, in addition to the patchwork of national methods. If the national market is not so important, manufactures will not make the effort to provide data. National databases sometimes require additional testing or precalculation. The results are new barriers for trade within Europe.

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<sup>1)</sup> It is important to distinguish between "procedure" and "software". A procedure is the description of how to calculate, whereas the software is a tool, the electronic application of the procedure.

A new concept of database using an open source database is presented. It can be developed directly by the manufacturer or a professional association. The problem remains the link between a common database and the patchwork of national calculation methods (see comments before).

The participants underline the need for a European wide free database on hourly weather data. Meteorological data are very expensive in some countries.

### **5.3.4 Free issue software / commercial interfaces**

In some countries the public authorities finance a "core" software or free software with simplified interfaces. In addition to free-issue interfaces there are "commercial" interfaces developed to facilitate the use of the software (e.g. graphical interfaces).

The participants mostly agree that there are two domains: a public domain and a private (commercial, business) domain. The common method would have to be public domain.

The 'private domain' is software but it was agreed that the 'public domain' would be a common method and it was generally agreed that there would be no need for a Europe wide standard software.

The common method could replace free government methods but should not prevent commercial EPBD applications from being used.

A common method (description) is preferred to core software.

### **5.3.5 Accreditation of software tools**

The enquiry realised before the workshop showed that other software tools, based on different procedures, are allowed in some countries to be used within national regulatory systems (minimum requirements, certificate). Sometimes this software has to be accredited, sometimes not. Accreditation rules and methods have been developed by several organisations (e.g. IEA, ASHRAE).

National accreditation of software using a common procedure, based on standards, would facilitate accreditation across Europe. The common European method could even be used for international calibration of national softwares.

The European Commission has already announced such international calibration in the recast of the Directive (development of a common method for calibrating the minimum requirement of the Member States).

If accreditation is well established it would give the possibility of using dynamic calculation methods for EPBD asset rating calculations. It should not be a problem that two tools comes out with two different results, for example a detailed method with a lower energy consumption compared to the higher energy consumption determined with as a simplified method. But coherence has to be established.

The difference between "software accreditation" and "software validation" is underlined. The validation is understood as the comparison between calculated and actual values. This is an important topic because the certificates are including recommendations for upgrading the energy performance of buildings. After renovation the end user will compare the predictions with his actual energy consumption.

In some countries end users can not compare 'energy predictions with actual energy consumption' based on compliance simulations, because compliance methods use standardised data and as such are 'idealised' according to building type and therefore cannot be directly compared in all cases with 'real' performance. This underlines the need for robust design tools which should be used for such direct comparison. The compliance results provide a useful benchmark across the building stock under standardised conditions.

## **5.4 Identification of common actions**

### **5.4.1 Public domain: Standardisation - Why? How to participate?**

As discussed in the previous session, two domains, one public and one private, related to software in building energy performance has been identified during the workshop.

Some participants are hesitating to bring their knowledge to public domain, because of loose of company owned know-how without economical compensation and counterpart (feedback).

Majority of the participants underline the need for a public domain where people can share experiences and develop together better procedures for energy efficient buildings. There should be no commercial interest, in order to allow public organisations (building authorities, institutes, universities) and private companies (industrials, energy suppliers, software companies) to work together. In the public domain, competition should be replaced by cooperation.

A common procedure, developed by international knowledge share, accessible to everybody, will favour the acceptance on a national level by national authorities.

International standardisation seems to be the most appropriate structure to realise the work in the public domain. Standards are well recognized, and can be referenced all over the world. The working procedures are transparent and democratic. At several stages of standard realisation, possibilities are given to provide input, to react and finally to vote on a proposal. It is remembered that in Europe the transposition of European standards into national standards is mandatory.

Experts willing to participate in international standardisation have to be appointed by the national standardisation bodies (e.g. BSI, DIN, AFNOR, NEN, CTI, etc). After having been appointed by national standardisation bodies, and accepted by the convenors of the working groups, experts can participate directly on international level as a member of a working group. However direct participation on ISO level is cost intensive (meetings all around the world). In general, parties with common interest organise in a mirror group to share the costs, but also to elaborate common positions which are then brought on international level. The mirror group "Software and EPBD standards" could be created as a section inside an existing structure (e.g. REHVA, IBPSA, 18599 Gütegemeinschaft) or be stand alone.

To answer the hesitation, especially of small companies, to contribute to knowledge share in the public domain, it is mentioned that the participation in standardisation is also a way to protect the investments done in the last years. In general, standardisation work creates harmonised market conditions which increases the productivity for the companies working in these fields and opens a wider market.

It is decided that participants shall declare their interest to the workshop convenor (J. Zirngibl) and indicate their preference for direct participation or creating of a mirror group. The link to existing structures will be discussed later.

#### **5.4.2 Private domain: commercial interfaces, regional implementation, data bases, training**

The participants underline that the public domain needs to be completed by the dynamic of the private sector (competition, commercial interest).

Private companies could elaborate software interfaces adapted to the needs (simplified, detailed) of different users and sponsors, set up databases, provide training, etc. As the common procedure has to be tailored to individual countries requirements (e.g. climate), regional implementation is needed.

Participants are interested in company's international networking.

The convenor proposes to prepare a company profile template to facilitate the business contacts between the participants.

### **5.5 Practical follow ups - opportunities**

The subject of the workshop is considered of high actual priority. The participants express their wish to go further within this cooperation. During the workshop opportunities and possibilities for sustained cooperation are identified.

At this stage three topics are distinguished:

- keep in touch;
- work in standardisation;
- practical applications.

#### **5.5.1 Keep in touch**

A possibility should be provided to encourage feed back and dialogue, to continue the exchanges launched by this workshop.

The decision is taken to create a "software community" on Internet. This community could be located at BUILDUP ([www.buildup.eu](http://www.buildup.eu)), the communication portal of the European Commission related to the energy performance of buildings, and/or at a specific Website dedicated to the needs of the software community.

The funding for launching the Website are provided by the BUILDUP and the CENSE project, but for sustained cooperation (maintenance of the Website) a business model has to be identified.

### 5.5.2 Work in standardisation

In the field of energy performance of building there are at least two opportunities:

- the revision of EN 12381 (heat load);
- the transfer of CEN standards to ISO level (including updating).

#### Revision of EN 12831

This standard is widely used in Europe for heat load calculation and heating system design.

The main target in revision is to create a common structure that can be easily parametered by a national data file (simply upload the file to the core software).

This standard could be the first practical example of a common European procedure (methodology) tailored to individual country requirements by a national annex.

The existing structure of EN 12831 already integrated this idea. In annex D all the national data were collected. But national standardisation bodies added tables and equations (also because the standard was not complete).

The revision should integrate the five years European experience in the use of this standard, and to make it "software proof".

It is intended to associate the software developers in the revision of the standard by creating a mirror group EN 12831 within the software community.

*Note JZ: In order to finance the standardisation work (organising the meeting, updating and dispatching the documents, reporting to the mirror group, etc) an annual contribution could be asked to the participants (usual in standardisation work).*

#### Transfer from CEN standards on ISO level (including updating).

Climate change is a global problem. It was decided to bring the CEN standards on ISO level because reliable calculation tools are needed all over the world. Countries like China, India or USA do not participate at CEN level but at ISO level and could therefore not share the European experience and know-how.

New work items have already been asked at ISO level. They are linked to the top standards as EN 15603, but also to modules like heat pumps (EN 15316-4.2) and boilers (EN15316-4.1). It is intended to work at the same time on ISO and CEN level.

The same organisation as under EN 12831 could be adapted.

### 5.5.3 Practical applications: CEN Package to National building regulation

Several of the participating countries (Croatia, Slovenia, Turkey) are just now working on the implementation of the CEN standards in their national building regulations. They will have to face the same difficulties (many choices to be made at national level, different time steps, loose ends) as some other countries (e.g. Italy) have already solved. Related software has to be developed. The deadline for the elaboration of the national building regulations is about the end of this year.

The proposal is made to work together on the common European structure. Each country could then focus on individual countries specifications (like weather data).

The team could be constituted by:

- country responsables for the development of the national building regulation;
- european experts having already experience in the adaptation of the CEN package;
- software companies for commercial software development.

This team work would be a big step towards a common European method and towards Pan-European software.

At this stage it is asked:

- to the responsables of these three countries;
- to the European experts having experiences in the application of the CEN package;
- to the software companies developing tools based on EN standards;

to declare their interest in such a work to the convenor of the workshop.

The funding of these activities has to be identified (public authorities, sponsors, company investments).

## **5.6 Closing the workshop**

Johann Zirngibl thanked CEN – meeting centre and especially the chair of CEN BT TC 371 for the support in organizing the workshop.

The meeting was closed at 16h30.

## **6 Conclusions and recommendations**

The set of the following actions has been decided:

### **- Keep in touch**

- Create a "software community" on Internet
- Prepare a company profile template to facilitate the business contacts between the software community

### **- Work in standardisation (revision EN 12831)**

- Declaration of interest to the workshop convenor. Indicate preference for direct participation or creating of a mirror group
- Creating of mirror group "EN 12831" within the software community

### **- Practical application (CEN – national regulations)**

declare interest in practical application to the convenor of the workshop:

- Participants from Croatia, Slovenia, Turkey;
- Experts having experiences in the application of the CEN package to national building regulations;
- Software companies developing tools based on EN standards.

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## Annex A - Workshop Programme

**Towards Pan-European Software for Building Energy Performance?**  
**Workshop organised by CENSE**  
29<sup>th</sup> of June / 11h00 to 16h30 - CEN Meeting Centre/ Brussels

### Draft agenda

#### **11H00 – 11H30 Welcome and opening**

11h00 – 11H10 Welcome and context (*Johann Zirngibl*)

11h15 – 11H30 Opening (*Gordon Sutherland*)

Questions

#### **11h30 – 13h00 Information**

11h30 – 12h00 Available CEN standards / Application in national building regulation  
(*Jaap Hogeling*)

Questions

12h00 – 12h30 EPBD energy calculation procedures

(*Roger Hitchin*)

Questions

12h30 – 13h00 CEN standards and software – the Italian experience (*Laurent Socal*)

Questions

#### **13h00 – 13h45 Sandwich break**

#### **13h45 – 14h45 Exchanging experiences, views and opinions**

*Preparation / Moderation: Johann Zirngibl*

Discussions about

- fears (concentration of companies), possibilities (EU software), market transparency
- pros and cons of a unified framework
- which tool (simplified – detailed), tool integration, interoperability
- free issue software and commercial interfaces, open source codes
- performance benchmarking of software, early avoidance of future market barriers

#### **14h45 – 15h00 coffee break**

#### **15h00 – 16h00 Identification of common actions**

*Preparation / Moderation: Johann Zirngibl*

- Possibilities of action
- How to participate to standards development
- Creating a European Network
- Launch of a community,
- sustained, collaboration and dialog of software providers, standard writers

#### **16h00 – 16h30 Closure** (*Gordon Sutherland / Johann Zirngibl*)

## **Annex B – Presentations**

Available as pdf's at the public part of the website: [www.iee-cense.eu](http://www.iee-cense.eu)

Available as PowerPoint files at the private part of the website.

## Annex C – List of participants

organisation	persons	country
Bendzalová	J. Bendzalová	Slovakia
BINK SoftwareBV	K. Krijger	Netherlands
BRE	P. Davidson	United Kingdom
BuildDesk Austria	M. Graf	Austria
Center for processes research	A. Jakovics	Latvia
CSTB	P. Tournie	France
CSTB (Cense)	C. François	France
CSTB (Cense)	H. Lahmidi	France
CSTB (Cense)	J. Zirngibl	France
Design Builder	A. Tindale	United Kingdom
DGMR Software	R Schmidt	Netherlands
EACI	G. Sutherland	Europe
EDF	M.-H. Foucard	France
EDF	C. Muresan	France
Edilclima	F. Soma	Italy
Edilclima	M. Vallengia	Italy
Eszak-Alfold Region	Zoltan Balogh	Hungary
EVD Energy Management	Ergin Kaya	Turkey
E4tech	F. Foradini	Switzerland
Fibran	M. Zupan	Slovenia
Fraunhofer-IBP (Cense)	A. Staudt	Germany
Hottgenroth Software	A. Gallrein	Germany
Hottgenroth Software	F. Richert	Germany
Hottgenroth Software	S. Vidrih	Germany
IES	D. McEwan	United Kingdom
Institut IGH	Zeljko Stromar	Croatia
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KERN Ingenieurkonzepte (Bauphysik Software)	G. Siegenhorn	Germany
Knauf Insulation	Novak Silvio	Croatia
LMIT- Innovation & Technology	J. P. Santos	Portugal
Ministry of Environmental Protection	N. Mardjekto	Croatia
Socal (Cense)	L. Socal	Italy

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<b>organisation</b>	<b>persons</b>	<b>country</b>
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Université de Liège	J. Lebrun	Belgium
University of Seville	J.L. Molina	Spain
University of Valencia	V.M. Soto Francés	Spain
University of Valencia	J.M. Pianzo Ojer	Spain
University of Zagreb	D. Dovic	Croatia
Vabi Software	W. Plokker	Netherlands