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IAP Validation Workshop: ICT for Energy Efficiency – Cross-Sectoral Interoperability Workshop

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1. Executive summary

This document describes the background and proceedings of the REViSITE Implementation Action Plan (IAP) Workshop, the last in a series of meetings with experts from the target domains of energy grids, the built environment, manufacturing and lighting.

The workshop was held in Paris, France, March 9th, hosted by CSTB.

Since this workshop represented the most important of the five organised by the project a detailed and accurate preparation has been conducted.

The consortium aimed to provide the audience beforehand with a short document related to the Strategic Research Agenda, both to offer them a background of the priority research topics identified up to now, and also to gather feedback on them.

Furthermore, to prepare the audience for the scheduled work group exercises, the consortium provided also a short version of the Implementation Action Plan.

The Consortium met on the day before the workshop and defined the scope and the most suitable strategy to gather the most out from all participants about the following items:

- D3.3 – Feedback on The Implementation Action Plan, previously sent to the participants
- D3.4 – Recommendation for Standardisation proposals.

The full day saw the consortium and experts working together in groups on some validation exercises in relation to the results developed within the Implementation Action Plan and about the standardisation proposals.

After the welcome and the brief presentation of the project, the partners gave explanation about the work developed up to date by REViSITE and explained in details the aim of the day and what we did expect from the audience.

The audience has been represented by 10 external experts.

During the workshop the consortium also organised some quick poll questions to gather points of view about:

- REViSITE Framework validity
- Recommendations about standardisation proposals
- Barriers for standards implementation

Through the use of an electronic voting tool the consortium has been able to gather feedback in real-time and then to develop an analysis to define important inputs for the upcoming closure of the project.

The day ended positively, both the consortium and experts were satisfied about the work done.

The Consortium had the chance to validate, improve and finally define its inputs both in relation to the IAP and to the standardisation proposals.

2. Abbreviations

VW3	Validation Workshop
IAP	Implementation Action Plan
SRA	Strategic Research Agenda
REG	REViSITE Expert Group
eeBDM	Energy Efficiency Building Data Models
BIM	Building Information Management
SLA	Service Level Agreement
QoS	Quality of Service

3. Preparation for Validation Workshop 3 (VW3)

3.1 Target Audience

Considering the importance of the workshop, The consortium, planned an accurate strategy of selection for inviting high level experts.

From the list of experts, both belonging to the community and not, and from the list of the REG, a qualitative selection has been made focusing on high level experts and standardisation bodies.

It is worth mentioning that a presentation of REViSITE and an invitation to this workshop has been made by CSTB who was invited by a Strategic Coordination Group about Energy Grid and ICT of the French Standardisation association “AFNOR” the week before the workshop. It has been a good opportunity for REViSITE to get in touch with experts in relation with standardisation and energy grids topics.

An invitation has been sent to 34 experts duly selected for their complementary profiles (list in appendix II).

On 34 invitation sent, the 50% accepted to attend the workshop, but then only 10 participated.

3.2 Workshop Planning

To gather the most from the audience, and their respective point of view about the different topics covered during the day, the consortium decided to adopt an electronic polling tool, named ‘Turning Point Anywhere’. This tool is an audience response system that allows audiences to participate actively by submitting responses to interactive questions through the use of a keypad.

Thus the consortium structured three different types of questions for gathering information, and developed eight different questions in respect to:

ID	Question	Response expected	Reason for
A	Which sector do you associate yourself with?	Demographical Information	Understanding the level of the audience (expertise and institution represented)
B	What type of organisation do you represent ?		
C	“The REViSITE framework is a useful integral classification system and qualitative mean of impact assessment”	Agreement or Disagreement	Assessing the validity of the REViSITE Framework
D	Do you agree that the topics listed are appropriate for recommendation as standards proposal? (5 presented)	Level of importance for each proposal	Ranking for each standardization proposal developed

The preparation for the workshop foresaw also the development of an invitation brochure sent to selected persons. Such brochure has been developed through the use of HTML and sent by mail. The Brochure contains interactive links to simplify the information gathering for attendants such as:

- Maps of the venue of the workshop
- Maps of the venue of the dinner previous to the workshop
- Links to the REViSITE website and to the European Commission website
- Links to the partners' organisations

The brochure is reported in Appendix VI of this document.

4. The aims of the Workshop

4.1 Objectives and scope

The main objectives of the workshop were:

1. To sanity check D3.3 stakeholder-specific recommendations for the IAP, suggesting appropriate changes and/or additions
2. To validate and evolve the five specific recommendations of D3.4 with respect to interoperability and standards

Additionally, the workshop sought validation with respect to the methodology applied in developing the content of deliverables D3.3 and D3.4. However this was more a grounding exercise to ensure all attendees could understand progression to the current project stage.

Scope:

Workshop attendees worked on the premise that the ‘target outcomes’ identified in D3.3 were appropriate and fixed. Justification for this was that same had been sanity checked as part of the D3.2 SRA consultation process.

As such in keeping with the above objectives, the specific scope of the workshop focused on the five recommendation themes of D3.4 and on the stakeholder recommendations made in relation to the identified target outcomes with D3.3.

4.2 Main Results

The workshop provided the consortium the opportunity to better define and improve small details for the final refinement of the ‘target outcomes’ of the D3.3. Details are reported in paragraph 5.2.1.

It also provided a definitive consultation about which recommendations for standardisations proposals should be addressed as outcome of the REViSITE work.

5. Workshop execution

5.1 Structure of the workshop

As mentioned previously the workshop was hosted by CSTB at its Paris facilities. The two main sessions were organised in accordance with the two main workshop objectives:

- First session focused on the validation and or addition of the stakeholder specific recommendations contained in the Implementation Action Plan.
- Second session focused on the validation and ranking of the five REViSITE developed standardisation proposals. .

Before starting the Consortium welcomed the participants and provided all them with an electronic voting tool. This was done to encourage sustained engagement and to gather real-time answers to questions including the following:

Specific expertise of the audience
Points of view regarding the appropriateness of the REViSITE framework
Importance of the standardisation proposals introduced.

The REViSITE project was briefly introduced, as many within the audience were new to it.

This was followed by an explanation of the methodology adopted by the project to develop its SRA and IAP. Additionally, before the beginning of the second session an explanation was given to the participants on how the five standardisation proposals had been developed.

For the first session the audience was grouped into three different teams. In the main representatives from all four sectors were placed on each team however it was felt appropriate to allow a bias towards grids when dealing with category six which dealt with 'trade and transactional management technologies'.

The second session looked to validate and rank the five REViSITE developed standardisation proposals. This was conducted as an intact group with the plenary audience and utilised the polling tool.

After the polling exercise there was a facilitated discussion regarding barriers to the standardisation topics proposed.

5.2 Procedures

5.2.1 First workshop session

The first session of the workshop focused on sanity checking the 21 RTD tables developed for the Implementation Action Plan.

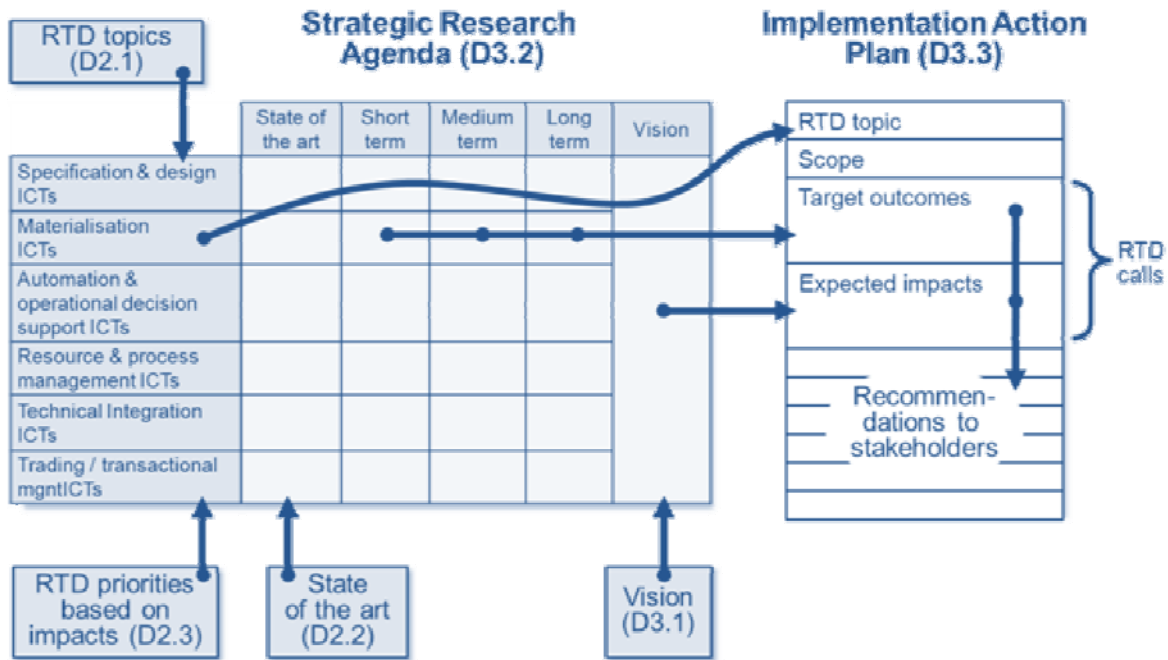


Figure 1: Information Flow from the SRA to the IAP development

Utilising figure 1 above it was explained how the 21 tables had been devised and how this was all ultimately based on the 21 sub-categories and 6 main categories of the REViSITE developed SMARTT taxonomy. The target outcomes and expected impacts for the 21 tables [top section of the IAP tables] were defined for participants and for the purpose of the task were assumed to be correct / fixed. The specific task therefore was to discuss, validate and augment the individual tables with respect to the specific ‘recommendations to stakeholders’ which populated the lower section of the tables.

Participants were divided into three groups with each group assigned two of the six high-level SMARTT categories. There were two rounds of discussion with groups focusing on one of their two categories per round. Specifically the task required each group to:

- Critique the recommendations to the stakeholders
- Check the appropriateness of the timescales identified
- Suggest any additional recommendations.

Group 1, focused on:

- Category 1: Specification & Design
- Category 2: Materialisation



Figure 2: Group 1 at work

Group 2 focused on:

Category 3: Automation and Operational decision support

Category 4: Resource & Process management



Figure 3: Group 2 at work

Group 3 focused

on:

- Category 5: Technical and Semantic Integration
- Category 6: Trading / Transactional management



Figure 4: Group 3 at work

Groups reported out on their discussion and suggested changes at the end of each round. Following are some pictures of the reporting discussions:



Figure 6: Reporting of Group 2 Discussion



Figure 5: Reporting of Group 3 Discussion



Figure 7: Reporting of Group 1 Discussion

5.2.2 Second workshop session

After session 1, the focus shifted to evaluating the five standardisation recommendations proposed by REViSITE.

The methodology by which these proposals were developed has been introduced to the entire audience and explained in details. Each single standardisation proposal was also been explained and reasoned.

The five identified standardization recommendations centre on the following topics:

- Extension of the existing ontologies for energy efficiency
- Energy performance indicators (metrics)
- Product catalogues that include energy dynamics
- Data exchange protocols
- Harmonisation and extension of the IEC Ontology

After an initial polling exercise the results were shared in order to prompt discussion. That discussion was facilitated by the consortium and lead by KEMA.

The discussion centred on two elements:

- The completeness and validity of the topics identified
- Identifying barriers/enablers to the adoption and implementation of the defined recommendations.



Figure 8: Plenary session

5.3 Outcomes

5.3.1 About the REViSITE IAP

Following are the outcomes reported per each group of category discussed by the experts and the Consortium during the first workshop session

5.3.1.1 Categories 1 and 2

Group 1 focused on category 1 'Specialisation and Design ICTs' and 2 'Materialisation ICTs'. The session was facilitated by REViSITE members from the ICT lighting and Manufacturing environment domains. Following there is a description of key points discussed.

General Points:

In general the topic is seen to be essential but not strictly connected to EE, for example energy consumption in Materialisation Phase is only approximately 2% of energy consumption in the entire life cycle of Building sector. The experts mentioned that the three subcategories are in some aspects very manufacturing-related.

- **Category 1**
 - **Sub-cat 1.1: Design conceptualisation** - regarding the stakeholder types *Policy makers* was not considered a correct one in this context because their impact is so indirect. Instead the type regulatory body was regarded appropriate. This observation applies also for some other subcategories. Standardisation of EE performance levels/indicators was regarded the most important recommendation for this sub-category and valid across all sub-categories.
 - **Sub-cat 1.2: Detailed design** – a common opinion was that this sub-category was too much focused on buildings. *Policy makers* was not seen relevant for the sub-category. Concerning e-catalogues it pointed out the importance of Life-Cycle data, and it was also reminded that such facilities, possibly non-standard, already exist in some areas.
 - **Sub-cat 1.3: Modelling** – as the most important topic was seen the development of standard based product data libraries by the Industry stakeholders. Also end user profiling was regarded beneficial.
 - **Sub-cat 1.4: Performance estimation** – it was pointed out that this sub-category is crucially important for the development of performance contracting. As a practical approach it was suggested that regulators instead of policy makers could enforce the usage of performance indicators. Regarding performance contracting using Life

Cycle performance metrics it was concluded unfeasible because contracts must be in practice for a certain time period and not for unlimited or too long time.

- **Sub-cat 1.5: Simulation** – as a conceptual distinction between modelling and simulation it was clarified that the simulation concerns dynamics and dynamic modelling. As a future target for simulation it was suggested a virtual real-time simulation based system working in parallel with real system. That could be very useful for example for remote monitoring, diagnostics, forecasting of system behaviour, testing of operational actions etc.
 - **Sub-cat 1.6: Specification & product/component selection** – it was considered whether the time scale was completely right because it was “M” for all recommendations. Regarding recommendations concerning product/material/service catalogues towards industry it was pointed out the importance of Life Cycle data needed for Life Cycle assessment.
- **Category 2**
 - **Sub-cat 2.1: ‘Decision support & visualization’** an important point could be modelling data to support decisions. Adverse decisions are under suspicion to be responsible for a gap between expected and reached reduction of energy consumption. Experience in Building Sector has shown that the reached reduction is half of the expected reduction.
 - **Sub-cat 2.2 ‘Management & Control’** the meaning of sensing for monitoring was missed.
 - **Sub-cat 2.3 ‘Technics for real-time-communication’** are seen to be widely available but there is still a need for research in basic technologies in the Grid sector.

In order to meet these helpful suggestions the tables were improved and the described outcomes by the experts are included.

5.3.1.2 Category 3 and 4

Group 2 focused on category 3 ‘Automation and Operational decision support’ and 4 ‘Resource and process management’. The session was facilitated by REViSITE member’s from the ICT, Manufacturing and Built Environment domains. What follows is a description of the points discussed listed by sub-category plus general points:

General Points:

A general point raised by Group 1, as part of the reporting done by each group, was subsequently discussed /agreed to by the Group2/3. The suggestion was to split out ‘policy makers’ from the role of ‘regulators’ i.e. to create another stakeholder class. In fact, Group 2 participants felt it might be appropriate to have three classes, namely: Policy makers, Regulators and Governments/Municipalities. The reason being that at times, as part of Group 2 discussion, the ‘policy maker’ class had at times assumed a position that strictly speaking was more akin to one of the other two stakeholder classes.

Another general point was the suggestion to have a ‘Continuous’, ‘C’ timescale in addition to Short, Medium and Long-term.

- **Category 3**
 - **Sub-cat: Automated monitoring & control** – under *policy makers* it was suggested that perhaps the EC needed to mandate for change [increase the level] This opened

up a debate in terms of open v mandated change. The group did not reach consensus but the majority felt that the EC did not have to mandate as such but rather be seen to support specific initiatives, which may be open standards or open collaborations.

It was also felt that both *Industry* & *Academia* should ensure self-demonstration utilizing their own campuses etc.

It was additionally felt that *Industry* needed to ensure strategic alignment with target outcomes and focus on articulating the business opportunity in target outcomes

In the main the timescales were felt to be appropriate with limited change.

- **Sub-cat: Operational decision support & visualisation** – in terms of target outcomes it was felt that an addition needed to be made regarding ‘Additionally, visualisation of ‘requirements’ in terms of building to individual i.e. where occupancy changes overtime’. Also it was felt the ‘move towards sustained interest’ in terms of visualisation needed to be made more explicit i.e. in addressing the historical drop of in user engagement.

In terms of *policy makers* two additions were made at this point but the group came to the decision that they were probably universal themes as opposed to specific to this sub-category. They were ‘Direction in terms of a holistic approach to Data privacy’ and ‘Open data & e-government initiatives to demonstrate the value of ICT4EE i.e. role model’. This later was used as an example for the need to have additional stakeholder categories in terms of *policy makers*, *regulators* and *municipals*.

In terms of *standards organisations* it was suggested the ISO STEP 10303 standard needed to be considered.

There was minimal adjustment to time scales.

- **Sub-cat: Secure Wired / Wireless control & sensor networks & Quality of Service ICTs** – In terms of target outcome 1 ‘Network topologies & architectures, considering ubiquitous connectivity & smooth handover with respect to the EE operation of the network & connecting sensors/devices’ it was felt that a framework was achievable in the short-terms with implementation in the medium term. It was also felt that this equally applied to target outcome no 5 ‘Guaranteed Quality of Service, Security, and Privacy. Together with an increased Quality of Experience [including simple deployment / integration] Network level automated SLAs

Regarding the recommendation to *policy makers* to allow for increased levels of ‘...spectrum sharing’. The comment from the group was that it be made explicit that this could not impact QoS.

In terms of *research and innovation funding organizations* one pre-populated recommendation was to ‘Support experimental work which is potentially expensive, long-term and risky. A tentative example might be layer less communications network research’. The group felt that this could be done in a modular fashion with increased funding moving from simulation to real world demonstrators and proliferation.

There was minimal adjustment to time scales.

- **Category 4**

- **Sub-cat: Inter-enterprise coordination** – regarding target outcome no. 3 ‘Methods for virtual enterprise (VE)...’ the point was made that there has been talk of the VE for over 20 years, it was felt this was more an issue of implementation and that actual implementation could be achieved in the short term.

In terms of *policy makers* suggestion was to ‘develop the basis for, and support the development of, a legal framework for realization of the virtual enterprise’.

In terms of *education & training stakeholders* it was suggested MBA type programs could promote the concept and value of virtual enterprises and inter-enterprise coordination.

There was minimal adjustment to time scales.

- **Business Process integration** – regarding *policy makers* the pre-populated recommendation was to ‘Encourage increased reusability & interoperability across technologies, projects & sectors’, the group suggested adding ‘via energy related incentives’.

A suggestion with relation to *standardisation bodies* was to ‘Agree/extend carbon/energy accounting methods to included assessment of rebound effects of distributed work. Also, standardise how this can be incorporated as an input to the likes of BIM type systems and corporate carbon/energy certification/reports’. But there was debate amongst the group as to what was the most appropriate sub-category in relation to this point.

There was minimal adjustment to time scales.

- **Information/Knowledge management & analytics** – regarding target outcome no.9 the text was changed from ‘Improved ease of access to EE knowledge which is modelled according to agreed standards’ to ‘...which is modelled according to agreed reference data’.

It was suggested *Policy makers* should set a holistic vision, *Regulators* should ensure legislation supports and *municipalities* could supply that actual infrastructure and platforms for data, information, knowledge sharing. The discussion centred on the fact that one organization could conceivably constitute all three roles and that this would have implications for timelines.

Regarding the pre-populated recommendation to *standardisation bodies* ‘Work to harmonize data exchange standards in promoting ubiquitous access’ the suggestion was to add the text ‘...specifically linking back to data privacy and security’.

Again there was minimal adjustment to time scales.

5.3.1.3 Category 5 and 6

The group 3 focused on discussion about the Category 5 ‘Technical Integration ICTs’ and 6 ‘Transactional Management ICTs’. The discussion was lead by REViSITE members belonging to the Building and Grid environment domains. The group discussed about the following points listed per category.

- Category 5
 - **Sub-Cat ‘Integration Technologies and Infrastructures’:** No particular comments on missing points. The main discussion was about the time scale as some processes mentioned in the table (i.e “Development of new services EE related”) should be clearly stated as “Continuous” . The group suggests also the following action in front of the Research & Innovative funding organisations” : Obligation to use recommended solutions & standards by funded projects.
 - **Sub-cat ‘Interoperability & Standards’** No particular comments on missing points. Some adjustments have been suggested in order to make the text more explicit.
- Category 6
 - **Sub-Cat ‘6.1.** The group provided the following recommendations:
 - Add a recommendation for “Research & innovation funding organisations” to support proof of concept projects. Examples would be The project “from Turbine to Tooster” (or “From Turbine to Fan”) in Ireland and the “Supernode” project. This would have short term relevance.
 - Replace ENSO-E with ENTSO-E
 - **Sub-Cat ‘6.2,** the following are the recommendations gathered:
 - Add to recommendation for Industry “and improve the existing distribution network”.
 - Add example of “IssyGrid”
 - **Sub-Cat ‘6.3’**With regard to table 6.3
 - Replace “tighten” with “toughen” in the recommendation to policy makers. The time frame would be “Continuous”.
 - Better explain that the “smart appliances” in the recommendation to the industry includes “all energy consuming, producing & storing” equipment.
 - The time scale for standardisation bodies would need to be changed to either Short or “Continuous”.
 - **Sub-Cat ‘6.4’.** We didn’t reach a final conclusion due to a great discussion on the usability of money as a motivator. The priorities for recommendations to research performers and industry should however be changed from Long term to Medium.

5.3.2 The Standardisation Proposals

For each of the following proposal, the audience was asked to express the level of importance according to their view from 1= Low importance to 5=High importance using the keypads of the electronic voting tool

The following table summarises the outcome of the voting exercise:

Results					
	1	2	3	4	5
Extension of existing ontologies for energy efficiency	7%	7%	14%	43%	29%
Harmonisation and extension of the IEC Ontology	0%	13%	40%	7%	40%
Energy Performance indicators	6%	0%	19%	31%	44%
Data exchange protocols	0%	6%	13%	31%	50%
Product catalogues that include energy dynamics	20%	7%	40%	27%	7%

Table 1: Polling exercise results for the standardization proposals

To evaluate the order of importance for each single proposal we assigned weight to the various grades. In specific we used the following weight in correspondence to the grades:

Grade	Weight
1	0.2
2	0.4
3	0.6
4	0.8
5	1

The results obtained after calculation are shown in the following graph:

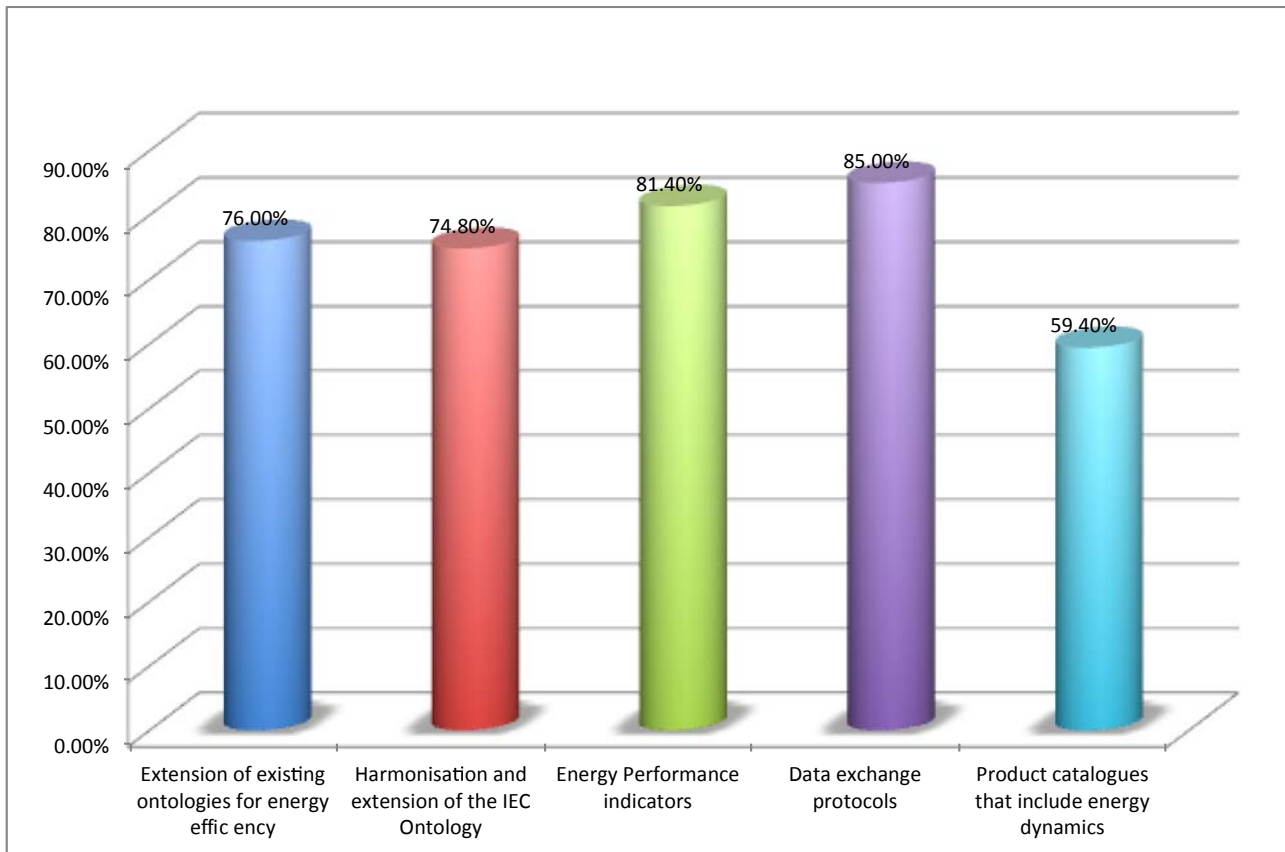


Figure 9: Weighted results for Standardisation Proposals

Hence the positioning for importance according to the workshop audience was:

1. Data exchange protocols
2. Energy Performance indicators
3. Extension of existing ontologies for energy efficiency
4. Harmonisation and extension of the IEC Ontology
5. Product catalogues that include energy dynamics.

Further to this ranking exercise, through the lead of KEMA, the audience brainstormed a discussion about the barriers and the difficulties to face per each of the single proposal to be adopted and taken on.

"The ranked proposals for standardisation exhibit great complexity. The workshop indicated that the standards and the processes that create and maintain the standards are difficult to grasp. An overview is difficult as lots of different and partially overlapping standards already exist. This is the case particularly in the area of communication protocols.

A further barrier was identified in the time it would take to establish a mature international standard or ontology. The CIM ontology took some 20 years to achieve its current maturity level. Current developments in technology however are much faster and would require a more flexible and agile standardisation creation and maintenance process.

Some of the disciplines involved in the discussions are relatively young (semantic web technologies, remote sensing, energy & carbon metrics, etc.). Some of these may require more

research before being stable enough for definitive standards. The subject matter knowledge that is needed for the standardisation may need further development."

6. Workshop Evaluation

6.1 Level of participation

The target audience invited to the workshop has been studied in details by the consortium. Since we aimed to endorse quality and not quantity specific organisations have been invited accordingly to the expected outcome.

The invitation has been sent to 35 among which 25 answered positively. In the end only 10 experts participated in the workshop.

The entire audience was composed by the following sector expertise:

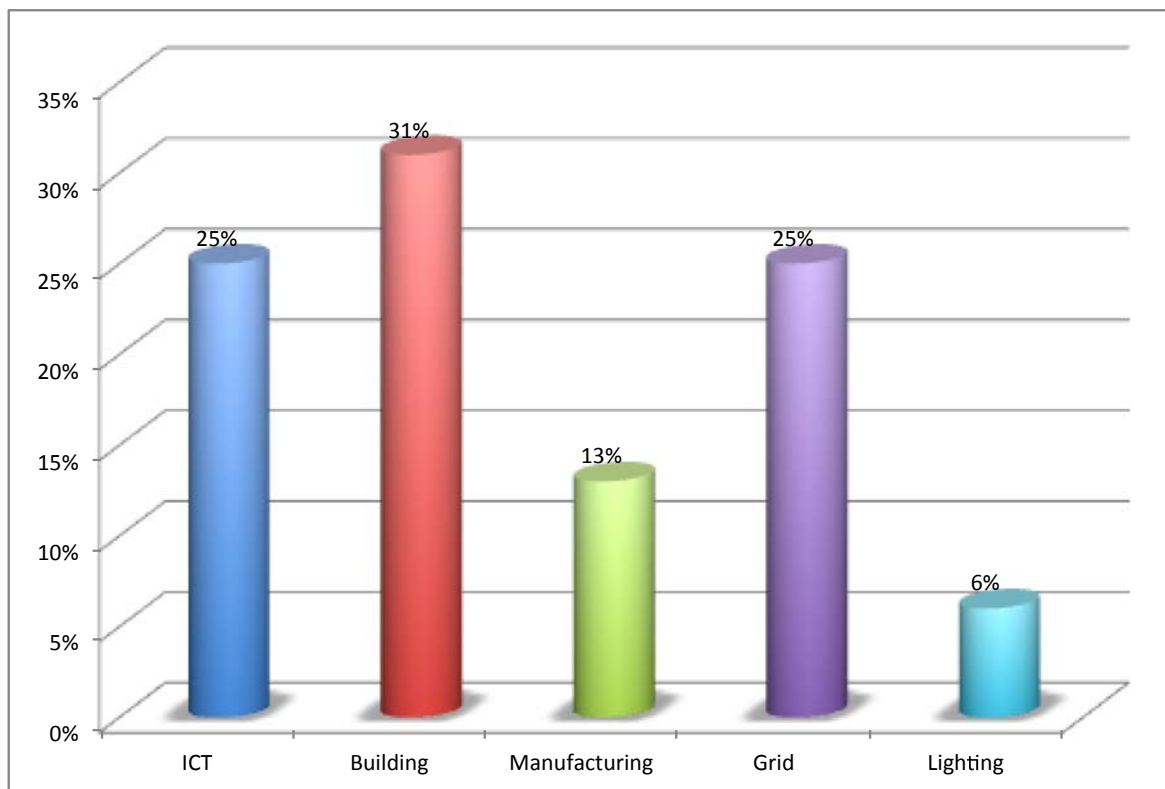


Figure 10: Percentages of audience sector specific expertise

Such figures show a complete coverage for the four sectors approached by the project.

While the percentage of the institutions represented is provided by the following:

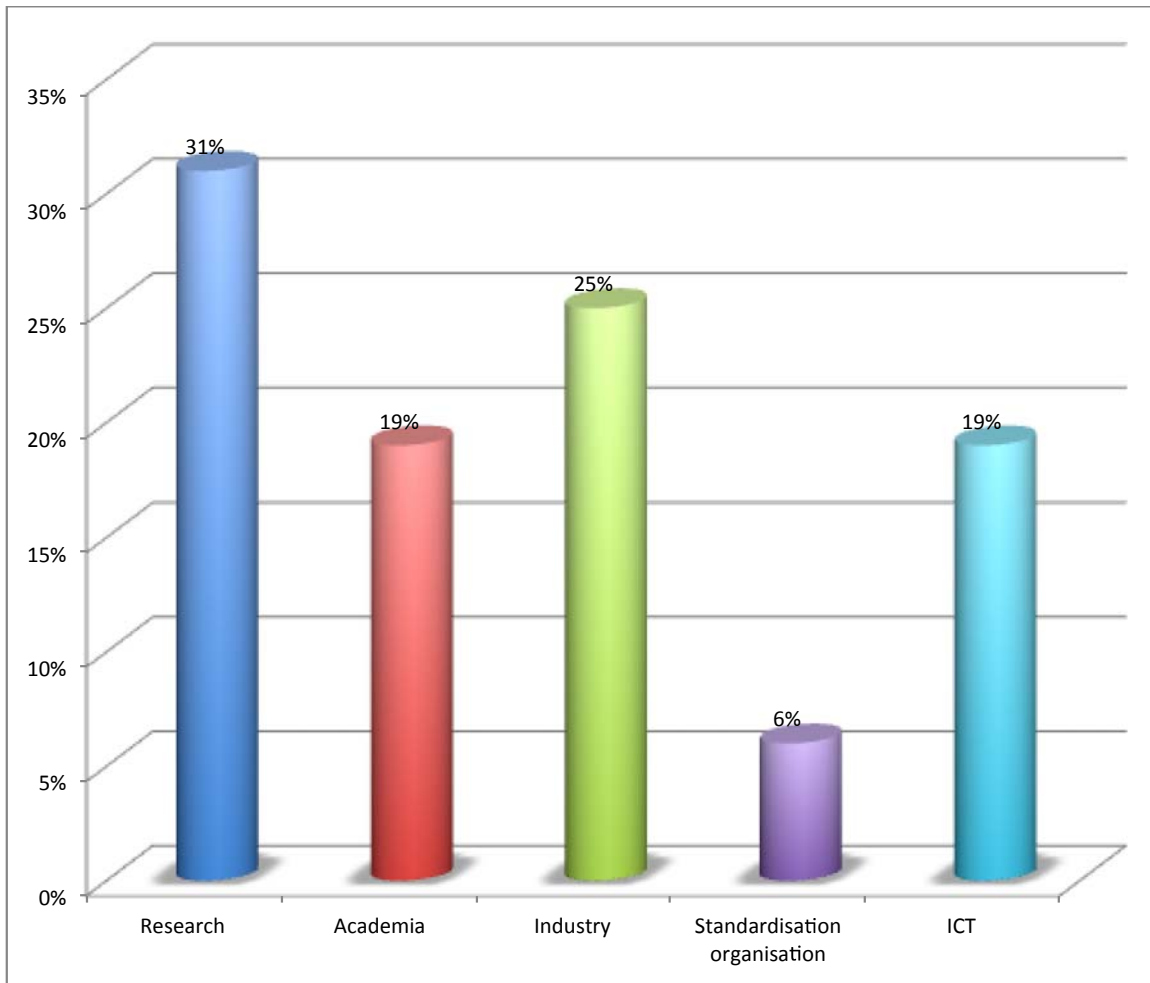


Figure 11: Kind of Organisation

6.2 Meeting the workshop objectives

As mentioned previously the workshop objectives were:

1. To sanity check D3.3 stakeholder-specific recommendations, suggesting appropriate changes and/or additions
2. To validate and evolve the five specific recommendations of D3.4 with respect to interoperability and standards

Both scopes were fully achieved during the workshop.

6.3 Feedback

6.3.1 Experts Comments

The overall assessment of the REViSITE project was positive from all the audience. Basically experts recognised the need for what REViSITE is producing, a common language and methodology that enables the four specific sectors for an easier communication mean.

Furthermore to consolidate this view, the consortium asked the audience to express their view in accordance to the following statement: **“The REViSITE framework is a useful integral classification system and qualitative mean of impact assessment”**. Experts had a five Likert scale choice to express their agreement or not, and specifically: 1= strongly agree, 2= agree, 3= neutral, 4= disagree and 5=strongly disagree.

The results are reported and visualised in the following picture:

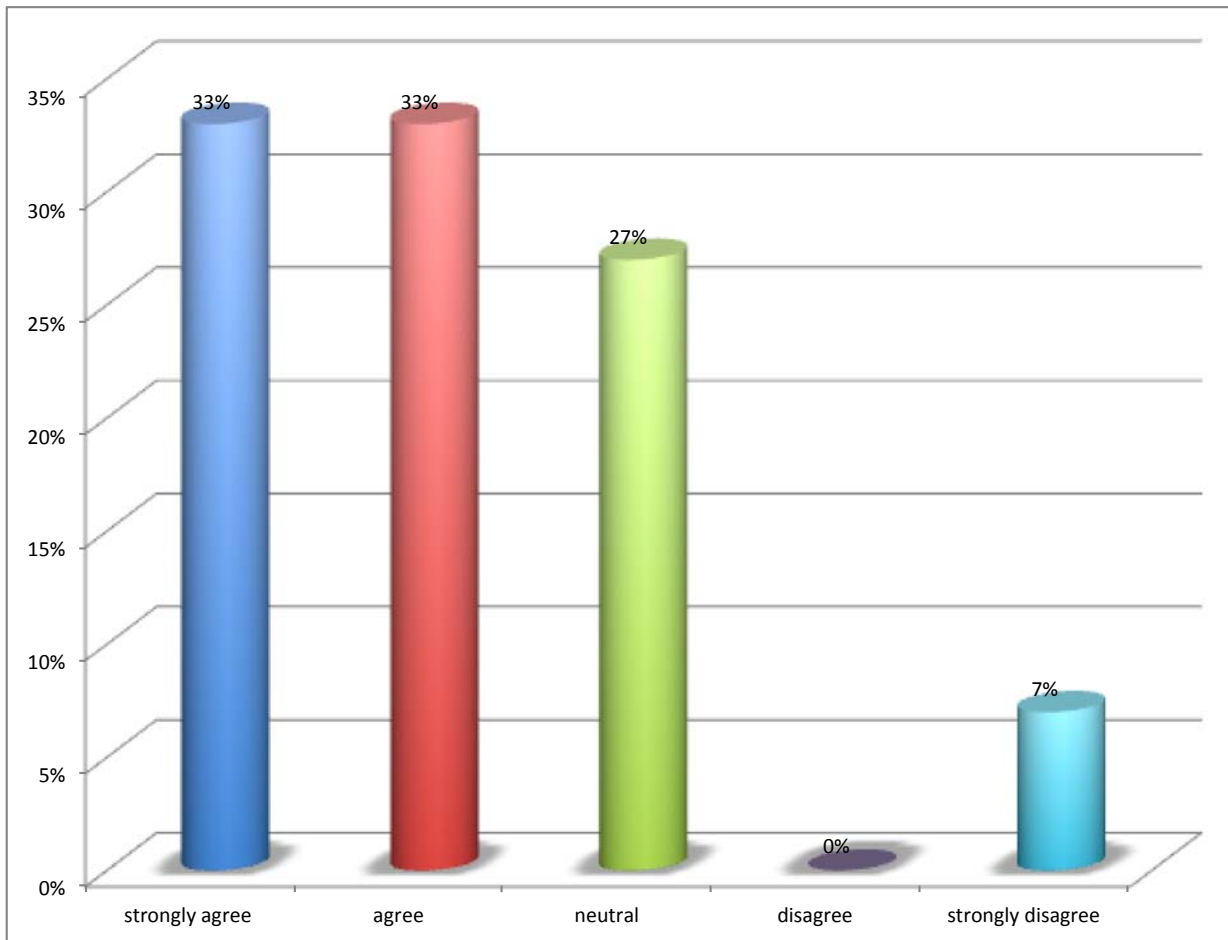


Figure 12: Results about the REViSITE Framework

As it is visible from statistics the most of experts agree that REViSITE framework represents an added value for the actual ICT for energy efficiency state of the art.

6.3.2 Chairman assessment and global evaluation

The outcome of workshop gave us, the REViSITE Consortium, entire confidence on the validity of the REViSITE framework and approach used to develop the SRA and IAP. This, complemented with the external validation which we have been seeking in parallel from the REViSITE Community and high level stakeholders demonstrates the added value of the REViSITE results. The results which will feed in D3.3 (IAP) and D3.4 (Recommendations for new standards to overcome interoperability barriers) will significantly assist in providing concrete and justified recommendations to all types of stakeholders associated with ICT4EE including standardisation bodies who will have a critical role in overcoming the chronic interoperability barriers particularly those related to EE data models.

7. Conclusion and recommendations

7.1 Conclusion and lessons learnt

The ‘ICT for Energy Efficiency Cross-sectoral Interoperability Workshop offered the unique opportunity to validate and consolidate the work done by REViSITE in regards to its positioning in the ICT for Energy Efficiency sector.

This workshop was the very good meeting point for the consortium and the experts in order to check the status of the SRA and the IAP. It shows as a first outcome that thanks to our SMARTT approach, we covered all the research topics as no mention has been made for missing areas. We were also able to come to the following conclusions:

- 1> Common Data models & Reference Processes: The first point that has been stressed is the importance of Data Models. In particular, there is a real need for a cross sectorial ontology describing energy flows / energy generation and consumption / infrastructures and devices. Coming together with this notion of Data Models, the community mentioned also that the exchanges (in other words the “dynamic” part, compared to the “static” Data models) have to be supported. The need for formalized cross-sectoral processes is strongly linked with the Data models need.
- 2> Common Metrics & Measurement: In Europe (but not only), there are several frameworks used to measure the EE of a building or a “device”. Most of the time is very hard to compare 2 solutions that have been assessed by 2 different frameworks. Thus in order to have an integrated approach, it is necessary to come to a common and harmonized set of metrics. In the same area, there is also a need to define the whole chain of measurement in order to ensure the reliability / accuracy of the data collected but also their meaning and their privacy.
- 3> eeBDM and VPP: This last point is linked with the first one. As previously said, the EE facet of the BIM has to be reinforced (even if it is an ongoing task especially if we take into account the last IFC4 version). In the context of REViSITE, focus has been made on cross sectoral needs and with respect to that, the build environment has to be prepared to the new role that buildings will play in the emerging Grid. Buildings will be considered as “Virtual Power Plants” (VPP) with a specific behaviour in terms of energy consumption over the time. This VPP approach could be applied at several levels, from the device (solar panel, battery, washing machine) to the Building (aggregation of multiple smaller VPPs), to the notion of “District” (aggregation of several buildings seen as VPPs interrelated by micro grids), to the notion of “City”, etc...

The workshop brought some additional aspects from other sectors to the Materialization Phase (subchapter 2) which was previously more manufacturing-related. Especially the gap between the expected and the reached outcome regarding energy efficiency in case of retrofitting in the Building sector was a point that founds the “decision support & visualization” as well as the “Management and Control” subcategory. It also validated the information and assumptions which were speculated regarding needs in Building sector. Therefore, the target outcome of the IAP was approved in general and improved in some details.

8. Appendices

Appendix I: Agenda of the Workshop

REViSITE - ICT for Energy Efficiency - Cross Sectoral Interoperability Workshop
Workshop Agenda
Friday 9th of March - CSTB

Time	Activity
9:00 - 9:15	Welcome & Introduction (Bruno Fies, CSTB)
9:15 – 9:30	REViSITE overview (by Tarek Hassan, Loughborough University)
9:30 – 10:00	Introduction to research themes / Workshop goals / instructions (by Keith)
10:00 – 13:00	Part 1: Validation of proposed 'stakeholder's actions'.
13:00 – 14:00	Lunch
14:00 – 16:00	Part 2: Refinement of interoperability & standardisation recommendations.
16:00 – 16:15	Wrap up and Close

Appendix II: Invited Experts

	Name	Organisation	Expertise
1	Pierre-Damien Berger	Cea	Energy Efficiency
2	Jean-Jacques Bernardini	Agence Régionale de l'Innovation Alsace	Energy Efficiency
3	Michel Böhms	Tno	ICT/Building
4	Frédéric Bourquin	Ifsttar	Building / Energy Efficiency
5	Yves Dherbécourt	Edf	Energy Efficiency / Grid
6	Joost Duflou	University of Kuleuven	Energy Efficiency
7	Andrew Eastwell	Bsria	Energy Efficiency
8	Bernard Ferries	Laurenti	Building / Standardisation
9	Vernon Fox	Mainstream Renewable Power	Grid
10	Christian Giraud	Eurostep	ICT
11	Filip Gluzak	GridPocket	Grid
12	Andrew Haslett	Eti	Energy Efficiency
13	José Javier de la Heras	Advantic	Building / Energy Efficiency
14	Bernd Kosch	Fujitsu	Energy Efficiency
15	Jean-François Legendre	Afnor	Standard / Grid
16	Thomas Liebich	Aec3	Building / Standard
17	Jean-Jacques Marchais	Schneider	Standard / Grid
18	Philippe Maréchal	Cea	Energy Efficiency / Building
19	Joao Martins	Uninova	Building / ICT
20	Maxime Mary	Solucom	Grid / Standard
21	Alain Maury	BuildingSmart / French Chapter	Standard / Building
22	Christoph Mayer	Offis	Grid
23	Catherine Moutet	Afnor	Standard
24	Shailendra Mudgal	Bio Intelligence Service	Energy Efficiency
25	Alexandre Nassiopoulos	Ifsttar	Building / Energy Efficiency
26	Thierry Parinaud	Building Smart	Building / Standard
27	Neill Pawsey	Fiotech	Building
28	Giorgio Recine	Labor Roma	
29	Nicolas Salmon	Nobatek	Energy Efficiency
30	David Shipworth	Ucl Energy Institute	Energy Efficiency / Buildin
31	Jean-Louis Six	CEA	Energy Efficiency
32	Bruno Smets	Philips Lighting	Energy Efficiency / ICT
33	Vaino Tarandi	Kth University	ICT / Building
34	Mathias Uslar	Offis	Grid

Appendix III: Accepting Experts and Experts attending the workshop



Invited Experts

Name	Organisation	Signature
Joao Martins	Uninova	<i>Joao Martins</i>
Bruno Smets	Philips Lighting, The Netherland	<i>Bruno Smets</i>
Thomas Liebich	Aec3	
Thierry Parinaud	Building Smart / French Chapter	
Shallendra Mudgal	Bio Intelligence Service S.A.S., France	
Filip Gluszak	GridPocket	<i>Filip Gluszak</i>
Jean-François Legendre	Afnor	
Vernon Fox	Mainstream Renewable Power, Ireland	<i>Vernon Fox</i>
Shipworth, David	Ucl Energy Institute, United Kingdom	<i>David Shipworth</i>
Christoph Mayer	Offis	
Mathias Uslar	Offis	
Frédéric Bourquin	Ifsttar	<i>Frédéric Bourquin</i>
Jean Jacques Bernardini	Agence Régionale de l'Innovation Alsace	<i>Jean Jacques Bernardini</i> ✓

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Name	Organisation	Signature
Alain Maury	BuildingSmart / French Chapter	
Christian Giraud	Eurostep	<i>Christian Giraud</i>
Yves Dherbécourt	Edf	<i>Yves Dherbécourt</i>
Maxime Mary	Solucom	<i>Maxime Mary</i>

Appendix IV: Consortium Participants

Name	Organisation	Signature
Tarek Hassan	Loughborough University	
Steven Firth	Loughborough University	
Farid Fouchal	Loughborough University	
Keith Ellis	Intel Performance Learning Solution Ltd	
Antonio Feraco	Innova Spa	
Bruno Fiès	Centre Scientifique & Technique du Bâtiment	
Veijo Lappalainen	VTT Technical Research Centre	
Felix Kai-Lindow	Fraunhofer-Institute for Production Systems and Design Technology IPK	
Nico Vlug	KEMA Consulting	

Appendix V: Minutes of the workshop (extracts from discussions)

No	Topics Covered	Action(s) by
1.	<ul style="list-style-type: none"> • Welcome to the participating audience • Presentation of Agenda of the Workshop • Overview of REViSITE positioning in the actual ICT for Energy Efficiency sector 	Bruno Fies (CSTB)
2	<ul style="list-style-type: none"> • Brief description of REViSITE project • Description of REViSITE Community characteristic (not sector specific) • Description of REViSITE methodology • Description of REViSITE Roadmap (Vision, SRA, IAP) • Description of REViSITE approach 	Tarek Hassan (Loughborough University)
3	<ul style="list-style-type: none"> • Introduction to the SMARTT taxonomy • Description of the REViSITE framework • Introduction to the polling exercise • Description of the IAP and its tables that need to be validated and sanity checked 	Keith Ellis (Intel)
4	<ul style="list-style-type: none"> • First Polling exercise to gather information about the audience (Sector specific expertise, Type of industry with which they are associated) 	Audience
5	<ul style="list-style-type: none"> • Question from the audience about: <ul style="list-style-type: none"> ○ Definition of Energy Efficiency ○ Did REViSITE consider the flexibility characteristics of tools? ○ Did REViSITE consider the versatility of a process? (switching from an energy source to another in accordance to the energy consumption and peak time periods) ○ Is REViSITE considering also carbon low emissions? 	Audience
6	<ul style="list-style-type: none"> • Clarification of all issues raised by the audience 	Keith Ellis Tarek Hassan
FIRST SESSION START		
(IMPLEMENTATION ACTION PLAN SANITY CHECK)		
7	<ul style="list-style-type: none"> • Groups exercise: Validation and sanity check of: <ul style="list-style-type: none"> ○ Categories 1, 3, 5 	Consortium + Audience
8	<ul style="list-style-type: none"> • Presentation of outcome for Categories 1, 3, 5. 	Consortium + Audience
9	<ul style="list-style-type: none"> • Group Exercise: Validation and Sanity check of <ul style="list-style-type: none"> ○ Categories 2, 4, 6 	Consortium + Audience
10	<ul style="list-style-type: none"> • Presentation of outcome for Categories 2, 4, 6 	Consortium + Audience

11	Lunch	Consortium + Audience
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SECOND SESSION START
(STANDARDIZATION PROPOSALS EVALUATION)

12	<ul style="list-style-type: none"> • Presentation of standardization proposals developed and methodology adopted 	Nico Vlug (Kema) Bruno Fies
13	<ul style="list-style-type: none"> • Discussion about the standardization proposals 	Audience
14	<ul style="list-style-type: none"> • Polling exercise to rank the importance of the developed standardization proposals 	Audience
15	<ul style="list-style-type: none"> • Discussion about barriers to the standardization proposals 	Consortium + Audience
16	<ul style="list-style-type: none"> • End of the workshop 	Consortium + Audience

Appendix VI: Paris Workshop Invitation Brochure



ICT for Energy Efficiency Cross-Sectoral Interoperability Workshop

The focus of this Workshop is to develop cross-sectoral recommendations with respect to ICT4EE interoperability and standardisation. Using the recently developed Strategic Research Agenda as an input attendees will focus on identifying key ICT4EE trajectories and stakeholder specific interoperability and standardisation recommendations.

Programme : Get together for dinner on a cruise by the Seine with La Compagnie des Bateaux-Mouches

Date: Thursday, 8 March 2012

Time: 19:30 (cruise dinner from 20:30 to 23:00)

Venue: ["Pont de l'Alma" \(Alma Bridge\)](#)

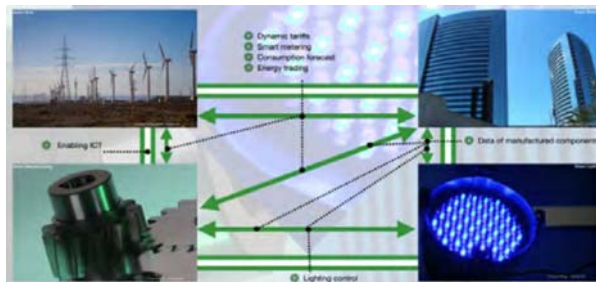
Programme : Cross-Sectoral Interoperability Workshop

Date: Friday, 9 March 2012

Time: 8:30am to 4:00pm

Venue: [CSTB Facilities, Paris, 4 Avenue du recteur Poincaré, 75782 Paris Cedex 16](#)

Background - The REVISITE project centres on co-ordinating co-operation and communication within the multidisciplinary 'ICT for energy-efficiency' research community in Europe. REVISITE targets four energy intensive sectors: Electrical grids, buildings, lighting and manufacturing.



TIME	ACTIVITY
08:45	Event Registration
09:00	Welcome - Bruno Fies (CSTB)

Morning Session : Introduction and Discussion on Implementation Action Plan

09:15	The REVISITE Project - Prof. Tarek Hassan (Loughborough University - REVISITE Project Coordinator)
09:30	Workshop goals/Introduction to research themes (Keith Ellis - Intel Labs)
10:00	Part 1: Validation of proposed 'stakeholder's actions'
12:00	Lunch Break

Afternoon Session: Discussions and proposals for Standards

14:00	Part 2: Refinement of interoperability & standardisation recommendations
15:30pm	Conclusion
16:00pm	Recap and workshop closure

REVISITE has engaged key stakeholders from the 4 sectors via dedicated 'focus group' and concise 'expert group' discussions, so as to compare and analyse sector specific RTD agendas such as Strategic Research Agendas (SRAs) of the relevant European Technology Platforms (ETPs), European and national RTD initiatives.

This will catalyse synergetic RTD and innovation in multiple sectors by pointing to cross-sectoral RTD opportunities in common areas of interest that have the highest potential impact.

If you would like to know more about the SRA of ICT for Energy Efficiency, you are cordially invited to attend our workshop which will take place in Paris on the 8th and 9th of March 2012. In this workshop, you will take part in the process of finalising the recommendations which we will provide to the European Commission for the implementation of the SRA.

If you are interested to participate, please [register here](#) or directly send an email to Bruno Fies at bruno.fies@cstb.fr

Looking forward to hearing from you

Kind regards - The REVISITE Consortium

