D8.2 Knowledge dissemination in cooperation with other EU programmes

Overview and summary

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Streamer - Optimised design methodologies for energy-efficient buildings integrated in the neighbourhood energy systems.
The Streamer project is co-financed by the European Commission under the seventh research framework programme FP7.EeB.NMP.2013-5 ; GA No. 608739)

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Colophon

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Publishable executive summary

This document summarizes the exchanges that the STREAMER project has had with other projects in the EeB domain. Especially the other projects that were granted in the same call have been approached: Design4Energy, Holisteec, and EeEmbedded. Additionally, STREAMER has collaborated with other projects in a number of other platforms and congresses. In this document, these meetings are listed, together with the main conclusions and insights from those meetings.

The goals of these exchanges were to cluster (so that one event would be organized that would disseminate the results from multiple projects, which is much more efficient) and to exchange (avoiding double work; discuss approaches in order to find optimal solutions; and to build upon each other's results and insights).

Insights from 9 joint dissemination meetings are presented: all EeB Impact workshops; two EUHPN workshops, the Green@Hospital final conference, the ISES final conference, a conference organized by the EINSTEIN project, and Sustainable places 2015, 2016 and 2017.

List of acronyms and abbreviations

- BIM: Building Information Model
- EeB: Energy Efficient Building
- EUHPN: European Union Health Property Network
- HVAC: Heatinig Ventilation Airconditioning Cooling
- IFC: Industry Foundation Classes (=standard for file exchange in BIM)
- MEP: Mechanical Electrical & Plumbing

Contents

1. Introduction

This document summarizes the exchanges that the STREAMER project has had with other projects in the EeB domain. Especially the other projects that were granted in the same call have been approached: Design4Energy, Holisteec, and EeEmbedded. Additionally, STREAMER has collaborated with other projects in a number of other platforms and congresses. In this document, these meetings are listed, together with the main conclusions and insights from those meetings.

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2. Joint dissemination activities

The joint dissemination activities have come in a number of variations. Below, all occasions where two or more projects presented their insights to a larger public are listed. Besides the EeB Impact sessions and the Sustainable Places conferences, a couple of other occasions have been used to jointly disseminate results, and, very important for the project, to exchange ideas on the approaches of each project. Especially in the beginning of the STREAMER project, a couple of these smaller (2 or 3 projects represented) sessions were attended and this helped to identify the best way forward for STREAMER.

2.1 EeB impact sessions

Brussels (BE), 2015-2017

The European Commission organizes yearly EeB impact sessions (the 2017 version was organized by ECTP, though). Naturally, the projects that address energy efficiency in the Built Environment meet there. The meetings that were attended on behalf of STREAMER were:

- April 26-27, 2015
- April 18-19, 2016
- May 16-17, 2017

These workshops were large; the audience for the area in which STREAMER was presented was typically of the size 100-150.

The presentations that were given were always coordinated with other relevant projects. Specifically, these projects were represented:

- BESOS,
- Design4Energy,
- ECODISTR-ICT,
- eeEmbedded,
- FASUDIR,
- HOLISTEEC,
- READY4SmartCities,
- STREAMER,
- Orpheus

The presentations focused not only on the approach, methodology and (intermediate) results, but also very much on the impacts and the productization strategy of the various projects. While the presentations were necessarily relatively high-level and time for plenary discussion was short, the meetings provided good opportunities to exchange experiences with the coordinators of other projects during the coffee breaks and after the workshop. For instance, the STREAMER concept to create Implementers Communities was shared with a number of other projects since they thought that approach was an attractive way to involve third parties to the project.

2.2 EUHPN STREAMER workshop Leiden

Leiden (NL), April 2014

A one-day seminar was organized by STREAMER, on the theme of Building Information Modelling (BIM) for the healthcare sector. The seminar was organized jointly by STREAMER and the European Health Property Network (EuHPN). Invitations were sent to EuHPN-members and professional healthcare (related) organizations that have an interest in the use of BIM in all phases of the building lifecycle, where BIM is used to improve the planning, construction or running of buildings, and to ensure more efficient and effective collaboration between the all of the agencies involved in creating high quality healthcare buildings. The workshop was attended by 17 participants from the UK, the Republic of Ireland, Sweden, Norway and the Netherlands. They represented public administrators (national/regional), architects, hospital designers, planners, construction companies and representatives of hospital or healthcare organisations.

Various aspects of BIM in healthcare design were discussed. One of them was the use of parametric designs; this was at that time a key aspect of the STREAMER approach. The workshop shed some doubt on the viability and appropriateness of this approach, and it can be concluded that subsequent interpretation of the 'parametric' design by STREAMER project has been adapted.

Another topic that attracted quite some attention was the possibility to use knowledge (evidence based design) in BIM design. The outcomes of this discussion can be seen in the STREAMER project having adopted 'design rules' as a way to make tacit knowledge explicit and computable.

2.3 EUHPN workshop Edinborough

Edinborough (UK), October 2014

In this 3 day EUHPN workshop, intensive exchanges between Health Property owners, users, and designers were held. The session "The role of innovation in planning and designing healthcare buildings" was of specific importance for STREAMER. Other sessions where the STREAMER partners attended, were "Designing healthcare facilities to enhance quality and safety of care", and "Integration of secondary, primary and social care; how the built environment can contribute to this emerging model", which addressed topics relevant for STREAMER as well.

Because EUHPN focuses on healthcare only, no other EeB projects were represented in this workshop. However, the European EcoQUIP project was represented here, which also aims to reduce hospitals' carbon footprints, albeit through a completely different approach (innovative procurement). For STREAMER, the EUHPN workshop mainly worked as a way to receive feedback from the "end user community" on our approach.

In the session "The role of innovation in planning and designing healthcare buildings", three presentations from STREAMER were given.

- The Leiden workshop results were summarized for a larger audience by TNO.

- The case of the Rijnstate Hospital pilot was presented by RNS. The presentation focused on the role of innovation projects like STREAMER in the day-to-day challenges of Facility Management in hospitals, focusing on the role of BIM as the central place to store and manage building-related information.
- STREAMER partner DJG presented their views on the role of BIM in design processes in relation to the STREAMER approach; extensive attention was paid to the STREAMER design process and more specifically, the labelling approach was presented as a follow-up and elaboration of the Layer Methodology, which is well-known in the EUHPN community. This was one of the first public discussions of the Semantic Label innovation of STREAMER; based on the reactions, we were strengthened in our conviction that this approach would be an important concept for innovating the design process, especially in the early design phases.

2.4 Green@Hospital

Ancona (IT), October 2014

The Green@Hospital project organized its final conference in October 2014 at the Ancona Hospital (Azienda Ospedaliero Universitaria Ospedali Riuniti Umberto; one of their pilot locations). STREAMER was invited to present its approach. The conference was attended by about 60 people, mainly Green@Hospital partners and Italian hospital representatives and attendees from the building & construction sector.

The Green@Hospital project focused on electrical energy. Their approach was to focus on the operational phase of a hospital (not looking at the design phase as STREAMER does), and to create a user-friendly overview for facility managers that enables them to get continuous insight into the (electrical) energy performance of the hospital. One major source of energy reduction came from replacing conventional lighting (incandescent lightbulbs, TL) with LED lighting. Another major source was identified for HVAC, especially ventilation.

Since replacing lighting with LED does not have a relation to the (early) design phase that STREAMER focuses on, this aspect was not very relevant for STREAMER. The HVAC energy consumption however is highly relevant for STREAMER. It was one of the inspirations for the Semantic Labels-based design rules approach, especially the clustering of rooms with comparable ventilation requirements and opening hours: having a whole wing of a building with the same opening hours (office hours only) would enable the ventilation to be shut off almost completely outside these hours, thus saving on electricity. (According to the Green@Hospital project, it appears that ventilation alone can account for 35% of the electricity bill of a hospital.)

The approach presented by STREAMER thus fitted well with the Green@Hospital insights, and provided a supplementary (design phase) approach complementary to the Green@Hospital approach.

2.5 ISES

Athens (GR), November 2014

The final conference of the ISES project was organized in Athens (November 2014). For this conference, the HESMOS project was also represented (the project had ended half a year before), just as EeEmbedded. These projects presented their results and approach. The conference was in parallel to the ASHRAE conference Energy

In Buildings. The ISES workshop was attended by about 80 people, mainly partners from the projects represented.

The approach presented by STREAMER has many things in common with the ISES project. In fact, a high-level architecture was drawn in which the HESMOS, ISES and STREAMER functionalities could be plotted. The architecture was intended be the start of a joint platform to share results and tools. (Due to personal reasons, the proponent of the foreseen platform was not able to conclude this initiative. The STREAMER results were at that stage by far not enough advanced to take over the role of a platform.)

A number of topics were addressed in this joint meeting:

- The expectations on the use of GIS for energy reduction. The ISES project did not see many uses for GIS; one aspect was to vary the orientation of the building and see what effect this would have on the energy performance. Other GIS uses were not identified. This was relevant because STREAMER was at that time struggling with the best use case for incorporation of GIS. *(Note: In STREAMER D2.8, the use of GIS is illustrated, and it has a significant contribution to the optimization of the overall, district-wide, design. However, interaction between an individual building and the district is limited.)*
- The issue with 2nd order space boundaries in IFC when simulating energy, and the modeling of the thickness of walls (volumes) between IfcSpaces was experienced with ISES as well, and the involved experts have exchanged approaches and solutions on this topic.
- STREAMER has addressed the issue of MEP systems (and other parameters) not being exactly know design-time by making use of labels. HESMOS and ISES have followed another approach: the varied the parameters of EeB (façade technologies) and MEP technologies stochastically, and simulated energy performance for each combination of parameters. This involves a lot of computation time, but the output indicates which parameters are most sensitive to energy performance and this helps designers to make optimal choices. This is a completely different approach than the STREAMER approach.

2.6 Sustainable places 2015

Savona (IT), September 2015

The Sustainable Places conference is a natural place for a project like STREAMER to present its achievements, and to coordinate with other projects. The conference brings together academics, practitioners, facility managers, EU research projects, and vendors. The level of information exchange is very much towards applications; not many academic discussions are held, but manages to steer away from the shallow commercial levels that are sometimes also found. Locations are always chosen so that a practical example of Energy Efficient Building can be seen.

In 2015, a paper ‘STREAMER semantic BIM design approach for hospitals: research case of Rijnstate Hospital in Arnhem, The Netherlands’ was written. During the conference the Rijnstate hospital pilot project (live case) was presented. More specific the preliminary results were presented.

The role of BIM in the project was highlighted, and the design choices to be made in order to balance energy efficiency, operational quality and cost of the project.

Some other partners (incl. CSTB) also attended SP2015 and in particular some workshops relevant for STREAMER like the joint workshop organized by the EEBERS and SWIMming projects ("ICT & open data for building life cycle energy management") where discussions were on how ICT and open data solutions can benefit building life cycle energy management.

2.7 EINSTEIN

Warsaw (PL), September 2015

The EINSTEIN project (Effective INtegration of Seasonal Thermal Energy storage systems IN existing buildings) organized an international seminar on Energy storage in smart hospital districts. Besides STREAMER, the STRATEGO project was represented, addressing Heating and Cooling Strategies in Sustainable Urban Environments, and the EcoQUIP project, addressing Improving energy efficiency of a hospital using innovative public procurement. The other meeting's contributions focused on the usage of heating, cooling and storage technologies. The conference was attended by about 100 participants; project partners from the projects and Polish representatives of the healthcare and energy in buildings sector.

This conference was the first one where the Semantic Labels approach of STREAMER was presented. Since the other projects mainly focused on the district aspect of energy, and the labels concentrate on one building mostly, there were not many remarks or observations to be made when comparing STREAMER and the other projects. The conclusion with respect to environments was mainly that a clever choice of technologies could bring a lot of advantages regarding energy conservation. Since STREAMER concentrates on the design phase, it was interesting to see how the design and choice of these technologies usually takes place. It appears that automated design is still quite difficult, requiring a lot of effort from experienced designers. However, STREAMER has tried to capture some design methodology in D2.8, addressing the district-wide design of energy systems using GIS.

2.8 Sustainable places 2016

Anglet (FR), July 2016

The Sustainable Places conference is a natural place for a project like STREAMER to present its achievements, and to coordinate with other projects. A joint workshop was organized with Holisteec, EeEmbedded and Design4Energy. This conference was attended by about 150-200 people.

In the workshop, that ran parallel to the program and that lasted almost a day, the various projects presented their achievements. Focus was on the tools that were being developed. It was the first time that the Early Design Configurator and the Decision Support Tool were presented to a larger audience. Additionally, the Semantic Labels approach was presented in a more detailed way (alongside the conference, a peer-reviewed paper was written and published in the Entrepreneurship and Sustainability Issues journal.

The approach of HOLISTEEC is very much comparable to STREAMER. Dirk van Maercke (CSTB) and Davide Mazza (CEA) presented. HOLISTEEC also uses an "e-Catalogue" that seems to be a bit like the STREAMER matrix of MEP solutions of WP2. HOLISTEEC uses a NIM = Neighborhood Information Model (CityGML), based

on the output of an IFC to CityGML mapping tool created by Tecnalia. In the neighborhood scope they look at energy, acoustics, lighting, LCA, public transport, etc.

eeEmbedded works with “knowledge templates” to enable simulation in early design phases. These templates are an approach to fill in some default designs, and thus act as a kind of semantic labels, mostly used for envelope/facade technologies. eeEmbedded performs mass simulation of many different designs, to find out which are the ‘sensitive’ parts of a design in terms of energy efficiency. This could be compared to the Early Design Configurator; the functionality is different but the role is the same: to explore the effects of a huge number of design alternatives. However, the STREAMER looks at spatial configurations, eeEmbedded looks at technology choices in the design.

The Semantic Labels approach was received well by the audience. A couple of questions were asked but in general the idea of using the labels in conjunction with automated design of floorplans appealed to most attendees (even the architects, that might be expected to be afraid to lose work when design can be automated).

2.9 Sustainable places 2017

Middlesborough (UK), June 2017

Based on earlier experiences with the Sustainable Places conferences, it was considered to be a very good opportunity to present and discuss STREAMER results here again. A joint workshop was organized with Holisteec, EeEmbedded and Design4Energy.

The outline of this edition of Sustainable Places was very much like the SP2016 edition, having a separate longer workshop that combines the results from the four EeB projects. In 2017, the focus was much more on demonstrating results: tools, simulations, and methods.

All four projects are finishing end of August or September 2017. If simulation, KPIs, and multi-criteria analysis are common features, with a view to improving the design decision-making process, each project has developed a specific solution, supported by a (collaborative) design services platform. It can also be noted that the use of design knowledge is also a common topic shared by the projects, practically addressed in different ways.