Re-Co SERVICES NEWSLETTER

Issue 3
July 2013

INSIDE THIS ISSUE:

Re-Co live in Ludwigshafen **1**

Listen and repeat – but listen carefully! **2**

Optimisation of the ventilation systems in the BG Klinik Ludwigshafen **4**

Energy monitoring and input from external expert is the key at UMB in Norway **5**

Policy drivers and a regulatory framework which may drive Re-Commissioning projects **7**

Events outlook **7**

Re-Co project partners **8**

Visit us on:
http://www.re-co.eu/

Re-Co project

Reducing energy cost through optimization of existing building technology systems and user behaviour in existing non-residential buildings, especially in the health sector, universities and office buildings.

Project duration:
01. September 2011 to 31. May 2014

Co-funded by the Intelligent Energy Europe Programme of the European Union

Re-Co LIVE IN LUDWIGSHAFEN

REINHARD UNGERBÖCK, GEA, AUSTRIA
BARBARA PETELIN VISOČNIK, JSI, SLOVENIA

Dear readers,

At the beginning of March 2013, when the Re-Co project partners and some building partners met at Ludwigshafen in Germany, energy efficiency measures with an overall energy saving potential of 9,6 GWh have already been identified within 15 Re-Co pilot projects. With the energy consumption of the buildings included being 138,7 GWh in 2010 and the project's goal to achieve 10% final energy savings (i.e. 13,9 GWh), this means that 70% of the target set have been identified so far. One of the successful pilot projects is the BG Klinik Ludwigshafen, which we present in this issue, where the project partner STZ has first focused on the ventilation systems, which makes up almost half of the total energy consumption. Due to the optimisation of the ventilation systems, about 8% heat and electricity have been saved since the start of the Re-Co project. Besides the project in Ludwigshafen, we also present a Re-Co pilot project at the University of Life Sciences (UMB) at Ås in Norway, where the project partner NEE successfully focuses on the improvement of the existing energy monitoring system.

Re-Co project and building partners at the Ludwigshafen hospital in March 2013

The main article of this Re-Co services newsletter issue is, however, focusing on a less technical matter: on the importance of the proper communication in initiating and implementing Re-Commissioning projects as well as energy efficiency projects in general. We would also like to draw your attention to a study about policy drivers and a regulatory framework which might help to drive Re-Commissioning projects. The whole study is available on the Re-Co's web page http://www.re-co.eu/. On page 7, don't forget to check out our new column on past and coming events, where you can learn more about the Re-Co project and Re-Commissioning.

LISTEN AND REPEAT – BUT LISTEN CAREFULLY!

WHAT LANGUAGE REVEALS ABOUT YOUR BUILDING PARTNER'S MOTIVATION TO ENGAGE IN RE-COMMISSIONING

FLORIAN E. KLONEK, SIMONE KAUFFELD, TU BRAUNSCHWEIG, 4 A-SIDE, GERMANY

In Re-Commissioning – and when it comes to saving energy – advisers usually need to talk to building owners and staff in order to propose measures that help saving energy. These measures can either include technical changes but may also encompass behavioural strategies aimed at motivating building users to save energy. In any case, change needs to be implemented!

Imagine now, you work as a Re-Commissioning adviser. You have identified measures for a building partner that will save up to 15% energy. You have worked out your idea precisely, knowing each technical flaw of the building that leads to energy waste. You are excited to present your propositions to the management. As you start speaking to your building partner and explain which changes need to be realized in the operational system and how this might improve the building's energy performance you slowly realize your partner does not share the excitement. In contrast, you face scepticism ("I have doubts that this might work!"), counter-arguments ("I do not want to change this procedure, because it will affect the whole work flow."), or even bare resistance in form of cynical comments ("Exactly– for you this makes sense, but in the end, you do not have to deal with the problems!"). It is quite hard to argue further against this form of verbal steel jacket. In fact, the more you try to convince your partner about the importance of changing, the more you encourage him to defend his own position. In any case, his/her concerns might be valid and you need to give him/her credit for that.

As a matter of fact, you are not alone when it comes to working with clients that are not willing to follow good advice. Literature in counselling psychology describes how therapists often deal with clients high in resistance (e.g., Arkowitz, 2002, Miller & Rollnick, 2004). However, considering these clients as being resistant does not actually help to work jointly with them. In contrast, it rather worsens the relationship between you – the "change-agent" – and them – the "change recipients". It is more helpful to use the term ambivalence (Arkowitz, 2002) instead of resistance in order to understand the kind of language that you might encounter. We describe this language as *Change and Sustain Talk* – a psycho-linguistic construct that is used to describe how an individual expresses his intra-personal conflicts

Figure 1: *Interaction analysis between a Re-Co advisor and a building partner in a 7-minute interaction*

Note: *Figure 1* was created by means of the software INTERACT (Mangold, 2010). Each event is depicted on a separate line. Lengths of events = duration of verbal utterance. Blue balloons = Re-Co advisor; Orange balloons = Building partner. Green bars = facilitate change; red bars = increase resistance.

about changing (Amrhein, 2004). So what actually happens during the communicative change process?

In fact, any verbal utterance within a communication setting that targets to change a specific behaviour or a specific situation can be classified as language that favours change *(Change Talk)* versus language that argues against change *(Sustain Talk)*. More generally speaking, *Sustain Talk* reflects resistance to change while *Change Talk* reflects your communicative partner's motivation to change. It is also possible to further categorize *Change or Sustain Talk* into more specific units, such as reasons to sustain ("This measure costs me a lot of time"), lacking abilities to change ("We do not know how to carry out these procedures"), or – in contrast – needs to change ("We must change the energy system or we will lose money") and steps that have already been carried out ("We implemented the new system for another team").

Figure 1 gives an example about how a communication can be decoded utterance by utterance in order to reveal what happens during the interaction. We apply a method called interaction analyses in order to work out communication patterns (Klonek & Kauffeld, 2012a, 2012b; Mangold, 2010).

This method can give change agents a more detailed picture about their communication skills and may help identifying change-inhibiting communication. We can also use interaction analysis to help change agents develop a better sensitivity for *Change and Sustain talk*. Being able to "hear" or "decode" this kind of language is a prerequisite in order to use active listening skills appropriately. *Table 1* gives an example of two hypothetical communication scenarios. Note that both scenarios start with the same utterance. The first change agent shows improved active listening skills as he reflects the *Change Talk* part. In contrast, the second change agent uses a different reflection and hence stresses sustaining. As a consequence, the first change agent facilitates change while the second increases resistance. This also depicts how large-scale change management projects are dependent on the micro-verbal communication level.

Those who are actually responsible to carry out changes and to communicate it to stake-holders, employees and building users actually benefit if they develop their abilities to decode *Change and Sustain Talk* – e.g., by training active listening skills. The concept does not only apply to Re-Commissioning advisers but to anyone who works in change initiatives (cf. Ford & Ford, 2009). Furthermore, interaction analysis can help to show how communicative patterns are produced and provide a valuable feedback tool for Re-Co advisors.

For the references of this article and further reading on *Creating a Commitment to Change in Re-Commissioning projects* please visit our web page http://www.re-co.eu/.

Table 1: *Two hypothetical interaction scenarios starting with the same initial statement of the change recipient but different active listening skills of the change agent*

Scenario	Qualitative interaction stream		
	Change Recipient	**Change Agent**	**Change Recipient**
A	"I am unwilling to go on with this. It is no fun! On the other hand, I have a lot of good ideas that I would like to try out."	„You say you have a lot of good ideas."	„Indeed! I have so many ideas. For example, I know…"
B		„You think it is no fun?"	"Oh, of course it is no fun! I really would like to discuss other things…"
	Coded interaction stream		
A	*[Sustain Talk][Change Talk]*	*[Reflection of Change Talk]*	*[Change Talk]*
B		*[Reflection of Sustain Talk]*	*[Sustain Talk]*

Optimisation of the Ventilation Systems in the BG Klinik Ludwigshafen

Ursula Rieger, STZ, Germany

The Steinbeis-Transferzentrum Energie-, Gebäude und Solartechnik Stuttgart (STZ) is improving the energy performance of the emergency hospital *BG Klinik Ludwigshafen* in the course of the Re-Co project. The clinic has an annual energy consumption of about 25 GWh which corresponds to energy costs of about 2,7 million Euro.

Basic data of the pilot project	
Net floor area	68.000 m^2
Number of beds	418
Energy consumption	ca. 25 GWh/a
Energy costs	ca. 2,7 mio. €/a

Since the start of the Re-Co project about 8% heat and electricity have been saved through optimisation of the ventilation systems.

First, a rough analysis was carried out, to find out where the consumed energy (from the energy bills) went. This resulted in an energy flow chart *(Figure 1)*, which points out the main energy consumer.

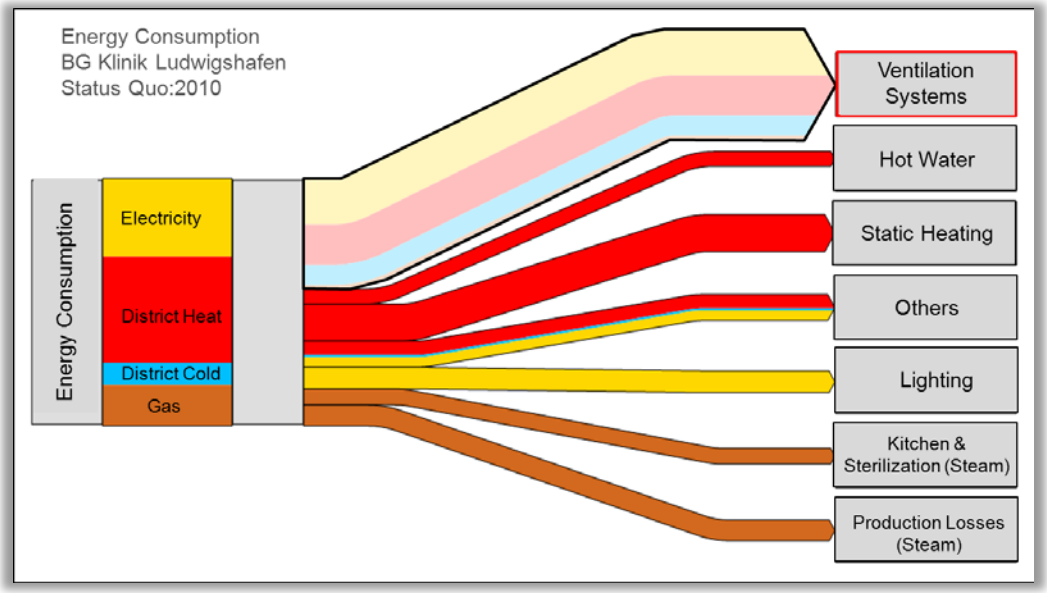


Figure 1: *Energy flow chart of the BG Klinik Ludwigshafen*

From the energy flow chart, it is clearly visible that the ventilation systems need approximately 45% of the total energy used. This corresponds to about 54% of the clinic's total energy costs.

For a detailed analysis the operation of the selected ventilation systems was simulated under current operating conditions and the yearly energy consumption could be calculated. Afterwards the energy saving potential was calculated through adapting the mode of operation to its actual use in cooperation with the technical staff, the users and involved companies. The calculated savings of an exemplary ventilation system are shown in the *Figure 2*.

The calculation for the individual ventilation systems showed the energy saving potential in the range from 4% to even 58% with average savings of more than 35% of the originally used energy.

These savings were reached by implementing low-or-no-cost measures. The highest potential was found in measures adjusting the supply to the demand side such as shutting down the system overnight, reducing the volume flow, adapting the actual time profiles in the building management system to its actual use or adapting the conditions to new utilisation of the supplied rooms. Other measures increasing the energy efficiency were: reducing of set values of the supply air pressure, exchanging damaged regulating flaps and checking several controls of the volume flow.

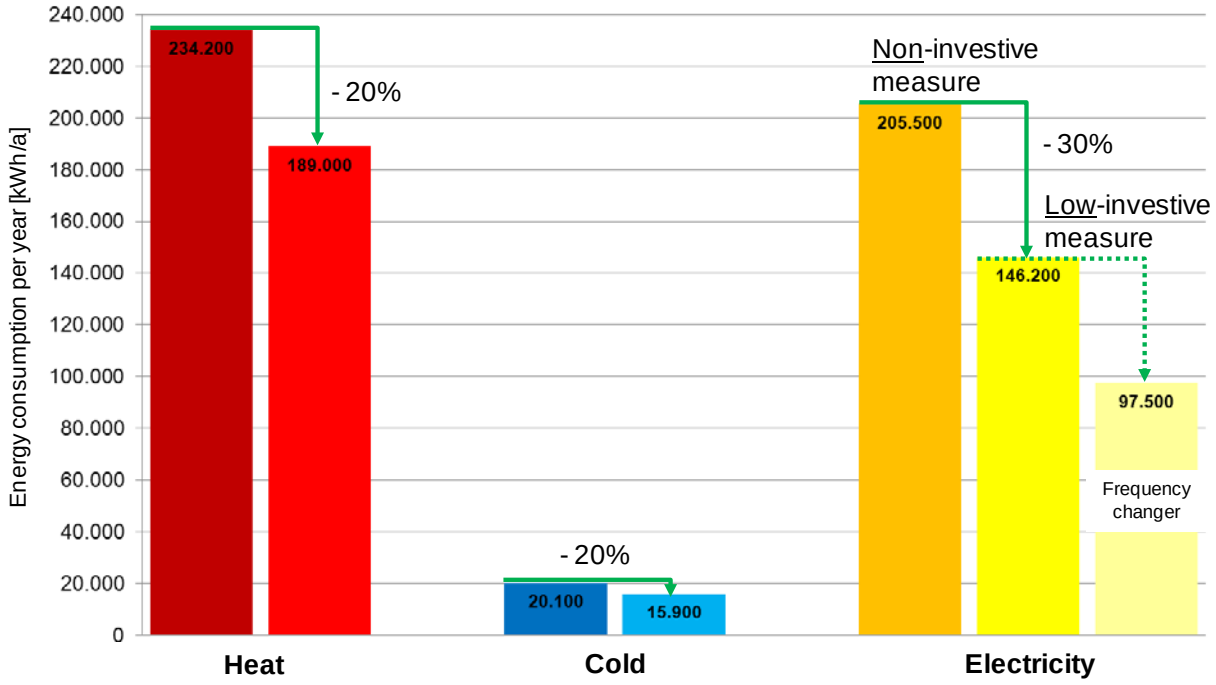
The result in the BG Klinik Ludwigshafen shows that large energy savings can be reached only by adapting set values and time profiles of the ventilation systems in the building management system.

Energy costs of about € 170.000 per year could be saved in the clinic by investing about € 110.000. **The identified measures pay themselves off after less than one year.**

Optimisation of ventilation systems	
Investment	ca. 110.000 €
Energy savings	ca. 1,8 GWh/a
Cost savings	ca. 170.000 €/a
CO_2 savings	700 tCO_2/a
Payback period	ca. 8 months

More information on the optimisation of the ventilations systems in the BG Klinik Ludwigshafen can be found on the Re-Co web page under http://www.re-co.eu/node/57.

Figure 2: *Example of the calculated potential energy savings for one of the ventilation systems*



Energy Monitoring and Input from External Expert is the Key at UMB in Norway!

Thea Marie Mørk, NEE, Norway

The Norwegian Re-Co pilot project is led by the Re-Co project partner Norwegian Energy Efficiency Inc (NEE) and takes place at the University of Life Sciences (UMB) at Ås, 40 km south of Oslo. UMB has more than 1.100 researchers and 3.800 students. The campus is a historical site with 160 buildings (150.000 m^2) built between 1859 and 2002. The old buildings combined with a large and complex organisational structure present many challenges with regard to energy use and control.

Two buildings were chosen for the Re-Co pilot project based on complexity, stable framework conditions with no large rehabilitation planned and saving potentials. The buildings are used as offices, research areas and for educational purposes.

The initial building audits showed that several measures were relevant for both buildings. Some measures have already been implemented and some are still under discussion.

Basic data of the pilot project	
No. of buildings	2
Net floor area	19.700 m^2
Energy consumption	3.700 MWh/a

Energy Monitoring

The main focus of the pilot project was to get the existing energy monitoring system into a better shape. An automatic system reading energy use on a weekly basis has already been established. However, some measuring equipment was still missing, and there were no routines for the use of the system.

Routines for reporting on all levels, including management, are important for the energy monitoring system if energy savings are to be achieved. Also the resources necessary have to be allocated, both with regards to skill and time. For the buildings at UMB the responsibility was defined, but it was still difficult to prioritise the time and to establish routines. The Re-Co pilot project was a welcome opportunity to focus on these tasks.

Control of the Building Systems

Also the use of the centralised control system was an issue in the pilot project. The routines have been changed so that the person in charge of the energy monitoring also has a better access to the data from the HVAC-systems, providing a better chance to detect energy leaks and to influence the control of the systems.

An external heating system installed to keep entrance areas free of snow and ice was identified to have poor control systems. Several measures were implemented to solve this problem and savings of 4-500 kWh/day have been documented as illustrated in the figure below. The first period on the graph is the consumption of the snow melting system before the measures were implemented and the second half is the period after.

Another measure implemented were changes of the opening times of external doors to reduce air and heat leaks in one of the buildings. Existing sensors detected objects being in "the door zone", so long opening times were unnecessary.

Ventilation of some educational areas was identified to be out of balance. Allowing the ventilation to be in balance, the set-value for the CO_2-value could be adjusted, while keeping the climate conditions good.

Also simple information posters to inform the users of how to apply the manual control systems to maintain indoor air quality while minimising energy use were produced during the Re-Co project.

Results

In total a saving of over 300 MWh has been documented for one of the buildings in 2012 compared to 2011. Further savings are expected in 2013. This is a saving of around 14%. For the other building, the baseline data is lacking, but the outlook is good also in this case.

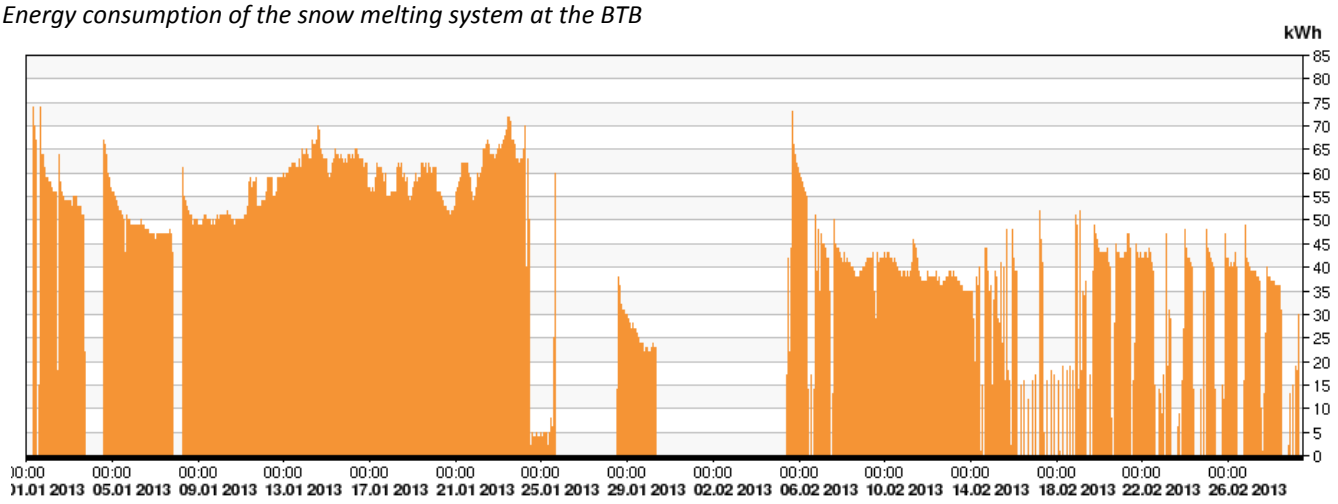
Trond Langseth, Energy adviser at UMB

"The work done on two of our buildings has given us knowledge about issues and measures contributing to energy reductions without large investments. These measures and experiences will be taken on board in our future work with the other building stock. The support from the energy experts has made us put higher priority on the energy efficiency work".

Dag Erik Eilertsen, Energy expert at NEE

"The case has shown that, in spite of being a large organisation with professional technical staff and competent energy management, low cost measures can lead to substantial savings in energy consumption".

Energy consumption of the snow melting system at the BTB



"Policy Drivers and a Regulatory Framework" Which may drive Re-Commissioning Projects

Ursula Rieger, STZ, Germany

A study carried out in the context of Re-Co, showed that there is still an urgent need for legislative action concerning the examination and optimisation of energy efficiency of existing buildings. While there are numerous and partially very ambitious standards for new constructions and retrofits, there are only very few guidelines and general recommendations for Re-Commissioning measures.

The implementation of ISO 50001 and compulsory inspections may support greater sensitivity towards these improvements. If they were tightened they might actually help to initiate implementation of the measures and to reduce energy consumption. Lately, standards slowly seem to move in the right direction. In Germany a draft of the norm DIN SPEC15240 concerning the regular inspection of the ventilation and air-conditioning systems was published in December 2012 defining in detail what needs to be measured. Also the draft of the new EnEV 2013 introduces a controlling body and supervision of consequences. Hopefully, this will start to put more focus and pressure on supervising the operation of the buildings.

For more information on policy drivers and regulatory framework you can have a look at the study on the Re-Co expert platform at http://www.re-co.eu/.

European policy	Realization in Germany		What might help for Re-Co	Reality
2002/91/EG Energy Performance of Buildings Directive (EPBD) Year 2002	→ EnEV 2009 Energie-einspar-verordnung	Requirements for **New Buildings / Retrofits**	**Periodic energetic inspections** of air-conditioning systems > 12 kW compulsory since 2009	No inspections realized as not officially checked
EN ISO 5001 Energy Management Systems Year 2011	→ DIN EN ISO 50001 (German version)	**Guidelines for establishing** energy management system	**Compulsory for tax savings** for industry with electricity consumption of >10 GWh/a (2013)	BMS is installed + energy manager, savings not compulsory, however good basis for Re-Co

Events Outlook

COMING EVENTS	PAST EVENTS
Change of Values in Hospital Technology, *Workshop Re-Commissioning Energie*, 25.9.2013 , Pörtschach/ Wörthersee, Austria, registration at http://www.oevkt.at	Barbara Petelin Visočnik: *Importance of Re-Commissioning for Improvement of Energy Performance of Non-Residential Buildings*, 3rd International Conference Energy Technology and Climate Changes, 20. – 21. 6. 2013, Velenje, Slovenia;
Reinhard Ungerböck: *Re-Commissioning Services: Immediate Savings and Triggering Building Refurbishment Measures in Non-Residential Buildings*, 27.9.2013, Graz, Austria, registration at http://www.sb13.org	Reinhard Ungerböck: *Energy Efficiency without Investment*, EU-China Conference on Policies for the Benchmarking of Large-scale (Commercial) Buildings, 3. 4. 2013, Beijing, China
National study tours to the pilot project's sites, autumn 2013, for further information, please, contact your national Re-Co project partner	Uwe Hemminger: *Realised measures in the BG clinic Ludwigshafen in the context of the EU-project Re-Co*, Expert conference Energy efficiency in hospitals in Baden-Württemberg, 13. 3. 2013, Stuttgart, Germany

Project Coordinator

Grazer ENERGIEAgentur
Kaiserfeldgasse 13/I
8010 Graz
Austria

Boris Papousek
Phone: +43-316-811848-12
E-mail: papousek@grazer-ea.at

Newsletter editor:

Barbara Petelin Visočnik
Jožef Stefan Institute
Energy Efficiency Centre
Jamova cesta 39
1000 Ljubljana
Slovenia
Phone: +386-1-5885-394
E-mail: barbara.visocnik@ijs.si

IEE/10/328/SI2.589423

Co-funded by the Intelligent Energy Europe Programme of the European Union

Re-Co Project Partners

In the Re-Co project
10 project partners from
8 European countries take part.

Re-Co Project Coordinator