

BLUEPRINT QUESTIONS: IAN KNIGHT

1. What benefits do you hope iSERV will bring in general terms?

Long answer: iSERVcmb is addressing the problem of improving the energy performance of HVAC systems in EU buildings **in practice**. It aims to do this by producing benchmarks from sub-hourly in use data obtained from around 1600 HVAC system components located around the EU. This data will be categorised according to the end use activities the HVAC components serve.

iSERV is a first attempt to provide a framework and process to address the lack of real in-use energy use data for these components, and has been designed to produce a large dataset of sub-hourly energy use in European HVAC systems and their components.

The collection and analysis of this data will allow iSERVcmb to suggest methods regarding the reduction of compliance burdens on well-run HVAC systems, the achievement of lasting and cost effective improvements in HVAC system energy efficiency, the rapid identification of good and best practice in HVAC energy use, and the improvement of the energy inspection process efficiency.

Short answer: iSERVcmb should help clarify what approaches to reducing the energy use of HVAC systems actually work in practice when servicing given end use activities. This knowledge will help produce better designs and more energy efficient HVAC components. The hope is to help reduce the total EU electrical energy use by around 2% from where it would otherwise be. It is also hoped that iSERVcmb will help put into place the legislative mechanisms needed to achieve this aim.

2. Why are there no comprehensive benchmarks for HVAC systems?

Long answer: Until very recently the infrastructure to monitor energy consumption cheaply at the level of HVAC components was lacking. This has now changed. Historically, only a relatively small amount of buildings in Europe monitored and reported their HVAC system performance.

This has led to a real absence of publicly available information data derived from large scale datasets on the detail of the energy consumption of HVAC systems in buildings. As a result there is a lack of information on which to base policy decisions and future legislation regarding achieving energy efficiency in HVAC systems in the EU.

This is the main reason behind the funding of this Intelligent Energy Europe project. iSERVcmb is collecting and analysing detailed energy consumption data for up to 1600 heating, cooling and ventilation systems across 16+ EU Member states. From this data, initial benchmark energy use ranges will be derived for the energy consumed by HVAC components servicing specified end-uses, areas and hours-of-use. This will enable bespoke benchmarks to be derived for actual HVAC systems servicing specified activity mixes.

Short answer: No-one was monitoring, recording and reporting their HVAC component energy use in a manner suitable for producing these benchmarks. The predecessor to iSERVcmb was the HARMONAC project, and this is the main public source of such information in the EU at present.

3. Could iSERV be utilised by HVAC manufacturers to showcase energy efficient products and solutions and perhaps establish best practice benchmarks?

Long answer: Yes. iSERVcmb as an independent project is able to show the practical operation and benefits of an automatic monitoring and feedback system, and identify good and best practice in HVAC energy use without favouring any technology or approach. It is technology 'neutral' as it is only interested in what 'works'.

From this perspective, the information collated by iSERVcmb will support HVAC manufacturers, installers and energy managers in implementing effective energy saving measures in new and existing HVAC systems. We hope HVAC component manufacturers will view this project as an open platform through which they can showcase the energy performance of their products to end users interested in improving their HVAC system performance.

By participating in iSERVcmb, HVAC manufacturers will be able to obtain independent verification of the in-use energy consumption of their systems and components when servicing specific end-uses. If manufacturers bring systems to iSERVcmb to test they can also obtain anonymity for their products unless otherwise requested.

At a larger scale, HVAC manufacturers will enhance their corporate image and brand reputation by adding value to their product offerings, and by participating in an influential project, funded by the European Commission, seeking to improve in use energy efficiency in HVAC systems for Europe. The data produced by iSERVcmb will be used as part of new professional guidance to be published for Building Services Engineers around the EU. It is also likely to be used to help set new CEN Standards in this area.

Short answer: Yes. As an independent, technology neutral, project iSERVcmb is the perfect vehicle for HVAC manufacturers to demonstrate their products and help the Professional Bodies produce benchmarks for expected performance when servicing given activities.

4. How is the project doing – it is still presumably in a start-up phase?

Long answer: iSERVcmb started in May 2011 and has now completed its start-up phase. We spent the first year of the project focusing on how to make the process of entering buildings to the iSERVcmb database as straightforward and quick as possible. As a result, we have developed a fully web-based database which allows anyone collecting sub-hourly energy consumption data from their HVAC systems to send their data electronically and directly participate in the iSERVcmb project.

Integral to the iSERVcmb database is the iSERV data entry spreadsheet. Designed to link together in one space all the information about HVAC system components; areas and activities served; and the meters and sensors monitoring the HVAC system and spaces, the spreadsheet is a valuable tool which also addresses a major problem for EPBD Inspections – the lack of data - leading to either more costly inspections and/or less effective inspections.

The effectiveness of the iSERVcmb spreadsheet has led both CIBSE and REHVA to endorse it as a good way of collating this information and keeping a record for future inspections. Currently, we are working on further development of our database and updating our reporting system. These actions will continue throughout the project in order to be able to provide our end users with progressively more detailed reports based on their feedback and preferences.

The iSERVcmb project has already started the full scale recruitment of owners or operators of HVAC systems, HVAC system or component manufacturers, facility managers, legislators or policymakers. All interested actors who wish to participate in the iSERVcmb project can visit us at <http://www.iservcmb.info/>.

Short answer: The project has recently completed its initial phase. This phase was to provide a common means of describing HVAC systems in operation in buildings across Europe. This phase also covered the development of the fully web-based database, along with initiating data collection from HVAC systems around the 27 EU Member States. The project is just about to begin the next phase of populating the database and being heavily promoted amongst the relevant actors affected by the project.

5. Can iSERV provide immediate benefits for HVAC system owners who input data?

Long answer: HVAC system owners who are able to provide us directly with consumption data on HVAC system components, sensors and utility meters, combined with information regarding the floor area and activities served, and ongoing sub-hourly data for at least the chiller, recorded in the span of a full year, will have direct access to a number of monthly illustrated reports of the bespoke performance of their HVAC systems that will allow them to understand and reduce their HVAC energy consumption. iSERVcmb reports offer analysis of the energy consumption of the end user's HVAC system. These reports will increase in detail over the project period as the data becomes available, growing to include comparison with other systems around Europe according to activity and HVAC type, as well as targeted feedback on potential energy conservation opportunities (ECOs) for their specific system.

Short answer: The initial reports from iSERVcmb to an owner will provide immediate unique insights into the operation of the HVAC system from which the data is provided. As the project database is free to use during the project period it is anticipated that all end users will achieve substantial energy savings if they have not previously focussed on this aspect of the energy use.

6. Briefly, what long-term benefits can iSERV deliver for participants?

Long answer: The iSERVcmb project works on the basis that it is important that we not only understand the ranges for actual energy consumption in HVAC systems serving various end-use activities (the 'effects'), but that we also understand the causes of variations in HVAC system energy consumption for meeting the requirements of the same end-use activities.

This information will allow more confidence in investment in improving the energy efficiency of poorer performing systems, as well as provide an understanding of how legislation should be framed to encourage better performing systems to be adopted. Additionally, iSERVcmb creates the opportunity to achieve more energy savings in HVAC systems than are possible from inspection alone, and thus to improve the cost-effectiveness of the EPBD transposition. These outcomes are expected to benefit, in the long term, a wide network of interested actors from end users to HVAC manufacturers and legislators.

A specific and unique hoped for long-term benefit is that the legislation could return control over the delivery of energy savings to the actors in the sector from the legislators, i.e. it does not matter how you reach the targets provided you can demonstrate that you have through

the monitoring. This allows innovative techniques and approaches to emerge, as well as acknowledging that all actors can play a role in highlighting good performance and helping move towards the near Zero Energy Buildings (nZEB) required for 2019 onwards.

Additional answer: The long-term benefits for end user participants, besides reduced energy consumption, include more effective maintenance procedures; better choice of replacement components; continual monitoring of their system performance and feedback of problems; etc. The main financial benefits are however likely to be felt in terms of more focussed and easier to justify investment in energy efficiency, and a reduction of manpower costs associated with the analysis of the potential energy conservation opportunities open to them along with a clearer understanding of each HVAC system.