

Inspection of HVAC Systems through continuous monitoring and benchmarking (iSERV)



The European iSERV Project

Aims

- To establish that the continuous monitoring and benchmarking of HVAC processes will provide energy saving benefits equivalent to or better than those achievable by Physical Inspection alone – thus allowing the use of this technique in EU Member States as a complement to the Physical Inspection process
- To produce benchmarks of energy consumption by HVAC systems against end use activities derived from measured data around Europe
- To encourage the rapid adoption of more energy efficient HVAC systems through demonstrating their in-use benefits

By collecting sub-hourly HVAC system energy use data from around 1600 HVAC systems in the EU Member States, the iSERV project will be able, amongst other things, to:

- Provide feedback on energy use patterns to those system owners/operators participating in this project which should allow them to achieve measurable energy savings in operation in practice.
- Establish a detailed understanding of the energy consumption of European Heating, Ventilating and Air Conditioning (HVAC) systems meeting specified end use activities. This will allow activity-based benchmarks to be derived against which the comparative energy performance of an HVAC system can be compared. Those systems showing poor performance could then be considered in need of the more detailed Physical Inspection currently mandatory in Member States.
- Provide evidence-based information to HVAC system manufacturers, EU Member State Legislators, European Standards Bodies, Professional Building Services Bodies and HVAC system owner/operators on how to improve the in-use energy efficiency of HVAC systems.
- Potentially allow owner/operators of systems showing good energy performance to avoid needless Inspections. This is especially important in the light of the IEE AUDITAC project identifying a European-wide shortage of suitably experienced and qualified HVAC system Inspectors.
- Provide a rapid route for energy efficient HVAC systems to demonstrate themselves to the market through an independent process.

The overall aim of iSERV is to provide some reward to HVAC system owners/operators and manufacturers for addressing the energy efficiency of these systems in their operation and design. This will move the emphasis on improving the energy efficiency of these important energy consumers back to the people who can best influence this.

Opportunities for participation

Owner/operators

The fully web-based nature of the iSERV database means that anyone with the correct data collection capabilities can participate. To have an HVAC system included in iSERV a participant must be able to provide the following **minimum** information to the project:

HVAC system: Identification of types and numbers of energy consuming components e.g. 3 Cold generators; 2 Heat generators; 2 Humidifiers; 3 Hot Water pumps; 4 Cold Water pumps; 2 Air Handling Units (AHU's); 20 Fancoil units. The Cold generators and Humidifiers (if in use) **MUST** have dedicated electrical metering capable of recording data at sub-hourly intervals.

Spaces served by the HVAC system: Unique space ID's e.g. room numbers; floor area for each space; identification of main activity within a space (from drop-down menu). The energy consumption data from the HVAC system must be uploaded into iSERV at least monthly in an agreed format.

Further data desirable for collection, to allow more detailed feedback to the HVAC system owner on performance and potential Energy Conservation Opportunities (ECOs), is shown on the iSERV initial data entry spreadsheet. This can be downloaded from the iSERV [website](#).

All other actors

If you feel you could benefit from involvement in this project, please contact the project via the iSERV website www.iservcmb.info – or contact the project Coordinator, Dr Ian Knight, at knight@cf.ac.uk

Benefits to iSERV participants

The following bullet points list some of the benefits that are likely to accrue to iSERV participants:

- The committee responsible for the next version of the CEN Standards regarding Inspection of HVAC systems will consider the findings from iSERV and the IEE HARMONAC project (www.harmonac.info) in setting these new Standards
- Strong links to policymakers responsible for implementing the EPBD in each EU MS
- REHVA and CIBSE are Partners in the project meaning future professional guidance to improving the energy efficiency of your systems will emerge based on the findings from this project.
- iSERV is managed and run by Participants who are independent of all Industry ties and therefore bias. The results produced will therefore be of great help to all actors in this market who wish to pursue lower energy consumption in use.

- Owners/operators: Ability to claim your HVAC operational data is used in setting benchmarks, and to claim your organization is helping Europe achieve its transition to a low carbon economy in any environmental and/or energy reporting undertaken.
- Owners/operators: Use of iSERV logo and IEE logo on your system specific reports generated from iSERV from the data you have supplied
- Owners/operators: Obtain bespoke benchmarked performance of your HVAC systems against the mix of activities served
- Owners/operators: Understand the practical potential for saving energy in your specific circumstances
- Owners/operators: Be kept informed about those HVAC system types and operating practices that are proving to be most energy efficient in practice when supplying your end use activities – allowing more confident system improvement and replacement strategies
- Owners/operators: Receive targeted feedback on potential ECOs based on data supplied about your buildings and systems
- Anonymity of end users and manufacturers unless requested otherwise e.g. if you have a system or product coming towards the upper end of energy efficiency for the stated mixture of end uses
- HVAC Manufacturers: Stimulating rapid market penetration of low energy HVAC systems as data can start being compared within a month of entry onto iSERV application
- HVAC Manufacturers: Ensuring your clients are aware of the project gives you an opportunity to discuss energy efficiency with them using independent findings for your HVAC systems and components where they are contributing information to iSERV

When can I start entering information to the iSERV system?

Version 1 of the online iSERV database will be released in **early 2012**. However, it will be possible to enter historic HVAC data, meaning that you should start recording data as soon as possible if you wish to participate. An Excel-based spreadsheet was released at the start of November 2011 to enable the most efficient entry of the initial data needed for the spaces, activities and HVAC system. The data format required for on-going consumption data upload is **.csv**, though if you are unable to provide data in this format please contact the coordinator to discuss alternatives.

Is the effort of entering data on my system to iSERV useable elsewhere?

CIBSE and REHVA are supporting the iSERV initial data entry spreadsheet as good practice for HVAC record keeping. This data is important for achieving useful results from an EPBD Inspection as it allows the Inspector to use his time more efficiently.

How much monitoring data should I look to collect?

Energy use by **at least the Cold generator** component of the HVAC system is required to participate in iSERV. However, energy use in other HVAC components such as Chilled Water Pumps, AHU's, Heat rejection fans, etc., along with space temperatures, Relative Humidity, Pressures and fluid flows are all additional data capable of storage in the system and providing much more precise feedback to you, so worth recording now. Hours of use and setpoints will also be needed. The iSERV project intends to offer automatic identification of possible ECOs based on the data you supply.

Will iSERV need access to my organisation's data systems?

iSERV will not connect to any systems directly. It works by you sending data to the iSERV application. This process can be automated in many BMS or other data collection systems. There are therefore no computing security issues that need to be addressed through the use of iSERV.

Can I access and manipulate the data I have loaded to iSERV?

Yes. The iSERV system is completely web-based meaning most web browsers will be able to access it. Users will be given unique usernames and passwords allowing them to undertake some reporting directly from the system, including being able to download user definable tables of their data so that they can manipulate the data in their own Excel sheets.

How many systems are needed and is it free to use?

The iSERV database will be free to use for the first 100 HVAC systems entered from each EU Member State – with around 1600 HVAC systems being sought across Europe. This is not very many so you are encouraged to register interest as soon as possible. Additional systems entered after these numbers have been reached will be allowed only if sufficient space exists on the database. The database architecture is infinitely expandable but additional data storage and processing carries associated costs which will need to be met if required. This issue will be addressed once it is reached. There is no limitation on the amount of data that can be stored for each HVAC system as some systems are necessarily more complex than others, though data collection intervals of less than 15 minutes will be consolidated into 15 or 30 minute interval data as appropriate. One of the conditions of the European Commission's IEE grant is that the systems recorded should be representative of the mix of HVAC types found in each EU MS. iSERV therefore has the final decision on whether to include a system or not.

How do I register my interest in participating in iSERV?

Visit the iSERV website www.iservcmb.info and register as shown

