



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

## Project Fact Sheet – July 2014

### Inspection of HVAC Systems through continuous monitoring and benchmarking (iSERVcmb)



#### Main Information

<b>Key Action:</b>	SAVE: Energy Efficient Buildings
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<b>Project's Partners</b>	K2n Ltd, UK FEUP, University of Oporto, Portugal Politecnico di Torino, Italy MacWhirter Ltd, UK National and Kapodestrian University of Athens, Greece Univerza v Ljubljani (University of Ljubljana), Slovenia Université de Liège, Belgium University of Pecs, Hungary Österreichische Energieagentur - Austrian Energy Agency, Austria Chartered Institute of Building Services Engineers (CIBSE), UK Federation of European Heating, Ventilation and Air-conditioning Associations (REHVA), Belgium
<b>Project's website:</b>	<a href="http://www.iservcmb.info">www.iservcmb.info</a>
<b>Benefits:</b>	Improved energy efficiency of HVAC systems in use, whilst usually achieving significant cost savings for the system owner/operators. A direct aid to EU Member States legislators looking to transpose the recast EPBD into National legislation. Savings of up to 5% of the total EU electricity use appear possible.
<b>Keywords:</b>	Inspection of HVAC systems, energy benchmarking, continuous energy monitoring
<b>Duration:</b>	07/05/2011 – 06/05/2014
<b>Budget:</b>	3,293,562 Euro (EU contribution 75%)
<b>Contract number:</b>	IEE-10-272

## Summary

The IEE HARMONAC project, [www.harmonac.info](http://www.harmonac.info), estimated that EPBD Article 9 Inspections would only identify 37% of the potential energy savings available for Air-conditioning systems, and that the rest of the savings were only visible through analysis of continuous monitoring data. The findings from HARMONAC helped influence the recast EPBD, which now allows for automatic monitoring of Building Technical Systems as a complement to Inspection in Articles 8, 14, 15 and 16.

With the recasting of the EPBD, iSERVcmb is designed to show how the ability for automatic HVAC system monitoring to reduce energy use in practice might be implemented in practice, and to encourage allowance for it in the new regulatory frameworks being developed by European Member States for the recast Directive.

The project partners include the main Building Services Professional Bodies in Europe, and the findings from the project will find their way into professional guidance for achieving energy efficiency in HVAC systems in Europe. It is anticipated that some of this guidance will be in the form of ranges of benchmark energy consumption for various end-use activities.

The main target groups for this data are Building designers, HVAC system designers, HVAC system, manufacturers, Facilities Managers, HVAC Inspection bodies, and EU Member States legislators.

## Project's results

Result 1	Savings of 1 – 5% of building electrical energy use were expected on average. Savings of over 33% have been found to date in some buildings, with average savings over 9% looking possible. Savings in non-electrical energy use are not evaluated, and will be on top of this reduction
Result 2	If applied across Europe, the ranges of the savings achieved to date would lead to a reduction in the total EU electricity use of between 0.3 to 5%
Result 3	In monetary terms the estimated energy savings would be worth over 20 Billion Euros per annum across Europe. The cost to achieve this is expected to be not much more than 1 - 3 Billion Euros.
Result 4	The project recruited 330 buildings, comprising 2,831 HVAC systems, 7,685 HVAC components, 2,230 Meters, 11,173 Spaces, 72 Activity types and 1,551,638 m2 of floor area, from 15 EU Member States during the project period
Result 5	Process, spreadsheet and unique measured in use energy and power demands are freely available from the project website.

## Lessons learnt

Lesson 1	There are virtually no buildings in Europe that fully understand and document their HVAC systems where they are more complicated than a heat source and heat distribution system. The iSERVcmb spreadsheet was developed to overcome this data gap as a mandatory precursor to understanding the monitoring data being collected
Lesson 2	The savings achieved from this approach the sample set are far higher than expected. This appears to be due to the approach allowing clarity in the energy use of the building as a whole. This provides the energy manager or operator with confidence to achieve savings beyond just those associated with the HVAC systems.
Lesson 3	Very little money needs to be spent to achieve substantial energy and cost savings initially. The energy reductions can therefore be almost self-financing. Many early cost savings achieved to date pay for themselves many times over per year
Lesson 4	The predictions of achieved performance from the iSERVcmb process generally agree with the findings of system condition from concurrent Physical Inspections, meaning it can be used as at least an equivalent legislative approach to meeting the requirements of the EPBD

Last updated – 31/07/2014