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Professor Ian P. Knight
Project Coordinator

Welsh School of Architecture, Cardiff University
knight@cardiff.ac.uk

Welcome to the final iSERVcmb Newsletter,

The iSERVcmb project has now been completed and has a number of findings to report. This newsletter is structured to reflect the final report for the project, which is available in full and with links to even more information at www.iservcmb.info/results.

The main findings are that:

- The proposed process leads to significant savings in operational buildings across Europe – with annual electricity savings of up to 5% of the total EU electrical energy use appearing possible.
- The iSERVcmb spreadsheet can be used for all buildings and HVAC systems across Europe
- The project has produced a unique set of measured data on energy use and power demands in HVAC sub-components servicing given end use activities across Europe
- Energy Conservations Opportunities are capable of being identified from sub-hourly data
- Physical Inspections and Indoor Air Quality studies have confirmed that continuous use of metered data can be used to benchmark the performance of buildings and systems
- The approach and data is of interest to Building Services Professional Bodies in providing guidance to their members on improving the operational energy efficiency of building services

All the main Actors from across Europe, with an interest in reducing the operational energy use of buildings and their building services, have participated in and/or contributed to the shape and findings of this project.

I hope you find the project outputs useful and interesting.

Ian Knight



Stay up to date and get involved in discussing topics surrounding iSERVcmb - join the iSERVcmb group on LinkedIn





iSERVcmb Overview Report – iSERVcmb Overview Report – i

The iSERVcmb project has provided a unique approach to understanding and reducing operational energy use in building services across Europe. It has accumulated a unique set of operational data for building services components during its 3 year period. The project acquired data from 16 countries around Europe as shown in Figure 1.

The iSERVcmb overview report presents summaries of the results, findings and observations from the various aspects of the iSERVcmb project and provides links to the more comprehensive underpinning information from the project where available.

The structure of the report examines the following aspects of building performance, maintenance and operation that have been explored in buildings and systems across Europe:

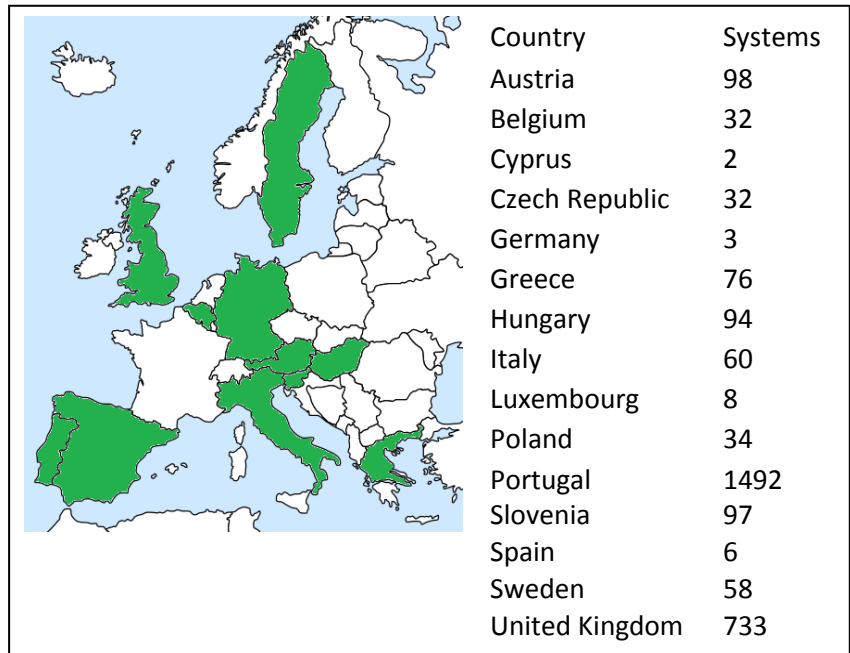


Figure 1 - EU distribution of iSERVcmb data sources

- The establishment and testing of a procedure for describing and collating buildings in terms of their spaces, activities, building services components and meters
- The electrical energy consumption and power demands measured in HVAC components across Europe
- The energy conservation opportunities (ECOs) identified in HVAC components across Europe and the predicted overall savings from these ECOs
- The actual electrical energy savings achieved in buildings using the iSERVcmb system
- The Indoor Air Quality of a sample of the buildings and systems tested
- The findings from EPBD Inspections undertaken on a sample of Systems across Europe
- The impact on Professional Bodies, HVAC Manufacturers and Maintenance Companies
- The implications of the results of iSERVcmb for future legislation and operation of buildings
- How the process might be transposed into a working system within EU MS

➤ To read the iSERVcmb Overview report, download a copy from the “Overview Report” report at www.iservcmb.info/results.



The iSERVcmb spreadsheet – The iSERVcmb spreadsheet – T

The iSERVcmb approach is founded on understanding the interaction of the physical assets of a building, including its meters, services and the activities undertaken in the building. Benchmarks, ECOs and other guidance are derived wholly from data obtained from the operation of buildings, as HARMONAC showed that this was a major factor in persuading end users to act on their energy data.

To provide performance benchmarks, iSERVcmb requires details on the physical composition of buildings in terms of Utility Meters, Floor Areas, Activities undertaken and the Building Services components installed.

In iSERVcmb, an HVAC system is a virtual entity comprised of a series of physically described HVAC sub-components. This virtual entity is then attached to the spaces and activities it services within the building. An HVAC sub-component, for example a cold generator, can serve one or more such HVAC systems within a building depending on the arrangement of the services in that building. iSERVcmb handles all interactions between meters, component, activities and spaces once they are described in the iSERVcmb spreadsheet.

The screenshot shows a spreadsheet with the following sections:

- CUBRIC Building IT Suite - Example of Single Space Configuration**
- Heating, Ventilation and Air Conditioning System Details**
- Building** (Table with columns: Building Name, Description, Organisation Name, Site Name, Sector, Address, Town, Postcode, Country, Control of HVAC, Temperature, Construct Month, Date Starts From, End Month)
- Utility Meter** (Table with columns: Meter, Description, Meter Type, Unit Type, Multiplier, Space Where Located, Unique Meter ID, Date Starts From, End Month, Parcel Meter Name)
- HVAC Sensor** (Table with columns: Sensor, Description, Sensor Type, Unit Type, Description Area ID, Unique Sensor ID, Date Starts From, End Month)
- HVAC System** (Table with columns: Name, Description, Main HVAC System, HVAC Type, System Classification, System Sub-identification, Date Starts From, End Month, Sensor Name(s), Meter Name(s), Control Of Flow Parameters)
- HVAC Component** (Table with columns: Name, Description, Component Type, Component Sub-type, Server which HVAC System(s), Space Where Located, Maximal Electrical Power Input (kW), Meter Name(s), Sensor Name(s), Date Starts From, End Month, Parcel Component, Maximal Flow Rate (kg/s))
- Schedules of Setpoint and Occupation** (Table with columns: Name, Description, Range 1 - Applies From, Range 1 - Applies To, Range 2 - Applies From, Range 2 - Applies To, Range 3 - Applies From, Range 3 - Applies To, Range 4 - Applies From, Range 4 - Applies To)
- Space** (Table with columns: Name, Description, Floor Area (m²), Height (m), Sector, Activity, Served By HVAC(s), Utility Meter(s), Schedule of Setpoints, RH and Occupancy, Sensor Name(s), Date Starts From, End Month, Control of HVAC Temperature)

Figure 2 - iSERVcmb spreadsheet showing part of the data sought

The iSERVcmb spreadsheet is a free, standalone spreadsheet which provides the basic elements of iSERVcmb, from collection and collation of data on a building and its services, through to providing estimated benchmarks for the building and each system within it. Uploading the completed spreadsheet to the iSERVcmb HERO database will provide additional insights into the building. The spreadsheet is available in English, French, German, Dutch, Portuguese, Italian, Slovenian, Hungarian, Greek, Spanish and Danish.

The iSERVcmb spreadsheet has been endorsed by both CIBSE and REHVA as a means of collating the data needed to better understand HVAC systems in buildings, as well as being beneficial for mandatory inspections. It is also now part of the UK's Education Funding Agency's process for new schools. It can also be considered to be able to take the role of an asset register in which all building, HVAC component and utility meter assets are described and linked to each other.

Completing the spreadsheet for existing buildings was found to require a conservative time and cost investment of approximately €1/m² based on the iSERVcmb experience.

iSERVcmb spreadsheet key points:

- The iSERVcmb process revolves around physical items.
- The information concerning the meters, HVAC components, spaces, etc., within buildings usually resides with a number of people within the organization. Commonly much information does not exist and needs to be physically obtained.
- Permissions to obtain the information needed for the spreadsheet can be difficult to obtain depending on an organization's data records and operation
- The spreadsheet helps collate this information in one place, helping with general building operations as well as helping reduce energy use.
- The electrical distribution and metering strategies used are key to eventual type of information which can be provided

- To learn more about the iSERVcmb spreadsheet, please read the iSERVcmb overview report at www.iservcmb.info/results.
- The spreadsheet can be downloaded, along with instructions on how to use and complete it, from the "iSERVcmb spreadsheet" folder at www.iservcmb.info/results.

HERO Database – Hero Database – Hero Database – Hero Database –

Once the physical assets in the building are described and entered into the spreadsheet, it can be sent to an email address where it is then automatically loaded and configured in the HERO database. HERO is an online database into which the iSERVcmb spreadsheet data can be input, along with on-going consumption data, to produce targeted energy benchmark reports for buildings, HVAC systems and HVAC components.

Once loaded, a set of reports can be produced which are tailored to the building, systems and activities described. If no data is provided then only an overview report is produced for the building and systems.

As the database receives data regularly from many buildings, meters and sensors, it can produce regularly up-dated reports which are benchmarked against this latest data. The benchmarks derived from this real consumption data can be presented by system, component, space and activity.

For a particular building, plotting the actual metered consumption over the tailored benchmark ranges immediately conveys how well the building, system or component is performing. A major strength of this approach is that, as the benchmark ranges are derived from operational data from other users servicing the same end use activities, this is shown to be persuasive in getting end users to act on the information provided.

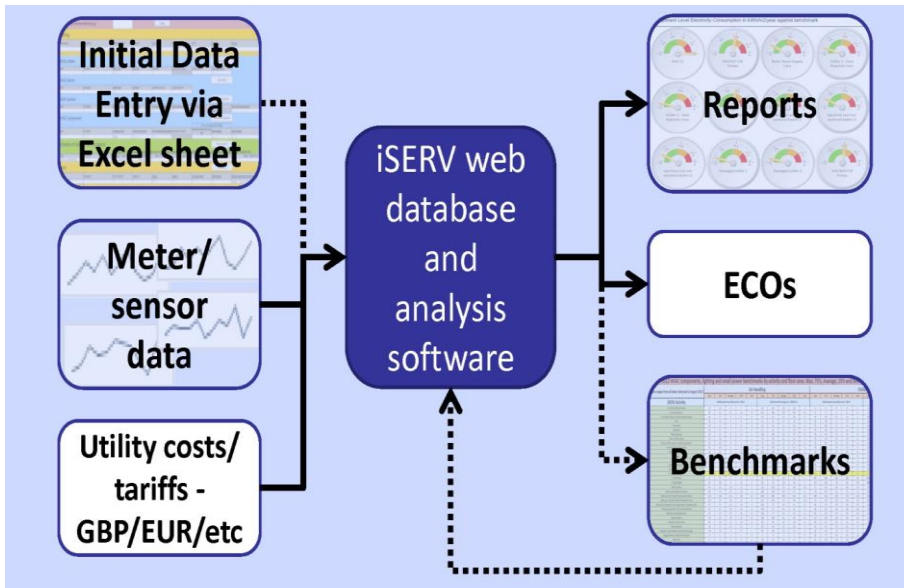


Figure 3 - Schematic of iSERVcmb process

End users also receive analysed data showing potential ECOs (Energy Conservation Opportunities) in automated monthly reports, or on demand between monthly intervals. More than 20 ECOs have been integrated to HERO, which scan the data provided to detect and report on potential energy saving opportunities in specific HVAC components.

The provision of HVAC component technical specifications is required to allow some ECOs to be triggered and included in the HERO reports.

The diagram in Figure 3 shows the major components of the iSERVcmb process as they relate to the HERO database. These are further described below.

The HERO database allows for either the automated loading of data via email attachments or manual entry via the online user interface. Its data cleansing function proved central to the provision of high quality data for the project as the data supplied from around Europe was of a variable quality.

The HERO Reporting Module allows users to log into the HERO website and configure sets of standard reports which can be automatically emailed out in a series of formats such as Excel, Word, PDF and HTML. Users are also able to produce individual reports on demand from the HERO library of reports. The HERO Reporting Module was configured during the project to automatically generate 2 standard reports per building on a monthly basis. The first is a high level report that shows a summary of the building, its consumption and any potential savings that can be made. The second report is more detailed and shows a breakdown at the services level for the building along with heat maps at meter level where sub-hourly data is available.

The report in Figure 4 is central to the iSERVcmb project. It shows tailored benchmark ranges derived from the building, services and activities description for the iSERVcmb McKenzie House Case Study. The buildings' measured Rolling Annual Consumption per m² for the building is overlaid in the blue columns. Rolling Annual Consumption is one year's data summed up to the end of the month shown. The Dec 2006 consumption would therefore be the aggregation of the 12 months Jan 06 – Dec 06.

If the consumption is in the red band, iSERVcmb proposes that the building "Needs Checking", the amber band suggests "Average" utility usage and the green band is "Good". It can be seen that this building has significantly improved its performance since December 2006 and is now performing at a "Good" level according to iSERVcmb. Similar reports are produced at HVAC System and Sub-component level.

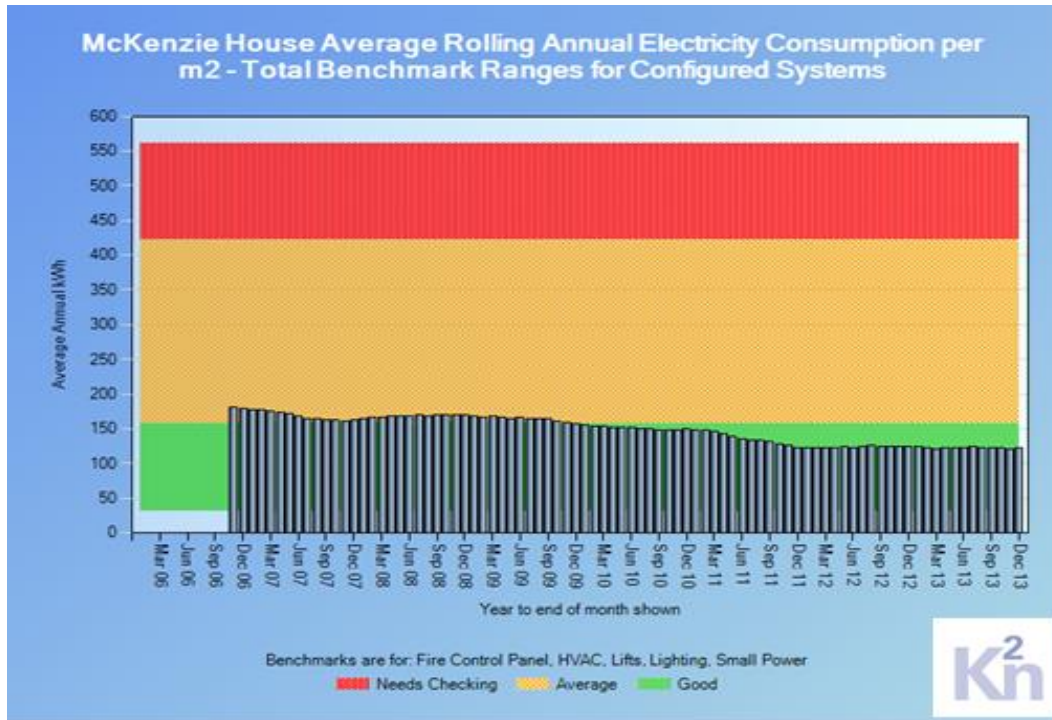


Figure 4 - Example iSERVcmb benchmark report - whole building level

- More detail on the HERO database is given in the iSERVcmb overview report at www.iservcmb.info/results.
- Further details of the HERO database, including the public report on the Database algorithms and methodology and the database’s translation are available in the “Database Information” folder at www.iservcmb.info/results.

Power and Energy Benchmarks – Power and Energy Benc

Part of the iSERVcmb project’s aims have been to analyse the HVAC system data collected to provide publicly available information on achieved HVAC system performance by end use activity. This information is important for producing meaningful recommendations for HVAC systems that are likely to be acted upon, as well as forming a crucial part of the iSERVcmb process. The data can also help with existing and future Physical Inspection processes.

iSERVcmb has generated a unique set of measured consumptions and power demands for HVAC components in operational buildings at the level of Annual kWh/m² and Power W/m². The first outputs from this data are available from the iSERVcmb website at www.iservcmb.info/results.

The HERO database uses the metered data from the buildings and components in its system, in conjunction with the spaces and activities served, to generate updated benchmark figures on demand. This shows that the continual updating of benchmarks can be quickly and easily achieved by this process, which is an im-

portant part of providing confidence to the end user of the ongoing relevance and reliability of the benchmarks they are using to make decisions on whether to invest or not.

This benchmark information allows us to estimate energy consumption at the building, system, component, space and activity level using only the building main incomer data available. This allows ISERVcmb to provide a top-down methodology for estimating energy efficiency. These estimated consumptions provide building owners with an indication of where the utility consumption is most likely taking place in the building. The accuracy of these estimates can then be improved by sub-metering if desired. Figure 5 shows an HVAC sys-

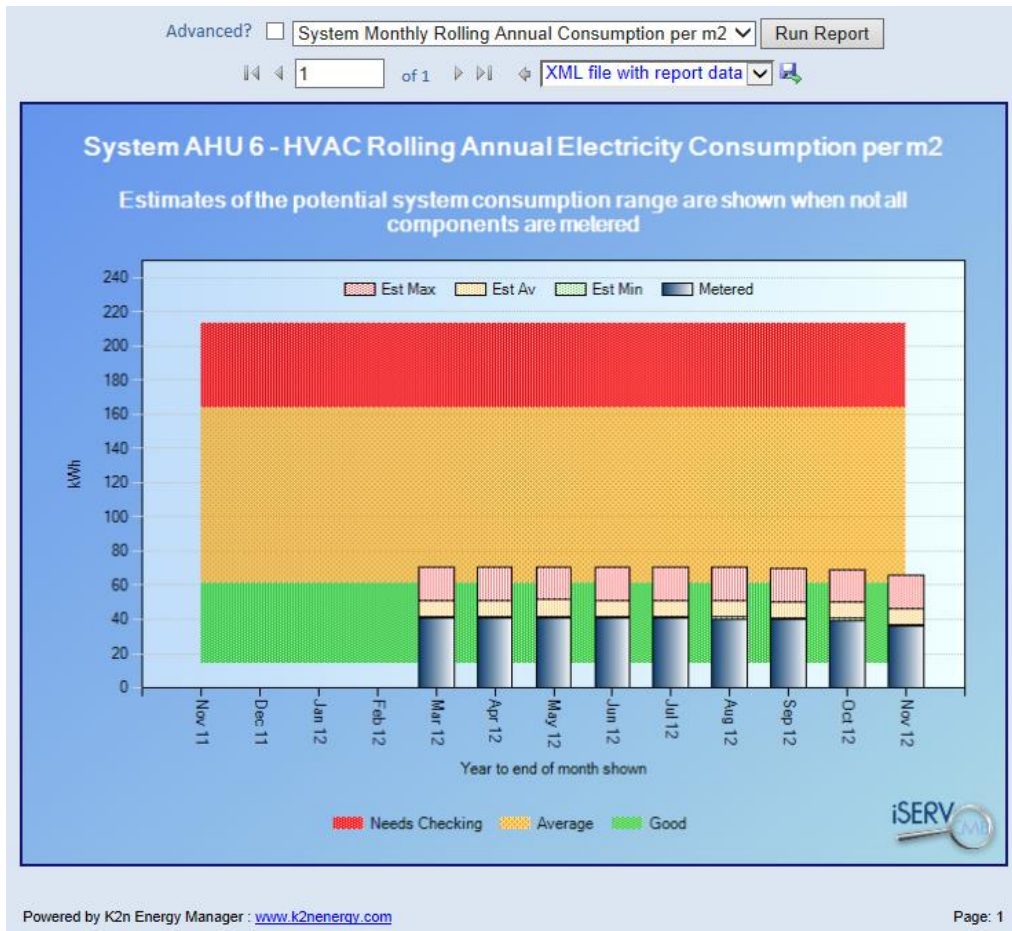


Figure 5 – Example of a HERO report for a HVAC system with only partial metering of the HVAC components.

tem with only partial metering of the HVAC components. The consumption data columns are broken into three parts. The blue section denotes the metered components. The yellow and pink sections denote estimates of the range of consumption for the non-metered components. The yellow section shows estimated average consumption whilst pink shows the estimated maximum consumption. This report type can also be produced for HVAC System Components.

- To learn more about how iSERVcmb benchmarks are assembled for a building or system, please read the iSERVcmb overview report www.iservcmb.info/results.
- Further details of the Power and Energy Benchmarks, including the public report on the iSERVcmb Power and Energy Benchmarks are available in the "Power and Energy Benchmarks" folder at www.iservcmb.info/results.



iSERVcmb Case Studies – iSERVcmb Case studies – iSERVcmb Ca

Inspection of HVAC Systems through continuous monitoring and benchmarking
Intelligent Energy Europe Project Number: IEE-10-272
Acronym: iSERV

iSERVcmb Best Practice

Electricity savings of 13% per year through replacement of inefficient components, reduction of heat loads, and instruction of users

Building number 3

Vienna – AT

Introduction
This report summarizes the results of Owner's participation to the iSERVcmb project with regard to its cooling system energy consumption. The report refers to the period from 2012 to 2014.

iSERV Achievements

Energy Savings
Electricity: 14.6 kWh/m²

Cost Savings
Electricity: 2.9 €/m²

Emissions Reductions
Electricity: 6.1 kg CO₂/m²

Investment to achieve savings
17.6 €/m²

13%

Total building electrical consumption reduction since participation

Key Figures	
Location	Vienna, Austria
Sector	Office
Construction Date	1905
Project Size	466 m ²
EPC	N/A
Sub-metering Level	Partly metered
Data Frequency	15'
Data Collection Protocol	Manufacturer on-board data collection system
Data Sending Protocol	Manually extract & send data to an address
Nature of savings achieved	HVAC Equipment Replacement Reduction of heat loads Training of users
No. HVAC Systems	12
HVAC Components	<input type="checkbox"/> Heat Generators <input checked="" type="checkbox"/> Cold Generators <input type="checkbox"/> All-in-One Systems <input type="checkbox"/> Heat Pumps <input type="checkbox"/> Air Handling Units <input type="checkbox"/> Humidifiers <input type="checkbox"/> Dehumidifiers <input type="checkbox"/> Pumps <input type="checkbox"/> Storage Systems <input type="checkbox"/> Terminal Units <input type="checkbox"/> Heat Recovery <input type="checkbox"/> Heat Rejection

"The meaningful use of energy is not only a central issue for our society but also a significant factor in view of the provided efficiency of technical systems. For your requirements we work out special solutions and are happy to provide information about sustainable planning approaches. Therefore we offer special services in the fields of energy and environment."
 Owner of the building number 3

The sole responsibility for the content of this case study lies with the authors. It does not reflect the opinion of the European Union. Neither the EAC nor the European Commission are responsible for any use that may be made of the information contained therein.

Supported by

Figure 6 – Example of iSERVcmb Case Study

iSERVcmb has shown that understanding what it is reasonable for HVAC system components to consume when designing new buildings or servicing existing ones, will lead to investment in more efficient operation and should allow realistic targets to be set for improvement in specific buildings and systems..

Applying the iSERVcmb process to the operational buildings that participated to the project helped achieve savings of up to 33% in a building's total electrical energy use – often for little capital outlay.

Across all the buildings on the iSERVcmb database, the actual or projected annual energy savings were around 9% on average. Greater average savings are anticipated if the project were to run longer, as shown by the savings generally being larger in those buildings which have been on the database for longer.

An average annual saving of 18% of the electricity use in iSERVcmb systems where reductions were achieved, with more than a year's data, is a very encouraging figure - particularly as the project was late in providing reports back to end users - meaning that the full impact was unlikely to be seen over the life of the project.

Evidence from those systems that were also in HARMONAC is that full savings can take easily 2+ years to achieve, due to time taken to implement the measures needed to produce all the savings available, and for the full savings to appear in annual reporting.

➤ To view examples of buildings that participated in the iSERVcmb project from 9 different EU Member States, please visit the "Case Studies" folder at www.iservcmb.info/results.



Energy Conservation Opportunities – Energy Conserv

One of the iSERVcmb project aims was to establish where energy and cost savings possible from the iSERVcmb approach were most likely to occur. The project has produced an Energy Conservation Opportunity (ECOs) identification methodology based on measured and modelled data for Buildings, HVAC Systems and HVAC Components, which identifies ECOs specific to buildings, systems and components.

There have been two specific work strands in the project looking at identifying ECOs from the building description and the metered data respectively. The algorithms and models for these ECOs are incorporated into the HERO reporting system to enable estimates of savings to be obtained and reported. The more meter and sensor data for a building being held in the iSERVcmb database the more ECOs will be activated.

For the ECO's from measured data:

- Most frequent ECO's identified from analysing the measured data are night time ventilation; change filters; switch off pumps when not required
- ECO's can be used to automatically interpret measured data and identify savings
- Savings from ECO's identified from the data in HERO range from 2 – 40% in nearly all systems on HERO, with a mean predicted saving of 15%

For the modelled ECO's:

- Replacing lighting equipment by low consumption type has the largest predicted impact on electricity savings at the building level
- Reducing solar gains (e.g. window film or tinted glass) has the highest predicted potential for electricity savings at HVAC system level
- Lack of available data, especially nominal power rating of components, limits the occurrence of some ECOs calculations

Conclusions:

- The predicted savings potential across all the systems, based on the iSERVcmb database benchmarks, and the predicted savings from the measured and modelled ECO's approaches broadly agree with each other. This suggests that using the iSERVcmb approach can identify energy savings potentials properly, and that the ECOs can help more accurately pinpoint where to make some of these savings.

The ECO reports are grouped together in a configured report which is produced automatically and emailed out to the end users. A sample ECO report within a building is shown below.

www.iservcmb.eu **Energy Conservation Opportunities**

BEMS and controls / Miscellaneous

Reduce power consumption of auxiliary equipment : Description To reduce energy consumption of pumps and fans the algorithm checks the following: It's happening that HVAC components like fans and pumps work outside the schedule of building. This ECO algorithm checks if pumps and fans work according to the building schedule, thereby preventing energy over-consumption.

Annual GBP Savings	Annual kWh Savings	Annual Energy Savings	Annual CO2 Savings
£560,00	3500 kWh	5.2%	800 tons

- Further details of the Energy Conservation Opportunities, including the public reports on the the Algorithms for most common ECOs from measured data and the Code to integrate modelling tools into database are available in the "Energy Conservation Opportunities" folder at www.iservcmb.info/results.



Indoor Air Quality – Indoor Air Quality – Indoor Air Quality – Indoor

To show that benchmark boundaries are not set inappropriately at the expense of Indoor Air Quality, IAQ measurements were undertaken in 64 sample buildings across Europe.

To achieve this at a reasonable cost during the project's period, a compact Indoor Air Quality system was developed and placed in buildings across Europe with HVAC systems larger than 12kW, in order to investigate whether a relationship exists between IAQ and energy consumption. The study was also to provide confidence that the benchmark energy consumption boundaries used in iSERVcmb were not being obtained at the expense of IAQ.

Main Conclusions

- The indoor air quality of the majority of buildings tested was satisfactory.
- CO₂ concentrations were at low values in the majority of buildings tested, indicating a good air quality and adequate ventilation with minor exceptions.
- Overall, VOC concentrations showed no major problems, also indicating that ventilation is adequate.
- Indoor Air Quality shows some correlation with the age and the maintenance of the HVAC system.
- There is no obvious correlation between IAQ and energy consumption
- A portable standalone IAQ system can measure IAQ successfully.
- Turning HVAC systems off at night does not lead to a decreased IAQ except in specific circumstances where Volatile Organic Compounds remain at higher levels during the non - operation of the buildings due to emission of materials in super market stores or due to the presence of people e.g. cleaners, after normal operational hours.
- One portable IAQ system can successfully represent a building which has similar activities throughout. For example, in Super Market stores the IAQ does not appear to vary significantly across a store, except for where there are detergents, in which VOC values differ significantly.

To check comparability within buildings, cities and Member States, a large number of initial measurements were taken firstly from one Greek building (which served as a pilot building) and then from a number of Greek Offices and Supermarket stores. Finally the IAQ kits were sent to several European Cities to explore the variation of IAQ across Europe in Offices and Supermarkets.

The sensors employed were able to continuously monitor temperature, relative humidity, CO₂ as well as VOC (Volatile Organic Compounds) levels, while existing energy monitoring systems were used to provide information regarding the building and HVAC system energy profiles.

The buildings were classified as Offices, Supermarket or Electronics Stores. Greek Offices are shown separately to facilitate comparison with the findings in Offices in the rest of Europe. Air quality levels were distinguished into 3 categories corresponding to 'Good', 'Acceptable' and 'Poor' for CO₂. 'Comfort', 'Decreasing comfort' and 'Discomfort' were the descriptions used for VOCs, due to exposure to multiple factors.

- Further details of all the IAQ tests undertaken, including detailed IAQ reports, are available in the "Physical Inspections" folder at www.iservcmb.info/results.



Physical Inspections – Physical Inspections – Physical Inspections -

To show through Physical Inspection that the iSERVcmb approach can correctly identify the level of energy efficiency at which the HVAC systems are performing, the project team inspected 64 of the systems participating in iSERVcmb. The buildings inspected included offices, education facilities, retail and leisure facilities. They were located in the United Kingdom, Greece, Austria, Slovenia, Italy, Portugal, Belgium, Luxembourg and Hungary.

Comparing the Inspections undertaken with the predicted benchmark ranges for the same systems from iSERVcmb, showed that both approaches generally agreed on the performance being achieved by most systems, though iSERVcmb also showed many systems had much greater potential savings than the Inspections suggested.

Main Findings

- Very few building operators have many details of their HVAC components
- Very few building operators have maintenance records
- Southern European States tend to have better maintenance regimes and sizing of components
- Energy saving initiatives are rarely followed up to verify savings
- Free cooling/heat recovery was rarely used, even if available as an option
- Energy Conservation Opportunities noted during inspection are listed for each Inspection undertaken but calculations of specific savings to be made were rarely possible for anything other than the main cooling plant
- The frequency of occurrence of various ECOs is presented

What iSERVcmb has shown is that regardless of how their impact is perceived, Inspections can still have a role to play in EU legislation if they are valued and undertaken properly – this means being properly funded and allowing time for a full report to be written. iSERVcmb considers that, as a minimum, this role could be to act as a statutory consequential requirement when poor performance is identified by systems opting for the iSERVcmb continuous measurement type approach to compliance. The other important role is as the option for those systems which do not adopt the metering approach.

- Further details of all the Inspections undertaken, including each detailed Inspection report, are available in the “Physical Inspections” folder at www.iservcmb.info/results.



Feedback and Surveys – Feedback and Surveys – Feedback and S

Part of the project’s aims was also to inform relevant stakeholders about the scope, progress and results of the project, and to establish a network of actors.

As shown in Figure 7 the established network of actors consists of 53% end users, 5% EU member States legislators, 22% building service professional bodies and 7% HVAC manufacturers.

Building Services Professional Bodies appeared more interested in how HERO operates, and in the energy performance of real buildings. REHVA and CIBSE adapted existing information and aligned their dissemination activities to include iSERVcmb results that were subsequently distributed through their own international networks consisting of more than 100.000 engineers around the world.

READINESS OF EUROPE TO PARTICIPATE: Current capabilities in buildings means that there is great potential for an iSERVcmb type approach to be implemented across Europe. It appears there is a significant population of buildings equipped with sub metering recording at sub hourly intervals, one which adheres to the prerequisites iSERVcmb sets.

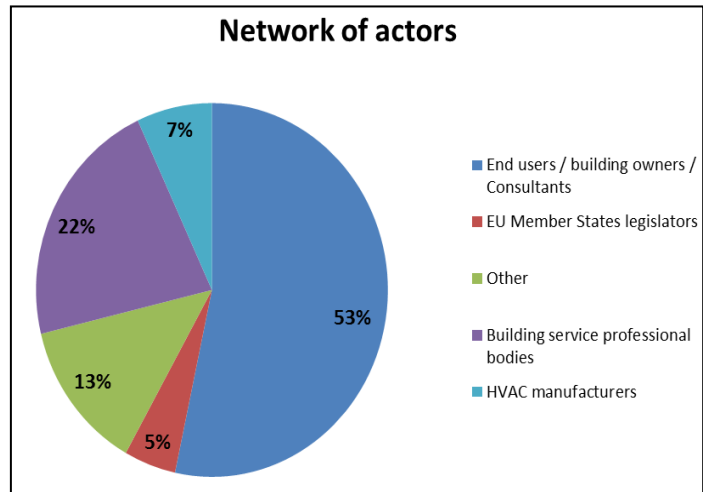


Figure 7 - Network of actors

REASONS FOR PARTICIPATION: There is great potential for an iSERVcmb-type process to be implemented across Europe given the current state of technology available. HVAC Manufacturers consider that continuous monitoring of HVAC components is clearly helpful in reducing overall energy consumption in buildings, and most can provide energy and other performance data over the internet for use by their customers. Further cooperation with the HVAC manufacturing industry is required to address:

- The HVAC industry’s current reluctance to provide HVAC energy and performance data for use by their customers.
- The main barriers HVAC manufacturers believe to be preventing them from integrating online monitoring within their products.
- The HVAC industry’s scepticism on complying with a standard covering data requirements from HVAC components to allow their products to participate in an iSERV-type process.

PROJECT FEEDBACK: A parallel process of holding local workshops at the end of each project meeting, contributed in recovering valuable feedback from the targeted stakeholders across Europe. During the workshops, building services professionals supported the project by sharing their experiences which allowed the project to develop the iSERVcmb process further.

The professional bodies participating to the project, CIBSE and REHVA, and the iSERVcmb Steering Group members were asked to provide feedback about the project. Overall, continuous monitoring at a sub-hourly level was recognized to provide unique information on the energy consumption of HVAC system and components. Benchmarks that derive from this real world ‘big data’ were considered to be invaluable in the evaluation of HVAC market products.

The lessons learned through the iSERVcmb project were noted to have the potential of allowing the creation of new standards and guidelines for on-site monitoring and benchmarking of HVAC system products. REHVA has already planned to produce a REHVA Guidebook about inspections of air conditioning systems, and the REHVA Technical and Research Committee has decided to include chapters about monitoring of air conditioning systems based on iSERVcmb results. EUROVENT is also considering producing guidelines for on-site monitoring of HVAC products and systems in the near future. CIBSE is interested in providing up to date guidance on the monitoring and management of HVAC systems, recognizing that the iSERVcmb project has produced invaluable information on this topic. At the time of this report CIBSE are in discussions with the

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Coordinator about how best to incorporate the project findings into professional guidance for their members.

- REHVA, CIBSE, EUROVENT Certification, Camfil Farr, SWEGON and SKANSKA supported and helped steer the project.
- The necessary infrastructure is already in place or readily implementable with existing technology
- The necessary European Legislation already exists to enable such an approach. It just needs to be implemented at Member State level now.
- The large majority of people responding to the project through surveys or workshops understood and were happy with such an approach if it were to be implemented.
- More than 313 dissemination activities were undertaken, more than 2,000 people were directly involved in the project and more than 2.6 million people were informed about the project

- Further details of all the iSERV Feedback and Surveys are available in the “ Feedback and Surveys ” folder at www.iservcmb.info/results.



Publications and other dissemination – Publications

The iSERVcmb project has been trialled across Europe, and there are many findings and observations that have not fitted into this final report, which is meant to provide a basic overview of the project and its potential impacts.

Analysis of the project data will continue, with the aim of encouraging a move towards using the explosion in data and information available to building professionals to help produce more efficient, healthy buildings that are fit for the challenges of the 21st Century.

- Further details of all the iSERVcmb Publications and other Dissemination are available in the “ Publications and other Dissemination ” folder at www.iservcmb.info/results.

- To keep up to date with our publications please use the following websites:

iSERVcmb results: <http://www.iservcmb.info/results>

iSERVcmb website: <http://www.iservcmb.info> and http://www.eaci-projects.eu/iee/page/Page.jsp?op=project_detail&prid=2430



iSERVcmb Partners – iSERVcmb Partners – iSERVcmb Partners – iS

Welsh School of Architecture, Cardiff University UK (Project co-ordinator)		K2n Ltd UK	
MacWhirter Ltd UK		National and Kapodistrian University of Athens Greece	
University of Porto Portugal		Politecnico di Torino Italy	
Université de Liège Belgium		Univerza v Ljubljani Slovenia	
University of Pecs Hungary		Austrian Energy Agency Austria	
REHVA EU		CIBSE UK	

iSERVcmb Steering Group Members:

SWEGON AB		Camfil Farr	
SKANSKA		Eurovent Certification	

For contact details please visit <http://www.iservcmb.info/partners> or contact:

PROFESSOR IAN P. KNIGHT
 E: knight@cf.ac.uk

AFRODITI M. KONIDARI
 E: konidarim@cf.ac.uk



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