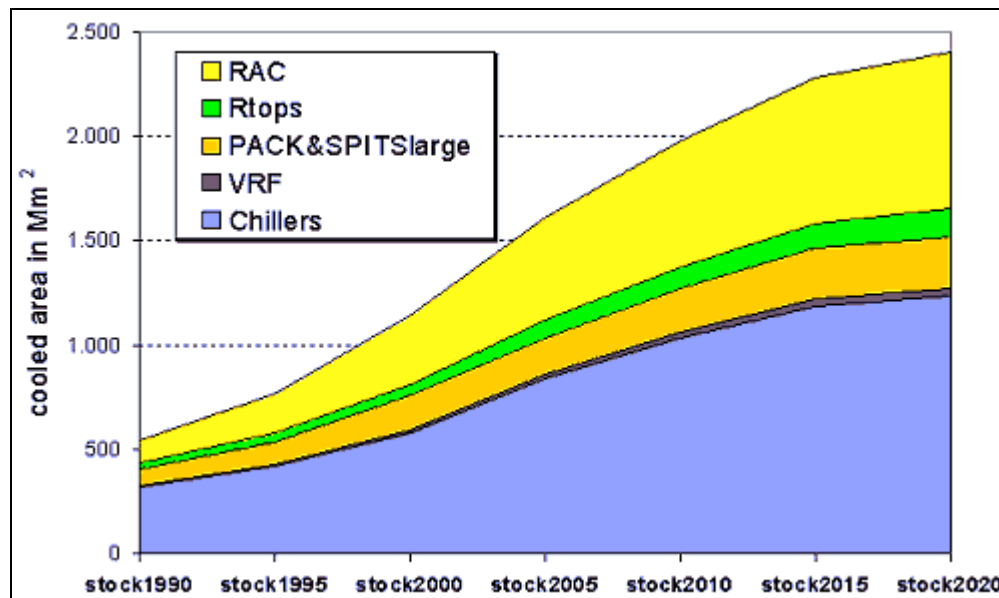


Field Benchmarking and Market Development for Audit Methods in Air Conditioning (AUDITAC)

Introduction

In the coming years the stock of Air Conditioning (A/C) equipment in use in Europe will partly become obsolete. Most systems will be renovated for the first time (after 10-15 years of operation) and an opportunity exists to introduce higher efficiency systems. Out of the 1.974 Mm² of air conditioned building area in use in 2010 in Europe, 800 Mm² will date by more than 15 years and will need urgent renewal. A SAVE Study (EECCAC) had the result, that there is energy saving of about 35 %. That means: A/C – Systems are able to operate with about 35 % less energy.

Cooled area in Europe



Source: EECCAC

This market will be influenced by the DIRECTIVE 2002/91/EC OF THE EUROPEAN PARLIAMENT AND OF THE COUNCIL of 16 December 2002 on the energy performance of buildings (EPBD). According to this new directive all over Europe, the building legislation will be changed to create higher energy efficiency within the European buildings.

Article 9 of this Directive takes care about the Inspection of air-conditioning systems:

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Article 9

Inspection of air-conditioning systems

With regard to reducing energy consumption and limiting carbon dioxide emissions, Member States shall lay down the necessary measures to establish a regular inspection of air conditioning systems of an effective rated output of more than 12 kW.

This inspection shall include an assessment of the air-conditioning efficiency and the sizing compared to the cooling requirements of the building. Appropriate advice shall be provided to the users on possible improvement or replacement of the air-conditioning system and on alternative solutions.

The INSPECTION should not only include assessment of the air-conditioning efficiency and the best sizing but should also include some advice to make some improvements. Here AUDITAC wants to start. AUDITAC is the short name for "Field Benchmarking and Market Development for Audit Methods in Air Conditioning". The name is the program.

This two-year project, largely funded by the European Commission through its "Intelligent Energy - Europe" programme has started in January 2005. It has participants from France (the project coordinators), UK, Slovenia, Austria, Belgium, Portugal and Italy. Eurovent is also a participant.

AUDITAC is not a project about the implementation of Article 9 of the EPBD. It is much more a project about the questions what comes after the legislation on the national level.

Within the focus of AUDITAC is to support the European A/C market to reach higher efficiency.

Who will get support from AUDITAC?

- You are a building owner and you want to know what you can expect from an audit. At a later stage of this project you will find information about benchmarks and case studies of A/C Systems.
- You are an energy auditor and look for tools and practices. At a later stage of this project you will find information about best practices and procedures.
- You are a professional association and want to train and certify future energy auditors. At a later stage of this project you will find information about training materials.

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What will be the results of AUDITAC?

AUDITAC will give quite a lot of support to start at this point:

- The market has to be informed about the Air Conditioning inspection. This is necessary to accelerate the adoption. Newsletters, national Workshops and media work should inform and motivate the actors on the markets. They should take advantage of the opportunities created by the EPBD.
- A guideline will be written, to show how a good inspection should look like. Best practise case should demonstrate success stories about inspection to raise the acceptance of inspection and to define a quality standard for inspection. Guidelines will also be produced to inform the user about the efficiency and the best size.
- The main focus of the project will be that finally high quality audits are put in place to namely investment-grade audits and actual works on the existing Air Conditioning facilities in Europe.

You want to know more about AUDITAC?

- You want to know more about the project?
- You want to get the AUDITAC newsletter? Written in English with national notes!
- You want to be informed about the national workshops?

Send an e-mail to the national contact points!



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Publications

and other outputs from AuditAC

General Output

Short Description of the Project AuditAC (Power Point Presentation)

(October 2005, 4 pages)

Overview about the Project AuditAC (Power Point Presentation)

(May 2006, 13 pages)

Poster: Field Benchmarking and Market Development for Audit Methods in Air Conditioning

(AuditAC project as poster)

Inspection and Auditing of Air-Conditioning Facilities in Europe – A New Efficiency Target

(July 2005, 14 pages)

How the European AuditAC Project Can Benefit the Air Conditioning Sector (Power Point Presentation)

(Ian Knight, Welsh School of Architecture, February 2006, 10 pages)

Newsletters

AuditAC Newsletter: Issue 1

(May 2005, 4 pages)

AuditAC Newsletter: Issue 2

(September 2005, 4 pages)

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AuditAC Newsletter: Issue 3

(January 2006, 5 pages)

AuditAC Newsletter: Issue 4

(January 2006, 5 pages)

AuditAC Newsletter: Issue 5

(December 2006, 6 pages)

AuditAC Newsletter: Issue 6

(March 2007, 4 pages)

Tools

AuditAC Training Package (about 160 slides which inform you about the energy efficiency in AC systems)

This document is a PDF Version. A more user friendly Power Point version (about 8 MB) is available on request and can be asked by the project partners.

AC-Cost: Calculation Tool for AC Running Costs

(June 2006)

AC-Cost-User's Guide

AuditAC Tool user's guide

EES Benchmarking Tool

This tool allows the auditor to establish a seasonal energy analysis of the HVAC system considered. The simulator model was developed with the help of the "EES" software.

EES Benchmarking Tool - User's Guide

AuditAC Tool user's guide

How to Use AuditAC Database of the Audit Case Studies on the INEGI & FEUP Website

The Customer Advising Tool (CAT)

This tool provides guidance to the Building Owner, Inspector and/or Auditor on the potential for reducing the cooling demand of the building being Inspected or Audited. It achieves this by illustrating how the RELATIVE building heating and cooling DEMAND might be altered in percentage terms by changing certain elements of the building design or operation.

EUROVENT Database

Services allowing retrieval of past performance of equipment when Eurovent certified and default values for others. The database allows comparing data and performances of old equipment (from 1995

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certified products) with equipment in sale today, avoiding the waste of time often due to the lack of accessible information on old equipment and reliable information of new equipment. Please refer to the Volume 6 for more information about how to use the database and how retrieve default efficiency values for AC equipment.

Technical Guidelines

TG 1: Are you sure you are not paying for inefficient cooling?

(June 2006)

TG 2: Energy auditing of air conditioning systems and the energy performance in buildings directive:

What does the new regulation say?

(June 2006)

TG 3: System recognition guideline for field visit

(June 2006)

TG 4: An AuditAC proposed preliminary audit methodology for air conditioning facilities

(June 2006)

Support TG 4/5: A full list of energy conservation opportunities (ECO) for air-conditioned buildings

(This documents supports the information of Guide 4 and 5; June 2006)

TG 5: Technical guides for owner/manager of an air conditioning system

Energy Conservation Opportunities (ECOs) for Air Conditioning auditors

TG 6: How to benefit from the Eurovent- Certification database and to retrieve past equipment data in the audit process

(June 2006)

TG 7: A benchmarking guide adapted to air conditioning based on electricity bills

(December 2006)

TG 8: How manufacturers could help the unfortunate energy auditor

(June 2006)

TG 9: How to integrate Energy Efficiency and AC inspection with full benefit in the structures in place

(December 2006)

TG 10: Successful Case Studies in AuditAC

(December 2006)

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Press Release

Press release Nr. 1 (long): Air conditioning systems have to become more efficient!

EC Building Directive (EPBD) ask for regular inspection, EIE project AuditAC will support the conversion

(April 2005, 2 pages)

Press release Nr. 1 (short): New project AuditAC aims to improve the energy efficiency of existing air-conditioning systems

(April 2005, 1 page)

Press release: AuditAC for the UK from the Association of Building Engineers (ABE)

(August 2005)

Press release Nr. 2: New documents and tools released by the AuditAC project

(May 2006)

Press release Nr. 3: AuditAC deliverables still on time for helping EPBD implementation

(March 2007)

Presentations and Posters

Short Description of the Project AuditAC (Power Point Presentation)

(October 2005, 4 pages)

Overview About the Project AuditAC (Power Point Presentation)

(May 2006, 13 pages)

Poster: Some AuditAC project results: the AC running costs tool and the system recognition guide

(Daniela Bory, Center for Energy and Processes, Mines de Paris, FRANCE, presented by the KLIMAFORUM in Slovenia, September 28th 2006)

Poster: HVAC System Efficiencies for EPBD Calculations

(Roger Hitchin Technical Director, BRE Environment, Watford, UK presented by the KLIMAFORUM in Slovenia, September 28th 2006)

Papers

Le prestazioni energetiche degli impianti di climatizzazione e la Direttiva 2002/91/CE: il progetto AuditAC

(Marco Masoero, Chiara Silvi, present by the AICARR Conference 2005 in Padua, Italy)

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Carbon and Cooling in UK Office Environments

(G.N. Dunn and I.P. Knight, present by the 10th international Conference on Indoor Air Quality and Climate Indoor Air 2005 in Beijing, China, 4th September - 9th September 2005)

Inspection and auditing of air-conditioning facilities in Europe – A new efficiency target

(Maxime Dupont and Jérôme Adnot, present by the ECEEE 2005 Summer Study, Mandelieu, Côte d'Azur, France, 30 May-4 June 2005)

Issues of the implementation of the EPBD article 9: how and why to inspect all air conditioning systems all over Europe?

(Roger Hitchin, Jérôme Adnot, Maxime Dupont, present by the AICARR Conference 2006, Milano, 1st March - 2nd March 2006)

Experimentation of the CEN standard on inspection of airconditioning systems

(Maxime Dupont, Jérôme Adnot, Patrice Drapier, Bruno Georges; IE ECB 06 in Frankfurt, April 2006)

Selection of procedures for air conditioning audit and definition of the associated training package

(Daniela Bory, Jérôme Adnot, Maxime Dupont, Marco Masoero, Chiara Silvi, Simon Muhic, Vincenc Butala, Matjaz Prek; IE ECB 06 in Frankfurt, April 2006)

About the audit of air conditioning systems: Customer advising with the help of case studies and benchmarks, modelling and simulation

(Alexandre José Luís, Knight Ian, Andre Philippe, Hannay Cleide, Lebrun Jean; IE ECB 06 in Frankfurt, April 2006)

Effect of the Certification on Chillers Energy Efficiency

(Yamina Saheb, Sulejman Becirspahic, Jérôme Simon; IE ECB 06 in Frankfurt, April 2006)

National and EU wide efforts to increase Energy Efficiency of installed Air Conditioners

(Jérôme Adnot, Maxime Dupont, Roger Hitchin; IE ECB 06 in Frankfurt, April 2006)

Measured Buildings and Air Conditioning Energy Performance: An empirical evaluation of the energy performance of air conditioned office buildings in the UK

(Gavin Dunn, Mrs Clarice Bleil de Souza, Andrew Marsh, Ian Knight, Welsh; IE ECB 06 in Frankfurt, April 2006)

The Seasonal Efficiency of Multi-Boiler and Multi-Chiller Installations

(Roger Hitchin, IE ECB 06 in Frankfurt, April 2006)

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Some AuditAC project results: the air-conditioning running costs tool and the system recognition guide

(Daniela Bory, Jérôme Adnot, Maxime Dupont, Klimaforum 06, Godivic, Slovenia, September 2006)

Example of audit of an air conditioning system

(Lebrun Jean, André Philippe, Hannay Cleide, Hannay Jules; Klimaforum 06, Godivic, Slovenia, September 2006)

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