International Energy Agency

ECBCS

Energy Conservation in Buildings and Community Systems Programme

Australian Technical Day Energy & Sustainability Targets for Buildings

by Karen Hitchiner, Standards Australia

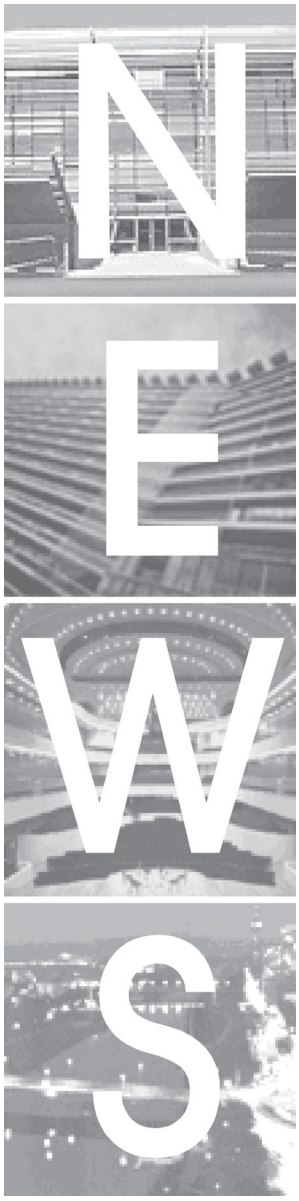
Standards Australia hosted a technical day in conjunction with the 56th ECBCS Executive Committee Meeting in Sydney on the 10th November 2004. The day provided an ideal opportunity to promote the work of the IEA to local Australian Industry and also for local industry to share with international delegates the current targets and schemes introduced in Australia to encourage energy conservation.

Representatives from Australian government, industry and research and operating agents for various Annexes were invited to speak on their most recent research and findings. The technical day focused on recent developments in energy rating tools to assess the energy efficiency of buildings. And also helped to increase the awareness of the Australian energy and industry representatives about activities and achievements within the IEA's Energy Conservation in Buildings and Community Systems Program.

Targets for Energy Efficiency

Dr Tony Marker from the Australian Greenhouse Office discussed targets for energy efficiency and environmental impacts for residential and commercial buildings in Australia through such schemes as the National Greenhouse Strategy, developed in 1998.

This scheme aimed at developing minimum energy performance measures in residential buildings as well as the use of performance measures or ratings such as the Nationwide House Energy Rating Scheme (NatHERS). The strategy also targeted commercial buildings with the aim of implementing mandatory energy performance standards through the Building Code of Australia (BCA). Since January 2003 the BCA has introduced minimum energy performance levels for detached housing and gradually extended these requirements for multi-residential buildings to be implemented in May 2005 and ex-



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pects to extend to commercial and public buildings in May 2006.

National Framework for Energy Efficiency

Mr David Nemtzow from the NSW Department of Energy, Utilities and Sustainability spoke about "The National Framework for Energy Efficiency" which was agreed to by all states in Australia in August 2004. This national framework aims to achieve consistency among the various Australian states, to drive improvement in building performance, and harmonise national residential design rating tools. Greenhouse emissions from the commercial property sector are the fastest growing emissions in Australia and are set to double on 1990 levels by 2010.

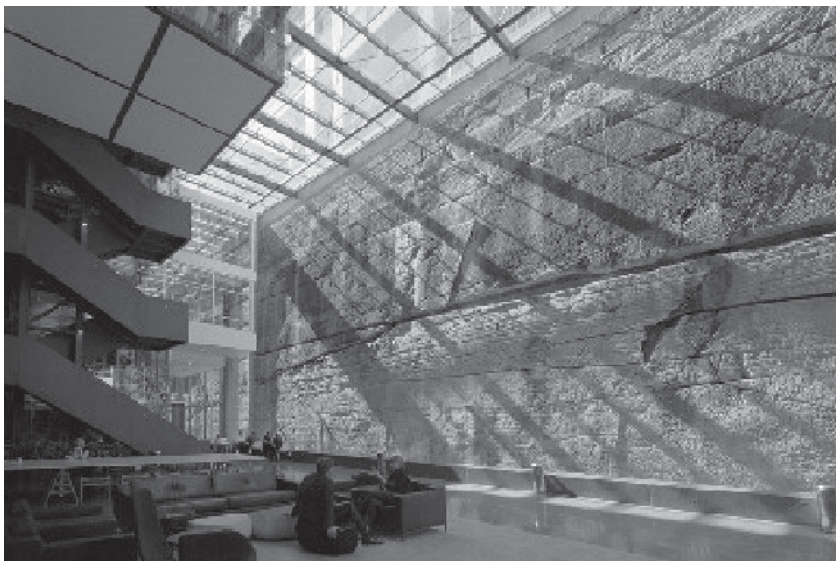
Energy Simulation and Rating Tools

Current research underway at CSIRO and research into energy simulation and rating tools was presented by Mr Steven Moller. Three projects underway were discussed including Energy Express, LCADesign and AccuRate. Energy Express is a design tool for commercial buildings to estimate energy consumption and cost for new and existing homes. This tool can be used to compare the performance of competing designs. AccuRate is a revision of software called 'NatHERS', developed in the early 1990's, which will be much more flexible than its predecessor. The software will include the ability to model many more zones in a house, and will take into account such items as wind direction, opening locations, opening between rooms, effect of air movement on comfort etc.

'BASIX' Sustainability Index

Ms Rachel O'Leary from The Department of Infrastructure Planning and Natural Resources also spoke at the technical day about the recently released 'BASIX' which is a Sustainability Index Developed for Housing in NSW which was introduced as part of the NSW planning system. 'BASIX' (the Building Sustainability Index), is a web-based planning tool that measures the potential performance of new residential dwellings against sustainability indices.

BASIX ensures each dwelling design meets the NSW Government's targets of 40% reduction in water consumption and 25% reduction in greenhouse gas emissions, compared with the av-



The new Bovis Lend Lease HQ at 30 The Bond, Australia's first commercial building to commit to a five star energy rating from SEDA (The Sustainable Energy Development Authority)

erage home. The greenhouse target will increase to 40% from July 2006.

The attendees at the technical day also saw presentations from various ECBCS Annex work – including Annex 5 Air Infiltration and Ventilation Centre (AIVC); Annex 42 The Simulation of Building-Integrated Fuel Cell and Other Cogeneration Systems; Annex 45 Energy Efficient Electric Lighting for Buildings; and Annex 43 Testing and Validation of Building Energy Simulation Tools – How Accurate Do We Need to Be?

The technical day ended with a site visit to Australia's first commercial building in Australia to commit to a five star energy rating from SEDA (The Sustainable Energy Development Authority), 30 The Bond, which is the new Bovis Lend Lease Headquarters. The delegates were given a tour of the building which is a nine storey commercial office building in the heart of the Sydney CBD. Various environmental design and construction innovations that have been used in the building will contribute to a 30% reduction in greenhouse gas emissions, compared to a typical office building of its size.

Holistic Assessment Toolkit on Energy Efficient Retrofit Measures for Government Buildings – ENERGO" – A New ECBCS Research Project (Annex 46)

Alexander Zhivov, US Army Corps of Engineers Engineer Research and Development Center, USA

The ECBCS ExCo approved the preparation stage of a new Annex "Holistic Assessment Toolkit on Energy Efficient Retrofit Measures for Government Buildings – ENERGO."

Analysis of non-residential building structures shows that many government buildings are characterized by high energy consumption. Since government buildings are constructed similarly in many countries, experience gained with retrofitting such buildings with energy-saving technologies should be widely applicable—on an international scale. However, energy saving measures are seldom applied when these buildings are retrofitted. Often, decision makers simply lack knowledge of the many energy-saving measures available to them, and of the efficiencies and return on investments that such measures can yield. Consequently, decisions to retrofit are often made without sufficient consideration of the many energy saving options available to retrofit designers.

In fact, such considerations can be based on some simple tools. Useful tools like Energy Concept Adviser for Educational Buildings (developed in IEA ECBCS Annex 36) provide "rules of thumb" for quick and easy estimates of required investments and potential energy savings applicable to Government buildings, before analyzing the building structure in detail.

Administrative/office buildings, and production and maintenance facilities pose specific challenges to those seeking improved energy management and building energy performance, specifically:

1. Lighting and ventilation/air-conditioning are more important energy users in these buildings than in residential buildings.
2. Most nonresidential buildings are very large and require sophisticated energy management systems.
3. Total building energy use is heavily influenced by the energy use and the ventilation requirements of building-specific processes and applications, especially in production and maintenance facilities.
4. Common to all these buildings is the fact that questions on the energy consumption are generally secondary to the improvement of comfort and/or functionality. This is most pronounced within the existing building stock. Decisions to retrofit a building are often made because of dissatisfaction concerning the comfort level or as a consequence of changes in usage or processes. Therefore the primary goal is to improve these conditions. Decision makers often view measures to reduce the energy consumption negatively because they believe these measures may reduce indoor comfort levels, limit their functional/production capabilities, or increase costs. Moreover, if a retrofit compromises on energy efficiency, its energy-saving potential is "locked in" for the long term because of the longevity of the components.

When considering the building stock and the associated energy consumption for heating, cooling, ventilation, and lighting in the IEA member countries, we must realise that energy efficient buildings (most of which were built after 1980) represent about 20% of the building stock, but only 5% of the energy consumption. To meet the objectives of the Kyoto Protocol, we must concentrate on improving the energy-inefficient building stock. Therefore, this project focuses exclusively on the energy retrofit in selected building categories that represent a substantial part of the non-residential building stock: office/administrative buildings, hospitals, large one-story production facilities and maintenance shops, and specialist warehouses.

Before decision makers will consider energy conservation as a goal, they must overcome their reservations about the compatibility of energy conservation with other primary goals (i.e., occupants' comfort and building func-

tionality). They need to see convincing, real-world examples that show how improvements in comfort and functionality can be accompanied by energy savings measures. Good technologies that achieve this end are currently available.

Similarly, users must become more deeply involved in assessing the energy consumption of their facilities. It should be evident how their choices influence energy consumption. This is particularly important to ensure the long-term efficiency of installations. Simple tools for analysis are needed.

Government buildings can exemplify the intelligent application of energy-efficient technologies. It is particularly important for Government buildings to demonstrate exemplary solutions and showcase them to the public. Government buildings can potentially change public opinion, and thereby help increase the market penetration of energy-saving technologies.

The objectives of this Annex are:

1. To provide tools and guidelines for decision makers and energy managers, performance contractors and designers in order to improve the working environment of Government buildings through energy-efficient retrofitting projects. Although the focus of this Annex is on Government buildings, many results can be applied to similar private sector buildings.
2. To provide recommendations on how to operate the retrofitted buildings.
3. To promote energy- and cost-efficient retrofit measures by providing successful examples.
4. To support decision makers in evaluating the efficiency and acceptance of available concepts.
5. To improve application of Energy Performance Contracts (ESPCs) for Government building retrofit measures.

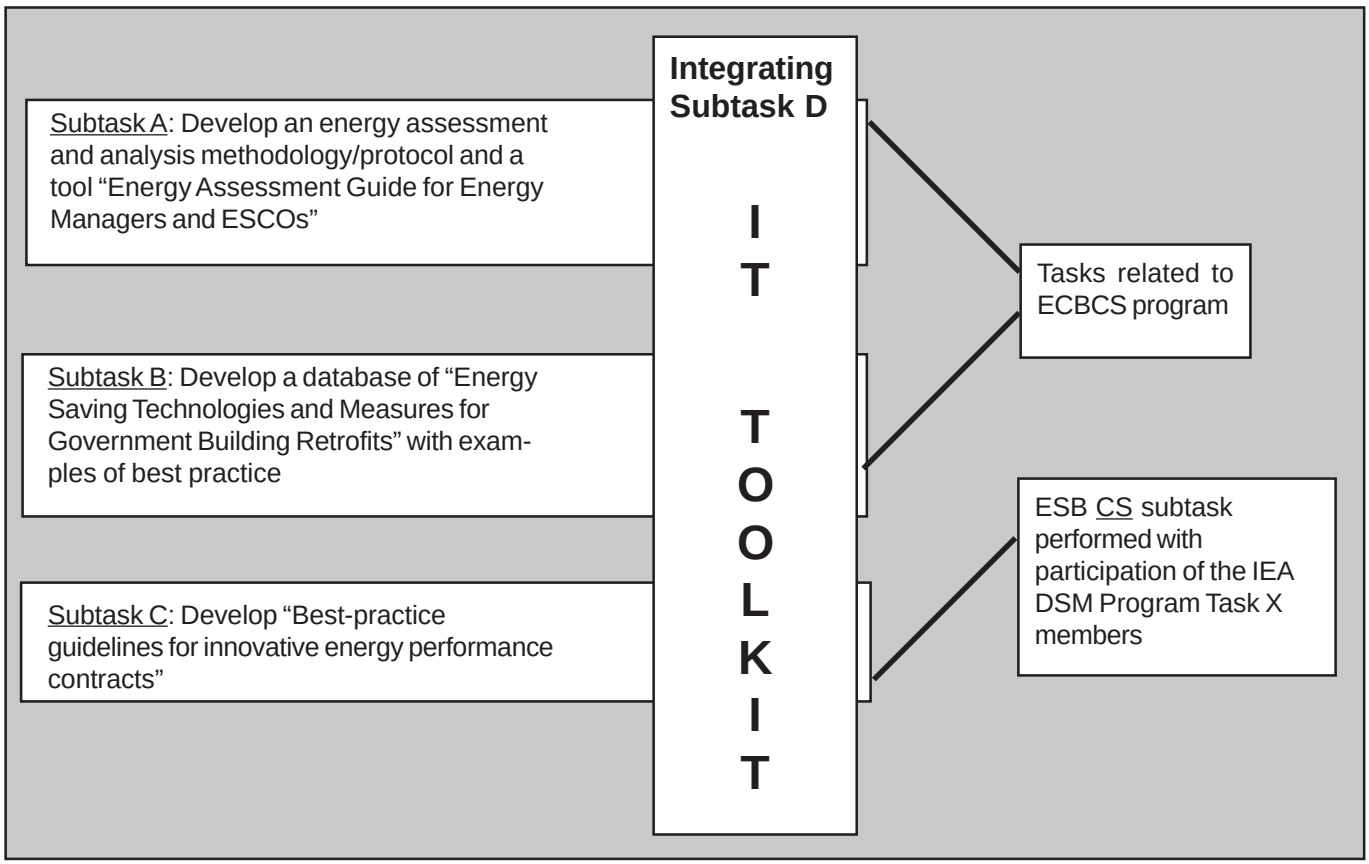
To accomplish these objectives, participants will carry out research and development in the framework of the following three Subtasks (A, B, and C) and one joint working group (D), described in the following sections.

Guide: Subtask A

Develop an energy assessment and analysis methodology/protocol and a tool: "Energy Assessment Guide for Energy Managers and ESCOs"

Subtask A will analyze best practices and procedures for identifying energy conservation opportunities in retrofitted Government buildings. (The opportunities relate to the building envelope, internal loads, HVAC, and other mechanical and energy systems.) Subtask A will develop a consensus protocol for conducting energy assessments at Government administrative/office buildings and production and maintenance facilities. It will document resource consuming activities, and identify wasteful practices, prioritize conservation opportunities, implement best practices, and guide investment in resource-conserving technology upgrades. The Annex will address several different levels of assessment:

- Energy conservation opportunities



analysis. This involves no instrumentation using basic analysis generate a list of top energy saving ideas (Level 1).

- Energy optimization analysis geared toward funds appropriation. This calculates savings and uses partial instrumentation with cursory analysis (Level 2).
- Detailed engineering analysis with implementation, M&V. This includes performance measurement and verification assessment, and a fully instrumented diagnostic audit (Level 3).

Subtask A will develop the rationale behind each of three levels of assessment. It will state the motivations behind undertaking each level, the expected results, and the degree of effort and instrumentation required. It will specify procedures and suggest the format of the report that will document the assessment findings. The subtask will result in the "Energy Assessment Guide for Energy Managers and ESCOs," which can be used in future assessments and serve as basis for the Energy Service Performance Contracts.

Database: Subtask B

Develop a database of "Energy Saving Technologies and Measures for Government Building Retrofits" with examples of best practices

Subtask B will analyze series of best practice examples of retrofitted buildings (from the late 1990s) of which a few are still under renovation and are to be finished in 2005–2006. Based on these international experiences and best practices, Subtask B will develop a database of promising energy saving technologies and measures (current, proven, well known or underused). These will include technologies/measures that relate to building envelope, internal load reduction, HVAC systems, energy consuming processes in the building, supplemental energy systems (e.g., compressed air, steam system), etc.

Subtask B will identify tools/computer programs to screen candidate technologies/ measures, and will screen for representative conditions (building type, standard climatic conditions, energy costs, etc). The results of the analysis and showcase descriptions will be categorically summarized and presented for energy managers in a user-friendly format.

Guidelines: Subtask C

Develop "Best-Practice Guidelines for Innovative Energy Performance Contracts"

To effectively support decisionmaking regarding a given process, it is necessary to analyze the steps involved in that process in some detail. To establish and successfully complete Energy Service Performance Contracts (ESPCs), it is essential that the contracting parties share common views on energy saving potentials, costs, risks, and organizational aspects. This is also true if building owners undertake larger retrofits on their own behalf. In the participating countries, a broad experience on these aspects has been documented. It is important to share these experiences internationally to support ESPCs. Three fields of particular interest for a sharing of information and the establishing best-practice guidelines are:

- Use of life-cycle cost analysis (LCCA) and benchmarking for retrofit assessment and ESPCs
- Risk assessment and risk sharing in retrofit assessment and ESPCs
- Financial and organizational best practices in ESPCs.

An analysis of these aspects of current case studies will contribute to the development of best-practice guidelines for successful ESPCs. Furthermore the ESPCs will obviously benefit from the benchmarks, guidebooks, and IT-tools established in the previous work packages. In particular, the IT-toolkit should allow energy service providers and building owners to develop a common view of possible performance improvements and risks. This subtask will be based on the results of the recently completed IEA Demand Side Management Program, Task X and will be executed as an ECBCS Annex subtask with contributions from the IEA DSM Program Task X members

Toolkit: Subtask D

Develop IT-Toolkit "EnERGo"

Subtasks A, B, and C will provide their results as input to this joint activity. Subtask D will be based on these results, and will develop an electronic interactive source book (IT-Toolkit "EnERGo"). A central database will include all Annex results and will allow users to obtain extensive information, according to their individual focus of interest: energy saving opportunities, design inspirations, design advice, decision tools, design tools, commissioning methods, long-term monitoring systems and measures that require no financial investment. Thus, users will be able to quickly and reliably increase their knowledge in specific fields of interest. They may choose between analyzing design scenarios individually, or they may access a broader pool of information on energy saving potentials and requirements by using experiences gained from "best practice" examples.

The IT Tool-kit "EnERGo" will be based on the Energy Concept Adviser (ECA) tool developed in Annex 36 (www.annex36.com)—a package of selected analysis tools, ranging from simple spreadsheets to advanced computer programs that take into account the impact of light, cooling, and heating, as well as process requirements in buildings on comfort and energy criteria. It will also include findings from several other IEA Annexes (e.g., Annex 37 "Low Energy Systems for Heating and Cooling of Buildings"). Among the major value-added features of the proposed Annex (compared with the completed ones) are tools that identify potential areas of improvement (an Energy Assessment Protocol), an increased scope/menu of the energy efficient technologies and measures (database of "Energy Saving Technologies and Measures for Government Building Retrofits"), and tailored recommendations on their practical implementation (i.e., best-practice guidelines for

innovative energy performance contracts).

The first Annex preparation workshop took place in February 2005 in Orlando, FL, USA.

For more information about the Annex and future workshop, please contact the Operating Agent, Alexander Zhivov (Alexander.M.Zhivov@erdc.usace.army.mil), USACE ERDC, USA.

Low Exergy Guidebook Offers Basic Knowledge of Heating and Cooling Systems for Sustainable Buildings

Markku Virtanen, VTT Building & Transport

The Guidebook is the achievement of the work done in the IEA ECBCS Annex 37 "Low exergy systems for heating and cooling of buildings". The aim of the programme was to promote rational use of energy by encouraging the use of low temperature heating systems and high temperature cooling systems of buildings. In Annex 37 these systems were called low exergy (or LowEx) systems.

The Guidebook is intended to be useful for architects and engineers designing heating and cooling systems of buildings. A database of low exergy components has been completed with the guidelines for selection of products. Examples of system concepts for different buildings and climates are presented as well as a set of tools for analysis. All this is expected to be helpful for engineering offices, consultants and architects in their search for energy efficient heating and cooling systems that can provide the occupants with a comfortable, clean and healthy environment. An analysis of case studies together with rationale of the exergy concept and recommendations concerning regulations in the building sector and energy tariffs are expected to be helpful for real estate builders, building maintenance managers, political decision makers and the public at large. The description of the current market situation offers the reader additional background information about the situation in different countries.

The Guidebook is available as a CD-ROM and also on the internet (http://www.lowex.net). Since many readers prefer to just print out the whole thing at once, you can choose to open the Guidebook as a pdf version and print it out. The CD-ROM version, however, offers a more user friendly environment and some additional information.

Figure 1: The final products of Annex 37 have been published in many formats

Exergy approach

An essential aim of Annex 37 was to open up opportunities for increasing energy savings and reducing emissions from buildings. Annex 37 group wanted to promote a more efficient use of energy by means of facilitating and accelerating the use of low valued and environmentally sustainable energy sources for the heating and cooling of buildings. LowEx heating and cooling systems that work at a temperature close to room temperature are a prerequisite for the efficient utilisation of low valued energy sources. Since heat and cold emission systems (e.g. floor and wall heating) have a life cycle of 40 to 50 years, low exergy systems should be applied as soon as possible in order to realise the use of low valued energy sources within the next half century.

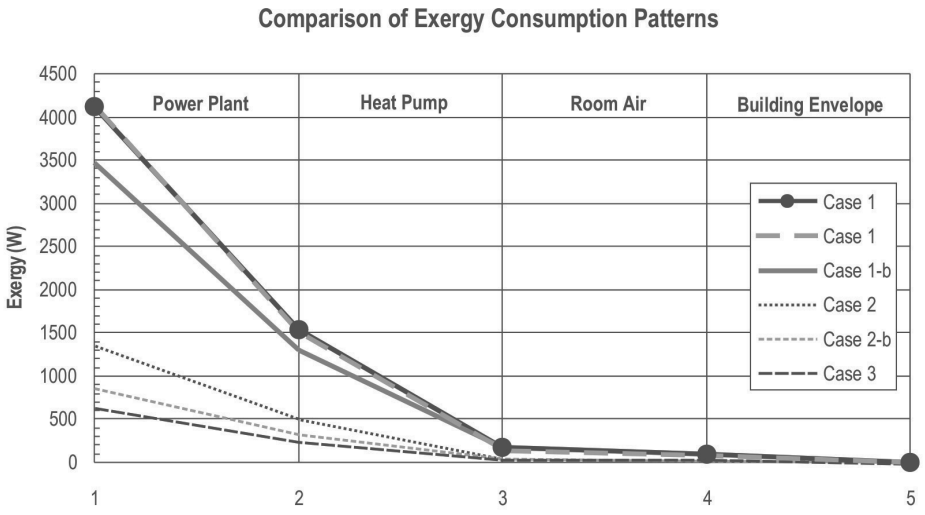
The question of how to build sustainable houses has been a constant source of discussion in recent years. A highly efficient usage of energy and all of the potentials in the energy flows involved are undisputably essential for this. Taking into account the qualitative aspects of energy use leads to the introduction of the exergy concept, which was the key concept of Annex 37. To find and to quantify further reduction potentials in energy use, the thermodynamic concept of exergy can

be beneficial. Exergy is energy, which is entirely convertible into other types of energy. Energy, which has a very limited convertibility potential, such as heat close to room air temperature, is low valued energy. Low exergy heating and cooling systems use low valued energy, which could also easily be delivered by sustainable energy sources (e.g. by using heat pumps, solar collectors or others). Common energy carriers like fossil fuels deliver high valued energy. The idea of exergy not only enables us to estimate the amount of energy used or required, but in addition, the potentials and the quality can be calculated.

Exergy analysis tools for pre-design of energy systems in buildings

To increase the understanding of exergy flows in buildings and to be able to find ways to further reduce the energy use, pre-design analysis tools were introduced. These tools are part of the CD-ROM and also available on the internet. Today calculations of the energy use in buildings are based on the energy conservation principle, the first law of thermodynamics, only. But the energy conservation concept alone is not adequate enough to gain a full understanding of all the important aspects of energy utilisation processes. Instead, the method of exergy analysis based on a combination of the first and second law of thermodynamics is the missing link needed to fill the gap in understanding and designing energy flows in buildings. The predesign tools are meant for simple steady-state and annual energy and exergy analysis of buildings.

Easy-to-use tools present rough energy and exergy estimates of various low temperature heating and high temperature cooling technologies in buildings. The exergy analysis approach was made clear and the required inputs needed to be limited. All steps of the energy chain – from the primary energy source, via the building, to the sink (i.e. the ambient environment) – are included in the analysis. Tools were built up in different blocks of sub-systems for all important steps in the energy chain. All components, building construction parts and building services equipment have sophisticated input possibilities. Heat losses in the different components are noted, as well as the required auxiliary electricity for pumps and fans. The electricity demand for artificial lighting and for driving fans in the ventilation system is included.



Case 1	Base Case - Moderate Thermal Insulation of Building Envelope, Internal Shading Devices
Case 1-b	Improved COP Coefficient
Case 2	Improved Thermal Insulation, External Shading Devices
Case 2-b	Improved Thermal Insulation, External Shading Devices, Improved Electric Lighting
Case 3	Improved Thermal Insulation, COP and Electric Lighting, External Shading Deivices

Figure 2: The calculation results of the tools are presented graphically

Database for quick overview of possibilities and limitations of LowEx technologies

The LowEx Guidebook contains a database of low exergy heating and cooling systems for buildings. The database consists of 64 information sheets, which describe the technologies; their basic principles, technical risks and benefits, advantages, limitations and state-of-the-art (commercially available, prototype or innovative concept). The idea is to give a quick overview of the possibilities and limitations of the technologies. Guidelines for how to compile a system from these components are also given and some system descriptions are included. With appropriate emission systems, the overall system design of a building is flexible in meeting future requirements, and they are open to being supplied by low temperature energy sources. There are already a number of different low exergy components, systems and technologies on the market.

In the database of low exergy heating and cooling systems for buildings, the systems are divided into the following groups:

- Surface heating and cooling systems (floor, wall and ceiling heating and cooling, local heaters or phase change on material surfaces)
- Air heating and cooling systems (air-to-air heat exchangers, water-to-air heat exchangers, steam or vapour-to-air heat exchangers and passive systems like atria or evaporative cooling)
- Metabolic systems (biological systems like bacteria, animals or plants)
- Generation/conversion of heat and cold (boilers, heat pumps, solar collectors, CHP, waste heat, fuel cells and biological systems)

- Thermal storage (seasonal or short term)
- Distribution systems (liquid or air as transfer medium)
- Community systems (district heating and cooling).

Examples showing good experiences from many countries

The LowEx Guidebook presents 30 case examples of LowEx buildings from 11 countries. There are examples from all kinds of buildings, from newly erected to retrofit, from dwellings to commercial buildings, and also cultural monuments, such as churches and castles. The case examples show the wide variety of applications of low exergy systems. They also demonstrate the flexibility of the systems with regard to the energy source. In these examples there are systems that use heating or cooling energy from the sun, the ground, the district heating network as well as electricity or gas network.

The experiences from the case examples prove that low exergy systems provide many additional benefits be-

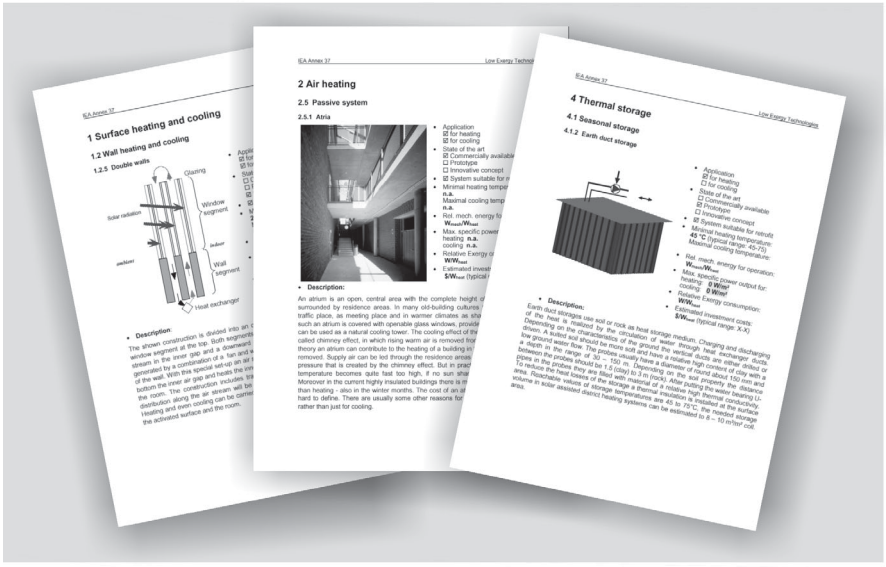


Figure 3: In the beginning of each data sheet there is a picture and some main data about the concept

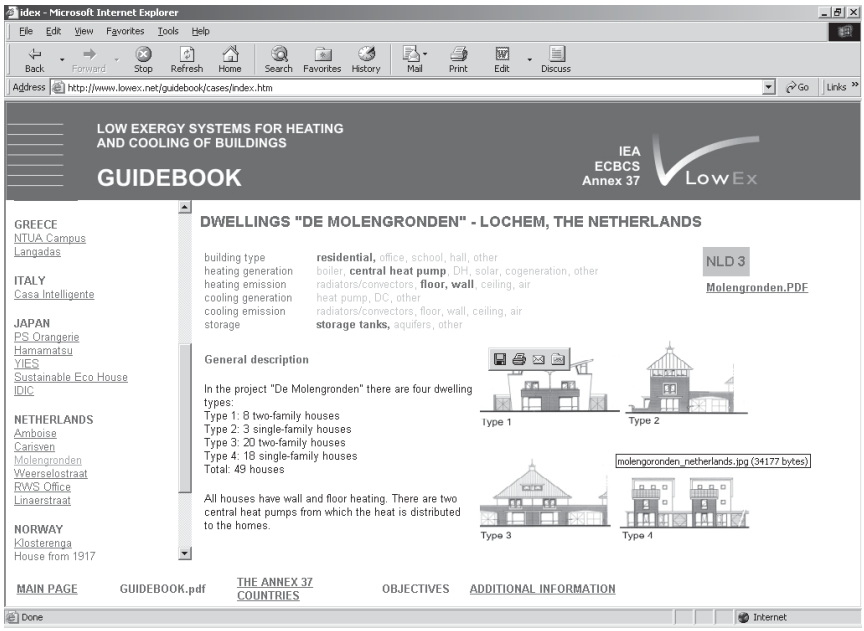


Figure 4: In the Web Guidebook and the CDROM, each case is presented with a front page from which the reader can click to the more detailed description

sides energy supply, such as: improved thermal comfort, improved indoor air quality and reduced energy consumption. These aspects must be promoted to increase the application of low exergy systems for heating and cooling of buildings. It is especially delightful to find the results of some refurbishment cases: it is evident, that the refurbishment is usually meant to improve the situation, but it seems that the new low exergy systems have surpassed the expectations of the occupants. Also, in these examples the comparison between high and low exergy systems is even more indisputable, because the houses and the occupants are the same in both cases.

Market implementation and strategies to strengthen the demand of LowEx systems

LowEx systems are well received and the benefits are highly appreciated. With this strong evidence in hand, it is easy to say that applying LowEx systems to buildings gives great potential in creating a sustainable built environment both inside and outside the building itself.

An analysis of the market implementation of the LowEx systems was made. Principal contractors, architects, consultants, manufacturers and suppliers, installers and end-users in the participating countries were asked about their recognition of the name low temperature systems, associations / feelings towards these systems, attitude towards extra investments and appreciation of thermal comfort as a target. The results of the national market analyses were collected in a table format to get a quick overview from each country (see Table 1). The national building codes and energy strategies were studied to find out if they contain something that will favour or prevent the implementation of the LowEx systems on the national market. Descriptions of the national strategies and policies are summarized in the Guidebook.

LowExNet – International Society for Low Exergy Systems in Buildings has been founded. The decision was made to form a network on the issues of new ways for energy systems in buildings and to continue the work of the IEA Annex 37, which is to seek various low exergy system solutions. The overall mission of the work in the LowExNet is to promote a more rational and effective use of energy; namely, the utilization of low valued and renewable energy sources. The work, which is based on the use of the central concept of exergy, is not only focused on the best possible and economical use of energy, but also on the application of the exergy concept for solving various issues in order to come up with a better environment for human wellbeing.

These goals shall be reached by providing knowledge on and tools for exergy analyses, which are to be applied in the built environment. Masanori Shukuya was nominated as the first chairman, Dietrich Schmidt as the first operating agent. Gudni Johannesson, Markku Virtanen, Paul Ramsak, Johann Zirngibl, Elisa Boelmann and Lars Kühl agreed to become board members. The Centre for Sustainable Building in Kassel is hosting the network in the beginning.

Further information:
http://www.lowex.net

Summary of (Limited) Market Analysis on LTS in Canada

	Principal contractors	Architects	Consultants	Manufacturers and suppliers	Installers	End users
Recognition of name LTS	*Not familiar with the term, but with the concept*	**No**	**No**	Yes	Yes	**No**
Asociations/ feelings	Like it, more comfortable heat	*Great for residential, but not where large air changes are required*	Radiant heating, comfort	Associated with hot water and in-floor heating systems, like and promote these.	*Associated with in-slab heating, more energy efficient, higher capital cost*	Good control, keeps everyone happy
Attitude towards extra investments	Acceptable, wise thing to do, especially given the cost of gas	**Mechanical costs already too high in commercial applications**	There are demonstrable paybacks, extra cost for comfort is demanded by some owners	Good investment, advantages are underrated.	Like it, owners with larger capital budgets will install	Good energy saver, worth extra investment
Appreciation of thermal comfort as a target; strategic significance	**Not typically appreciated by most**	*Most important is to give individuals control*	*Important for users and owners, but developers don't see the benefits*	Very important, major complaint is lack of personal control.	Provide more comfortable heat and are cheaper to operate	Very important, people work better when more comfortable

Based on extended single interview per target group.
Yes/Positive; **No/negative**; *Neutral/inconsistent*

Table 1: The market analysis of each country was summarised in this kind of table for a quick overview

The Energy Concept Advisor Working Group

by Ove Mørck, Cenergia Energy Consultants, Operating Agent of the ECA Working Group

The main outcome of the work in Annex 36 (Retrofitting of Educational Buildings - Energy Concept Adviser for Technical Retrofit Measures) was the Energy Concept Adviser (ECA) to retrofit educational facilities. The Annex 36 participants suggested a continuation of the work on the ECA in a separate Working Group in order to:

- Pilot (-test) the ECA with the intended target group (client bodies such as local education authorities, energy associations, design advisers), and thereby obtain important feedback, problems for debugging and identify knowledge gaps for further improvement and development of the ECA.
- Translate the ECA into several national languages. Representatives from the following countries have stated that they will seek to have the ECA translated: France, Poland, Finland, and Greece. The ECA will initially be produced in English and German.

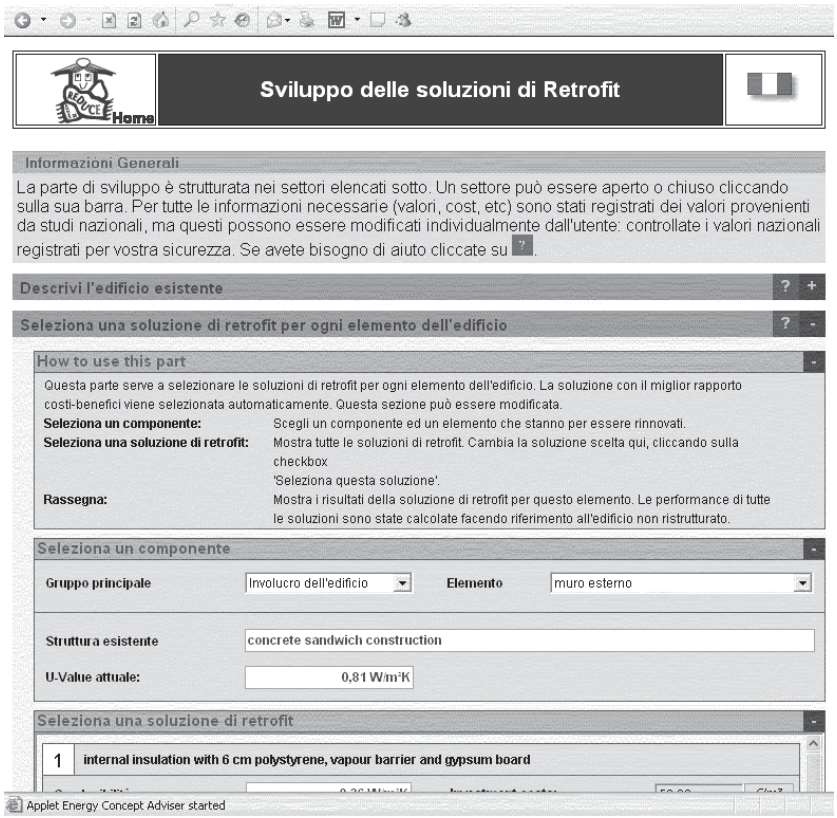
The ExCo of the ECBCS agreed at its meeting in Prague, Nov. 2003 to an 18-month Annex Extension Working Group.

Now, after 15 months of work the participants from Italy, Finland, France and the USA have focused on developing national versions of the ECA reaching various degrees of translation – with a complete Italian version as the highest achievement. In the other countries the ECA has been tested in several case studies. A number of bugs and requests for changes were identified and reported in three categories: computer bugs, a list of suggested changes. Also the part of the ECA which is referred to as "problem related recommendations" has been checked for consistency and corrected. Based on this a new version of the ECA has been released by the developer "Fraunhofer-Institut für Bauphysik".

Experts from Russia have officially asked to become an active observer to the Working Group and are planning to develop a Russian version.

The conclusion of the overall testing and evaluation of the ECA is that it is a useful tool when dedicated national versions are developed. Some of the European participants plan to use the ECA for energy certificates to support EU Energy Performance of Buildings Directive (EPBD).

The working group will at its final meeting in Lyon on April 1, 2005 discuss the future of the Energy Concept Advisor. The meeting will deal with the following issues: How will the ECA be disseminated and managed in each country and how will it co-exist over the next 3-4 years while different parts of it are developed further by other international projects. In the new IEA Annex 46 - Holistic Assessment Tool-kit on Energy Efficient Retrofit Measures for Government Buildings (EnERGo) – part of the ECA will be developed to deal with building types other than educational buildings. In an EU demonstration project, BRITA-in-PuBs, other parts of the ECA will be developed to cover more case studies and more technologies.



Action for Sustainability

The 2005 World Sustainable Building Conference in Tokyo

SB05Tokyo

27-29 September, 2005

Venue: International Convention Center PAMIR, New Takanawa Prince Hotel, Tokyo, Japan

Host: Japanese Ministry of Land, Infrastructure and Transport (MLIT)

Co-hosts:

International Council for Research and Innovation in Building and Construction (CIB: www.cibworld.nl)

International Initiative for Sustainable Built Environment (iiSBE: www.iisbe.org)

United Nations Environment Programme (UNEP: www.unep.org)

The conference slogan "Action for Sustainability" recognises that now is the time to move into action towards the common goal of providing buildings and urban context that support sustainable ways of living. SB05Tokyo is to be a venue for constructive debates among the participants, to shape positive actions that can be supported and/or shared. Discussion will include not only new buildings, but also existing building stock to be maintained, upgraded, re-used or converged, which is widely recognised to be crucial in lowering the environmental load.

Breakout Sessions and Poster Sessions

The Academic program will consist of Breakout Sessions and Poster Sessions on nineteen (19) unit topics related to sustainable buildings (each unit consists of several sessions).

With regard to Breakout Sessions, in consideration of the basic concept of the conference; "Bridging Three Gaps", the best set of papers submitted on each unit topic will be selected for oral presentations by the Convenors indicated in each of the following units. Many papers will also be presented during the Poster Sessions at the conference venue.

The 19 unit topics for presentations and discussion and the names of Convenors (countries / regions) are as follows:

The general topics of the academic section are as follows:

- Environmental Performance
- Assessment
- Technology
- Stock
- Regional and urban context
- Stakeholders
- Ethics

Registration

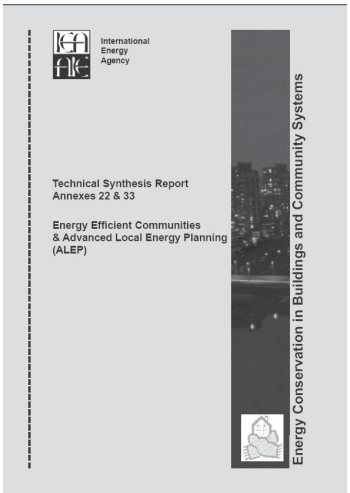
Register online at www.sb05.com

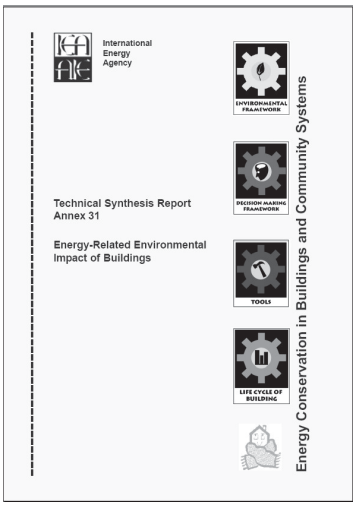
Forthcoming Technical Synthesis Reports from ECBCS

Annex 22 & 33 Energy Efficient Communities & Advanced Local Energy Planning (ALEP)

Annex 31 Energy Related Environmental Impact of Buildings

www.ecbcs.org





26th AIVC Conference
Ventilation in Relation to the Energy Performance in Buildings

Subtheme: Whole Building Heat Air and Moisture Transfer

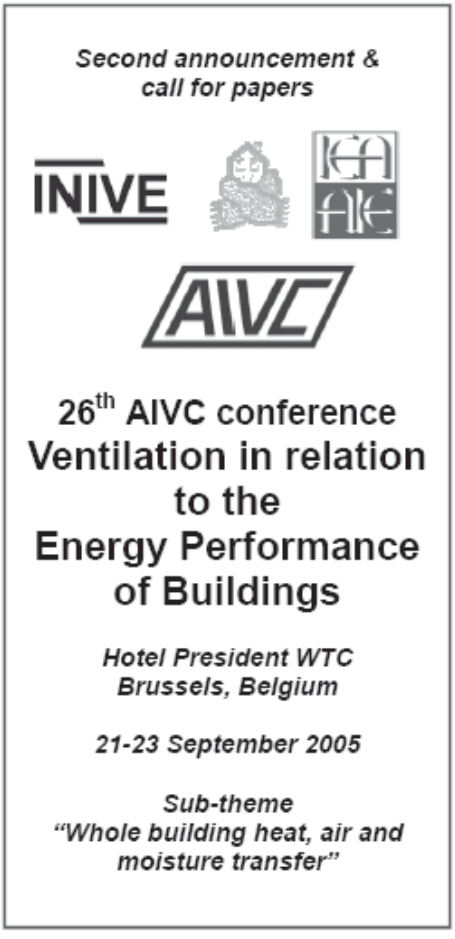
The AIVC conference is organised by the International Network for Information on Ventilation (INIVE EEIG) on behalf of the Air Infiltration and Ventilation Centre (AIVC).

Purpose

Since 1980, the AIVC conferences have been the meeting point for presenting and discussing interesting developments and results regarding ventilation in buildings. For each conference a specific theme is selected and a substantial part of the presentations relate to this theme. The theme of this 26th conference is 'Ventilation in relation to the energy performance of buildings'.

There are several reasons for selecting this theme:

- Buildings represent in many countries of the order of 30-50 % of the total energy and pollution load. The improved insulation of new and existing buildings in combination with an increased number of buildings with ventilation systems risk leading to a higher percentage of the energy consumption due to ventilation;
- An increased number of countries are implementing so-called energy performance regulations, whereby limit values are imposed on the total energy consumption of a building for clearly defined boundary conditions. For the 25 EU countries, this process is substantially accelerated due to the Energy Performance of Buildings Directive which imposes all countries to have an energy performance regulation in place in January 2006 with, for example, energy performance requirements for ALL new buildings as well as energy performance certification for all buildings when constructed, rented or sold. This conference is an excellent occasion to develop a clear picture regarding the status of implementation just a few months before January 2006.
- During the last decade, a lot of attention has been given to the development of innovative ventilation systems. Energy Performance regulations can be a stimulus for the market introduction of innovative systems but also a barrier.



As during previous conferences, this conference also has a sub-theme. This year, the topic is 'Whole building heat, air and moisture transfer'. This topic is also the title of IEA ECBCS Annex 41.

A new feature of this conference is the organisation of 2 parallel tracks

:

- One track can be considered as the 'practice track': presentations and discussions focused on information for practitioners. Given the topic of the conference, these sessions should give the participants a good view of various aspects of energy performance regulations (where the implementation of the European Energy Performance of Buildings Directive is in the center of attention) and allow them to correctly situate ventilation related issues within the various topics. Specific attention will also be given to the transfer of information regarding ongoing practice oriented projects.
- The other track can be considered as the 'ventilation oriented research track': presentations which are more focused on the ventilation research community, specialised consultants, the ventilation industry, etc. Several of these sessions will deal with whole building, heat, air and moisture transfer.

Of course, all participants will receive all conference papers and both tracks are open for all participants.

The topics of the conference include the following:

- The treatment of aspects of ventilation in standards and regulations
- The handling of ventilation in energy performance regulations outside Europe

- Airtightness of buildings and ducts
- Energy for the transport of air
- Innovative ventilation systems and energy performance regulations
- The impact of regulations on the ventilation market
- Good indoor climate and energy performance
- Ventilation in the context of the energy certification of buildings
- The commissioning and inspection of ventilation systems
- Ventilation related challenges for the existing building stock
- Ventilation in very low energy buildings
- Aspects of ventilation in warm and cold climates
- Coupling, in terms of heat, air and moisture flows, between the building and the building fabric, consequences for energy consumption and durability
- The combined effect of ventilation and hygric inertia on indoor climate and energy consumption.

Venue and dates

AIVC Conference 2005 will be held at the Hotel President in Brussels, Belgium. English will be the official language.

http://www.presidenthotels.be

The Conference will start on Wednesday 21 September 2005 (at 9.00) and will end on Friday 23 September 2005 (about 16.00).

More information : http://www.aivc.org or e-mail to stephane.degauquier@bbri.be

BUILDING SIMULATION 2005
École Polytechnique de Montréal August 15-18, 2005

http://ibpsa.ca/bs2005

Preparations for the 9th IBPSA Conference and Exhibition are well underway. Some 230 papers are currently being reviewed under the supervision of Ian Beausoleil-Morrison, chair of the scientific committee. Following are some key announcements concerning keynote speakers, the IBPSA student travel award, the exhibition, and software demo sessions.

Confirmed keynote speakers

Kevin R. Hydes
President and CEO, Keen Engineering, P.Eng., P.E., C.Eng., LEED AP
Chairman US Green Building Council and Founder Canada Green Building Council
Green Buildings...A Common Language

Professor Sanford A. Klein
Bascom-Ouweneel Professor of Mechanical EngineeringUniversity of Wisconsin – Madison
Energy Issues: Demand, Supply, and Opportunities for Increased Efficiency

Professor Michael Holmes
Consultant to Arup Research+Development and Royal Academy of Engineering Visiting Professor of Design to the Department of Civil and Building Engineering at Loughborough University (UK). Winner of the 2003 Outstanding practice award -IBPSA
Simulation - The Future - An Industrial Vision

IBPSA Student Travel Awards– Building Simulation 2005

IBPSA will grant up to five travel awards for students presenting papers at Building Simulation 2005. Each award may be up to 1 000$US. For more details consult our web site at: http://ibpsa.ca/bs2005/student_awards.htm

Call for Exhibitors – Building Simulation 2005

Potential exhibitors are kindly invited to play an active role in this conference by participating in the exhibition which will be held from 9h00 to 17h00 on August 16 and 17, 2005. The exhibition is an excellent opportunity for any institution or company to present building performance simulation products or services to the conference participants. The deadline for renting a space at the exhibition is April 15, 2005.

Software Demo Submission – Building Simulation 2005

Software companies and individuals are invited to take part in special software demos sessions.Much like technical presentations, the software demos sessions will consist of presentations in front of an audience. However, these presentations will not be peer-reviewed and therefore not included in the conference proceedings. (Although the submission of a technical paper on the software that meets one of the conference themes is encouraged.)

Recent ECBCS Annex Publications

Annex 5

Air Infiltration and Ventilation Centre (AIVC)

- AIR Newsletter and AIVC CD published every 3 months. See www.aivc.org for details of Annex 5 publications.

Database

- AIRBASE - bibliographical database, containing over 16,000 records on air infiltration, ventilation and related areas. **Now available on the website**

Technical Notes

- Reducing Indoor Residential Exposures to Outdoor Pollutants, 2003, Sherman M and Matson N, TN 58

Annotated Bibliographies

- Review of Airflow Measurement Techniques, 2003, McWilliams J, BIB 12

AIVC Conference Proceedings

- Ventilation, Humidity Control and Energy, 2003, Washington, USA, CP24
- Ventilation and Retrofitting, 2004, Prague, Czech Republic, CP25

Ventilation Information Papers

- Airtightness of Ventilation Ducts, 2003, Delmotte Ch, VIP 01
- Indoor Air Pollutants – Part 1: General Description of Pollutants, Levels and Standards, 2003, Levin H, VIP 02

ECBCS Bookshop
www.ecbcs.org

Annex 27

Evaluation and Demonstration of Domestic Ventilation Systems

- Technical Synthesis Report: Annex 27 Evaluation and Demonstration of Domestic Ventilation Systems, Concannon, P, 2002.
- Simplified Tools and Handbook CD with VENSET, 2002

Annex 30

Bringing Simulation to Application

- Technical Synthesis Report: Annex 30 Bringing Simulation to Application, Warren P, 2002

Annex 31

Energy-Related Environmental Impact of Buildings

- Energy-Related Environmental Impact of Buildings (Highlights), 2002
- Environmental Framework, 2001
- Decision-Making Framework, 2001
- Directory of Tools, A Survey of LCA Tools, Assessment Frameworks, Rating Systems, Technical Guidelines, Catalogues, Checklists and Certificates, 2001
- LCA Methods for Buildings, 2001

See www.annex31.com to download Annex 31 publications.

Annex 35

Control Strategies for Hybrid Ventilation in New and Retrofitted Office Buildings (HYBVENT)

- Principles of Hybrid Ventilation, edited by Per Heiselberg, report and CD, 2002

Annex 36

Retrofitting of Educational Buildings

- Retrofitting of Educational Buildings - Case Study Reports, edited by Morck O, 2003

Annex 37

Low Exergy Systems for Heating and Cooling

- The LowEx Guidebook, available free of charge at *www.lowex.net* (click on Guidebook)

Annex 38

Solar Sustainable Housing

- Sustainable Solar Housing: Marketable Housing For A Better Environment Brochure, 2003
- SIS Demonstration Housing Project in Freiburg, Germany, 2003
- Demonstration House in Monte Carasso, Switzerland, 2003
- Demonstration Houses in Kassel, Germany, 2003
- Demonstration Houses in Hannover-Kronsberg, Germany, 2003
- Zero Energy House, Kanagawa, Japan, 2003
- Sunny Eco-House, Kankyokobo, Japan, 2003

Annex 40

Commissioning of Building HVAC Systems for Improving Energy Performance

- Annex CD and Final Report, 2005

See www.iea-shc.org/task28 to download Annex 38 publications.

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36 Retrofitting in Educational Buildings – Energy Concept Adviser for Technical Retrofit Measures (1998-2004)

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36 Energy Concept Adviser Working Group Annex Extension (2004-2005)

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37 Low Exergy Systems for Heating and Cooling of Buildings (1999-2003)

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38 Solar Sustainable Housing (Solar Heating and Cooling Task 28) (2000-2005)

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39 High Performance Thermal Insulation Systems (2001-)

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40 Commissioning of Building HVAC Systems for Improving Energy Performance (2001-)

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41 Whole Building Heat, Air and Moisture Response (MOIST-ENG)

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42 COGEN-SIM : The Simulation of Building-Integrated Fuel Cell and Other Cogeneration Systems

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43 Testing and Validation of Building Energy Simulation Tools (Solar Heating and Cooling Task 34)

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44 Integrating Environmentally Responsive Elements in Buildings

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45 Energy-Efficient Future Electric Lighting for Buildings

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46 Holistic Assessment Toolkit on Energy Efficient Retrofit Measures for Government Buildings

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