

KeepCool I

Improving the policy framework

Adaptive Comfort in European Standard EN 15251

KeepCool succeeded to include the Adaptive Comfort Model into the European Standard EN 15251

"Indoor environmental input parameters for design and assessment of energy performance of buildings - addressing indoor air quality, thermal environment, lighting and acoustics" and to remove further barriers towards the use of passive cooling solutions.

Limits to cooling demand in Austrian Service Buildings

The Austrian Energy Agency has been involved in the harmonisation of the regional building codes and the development of the new OIB Guidelines. AEA staff made recommendations for minimum requirements of energy efficiency in terms of limits in heating and externally induced cooling demand, which are now part of the new guidelines.

Influence new legislation on energy efficient buildings in Italy

In Italy, experience and know-how gained during the project has been used during contacts with policy makers in order to support new legislation on energy efficient buildings, in particular regarding the reduction of cooling demand.

Andalusian funding scheme for sustainable energy projects

The Andalusian Energy Agency included "sustainable cooling" projects into the energy efficiency category of the Andalusian sustainable energy development funding scheme. This scheme, which is managed by the Andalusian Energy Agency itself, provides funding for solutions in buildings that accomplish a energy consumption reduction of at least the 10 % of the original energy consumption.

Bringing together relevant actors in Sweden

In Sweden, KeepCool initiated a dialogue between authorities and the HVAC designers association, which provided feedback to authorities on how regulations and recommendations can be applied, revised or better enforced. This initiative was highly appreciated and interest to continue the cooperation was stated. The adaptive model and its practical use in recommendations and its applicability was discussed in detail.

Detailed information on these results and further recommendations for EU policies in the field of sustainable summer comfort can be found in the KeepCool final report.

Impressum

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"State of the art" of sustainable summer comfort

What is Sustainable Summer Comfort?

Sustainability in the context of cooling means achieving good comfort conditions with no or limited use of conventional energy (fossil or nuclear). This can be achieved if the building itself is built right, the internal loads are kept low and if the regulation of the cooling systems reflects the needs of the occupants. In our project, we worked out a strategy of 10 steps for achieving sustainable summer comfort:

1. Define the thermal comfort objectives explicitly, using the Adaptive Comfort model where possible
2. Intervene on the site layout and features of the surroundings which can affect summer comfort
3. Control and reduce heat gains at the external surface of the envelope
4. Control and modulate heat transfer through the building envelope
5. Reduce internal gains
6. Allow for local and individual adaptation
7. Use passive means to remove energy from the building
8. Use active solar assisted cooling plants
9. If still necessary to reach the stated comfort objectives, use high efficiency active conventional cooling plants
10. Train building managers and occupants on how to use, monitor performances and adequately operate and maintain the building.

This strategy can be used in two ways in order to improve the energy efficiency of cooling: When planning a good new building or a comprehensive refurbishment project, following Steps 1-10 from the top down will result in best possible reductions of cooling energy demand. Selected steps can be used when appropriate to improve the situation in existing buildings.

The document "Definitions of sustainable summer comfort" provides a detailed description for each step.

Technologies for Sustainable Summer Comfort

For the most important steps of our definition, we compiled available solutions in the following technology reports:

- Comfort Models
- Heat Gains at the Building Envelope
- Heat Transfer through the Building Envelope
- Internal Heat Loads

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- Individual Adaptation
- Passive Cooling Technologies
- Solar Cooling
- Efficient Active Cooling
- Operation and Maintenance

Suppliers and Experts

A list of technology suppliers for the above described technologies and cooling or building energy experts is provided for each participating country.

Best Practice Projects

KeepCool does not invent new technology. It rather relies on the work of pioneers who already put the described solutions into reality. In the download section, best practice examples can be found. The descriptions show the strategic use of sustainable cooling in real-life conditions, in real cases from all participating countries. Almost all technologies described above have been deployed in these cases, mostly different steps of our proposed strategy are combined with each other in order to reach good results. Additional Best Practice descriptions in German, Lithuanian and Spanish language can be found in the KeepCool toolkit.

National and Regional Legislation

The prevailing comfort legislation susceptibly influences the possibilities to use passive cooling. The document "Survey on national legislation defining or affecting summer comfort" summarizes the regulations and guidelines defining or affecting summer comfort in the building regulations, legislation on working conditions, and other used norms and guidelines in each participating country.

Market Situation

EECCAC, a previous project financed by the European Commission, analysed the European market for central air conditioners. The document "European cooling market" summarizes the main findings from the EECCAC project. The detailed market analysis can be found in the EECCAC final report.

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Toolkit for Sustainable Summer Comfort

Overview about Building Calculation Tools

In this report, we summarise describing up-to-date building simulation tools in the market. In addition, we list more locally used, or simpler calculation tools that can be used for first planning stages or for the calculation of single passive cooling solutions.

At the end of the report, a two tables indicate the capabilities of each tool regarding the sustainable cooling solutions dealt with in our technology descriptions.

Toolkit for Sustainable Summer Comfort



The information provided in the "State of the Art" of Sustainable Summer Comfort, the above tools and additional information material has been processed into a web-based toolkit for building owners, planners, building users and facility management professionals. The toolkit combines our approach for sustainable summer comfort with the complex set of roles the different actors take when constructing, using, operating or maintaining a building, linking the main target groups to those pieces of information which are relevant for them. Beside these documents, the toolkit also contains 41 Best Practice Examples in national languages (German, Lithuanian, and Spanish), numerous links to existing documents from other projects and easy-to-understand short summaries for each target group.

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Marketing and Dissemination

Marketing and dissemination towards building owners and other target groups was the heart of the project. We applied a variety of direct and indirect marketing methods, from concrete advice in existing projects, over organising or presenting at events of the target groups, media articles and websites, university education to presentations and discussion at international conferences. A detailed description of these activities, discussion and conclusions can be found in the Final Report of the project.

Concrete advice to building owners

Concrete advice was given to building owners in each participating country. Beside around 500 individual building owners, KeepCool conveyed the message of sustainable summer comfort to a row of large property owners, such as the municipalities of Vienna, Stockholm and Asti, the Austrian Railways ÖBB, the food chains COOP in Italy and SPAR in Austria, and the Swedish BELOK group which represents the country's largest property owners. Pilot projects which use our approach in refurbishment or planning for new constructions, are described in KeepCool's Final Report, too.

Awareness raising on summer energy consumption

KeepCool published numerous articles in daily and technical press, appeared on conferences and in technical workshops, described passive cooling measures in two online encyclopaedias, and was even broadcast on radio and TV and has got 140.000 hits on its German website www.keep-cool.net. Some of the articles are included in the download section below.

International Dissemination

Since the target groups of the project are mostly organised nationally, international dissemination was of secondary importance. Nevertheless, international meetings were a good concentration point to scrutinise the KeepCool approach to Sustainable Summer Comfort.

The project or specific parts were presented and discussed at the following international conferences: At the 9. International Passive House Conference 2005 (oral presentation), at PALENC 2005 (Pagliano & Zangheri, 2005), eceee 2005 (informal session on summer comfort), IE ECB 2006 (Varga & Pagliano, 2006), NCEUB 2006 (informal discussions) and finally with three presentations at EPIC 2006 (Varga et al., 2006; Nicol & Pagliano, 2006; one additional oral presentation).

Parallel to these activities, KeepCool was invited to an expert meeting of the WHO, and was briefly presented by the AuditAC project team at the AICARR 2006 Conference. As follow-up activities, the

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project's results will be presented at the eceee 2007 Summer Study, and at the PALENC 2007 Conference. Some papers are included in the download section below.


Concluding Conference at EPIC 2006

KeepCool will provide four presentations in the frame of EPIC 2006 AIVC, the 4th European Conference on Energy Performance & Indoor Climate in Buildings: Technologies & Sustainable Policies for a Radical Decrease of the Energy Consumption in Buildings.

Together with the 27th Conference of the Air Infiltration & Ventilation Centre and with the Conference of the IEA Programme on Energy Conservation in buildings & Community systems, EPIC 2006 AIVC will take place 20-22 November 2006 in the Palais des Congrès of Lyon, France.

Detailed information, programme and registration at the EPIC 2006 AIVC portal.

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