
MARKET OPPORTUNITIES FOR ADVANCED VENTILATION TECHNOLOGY

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**The Air Infiltration and Ventilation Centre :
Your companion in the Ventilation world**

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1. Introduction

For over 20 years, the AIVC has been a key player in developments in technical knowledge on ventilation and related issues, and has always been very active in the dissemination of information. Since its creation in 1979, there has been a substantial change in the users' expectations of how information on ventilation knowledge should be disseminated. The AIVC has always tried to adapt its strategies to these evolving needs.

In the first part of this paper, a brief historic overview is made. It is followed by a more extensive discussion of our envisaged new approach.

2. A brief history of AIVC

2.1 The 1979 mission for the Air Infiltration Centre

In 1979, the Implementing Agreement on Energy Conservation in Buildings and Community Systems (ECBCS) of the International Energy Agency (IEA) decided to create the so-called annex 5 : the Air Infiltration Centre.

The annex went into force on May 22 1979, whereby the objectives, means and results were described as follows (ref. 1) :

Objectives for IEA Annex 5 as defined in 1979:

“The objectives of this Task are to support institutions active in air infiltration research through the collation, analysis, evaluation and dissemination of experimental data and technical information, and to assist in the co-ordination of national research activities in air infiltration, to develop tools which architects, building services engineers and energy management professionals can use to assess the energy losses due to air infiltration from domestic, commercial and industrial buildings, and thus to assess more reliably the cost effectiveness of measures available to reduce these losses. A further objective is to provide advice on cost effective measures available to reduce air infiltration losses.”

Means for IEA Annex 5 as defined in 1979

“The Participants will jointly fund the creation of an Infiltration Centre which will perform the following functions:

1. Information Service

The Centre will catalogue and disseminate published and unpublished papers and research data in the field. It will respond to individual requests by Participants for information, will publish regular surveys of on-going research and reviews and critiques of completed work in infiltration. The Centre will organize conferences and meetings to discuss specific questions of concern to researchers in the field.

2. Standardize Procedures for Reporting Experimental Results.

The Centre will prepare standardized formats for reporting the results of air Infiltration research, including test buildings characteristics, occupancy rates, and data collection procedures. The Centre will seek the advice of the research community in developing these formats and will be active in recommending their adoption.

3. Calibrate and Validate Air Infiltration Models Using Existing Data

The Centre will use available high quality air infiltration test data to calibrate and validate infiltration models of special interest to Participants. The Centre will compare the ability of alternative models to represent air infiltration.

4. Collect Additional Data for Model Evaluation.

To provide a more complete data base for validating air infiltration models, the Centre will collect additional documentation and processed or semi-processed data from previous IEA air infiltration studies. The Centre will publish an index of complete and reliable data sets for validating models.

5. Air Infiltration Handbook.

The Centre will assist the Swedish Participant in the production of a handbook developing a set of guiding principles for reducing air infiltration in new and existing residential and commercial buildings and including instrumentation and methods for infiltration testing (e.g. tracer gas, pressurization, air-flow, and related measurements).

6. Co-ordination of Research.

The Centre will identify areas where research is necessary and will advise the research community of these areas.

7. Sponsor Personnel Exchanges.

The Centre will provide opportunities for researchers from Participants' Countries to work at the Centre under arrangements to be made directly between the Operating Agent and the interested Participants.”

Results 1979 – 1982 for IEA Annex 5 as defined in 1979:

The expected results were described as :

1. “The publication of periodic surveys of on-going research and reviews and critiques of completed work in air infiltration;
2. A document containing standardized formats developed at the Centre for reporting the results of air infiltration research;
3. The publication of an index of data sets for validating air infiltration models;
4. A document containing the results of comparisons of alternative validating models;
5. The publication of an air infiltration handbook;
6. Reports on any special events or conferences sponsored by the Centre, and
7. An annual report on the activities of the Centre, summarizing the achievements in the past year, the services provided by the Centre to each Participant, and budget expenditures.”

2.2 Major developments during the last 2 decades

Whereas air infiltration and minimal energy use was the top priority in 1979 and in the beginning of the eighties, an important widening of scope has taken place in the 2nd half of the eighties. This is reflected by the change of name into ‘Air Infiltration **and Ventilation** Centre’: AIVC instead of AIC.

In the nineties, further major evolutions have taken place, e.g. :

- Attention for the possibilities of ventilation as part of a summer comfort strategy
- Increased attention for source control;
- More attention for non-domestic buildings

As illustrated by figure 1, we are far away from the situation that the AIVC focus was on the relation between air infiltration and energy use. Today, energy efficient ventilation for achieving appropriate IAQ conditions and good thermal comfort (in summer) is the real challenge, whereby airtightness, source control, demand control,.... can be considered as means for achieving this challenge.

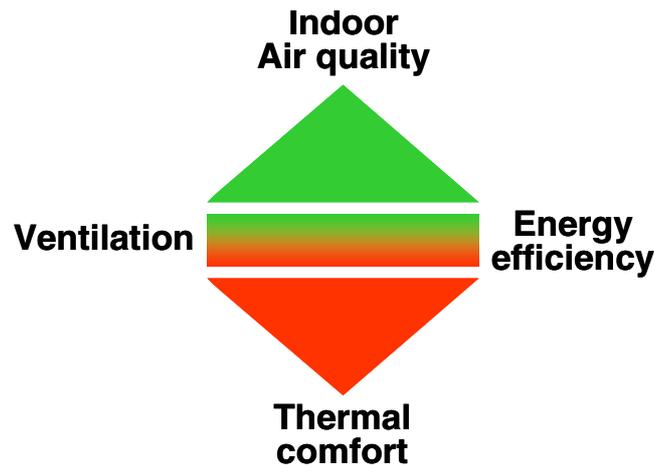


figure 1 : Optimisation of ventilation requires the integration of IAQ, thermal comfort and energy efficiency concerns

2.3 Reasons for the new approach

During the last decade, a number of major developments have taken place which justified and even urged for another approach with respect to the management and technical organisation of the AIVC :

- In the eighties, the existing knowledge with respect to ventilation was rather limited and the research area was rather narrow (e.g. focused on air infiltration). This made it very appropriate to create a small group of technical staff which prepared technical notes for international distribution. However, the field of ventilation has become very wide with as result a whole range of specific disciplines (modelling, measurement techniques, standardisation and legislation,...) whereby often sub-disciplines exist with a high level of technical skills.

As an illustration, the evolution of knowledge on measurement techniques can be mentioned :

- the first AIVC publication on measurement techniques was TN 10 'Techniques and instrumentation for the measurement of air infiltration in buildings – a brief review and annotated bibliography'. It contained not more than 60 pages and it was at the time considered as a reference work on measurement techniques in the area of air infiltration and ventilation. The document can be found on the CD-ROM in pdf-format.
 - In 1991, another technote (TN 34) was published in collaboration with IEA Annex 20 'Air flows patterns within buildings : measurement techniques'. This time, it contained some 280 pages.
 - Since then, substantial further developments have taken place.
- In contradiction with the situation in the eighties, there are now an increased number of organisations and/or projects in which synthesis of information concerning ventilation related aspects is a key action. This is e.g. the case for certain building research institutes and for national and international projects. Some of these publications reach a quality level above what typically is produced by the existing AIVC. However, international dissemination of this information is often not envisaged or only at a very limited scale and

this for various reasons, e.g. because of the type of financing, because of translation problems, because of insufficient editing resources, because of lack of an infrastructure for informing potential users,...

- Especially during the last 5 years, there has been a steady reduction in guaranteed income from the member countries. At present, one is below a sufficient basic funding for providing the required services without generating additional income from the sale of this publications. However, the selling of a large part of the services at typical commercial rates risks to substantially limit the number of users.

- Classical information services

The dissemination services (AIR Newsletter, Airbase, Recent additions to Airbase,...) are still very relevant and are produced at a competitive cost level. However, the cost for obtaining e.g. Airbase (which contains at present some 14.000 references) is rather high (100 £) due to which there are a rather limited number of users.

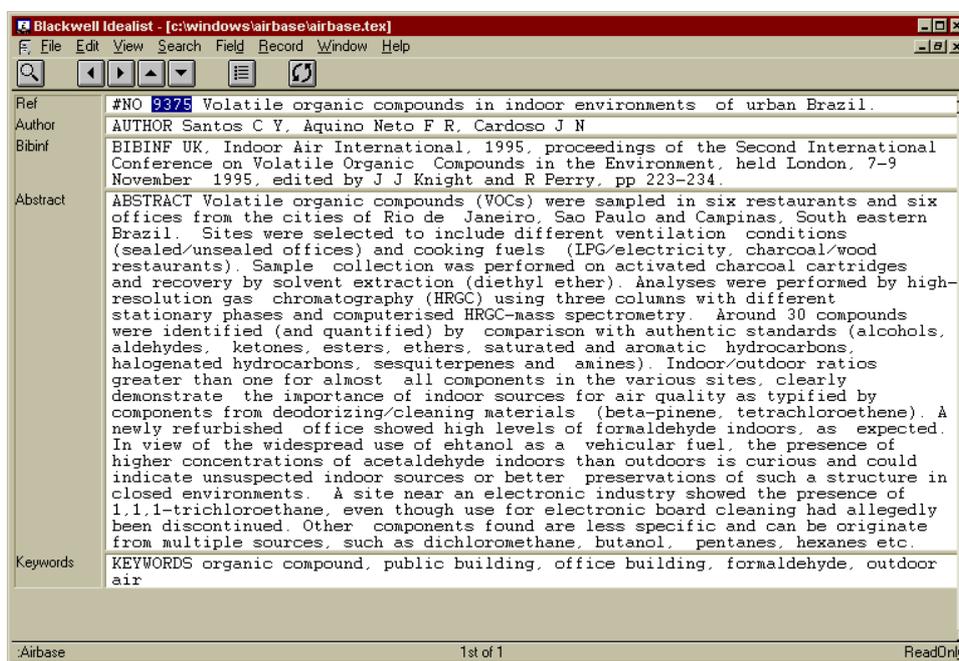


figure 2 : AIRBASE - the AIVC database

In parallel with these developments, there have been important developments in the dissemination priorities and possibilities :

- Dissemination possibilities

The present electronic media (CD-ROM, internet,...) allow a wide scale and low-cost distribution strategy.

Since 1995, the AIVC website (www.aivc.org) is playing an important role in the dissemination strategy of the AIVC.

As illustrated by figure 3, the use of the AIVC website has been substantially increased over the years.

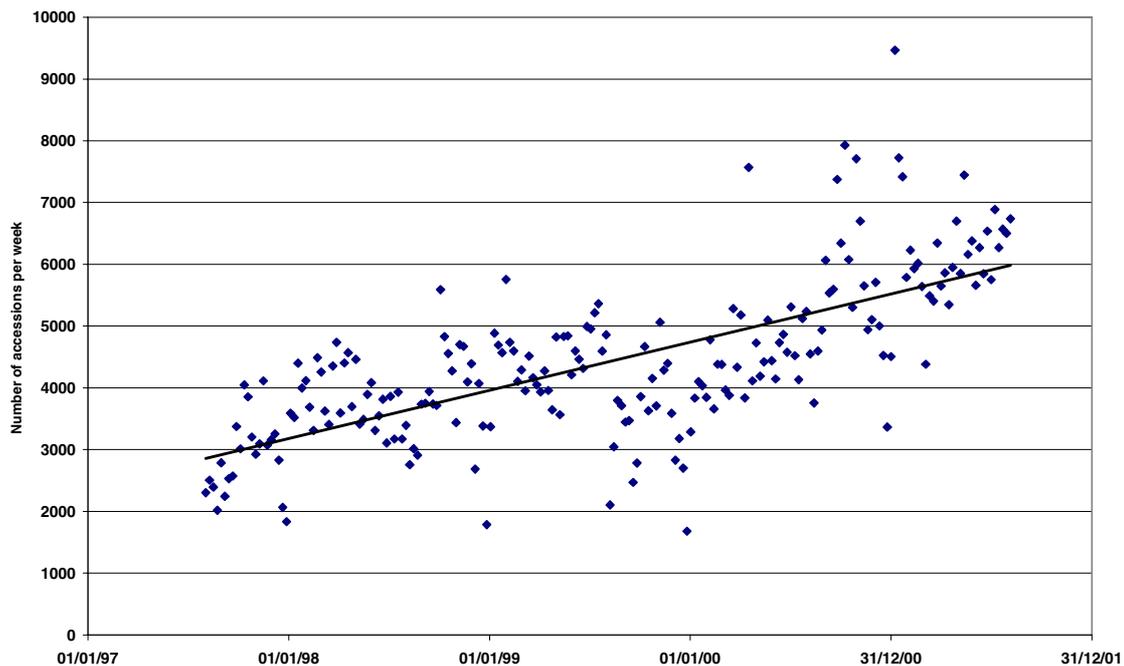


figure 3 : Number of accessions per week of AIVC website



International Energy Agency



Air Infiltration and Ventilation Centre

Welcome to the AIVC website.

Read the latest AIVC [news](#) or [search](#) for what you want.

Find out [about](#) the AIVC and its website.

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As an example, a CD-ROM with up to 600 Mb of information has a production cost of less than 0.5 EURO. The proceedings of the recent AIVC conference require only some 10 Mb. In practice, almost all AIVC deliverables can be put onto 1 single CD-ROM.

- More relevance for practice

There is also an increased interest for information which is more usable by practitioners. The increased complexity of the ventilation field makes it more difficult for the existing AIVC staff to produce the appropriate information.

- Role of building research institutes in relation to dissemination

Dissemination of information from research and other activities is for most building research institutes of increased importance. However, even for the larger building research

institutes, some dissemination activities are not longer evident at the scale of the individual institute. Networking (often through international collaboration) allows new opportunities.

As a result, and after intensive discussions, it has been decided to apply a new approach for the period June 2001 – May 2004.

3. The new AIVC : a new operating agent

The contracting party is 'INIVE eeg' (International Network for Information on Ventilation). The creation of this legal entity was done on May 23 2001.

The following information concerning the contracting party is relevant :

- It has the legal structure of a European Economic Interest Grouping (EEIG). The requirements for the creating of an EEIG are specified in the European Council Regulation of July 25 1985. Several of the organisations involved in this EEIG proposal have positive experiences with the functioning of other EEIG's. The fact of 'European' does not mean at all that the network is focusing on Europe. However, it is a legal requirement that all full members are organisations with their head office in one of the member countries..
- The European law describing the conditions for an EEIG imposes that only firms and companies registered in one of the member countries of the European Union can be a full member. The members have unlimited joint and several liability for the debts and other liabilities of the Grouping of whatever nature.
- The following Research Institutes are founding members of INIVE EEIG :
 - BBRI - Belgian Building Research Institute (BBRI), Brussels, Belgium
 - CETIAT, Villeurbanne, France
 - CSTB - Centre Scientifique et Technique du Bâtiment (CSTB), Paris, France
 - NBI - Norwegian Building Research Institute (NBI), Oslo, Norway
 - NKUA, Athens, Greece
- The official address of INIVE EEIG is Avenue Poincaré 79, 1060 in Brussels, Belgium.

It is the intention to have besides the so-called full members also associated members. An associated member can be any kind of organisation with interest in the activities of the EEIG and it can be also from outside Europe. The management of the INIVE EEIG is the responsibility of the College of the Members of the INIVE EEIG. Each full member can designate one person for the college of the members. The College of the members can decide to allow also representatives from associated members to (part of) the meeting of the College of the Members.

The manager of INIVE EEIG is, after consultation of the AIVC SG members, designated by the College of the Members and will represent INIVE EEIG as Operating Agent.

INIVE EEIG can be contacted by mail (inive@bbri.be). Moreover, a website will be operational from September 2001 on : www.inive.org.

4. The new AIVC : New Services

In parallel with the formal change in Operating Agent, and to a large extent due to this change, there will be a fundamental change in the services provided to the ventilation world.

The keywords are '*more information - more users - lower cost*'.

4.1 More Information

In the present issue of AIR, the changes are marginal: instead of 'Air Infiltration Review', it is now called 'Air Information Review'. There are also a few changes in the layout. However, from the September issue on, you will see major changes, and in particular '*more information*'. On the one hand, the layout and type of articles in AIR will change, on the other hand, there will be an accompanying CD-ROM with each issue, called the 'AIVC CD'.

Instead of typically long articles, the 16-page AIR newsletter mostly contains very short contributions. The newsletter is organised around topics such as 'news from research, standardisation and regulation, information from practice, websites, new publications, information on research programmes', etc. For most of these contributions, there are hyperlinks to the accompanying CD-ROM and/or to the internet. It is also the intention to feature the full content of AIVC technical reports on the CD-ROM, as well as the AIVC guides, AIRBASE and the AIVC conference proceedings. In parallel, we intend to distribute information from many ventilation related activities: final reports from international and national ventilation research projects, software tools, and more.

Whereas the AIR newsletter provides mainly summaries and (hopefully) give you a taste for obtaining more information, the AIVC CD contains a wealth of information. In fact, with some 600 Mb of storage space available, the CD allows us to distribute a great deal of information.

The September 2001 issue is the first newsletter in line with this new approach. Without any doubt, there is room for improvement and we hope that the next issues will even better meet the needs of our users.

4.2 More Users

In order to reach '*more users*', we have decided to apply a fundamental change in the dissemination strategy: instead of selling the majority of the information at costs which, though not exaggerated, are also not marginal, we are aiming for a very low-cost distribution, with even the possibility of a free-of-charge distribution to several target groups. It is our ambition to reach a quarterly distribution of 10,000 issues of AIR and the AIVC CD. In order to achieve this, achieving a low unit cost for providing information to our users is crucial. We believe that the newsletter and the AIVC CD will make such a wide scale dissemination possible. Moreover, our aim is not only to print 10,000 copies, but effectively to reach 10,000 or more key actors ('decision makers') in the fields of ventilation, indoor air quality and energy use. Therefore, the content of AIR and the AIVC CD is broadened in order to attract more interest from a wide range of people: manufacturers, consultants, designers, building owners and managers, researchers, etc.

4.3 Lower cost

'A *lower cost*' for the end-user will be achieved by combining low cost publications with sponsorship. In fact, we believe that there is a strong interest in the ventilation world in becoming an AIVC sponsor. We have the impression that the package is very attractive. The income from sponsors will to a large extent help us to finance our dissemination activities.

Everybody within and outside the AIVC member countries will be in a position to obtain the majority of the AIVC related deliverables. Of course, persons and organisations in AIVC member countries will receive a substantial price reduction, and further price reductions will be offered to the INIVE EEIG members.

5. The new AIVC : the technical work programme

In the new operating period 2001-2004, we anticipate addressing a whole range of issues, e.g.:

- appropriate ventilation, such as passive cooling and hybrid systems, to address the issue of climate change and sustainable development
- impact of ventilation on occupant performance such as productivity and learning skills in the non industrial built environment
- ventilation in the urban environment and strategies for a cleaner city of tomorrow
- the impact of ventilation and infiltration in the energy performance of buildings with respect to regulations
- guidance on product specifications for innovative development related to emerging codes, regulations and standards
- the role of the external envelop on rational energy use and moisture transmission through ventilation and infiltration
- simplified measurement techniques for commissioning and maintenance during system life time.

6. Financing mechanisms

6.1 Various sources of income

In the past, the bulk of the income came from financial contributions by the AIVC member countries. During recent years, the annual country contribution varied (as function of the size of the country) from 6.600 £ to 52.800 £.

From June 2001 on, a new concept is applied whereby income from various sources is envisaged.

- Income from AIVC member countries

Countries can become member of the AIVC by paying an annual contribution fee of 8.000 EURO in combination with a labour effort equal to 3 manmonths per year. At present, the participation of Belgium, France, Greece, Norway and the United States is almost sure and we expect other countries to join in the near future.

- Income from INIVE members

An additional source of income is expected to come from the INIVE EEIG members. This can be research institutes (as the founding members of INIVE EEIG), it also can be e.g.

large consulting companies,... They pay an annual contribution ranging from 8.000 to 12.000 EURO. The benefits are a strong involvement on the dissemination strategy and they receive the AIVC deliverables at very low rates.

- AIVC sponsors

We believe that the package offered by this new approach is sufficiently attractive for obtaining the support of private companies. Therefore, the concept of AIVC sponsor has been created. The annual fees for an AIVC sponsor varies between 5.000 and 20.000 EURO.

6.2 Income from subscribers

Individual persons and organisations can take a subscription in order to receive all the AIVC publications.

7. Conclusions

Over the last 20 years, AIVC has undergone various changes in order to meet new needs from the building society. From June 1st 2001, a very fundamental change have been implemented which envisages a substantial improvement of the dissemination means of AIVC. In order to achieve this, another organisational approach was required and in the meanwhile implemented.