



CRISP



Construction and City Related Sustainability Indicators

EC-funded
Thematic Network
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Energy, Environment
and Sustainable Development

Key Action
"City of Tomorrow
and Cultural Heritage"

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Visit our Website : <http://crisp.cstb.fr>

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CRISP objectives

CRISP is a European Thematic Network gathering 24 partners from 16 countries, whose general objective is to create a group dynamic in the field of Construction and City Related Sustainability Indicators.

The main activities of the Network are:

- to define a framework and general methodology for construction and city related sustainability indicators,
- to stimulate and co-ordinate the development and use of such indicators,
- to gather and organise indicators within a database including information on validation, testing, criteria of use...
- and to widely disseminate the results of the research carried out.

The indicator database will form the main deliverable of this network and will be included in a public Website gathering several other types of information regarding sustainability indicators.

From a thematic point of view, four groups (called "clusters") have been established :

- the "**product**" cluster
- the "**building**" cluster
- the "**urban blocks**" cluster
- the "**process / strategy**" cluster

The collection of indicators and related systems of indicators involves all CRISP members and is controlled by these 4 clusters. The cluster leaders gather, check and synthesise the data coming from the members. Then the data can enter into the public database.



Luxury apartment building in Helsinki equipped with an underfloor heating / cooling system (free cooling energy is taken from the ground)

Framework and general methodology

• Why indicators ?

Indicators, which may be expressed quantitatively or qualitatively, enable us to monitor the change of phenomena over time and the development of phenomena in relation to stated objectives. One of the important functions of an indicator is its potential to show trends. Indicators should be objective and the results should be repeatable. In many cases indicators should also be internationally comparable, although they will most often be used nationally. The main risk with regard to indicators concerns excessive simplifying and the loss of important information. Another possible problem is the difficulty in practice to get the necessary input data for evaluation.

Agenda 21, chapter 40 states that "Indicators of sustainable development need to be developed to provide solid bases for decision making at all levels, and to contribute to a self-regulating sustainability of integrated environmental and development systems." In relation to policy-making, environmental indicators are used for three major purposes (EEA 1999)¹:

- to supply information on environmental problems, in order to enable policy-makers to assess their seriousness,
- to support policy development and priority setting, by identifying key factors that cause pressure on the environment,
- to monitor the effects of policy responses.

• Data Sheet formats

The CRISP Network has collectively defined two linked data sheet formats for the relevant documentation of indicators and systems of indicators. The structuring of the different items is inspired from EEA typology and specific construction-related issues. The formats also include information on implementation context, precautions of use, previous uses, as well as references. Detailed filling instructions have been developed together with the data sheets.

The two formats, the first one designed for systems of indicators, the second one for indicators themselves, are presented below, each one filled with an example (note : the indicator presented in the example does not belong to the system presented beside).

*Apartment building
in Eco-Viikki-area in Helsinki
(heat demand reduced by 50 %)*

¹ European Environment Agency, 1999 : Technical report No 25, "Environmental indicators: Typology and overview". Smeets, E. & Wetering, R.



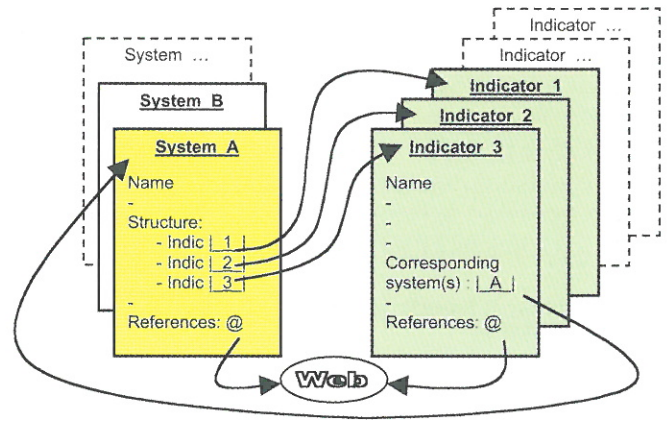
System details	
Name	Eco-Quantum
Description and aims	
Developer name	Dutch Building Research Foundation - W/E Consultants - IvAM
Developer country	List of CRISP countries: <input type="checkbox"/> Austria <input type="checkbox"/> Belgium <input type="checkbox"/> Denmark <input type="checkbox"/> Finland <input type="checkbox"/> France <input type="checkbox"/> Germany <input type="checkbox"/> Greece <input type="checkbox"/> Hungary <input type="checkbox"/> Ireland <input type="checkbox"/> Italy <input type="checkbox"/> Norway <input type="checkbox"/> Romania <input type="checkbox"/> Spain <input type="checkbox"/> Sweden <input checked="" type="checkbox"/> The Netherlands <input type="checkbox"/> United Kingdom <input type="checkbox"/> Other (define):
Detailed Structure <i>(list or tree structure, will be linked to the indicators sheets)</i>	Eco-Quantum Emissions Eco-Quantum Resources Eco-Quantum Waste Eco-Quantum Energy
Purpose	<input type="checkbox"/> Diagnosis <input type="checkbox"/> Monitoring <input type="checkbox"/> Assessment <input checked="" type="checkbox"/> Design <input type="checkbox"/> Other (define):
Type <i>(will be automatically filled from indicator sheets)</i>	[2] Descriptive: () Performance (2) Pressure () State () Impact () Response [2] Efficiency
Methods of evaluation	Calculation and simulation
Impact level <i>(will be automatically filled from indicator sheets)</i>	[4] Global [..] National [..] Regional [..] Local [..] Other
Sustainable Development Issue <i>(will be automatically filled from indicator sheets)</i>	[4] ENVIRONMENTAL (1) Natural raw materials (water included) () Bio-diversity (1) Energy (2) Environmental pollution (waste included) () Land use () Other [..] ECONOMIC () Economic development and finance () Production and consumption () Urban and community services and responses () Other [..] SOCIAL () Access () Safety & Security () Health and comfort () Socio-economic well-being () Community Responses and Human Capacity () Cultural heritage () Other
Construction Category	<input type="checkbox"/> Urban <input type="checkbox"/> Agglomeration <input type="checkbox"/> City <input type="checkbox"/> Neighbourhood <input type="checkbox"/> Infrastructure <input checked="" type="checkbox"/> Buildings <input type="checkbox"/> New <input type="checkbox"/> Refurbishment <input type="checkbox"/> Building products <input type="checkbox"/> Process
System use	
Implementation scale	<input type="checkbox"/> Unit scale <input checked="" type="checkbox"/> Multi-unit scale <input checked="" type="checkbox"/> Country scale <input type="checkbox"/> European scale
Users	<input type="checkbox"/> Planners <input type="checkbox"/> Owners <input checked="" type="checkbox"/> Developers <input type="checkbox"/> Designers <input type="checkbox"/> Contractors <input checked="" type="checkbox"/> Producers <input type="checkbox"/> Facility Managers <input type="checkbox"/> Users and inhabitants <input type="checkbox"/> Interest groups and associations <input checked="" type="checkbox"/> Public bodies: <input type="checkbox"/> National <input type="checkbox"/> Regional <input type="checkbox"/> Local
Process phase	<input checked="" type="checkbox"/> Building process: <input type="checkbox"/> Planning <input checked="" type="checkbox"/> Design <input checked="" type="checkbox"/> Property development <input type="checkbox"/> Construction <input type="checkbox"/> Operation <input type="checkbox"/> Demolition <input type="checkbox"/> Disposal <input type="checkbox"/> Manufacturing process: <input type="checkbox"/> Product development <input type="checkbox"/> Manufacturing
Restrictions and warnings for use	
Previous use	
User country(ies)	List of CRISP countries: <input type="checkbox"/> Austria <input type="checkbox"/> Belgium <input type="checkbox"/> Denmark <input type="checkbox"/> Finland <input type="checkbox"/> France <input type="checkbox"/> Germany <input type="checkbox"/> Greece <input type="checkbox"/> Hungary <input type="checkbox"/> Ireland <input type="checkbox"/> Italy <input type="checkbox"/> Norway <input type="checkbox"/> Romania <input type="checkbox"/> Spain <input type="checkbox"/> Sweden <input checked="" type="checkbox"/> The Netherlands <input type="checkbox"/> United Kingdom <input type="checkbox"/> Other (define):
Further information	
References	
Additional information and remarks	Eco-Quantum can use MRPI indicators as inputs
CRISP members' comments	
Proposer	
Name / Country / Email / Date	Peter Rommens, The Netherlands, rommens@we-nl, 21 December 2001

- Example of system from the Building cluster -



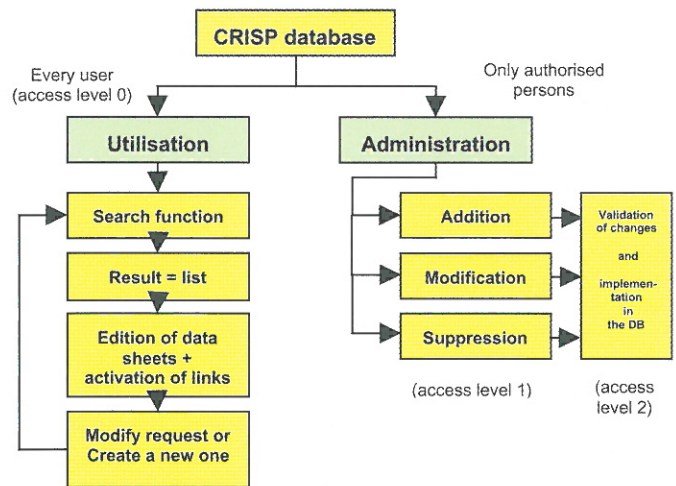


Indicator details	
Name	Local contribution to global climatic change
Description and aims	CO ₂ emissions (in the longer term, when simplified methodology has been identified, this indicator will focus on the ecological footprint)
Unit	
Type	<input checked="" type="checkbox"/> Descriptive: <input type="checkbox"/> Performance <input checked="" type="checkbox"/> Pressure <input checked="" type="checkbox"/> State <input type="checkbox"/> Impact <input type="checkbox"/> Response <input type="checkbox"/> Efficiency
Method of Evaluation	Calculation and simulation
Impact level	<input checked="" type="checkbox"/> Global <input type="checkbox"/> National <input type="checkbox"/> Regional <input type="checkbox"/> Local <input type="checkbox"/> Other (define):
Sustainable Development Issue	<input checked="" type="checkbox"/> ENVIRONMENTAL <input type="checkbox"/> Natural raw materials (water included) <input type="checkbox"/> Bio-diversity <input type="checkbox"/> Energy <input type="checkbox"/> Environmental pollution (waste included) <input type="checkbox"/> Land use <input type="checkbox"/> Other (define) <input checked="" type="checkbox"/> ECONOMIC <input type="checkbox"/> Economic development and finance <input type="checkbox"/> Production and consumption <input type="checkbox"/> Urban and community services and responses <input type="checkbox"/> Other (define) <input checked="" type="checkbox"/> SOCIAL <input type="checkbox"/> Access <input type="checkbox"/> Safety & Security <input type="checkbox"/> Health and comfort <input type="checkbox"/> Socio-economic well-being <input type="checkbox"/> Community Responses and Human Capacity <input type="checkbox"/> Cultural heritage <input type="checkbox"/> Other (define)
Construction Category	<input type="checkbox"/> Urban <input type="checkbox"/> Agglomeration <input type="checkbox"/> City <input type="checkbox"/> Neighbourhood <input type="checkbox"/> Infrastructure <input type="checkbox"/> Buildings <input type="checkbox"/> New <input type="checkbox"/> Refurbishment <input type="checkbox"/> Building products <input type="checkbox"/> Process
Indicator use	
Corresponding system(s)	The 10 composite European indicators (The system is a composition of 5 core or compulsory indicators and 5 additional or voluntary indicators)
Restrictions and warnings for use	
Further information	
References	"Towards a local sustainability profile: European common indicators", Technical Report Elaborated by the Working Group on Measuring, Monitoring and Evaluation in Local Sustainability, Expert Group on the Urban Environment, European Communities, 2000 http://www.sustainable-cities.org/expert.html
Additional information and remarks	It's one of the 5 core indicators The measurement methods could be: buildings, transports, ... energy consumption, ...
CRISP members' comments	It's relevant for important conurbations: it needs specific means and tools
Proposer:	
Name / Country / Email / Date	Catherine CHARLOT-VALDIEU, Philippe OUTREQUIN, France, Charlot_Valdieu@csb.fr, la.calade@free.fr, May 2002



- Organisation of data sheets in the database -

Like every database, the CRISP one will be accessible in different ways, for utilisation or for administration purposes. Different access levels are defined. The database access and main functions are shown in the figure below.



- Basic principles of the CRISP database -

- Example of indicator from the Urban blocks cluster -

Description of the CRISP indicator database

• Structure of the database

The database structure is based on two linked data sheets: the "indicator data sheet", documenting the indicators individually, and the "system data sheet", documenting the sets or systems of indicators. Indeed, a system is made of several indicators, and an indicator may belong to one or more system. The following figure presents schematically how the two complementary types of data sheets are linked inside the database, so as the user be able to navigate from indicators to systems and from systems to indicators.

As the information contained in each data sheet is necessarily limited, the data sheet will include in the field "references" an Internet address, allowing the user to access directly to more detailed information.

In order to avoid double working for those filling the database, some figures are automatically calculated for each system, e.g. the number of indicators of this system dealing with each sustainable issue. This is another kind of internal link, specifically designed for this database.

• Expected functions and end-users' viewpoints

- For an end-user, the objectives of the utilisation part are :
- to get an overview of the whole contents of the database,
 - to search indicators or systems according to a "certain number" of criteria, selected among the whole set of criteria and sub-criteria (see ticked boxes) in a flexible way, adapted to the needs and concerns of each end-user,
 - to complete the search with one or several keywords,
 - to get a list of the selected data sheets,
 - to visualize the full contents of them,
 - to be able to navigate between indicators and systems data sheets, using the internal links of the database,
 - to activate Web external links,
 - to modify the current request or to create a new one.

The potential end-users of the CRISP database are very diversified : policy-makers, local authorities, designers, building owners, etc. Their concerns and interest are therefore very diversified, and also their possible starting questions, which forms the "entry keys" of the database. Consequently, the search function of the database must be as flexible as possible in order to reflect the various end-users' viewpoints.

• **Example of end-users' feedback**

The CRISP members arranged end-user meetings in their country, and during the latest ones, the end-users commented on the structure of the datasheets in terms of usefulness and readability. For example, the end-user meeting arranged in Finland in February 2002 gave the following feedback, also given in some other countries:

- CRISP indicator System data sheets seem promising in practice, especially if they have active links to related Web-sites with references,
- it's important to know if the Indicators or Indicator Systems have an official status somewhere or if they are widely/frequently used,
- individual indicators may have a very limited applicability as such, but in a form of systems of indicators they add value to the current practice,
- indicator reference/target values would be useful,
- various search functions would be practical.

• **Status of work**

At the beginning of 2002, 259 indicators, gathered in 17 sets or systems, have been collected through CRISP members. The 17 systems are the following : Cities of the Future – Ecodec – EcoProP – Eco-Quantum – GDR – GBC – Group A Indicators – Hammarby Sjöstad Indicators – MEGAD – MRPI – PIMWAG – REKOS for residential buildings – REKOS for Actors – RT Environmental Declaration – Sustainability Indicator Set for the Construction Sector – TQ Building Assessment System – 10 Composite EU Indicators. Of course, detailed information will be available in the database.

As soon as the data sheets are checked by the cluster leaders, they will be put in the database of the public website. An internal prototype has been set up in order to demonstrate to the end-users the contents and the structure of the database. The objective is of course to enlarge it and to develop a robust, easy-to-use and easy-to-maintain tool.

• **Concluding remarks**

The CRISP Network has defined a framework for indicators, collected and outlined indicators in accordance with the framework. The collecting of indicators and the building up of a database is still going on. The idea is to collect a reasonable number of well organised indicators and thus support the use and development of appropriate sustainability indicators in the different stages of building process.

Collecting relevant R&D information

• **Larger Concept of CRISP database**

The CRISP public Web site (see <http://crisp.cstb.fr>) is already the support of several sorts of databases, including not only the sustainability indicator database, but also two allied databases dealing with :

- 1) **Recent and on-going R&D works** carried out in the CRISP member countries, in the field of sustainability indicators,
- 2) **Links to other Web sites**, about research, projects, networks, experiments, etc., in Europe and all around the world, with a short comment.

Regarding recent and ongoing R & D works, the objective is to share information on works carried out by the CRISP members, in relation with indicators in the construction sector. The Website presently welcomes the first sheets, and some others are expected in the next future. By exchanging and disseminating such information of the Web, this task contributes to one of the CRISP objectives: to stimulate and co-ordinate the development and use of construction and city-related indicators. Let's mention the first documented R & D works :

- The material-based environmental performance profile of buildings - The Netherlands Standardization Institute
- Sustainable building (MISTRA-bygg) – Chalmers University - Sweden
- ESCALE, assessment method of buildings environmental performance – CSTB - France
- Sustainability profile for a location (DPL) – TNO - The Netherlands

Dissemination of results

• **Website**

A Website for public audience has been set up to disseminate information on the activities and main events of the Network, but also, through specific pages and links to other Web sites, to disseminate information on the related information (URL address: <http://crisp.cstb.fr>). The Website will evolve all along the project. The Web site hosts all the public deliverables of the Network, that is to say so far: the project abstract, a summary, the state-of-the-art report, the national reports, the newsletters, some examples of R&D works carried out by the CRISP partners, interesting web links with other projects in the world that are close to CRISP scope, and a first version of the CRISP indicator database showing through some examples how the two data sheets are structured and linked. Questions and comments are welcome.

• Newsletters

In certain countries, it appeared important to translate the newsletter, in order to reach every kind of end-user. Full text of the first newsletter is available in 4 languages: English, Hungarian, French and Italian. We hope to get also translated versions of this newsletter 2.

The dissemination takes several ways:

- mails to end-users,
- Web site,
- conferences and other events in the different countries.

• Network of End-users

Every CRISP Member has been asked to set up a national end-users network. These national networks, put together, will form a CRISP end-users network, to which results from CRISP will be disseminated. This network will be updated continuously all along the life of the Network.

At the beginning of 2002, the list contained about 600 names. The end-users identified so far belong to different kinds of companies, organisations or bodies, at different scales: national, regional and local. We can also find in the lists different categories of professionals, as individuals and as federations. In addition, some international experts, from Europe and outside, have been selected to supplement the lists of end-users. Because of confidentiality rules in some countries, the list of end-users is not published.

The CRISP Advisory Committee also acts as a European User Group.

The CRISP members organised during the second half of 2001 one or two meetings with the end-users of their country, where CRISP was presented and discussed, in order to get feedback and to know their needs and constraints.

• Standardisation awareness

It is important that CRISP information and results can reach standardisation organisations and related experts. This process has begun in some countries and will be strengthened in the future.

• Links with other EU projects

Links have been established with other topic-related EU networks or projects : BEQUEST, TRA-EFCT, PRESCO, SUREURO, HQE2R, PASTILLE. Cross participation of persons in different projects is also a factor of success.

• Joint PRECO-CRISP Workshop in Ostend, Belgium, June 2002

The two European Thematic Networks, CRISP and PRESCO, are organising a joint Workshop on 24th and

25th of June 2002, in Ostend, Belgium. All types of potential future users of CRISP and/or PRESCO deliverables have been invited to participate and to give their views. The importance of this should not be underestimated: Once established, the recommendations of PRESCO and the indicator database of CRISP will be used by the authorities and organisations involved in the networks to guide their decisions.

The objective is to present progress and achievements, and to gather comments and amendments on the recommendations developed by PRESCO and on the indicator database developed by CRISP.

The workshop will also enable participants to be informed about recent developments with regard to European and international research on sustainable construction. Keynote speakers have been invited to talk about the European 6th Framework Programme, the Green Building Challenge, the Competitiveness of the Construction Industry, Inclusive Design and Sustainable Architecture.

Information on PRESCO and on this workshop is available at <http://go.to/presco.net> . After the Workshop, a summary will be published on CRISP and PRESCO Websites.

• Other events

CRISP was presented in several conferences. The next presentation of CRISP objectives and status of work will occur at the international conference "Sustainable Building 2002" (Oslo, september 2002). See www.sb02.com for details.

On the CRISP Website are also mentioned other interesting conferences having connection with CRISP scope:

- Indoor Air 2002, 9th International Conference on Indoor air Quality and Climate, June 30th – July 5th 2002, Monterey, California (USA)
- The Sustainable City 2002, 2nd International Conference on Urban Regeneration and Sustainability – 3-6 July 2002, Segovia (Spain)
- "DM in UCE" London' 2002, 3rd International Conference on Decision Making in Urban and Civil Engineering, 6-8 november 2002, London (UK)
- Fifth International Eco-city Conference, August 19-23, 2002, Shenzhen (China)
- ... and other events like the SUREURO periodic conferences.

Members and organisation

The CRISP Network comprises 24 members and cover 16 countries in Europe. CRISP is led by 2 main partners: CSTB (Centre Scientifique et Technique du Bâtiment, France), the Network Co-ordinator, and VTT Building and Transport (Finland). 22 other members are involved (see table next page).

<ul style="list-style-type: none"> • AUSTRIA <p>Wien University of Technology (TUW) Mr Thomas Macoun (thomas.macoun@tuwien.ac.at)</p> <p>Austrian Institute for Applied Ecology (AIAE) Ms Susanne Geissler (geissler@ecology.at)</p> <ul style="list-style-type: none"> • BELGIUM <p>Belgian Building Research Institute (WTCB/CSTC/BBRI) Mr Jan Desmyter (jan.desmyter@bbri.be)</p> <p>Centrum Duurzaam Bouwen / Center for Sustainable Construction (CSC) Mr Berthold Simons (b.simons@centrumduurzaambouwen.be)</p> <ul style="list-style-type: none"> • DENMARK <p>By og Byg Danish Building and Urban Research (DBUR) Mr Klaus Hansen (klh@by-og-byg.dk)</p> <ul style="list-style-type: none"> • FINLAND <p>VTT-Building and Transport Ms Tarja Hakkinen (tarja.hakkinen@vtt.fi) Mr Pekka Huovila (pekka.huovila@vtt.fi)</p> <ul style="list-style-type: none"> • FRANCE <p>Centre Scientifique et Technique du Bâtiment (CSTB) Mr Luc Bourdeau (l.bourdeau@cstb.fr) Mrs Sylviane Nibel (nibel@cstb.fr) Mrs Catherine Charlot-Valdieu (charlot_valdieu@cstb.fr) Mr Jean-Luc Chevalier (jl.chevalier@cstb.fr)</p>	<p>La Calade Mr Philippe Outrequin (la.calade@free.fr)</p> <p>Energie-Cités Mr Peter Schilken (p.schilken@arcormail.de)</p> <ul style="list-style-type: none"> • GERMANY <p>Fraunhofer Gesellschaft - Institut für Bauphysik (FhG/IBP) Mr Erhard Mayer (mayer@hoki.ibp.fhg.de)</p> <ul style="list-style-type: none"> • GREECE <p>Aristotle University of Thessaloniki (AUTH) Mr Dimitrios Bikas (bikasd@civil.auth.gr)</p> <ul style="list-style-type: none"> • HUNGARY <p>EMI Plc Mr György Kunszt (gtideren@emi.hu)</p> <ul style="list-style-type: none"> • IRELAND <p>Dublin Institute of Technology (DIT) Mr Ken Beattie (ken.beattie@dit.ie)</p> <ul style="list-style-type: none"> • ITALY <p>University of Florence – Faculty of Architecture Mr Marco Sala (marco_sala@unifi.it)</p> <ul style="list-style-type: none"> • NORWAY <p>BYGGFORSK Norwegian Building Research Institute (NBI) Mr Sverre Fossdal (sverre.fossdal@byggforsk.no)</p>	<ul style="list-style-type: none"> • ROMANIA <p>URBANPROIECT Spatial Planning Mrs Jana Suler (urban@fx.ro)</p> <ul style="list-style-type: none"> • SPAIN <p>Universita Politecnica de Catalunya (UPC) Mr Pere Alavedra (pere.alavedra@upc.es)</p> <ul style="list-style-type: none"> • SWEDEN <p>University of Gävle (HiG) Mr Mauritz Glaumann (mauritz.glaumann@hig.se)</p> <p>CHALMERS University of Technology Mr Michael Eden (eden@arch.chalmers.se)</p> <ul style="list-style-type: none"> • THE NETHERLANDS <p>W/E Consultants Sustainable Building Mr David Anink (anink@w-e.nl)</p> <p>TNO-Bouw Mr Roel Lanting (r.lanting@bouw.tno.nl)</p> <ul style="list-style-type: none"> • UNITED KINGDOM <p>Building Services Research and Information Association (BSRIA) Mrs Anu Palmer (anu.palmer@bsria.co.uk)</p> <p>Building Research Establishment (BRE) Mr David Crowhurst (crowhurstd@bre.co.uk)</p> <p>University of Salford (USAL) Mr Stephen Curwell (s.r.curwell@salford.ac.uk)</p>
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The CRISP Network Board comprises 4 members: the Co-ordinator Luc Bourdeau (CSTB), the Technical Director Tarja Hakkinen (VTT), the Exploitation Director Pekka Huovila (VTT) and the Communication Director Sylviane Nibel (CSTB).

Four cluster leaders have been appointed : Catherine Charlot-Valdieu (CSTB) for the Urban block cluster, Tarja Hakkinen for the Building cluster, Jean-Luc Chevalier (CSTB) for the Product cluster and Pekka Huovila for the Process/strategy cluster.

An Advisory Committee was created, including representatives of other related European Networks and representatives of the main end-users. A meeting with this Committee was organised in october 2001.

Practical information

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• About CRISP

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[Web site: http://crisp.cstb.fr](http://crisp.cstb.fr)

• About this newsletter

This newsletter is the second of a series of four. It is disseminated mainly through e-mail and can be downloaded from <http://crisp.cstb.fr>. Hard copies of this English version can be obtained, please contact nibel@cstb.fr.

Photos : Finnish low energy buildings
Photographed by Antonin Halas
Pictures owned by VTT