

**NATO/CCMS
Short Term Project**

**SUSTAINABLE BUILDING
FOR
MILITARY INFRASTRUCTURE**

2nd Phase

October 2000 – February 2003

Report No. 263

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1. SUMMARY REPORT

The NATO Committee on the Challenges of Modern Society agreed to implement the short term ad hoc project “Sustainable Building for Military Infrastructure” (SBMI) commencing in March 1999. The short term project has been completed in two phases; the project steering group submits this final report on the SBMI project with emphasis on the second phase. A brief summary of Phase I is included; the full report of the first phase of the project is available at CCMS in report no. 246.

The short term project has been conducted within the terms of reference to achieve objectives as agreed for Phase II of the project:

- To provide an ongoing forum for exchange of technological demonstrations and analysis of innovations;
- Providing source documents establishing acceptable methodologies for:
 - Identifying sustainable building projects;
 - Applying sustainable building principles to military building projects;
 - Measuring key aspects to establish performance indicators;
 - Reporting on projects with a view to sharing lessons learned.

The 2 Phase project included participation of 8 NATO member countries and 9 EAPC countries; the initial phase of the project established the extent to which the principles of sustainable building were being applied in the military infrastructure spheres of different countries; the second phase has focused on knowledge transfer related to sustainable building amongst participating countries.

The second phase of the Sustainable Building for Military Infrastructure project has been successful in:

- Consolidating and expanding network of participants active in the knowledge transfer within the target community;
- Completing and documenting a second seminar that included 20 presentations from 10 countries; the seminar was attended by in excess of a hundred participants from 22 NATO and EAPC countries.
- Establishing a framework within which ongoing knowledge transfer on sustainable military infrastructure amongst participants can be achieved; currently there are in excess of 50 document files from 11 participant countries within the documentation database. In addition there is a plan in place to sustain the knowledge transfer and derive benefit for the participant community from complementary civilian international initiatives, such as the iiSBE Sustainable Building Information System.
- Establishing a Sustainable Building site within the NATO CCMS web site to facilitate ongoing knowledge transfer.

The Sustainable Building for Military Infrastructure short term project has proven beneficial in furthering participants’ knowledge in the subject area, dissemination of methodologies, tools and processes, sharing of experience and lessons learned. More importantly the project has laid the ground work for the ongoing transfer of knowledge and the further evolution of collaborative and targeted endeavours by project participants in the sustainable building sphere.

As a result of the short term project participants have gained the knowledge to realise benefits in terms of reduced resource use, lower environmental burdens, fewer adverse effects on the global environment and enhanced indoor environmental performance related to their military buildings.

2. INTRODUCTION

Background

The vision of "sustainable development" has been endorsed internationally (World Commission on Environment and Development) and public concern regarding environmental issues such as "climate change" are heightened. Leadership from the public sector is necessary.

Infrastructure has a significant impact on the environment; for example buildings account for 40% of the energy and 16% of the water used annually world-wide. Ministries of Defence own and occupy a significant share of public infrastructure, and thus have a particular responsibility to improve environmental performance in this area.

"Sustainable building" is the application of sustainable development principles to the programming, design, construction, renovation, operation and decommissioning of infrastructure. This offers a unique opportunity for our defence organisations to benefit from resulting improvement.

The objective of "sustainable building" has also been defined as:

"...Sustainable building is directed at improving the health and environmental effects of the building process, of buildings and of the built environment. Therefore it is important that designers, contractors and other parties involved in building activities realise that during the whole building process there are possibilities to contribute to a sustainable development in the building sector..."

Phases

The project "Sustainable Building for Military Infrastructure (SBMI) has been carried out in two phases.

The first phase sought to find to what extent the principles of Sustainable Building were already being applied in different countries and to gauge whether there was interest in setting up a more thorough study of the subject. The main event of Phase I was a seminar at Delft, the Netherlands in March 2000, where seventeen countries participated.

In Phase II more information has been gathered on Sustainable Building policies and programs, methods and tools, examples of sustainable buildings and a network of experts. Besides those activities a second seminar was organised in Brussels, Belgium and working groups have worked at setting up a web site and a database for the distribution and exchange of information on sustainable building.

The first phase ran from the Spring CCMS Plenary in March 1999, where the project was approved. At the Fall CCMS Plenary in Berlin (October 2000) the final report of Phase I was presented and at the same time a proposal for continuation of the project was presented.

The second phase stretched therefor from October 2000 to the presentation of the final report at the Spring 2003 CCMS Plenary.

Project Management

The Department of National Defence of Canada and the Ministry of Defence of the Netherlands have provided the co-directors for both phases of this project.

The Steering group, which was formed at the end of Phase I and facilitated all the work during Phase II, consisted of the two co-directors and of representatives of the Ministries of Defence of Belgium, the Czech Republic, Italy, Norway, Sweden and the United Kingdom.

3. PHASE I OBJECTIVES AND RESULTS

March 1999-October 2000

Objectives

The stated objectives of this short-term project were the following:

- establish to what extent participating countries have developed and implemented policies on sustainable building
- share experiences and successes in this field
- demonstrate good examples of sustainable techniques in building projects
- improve awareness of “green” design and assessment tools
- establish a network of sustainable building experts and
- determine plans for future action.

Participating countries

A total of 17 countries participated in the project:

NATO: Belgium, Canada, Czech Republic, Italy, the Netherlands, Norway, United Kingdom, United States

EAPC: Finland, Georgia, Lithuania, Moldova, Romania, Slovak Republic, Slovenia, Sweden, Switzerland.

Achievements

The first step in this project was to identify a network of contacts on sustainable building within the participating countries through the CCMS representatives. During the summer of 1999 a written survey was undertaken to identify the level of implementation of sustainable building concepts and the areas of interest in the different countries.

From March 14 to March 16, 2000 a seminar was held in the Netherlands to expose and discuss the survey information, to have speakers present specific aspects of the subject, to show examples of pilot projects and to determine plans for future action.

The following topics were addressed:

- The necessity of sustainable building
- What is sustainable building?
- Ongoing international initiatives
- A comparative study of sustainable housing in 24 European countries
- Presentation of survey results
- Sustainable building within the Norwegian defence organisation, the US Navy and the Dutch defence organisation
- Life Cycle Analysis and sustainable building measurement tools.

Implementation strategies and the use of measurement tools were discussed in smaller group workshops, to share experiences and establish common approaches for future work. Outcomes of these workshops were consolidated in the plenary sessions, and four statements of principle were agreed upon.

Field trips were undertaken to sites where traditional and new sustainable building projects were examined.

On March 20 and 21, 2000 the initial report was presented at the CCMS Plenary in Brussels.

On June 29 and 30, 2000 six countries (Canada, Italy, the Netherlands, Norway, Sweden and the United Kingdom) met in Birmingham to determine plans for future action and to set up a plan of approach.

The final report was developed and presented at the fall Plenary 2000, together with a plan for continuation of the short term project.

Publication of the full report

The full report on the first phase of the short-term ad hoc project (the contents and outcome of the March 2000 conference in the Netherlands) is available at CCMS under report no. 246.

Conclusions

Agreements reached during the course of this project included unanimous support for further action on sustainable building and endorsement of the guiding principles and initial steps required to further these efforts.

There was also a general acknowledgement of the overall success of this project and of the need for more rigorous application of scientific approaches to surveys.

In addition to the co-ordinating efforts of the Netherlands and Canada, participants from the following countries volunteered to develop a work plan for further action: Czech Republic, Italy, Norway, Sweden and the United Kingdom.

The principles agreed upon at this seminar were:

- i. NATO/EAPC countries working together can help guide and improve environmental practices to foster sustainability thereby promoting broader peace and security objectives. Ministries of Defence would thus be seen to be supporting national interests by encouraging environmental stewardship.*
- ii. Sustainable Building requires integrated early planning and management practices. It requires dedicated effort to achieve improved environmental performance and reduced life cycle costs.*
- iii. By assessing the environmental performance of our buildings and lands and by sharing lessons learned, participating countries can better understand the extent of sustainable activity now in place, and establish benchmarks for future action.*

- iv. *The CCMS can play a role in supporting and co-ordinating Sustainable Building efforts in the military sector of the participating countries.*

In addition, specific actions were agreed upon – and worked out further at the June meeting in Birmingham - as necessary first steps toward enhancing Sustainable Building principles:

- i. Establish common terminology including the definition of common parameters and identifying the key elements of sustainable building processes,
- ii. Exchange information on case studies (retrofit, new, regional) and topics such as implementation strategies, initial and life cycle costs and new technical developments,
- iii. The means of exchanging this information will be:
 - Periodical seminars (every one or two years)
 - The CCMS web site.

4. PHASE II OBJECTIVES AND RESULTS

October 2000 - March 2003

4.1 Background

At its March 1999 Plenary Meeting in Brussels Belgium, the Committee on the Challenges of Modern Society (CCMS) agreed to the implementation of a short-term project on this subject.

The core concept of sustainable building is, "...building in such a way that consideration is given to environmental quality as a matter of course at every stage of the building process, from design through the operational phase to demolition...".

Fifteen nations (see Final Report "Sustainable Building for Military Infrastructure", August 2000) attended the 3-day conference co-chaired by Canada and the Netherlands in Delft, the Netherlands from 14 to 17 March 2000.

The initial results of the (short-term project) conference were shared by the co-chairs with CCMS members at the March 20-21 2000 meeting in Brussels. At that time the co-chairs agreed to return to the CCMS fall 2000 plenary meeting with a plan of action following from the March conference.

In summary, the conference demonstrated clearly that:

- There is widespread interest across the military sector in the theory and practice of sustainable building;
- There are both short- and long-term benefits from integrating the principles into current practices;
- Regulated use of energy-saving technologies including sustainable building principles is a distinct possibility in the future, as fossil fuel sources become more scarce and expensive to exploit; and,
- The core practices are both "common sense" based and easily adapted to current practices.

As agreed at the March 20-21 CCMS plenary meeting, a group of nations (Canada, the Czech Republic, Italy, the Netherlands, Norway, Sweden, and the United Kingdom) would prepare a plan for further action. These nations met in Birmingham, UK on June 29-30, 2000 for this purpose (the Czech Republic was unable to attend).

This group developed a plan that respected the parameters agreed to in Brussels, namely that the plan would:

- Be based on the principles established at the (short-term project) conference;
- Address the specific actions addressed at the conference;
- Present a mechanism by which the sustainable building initiative could be advanced considering options such as: a pilot study, ongoing information exchange supported by regular meetings, and improved communications on a multilateral basis.

Further, members at the Birmingham meeting agreed that, to take full advantage of the benefits accruing from the integration of sustainable building principles and practices into existing processes, it would be necessary to conduct a "triage" exercise whereby potential sustainable building practices and processes could be identified, analysed, and shared among

participants so that the risk of adopting questionable new approaches is minimised. The proposed approach to achieving this overall goal is set out in the following paragraphs.

4.2 Objectives

The value of continuing and expanding the sustainable building short-term project was captured in the principles developed at the March conference, namely that:

- NATO/EAPC countries working together can guide and improve environmental practices to foster sustainability thereby promoting broader peace and security objectives. Ministries of Defence would thus be seen to be supporting national interests by encouraging environmental stewardship;
- Sustainable building requires integrated early planning and management practices. It requires dedicated effort to achieve improved environmental performance and reduced life cycle costs;
- By assessing the environmental performance of our buildings and lands and by sharing lessons learned, participating countries can better understand the extent of sustainable activity now in place and establish benchmarks for future action; and,
- Within this framework, the sustainable building efforts of the military sectors of participating countries can be supported and co-ordinated.

To respect these principles in the context of the original objectives of the short-term project, this expanded project would implement the objective “establishing plans for future action” to ensure specifically that the project will:

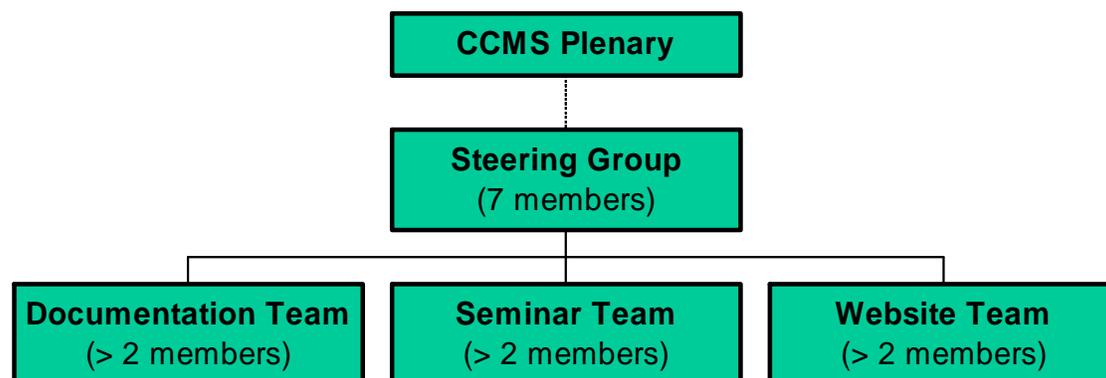
- provide an ongoing forum for the exchange of technological demonstrations and analysis of innovations;
- provide a source document establishing acceptable methodologies for:
 - identifying potential sustainable building projects;
 - applying relevant and appropriate sustainable building principles to those projects at every critical stage;
 - measuring key aspects of projects to establish performance indicators; and
 - reporting on projects to members with the goals of sharing lessons learned and actively promoting the positive elements of sustainable building practice;
- maximise the use of the CCMS web site as a vehicle for disseminating timely and relevant information to member nations; and,
- investigate the possibilities of applying sustainable building principles in the requirements for NATO common funded infrastructure.

The participating countries would consist of the member countries and the European Atlantic Partnership Council (EAPC) countries.

4.3 Programme and organisation

The programme for the expanded project would comprise three elements:

- a web site for disseminating new developments in the field of sustainable buildings;
- a series of conferences/trade shows once every 12 to 18 months at which “hands on” experiences and lessons learned could be shared and opportunities for collaborative partnerships identified and pursued;
- a document that would serve as an introduction to the theory and practice of sustainable building as well as a guide to implementing sustainable building projects.



The expanded project would be overseen by a Steering Committee with membership from Canada, the Czech Republic, Italy, the Netherlands, Norway, Sweden, and the United Kingdom.

The steering committee would in turn co-ordinate the work of three sub-committees:

- the Web Page Sub-committee;
- the Forum Planning Sub-committee; and,
- the Document Development Sub-committee.

In brief each of these sub-committees would be responsible for the planning, logistics, secretariat services, recording and reporting functions for that sub-committee’s activities.

The Steering Committee would operate under specific Terms of Reference to be drafted by this Committee and endorsed by participating nations in the event that this project is approved. These Terms of Reference would include but not necessarily be restricted to:

- Accepting the work plans and approving the products of the three sub-groups;
- Providing advice and guidance to the sub-groups and to member nations on various aspects of the project as necessary;
- Mediating on differences arising out of the workings and interactions of the sub-groups;
- Reporting to the CCMS plenary as required; and,
- Seeking approval for and disseminating final product(s) as they are developed.

The time frames for completion of the three elements of the project are as follows:

- Document writing: 18 months from CCMS approval;
- Forum on innovative technologies: the first to be held within 12 months of CCMS approval at a site to be volunteered by a member nation willing to host the event. Further fora to be scheduled on an 18 to 24 month recurring basis or as the need is identified;
- Web page exploitation: within 6 to 12 months of approval by CCMS

Resources

The Department of National Defence (Canada) and the Ministry of Defence (Netherlands) jointly sponsored the initial project proposal. As a result of the March 2000 conference, Italy, Norway, Sweden and the United Kingdom have joined the two original proponents in submitting this proposal. Although the Czech Republic was unable to attend the Birmingham meeting, they are still sponsors of this proposal. These nations agree to initiate, organise, and provide administrative support for the continued and expanded project.

It is assumed that participating nations will fund their own participation thus making the project practically self-supporting.

The NATO CCMS grant was available at both seminar to enable EAPC members to participate and share their experiences.

4.4. 2002 SEMINAR BRUSSELS

General Background

At the Rijswijk Conference 2000 a Steering Group was formed in order to pursue the principles agreed there. The Group took as an action to plan for a subsequent seminar in autumn 2001 or early 2002.

After Belgium had volunteered to host the seminar, a Belgian representative joined the Steering Group, and a meeting was held in Den Haag in August 2001 to discuss the arrangements. It was agreed to schedule the seminar for March 2002 to allow adequate time for preparations and logistics.

It was by then also clear that Norway had agreed to carry part of the seminar costs.

At the Steering Group meeting in Brussels January 22 the principles and the general agenda of the seminar was agreed upon:

- *As many countries as possible should be able to present their position;*
- *Belgium as an organiser must be given the opportunity to present more information than other countries;*
- *During the first day there is a larger audience than the 2nd and 3rd. The first day should bring a balanced program with:*
 - *General topics*
 - *Policy Topics*
 - *Project examples*

To the first day of the conference there will be, in addition to the NATO/EAPC delegates, invitees from the Belgium Armed Forces, from NATO International Staff and from Belgian civil authorities.

The meeting further discussed the subject of joining the military conferences to the largest global initiative in this field, the Sustainable Building Conference:

“The ideas about future seminars have been discussed and the following general principles have been agreed upon:

With the Ministries of Defence we can never reach the width and the depth of topics as presented during civil seminars (like the Green Building Challenge, Sustain 2001, Sustainable Building 2002). We should try to combine our military seminar with a civil seminar, for example in 2002: 3 days World Congress “Sustainable Building 2002” in Oslo, followed by 1 (?) day to focus on specific military subjects. We should try to have Ministries of Defence give presentations during the civil seminar.”

It was agreed that the organisers of the Sustainable Building Conference should be contacted, and that a proposition should be put to the participants of the seminar in Brussels to be agreed upon.

Proceedings of the Seminar

The seminar was conducted according to the decided general agenda (final agenda, see Annex A).

22 NATO and EAPC nations were represented at the seminar with approximately 100 participants present on the first day and some 60 delegates for all three days (Annex B).

20 presentations on policies, challenges and technical and constructional solutions, representing 10 countries, were given (Annex C)

The subject of future seminars was treated in a short plenary session. It was by then known that Sustainable Building conferences after Oslo 2002 probably would be every 3rd year.

The general feeling of the audience in Brussels was:

- It is desirable to have future seminars on Sustainable Building for Military Infrastructure
- Seminars ought to be every second year in order to maintain interest and momentum
- Seminars ought to be separate from large events like Sustainable Building so as to
 - facilitate putting in focus interests and special topics pertaining to the challenges of the NATO/EAPC countries
 - facilitate the delegates' making relevant contacts
- Seminars ought to be one-stream in order to facilitate the delegates being able to sit in on all presentations
- Seminars should have an official standing within the NATO CCMS system

It was concluded that it was desirable to pursue future seminars on Sustainable Building for Military Infrastructure

The question of whether to join the Sustainable Building Conference or to have separate seminars for Sustainable Building for Military Infrastructure was then put to the vote.

Conclusion: There was a majority for separate military and civilian seminars.

The question of an organising country for 2004 was then put to the audience. Although some countries expressed an interest, no delegate had at that time the authority to bind his/her country or agency.

4.5. WEB SITE

The web site working group launched the SBMI web site at the Brussels Seminar in March 2002. The current pages are attached to this report as Annex C.12. The structure of the site was designed to give visitors a brief introduction to the principles underlying the SBMI study, general information on the various working groups, together with the contact addresses for the working group members, news of events, particularly the seminars, and links to other web sites dealing with sustainability.

A revision to the pages is in hand to reflect the latest situation.

It is intended that some of the documentation web pages will move in due course to the iiSBE (Sustainable Building Information System) web site when this goes live. The items that will move are Policy and Programmes, Methods and Tools, and Buildings. They will still be easily accessible from the NATO/CCMS web site.

The logic behind this move is twofold, firstly that the iiSBE web site is updated on a regular basis, and secondly that the SBIS holds a great deal of information on buildings other than purely military ones.

The documentation team will retain responsibility for materiel destined for the SBMI element of the iiSBE web site, whilst the web site team will retain responsibility for the maintenance of the rest of the web site.

The web address to the Sustainable Building web site is:

www.nato.int/ccms/pilot-studies/sustain

4.6. DOCUMENTATION

The documentation action plan supports SBMI principles of sharing knowledge to facilitate an understanding of the extent of sustainable activity of military agencies in participating countries and dissemination of lessons learned.

SBMI documentation is intended to be both a legacy of the short term project but also a building block for ongoing knowledge transfer for use in the conduct of environmental issue management in the military building sector.

The SBMI documentation strategy has been developed to provide a vehicle for the exchange of sustainable building information within a structured framework facilitating compilation, access and use of the data. While SBMI focuses on military infrastructure applications the documentation strategy is intended to pre-position SBMI participants to derive benefit from access to and inter-operability with other complementary documentation reflecting the growing body of knowledge in the broader context of sustainable building..

In accordance with direction forthcoming from SBMI project participants, the documentation framework has been structured to allow for continuous evolution and seamless integration with the structure of the information database of the sustainable building information system (SBIS). The SBIS has been developed by the “international initiative for a Sustainable Built Environment” (iiSBE), a non-profit collaborative effort to facilitate and promote the adoption of policies, methods and tools to accelerate the movement towards a global sustainable built environment.

The SBMI documentation templates have been developed to allow for future capability for searching/ access and inter-operability with the iiSBE SBIS database. Searches based on criteria such as subject specific interests, climatic, occupancy, targeted environmental issues Ie: site, energy, resource use, indoor environment etc. will be accommodated when the SBMI documentation is installed on the SBIS database/ web-site.

The standardised SBMI data sheets have been distributed and completed by participants covering: people, policies & programs, methods & tools and buildings. The trial documentation has been completed based on the input from 11 participating countries: to date 54 files have been compiled for installation on the NATO CCMS SBMI web-site.

The SBMI documentation will initially be accessible only through the NATO CCMS SBMI web-site. SBMI documentation/ data is also to be compiled into an SBMI folder in the iiSBE Sustainable Building Information System (SBIS) database. The SBIS database is currently available on CD; it is being updated quarterly until the SBIS web-site is fully operational. CD's of quarterly updated SBIS database will be distributed to each country participant in SBMI until such time as the SBIS web-site is operational.

Canada has established a contract with iiSBE for the initial year of iiSBE SBIS access: this will enable SBMI project participants to access the SBIS to assess the utility of the enhanced search capability provided by this link. Based on user feedback a decision on maintaining iiSBE membership/ database access can be made.

Henceforth, SBMI documentation will be requested from established project participants/ military agencies interested in sustainable building knowledge transfer by e-mail twice yearly. Inputs are to be submitted on standardised forms to the documentation team member

identified on the web-site. Input data will be reviewed for quality assurance/ relevance by the documentation team prior to web-site installation and/ or transmittal to the iiSBE. The existing database files will also be reviewed annually to ensure currency.

The ongoing SBMI/ iiSBE SBIS interface should be reviewed for viability/ cost effectiveness after the initial year. Subject to the extent of documentation support provided and the scope and frequency of database access required by SBMI participants, the iiSBE membership status/ arrangement should be clarified for the longer term.

5. FOLLOW-UP ACTIVITIES

Although the Short Term Project “Sustainable Building for Military Infrastructure” has at this point come to an end a number of activities will continue.

Seminar

It has been decided that seminars will be organised at 2-year intervals to exchange information between the NATO and EAPC countries on this topic.

The decision to organise the Spring 2004 seminar in one of the NATO countries is at this point in time (February 2003) in the final discussion stage.

It is envisaged that these seminars will take the form of CCMS workshops; approval for these workshops will be sought through the regular channels.

Web site

The web site will be updated on a regular basis. A representative of the Belgian Ministry of Defence will be the contact point with the NATO webmaster. A representative of the Ministry of Defence of the United Kingdom will act as editor for the SBMI web site.

Documents

The documentation database will be maintained on a regular basis. A representative of the Canadian Department of National Defence will act as contact point to the iiSBE-organisation. The regional contact points to receive and gather the updated information will be:

North America:	Canadian Department of National Defence
Nordic Europe:	Norwegian Defence Estates Agency
Central Europe:	Ministry of Defence of the Netherlands
Southern Europe:	vacant

Organisation

The Steering Group will stay in contact but go into a “sleeping mode”. When the need arises they will become active.

Whenever somebody leaves the Steering Group because of other activities, he or she will find a replacement in his/her organisation.