Bringing Retrofit Innovation to Application in Public Buildings

Hans Erhorn
Fraunhofer Institute of Building Physics

eco buildings

Eco-buildings concept:

- meeting point of short-term development and demonstration
- support legislative and regulatory measures for energy efficiency and enhanced use of renewable energy solutions within the building sector,
- go beyond the Directive on the Energy Performance of Buildings

Project aims:

- new approach for the design, construction and operation of new and/or refurbished buildings
- double approach:
    1. to reduce substantially or to avoid the demand for heating, cooling and lighting
    2. to supply the necessary heating, cooling and lighting in the most efficient way and based as much as possible on renewable energy sources and polygeneration.

Abstract

- the BRITA in PuBs project aims to increase the market penetration of innovative and effective retrofit solutions to improve energy efficiency and implement renewables, with moderate additional costs
- realisation by exemplary retrofit of 9 demonstration public building in the four participating European regions
- by choosing public buildings of different types it will be easier to reach groups of differing age and social origin. Public buildings are engines to heighten awareness and sensitise society on energy conservation

Abstract

- research work packages include socio-economic research such as:
  - identification of real project planning needs and financing strategies
  - assessment of guidelines
  - internet-based knowledge tool on retrofit measures
  - quality control tool-box
- dissemination:
  - training of users and maintenance personnel
  - publishing the research and demonstration work to different target groups by targeted PR-campaigns, using local, national and international networks, the internet and other media and symposia.
- organisation: geographically by region, vertically by incorporating the owners of public buildings, the research team of architects and engineers and the dissemination networks. Managed via biannual meetings, a steering committee and four subtasks on design, implementation, use and dissemination.

BRITA in PuBs

Exemplary retrofit of 9 demonstration buildings:

- college
- cultural centre
- nursery home
- student houses
- church
- library, etc.

Research work:

- real project planning needs and financing strategies
- design guidelines
- internet-based knowledge tool
- quality control tool-box

Dissemination:

- training of users and maintenance personnel
- publishing the work to different target groups by:
  - > targeted PR-campaigns
  - > local, national and internatio-nal networks
  - > internet and other media
  - > symposia

Objectives

- development of people‘s consciousness to save energy by exemplary realisations of energy retrofit projects in public buildings:
  - reduction of the primary energy demand > factor 2
  - decrease of the dissatisfaction percentage > factor 2

- cutback on reservations against innovative energy saving retrofit concepts in public building administrations by dealing with arguements and solution methods, reliable information, energy saving potentials and costs. Development of a simple risk analysis method.

Objectives

- increase of energy saving potentials by using synergy effects in connection with other technologies (e.g. reduction of heating water temperature through better insulation)
- development of short and long-term quality control tool-box and evaluation of integral European harmonised assessment methods (CEN-standards, labelling, EU-directive)
- development of national and European benchmarking systems including estimation of potentials for innovative, cost-efficient energy retrofit strategies

Participants

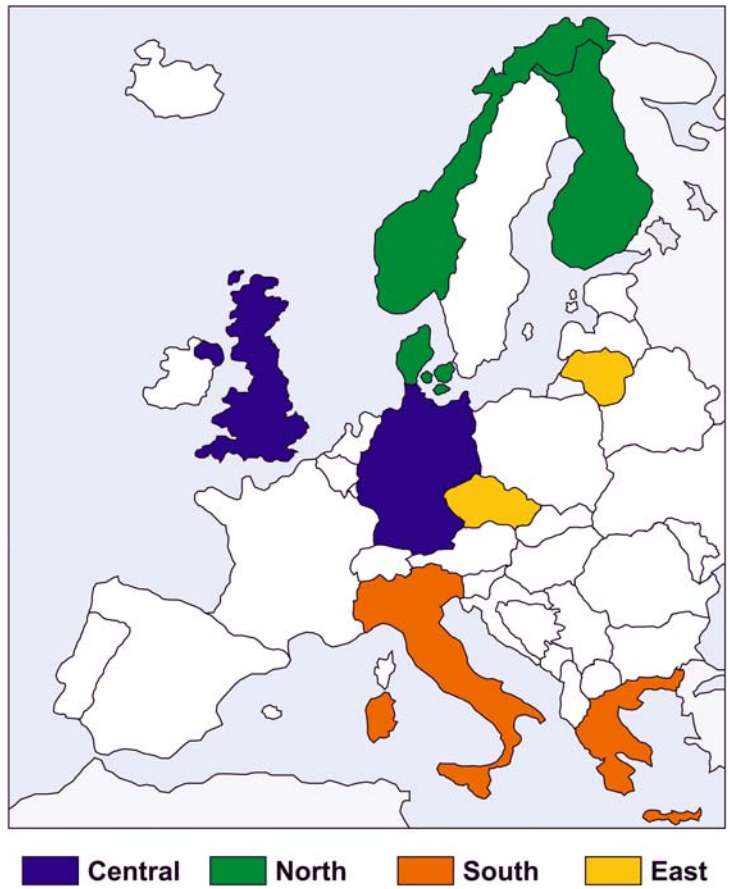
9 countries from 4 European regions:

North: Norway, Finland, Denmark

Central: UK, Germany

South: Italy, Greece

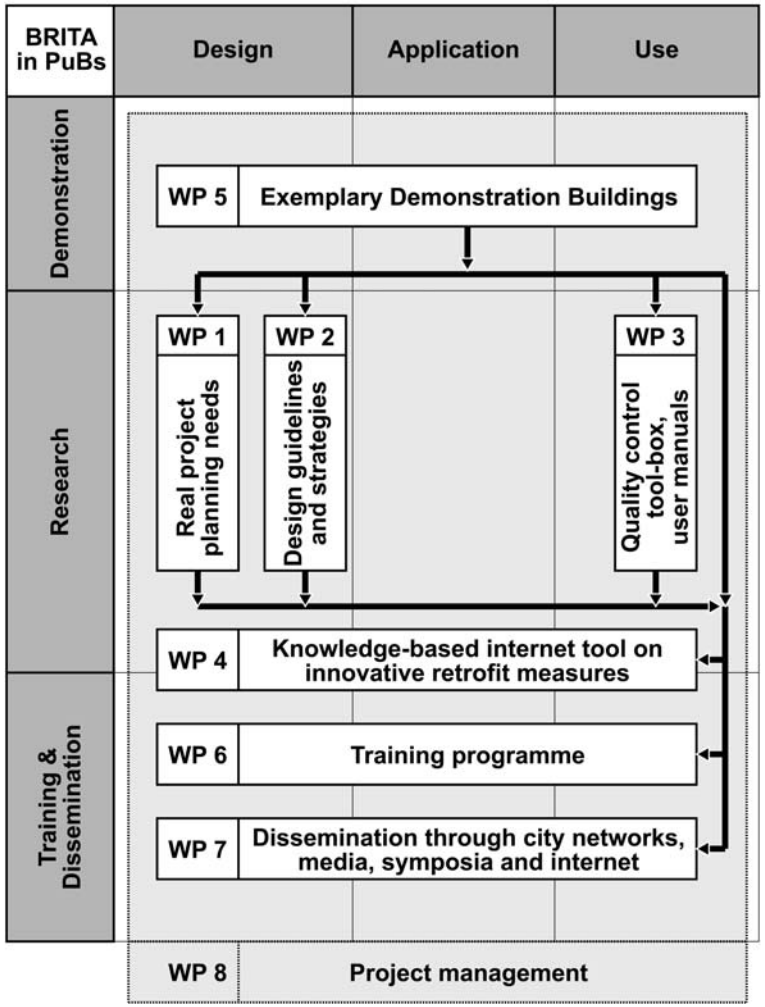
East: Czech Republic, Lithuania



Partic. No.	Research/disse-mination partner	Demonstration partner	National co-ordinator	National group		Geographical group
1	Fraunhofer		Fraunhofer	I	Germany	Central
2		City of Stuttgart				
3	IT-Power		IT-Power	II	UK	
4		Educ. Coll. of Plymouth				
5	SINTEF		NBI	III	Norway	North
6		Asker Municipality				
7		Hol Church				
8	NBI					
9	Sunlab					
10	Cenergia		Cenergia	IV	Denmark	
11		UUF Kobenhavn				
12	DBUR					
13	VTT		VTT	V	Finland	
14	ENEA		ENEA	VI	Italy	South
15	Politecnico di Milano					
16		Garboli Conicos				
17	University of Palermo					
18	N.T.U.A.		NTUA	VII	Greece	
19	EuDiti					
20		Evonymos Library				
21	University of Technology, Brno			VIII	Czech Republic	East
22	Vilnius Gediminas University			IX	Lithuania	
23	FZJ Forschungszentrum Jülich for financial administration and organisation of conferences					

Participants

Project structure and activities



WP1: Real project planning and decision barriers, project needs & financing strategies

Socio-economic research to bring the retrofit technology to application

- what are the barriers against energy saving initiatives in public administrations?
- what type of information is required, when and by whom?
- who are the real decision makers? Role of the building designers (architects and engineers)
- what level of detail of technical information should be presented to which target group?

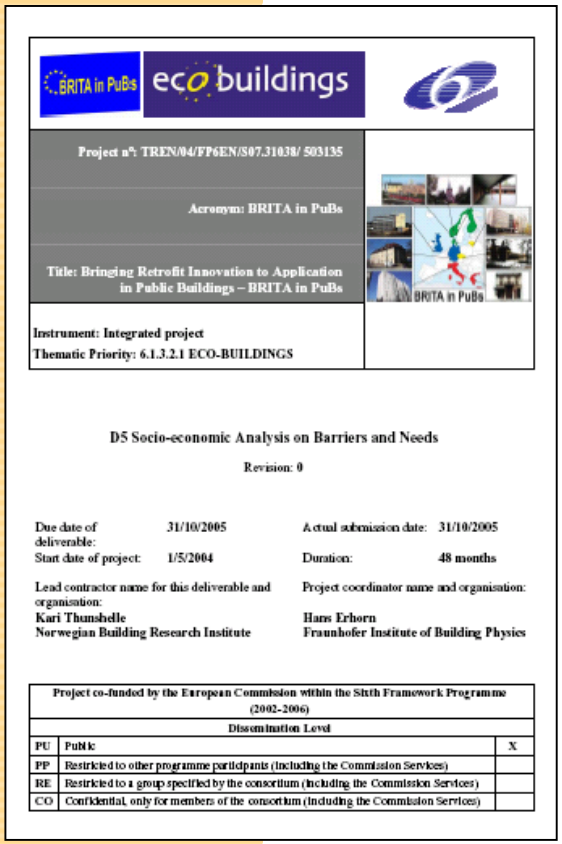
Economic research to provide insights in different financing strategies

- what different financial mechanisms/strategies are existing in the participating countries, could they be transferred to other countries?

Deliverables

- report on barriers and real project planning needs
- communication guide for targeting information to the specific target groups
- overview on financial schemes identified in each country

WP1: Real project planning and decision barriers, project needs & financing strategies



BRITA in PuBs eco buildings

Project n°: TREN/04/FP6EN/S07.31038/ 503135

Acronym: BRITA in PuBs

Title: Bringing Retrofit Innovation to Application in Public Buildings – BRITA in PuBs

Instrument: Integrated project
Thematic Priority: 6.1.3.2.1 ECO-BUILDINGS

D5 Socio-economic Analysis on Barriers and Needs

Revision: 0

Due date of deliverable: 31/10/2005
Actual submission date: 31/10/2005
Start date of project: 1/5/2004
Duration: 48 months

Lead contractor name for this deliverable and organisation:
Kari Thunshelle
Norwegian Building Research Institute

Project coordinator name and organisation:
Hans Erhorn
Fraunhofer Institute of Building Physics

Project co-funded by the European Commission within the Sixth Framework Programme (2002-2006)

Dissemination Level

PU	Public	X
PP	Restricted to other programme participants (including the Commission Services)	
RE	Restricted to a group specified by the consortium (including the Commission Services)	
CO	Confidential, only for members of the consortium (including the Commission Services)	

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Thematic Priority: 6.1.3.2.1 ECO-BUILDINGS

Implementation guide

Revision: 0

Due date of deliverable: 16/12/2005
Actual submission date: 16/11/2005
Start date of project: 1/5/2004
Duration: 48 months

Lead contractor name for this deliverable and organisation:
Ove Morck
Cenergia Energy Consultants

Project coordinator name and organisation:
Hans Erhorn
Fraunhofer Institute of Building Physics

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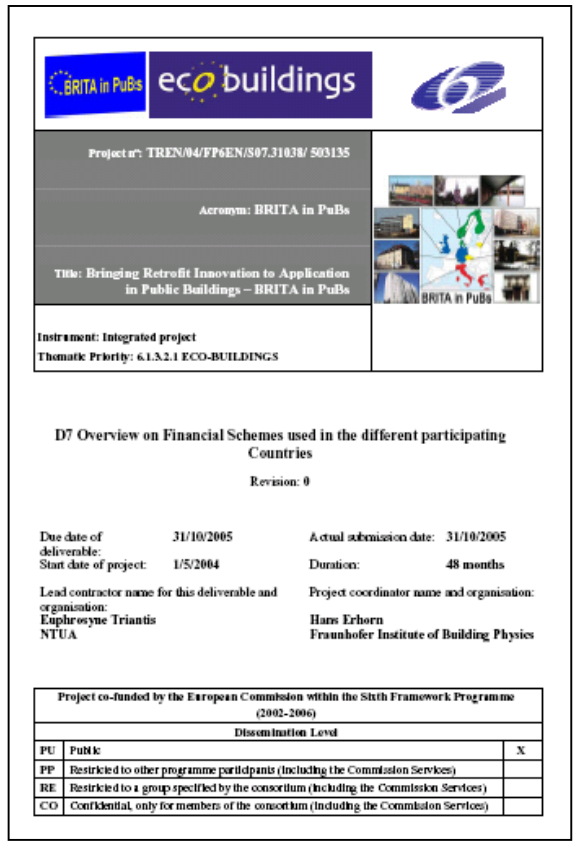
Available soon



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D7 Overview on Financial Schemes used in the different participating Countries

Revision: 0

Due date of deliverable: 31/10/2005
Actual submission date: 31/10/2005
Start date of project: 1/5/2004
Duration: 48 months

Lead contractor name for this deliverable and organisation:
Euphrosyne Triantis
NTUA

Project coordinator name and organisation:
Hans Erhorn
Fraunhofer Institute of Building Physics

Project co-funded by the European Commission within the Sixth Framework Programme (2002-2006)

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WP2: Guidelines and tools for choosing the right design strategies

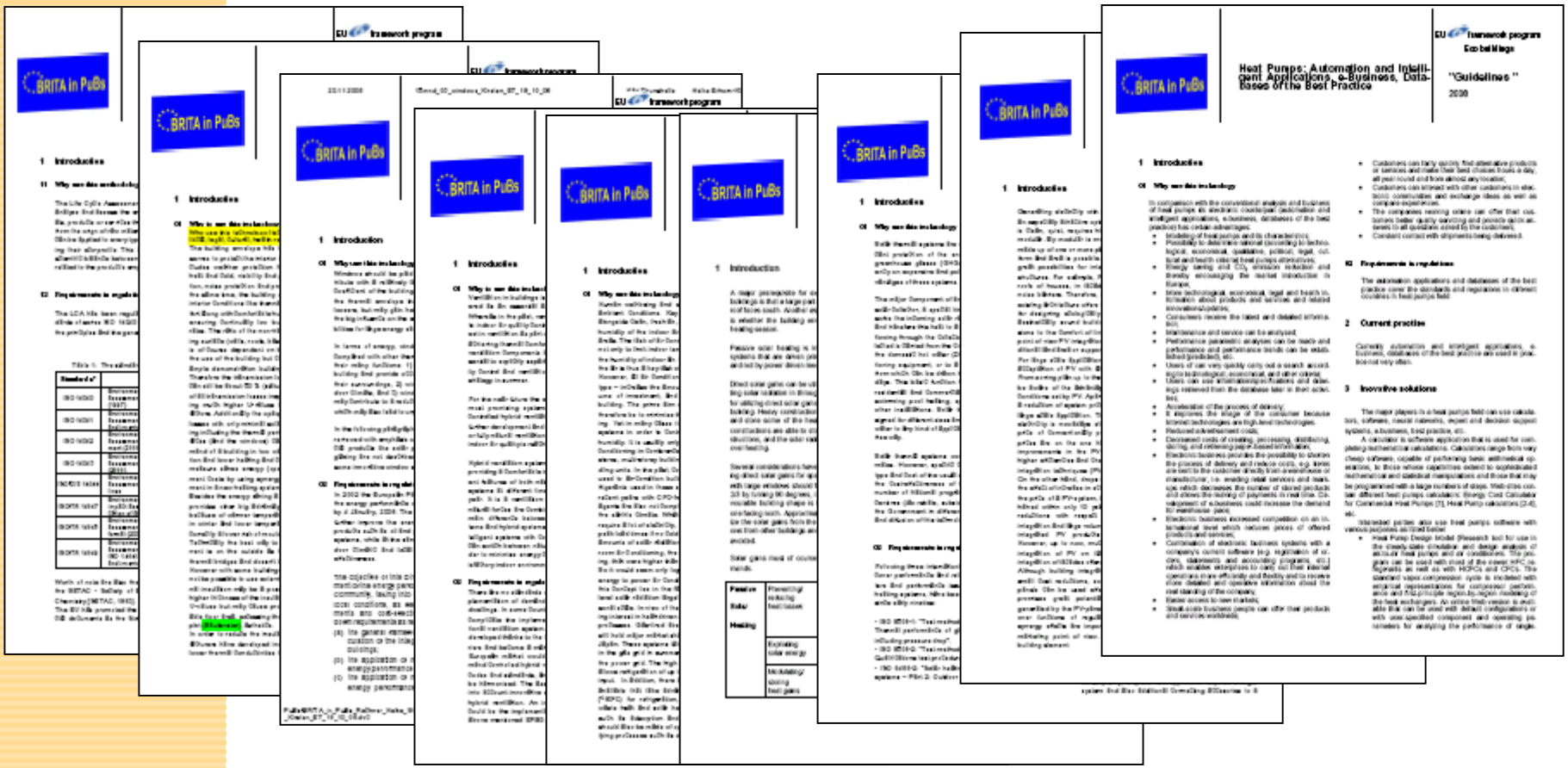
Integrated approach consisting of a comprehensive set of connectable reliable tools

- investigation on methodological and operative aspects with the aim of supporting the design stage with tools and data
- input from the design stage of the demonstration buildings will be collected and compared with the measured/observed data acquired by the case study monitoring phase
- a knowledge system gathered at the NBI will be used as a base for the guidelines

Deliverables

- handbook of design guidelines, tools and strategies for low energy refurbishment of public buildings

WP2: Guidelines and tools for choosing the right design strategies



Hans Erhorn
Fraunhofer Institute of Building Physics

WP3: Facility management tool – quality control tool-box

Three stage procedure:

1. procedures for benchmarking and short-term measurement procedures, risk-analysis model, LCC-model and energy consumption calculations will be evaluated, adjusted, combined, applied and tested for demonstration buildings
2. commissioning (quality control procedures including short-term measurements) will be taken into use
3. creation of an internet-based energy monitoring tool and facility management tool

Deliverables

- documentation of the quality control tool-box

WP4: Knowledge based information tool - BIT

Provision of profound database

- identification of new retrofit technologies and new building technologies also applicable when retrofitting buildings (efficiency, costs, advantages, synergy effects with other technologies, arguments against reservations)
- presentation of the demonstration buildings in a standardised format in the information tool including lessons learned and how to improve the cost-efficiency

Deliverables

- BRITA in PuBs knowledge-based internet information tool for decision makers and designers

Hans Erhorn
Fraunhofer Institute of Building Physics

WP4: Knowledge based information tool - BIT

BRITA in PuBs

BRITA in PuBs

Bringing Retrofit Innovation to Application in Public Buildings

BRITA in PuBs Information Tool

for Technical Retrofit Measures

Hans Erhorn
Fraunhofer Institute of Building Physics

Fraunhofer IBP Institut Bauphysik

WP5: Design, application and validation of exemplary retrofit measures at selected demonstration buildings

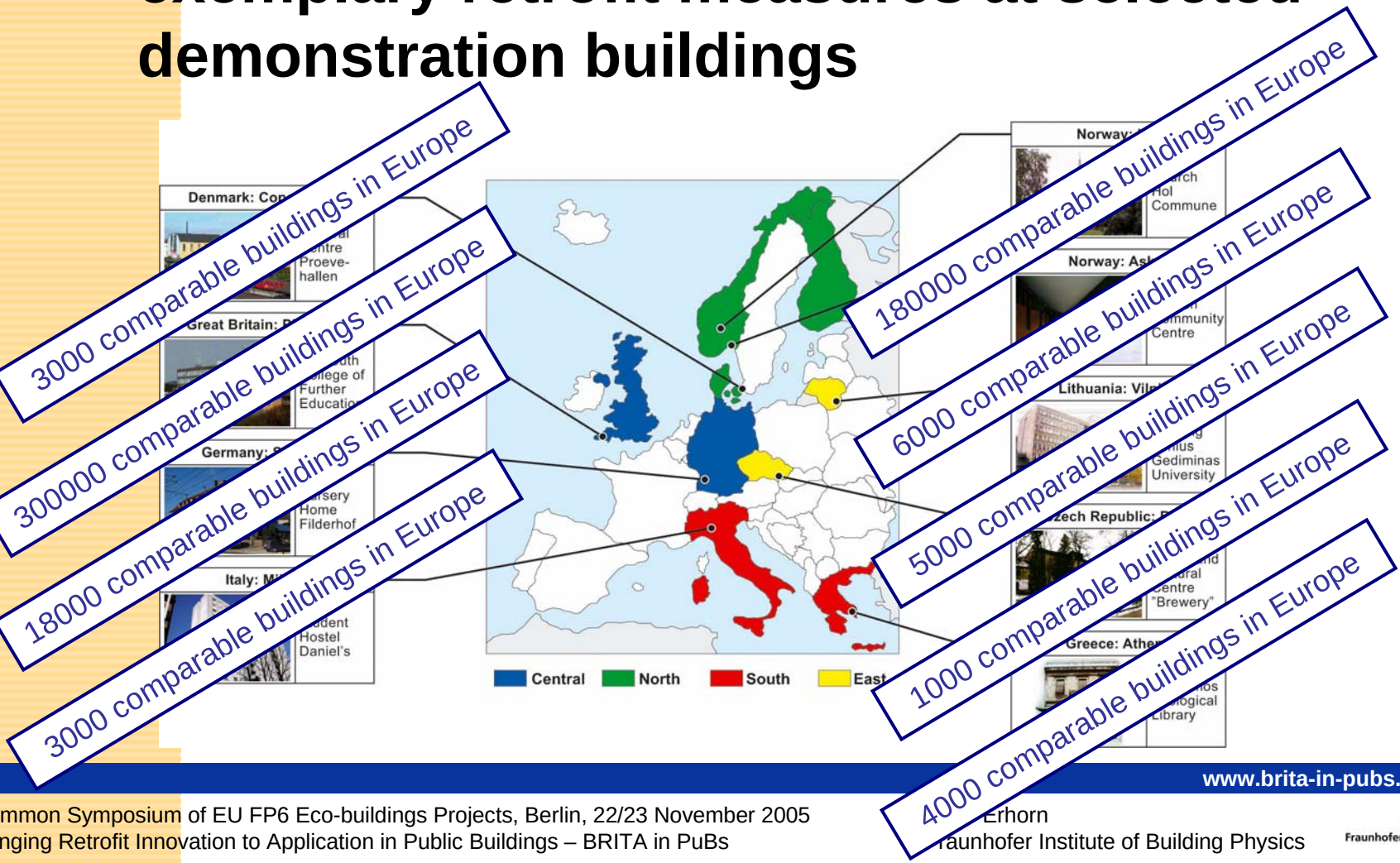
Use of public buildings as shining examples

- different representative building types and selected solutions of innovative character, including integrated planning and being close to profitable
- solution of restraints at the decision-makers by demonstrating the implementation of innovative energy saving renovation technologies in public buildings

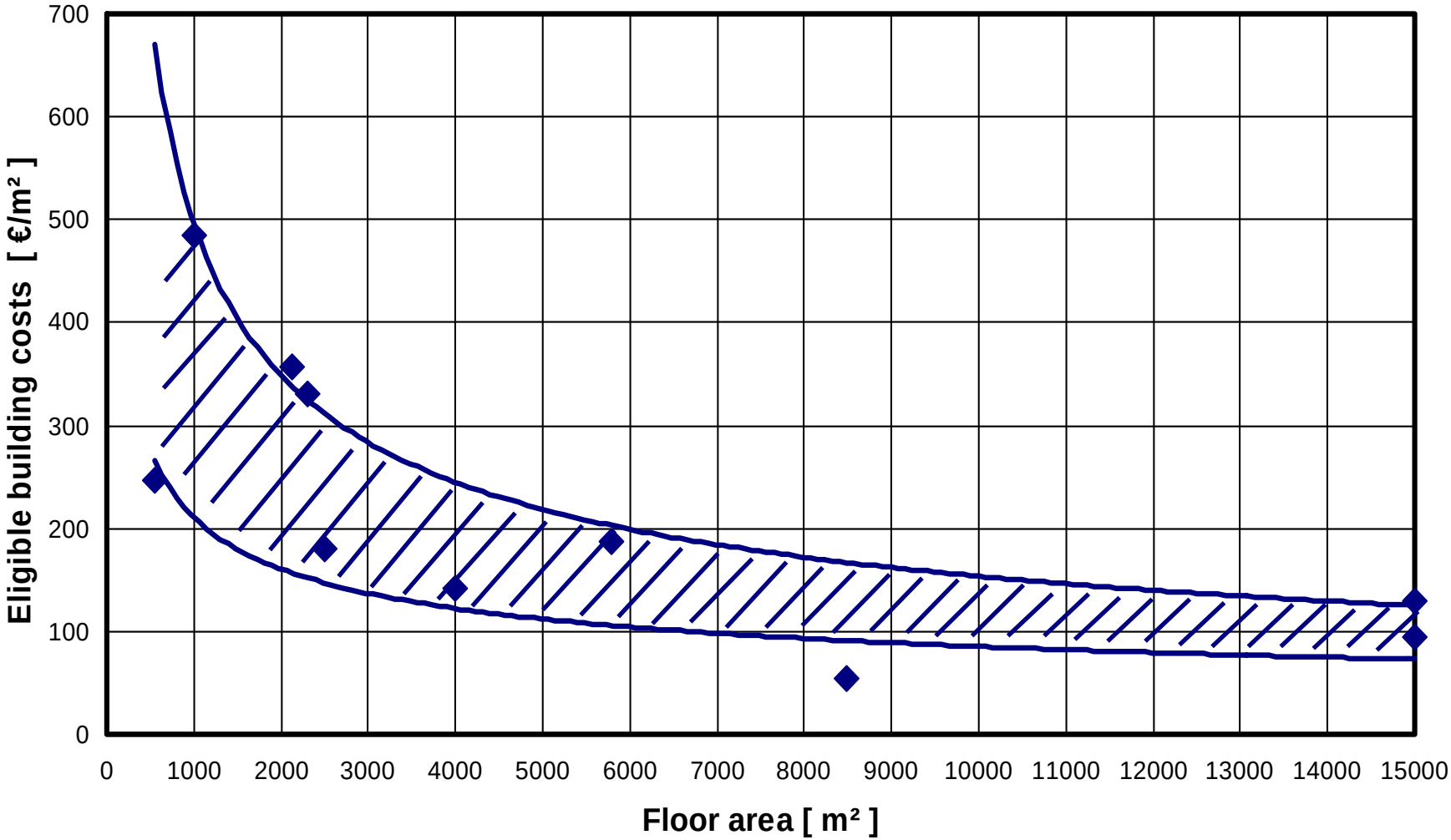
Deliverables

- report on concept development and realisation
- report on the validation including comparison between concept and realisation
- online presentation of the project progress (building diary)

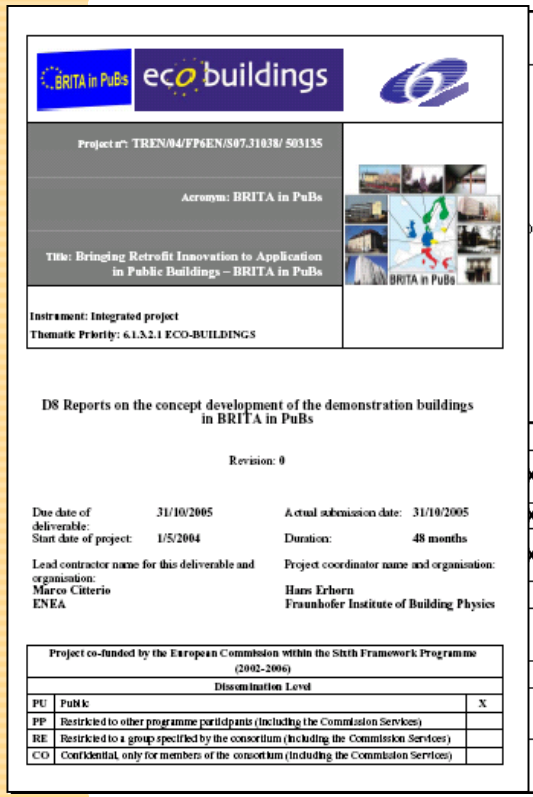
WP5: Design, application and validation of exemplary retrofit measures at selected demonstration buildings



BRITA in PuBs - Eligible building costs (innovative retrofit measures and renewables)



WP5: Design, application and validation of exemplary retrofit measures at selected demonstration buildings



BRITA in PuBs | eco buildings

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Acronym: BRITA in PuBs

Title: Bringing Retrofit Innovation to Application in Public Buildings – BRITA in PuBs

Instrument: Integrated project
Thematic Priority: 6.1.3.2.1 ECO-BUILDINGS

D8 Reports on the concept development of the demonstration buildings in BRITA in PuBs

Revision: 0

Due date of deliverable:	31/10/2005	Actual submission date:	31/10/2005
Start date of project:	1/5/2004	Duration:	48 months
Lead contractor name for this deliverable and organisation:	Marco Citterio ENEA	Project coordinator name and organisation:	Hans Erhorn Fraunhofer Institute of Building Physics

Project co-funded by the European Commission within the Sixth Framework Programme (2002-2006)

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Energy retrofit measure													Use of renewable energy technology					
exchangers	high-efficient artificial lighting	combined heat and power unit	condensing boilers	absorption chillers for cooling	advanced control to the heating system	advanced control of the ventilation system	advanced control to the lighting system	long-term-monitoring	use of building mass to reduce cooling and heating loads	shadings to reduce overheating	use of heat-pump in extract air and thermal water storage	tightening the facade	solar thermal collectors for DHW	use of passive solar gains for pre-heating of the air/solar air systems	improved daylighting	PV- integration	solar chimney	use of geothermal heat
	X	X	X		X	X	X	X					X	X	X	X	X	
X	X	X	X		(X)		X	X	X						X	X		
X						X	X								X			X
X	X	(X)			X	X	X	X		X			X	X	X	X		
	X				X		X		X			X	X	X	X	X		
		X		X	X		X	X		X								
					X	X	X	X		X		X	X		X	X		
	X		X		X	X	X	X	X		X		X	X	X	X	X	
					X	X		X				X						

WP6: Information material for the creating of awareness of different target user groups and lecture preparations

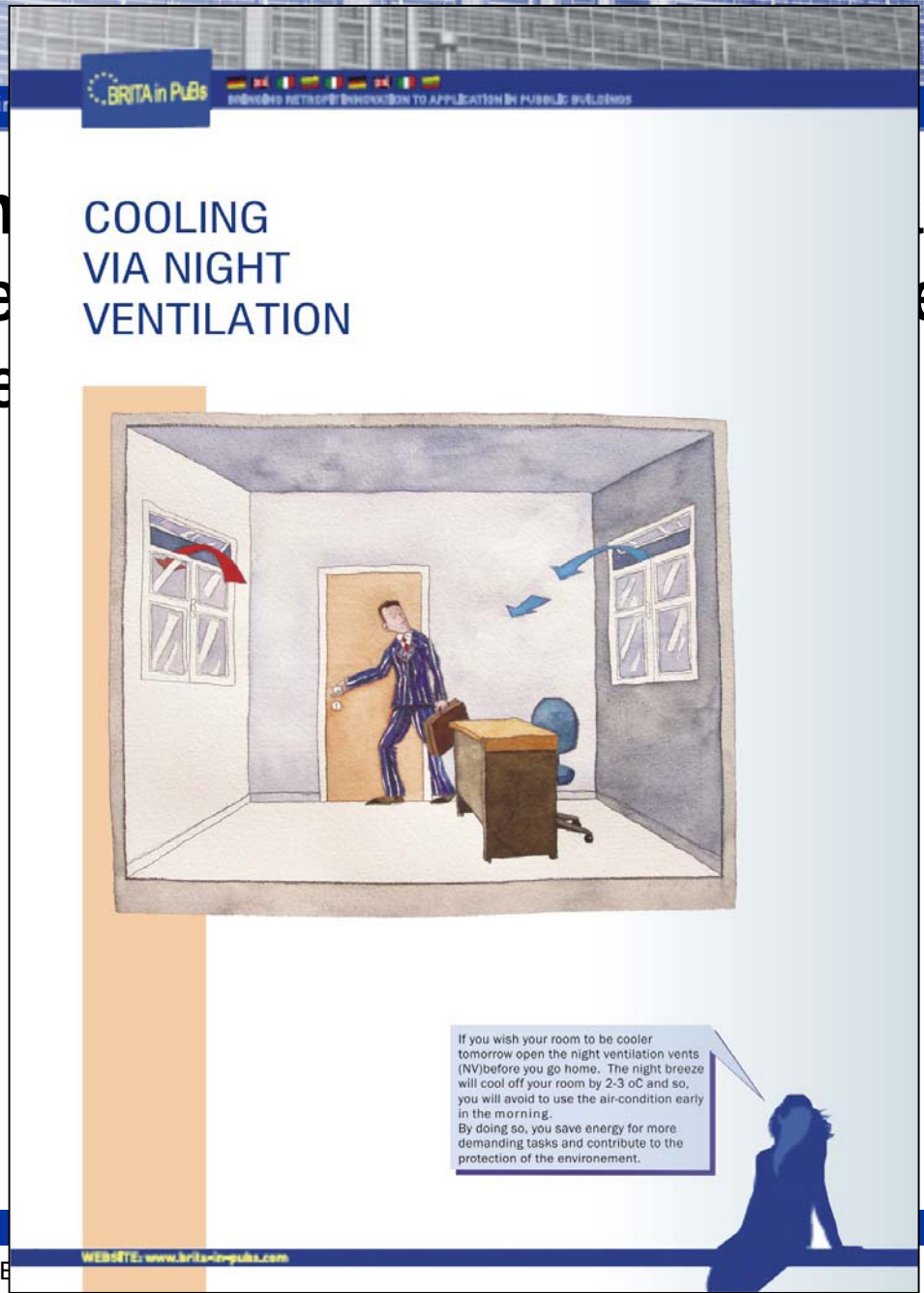
„a sustainable building starts with the user“
„an intelligent building management system, is just as intelligent as the care-taker and the maintenance personnel dealing with it“

Therefore:
- Development of simple black board spreadsheets on how to use/maintain a building correctly, like energy-efficient natural ventilation, which checks have to be made when for heating and ventilation systems, etc.
- Distribution via city and national networks

Deliverables
- Black board information sheets

Hans Erhorn
Fraunhofer Institute of Building Physics

WP6: Inform ting of aware er groups and le



WP6: Information material for the creating of awareness of different target user groups and lecture preparations

„E-learning is the future. Anyone can accumulate information from everywhere at any time via the Internet“

Therefore:
- E-learning modules on information of the project
- use of existing e-learning platforms like: Lernnetz Bauphysik, etc.

Deliverables
- E-learning module

WP7: Dissemination

1. **Website**: www.brita-in-pubs.com, www.brita-in-pubs.info, www.brita-in-pubs.de

2. **Use of existing networks**:
a) local, country specific municipality and professional networks (Städtetag, etc.)
b) international by Energie-Cités as subcontractor
„promoting sustainable energy policy through local action“ in 109 cities

3. **Targeted PR-campaign**:
PR-institute as subcontractor for identification of the national target group, direct mail, e-mail campaign, newsletters

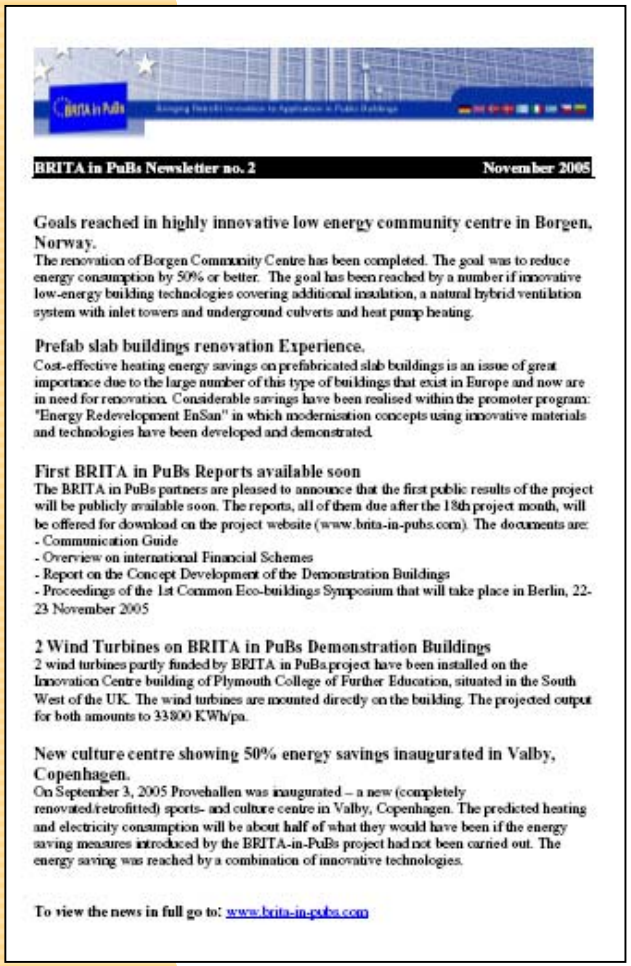
4. **Symposium**: common eco-buildings symposium in Berlin

5. **Articles to journals, presentations at conferences etc.**

6. **Common dissemination**: web-portal, newsletter, poster, brochures, meetings

WP7: Dissemination www.brita-in-pubs.com

WP7: Dissemination



BRITA in PuBs Newsletter no. 2 **November 2005**

Goals reached in highly innovative low energy community centre in Borgen, Norway.

The renovation of Borgen Community Centre has been completed. The goal was to reduce energy consumption by 50% or better. The goal has been reached by a number if innovative low-energy building technologies covering additional insulation, a natural hybrid ventilation system with inlet towers and underground culverts and heat pump heating.

Prefab slab buildings renovation Experience.

Cost-effective heating energy savings on prefabricated slab buildings is an issue of great importance due to the large number of this type of buildings that exist in Europe and now are in need for renovation. Considerable savings have been realised within the promoter program: "Energy Redevelopment EnSan" in which modernisation concepts using innovative materials and technologies have been developed and demonstrated.

First BRITA in PuBs Reports available soon

The BRITA in PuBs partners are pleased to announce that the first public results of the project will be publicly available soon. The reports, all of them due after the 18th project month, will be offered for download on the project website (www.brita-in-pubs.com). The documents are:

- Communication Guide
- Overview on international Financial Schemes
- Report on the Concept Development of the Demonstration Buildings
- Proceedings of the 1st Common Eco-buildings Symposium that will take place in Berlin, 22-23 November 2005

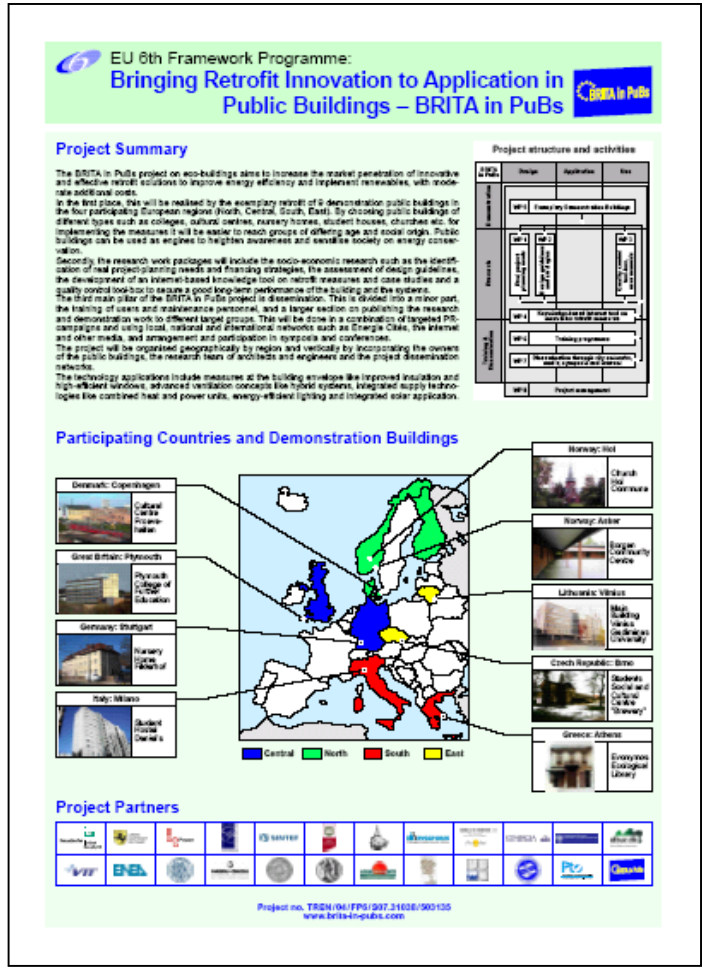
2 Wind Turbines on BRITA in PuBs Demonstration Buildings

2 wind turbines partly funded by BRITA in PuBs project have been installed on the Innovation Centre building of Plymouth College of Further Education, situated in the South West of the UK. The wind turbines are mounted directly on the building. The projected output for both amounts to 33800 KWh/pa.

New culture centre showing 50% energy savings inaugurated in Valby, Copenhagen.

On September 3, 2005 Provehallen was inaugurated – a new (completely renovated/retrofitted) sports- and culture centre in Valby, Copenhagen. The predicted heating and electricity consumption will be about half of what they would have been if the energy saving measures introduced by the BRITA-in-PuBs project had not been carried out. The energy saving was reached by a combination of innovative technologies.

To view the news in full go to: www.brita-in-pubs.com

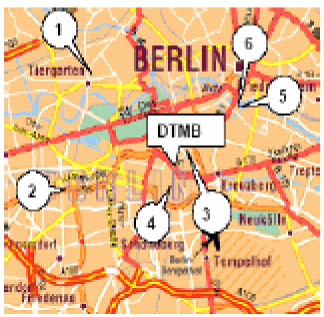


WP7: Dissemination

Hotel Booking

To facilitate your accommodation the following hotels will provide rooms until the 1st November at preferential conditions. Code "Ecobuildings"

Hotel	fon	fax
1 Hotel Tiergarten € Single: 60,- double: 75,-	+49 (0) 30 399896	+49 (0) 30 399 89 735
2 Berlin Mark Hotel € Single: 69,- double: 80,-	+49 (0) 30 88002802	+49 (0) 30 88002804
3 Ibis Potsdamer Platz € Single: 75,25 double: 96,25	+49 (0) 30 261050	+49 (0) 30 26 10 52 22
4 Mercure Mitte € Single: 76,- double: 108,-	+49 (0) 30 5165130	+49 (0) 30 516513690
5 Dorag Hotel Großer Kurfürst € Single: 83,- double:	+49 (0) 30 246000	+49 (0) 30 24600300
6 Park Plaza art'otel Mitte € Single: 83,- double: 113,-	+49 (0) 30 240620	+49 (0) 30 24062222



Location: Deutsches Technikmuseum Berlin (DTMB), Trebbiner Str. 9, D-10963 Berlin, Internet: www.dtmb.de

Participation fee

The contribution towards expenses for each participating person is 116,- Euro. The payment has to be made until 01/11/2005. Please use the form in the attachment.

Eco-buildings

At present the building sector is responsible for more than 40% of EU energy consumption. There are technologies under development, which could substantially improve (up to 30%) the energy performance of buildings, reducing the conventional energy demand in new and existing buildings and substantially contributing to the reduction of energy intensity, through combined measures of rational use of energy and integration of renewable energy technologies.

The Eco-buildings concept is expected to be the meeting point of short-term development and demonstration in order to support legislative and regulatory measures for energy efficiency and enhanced use of renewable energy solutions within the building sector, which go beyond the Directive on the Energy Performance of Buildings.

The projects aim at a new approach for the design, construction and operation of new and/or refurbished buildings, which is based on the best combination of the double approach: to reduce substantially, and, if possible, to avoid the demand for heating, cooling and lighting and to supply the necessary heating, cooling and lighting in the most efficient way and based as far as possible on renewable energy sources and polygeneration.

The Symposium is kindly supported by:

Organisation:
Fraunhofer-Institut für Bauphysik
Hans Erhorn
Nobelstr. 12, D-70569 Stuttgart

Forschungszentrum Jülich GmbH, PtJ
Markus Kratz
D-52425 Jülich
+49-2461-618044 fon
+49-2461-613131 fax

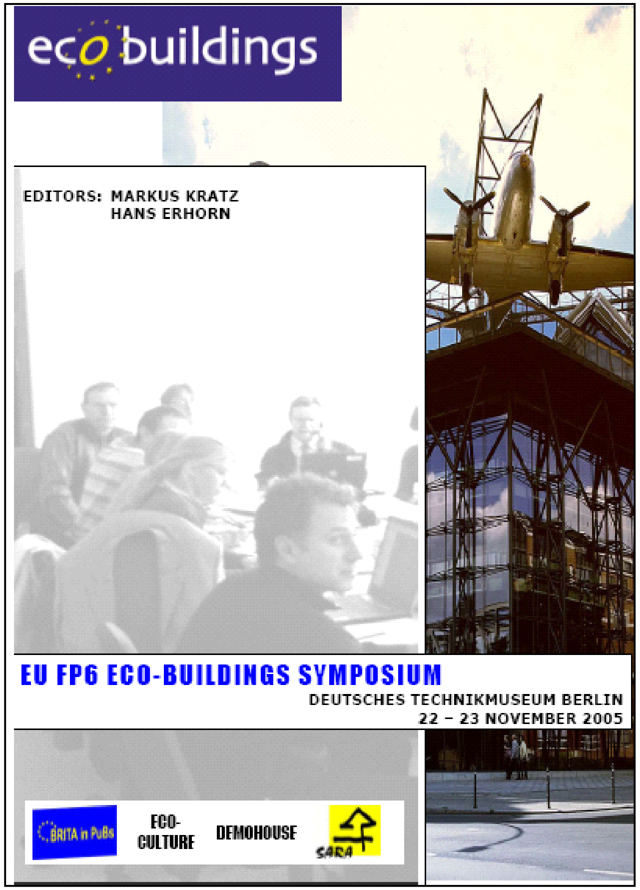
COMMON SYMPOSIUM of EU FP6 ECO-BUILDINGS PROJECTS

Deutsches Technikmuseum Berlin (DTMB)

22/11/2005 – 23/11/2005

eco buildings

Presentation and discussion of the first results of the projects: BRITA in PuBs, SARA, DEMOHOUSE and ECO-CULTURE.



WP7: Common Dissemination www.ecobuildings.info

eco buildings

Home

- Home
- BRITA in PuBs
- DEMOHOUSE
- Eco-culture
- SARA
- Events
- Download page of common material
- Links to other related sites

SIXTH FRAMEWORK PROGRAMME

- Webmaster LAJ/COVI
  (Latest update 07.10.05)

Eco-buildings

This is a common portal for four Eco-buildings demonstration projects.

Eco-buildings is an energy demonstration initiative of the European Commission (DG TREN) within the sixth Framework Programme.

The portal will provide common information on project development and links to the individual projects and other relevant sites.

The DG TREN Eco-buildings concept
The building sector is at present responsible for more than 40% of EU energy consumption. There are technologies under development, which could substantially improve the energy performance in buildings, reducing the conventional energy demand in new and existing buildings and substantially contributing to reduce energy intensity, through combined measures of rational use of energy and integration of renewable energy technologies.

The Eco-buildings concept is expected to be the meeting point

Hans Erhorn
Fraunhofer Institute of Building Physics

WP7: Common Dissemination

eco buildings Newsletter

July 2005
Issue 1

Eco-buildings is an energy demonstration initiative of the European Commission (DG TREN) within the Sixth Framework Programme

http://www.ecobuildings.info
web-site launch September 2005

eco buildings

This is the first Eco-buildings newsletter. It introduces the concept and the 4 projects in progress and it provides news of progress, of relevant events and of a new call for Eco-buildings proposals.

The newsletter is the result of collaboration between the 4 . It aims to disseminate the ideas, initiatives and progress of these projects to those involved in construction and building management in order to contribute to continual improvement of Energy performance of buildings in Europe.

You can expect newsletters every six months from now on and can check the project web sites for up to date information.

Contents

The DG TREN Eco-buildings concept

The building sector is at present responsible for more than 40% of EU energy consumption. There are technologies under development, which could substantially improve (up to 50%) the energy performance of buildings, reducing the conventional energy demand in new and existing buildings and substantially contributing to reduce energy intensity, through combined measures of rational use of energy and integration of renewable energy technologies.

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Eco-buildings projects aim at a new approach for the design, construction and operation of new and/or refurbished buildings, which is based on the best combination of the double approach: to reduce substantially, and, if possible, to avoid the demand for heating, cooling and lighting and to supply the necessary heating, cooling and lighting in the most efficient way and based as much as possible on renewable energy sources and polygeneration.

Four Eco-buildings projects are now in progress as a result of the first call for proposals (submitted 2003). This publication provides news about these four projects.

*COM 2002/91/EC Website: [illegible]

Common dissemination activities

Dissemination activities being developed other than this bi-annual newsletter

Brochures

A brochure with more details of each project will be produced before the end of 2005 and updated towards the end of the projects. .pdf versions will be available via the Eco-buildings website.

For more details contact the DEMOHOUSE project coordinator:

Henk Kaan, Energy Research Centre of the Netherlands (ECN)
E-mail: [illegible]

Web site

A web site for these four Eco-buildings is under construction. The plan is to have it up and working by September 2005. It will provide common information on project development and links to the individual projects and other relevant sites. The format will be similar to the Eco-culture project site: www.cowiprojects.com/eco-culture.

Contact this project coordinator for more details:

Jens Ole Hansen, COWI A/S, Denmark
Email: [illegible]

Posters

Posters of each of the 4 projects and a fifth explaining the Eco-buildings initiative are being prepared. The posters will look similar to the summary information on the projects presented on the previous pages and are designed to be printed at A0 size.

If you would like a copy of any poster, the electronic artwork is available from the Brita in PuBs project coordinator.

Hans Erhorn, Fraunhofer-Institut
E-mail: [illegible]

WP7: Common Dissemination

For more information on

BRITA in PuBs

and

eco buildings

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