

Intelligent Energy  **Europe**

Executive Agency for Competitiveness and Innovation
(EACI)

LCC-DATA

LCC-DATA

Life-Cycle-Costs in the Planning Process.

Constructing Energy Efficient Buildings taking running costs
into account

Grant Agreement EIE/06/154/SI2.447798

D11

Data base with input data for LCC
– interim report with description of collected data

Document ID: LCC-DATA-WP3-CRES-D11 Data base Interim report

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Status: Deliverable

Distribution: PU

Issue date: 05.2008

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Definitions and Abbreviations

Definitions

No necessary definitions

Abbreviations

None

1 Executive Summary

This report presents the status and the planned national activities for the LCC data base with input data for LCC and description of collected data.

Del. N°	WP N°	Del. name	Type of del.	Size/ Form	Lan g.	Target group	Lead participant	Dissemination level	Month of completion
D11	3	Data base for with input data for LCC – interim report with description of collected data	Data base and report		EN	Building owners, Architects, planners and consultants	SINTEF, CRES and national partners	PU - dissemination limited to target group	16

The main objective of this deliverable is to describe the status for the common database for building costs and the collected or inserted cost data for the various case study buildings from the participating countries to be included in the database. Special focus is given in the evaluation of the collection and input process in order to ensure quality of information and reliability in LCC indicators developed.

2 Database development

The project has not planned to develop a totally new database, but to improve or further develop database in cooperation with existing databases. During the Kick off meeting, 2 different data bases were presented, Key numbers for Benchmarking and Holte project.

Both databases can be used in early design, but the Key number data base might be more useful, as it is based on real information, the building owners are reporting their actual costs on the different buildings, using the NS 3454 Cost classification system, annually.

This data base was selected to be a basis for the further work, and the cooperation was initiated. Due to change of personnel and other important issues for the owner of the data base, the work was delayed.

The project team therefore started the data collection by use of excel as the preliminary data base, collecting information, which then will be going through a quality assurance before inserting into the new database.

The data base has to be web-based, making it easy for the building owners and during the project the project partners, to insert information. The Key numbers data base was not web based when starting the process.

For the LCC-data project it was important that energy use and/or energy demand were included in the collected information, as energy is an important part of the operation costs. This has to be included in the Key number data base, and the work is not finalised at this stage.

The data base has to have the possibility to sort costs for different countries, and working with different currency. This issue is not totally solved at this stage.

The data base will be finalised during the autumn, taking into account the experience the partners had during the first phase with collecting information. When the data base is finalised, the collected information from the excel sheets will be included after a quality check.

3 Data collection process

3.1 Introduction & aims

The main aim of this work is to develop a cost data collection process used for the development of the project cost database, which ensures quality, reliability and transparency of the resulted information.

The methodology followed on the data collection process was:

1. Define a common classification system (WP2/D4).

In order to understand the type of data that needs to be collected and stored, it was necessary to define a common classification system, especially helping countries where an official cost categorisation does not exist (such as Greece, Czech Republic, etc).

2. Investigate and identify potential data sources and professional building owners from the private and public sector.

The project dissemination activities (publications, presentations, etc) used as the main tool to exploit project aims and attract potential target groups for data collection purposes.

Variability of building owners and case studies were targeted and achieved within the project partners (covering office buildings, schools, hospitals, etc), both from private and public sector.

The representation of various building types and functions into the database became an important approach from the first stage of data collection process, covering both private and public sector. Therefore, an added value is achieved with reference buildings from different types/uses (offices: GR/AT/DE, schools/colleges: SL/NO/DE, hospitals: CZ, large-scale residential: CZ, etc) used for the database.

The contribution of the main building owners / target groups is important in this stage in terms of receiving feedback with recommendations on the proposed list of entries.

3. Develop the data collection process

The critical process of data collection requires active participation of the targeted building owners at national level. Each partner aimed to agree with one or more building owners for data provision and input in the database and supervise them throughout the collection and input process.

It is a time-consuming process (as expected) which requires building owners and/or users and/or database developers to contribute in terms of a systematic approach on accessing and assessing existing data records.

CRES is responsible that all partners collect sufficient data and ensure liability and quality of results with external expertise consultation (subcontract is foreseen for consultation and evaluation control of the collection and input process as described in section 3.4).

3.2 Status of data collection process

The main approaches of the participating organisations in identifying potential case studies were through:

- existing building related energy networks used for other EU projects
- building owners who work in sustainability field (environmental profile raise)
- existing recorded data for energy audits: enrich with costs
- public bodies and private companies (mostly large building owners) involved in developing and managing building infrastructures
- associations of building owners, quantity surveyors or facility managers, construction companies, real estate companies, developers and financial consultants
- existing relevant research work from universities, research centres and other market actors
- benchmark tools and software developing companies

3.2.1 Austria / office buildings

Cooperation has been established with the WWFF (Vienna business agency) and at least four (4) case studies are in preparation to be used in the database.

It was planned to use the database owned by University of Applied Sciences Kufstein who developed a benchmark-tool which includes the requested information on cost and energy consumption. However, the data input is under privacy by the partners. Furthermore it will not be filled with data before November 2008. Therefore AEA has been analysing additional options, such as other calculation tools and data collection methods. It is planned to collect energy consumption data and complete missing information with calculated values.

3.2.2 Czech Republic / hospitals

Focus is given to public hospitals (owners as Jablonec nad Nisou, Horice, Litomerice) as well as to a large-scale residential development / social housing in cooperation with Municipality of Kladno.

Possible case studies have been identified and City Plan is in the process of the development of the data collection plan together with the building owners.

3.2.3 Germany / office buildings, schools, universities, libraries

BEA cooperates closely with Senate of Berlin and also approaches benchmarking and other companies, such as ifma, AGES and BIM.

BEA is in the process of defining specific reference buildings for the data collection, together with the above-mentioned target groups.

3.2.4 Greece / office buildings

CRES cooperates closely with the Hellenic Public Real Estate Corporation (KED) as well as private companies in order to obtain sufficient cost data.

KED is a public organisation which accelerates the implementation of the Construction Programme for Governmental and Public Buildings and having main interest is the provision of modern allocation services by leveraging private sector finance, LCC method could be used as a decision making tool for economic efficiency of allocated investments. Certain reference office buildings have been identified with potential interest on costing (see Annex I) and data collection process is on progress.

From the private sector, CRES has been approached by construction companies & developers in order to use their buildings as reference case studies into the database.

CRES's offices will be also used as reference building into the cost database and cost data collection has been started.

3.2.5 Norway / colleges

SINTEF has mainly approached Statsbygg, which is the directorate of Public Construction and Property for possible case studies for cost data collection. Few case studies have been defined so far in the area of Bergen, Sogndal and Borre.

SINTEF has defined few reference buildings for the data collection, together with Statsbygg and is in the process of data collection.

SINTEF has also contact with several municipalities and members of the Network for Benchmarking, helping the building owners inserting their information into the existing data base.

3.2.6 Slovenia / school buildings

ZRMK has cooperated mostly with municipalities for cost data collection focusing on school buildings.

Municipality of Kamnik has already given related cost data for six (6) case study buildings, aiming to provide data for about 17 school buildings it total.

ZRMK has approached other municipalities in order to provide data at least for “level 1 database” with costs for early decision making.

3.3 Difficulties and barriers

Main difficulties identified in the data collection are the following:

1. Non common classification system existed between participating countries, so common field of work had to be established (WP2/D4). Additionally, for GR and CZ a national cost classification system doesn't exist, therefore building costs vary from case to case.
2. Non-uniformity of data collected. Business accounting systems and methods of storing and monitoring cost data for each country/organisation/building might differ.
3. Significantly time-consuming process in terms of data collection and adjustment according to the common database requirements. Building owners needed to have a strong incentive in order to dedicate long time on the collection process. Especially in cases where the owner, the developer and the user differ, so cost data is scattered.
4. Difficulty in approaching and extracting data from building owners. Costs often appears as confidential information. Additional effort was made to target groups which are not familiarised with the aims and benefits of LCC method.
5. Inexistence of cost data. Rarely cost data throughout a building's life time is registered and stored.

3.4 Quality of collection and input process

Special attention is given to cost data collection and input process in terms of quality control throughout the whole process.

CRES in cooperation with an external expertise (subcontract foreseen) is responsible all cost data to have the necessary quality and give all relevant guidelines to avoid mistakes and eliminate risks of data unreliability, as false input will lead to devious cost indicators and LCC analysis. The subcontractor will contribute on the evaluation and assessment of the common procedures followed during data collection as well as during data transfer.

Tender process has been progressed by CRES (out to tender on the 16.05.2008) and evaluation of offers is appointed for the 6th of June 2008. The contractor and the beneficiary/CRES will cooperate in order to assess the reliability of the whole data collected as a preliminary step on the input process into the database. Suggestions for modifications and recommendations for improving the data input concept will be mainly provided by the contractor.

3.5 Further Needs & Next steps




All partners will develop their plan in data collection and input process as described in Section 3.2 and further building owners will be approached in order to enrich the input reference buildings. Special effort will be dedicated to targeted dissemination activities for LCA and LCC aims & benefits (energy, environmental, economic) in order to attract more building owners and professionals.


Initial data collected will be inserted into the project database and presented to relevant target groups (through relevant workshops, seminars and presentations) in order to promote a process which is attractive, time-efficient and easily adaptable to common business working processes.

Special guidelines on the data collection will be provided by CRES in cooperation with the subcontractor within the whole process of the next 7 months. All feedback will be reported on the final evaluation reports (WP3/D14). These guidelines will refer to issues such as: process and time required, monetary adjustments, discounts and taxations, assumptions / groupings / normalisations to consider, building operational layouts, data frequency needed, various incidental costs, etc.




ANNEX 1: Template developed for draft summarised presentation of potential case study buildings used for cost data collection (WP3) as well as energy and LCC calculations (WP4)

- AUSTRIA/AEA to use case studies in cooperation with University of Applied Science Kufstein – Nov. '08

CS ⁽¹⁾	Photo of exterior	Type / use of building	Building owner ⁽³⁾	Type of ownership ⁽⁴⁾	Location ⁽⁵⁾	Construction Date ⁽⁶⁾	Short technical description ⁽⁷⁾	PUBLIC SECTOR (CZ)
		Public / Hospital - 5 buildings	Hospital Jablonec nad Nisou	Owner and user	CZECH REPUBLIC / Jablonec nad Nisou Urban area	Date of construction: 1994-2003 Renovation process: Yes	Total surface area: approx. 10,000 m ² 2/5-storey buildings Surrounded and attached to other buildings	
		Public / Hospital – 2 buildings	Hospital Horice	Owner and user	CZECH REPUBLIC / Horice Urban area	Date of construction: cca 1930 Renovation process: Yes	Total surface area: approx. 1,000 m ² 3/4-storey buildings Not surrounded; attached to each other	
		Public / Hospital – 7 buildings	Hospital Litomerice	Owner and user	CZECH REPUBLIC / Litomerice Urban area	Date of construction: 19-20 th century (last buildings: 1961, 1985, 1997) Renovation process: Yes	Total surface area: approx. 10,000 m ² 2/7-storey buildings Surrounded and attached to other buildings	

	Public / Resident, Social housing – 3 buildings	Municipality of Kladno	Owner, rent	CZECH REPUBLIC / Kladno	Date of construction: 1954 Refurbishment: Partial (heating system reconstruction) - 1998	Total surface area: 18,171 m ² 13-storey buildings (+2 underground storeys) Not surrounded or attached to other buildings
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- GERMANY/BEA in the process of identifying specific reference buildings in cooperation with Senate of Berlin, ifma, AGES, BIM.





CS ⁽¹⁾	Photo of exterior	Type / use of building	Building owner ⁽³⁾	Type of ownership ⁽⁴⁾	Location ⁽⁵⁾	Construction Date ⁽⁶⁾	Short technical description ⁽⁷⁾	
		Office building	Centre for Renewable Energy Sources - CRES	Owner and user	GREECE / Athens – Pikermi Located in non urban area	Date of construction: 07/2001 Renovation process: No	Total surface area: 529m ² Two-storey building with basement Non surrounded / attached by other buildings	CRES (GR)
✓		Office building	Centre for Renewable Energy Sources - CRES	Owner and user	GREECE / Athens – Pikermi Located in non urban area	To be provided	To be provided	
		Office building	NATIONAL STATISTICAL SERVICE OF GREECE / N.S.S.G. (E.Σ.Y.E.)	Owner and user	GREECE / Pireus Located in urban area	Date of construction: 02/2003 Renovation process: No	Total surface area: 22.000 m ² 8-storey building with 3-level basement Partly detached to other buildings	KED (GR) (Hellenic Public Real Estate Corp.)

	N/A	Office building	TRADER'S INSURANCE FUND / M.I.F. (T.A.E.)	Owner and user	GREECE / Athens Located in urban area	Date of construction: 08/2005 Renovation process: No	Total surface area: 4.670 m ² 6-storey building with 2-level basement Partly detached to other buildings	
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CS ⁽¹⁾	Photo of exterior	Type / use of building	Building owner ⁽³⁾	Type of ownership ⁽⁴⁾	Location ⁽⁵⁾	Construction Date ⁽⁶⁾	Short technical description ⁽⁷⁾	
	N/A	Office building	NATIONAL CONFEDERATION OF DISABLE PEOPLE / N.C.D.P. (E.Σ.A.E.A.)	Owner and user	GREECE / Athens Located in urban area	Date of construction: 10/2005 Renovation process: No	Total surface area: 4.750 m ² 4-storey building with 3-level basement Detached to other buildings	KED (GR) (Hellenic Public Real Estate Corp.)
	N/A	Office building Data centre / light industrial use	General Secretariat for Information Systems (Ministry of Finance and Economics)	Owner and user	GREECE / Athens - Moshato Located in urban area	Date of construction: 1970 Date of complete refurbishment: 1999 (change use and total renovation)	Total surface area: 24.000 m ² upper floors and 6.000 m ² basement 5-storey building with 2-level basement No detached to other buildings	
	N/A	Non-domestic / School (College) building	Statsbygg - The directorate of Public Construction and Property	Owner	NORWAY / Bergen	A few old, protected buildings should be implemented	Will be provided in later stage	STATSBYGG (NO)
	N/A	Non-domestic / School (College) building	Statsbygg	Owner	NORWAY / Sogndal	New localisation of 2 campus	14.200 m ²	

N/A	Non-domestic / School (College) building	Statsbygg	Owner	NORWAY / Borre	Existing buildings 18.000 m2	New buildings 16.000 m2. 2-3 storeys. Facilities for "Teacher education" New buildings 5.000 m2. Activity centre: Swimming pool, training centre, course facilities, offices etc. Statsbygg is not the owner of the activity centre.
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CS ⁽¹⁾	Photo of exterior	Type / use of building	Building owner ⁽³⁾	Type of ownership ⁽⁴⁾	Location ⁽⁵⁾	Construction Date ⁽⁶⁾	Short technical description ⁽⁷⁾	
		School buildings	Town of Kamnik				About 17 school buildings – 24.000m ²	
		Elementary school of Frana Albrehta	Municipality of Kamnik	Owner and user	Slovenia/ Kamnik	Date of construction: 1963 Renovation: 2004 (additional thermal insulation of roof – 15 cm)	Total surface area: 3.659m ² Three - storey building with basement Heating: district heating (natural gas)	KAMNIK (SL)
		Gymnasium of Frana Albrehta	Municipality of Kamnik	Owner and user	Slovenia/ Kamnik	Date of construction: 1980 Renovation: 2001 (exchange of windows)	Total surface area: 2.248m ² Part of school Frana Albrehta Heating: fuel oil	

	Elementary school in Mekinje	Municipality of Kamnik	Owner and user	Slovenia/ Kamnik	Date of construction: 1911 Renovation: 1950	Total surface area: 22.000 m ² 1-storey building Heating: fuel oil	KAMNIK (SL)
	Elementary school in Nevlje	Municipality of Kamnik	Owner and user	Slovenia/ Kamnik	Date of construction: 1963 Renovation: 1987 (exchange of boiler)	Total surface area: 882 m ² 1-storey building with two apartments in attic Heating: fuel oil	
	Elementary school in Tunjice	Municipality of Kamnik	Owner and user	Slovenia/ Kamnik	Date of construction: 1963 Renovation: 1987 (exchange of tile with additional thermal insulation of roof - 8cm)	Total surface area: 346 m ² ground floor building with two apartments in attic Heating: fuel oil	
	Elementary school in Vranja Peč	Municipality of Kamnik	Owner and user	Owner and user	Date of construction: 1947 Renovation: 2005 (exchange of tile with additional 20cm thermal insulation, renovation of façade).	Total surface area: 212 m ² ground floor building with attic Heating: fuel oil	

⁽¹⁾ Indicate which building will be also used for WP4:Energy and LCC analysis

⁽²⁾ Type / use of building: domestic, non-domestic, office building, school building, etc.

Deliverable 11

Data base with input data for LCC– interim report

EIE/06/154/SI2.447798

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⁽³⁾ *Building owner: public or private sector / design or construction company*

⁽⁴⁾ *Type of ownership: used by owner or rent*

⁽⁵⁾ *Location: Area / country*

⁽⁶⁾ *Date of construction and also if any refurbishment works done / dates*

⁽⁷⁾ *Area, number of storeys, density of surrounding built environment*