WORK ACTIVITY OF CLEANER BUILDING MATERIAL WORKGROUP

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Cleaner Building Material Workgroup (TEAM) was established in 1999 in Budapest. Original members were the Hungarian Assisiation of Building-biology, the St. Stephen University - Faculty of Ybl Miklós College - Labor 5, and the Independent Ecological Center.

The long-run aim of TEAM to introduce regular qualification of building materials from the point of view of building-ecology and building-biology in Hungary. To achieve this aim TEAM would like to work out a qualification method, which has a strong scientific background and is easy to adopt.

To find the adaptable method TEAM does research on international calculation and qualification methods and try work together with research institutes, ministries and trade-corporations.

In the past two years TEAM worked on two research project on the field of building-ecology and biology.

- In the frame of project called "Modification of market of building materials using economic regulations" TEAM did the research on ecological properties of building materials in the year of 2000.
- In the frame of project called "Cleaner Building Materials in Hungary!" TEAM did the research on ecological and biological properties of building constructions in the year of 2001.

Actually TEAM works in the frame of project called "Energy and cost demand of usual and environment-conscious houses" doing research on ecological properties of whole houses.

In the pre-qualification research work of TEAM the BauBioDataBank by Genossenschaft-Information-Bau-Biologie and, because of the lack of ecological and biological dates of Hungarian building materials, expert estimations were used.

BauBioDataBank is a database running on program 4^{th} Dimension. The database makes possible to use the ecological dates of more then 1600 "elements", more then 3500 "products and materials", more then 200 "constructions" and more then 10 "buildings.

On the "Element" level of BauBioDataBank nearby the descriptions of elements and their produce-process some ecological properties, as toxicant and environment load capacity are described. Figure 1.

On the "Product" level of BauBioDataBank nearby the descriptions, the technical dates and the produce-process of products and materials some ecological properties, as primer energy content (PEI), SO_{2eq}-content, CO_{2eq}-content are desribed. Figure 2.

On the "Construction" level of BauBioDataBank, using the dates of products, building constructions can be defined and their PEI, SO_{2eq} and CO_{2eq} value can be calculated. Figure 3.

On the "House" level of BauBioDataBank using the dates of constructions, PEI, SO_{2eq} and CO_{2eq} value of houses can be calculated. Figure 4.

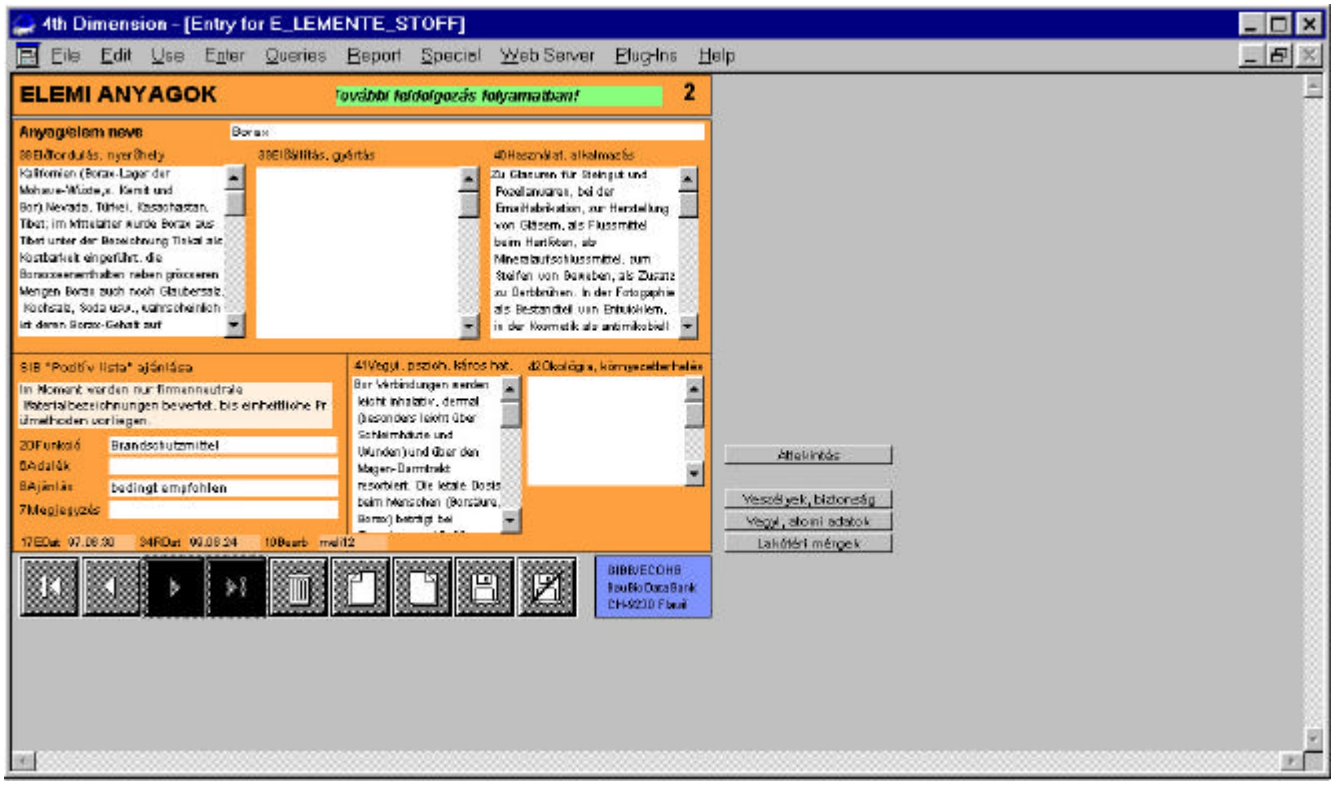

Figure 1.
Dates on "Element" level in BauBioDataBank.

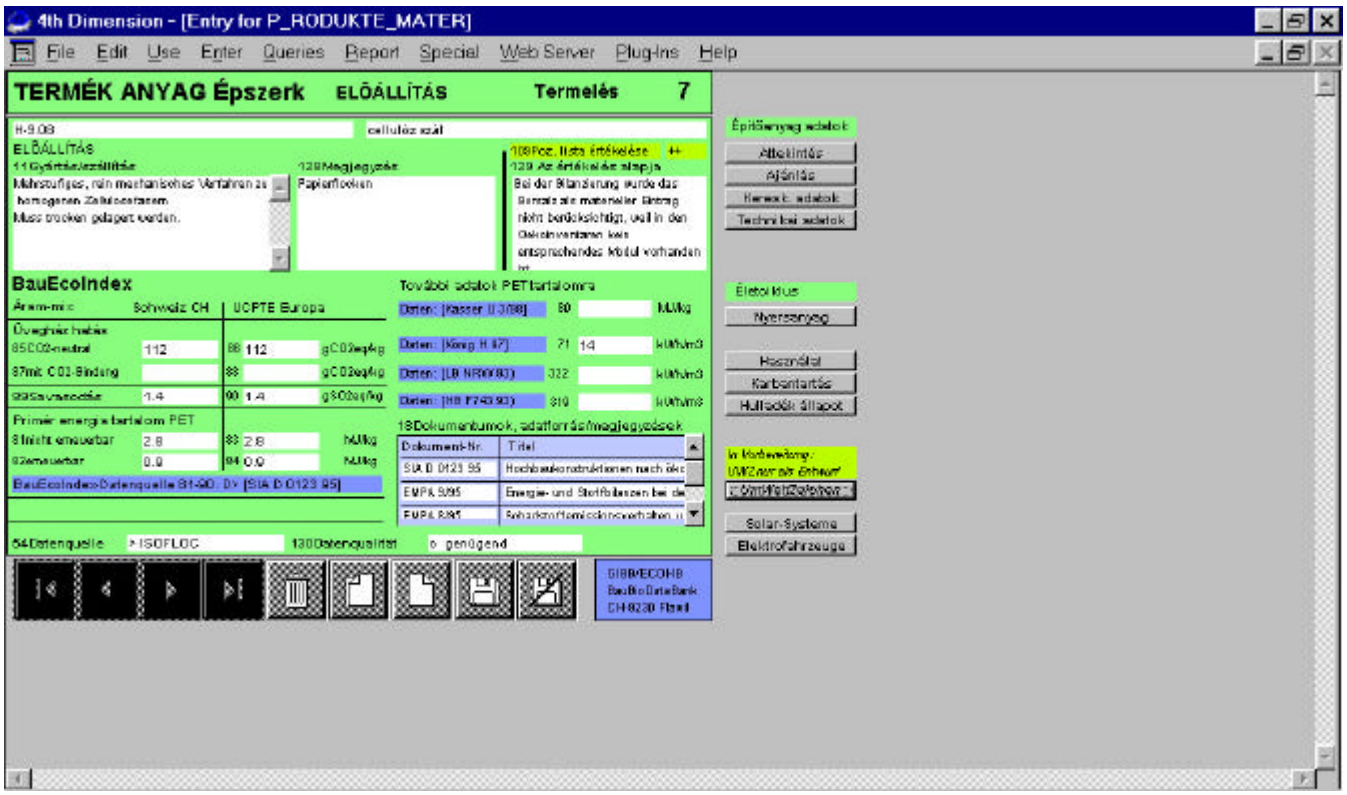

Figure 2.
Dates on "Product" level in BauBioDataBank.

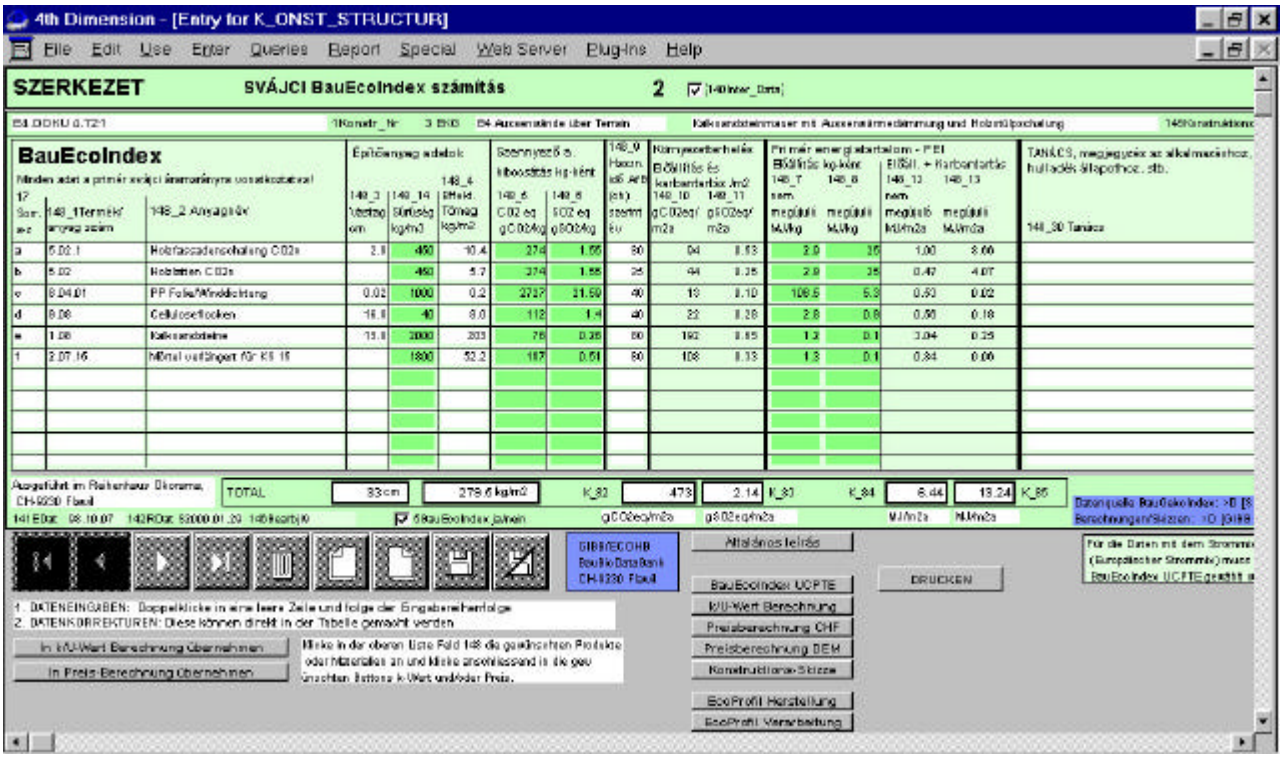

Figure 1.
Dates on "Element" level in BauBioDataBank.

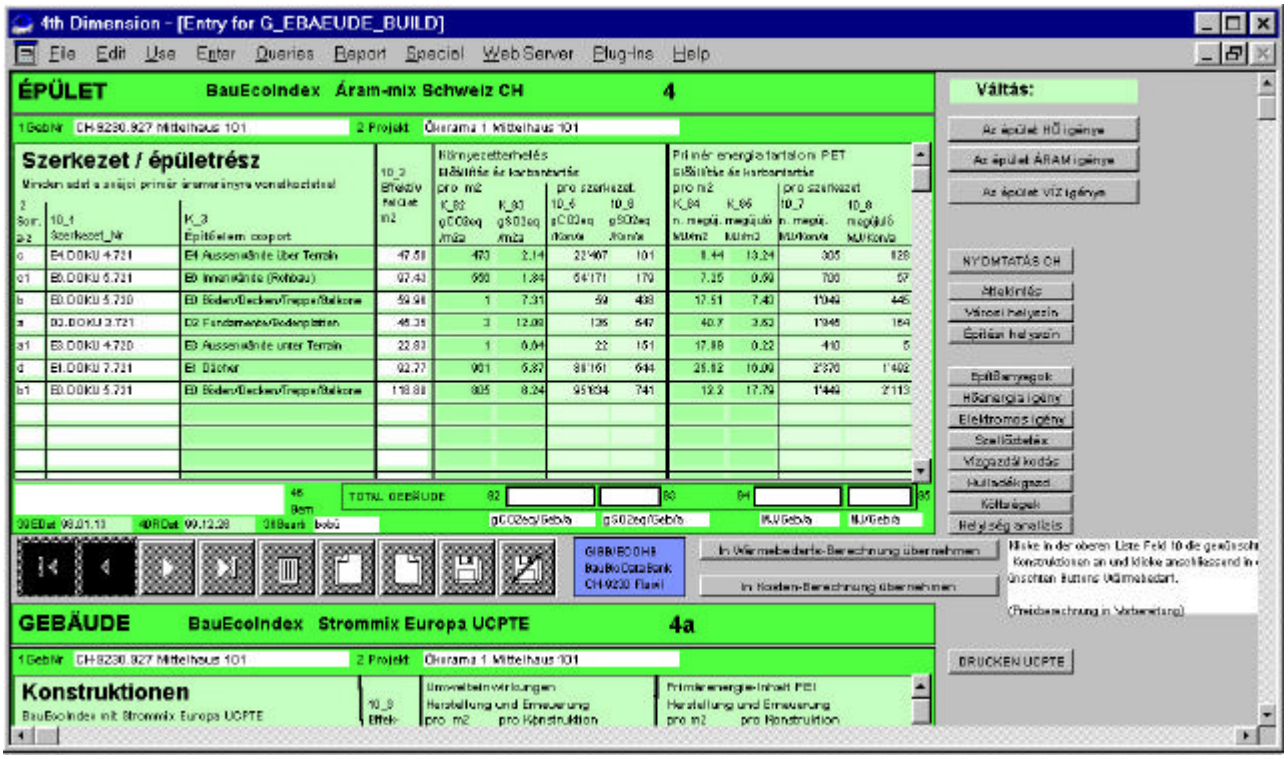

Figure 2.
Dates on "Product" level in BauBioDataBank.

In the pre-qualification work of TEAM a qualitative evaluative method were used. All live cycle aspect of examined building materials was with a "kv" number evaluate. To have an easy to use result the "kv" numbers were averaged. Table 1.

3	highly recommended
2	recommended
1	not recommended
0	neglected
nj	not caracteristic
na	no data available

Table 1.
Meaning of "kv" numbers.

TEAM examined the building materials in their raw material phase (attainability in national and/or global level), in their production phase (PEI, SO_{2eq}, CO_{2eq}, other environment load), in their building phase (energy demand, injurant emission), in their maintaining phase (energy demand, injurant emission), and waste material phase (energy demand, recyclable capacity). For example in the following we introduce the ecological examination of wall-materials, made by TEAM. Table 2. - Table 4.

	Usual thickness (m/m2)	Density (kg/m3)	Lambda value (W/mK)	Build in mass (kg/m2)	"U" - value (W/m^2K)	PEI (kWh/kg)	CO2 eq (g/kg)	SO2 eq (g/kg)	Life time (year - a)
Adobe	0,45	1600	0,35	720	0,69	0,5	208	0,88	na
Wood	0,2	600	0,16	120	0,70	1,3	-1042	2,21	50
Burned brick (average)	0,38	1000	0,5	380	1,08	0,6	249	0,94	80
_dense brick	0,25	1800	0,8	450	2,08	0,75	247	0,94	80
_usual brick	0,3	1150	0,57	345	1,44	0,75	247	0,94	80
_porous brick	0,38	800	0,2	304	0,48	0,75	247	0,94	80
masonry block with cement	nj	nj	nj	nj					
Porenconctete	0,38	600	0,16	228	0,39	1,16	456	1,4	80
Lightconcrete	0,38	1200	nj	456	nj	0,14	74	0,29	80
Woodconcrete	0,3	360	0,13	108	0,40	na	na	na	80
Concrete	0,15	2400	nj	360	nj	0,22	132	0,46	80
Polistirol masonry block	0,25	na	na	na	na (0.28)	na	na	na	80
Stone	0,5	1800	0,99	900	1,48	0,36	88	0,33	80
Liaporconctere	0,3	875	0,16	262,5	0,49	na	na	na	80

Table 2.
Wall material examination.

attainability	PEI (kWh/m2)	PEI (kv-num)	SO_{2eq} (g/m2)	SO_{2eq} (kv-num)	CO_{2eq} (g/m2)	CO_{2eq} (kv-num)	other e.load	Sum of process	
2	360	nj	149760	nj	633,6	nj	nj	<3,00>	Adobe
2	156	2	-125040	3	265,2	3	nj	2,67	Wood
2	228	2	94620	2	357,2	2	nj	2,00	Burned brick (average)
2	337,5	2	111150	2	423	2	nj	2,00	_dense brick
2	258,75	2	85215	2	324,3	2	nj	2,00	_usual brick
2	228	2	75088	2	285,76	2	nj	2,00	_porous brick
									masonry block with cement
2	264,48	2	103968	2	319,2	2	nj	2,00	Porenconctete
2	63,84	3	33744	3	132,24	2	nj	2,67	Lightconcrete
2	na	3	na	2	na	2	nj	2,33	Woodconcrete
1	79,2	2	47520	3	165,6	2	nj	2,33	Concrete
0	na	1	na	1	na	1	1	1,00	Polistirol masonry block
2	324	1	79200	2	297	2	nj	1,67	Stone
2	na	2	na	2	na	2	nj	2,00	Liaporconctere

Table 3.

Wall material examination.

Build in energy (kWh/m^2)	Build in energy (kv-num)	injurant emissio n (kv-num)	Sum of buil-ding (kv-num)	mainta n. energy demanc (kv-num)	useden ergy demanc (kv-num)	injurant emissio n (kv-num)	Sum of maintai ning (kv-num)	energy demanc (kv-num)	recycla ble capacit y (kv-num)	Sum of waste phase (kv-num)	Sum	
na	2	3	2,5	2	1	3	2	3	3	3	2,38	Adobe
na	3	3	3	2	3	3	3	2	3	2,5	2,63	Wood
na	3	2	2,5	3	2	2	2	2	2	2	2,10	Burned brick (average)
na	3	2	2,5	3	1	2	1,5	2	2	2	2,00	_dense brick
na	3	2	2,5	3	1	2	1,5	2	1	1,5	1,90	_usual brick
na	3	2	2,5	3	3	2	2,5	2	1	1,5	2,10	_porous brick
												masonry block with cement
na	3	1	2	2	2	1	1,5	2	2	2	1,90	Porenconctete
na	3	1	2	2	2	1	1,5	2	1	1,5	1,93	Lightconcrete
na	3	2	2,5	2	2	1	1,5	2	1	1,5	1,97	Woodconcrete
na	3	1	2	3	1	1	1	1	2	1,5	1,57	Concrete
na	3	1	2	1	1	0	0,5	1	1	1	0,90	Polistirol masonry block
na	2	2	2	2	2	2	2	2	3	2,5	2,03	Stone
na	3	2	2,5	2	2	1	1,5	2	1	1,5	1,90	Liaporconctere

Table 4.
Wall material examination.

As conclusion we have to state the followings:

- There is a lack of suitable valuation and qualification method to building materials.
- There is a lack of national dates of environment and health load of production and maintenance of building materials.
- There are significant differences between building materials (as a same construction) from the point of view of building ecology/biology.

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