



PRECASTEEL WP 1 – Task 1.6

Collection of data on industrial and commercial building from: Finland, Poland, the Czech Republic, Hungary and Romania

Authors: Anna-Leena Perälä, Harri Nuutila, Ludovic Fülöp

Confidentiality: Confidential
[Public after closing the project \(July 2010\).](#)

Report's title Collection of data on industrial and commercial building from: Finland, Poland, the Czech Republic, Hungary and Romania		
Customer, contact person, address Commission of the European Communities	Order reference RFS-PR-06054	
Project name Prefabricated steel structures for low-rise buildings in seismic areas	Project number/Short name 12597/PRECASTEEL	
Author(s) Anna-Leena Perälä, Harri Nuuttila, Ludovic Fülöp	Pages 37 p.	
Keywords Storage buildings, commerce, industry, warehouse, Poland, Hungary, Czech Republic, Romania, Finland	Report identification code VTT-R-00292-08	
<p>Summary</p> <p>This confidential report include construction market information in Finland, Poland, Hungary, Czech Republic and Romania from new storage, commercial and industrial warehouse buildings. Information has collected mostly from new building statistics in each country. Those statistics vary very much in each country. Those markets are increasing nowadays. Typical used materials, size, storeys, m³/unit and m²/unit, € have been calculated mostly from Finland, but there are some indicators also from other countries.</p> <p>In the second part of the document a summary of the available data is presented concerning the most adopted morphological and structural solutions for single-storey industrial (SSIB) and low rise commercial (LRCB) buildings. This data is based on a survey of construction companies operating on the local markets of the mentioned countries.</p> <p style="text-align: center;">Public after closing the project (July 2010).</p>		
Confidentiality	Confidential	
Tampere 18.02.2008		
Signatures	Signatures	Signatures
Written: Anna-Leena Perälä, Harri Nuuttila Ludovic Fülöp	Reviewed by Heli Koukkari Senior Research Scientist	Accepted by Eila Lehmus Technology Manager
VTT's contact address Ludovic.Fulop@vtt.fi		
Distribution (customer and VTT)		
Customer ():	1 copy	
VTT/Register Office:	1 copy	
<p><i>The use of the name of the VTT Technical Research Centre of Finland (VTT) in advertising or publication in part of this report is only permissible with written authorisation from the VTT Technical Research Centre of Finland.</i></p>		

Preface

This report includes relevant material about new storage, warehouses and industrial building markets Poland, Hungary, Czech Republic and Romania. This data is integrated with the results of a company specific survey to provide input data to the PRECASTEEL project (Unfortunately, the company survey on the Czech Republic was unsuccessful. Therefore, the company data is missing in this document.).

PRECASTEEL aims “at defining prefabricated steel solutions for realising single-storey industrial and low-rise commercial buildings in earthquake-prone areas, able to satisfy requirements of industrial and commercial activities”.

Therefore the focus of this report is to provide data for the statistical analysis of most adopted morphological and structural solutions for single-storey industrial (SSIB) and low-rise commercial (LRCB) buildings, paying particular attention to the more adopted geometries (height, spans,...), the typology of roofing systems and infill wall systems, the presence of overhead travelling crane, the possibility of external operation of the crane and all the requirements related to the free space entrance to carry out all the industrial activities, lighting advantages and disadvantages.

The first part of the report (Chapter 2 & 3) has done by Senior Research Scientist Anna-Leena Perälä, Data Analyst Harri Nuuttila and Statistics Analyst Risto Rintanen (VTT Construction Business Intelligence team).

Potential markets to SSIB and LRCB can estimated from Finland during last years and this is a case by buildings. Because the available statistical data is not so detailed in other countries like in case of Finland, potential markets can be different from emerging countries, but an average size and materials in those new buildings can be found. Those markets have now a big boom in this year and positive directions will continue during next years in all those countries.

The country based data provided in the first part is supplemented by the results of a survey concerning the most adopted morphological and structural solutions based on a company survey. (Chapter 4 & 5). This part was done by Ludovic Fulop.

Espoo 20th January 2008.

Anna-Leena Perälä, Harri Nuuttila, Ludovic Fülöp

Contents

Preface	2
1 Methods	4
2 New storage, industrial and commercial building construction in Finland	4
2.1 New storage buildings in Finland	4
2.2 New industrial buildings in Finland	7
2.3 New commercial buildings in Finland	8
2.4 Detailed data and potentials in Finland	9
3 Storage, industrial and commercial buildings in Poland, Czech Republic, Hungary and Romania	13
3.1 Poland	15
3.2 Hungary	18
3.3 Czech Republic	20
3.4 Romania	21
4 Morphological and structural data of SSIB	22
5 Morphological and structural data of LRCB	24
6 Conclusions	26
7 Summary	26
Appendix I – Morphological and structural data Finland	29
7.1 Single storey industrial buildings (SSIB)	29
7.2 Low-rise commercial buildings (LRCB)	30
Appendix II – Morphological and structural data Poland	31
7.3 Single storey industrial buildings (SSIB)	31
7.4 Low-rise commercial buildings (LRCB)	32
Appendix III – Morphological and structural data Czech Republic	33
Appendix IV – Morphological and structural data Hungary	34
7.5 Single storey industrial buildings (SSIB)	34
7.6 Low-rise commercial buildings (LRCB)	35
Appendix V – Morphological and structural data Romania	36
7.7 Single storey industrial buildings (SSIB)	36
7.8 Low-rise commercial buildings (LRCB)	37

1 Methods

The methods to look at new storage, industrial and warehouses markets in five countries have been:

- collect public information from construction statistics from Finland, Poland, Hungary, Czech Republic and Romania from interesting building types.
- To get relevant information from construction industry organizations, construction magazines and companies by internet.
- to provide more detailed statistics from Finland as case and calculate typical frame materials, an average size and storeys from interesting buildings with detailed data.

2 New storage, industrial and commercial building construction in Finland

In Finland there are 15 main building types, which need a new building permit. The number, m^3 and m^2 of storage, industrial and commercial new buildings in Finland have handled in Chapters 2.1-2.4. Chapters 2.1-2.3 include those building statistics between 2000...2006. Those main building types include also many subgroups, which have been calculated in Chapter 2.4 between 1990...1998 and between 2004...2006. Commercial, transport, industry and public buildings can include also SSIB & LRCB types of building shape.

2.1 New storage buildings in Finland

The storage construction starts vary between 3...6 mill. m^3 building space yearly (Figure 1) and 400 000 ...600 000 m^2/a in Finland (Figure 2). Storage building permits, starts and completed buildings change much according the situation of economic and investments of industry, commerce and public sector.

The markets share of bearing structure materials of steel vary about 44...47 % in building space and 35 % of building units, but sheet metal on facades is much more, about 50...75 % of facades area (Figure 3, Figure 4 & Figure 5). An average floor area is about 500...700 m^2 and in steel frame storages a little bit more.

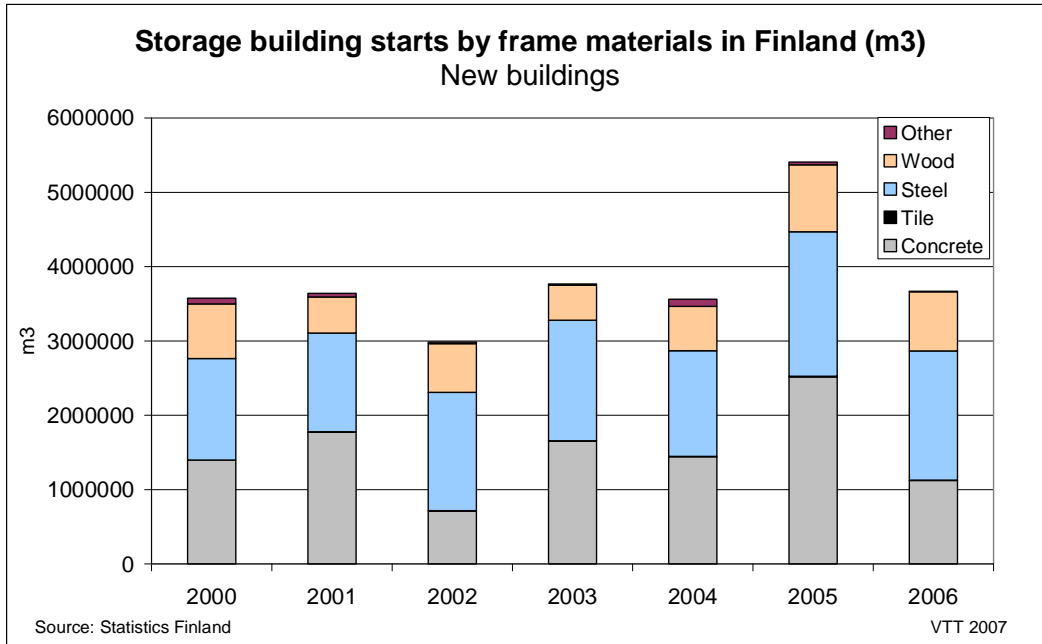


Figure 1. New storage building starts by bearing structure material in Finland between 2000...2006.

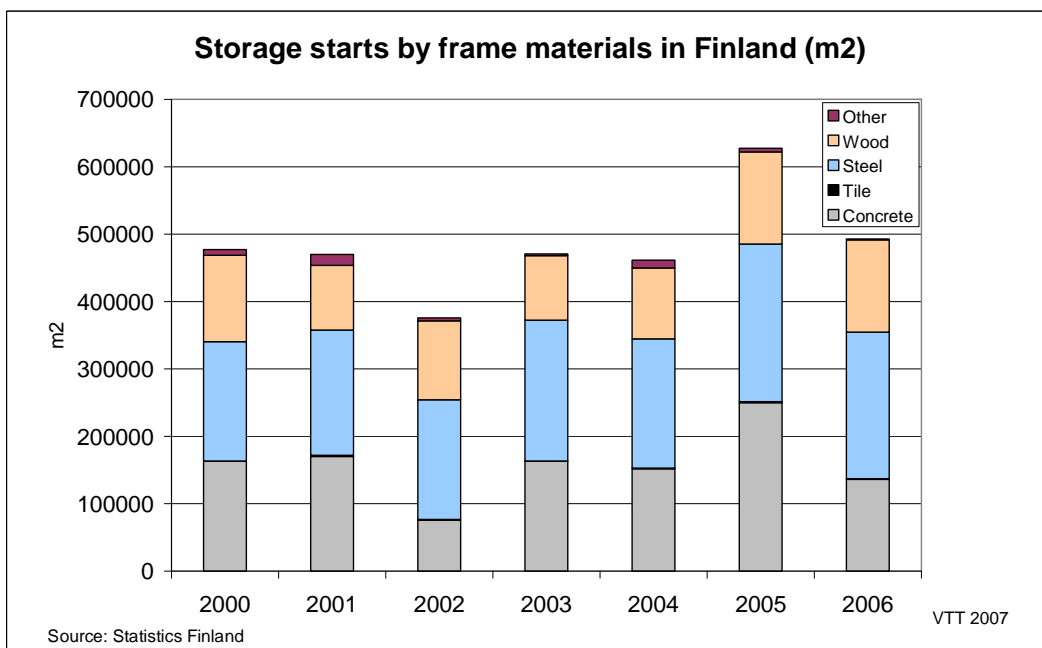


Figure 2. New storage buildings in floor space (m2) in Finland.

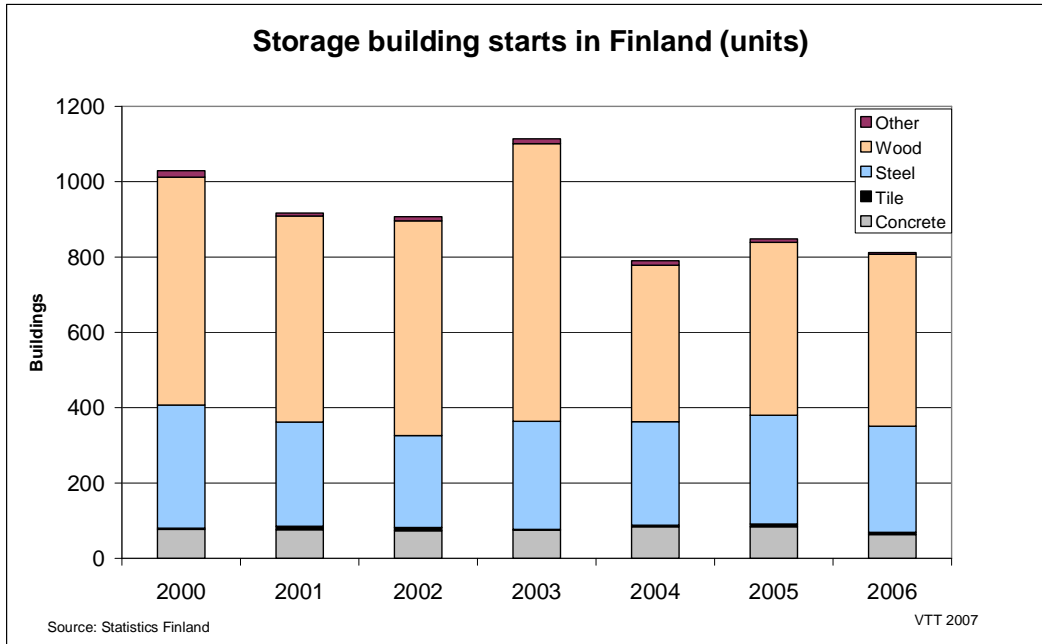


Figure 3. New storage building unit starts vary between 800...1100 buildings in Finland.

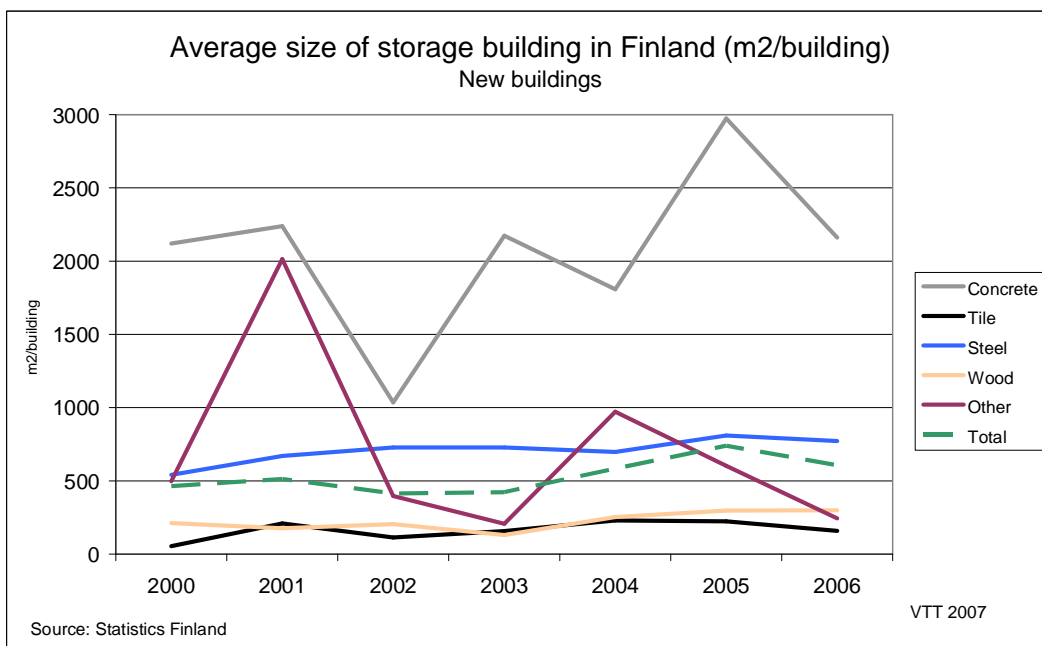


Figure 4. An average size of new storage building is about 500...700 m²/building in Finland.

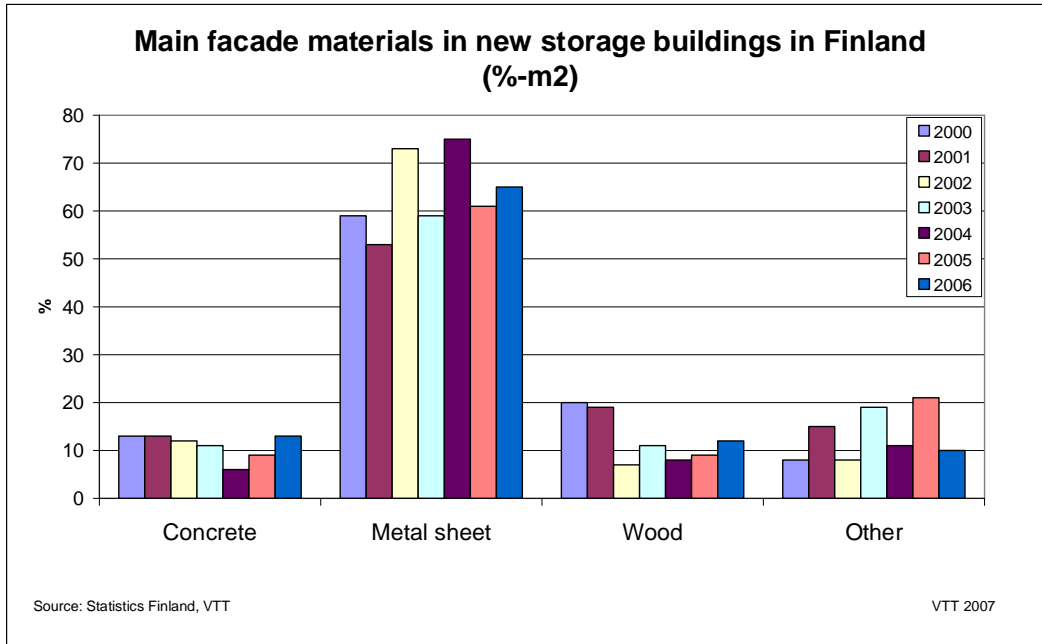


Figure 5. Metal sheet facades are 50 %...75 % of all storage facade surfaces in Finland.

2.2 New industrial buildings in Finland

During last year new industrial buildings is constructed between 4...8 million m³ in Finland (Figure 6). General bearing structures are concrete and steel. An average size of new industry building is about 600...800 m²/building between 2000...2006. Steel frame buildings can be a little bit smaller an average (Figure 7).

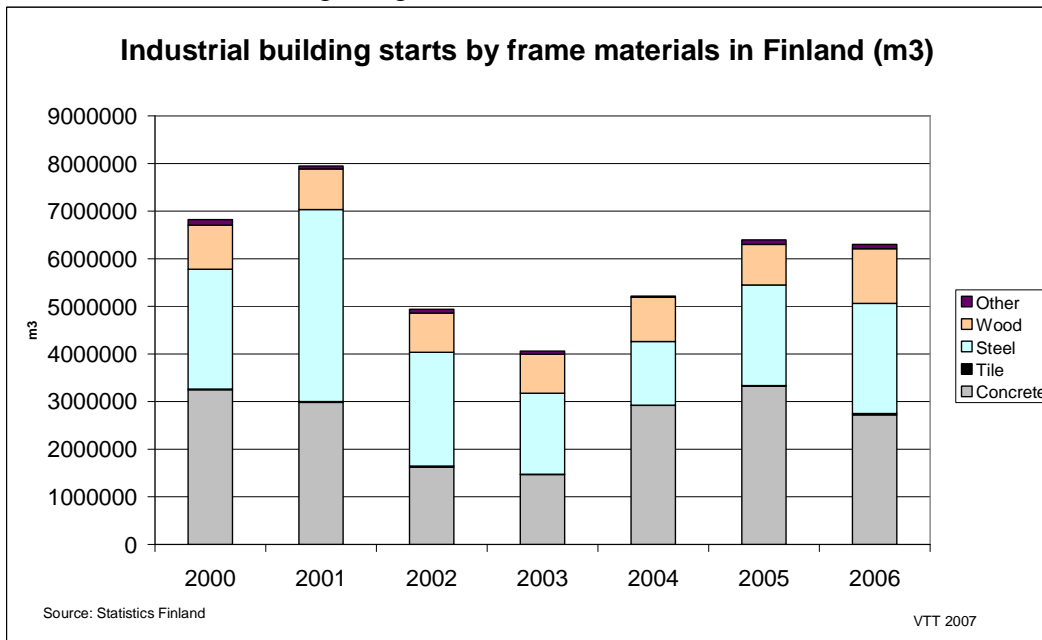


Figure 6. Industrial building construction investments change very much during 2000...2006.

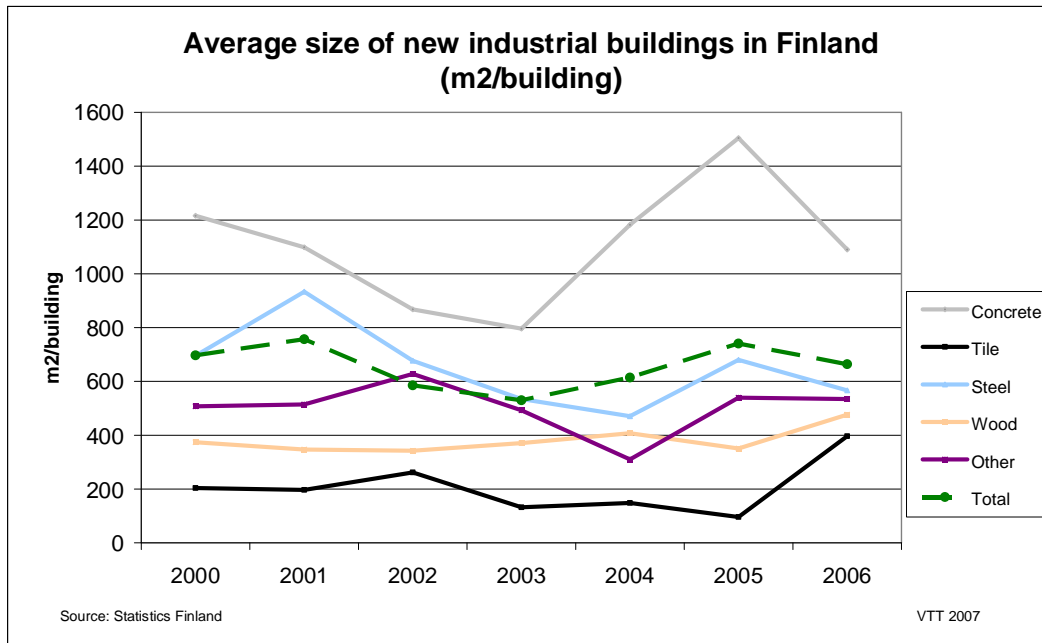


Figure 7. An average size of industrial buildings varies between 200...1500 m².

2.3 New commercial buildings in Finland

Commercial building starts have increased very much during 2007 in Finland. Commercial structure is changing and different national and international chains are investing much to secure Finnish market (Figure 8). Internal migration is rather fast and growing areas need more business space. Some buildings are very big and some cheaper chains will also offer commercial space.

Commercial buildings have mostly concrete frames, but there have been also some very big steel frame buildings (Figure 9). Commercial storages include to storage buildings in Finland. Typical size of commercial buildings has increased during last years an average size of commercial buildings have been between 500...1000 m²/unt.

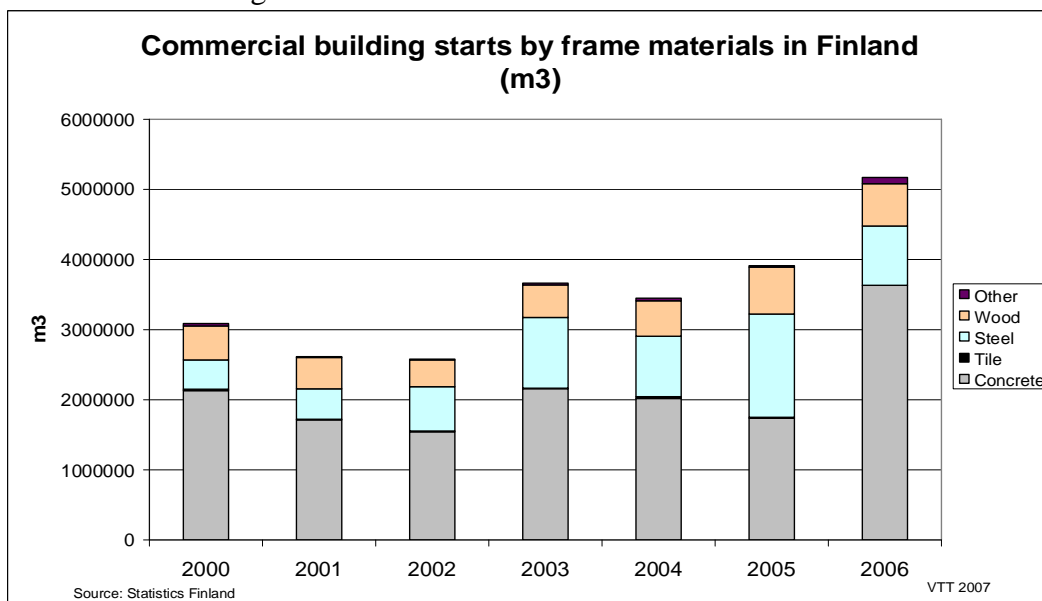


Figure 8. New commercial building starts have increased during last years in Finland.

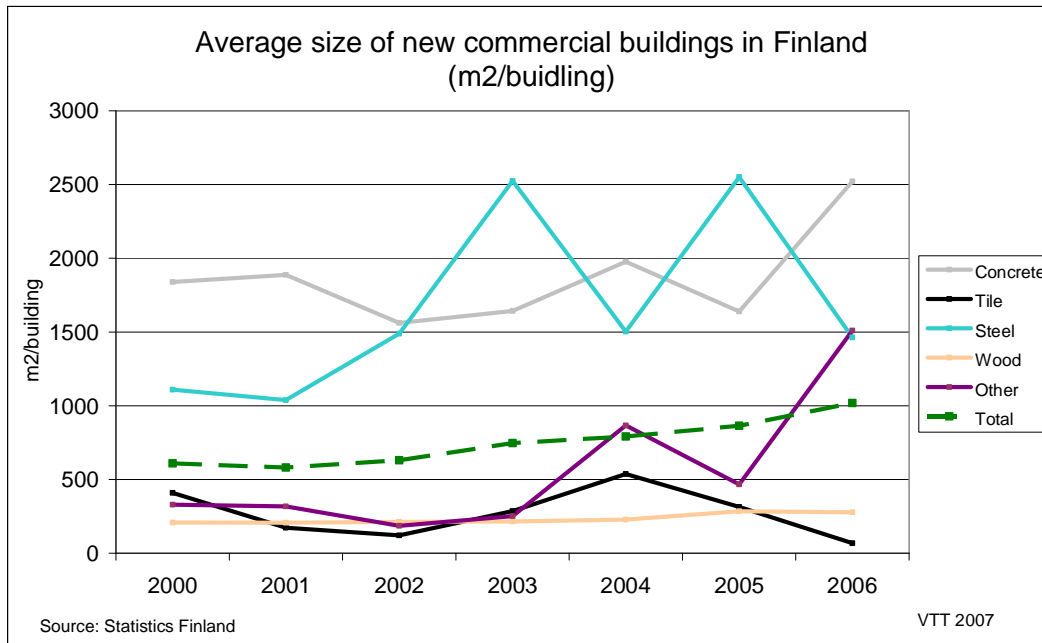


Figure 9. Average size of new commercial buildings varies much especially in steel structure.

2.4 Detailed data and potentials in Finland

Years 1990...1998. During 1990...1998 there have been built many kinds of storages, industrial and warehouses in Finland. They are now a case to concentrate potential buildings of SSIB and LRCB. Most building volumes have been during this timescale in big other industrial buildings, industrial warehouses and commercial warehouses (Figure 10). Steel frame buildings in those detailed building types vary between 13 %...55 % of building volume (Figure 11). More than half of those building volumes came from big buildings (size more than 20000 m³). Then there were buildings, which are less than 5000 m³ (Table 1).

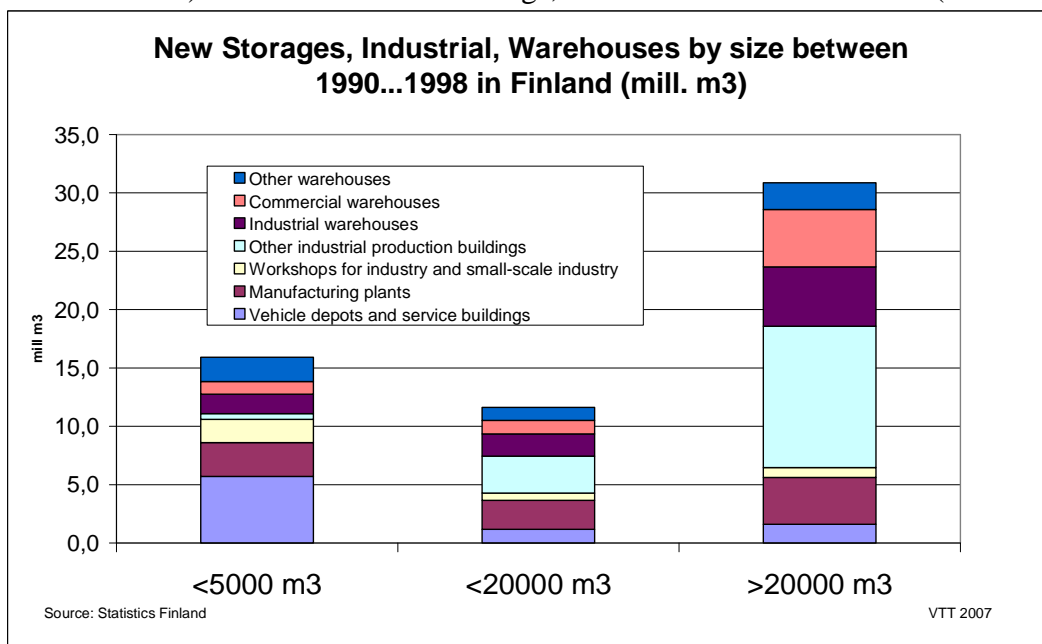


Figure 10. New detailed storage, industrial and warehouses by size in Finland between 1990...1998 (m³).

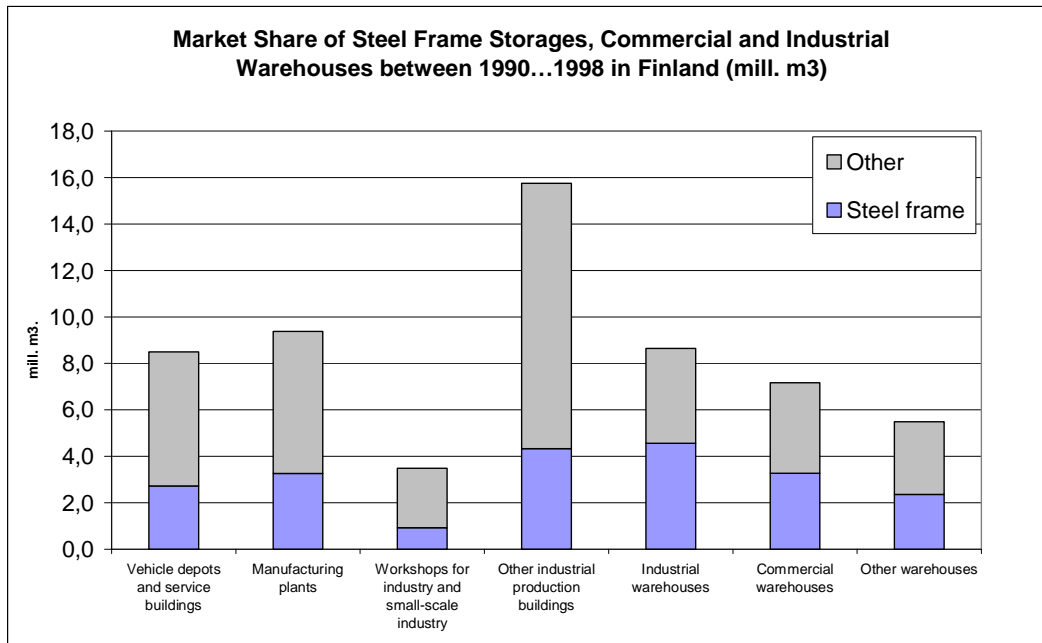


Figure 11. The market share of steel frame detailed building types between 1990...1998. Source: Statistics Finland.

Table 1. New storages, warehouses and industrial buildings by size in Finland between 1990...1998 (mill.m3).

New storages, warehouses and industrial buildings by size in Finland between 1990...1998 (mill. m3)	Size class of buildings									
	<5000 m3			<20000 m3			>20000 m3			Total
	Steel frame	Other	Total	Steel frame	Other	Total	Steel frame	Other	Total	Grand total
Vehicle depots and service buildings	1,3	4,4	5,7	0,3	0,9	1,2	1,2	0,5	1,6	8,5
Manufacturing plants	0,9	2,0	2,9	1,0	1,5	2,5	1,4	2,6	4,0	9,4
Workshops for industry and small-scale industry	0,5	1,5	2,0	0,2	0,4	0,6	0,2	0,7	0,9	3,5
Other industrial production buildings	0,1	0,3	0,5	0,8	2,3	3,2	3,4	8,7	12,1	15,8
Industrial warehouses	0,9	0,8	1,7	1,2	0,7	1,9	2,5	2,6	5,1	8,6
Commercial warehouses	0,5	0,6	1,1	0,5	0,7	1,2	2,3	2,6	4,9	7,2
Other warehouses	0,8	1,3	2,1	0,6	0,5	1,1	0,9	1,4	2,3	5,5
Total	4,9	11,0	15,9	4,6	7,0	11,6	11,9	19,0	30,9	58,4

Source: Statistics Finland, VTT, 2007

Table 2. 1-storey buildings are very common and potential SSIB & LRCB buildings are 65 %.

Potential SSIB and LRCB buildings in Finland between 1990-1998 % of m3	<5000 m3							<20000 m3						
	Steel			Other			Total	Steel			Other			Total
	One-storey	Other	Total	One-storey	Other	Total	Total	One-storey	Other	Total	One-storey	Other	Total	Total
Vehicle depots and service buildings	92	8	100	88	12	100	67	78	22	100	42	58	100	14
Manufacturing plants	100	0	100	99	1	100	31	99	1	100	100	0	100	26
Workshops for industry, small-scale industry	60	40	100	68	32	100	57	57	43	100	41	59	100	18
Other industrial production buildings	87	13	100	74	26	100	3	56	44	100	42	58	100	20
Industrial warehouses	97	3	100	95	5	100	19	96	4	100	74	26	100	22
Commercial warehouses	96	4	100	93	7	100	15	90	10	100	59	41	100	16
Other warehouses	98	2	100	94	6	100	38	92	8	100	83	17	100	20
Total	92	8	100	88	12	100	27	85	15	100	62	38	100	20

	>20000 m3							Total	Potential SSIB and LRCB buildings						
	Steel			Other			Total	Grand	<5000 m3			>20000 m3			
	One-storey	Other	Total	One-storey	Other	Total	Total	Total	1-storey	1-storey	1-storey	%- of m3	%- of m3	%- of m3	
Vehicle depots and service buildings	0	100	100	23	77	100	19	100	5078825	592038	103420	60	7	1	
Manufacturing plants	100	0	100	97	3	100	43	100	2872373	2468457	3917109	31	26	42	
Workshops for industry, small-scale industry	0	100	100	40	60	100	25	100	1316251	298701	264290	38	9	8	
Other industrial production buildings	38	62	100	16	84	100	77	100	368967	1456885	2678886	2	9	17	
Industrial warehouses	94	6	100	61	39	100	59	100	1601161	1666482	3938708	19	19	46	
Commercial warehouses	89	11	100	40	60	100	69	100	1022768	842634	3067422	14	12	43	
Other warehouses	79	21	100	79	21	100	42	100	1982093	989720	1809740	36	18	33	
Total	66	34	100	42	58	100	53	100	14242438	8314917	15779575	24	14	27	

Source: Statistics Finland and VTT, 2007

Potentials. Potential SSIB and LRCB buildings can be in many kinds of 1-storey buildings (Table 2). For instance vehicle and service buildings were in Finland mostly less than 5000

m³ building space. Manufacturing plants are 1-storey buildings and potentials could be both in smaller or bigger building, if the structures and fire-orders suits to production. Potentials to workshops for industry are mostly in smaller buildings, because buildings are typically multi-storey buildings. Other industrial production buildings are often big multi-storey buildings, so that they are not potential SSIB-buildings.

Industrial warehouses are potential SSIB buildings, but they are mostly very big 1-storey buildings. The situation in commercial warehouses is almost the same. LRCB-potentials are then mostly in big buildings. Instead of other warehouses they can be both small and big 1-storey buildings.

Case from potential buildings of warehouses between 2004...2006 in Finland. New warehouses are mostly more than size class 5000 m² in floor area. Sub-sectors of warehouses vary in industrial, commercial and other warehouses (Figure 12). Commercial warehouses are smaller market than other warehouses, but commercial buildings itself are much larger markets. Small warehouses are not so common.

Most warehouses are 1-storey buildings, because about 90 % of floor areas are coming from 1-storey buildings and only 10 % have more storeys (Figure 13).



Figure 12. New warehouses in sub-sectors in Finland.

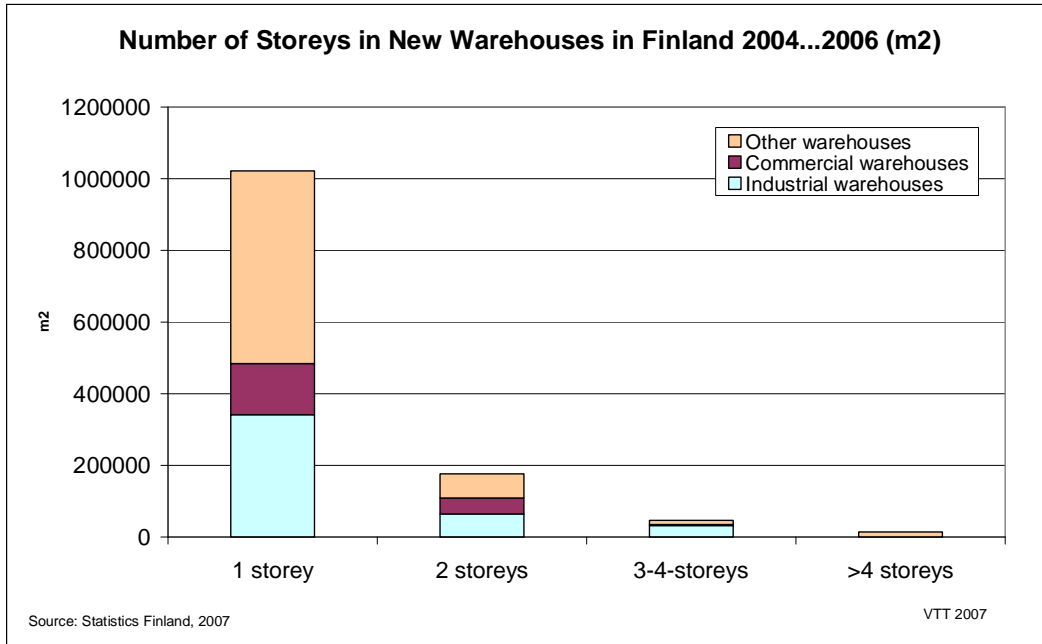


Figure 13. Most new warehouses are 1-storeys in Finland.

3 Storage, industrial and commercial buildings in Poland, Czech Republic, Hungary and Romania

Building statistics in Poland, Czech Republic, Hungary and Romania include different data of storage, industrial and warehouse buildings by countries. They can be a part of commercial, industry or transport buildings or exact storage and warehouse buildings. Also building units, m², m³ of building space and values in buildings are often different from countries.

VTT is a partner in Euroconstruct network. Building volume as € is produced from many countries. There is comparison between new storage, commercial and industrial building volumes in Figure 14 to Figure 17. They all meant 30 %...40 % of all new construction value. For instance in Finland new storage buildings were less than 5 % of all new building volume in 2006, but in Poland and Hungary even more. Commercial and industrial buildings can include also storage type buildings in some countries.

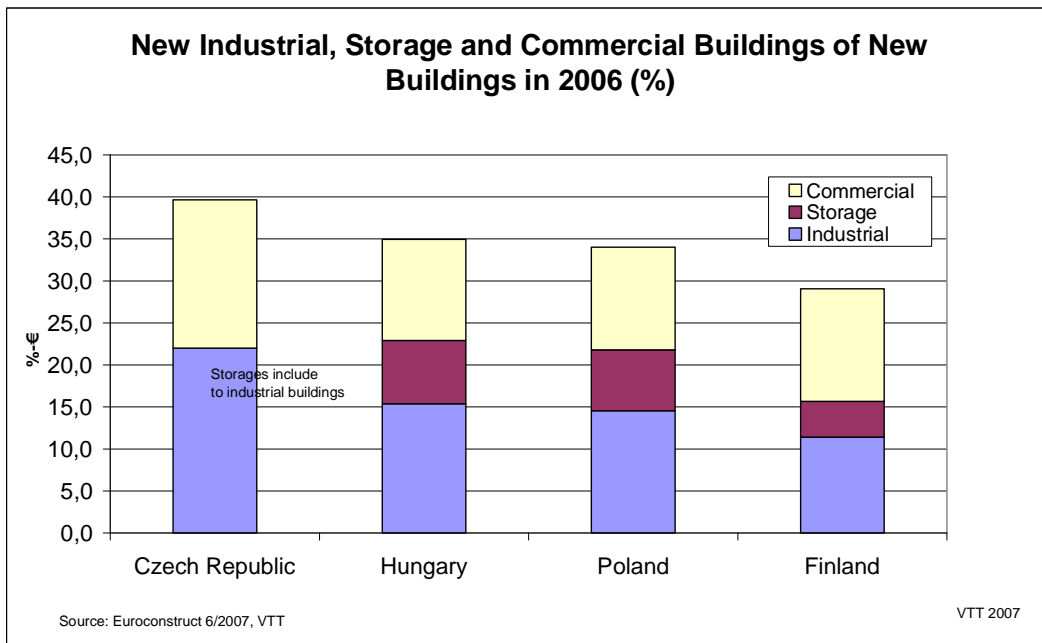


Figure 14. Share of industrial, storage and commercial building volume of all new buildings in four countries.

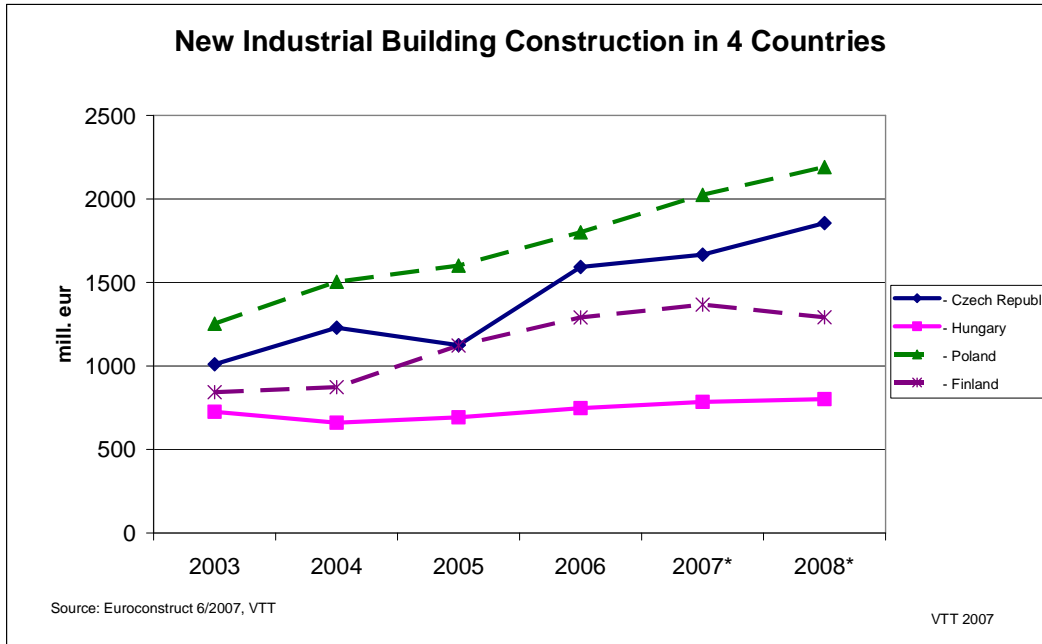


Figure 15. New industrial building volumes (€) is increasing in four countries. Source: Euroconstruct 6/2007.

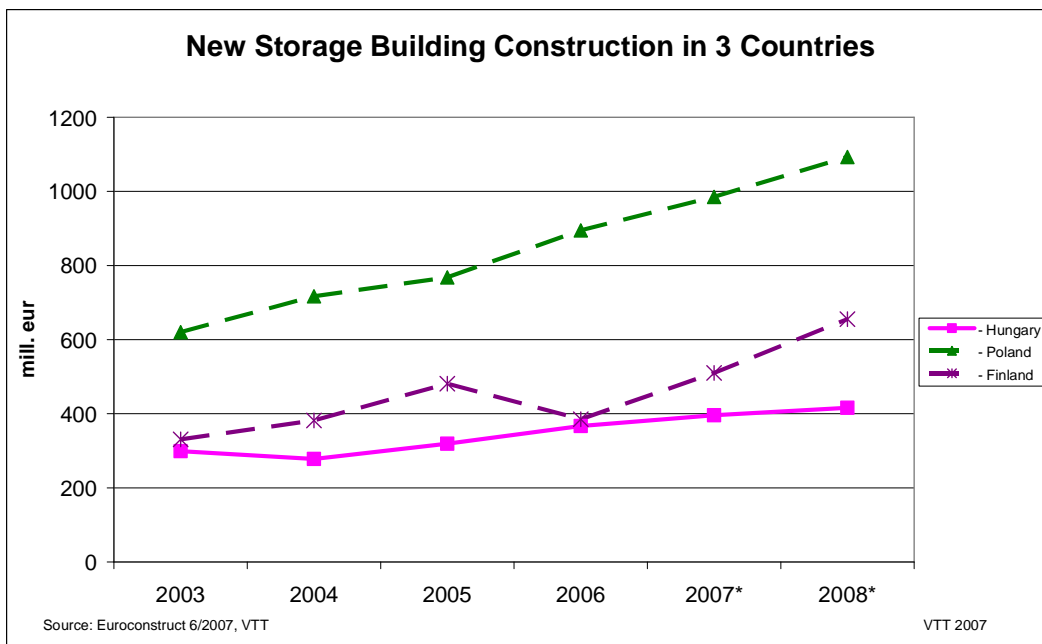


Figure 16. New storage building volumes (€) will increase most in Poland. Source: Euroconstruct 6/2007.

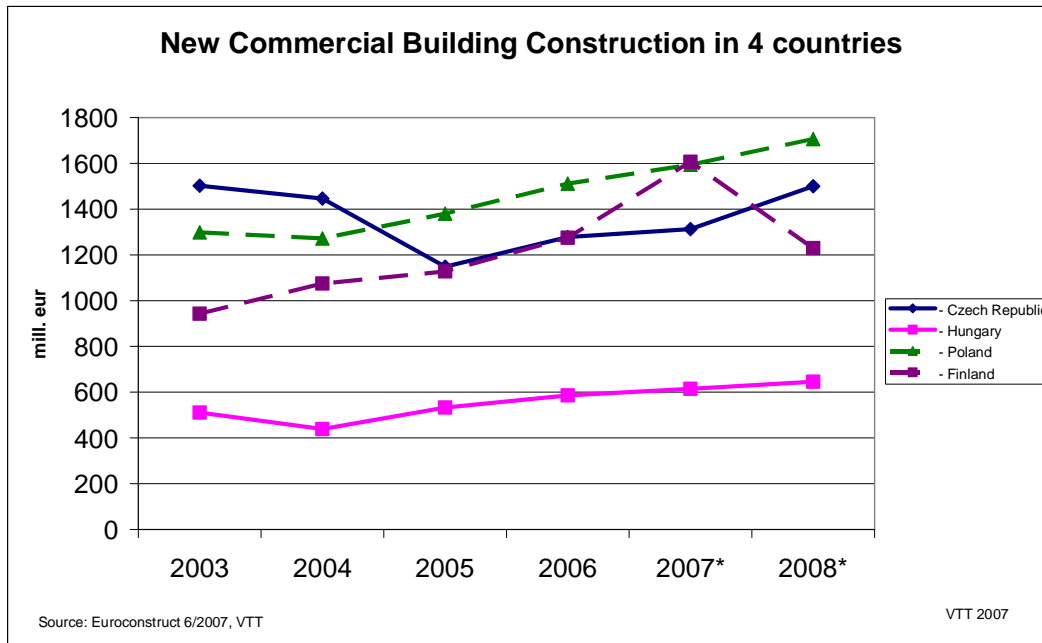


Figure 17. New commercial building volumes (€) can include also same kind of building space like storage buildings. Euroconstruct 6/2007.

3.1 Poland

High investment demand on the part of enterprises will be rooted in favorable perspectives of sales amid a relatively low cost of capital. The rise in investments will be additionally supported by the inflow of capital from abroad in the form of direct investments and the inflow of funds from the EU. Organizing the European Cup in Poland in 2012 will have a positive effect on the Polish economy in the subsequent years.

2006 was a third year after Poland's accession to the EU and the significant growth on the non-residential buildings market has been observed. This improvement has taken place rather in the private sector than in the public one. A key factor for this excellent result is a booming national economy, a trend that has continued since Poland's accession to the European Union in 2004. (Euroconstruct, 2007, Finpro a)

Private non-residential construction. In 2006, a record rise in private non-residential construction was noted. PAB-PCR&F estimates that in 2006 the private non-residential construction increased by almost 10%.

Significant growth noted in the range of industrial and warehouse objects has been caused by the increasing of the expenses for the construction work in the industrial and commercial objects.

Polish classification of types of construction are shown for instance in report (Central Statistical office a). There are 14 new non-residential building types. An average size of new commercial building is about 3400 m³, industrial building 11000...14000 m³ and warehouse 5000...8500 m³ (Table 3). The frame material of new buildings is not possible to get from construction statistics.

Table 3. Average size of new non-residential building in Poland is changing. Bigger industrial and warehouse buildings are increasing.

Average size of completed new non-residential building in Poland				
m3/building	2000	2004	2005	2006
	m3/building	m3/building	m3/building	m3/building
Hotels	871	1386	1434	1829
Office	8092	5969	6158	7525
Commercial	3377	2905	3388	3409
Communication	1492	1789	1933	2385
Garages	175	167	183	190
Industrial	7773	11494	13049	14084
Warehouses	4266	4887	6854	8563
Public, museums	11265	6716	6120	3998
Schools	14626	12030	12380	12168
Hospitals	5824	4161	5207	5323
Sport halls	10957	9619	10482	12205
Agriculture	1082	1587	1482	1149
Religious	4866	4314	5616	4291
Other non res.	1688	1755	750	2000

Source: Central Statistical Office, 2007 VTT 2007

Poland is the most rapidly expanding central European market. There were built about 3700 commercial buildings, 1300 industrial buildings and 2100 warehouses in 2006 (Table 4). Building unit is not so good indicator, because the size of those buildings can change very much.

An average size of trade warehouses in building stock has increased a little during last ten years (Figure 18). Typical trade warehouses in building stock are 500 m²/unit, roofed warehouses in private sector are about 1000 m²/unit (Table 5).

Table 4. Completed new buildings in Poland between 2000...2006.

Completed new buildings in Poland	Buildings	Buildings	Buildings	Buildings	%
	2000	2004	2005	2006	2006
1-dwelling buildings	29777	56231	55707	52813	68
2+ dwelling buildings	2337	2318	2442	2595	3
Residences of commu	37	31	35	23	0
Residential	32151	58580	58184	55431	71
Hotels	1419	687	1012	807	1,0
Office	444	490	486	487	0,6
Commercial	3706	3776	3822	3721	4,8
Communication	65	19	15	20	0,0
Garages	6215	6573	6454	5307	6,8
Industrial	983	1198	1175	1296	1,7
Warehouses	1580	2165	2114	2118	2,7
Public, museums	49	67	92	125	0,2
Schools	155	263	213	236	0,3
Hospitals	108	186	188	161	0,2
Sport halls	116	168	191	239	0,3
Agriculture	2991	4519	4293	7848	10,1
Religious	82	102	99	86	0,1
Other non res.	141	163	264	207	0,3
Non residential	18054	20376	20418	22658	29
Total new completed	50205	78956	78602	78089	100

Source: Central Statistical Office, 2007 VTT 2007

Table 5. Trade warehouses in building stock in Poland.

Trade warehouses in Poland		unit	1995	2000	2005	2006
Secured warehouses	number		25187	29826	29375	29057
of which private sector	number		22138	27851	28393	28093
-Storage area	1000 m2		10627	14776	16718	17526
of which private sector	1000 m2		8370	13649	16260	17066
Roofed warehouses	number		2160	3057	2927	2978
of which private sector	number		1730	2741	2828	2890
-Storage area	1000 m2		924	1064	1135	1281
of which private sector	1000 m2		740	943	1095	1249
Storage sites	number		3474	4862	4974	4905
of which private sector	number		2878	4369	4768	4685
-Storage area	1000 m2		8764	13352	14209	14118
of which private sector	1000 m2		6720	11062	12135	12081

Source: Central Statistical office, 2007

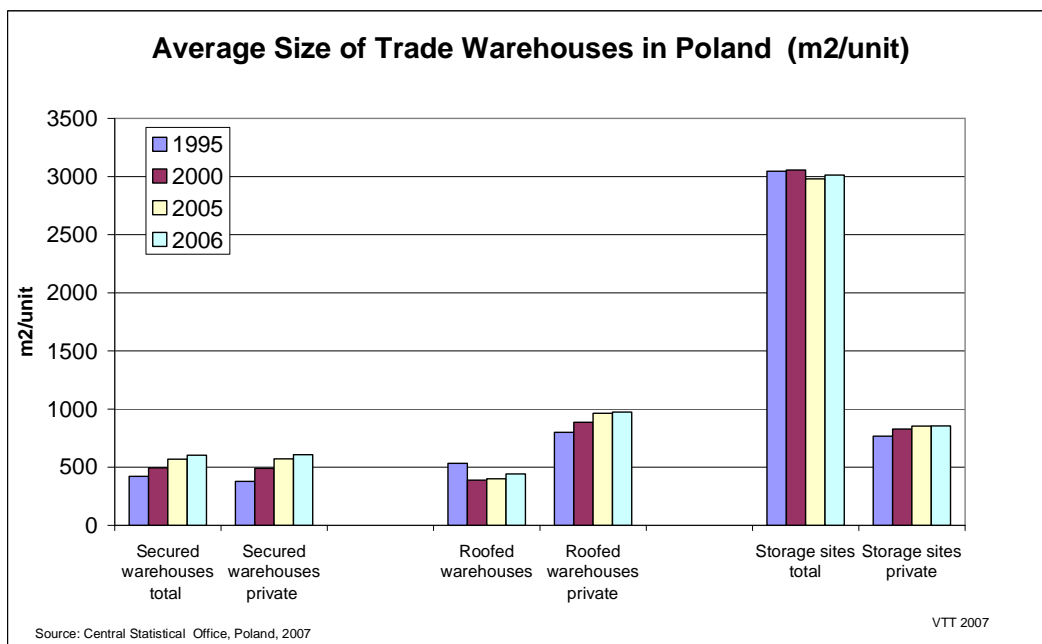


Figure 18. An average size of trade warehouses in building stock vary between 500...1000 m². (CSO b).

Partly as a consequence of the poor infrastructure the ratio of logistics floor space per capita in Poland is very low compared to many other countries. In 2006 it was in the region of 0.46 m² of logistics floor space per person, while in England it's 2.94 m² per person. From 2007, Poland will become the main recipient of EU-funding. (King Sturge).

Demand and Location Trends


Certain types of occupiers tend to settle in each area as outlined below:

Location	Type of Occupier (in general)
Warsaw Zone 1	Tends to be small companies distributing to the city
Warsaw Zone 2	Many tenants are manufacturing companies
Warsaw Zone 3	Typical tenants for this zone are 3PLs and major FMCG manufacturers / distributors
Central Poland	Typical use is central distribution warehouse servicing Poland and other countries in the region. Retail operators, 3PLs and producers are most common tenants.
Upper Silesia	Typical tenants are from automotive industry and 3PLs
Lower Silesia	Major tenants have been white goods producers, electronics manufacturers and 3PLs.
Wielkopolska	Major tenants are 3PLs, retail operators and service providers.

Figure 19. The main industrial occupiers locations in Poland.(King sturge).

3.2 Hungary

The most stable segment of the construction market now is non-residential building construction for investment and real estate development. The 2nd National Development Plan (2007-2013) could start those large projects that could become a driving force of the construction market earliest in the 2nd half of 2008, then from 2009 on. The export orientation of building materials and products will be more intensely directed towards the East. After 2005, a year considered as successful with the development of non-residential building construction, a large number of projects (office, industry, warehouse, logistics, and commerce) were started or completed in 2006. (Euroconstruct, Finpro b).

A strong foreign investor's demand and an increasing supply are characteristic of the real estate markets of Central- and Eastern Europe, thus that of Hungary as well. The prices of building sites are rising and so are architects' fees, the prices of building materials and products. Also, construction costs are growing slightly.

About 9% from new building construction activity was wholesale and retail trade buildings in 2005 (Table 6). Industrial warehouses include to industrial buildings.

Table 6. Building construction activity by groups of structures in Hungary.

Building construction activity by groups of structures in Hungary, 2005 (million HUF)					
2005					
million HUF	Construction	Non-constr. organizations	Total	of which investments	maintenance
1-fam. buildings	35473	801	36274	29747	6527
2-fam. and more buildings	120673	15545	136218	120616	15602
Residencies for communities	14119	1616	15735	12344	3391
Hotels, similar buildings	16478	2235	18713	12963	5751
Office	68026	8274	76300	56050	20250
Wholesale and retail trade build	62643	5138	67781	59134	8647
Traffic and communication build.	12805	3830	16635	10394	6240
Industrial and warehouses	209283	15511	224794	172648	52145
Public ent., education, hospital	80607	7014	87621	64289	23332
Other non-residential	49505	4124	53629	35245	18385
New building construction	669612	64088	733700	573430	160270
%	91	9	100	78	22
Source:KSH 2006			VTT 2007		

On the construction of retail stores and shops. 30 % of the floor space of new retail facilities are made up by shopping centres and "strip malls", 30 % by hypermarkets, 19 % by supermarkets, 13 % by DIY stores and 7 % by stores of interior design, on a total area of 6-700 thousand m². Besides developments in the countryside, commercial investments also find the capital city attractive again. (Euroconstruct).

Industrial, warehousing and logistic development projects. Actually the dynamic expansion of logistical or distribution facilities implemented as speculative development projects can be dated back to year 2000. Currently nearly **200 industrial parks** are operated in Hungary together with another 11 ones are to be added in 2007. The industrial parks now account for some 7-10 % of total employment and **30% of total industrial production and export**. The industrial parks represent the largest greenfield projects accommodating logistical centres as well as smaller manufacturers or warehousing organisations so as to find their locations and exert their regional organising powers. Net construction cost of buildings were in industrial buildings 830 €/m², warehouses 604 €/m² and commerce 845 €/m² at prices of 2007. Industrial or warehouse construction projects are linked to infrastructure. (Euroconstruct, 2007)

Following the enlargement of the European Union, Hungary has become an optimum site for regional logistical service centres. In addition to the logistic centres, the properties utilised for logistics and the industrial parks can also contribute to the accelerated development processes. (Euroconstruct, 2007).

Logistics/transportation services are one of seven main industry sectors supported by the state. Both logistics and industrial parks can apply for state funding from various sources. In addition, a third fund is available for state-approved logistics centres. Until the end of 2006, USD 50 million will be granted for industrial parks, development of logistics services and investments in industrial regions of Hungary (Figure 20).

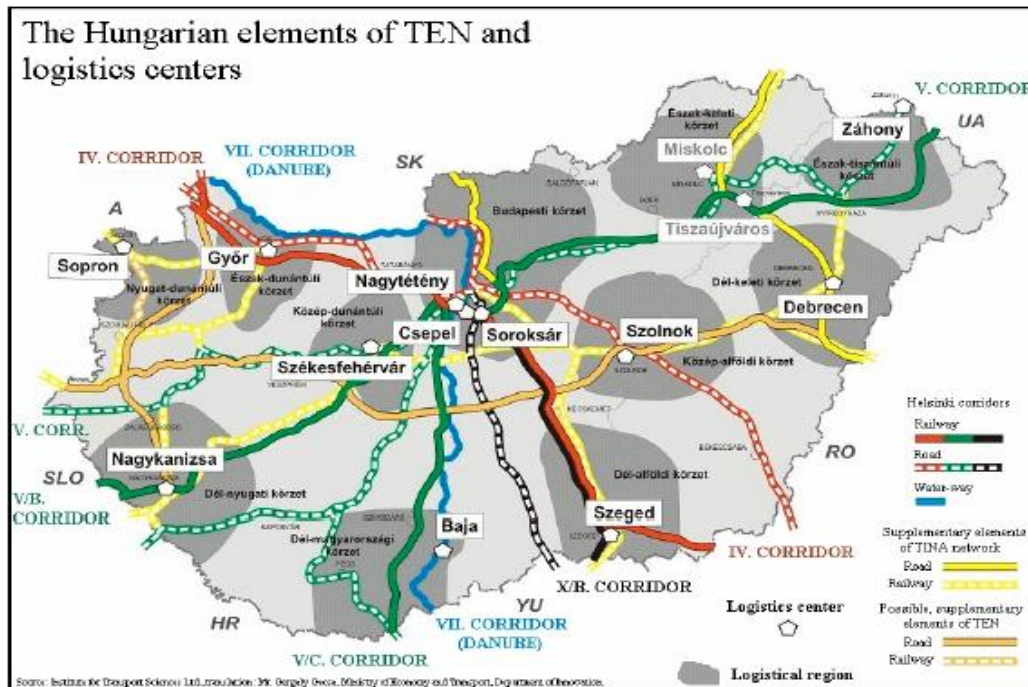


Figure 20. The Hungarian elements of TEN and logistics centres.

3.3 Czech Republic

The non-residential output reached 6.99 bills. Euro in the year 2006 in CzR, this is 40 % of total construction output (only 30.2 % in west Europe). The development of non-residential market was fluctuating and as a whole negative. The top output was reached in the year 1996, until year 2005 declined by 6.3 % and in the year 2006 is again increasing. (Euroconstruct, 2007).

The private non-residential output increased continuously, especially the construction of industrial centres and commercial buildings for trade networks. These two sub-sectors formed together two thirds of the total new non-residential output in the CzR. In the development of public and private non-residential output during the period 2002-2006 there are two quite different trends: while private non-residential output is still increasing in these 4 years, the public non-residential output was decreasing.

Two sub-sectors prevails in the CzR: industrial and commercial buildings. They together form 62.3 % of the total non-residential output (57.3 % in the year 2002). The construction output for new industrial buildings is in comparison with west Europe average more than 3 times higher, followed by commercial and administrative buildings that is about 2.4 times higher. Construction of buildings for education, health and agriculture is falling behind. After year 2006 is expected increasing demand for new private non-residential buildings in comparison with the period 2000–2005 as a consequence of direct foreign investments. (Euroconstruct, 2007).

The number of released building permits in non-residential buildings decreased a little in 2006 (Table 7). Also private non-residential sector decreased a little (Table 8). Warehouses and storages is just one part of non-residential new buildings.

Table 7. Number of released building permits in 2006 in Czech Republic.

Number of released building permits by type of construction in year 2006						
Czech Republic	Residential buildings			Non-residential buildings		
	Total	New	Adapt.	Total	New	Adapt.
Number	49777	18448	31329	24503	9336	15167
2006/2005	103,8	111	99,9	95,5	92,4	97,4
Source: The Czech Construction Industry 2007						

Table 8. Changes in building construction output in Czech Republic.

Changes in building construction output in Czech Republic							
% y/y	2000	2001	2002	2003	2004	2005*	2006*
Building construction	-5	6.4	0.5	13.7	3.0	4.6	2.7
Residential buildings	-13.4	2.5	2.2	45.6	17.1	4.4	4.2
Non-res. Private	6.1	8.4	2.5	5.7	-16.9	3.2	-0.8
Non-res. Public	-7.8	-0.8	-3.9	3.6	24.4	6.6	5.4
Source: The Czech Construction Industry 2007							

3.4 Romania

Construction in Romania has increased during last years more than 9 %, but especially in 2006 (more than +18 %), (Figure 19). The situation in 2007 will be also good. Construction effects very much to GDP in Romania.

Retail and wholesale buildings include to same building category (Table 9) and also industrial and warehouses. That's why more detailed information those buildings from building statistics is not possible to do now.

For most foreign investors, the attention is focused on the construction of office buildings, hotels, shopping areas and hypermarkets. Demand of high quality retail space is also high, with many international brands eager to enter the market but still trying to find right space. The three shopping malls in Bucharest will soon be joined by five new shopping centres and the stock of modern retail area could increase four-fold by the end of 2009. (Building Magazines, 2007).

The price level in industrial sheds varies 300...450 €/m², purpose built industrial units 400...700 €/m², supermarket shells 350...580 €/m², shopping centres 500...1000 €/m² in 1st quarter 2007 (Building Magazines, 2007).

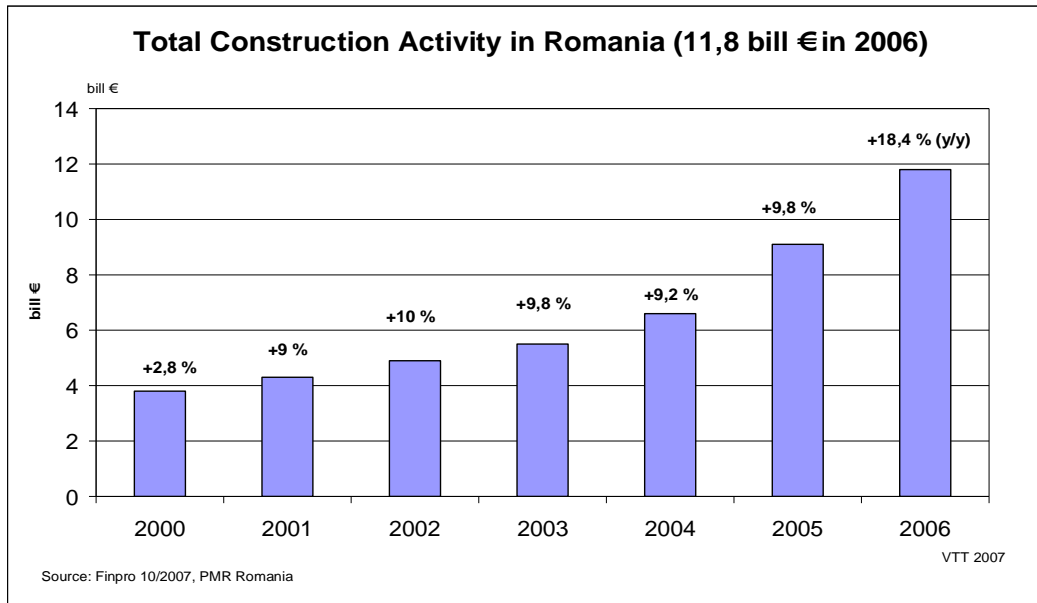


Figure 21. Total construction activity increased especially between 2001...2006.

Table 9. Construction works on contract and the share of commercial, industrial and warehouses in Romania. (NIS, 2006)

Construction works on contract, by category and objects and type of works in Romania 2004						
ROL billion current prices						
	Land preparatic	Buildings	Installations	Finishings	Renting, demoli	Total
Individual buildings	1837	10503	5165	3798	674	21976
Collective buildings (blocks)	224	7430	4204	1525	73	13456
Residential buildings for communities	140	1753	937	316	6	3152
Hotels and similar	55	2043	488	337	29	2952
Administrative buildings	635	13044	498	4235	96	18509
Retail and wholesaler buildings	109	6390	1243	677	52	8471
Traffic and communication build.	22	708	361	44	5	1140
Industrial and warehouses	537	16778	8596	1826	270	28007
Recreation, education, hospitals	160	5247	1651	1599	105	8762
Other non-residential	590	39118	3065	2270	202	45244
Total	4308	103014	26208	16627	1511	151668

Source: Romania Statistical Yearbook 2005.

There is enormous need of new space of logistics and storages. Romania has commercial space 25 m² per person while in EU the level is 180 m² per person. During 2007-08 will be constructed 750,000 m² new commercial space. International chains invest mostly. Building contractors have published 90 new commercial centres during next years. (Finpro d).

4 Morphological and structural data of SSIB

As it can be seen in Figure 22, structural materials used in SSIB buildings (per building unit) are almost equally divided between steel and concrete. Only in Finland there is a significant contribution of timber buildings, mainly in the range of smaller structures (400-500m² - Figure 7). This is due to the strong tradition of building with timber in Finland.

It should also be noted, that due to the activity of the data provider, the data set on Romania is probably biased towards steel buildings, and specifically portal frame buildings. One should also note the significant presence of light-gauge steel (LGS) buildings in Romania (probably

also in the small buildings range). This is especially intriguing as Romania has by far largest earthquake loads from the investigated countries.

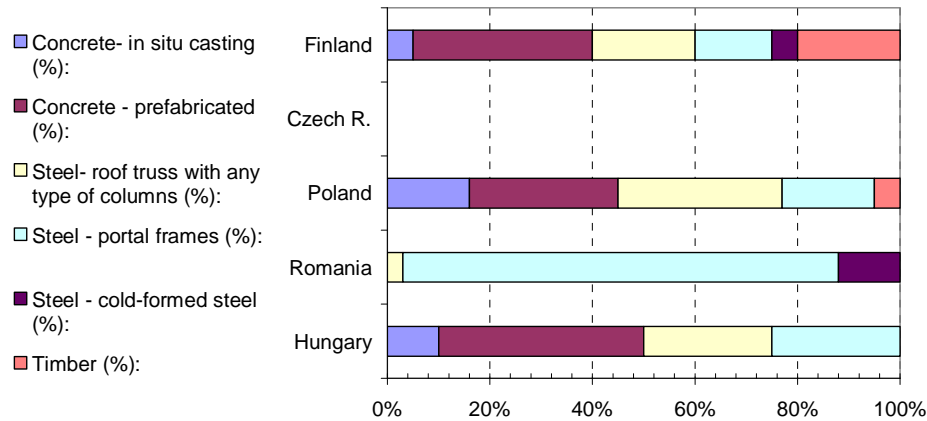


Figure 22. Share of different materials/structural typologies in case of SSIB

A large number of the buildings included in the survey seem to fall in the group of smaller buildings (up to 5000m²), and they are typically single-storey (Figure 23). Some fluctuations of the total area can be observed, most probably due to the different geographical/population characteristics of the countries. For instance, in Hungary, a smaller country with less population and good transport infrastructure, the total area appears to be smaller than in Romania, a larger country with more population but less developed transport infrastructure. These trends reflect the requirements of the local market environment.

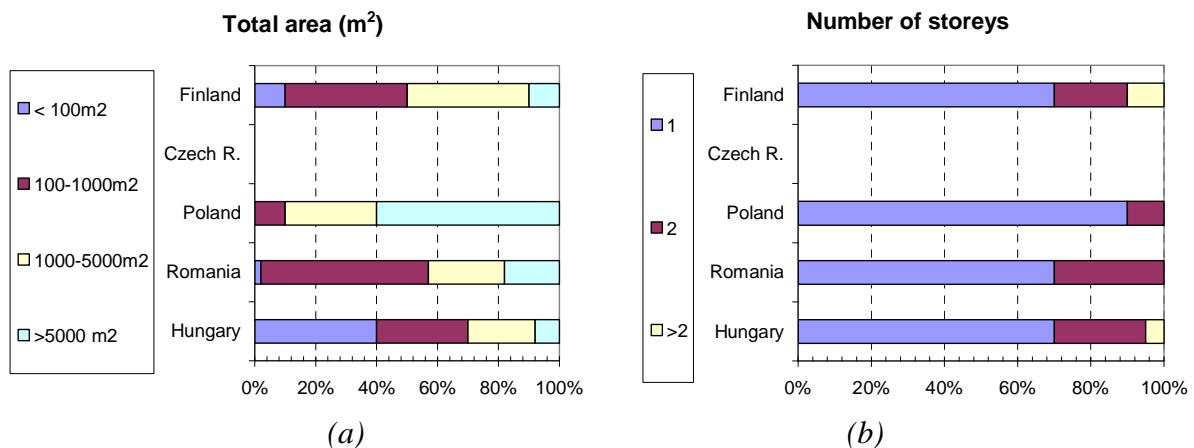


Figure 23. (a) Total area and (b) number of stories for SSIB

Technological processes in the buildings appear not to require the presence of an overhead crane (Figure 24.a - 80%). This would suggest that the majority of the buildings are not intended to host heavy industrial processes. Single spans structures are also overwhelming in the survey (Figure 24.b).

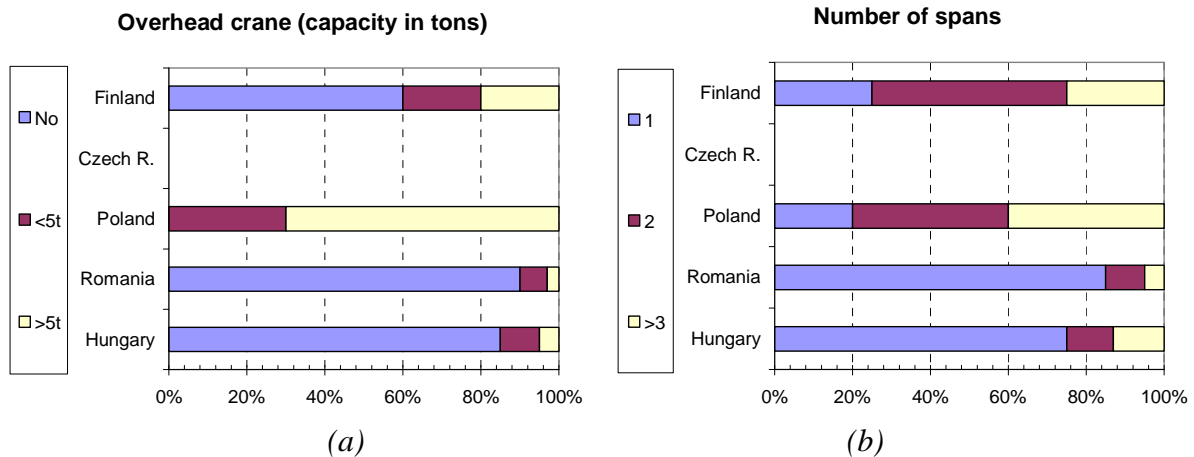


Figure 24. (a) Capacity of overhead crane and (b) number of spans for SSIB

Concerning the span and height of the SSIB buildings, the majority of the buildings seems to be in the small building range, with spans of up to 25m, and height of 4-6m (Figure 25).

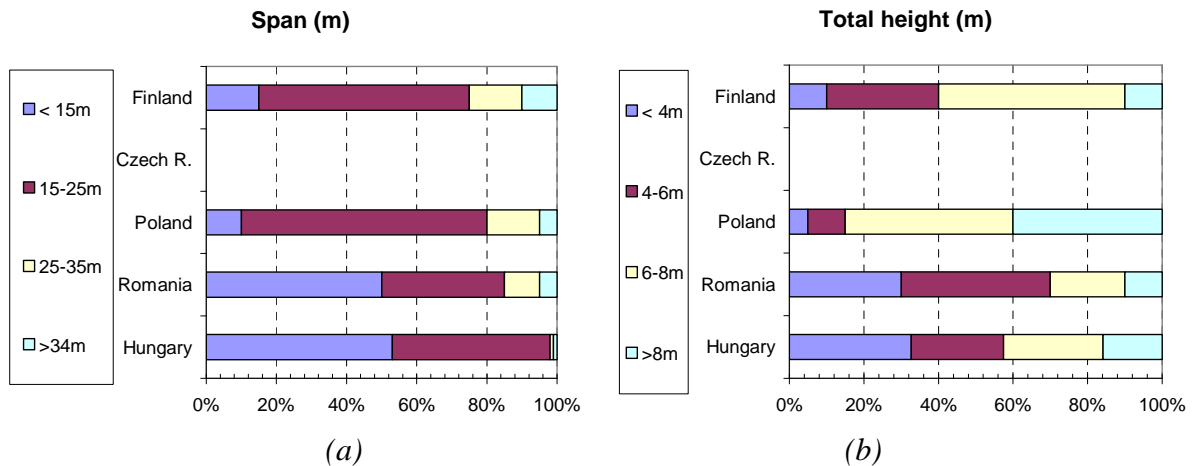


Figure 25. (a) Span and (b) height of SSIB's

This data would suggest that the market prefers simple solutions. A “typical” SSIB in the studied regions has the following characteristics:

- steel portal frame, steel truss or concrete frame skeleton;
- about 1000-5000m² area;
- single span;
- no overhead crane, or a very light one;
- span of up to 25m;
- and height of 4-8m.

5 Morphological and structural data of LRCB

Prefabricated RC seems to be the preferred choice for LRCB buildings in almost all countries (Figure 26). It is clear that in situ concrete is not a preferred choice, as most markets strive for prefabrication (i.e. both p.r.c. and steel). This tendency is stronger in Finland and weaker in Poland and Hungary. Interestingly timber and cold-formed steel retains a considerable market share of LRCB buildings only in Finland.

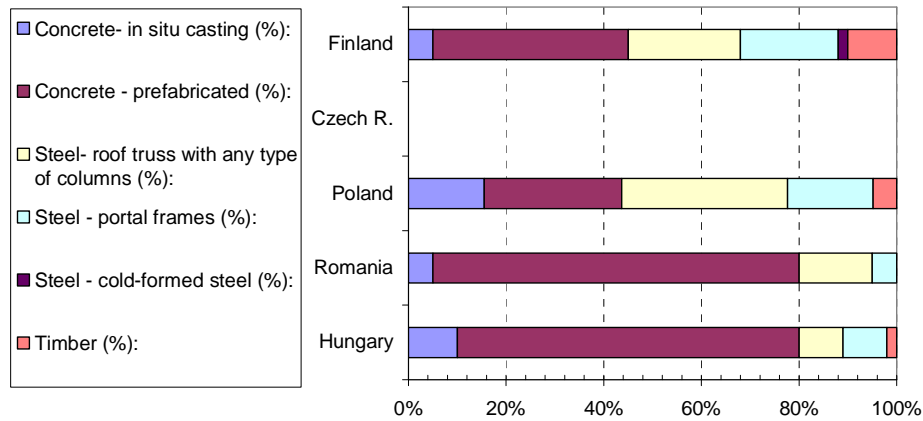


Figure 26. Share of different materials/structural typologies in case of LRCB

The total area of LRCB buildings is typically larger than 1000m^2 (Figure 27.a). It is interesting to note that in more populous countries (Romanian & Poland) the built area is typically even larger than 5000m^2 . This is probably dictated by market requirements in these countries. LRC buildings are also typically single-storey or at most two-storey buildings (Figure 27.b).

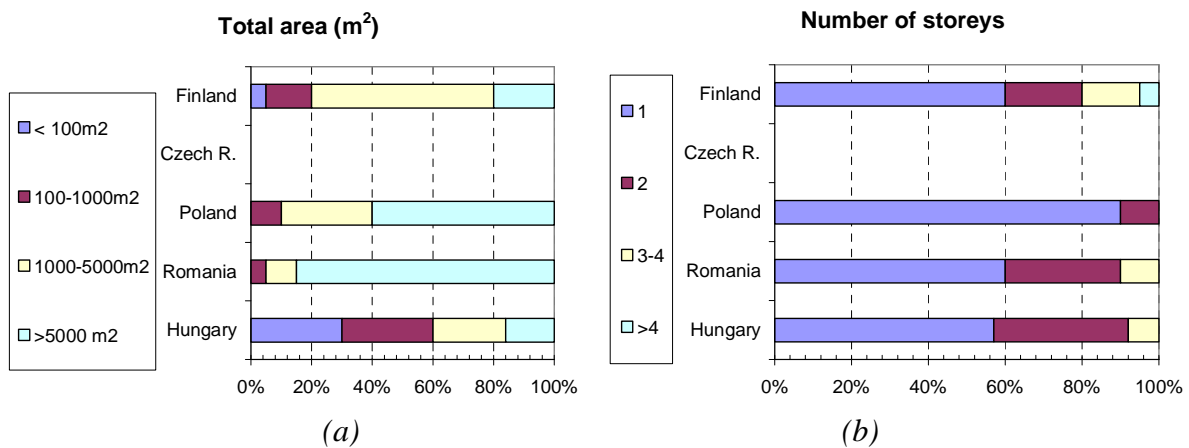


Figure 27. (a) Total area and (b) number of stories for LRCB

Typical spans reported in LRC buildings are presented in Figure 28. It is interesting to note that in Romania larger spans are reported compared to other countries. This is intriguing as the Romanian territory is characterized by both large snow loads and significant earthquake.

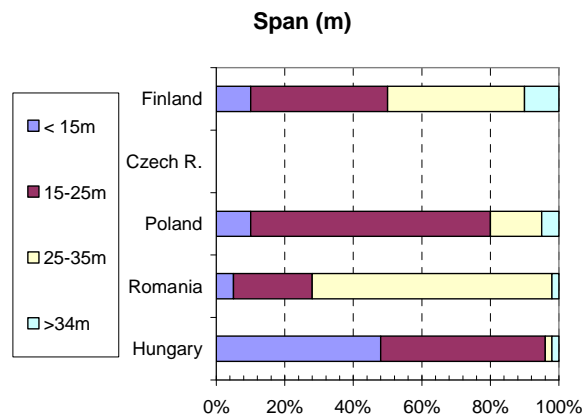


Figure 28. Typical span of LRCB's

6 Conclusions

The results of typical materials and size in different units are in history more accurate in Finland like in other countries, because buildings statistics are not so many-sided in Poland, Hungary, Czech Republic and Romania. Construction statistics in are different in almost every country.

Those emerging countries have big potential to build storage buildings, because there are lack of new storages near industrial, commercial and storage building area. New infrastructure must first be done constructing and this takes time.

International companies are interested in those markets and they will finance commercial and industrial buildings now and in the future. Also logistic centres need more new space.

Geography is quite different in those emerging countries like in case Finland. This means that every new storage building must be configured according to local requirements.

Potential markets of SSIB and LRCB buildings according size were about 60 % of new storages in case of Finland. Buildings can be almost the same kind in many countries.

Concerning the typical morphological and structural solutions it can be concluded that the dimensions of both SSIB and LRCB buildings is influenced by the local market requirements. Overall, buildings tend to be larger, in area and span, in Romania and Poland (i.e. larger countries with more population and less developed infrastructure) and smaller in Hungary and Finland (i.e. smaller countries with less population and better infrastructure).

SSIB buildings are typically shared 50%-50% between the steel and concrete industry. They are single-storey buildings with one or two spans of up to 25m. Typical height is between 4 and 6m, and overhead crane is not present. In some cases light overhead crane can be required.

LRCB buildings are mostly prefabricated r.c. buildings, steel having a more modest market share. The typical LRCB's are one or two storeys buildings with more than 1000m² built area and spans of about 25m.

7 Summary

The aim of this report has been to collect relevant statistics data and other market information from new storage, warehouses and industrial building construction in five countries. Precast-steel- project is developing buildings to:

- Single storey industrial buildings (SSIB)
- Low-rise commercial buildings (LRCB)

The methods to look at new storage, industrial and warehouse markets in five countries have been:

- to collect public information from construction statistics in Finland, Poland, Hungary, Czech Republic and Romania from interesting building types.
- to get relevant information from construction industry organizations, construction magazines and companies by internet.

- to provide more detailed statistics from Finland as case and calculate typical frame materials, an average size and storeys from interesting buildings with detailed data in history.

Building statistics in Poland, Czech Republic, Hungary and Romania include different data of storage, industrial and warehouse buildings by countries. They can be a part of commercial, industry or transport buildings or exact storage and warehouse buildings. Also building units, m^2 , m^3 of building space and values in buildings are often different from countries.

All new commercial buildings mean about 30 %...40 % of new building value in 2006 in those countries. On part of those are just storages, warehouses or logistic buildings. Commercial and industrial buildings can include also storage type buildings.

Potentials as in case Finland. Potential SSIB and LRCB buildings can be in many kinds of 1-storey buildings like in Finland. For instance vehicle and service buildings were in Finland mostly less than 5000 m^3 building space. Manufacturing plants are 1-storey buildings and potentials could be both in smaller or bigger building, if the structures and fire-orders suits to production. Potentials to workshops for industry are mostly in smaller buildings, because buildings are typically multi-storey buildings. Other industrial production buildings are often big multi-storey buildings, so that they are not potential SSIB-buildings.

Industrial warehouses are potential SSIB buildings, but they are mostly very big 1-storey buildings. The situation in commercial warehouses is almost the same. LRCB-potentials are then mostly in big buildings. Instead of other warehouses they can be both small and big 1-storey buildings.

New warehouses are mostly more than size class 5000 m^2 in floor area. Sub-sectors of warehouses vary in industrial, commercial and other warehouses (figure 12). Commercial warehouses are smaller market than other warehouses, but commercial buildings itself are much larger markets. Small warehouses are not so common.

Potentials in Poland, Hungary, Czech Republic and Romania can be same kind of style. There are lack of new good storage and warehouse space, but it takes time to construct them with national and international financing and local rules must be known.

References

Building Magazine. Country focuses Romania. 31.08.2007, pp. 50-52.

Central Statistical Office Poland a. Results of Activity in 2006. Warsaw July 2007. 90 p.

Central Statistical Office Poland b. Concise Statistical Yearbook of Poland. Warsaw 2007. 710 p.

Euroconstruct. Conference 6/2007.

Finpro a. Vilen J. Maaraportti Puola.8/2007.22p.

Finpro b. Vilen J. Maaraportti Unkari.9/2007. 21p.

Finpro c. Vilen J. Maaraportti Tsekin tasavalta.9/2007. 23 p.

Finpro d. Romania news. 10/2007.

King sturge. Elnews. Summer 2007. 6 p.

National Institute of Statistics. Statistical yearbook of Romania 2005. 2006. 690 p.

Statistics Finland a. Storage, industry and commercial building starts between 2000...2006 in Finland.

Statistics Finland b. Detailed data from storage, industry and commercial buildings between 1990...1998 in Finland.

Statistics Finland c. Detailed data from new storages between 2004...2006 in Finland.

Statistical yearbook of the republic Poland. 2006. Varzav 2006. 888 p.

The Czech Construction Industry 2007.II Construction. 73 p.

Appendix I – Morphological and structural data Finland

Data was provided by the representative of a major Finnish company active in all sectors of the construction industry (anonymity was requested). The data is an evaluation.

7.1 Single storey industrial buildings (SSIB)

Activity¹: Construction & Entrepreneurship

Market/Country name²: Finland

Year for the data³: 2007

Single storey industrial buildings, warehouses, deposits etc.	Number of buildings ⁴	NA
--	----------------------------------	----

Materials of the primary structure (- % from the number of buildings) ⁵				
Concrete	- in situ casting (%):	5	- prefabricated (%):	35
Steel	- roof truss with any type of columns (%):	20	- portal frames (%):	15
	- cold-formed steel (%):	5		
Other	Timber (%):	20	_____ (%):	

Typical configurations								
Most common destinations of the buildings ⁶ :	- NA							
	%		%		%		%	
Total area of building ⁷	< 100m ²	10	100-1000m ²	40	1000-5000m ²	40	>5000m ²	10
Nr. of storey: ⁷	- 1	70	- 2	20	- > 2	10		
Overhead crane: ⁷	- No	60	- up to 5t	20	- more than 5t	20		
Number of spans ⁷	1	25	2	50	>3 (multi-span)	25		
Span ⁷	< 15m	15	15-25m	60	25-35m	15	> 35	10
Total height ⁷	< 4m	10	4-6 m	30	6-8 m	50	> 8m	10
Most common roof coverings: ⁸	- profiled sheet + mineral wool + roof covering							
Most common floor types: ⁸	- concrete floor							
Most common wall finishing: ⁹	- stack sheet, concrete coating							

7.2 Low-rise commercial buildings (LRCB)

Activity¹: Construction & Entrepreneurship

Market/Country name²: Finland

Year for the data³: 2007

Low-rise commercial buildings (e.g. shopping centers, multi-storey deposits, etc. – please do NOT include office buildings)	Number of buildings ⁴ :	NA
--	------------------------------------	----

Materials of the primary structure (- % from the number of buildings)⁵				
Concrete	- in situ casting (%):	5	- prefabricated (%):	40
Steel	- roof truss with any type of columns (%):	23	- portal frames (%):	20
	- cold-formed steel (%):	2		
Other	Timber (%):	10	_____ (%):	

Typical configurations									
Most common destinations of the buildings ⁶ :	- NA								
	% ⁷		% ⁷		% ⁷		% ⁷		
Total area of building	- < 100m ²	5	100-1000m ²	15	1000-5000m ²	60	>5000m ²	20	
Nr. of storey: ⁷	- 1	60	- 2	20	- 3-4	15	- > 4	5	
Span ⁷	< 15m	10	15-25m	40	25-35m	40	> 35	10	
Most common roof coverings: ⁸	- profiled sheet + mineral wool + roof covering								
Most common floor types: ⁸	- concrete hollow core slabs + topping								
	- concrete								
Most common wall finishing: ⁸	- steel sheet								
	- concrete coating								

Appendix II – Morphological and structural data Poland

7.3 Single storey industrial buildings (SSIB)

Activity¹: Steel Constructions

Market/Country name²: POLAND

Year for the data³: 2006

Single storey industrial buildings, warehouses, deposits etc.	Number of buildings ⁴	NA
---	----------------------------------	----

Materials of the primary structure (- % from the number of buildings) ⁵				
Concrete:	- in situ casting (%):	16 %	- prefabricated (%):	29 %
Steel:	- roof truss with any type of columns (%):	32 %	- portal frames (%):	18 %
	- cold-formed steel (%):			
Other:	Timber (%):	5 %	_____ (%):	

Typical configurations								
Most common destinations of the buildings ⁶ :	- NA							
	- NA							
	%		%		%		%	
Total area of building ⁷	< 100m ²	0	100-1000m ²	10%	1000-5000m ²	30 %	>5000 m ²	60%
Nr. Of storey: ⁷	- 1	90%	- 2	10%	- > 2			
Overhead crane: ⁷	- No		- up to 5t	30%	- more than 5t	70%		
Number of spans ⁷	1	20%	2	40%	>3 (multi-span)	40%		
Span ⁷	< 15m	10%	15-25m	70%	25-35m	15%	> 35	5%
Total height ⁷	< 4m	5%	4-6 m	10%	6-8 m	45%	> 8m	40%
Most common roof coverings: ⁸	- flat roof : load bearing profiles + mineral wool + roof foil e.g. SIKA							
	- low slope roof : sandwich panels (PU, EPS or MW)							
Most common floor types: ⁸	- concrete							
	-							
Most common wall finishing: ⁹	- sandwich panel in horizontal application (PU, MW or EPS)							
	- liner trays+ mineral wool + cladding							

7.4 Low-rise commercial buildings (LRCB)

Activity¹: Steel Constructions

Market/Country name²: POLAND

Year for the data³:2006

Low-rise commercial buildings (e.g. shopping centers, multi-storey deposits, etc. – please do NOT include office buildings)	Number of buildings ⁴ :	NA
--	------------------------------------	----

Materials of the primary structure (- % from the number of buildings)⁵				
Concrete	- in situ casting (%):	16%	- prefabricated (%):	29%
Steel	- roof truss with any type of columns (%):	35 %	- portal frames (%):	18%
	- cold-formed steel (%):			
Other	Timber (%):	5%	_____ (%):	

Typical configurations								
Most common destinations of the buildings ⁶ :	- NA							
	- NA							
	% ⁷		% ⁷		% ⁷		% ⁷	
Total area of building	- < 100m ²	0%	100-1000m ²	10%	1000-5000m ²	30%	>5000 m ²	60%
Nr. Of storey: ⁷	- 1	90 %	- 2	10%	- 3-4		- > 4	
Span ⁷	< 15m	10%	15-25m	70%	25-35m	15%	> 35	5%
Most common roof coverings: ⁸	- flat roof: load bearing profiles + mineral wool + roof foil e.g. SIKA							
	- low slope roof : sandwich panels (PU, EPS or MW)							
Most common floor types: ⁸	- concrete							
	-							
Most common wall finishing: ⁸	- liner trays+ mineral wool + cladding							
	- sandwich panel in horizontal application (PU, MW or EPS)							

Appendix III – Morphological and structural data Czech Republic

Appendix IV – Morphological and structural data Hungary

Data was provided by the representatives of a major international building company, present on the Hungarian market with a substantial market share (anonymity was requested). The numbers are an evaluation, but they have been compiled with the help of personnel from the sales department, participating in preparing offers. The data was extrapolated to the county level, based on the market overview of these people.

7.5 Single storey industrial buildings (SSIB)

Activity¹: Construction

Market/Country name²: ALL HUNGARY

Year for the data³: 2007

Single storey industrial buildings, warehouses, deposits etc.	Number of buildings ⁴	1100
---	----------------------------------	-------------

Materials of the primary structure (- % from the number of buildings) ⁵				
Concrete	- in situ casting (%):	10	- prefabricated (%):	40
Steel	- roof truss with any type of columns (%):	25	- portal frames (%):	25
	- cold-formed steel (%):	0		
Other	Timber (%):	0	_____ (%):	

Typical configurations								
Most common destinations of the buildings ⁶ :	-warehouse, factory, agricultural							
	%		%		%		%	
Total area of building ⁷	< 100m ²	40	100-1000m ²	30	1000-5000m ²	22	>5000m ²	8
Nr. of storey: ⁷	- 1	70	- 2	25	- > 2	5		
Overhead crane: ⁷	- No	85	- up to 5t	10	- more than 5t	5		
Number of spans ⁷	1	75	2	12	>3 (multi-span)	13		
Span ⁷	< 15m	53	15-25m	45	25-35m	1	> 35	1
Total height ⁷	< 4m	32	4-6 m	25	6-8 m	27	> 8m	16
Most common roof coverings: ⁸	- low/ high corrugated sheet, purlins with low profiles/panels							
Most common floor types: ⁸	- ceramic tiles, reisin, hardened concrete, reinforced concrete, steel fiber concrete							
Most common wall finishing: ⁹	- brick, panel, purlin with low profile, liner tray walls							

7.6 Low-rise commercial buildings (LRCB)

Activity¹: Construction

Market/Country name²: ALL HUNGARY

Year for the data³: 2007

Low-rise commercial buildings (e.g. shopping centers, multi-storey deposits, etc. – please do NOT include office buildings)	Number of buildings ⁴ :	500
---	------------------------------------	-----

Materials of the primary structure (- % from the number of buildings) ⁵				
Concrete	- in situ casting (%):	10	- prefabricated (%):	70
Steel	- roof truss with any type of columns (%):	9	- portal frames (%):	9
	- cold-formed steel (%):	0		
Other	Timber (%):	2	_____ (%):	

Typical configurations									
Most common destinations of the buildings ⁶ :	-shopping centers, outlet shops, showrooms (car, furniture..), sport halls								
	% ⁷		% ⁷		% ⁷		% ⁷		
Total area of building	- < 100m ²	30	100-1000m ²	30	1000-5000m ²	24	>5000 m ²	16	
Nr. of storey: ⁷	- 1	57	- 2	35	- 3-4	8	- > 4	0	
Span ⁷	< 15m	48	15-25m	48	25-35m	2	> 35	2	
Most common roof coverings: ⁸	- ceramic tiles, high corrugated sheet, purlins with low profiles/panels								
Most common floor types: ⁸	- ceramic tiles, resin, hardened concrete, reinforced concrete, steel fiber concrete								
Most common wall finishing: ⁸	- concrete wall, brick, panel, liner tray walls								

Appendix V – Morphological and structural data Romania

The data is provided by a consultancy firm based in Bucharest, with expertise in steel structures. The data is also correlated with the activity of one major steel manufacturer in Romania (anonymity requested).

The numbers are most probably biased towards steel structures and portal frames, due to the competency of the data provider, and do not represent the whole market of Romania.

7.7 Single storey industrial buildings (SSIB)

Activity¹: Design / Consulting

Market/Country name²: Romania

Year for the data³: 2007

Single storey industrial buildings, warehouses, deposits etc.	Number of buildings ⁴	80
---	----------------------------------	----

Materials of the primary structure (- % from the number of buildings) ⁵				
Concrete	- in situ casting (%):	-	- prefabricated (%):	-
Steel	- roof truss with any type of columns (%):	3%	- portal frames (%):	85%
	- cold-formed steel (%):	12%		
Other	Timber (%):	-	_____ (%):	

Typical configurations								
Most common destinations of the buildings ⁶ :	- Car service + showroom, warehouse, light factory hall							
	%		%		%		%	
Total area of building ⁷	< 100m ²	2%	100-1000m ²	55%	1000-5000m ²	25%	>5000m ²	18%
Nr. of storey: ⁷	- 1	70%	- 2	30%	- > 2	0%		
Overhead crane: ⁷	- No	90%	- up to 5t	7%	- more than 5t	3%		
Number of spans ⁷	1	85%	2	10%	>3 (multi-span)	5%		
Span ⁷	< 15m	50%	15-25m	35%	25-35m	10%	> 35	5%
Total height ⁷	< 4m	30%	4-6 m	40%	6-8 m	20%	> 8m	10%
Most common roof coverings: ⁸	- Corrugated sheeting							
Most common floor types: ⁸	- Reinforced concrete							
Most common wall finishing: ⁹	- Corrugated sheeting, wall cassettes, sandwich panels							

7.8 Low-rise commercial buildings (LRCB)

Activity¹: Design / Consulting

Market/Country name²: Romania

Year for the data³: 2007

Low-rise commercial buildings (e.g. shopping centers, multi-storey deposits, etc. – please do NOT include office buildings)	Number of buildings ⁴ :	10
---	------------------------------------	----

Materials of the primary structure (- % from the number of buildings) ⁵				
Concrete	- in situ casting (%):	5%	- prefabricated (%):	75%
Steel	- roof truss with any type of columns (%):	15%	- portal frames (%):	5%
	- cold-formed steel (%):	0%		
Other	Timber (%):	0%	_____ (%):	

Typical configurations								
Most common destinations of the buildings ⁶ :	- Shopping center, recreation							
	% ⁷		% ⁷		% ⁷		% ⁷	
Total area of building	- < 100m ²	0%	100-1000m ²	5%	1000-5000m ²	10%	>5000 m ²	85%
Nr. of storey: ⁷	- 1	60%	- 2	30%	- 3-4	10%	- > 4	0%
Span ⁷	< 15m	5%	15-25m	23%	25-35m	70%	> 35	2%
Most common roof coverings: ⁸	- Membrane							
Most common floor types: ⁸	- Reinforced concrete							
Most common wall finishing: ⁸	- Sandwich panels, façade cassettes, corrugated sheeting							

Notes on the data fields:

¹ The main field of activity can be: design, execution, entrepreneurship, part supplier etc.

² The data should refer to the national market of the host country. So only the activity of the local subsidiary should be given. If data can not be separated by country, please describe the market area (e.g. Former Yugoslav Republics, Baltic States etc.).

³ Please use most recent year for which a reasonable estimate can be made.

⁴ Refers to all buildings built/designed/fabricated by the company that year.

⁵ Give the estimated %, in number of buildings, of each material/typology used by company.

⁶ Give the 3 most common destinations of the buildings. No detailed description is required. Use generic names like: food deposit, light factory hall, heavy factory hall with crane, sport facility etc.

⁷ Estimate the %, of number of buildings, from each category.

⁸ Give the most typical finishing types. No detailed description is required. Use generic names like: corrugated sheeting, cassettes, concrete tiles etc. Give only the typologies which constitute a relevant part of the buildings – in more than 10% of the cases that solution was used for the element. E.g. if 50 building had “concrete tiles” as roof and one had “corrugated sheet”, than corrugated sheet is not a “common roof type”. The only common roof type in this case is “concrete tiles”.