



Regional surveys on the consumption in the tertiary sector buildings - Comparison of results -

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Executive Summary

This survey is part of the EMILIE project, funded by the “Mediterranean” transnational cooperation Programme and aiming to support the growth potential and capacity for innovation of small and medium enterprises (SMEs) in the field of energy efficiency in buildings in the tertiary sector at the transnational level, in order to actively contribute to growth, competitiveness, and employment in the Mediterranean area.

Quantitative data of energy and heating sources, energy consumption and status of energy related systems, as well as potential for energy savings and application of pilot technologies from EMILIE project are collected for five the most typical types of buildings in tertiary sector like schools, hospitals, public administrative buildings, hotels and shopping centres.

This document provides overview and comparison of the following data:

- buildings area;
- final energy consumption regarding heating types;
- specific annual energy use and share of total energy use per building type.

More results and detailed information on building status and energy consumption could be found in 6 separate regional surveys, provided by project partners: AREA (Italy) for Friuli Venezia Giulia region, IAT (Spain) for Andalusia region, Capenergies (France) for Provence-Alpes-Côte d'Azur (PACA) region, Jožef Stefan Institute (Slovenia) for Slovenian region, CIRCE (Spain) for Aragon region and REA (Croatia) for Primorje-Gorski Kotar region.

This document as well as regional surveys are available for download from the EMILIE project website, www.emilieproject.eu.

Comparison of survey results and remarks

The comparison is done primarily for data which were provided by all project partners and gathered in the tables:

- Indicators for key types of buildings, 2008 (Table 1),
- Final energy consumption regarding heating types/fuels, 2009 (Table 2),
- Final energy consumption in tertiary sector and share of total energy use per building type (Table 3).

The following abbreviations for the types of buildings are used in the text:

EDU	Schools, research, other educational buildings
HOSP	Hospitals, retirement homes other health/social buildings
ADMIN	Offices, administrative (municipal and other public administrative) buildings
TOUR	Hotels, restaurants, other tourist buildings
SHOP	Shopping, retail centres

Table 1: Indicators for key types of buildings (2008)

% - share of total buildings area (in the tertiary sector)

Type of building	Indicator	region: Slovenia (SI)		region: Aragon (ES)		region: Primorje-Gorski kotar (HR)	
		[m ²]	%	[m ²]	%	[m ²]	%
EDU	Area	3.657.861	16	3.070.000	23,8	400.000	2,8
	Number of students	343.605		160.722			
HOSP	Area	1.668.740	7	3.054.000	23,5	350.000	9,9
	No. of rooms / beds	9586 beds		5404 beds			
ADMIN	Area	6.813.130	29	4.500.000	34,7	175.000	2,0
TOUR	Area	2.685.674	11	2.290.000	17,6	1.120.000	56,5
	No. of rooms / beds	38226 / 97193		96217 seats			
SHOP	Area	5.923.909	25	64.000 (retail c.)	0,4	530.000	28,8
Other			12				

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Type of building	Indicator	region: PACA (F)		region: Andalusia (ES)		region: Friuli Venezia Giulia (IT)	
		[m ²]	%	[m ²]	%	[m ²]	%
EDU	Area	12.800.000	20	9.800.000	41,0	1.174.000	21,7
	Number of students	1.070.000		1.563.194		195.352	
HOSP	Area	7.680.000	12	2.400.000	10,0	630.000	11,6
	No. of rooms / beds	42300 beds		23290 beds		18282 beds	
ADMIN	Area	16.000.000	25	3.100.000	13,0	1.014.400	18,7
TOUR	Area	7.040.000	11	5.900.000	24,5	668.000	12,3
	No. of rooms / beds	700.000		450659 beds		19975 / 41601	
SHOP	Area	10.240.000	16	2.800.000	11,5	1.933.650	35,7
Other			16				

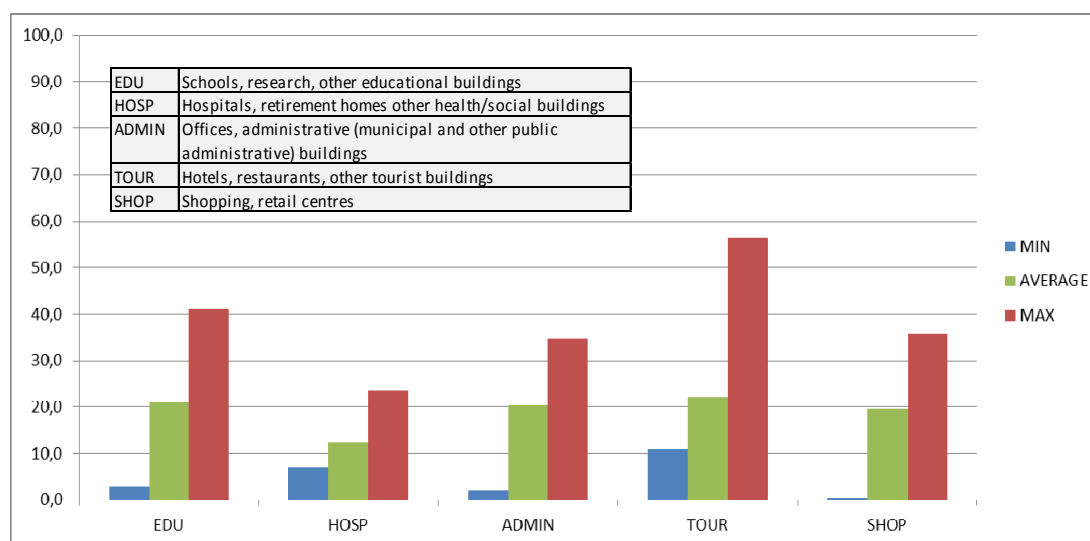


Figure 1: Minimum, average and maximum reported shares of types of buildings

Source: BPIE survey

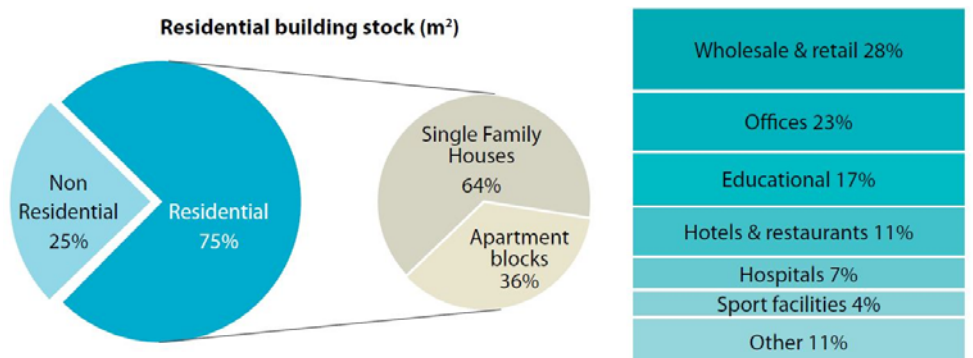


Figure 2: Shares of building stock in EU (Source: BPIE)

Remarks:

Shares of total building area by countries (regions), particularly for some building types, vary a lot. For easier comparison of survey data, the EU average figures (reported in BPIE¹'s Europe's buildings under the microscope, 2011) are provided. On one hand deviations result from the fact that some tertiary subsectors are dominant in a region (e.g. tourism in Primorje - Gorski Kotor County) but on the other hand this can be assigned to possible methodological differences i.e. in categorisation of building types or even mistakes.

Data on regional level are much more difficult to be retrieved than data on national level data (per country). Availability of statistical data particularly related to buildings state in the tertiary (services) sector is generally very poor.

¹ Buildings Performance Institute Europe

Table 2: Final energy consumption regarding heating types/fuels (2009)

region	Slovenia (SI)	Aragon (ES)	Primorje-Gorski kotar (HR)	PACA (F)	Andalusia (ES)	Friuli Venezia Giulia (IT)
[ktoe]	Year 2009					
Total final energy consumption	4812	3670	2690	1339		
% of tertiary s. in total	11%	7%	27%			
Tertiary sector	519	259	718		123	511
Coal	0	2	4*		0	
Liquid fuels	211	54	715*	340	3	19
Natural gas	18	24	720*	136	10	291
RES (and waste)	2	4	8*	309	5	
District heat	27	0,28	220*	34	0	
Electricity	261	175	1023*	897	105	201

* consumption in all sectors

Remarks:

Data on regional level were not available in all cases (only on national level). Energy mix in tertiary sector buildings by presented regions differs a lot, however electricity in the vast majority of cases represents the main energy type used for heating. Renewable energy sources (RES) as a rule (except in one case) represent a very small share in the total energy consumption used for heating. The share of tertiary sector total energy consumption seems to differ a lot among regions, but due to lack of statistical data in some regions the complete comparison is not possible.

Table 3: Final energy consumption in tertiary sector and share of total energy use per building type (sub sector)
Specific energy consumption [kWh/m² a]

Building type	Slovenia (SI)	Aragon (ES)	Primorje-Gorski kotar (HR)	PACA (F)	Andalusia (ES)	Friuli Venezia Giulia (IT)	min	max
EDU	170	312	81	97	17	140	17	312
HOSP	359	394	320	255	101	220	101	394
ADMIN	227	218	202	238	124	90	90	238
TOUR	244	121	307	309	33	250	33	309
SHOP	361	2116	106	237	175	170	106	2116

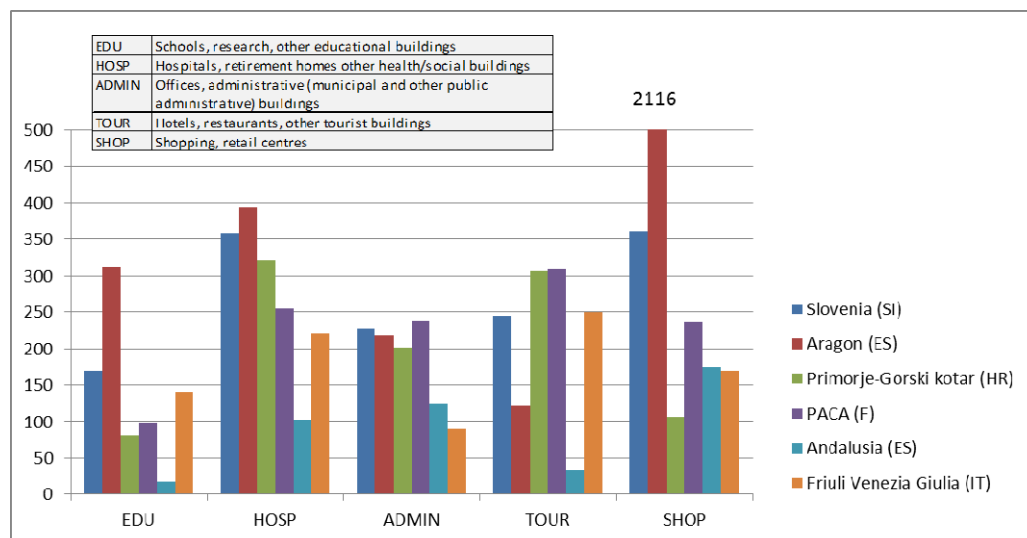


Figure 3: Reported specific final energy consumption (in kWh/m² a) per building types

Share of total energy use [%]

Building type	Slovenia (SI)	Aragon (ES)	Primorje-Gorski kotar (HR)	PACA (F)	Andalusia (ES)	Friuli Venezia Giulia (IT)	min	max
EDU	10%	20%	6%	7%	11%	21%	6%	20%
HOSP	10%	25%	19%	11%	16%	5%	10%	25%
ADMIN	26%	21%	6%	22%	26%	12%	6%	26%
TOUR	11%	6%	59%	12%	13%	21%	6%	59%
SHOP	36%	28%	10%	14%	33%	42%	10%	36%

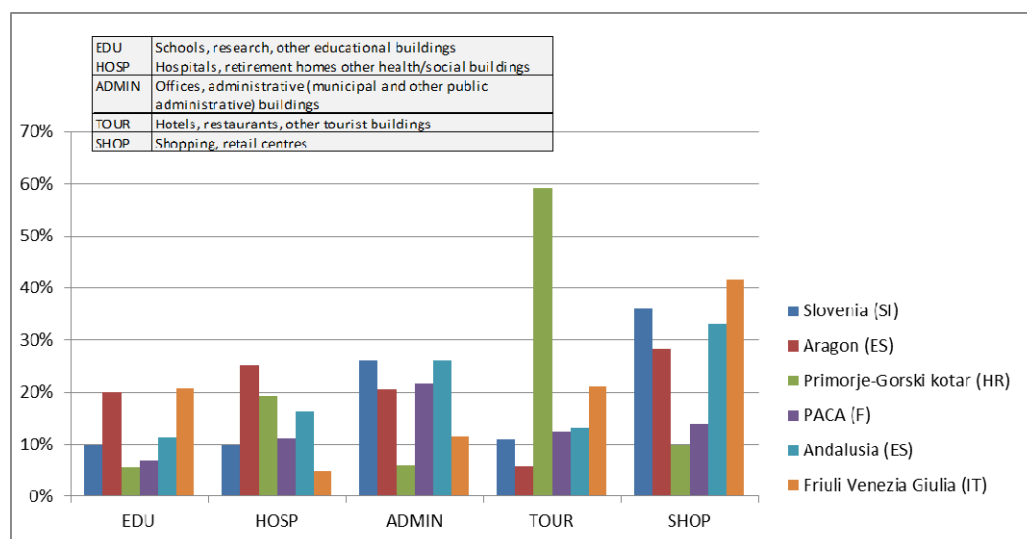


Figure 4: Reported shares of total energy use per building types

Remarks:

Specific energy consumption in most regions and for most building types amounts between 170 and 320 kWh/m² per year, which could be considered realistic for the current stock of non-residential buildings. BPIE data show that the EU average is 280kWh/m² per year (covering all end-uses) which is

at least 40% greater than the equivalent value for the residential sector. For one of the regions rather low figures on specific energy consumption were reported – the winter climate in that region is rather milder than in most of others and energy consumption used for heating is very low (see Table 2). In one case, where the reported consumption data is extremely high, further analysis should be done to investigate the reasons.

Shares of total energy use by countries (regions) vary a lot. This to some extent results from the fact that some tertiary subsectors are dominant in a region, as well this can be assigned to possible methodological differences i.e. in categorisation of building types and quality of available data.