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Strategic Planning Towards Carbon Neutrality in Tourism Accommodation Sector

CARBONTOUR

**DELIVERABLE 1.1: Analysis & Documentation of the tourism
accommodation sector in the Region of North Aegean,
Greece and in Cyprus**

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1 Executive Summary

This report documents the existing situation regarding tourism development in Greece (and in particular the North Aegean region) and Cyprus. In both countries, tourism industry is among the largest economic sectors, enabling business development, foreign exchange inflows and employment opportunities, as well as, through its multiplier effect, stimulating a series of all other economic sectors.

2 Project implementation area

The prefecture of North Aegean lies in the North Eastern of Greece and consists of the peripheral units of Lesvos, Samos and Chios which cover a total area of 3.836 km². The peripheral unit of Lesvos is located at the upper part of the region with a land area of 2.154 km². Its main islands are Lesvos, Lemnos and Agios Efstratios. The peripheral unit of Samos located at the lower part of the region, covers an area of 778 km². Its main islands are Samos, Ikaria and Fournoi. The peripheral unit of Chios is located at the middle part of the region and covers an area of 904 km². It consists of three main islands, Chios, Psara and Inousses.



Figure 1: Map of North Aegean Region

Cyprus is an island in the eastern Mediterranean with a land area of 9.251 km² and is divided into six districts, namely the districts of Nicosia (1.979 km²), Famagusta (1.979 km²), Limassol (1.396 km²), Paphos (1.393 km²), Larnaca (1.129 km²) and Kyrenia (640 km²), with each capital having



the same name as its district. The island is divided into a northern, Turkish Cypriot sector and a southern, Greek Cypriot sector. In the framework of this project, the Greek Cypriot sector was examined which consists of the 65% of the Nicosia district, 10% of Famagusta district, 85% of the district of Larnaca and the districts of Limassol and Paphos.



Figure 2: Map of Cyprus



3

3 The existing situation regarding tourism development in Greece and Cyprus and the region of North Aegean

3.1 Tourism sector and the national economies of Greece and Cyprus

In both Greece and Cyprus, tourism industry is among the largest economic sectors, enabling business development, foreign exchange inflows and employment opportunities. Moreover, since tourism is connected with all sectors of economy, it has a larger contribution to the national economies and development of Greece and Cyprus.

Nevertheless, both countries must successfully tackle a number of challenges and needed reforms in order to offer a more divert and competitive tourism product that will increase the contribution of Travel & Tourism in their economies.

3.1.1 Greece

Greece has a well-established tourism industry that its absolute size ranks in position 21 among 181 countries. Tourism economy ranks in position 37 among 181 countries in relative contribution to the national economy.

Greek tourism industry has been, traditionally, focused on the concept of “islands, sea and sun” resulting in a one-dimensional, summer season, tourist product and an uneven development of the tourism infrastructure across the country in favour of the islands and the coastal areas. Moreover, the emerging competition by countries that can offer similar conditions in competitive prices (Turkey, Croatia, Israel, etc) has put a pressure on the Greek tourism industry to offer a more divert tourist product, and more importantly, to rationalize and reduce its operational costs.

Tourism industry, plays a significant role in the national economy, either directly (tourist industry revenues, inflow of foreign exchange, employment) or indirectly by stimulating relevant secondary and tertiary sectors. In the following Tables, a summary of the economic activity related to tourism in Greece is presented. Data includes year 2005, an estimation of year 2010 as well as a forecast for year 2020. Definitions of the table entries follow:

- *Personal Travel & Tourism* includes all personal spending by residents on travel % tourism services and goods used for travel & tourism activities
- *Business Travel* includes expenditure by governments and corporations on goods and services for employee business travel purposes
- *Government Expenditures* includes current expenditure made by government to provide or support travel & tourism



- *Capital investment* includes fixes investment expenditure by travel & tourism service providers and government agencies to provide facilities, capital equipment and infrastructure for visitors
- *Visitor Exports* includes expenditure by international visitors on goods and services within the economy
- *Other Exports* includes consumer goods exported for ultimate sale to visitors, or capital goods exported for use by travel & tourism providers abroad
- *Travel & Tourism Demand* includes the aggregation of all travel & tourism spending within the economy
- *Travel & Tourism Direct Industry GDP* includes the value added by traditional travel & tourism industries
- *Travel & Tourism Economy GDP* includes the activity of traditional travel & tourism industries plus tourism-related investment, public spending and export of goods. It includes both the direct and the indirect effects via the supply chain of travel & tourism spending
- *Travel & Tourism Direct Industry Employment* includes the jobs created by direct travel & tourism industries. *Travel & Tourism Economy Employment* includes the jobs created by the Travel & Tourism Economy GDP.

Table 1: Greek tourism industry GDP table

	2005		2010		2020	
	EUR bn	% of total	EUR bn	% of total	EUR bn	% of total
Personal Travel & Tourism	14,1	11,7	17,6	11,5	27,6	11,4
Business Travel	1,5	0,8	1,8	0,8	2,9	0,8
Government Expenditures	2,3	8,0	3,3	8,1	5,0	8,3
Capital Investment	5,9	14,2	5,6	14,2	9,6	14,6
Visitor Exports	10,9	47,3	10,3	54,4	24,6	22,4
Other Exports	0,8	5,9	1,2	5,4	3,4	3,1
Travel & Tourism Demand	35,5	15,7	39,8	14,2	73,1	15,7
Travel & Tourism Direct Industry GDP	13,4	7,6	15,4	7,0	27,9	8,0
Travel & Tourism Economy GDP	29,7	16,9	33,9	15,5	60,7	17,3



Table 2: Greek tourism industry employment table

	2005		2010		2020	
	Jobs	% of total	Jobs	% of total	Jobs	% of total
Travel & Tourism Direct Industry Employment	446.400	10,7	417.800	10,0	482.600	11,1
Travel & Tourism Economy Employment	851.000	20,5	784.700	18,8	916.100	21,0

The evolution of the key statistics, namely the contribution of the Travel & Tourism activities to the national GDP and the total employment are depicted in the following graphs:

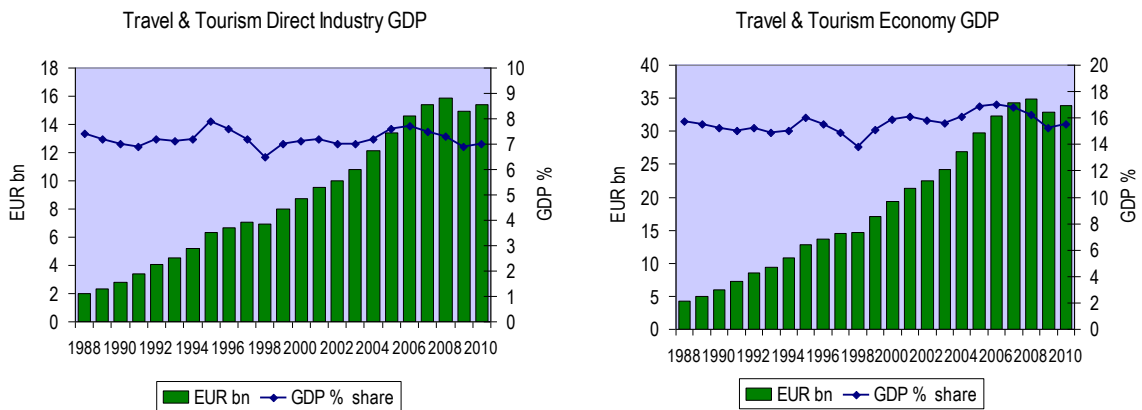


Figure 3: Travel & Tourism GDP contribution

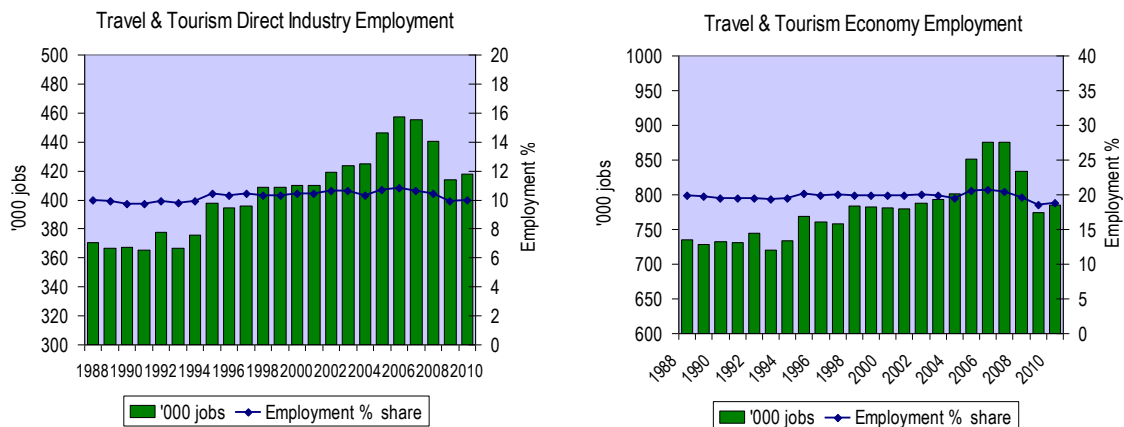


Figure 4: Travel & Tourism employment contribution



With regard to the sector of Hotels and Restaurants¹, annual enterprise statistics for the period 2002 – 2007 depict the increase in all relevant national statistics.

Table 3: Annual Enterprise Statistics in Tourism sector

	2002	2003	2004	2005	2006	2007
Number of enterprises	88.498	93.060	95.439	97.135	103.722	104.401
Turnover (€ mil)	7.148	7.233	8.186	8.743	9.475	9.931
Production value (€ mil)	6.944	7.041	8.036	8.651	9.378	9.882
Value added at factor cost (€ mil)	2.905	2.670	3.060	3.185	3.457	3.852
Total purchases of goods and services (€ mil)	4.151	4.483	5.064	5.750	6.139	6.267
Purchases of goods and services for resale in the same condition as received (€ mil)	205	192	186	225	190	172
Personnel costs (€ mil)	1.654	1.721	2.005	1.971	2.231	2.369
Wages and salaries (€ mil)	1.332	1.369	1.597	1.544	1.750	1.853
Social security costs (€ mil)	322	352	408	427	481	516
Gross investment in tangible goods (€ mil)	545	684	732	822	1.322	1.671
Number of persons employed	250.740	254.921	277.885	280.174	303.723	298.118
Number of employees	127.673	130.059	140.618	141.320	155.911	157.631

It is evident that currently Greek tourism industry is not a booming sector, but rather, follows the increase trends and development of the rest of the national economy (flat GDP share and employment share curves). This trend is also reflected in the World Travel & Tourism Council forecast that the Greek Travel & Tourism economy is ranked in position 149 among 181 countries with respect to its expected 10-year growth rate (2010 – 2020). While Greek tourism has positive perspectives, there are a number of challenges that must be dealt with, in order to raise the contribution of Travel & Tourism to GDP from 15,2% to 17,3% by 2020, especially after the emergence of competitive tourism markets in the region of Eastern Mediterranean.

¹ NACE rev. 1 total sector 55



3.1.2 Cyprus

Although tourism industry in Cyprus is smaller (its absolute size ranks in position 79 among 181 countries), compared to the Greek one, tourism economy ranks in position 35 among 181 countries in relative contribution to the national economy.

Cypriot tourism industry has also been focused on the development of coastal and sea tourism activities. Nevertheless, the warm climate has contributed to the existence of an extended peak period, while the small size and island environment of Cyprus has contributed to a more even development of the tourism infrastructure across the country. The emerging competition by countries that can offer similar conditions in competitive prices (Turkey, Croatia, Israel, etc) puts a pressure on the tourism industry of Cyprus that seeks to rationalize and reduce its operational costs.

Tourism industry, plays a significant role in the national economy, either directly (tourist industry revenues, inflow of foreign exchange, employment) or indirectly by stimulating relevant secondary and tertiary sectors. In the following Tables, a summary of the economic activity related to tourism in Greece is presented. Data includes year 2005 and estimation for year 2010:

Table 4: Cypriot tourism industry GDP table

	2005		2010	
	EUR bn	% of total	EUR bn	% of total
Personal Travel & Tourism	0,9	10,7	1,0	9,1
Business Travel	0,2	1,7	0,2	1,2
Government Expenditures	0,2	9,1	0,3	9,2
Capital Investment	0,5	19,8	0,6	16,7
Visitor Exports	2,1	40,6	1,9	28,8
Other Exports	0,1	6,3	0,1	5,6
Travel & Tourism Demand	4,1	20,1	4,1	16,4
Travel & Tourism Direct Industry GDP	1,4	10,2	1,2	6,6
Travel & Tourism Economy GDP	3,1	22,7	2,8	16,0



Table 5: Cypriot tourism industry employment table

	2005		2010	
	Jobs	% of total	Jobs	% of total
Travel & Tourism Direct Industry Employment	49.900	14,3	36.100	9,3
Travel & Tourism Economy Employment	100.300	28.8	76.700	19.8

Definitions of the table entries can be found in the respective paragraph for Greece (3.1.1).

The evolution of the key statistics, namely the contribution of the Travel & Tourism activities to the national GDP and the total employment are depicted in the following graphs:

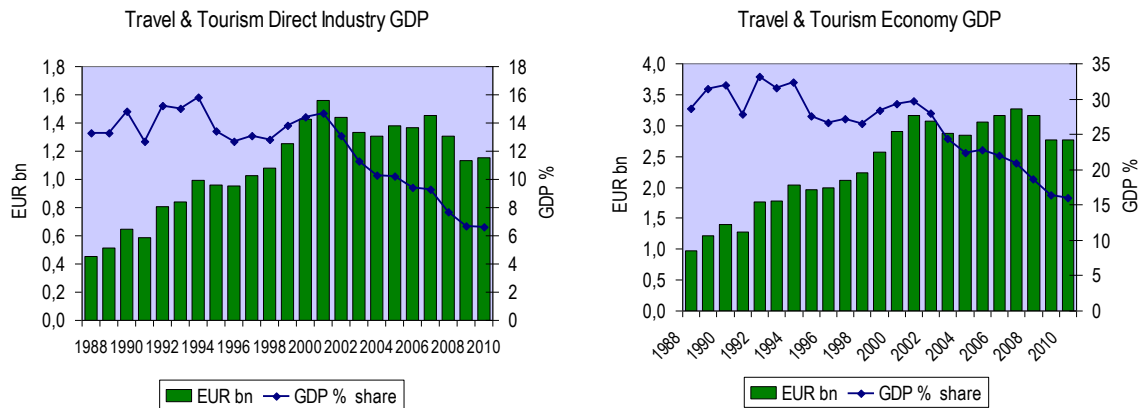


Figure 5: Travel & Tourism GDP contribution

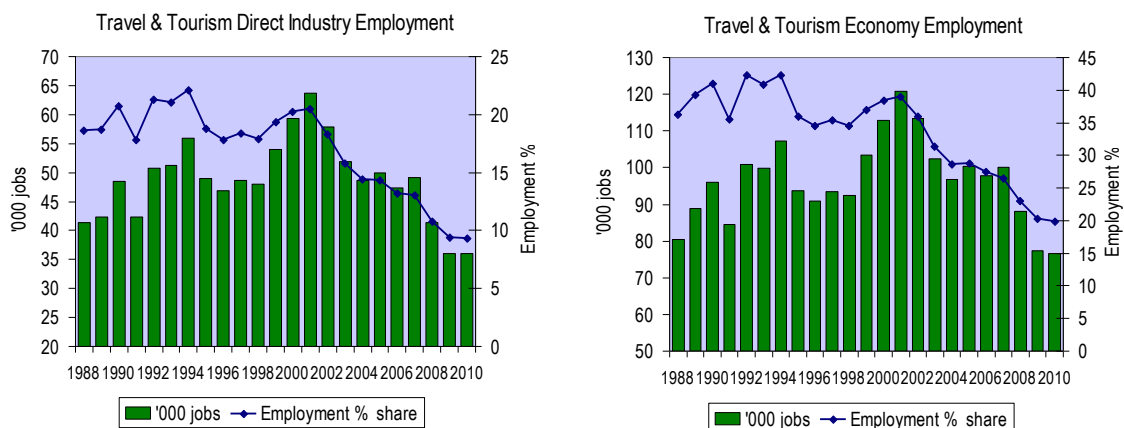


Figure 6: Travel & Tourism employment contribution



It is evident that Cypriot tourism industry goes through a long period of no development, leaving other economic activities increasingly contributing to the GDP and the employment of the country. Nevertheless, prospects of the Cypriot tourism industry are somewhat better than these of the Greek tourism industry since the Cypriot Travel & Tourism economy is ranked in position 79 among 181 countries with respect to its expected 10-year growth rate (2010 – 2020). While tourism industry in Cyprus has positive perspectives, there are a number of challenges that must be dealt with, in order to stop the current trend and raise the contribution of Travel & Tourism to GDP from 16,0% to 19,1% by 2020, especially after the emergence of competitive tourism markets in the region of Eastern Mediterranean.

3.2 Tourism sector and the regional economy of North Aegean

Region of North Aegean consists of three (3) prefectures (Lesvos, Chios and Samos) and includes nine (9) inhabited islands: Lesvos, Lemnos, Agios Efstratios, Chios, Inousses, Psara, Samos, Ikaria and Fournous. According to the 2001 census, the Region has a population of 206.121 or 1,88% of the total population of Greece. In the following table, a short identity of the region is presented:

Table 6: Identity of the Region of North Aegean

	1981	1991	2001
Population	195.004	199.231	206.121
Area (sq. km)	3.836	3.836	3.836
Urban population	54.733	54.951	88.996
Rural population	106.142	110.974	117.125

The regional economy is based mainly on the primary and tertiary sectors, with tourism industry having the largest development during the last years. The relative size of the economy of North Aegean with regard to the national economy and the relative importance of the various economic sectors in the regional economy are:

Table 7: National and regional GDP (EUR mil, current prices)

	2000	2001	2002	2003	2004	2005	2006	2007
Greece	136.281	146.428	156.615	172.431	185.813	195.366	210.460	226.437
North Aegean	1.805	2.007	2.049	2.341	2.419	2.546	2.869	2.915
Lesvos	909	1.034	1.029	1.200	1.220	1.287	1.443	1.481



Samos	397	443	452	494	488	521	588	607
Chios	499	529	568	647	711	738	839	827

Table 8: National and regional GVA per sector (EUR mil, current prices)

	Primary ²			Secondary (a) ³			Secondary (b) ⁴			Tertiary (a) ⁵			Tertiary (b) ⁶			Tertiary (c) ⁷		
	2005	2006	2007	2005	2006	2007	2005	2006	2007	2005	2006	2007	2005	2006	2007	2005	2006	2007
Greece	8.602	7.272	7.670	23.731	24.753	27.110	10.549	12.429	12.077	57.806	62.592	66.943	33.270	34.535	37.484	41.212	44.463	48.517
North Aegean	192	209	165	178	214	228	199	228	137	519	565	598	580	605	657	614	715	788
Lesvos	104	117	76	92	109	124	79	88	62	245	266	282	293	305	331	340	389	431
Samos	22	22	22	39	44	44	44	46	32	135	150	159	109	115	124	119	142	156
Chios	66	69	66	47	61	60	76	94	43	139	149	158	178	185	203	155	184	201

Sector Tertiary (a) of the above Table includes, among others, Travel & Tourism activities. In order to assess the expected development in the infrastructure of these activities, a time series of the gross fixed capital formation for the Tertiary (a) sector at national and regional levels follows:

Table 9: Gross fixed capital formation in sector Tertiary (a) (EUR mil, current prices)

	2000	2001	2002	2003	2004	2005	2006	2007
Greece	5.902	7.070	9.522	10.375	11.351	9.713	9.514	11.657
North Aegean	167	186	253	149	244	481	446	223

Finally, in order to assess the impact of the economic activities related to Hotels & Restaurants activities, a time series of the employment for the national and regional levels follows:

Table 10: Employment in Hotels & Restaurants sector

² Agriculture, forestry, fishing

³ Industry including energy

⁴ Constructions

⁵ Wholesale and retail trade, repair of motor vehicles and household goods, hotels and restaurants, transport and communications

⁶ Financial intermediation, real estate, renting and business activities

⁷ Other service activities



	2002	2003	2004	2005	2006	2007
Greece	250.738	254.920	277.885	280.175	303.723	298.118
North Aegean	5.714	5.850	5.954	5.566	6.297	6.050

Tourism related employment in Northern Aegean has not followed the national trends of increase from 2002 to 2007, that is a 5,9% increase at a regional level towards a 18,9% increase at national level.

3.3 The main components of tourism sector in the project regions

Tourism industry is not similarly developed in the project regions of North Aegean and Cyprus. Moreover, in the region of North Aegean, tourism industry is not equally developed among the three prefectures. Greek island tourism (North Aegean) has traditionally been developed through small and medium units offering a narrow range of services. Cyprus, on the other hand, has also seen adequate investments in large hotel units and entertainment facilities.

Nevertheless, both North Aegean and Cyprus have to compile and adopt more ambitious tourism development plans in order to lengthen their tourism peak period, promote alternative forms of tourism and provide competitive products and services.

3.3.1 North Aegean

The three prefectures of North Aegean have exhibited different rates of tourism development, as a result of the different tourism outset time in each island, as well as the different traditional economy activities that it complements (or substitutes). Tourism constitutes a critical factor for the development of the tertiary sector in the Region since, apart from the revenues and employment related to hotels and restaurants, has a strong impact on the sectors of transport / travel, construction, trade and services, even farming and food provision of the islands. As a general remark, tourism industry is developing in low rates resulting in a low contribution in the total national tourism activity.

North Aegean has favourable climate conditions with large sunshine duration, mediocre precipitation and temperate climate round the year. The region has a considerable historical and cultural heritage with numerous monuments, archaeological sites, castles, religious sites, etc. It is estimated that there are 75 traditional settlements coming right from the medieval years. Also,



North Aegean islands are well known for their rich natural environment, landscapes (mountainous and lowland), rich and diverse flora and a large number of beaches and varied coastal landscapes.

These characteristics favour the development of alternative forms of tourism in the Region of North Aegean. Nevertheless, mainly due to the lack of sufficient travel infrastructure among the islands, the development of alternative tourism is hindered, especially outside the summer peak period. Other problems are related to the lack of organization (e.g. for the promotion of sea sports) or specialized infrastructure (e.g. for the support of congressional tourism).

Region of North Aegean has a small contribution, in the area of 2%, in the total arrivals of tourists and nights spent in accommodation units (for both foreigners and Greek nationals). A number of useful conclusions on the structure of tourism in the North Aegean region can be deduced using the relevant statistics:

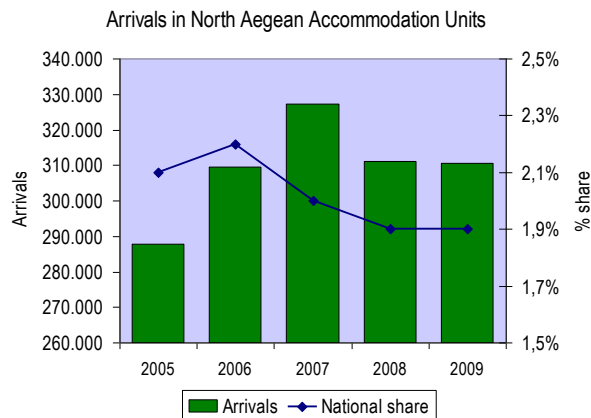


Figure 7: Arrivals in North Aegean

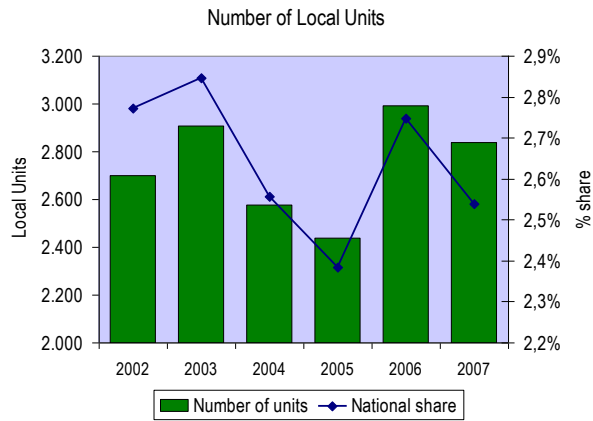


Figure 8: Number of local units⁸

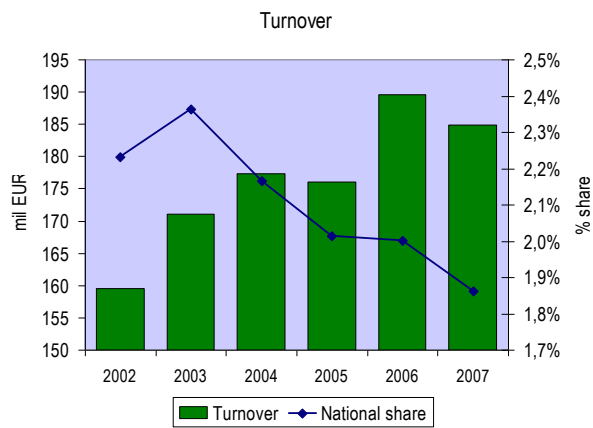


Figure 9: Turnover

⁸ NACE rev. 1 total sector 55



Figure 10: Wages and salaries

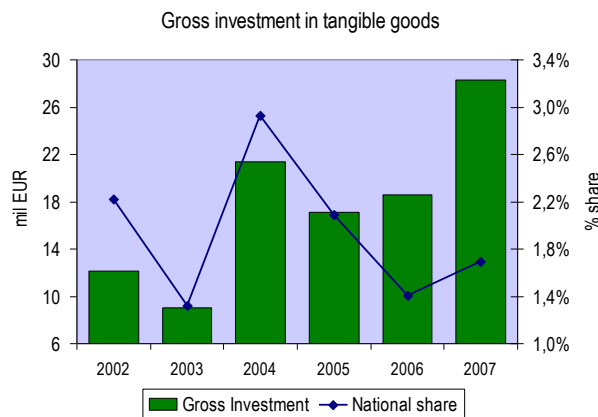


Figure 11: Gross investment in tangible goods

Total arrivals in the islands of North Aegean seem to be slightly declining, since 2007, in both absolute and relative numbers (Figure 7). Tourism in North Aegean is based on a large number of small (smaller than national average) sized enterprises (Figure 8 – number of local units larger than 2%). The small size could contribute to another characteristic, namely the short-living of many tourism enterprises, thus the strong year-to-year fluctuation in the absolute number of local units.

Decline of the importance of North Aegean (or, equally, lag in development) region is more intense in the case of annual turnover from tourism industry, where after a 2,4% high, on 2003, the region contributed a mere 1,85% in 2007 to the national tourism units turnover (Figure 9).

Statistics denote that North Aegean has relatively more medium and small-size accommodation units and less large-size accommodation units than the rest of Greece (Figure 6). This fact, in



conjunction with the declining tourism turnover in the region (Figure 7) has exerted a negative pressure in the wages and salaries of tourism related personnel (Figure 8). Local stakeholders need to pay attention to this decrease since, in the long-term, lower wages can result in employing personnel of lower qualifications and expertise. At a later time, this can result in the offering of insufficient services to tourists and the incapability of adapting to the new challenges of tourism in the area.

If a prerequisite for tourism development is “investments”, it is clear from Figure 11 that North Aegean is not a preferred receiver of investments, since the average share of investments, with regard to the total investments in Greek tourism from 2002 – 2007 is a mere 2,14%, a figure again in the area of 2%.

3.3.2 Cyprus

Cyprus, having a temperate climate and a variety of coastal landscapes, has traditionally relied on the “sun and sea” tourism product. Tourism exhibits a clear seasonal profile, reaching a peak period from May to October each year. The distribution of tourist arrivals over the four quarters of 2008 was as follows: January-March 9,5%, April-June 31,7%, July-September 40,6% and October-December 18,2%. The untapped development of the 1990 and the first half of 2000 decades was followed by a stagnant, if not declining, trend that classified the Cyprus tourism market in the mature ones.

Taking as a fact the importance of tourism for the national economy, the Cyprus Tourism Organization compiled a Strategic Plan for tourism development in Cyprus for the period 2000 – 2010. The Plan aimed at introducing the concept of “sustainability” of the tourism development in two main axes: Culture and Environment of Cyprus. In this context, tourism market was segmented, according to the “purpose of travel” / motivation of tourist to the following categories:

- Sun and Sea plus
- Culture
- Conference and Incentive Tourism
- Nature
- Walking/Hiking
- Sports Tourism
- Cycling
- Marine Sports and Yachting
- Mega Events
- Weddings and Honeymoons
- Sea cruises



Since then, this classification has been used as a guide for the creation of promotion campaigns and the formulation of policies, subsidies and incentives by the state agencies and the prioritization of investments in order to attract more tourists in the island.

In 2006 a series of external factors impacted and brought about a negative effect on tourism arrivals in Cyprus. The war in neighbouring Lebanon brought Cyprus to the forefront of the international stage of events in all media around the globe, as the only escape route for thousands of people of all nationalities. The increase in oil prices was yet another external factor that mainly influenced Cyprus' competitiveness by causing an impact on the prices of the tourist packages, as Cyprus is, in comparison geographically, located far from its source markets.

In 2008, tourists arrivals reached 2.403.750 recording a decrease of 0,5% compared to 2007.

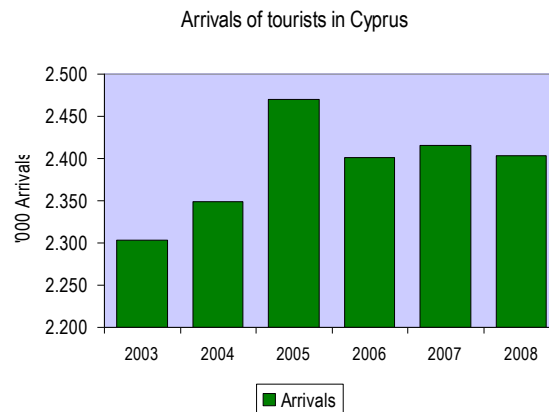


Figure 12: Arrivals of tourists

In 2008 the total revenue from tourism is estimated at €1.792,8 mil compared to €1.858,1 mil in 2007 recording a decrease of 3,5 per cent. The average expenditure per person was €745,8 (or €74,2 per day) recording a decrease of 3,0 per cent (or 3,9 per cent on the per day expenditure).

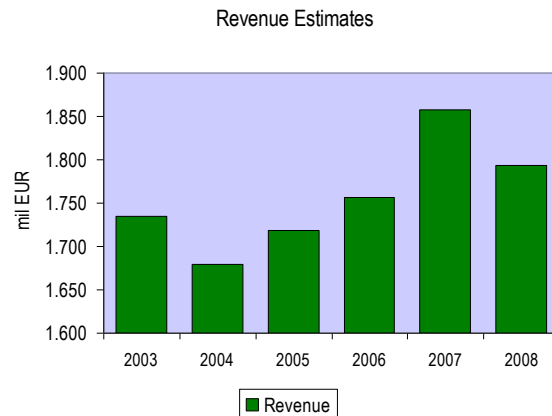


Figure 13: Revenue Estimates

During 2008, the sector of hotels and restaurants has been exhibiting a significant slowdown as compared to 2007. Value added in constant terms decreased by 3,4% compared to an increase by 3,4% that was realised in 2007. At current market prices, value added in 2008 increased by 1,5% to €1.025,7 mil compared to €1.010,7 mil in 2007 and its contribution to GVA in 2008 decreased to 6,4% from 6,8% in 2007. Gross output increased by 3,9% to €1.939,2 mil from €1.866,4 mil in 2007.

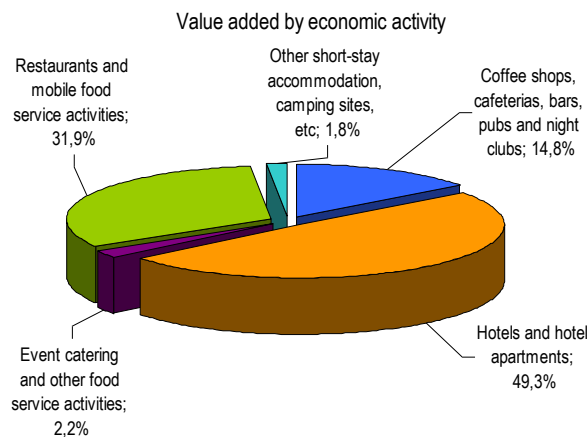


Figure 14: Value added by economic activity (2008)

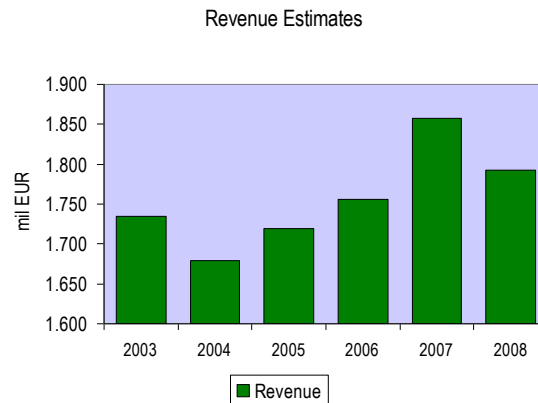


Figure 15: Revenue Estimates

Employment in restaurants and hotels increased by 1,9% in 2008 compared to the previous year and reached 39.137 persons, accounting for 9,2% of the total economically active population and 9,8% of the total gainfully employed population. Gross fixed capital formation in 2008 increased by 37,3% to €128,4 mil from €93,5 mil in 2007. Investment in new buildings (hotels, hotel apartments, restaurants etc.) accounted for €67,4 mil, in machinery and other equipment €26,8 mil, in furniture and fixtures €31,5 mn and in transport equipment €2,7 mil.

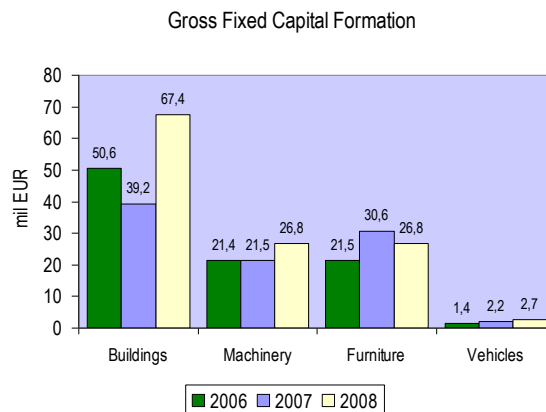


Figure 16: Gross Fixed Capital Formation

The total cost incurred for the production of goods and services in the sector of restaurants and hotels amounted to €1.718,4 mil. Of this amount, €903,0 mil was incurred in restaurants and €815,4 mil in hotels. Total cost as a proportion to total gross output was 88,6% (85,8% for restaurants and 92,0% for hotels). Direct cost (materials, fuels, electricity, repairs, etc.) used in the production of services accounted for 49,3% of the total production costs in restaurants and 32,9% in hotels. On the other hand, labour cost in restaurants and hotels represent 33,4% and



37,5% of the total cost respectively. The share of administrative costs in restaurants represent only 5,0% of the total, while in hotels 5,6%. The proportion of interests paid for loans in restaurants represent only 1,5% of the total costs while in the hotels 7,7%. Depreciation of buildings and equipment makes up 8,9% of the total cost for hotels and only 3,7% for restaurants. Indirect taxes represent 0,3% of the total production cost in restaurants and 1,4% in hotels. The proportion of rents paid in restaurants was 6,8% of the total costs while in the hotels 5,9%.

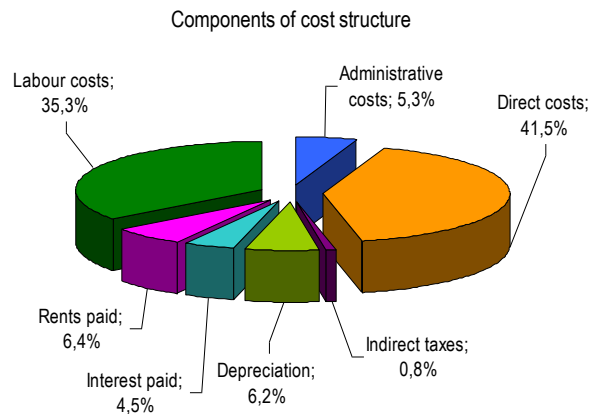


Figure 17: Components of cost structure

3.4 Accommodation infrastructure in the project regions

Characteristics of accommodation units vary significantly in the cases of Cyprus and North Aegean region. Cyprus relies on larger, hotel units while the preferred model in North Aegean is small and medium size hotels as well as rented rooms in small, family-run enterprises.

3.4.1 North Aegean

In the region of North Aegean relatively (with regard to the rest of Greece) small accommodation units predominate, especially hotels of category B, C, D and E. The prefecture of Samos has the largest concentration in accommodation units, Lesbos comes second and Chios third. Peak periods for the development of tourist accommodation units in North Aegean have been the 1980 decade and the 2000 – 2005 period, due to the favorable investment environment at the time.

Apart from hotel beds and beds in registered rented rooms, a large number of beds exist in unregistered rented rooms. It is grossly estimated that unregistered rented rooms are double the



number of the registered ones but no official or reliable data on the exact number can be presented.

Samos hosts 59% of hotel beds and 35% of beds in rented rooms. Lesvos hosts 21% of hotel beds and 51% of beds in rented rooms while Chios hosts 20% of hotel beds and 14% of beds in rented rooms. Regarding the phase of development, Samos is considered a mature tourism market while Lesvos is considered a developing one.

Table 11: Accommodation units per category in North Aegean region (2007)

	5-stars		4-stars		3-stars		2-stars		1-star		Camping		Total	
	Units	Beds	Units	Beds	Units	Beds	Units	Beds	Units	Beds	Units	Beds	Units	Beds
Lesvos	3	1.041	9	620	46	3.330	63	2.634	14	449	1	285	136	8.359
Samos	1	209	6	1.236	40	2.891	119	5.043	35	878	0	0	201	10.257
Chios	2	119	13	1.088	23	912	10	405	6	112	0	0	54	2.636
Total	6	1.369	28	2.944	109	7.133	192	8.082	55	1.439	1	285	391	21.252

Table 12: Accommodation units per category in North Aegean region (2008)

	5-stars		4-stars		3-stars		2-stars		1-star		Camping		Total	
	Units	Beds	Units	Beds	Units	Beds	Units	Beds	Units	Beds	Units	Beds	Units	Beds
Lesvos	2	631	11	711	53	3.718	59	2.463	16	541	0	0	141	8.064
Samos	2	808	6	687	42	2.948	119	5.071	32	816	0	0	201	10.330
Chios	2	119	14	1.117	25	820	11	515	6	112	0	0	58	2.683
Total	6	1.558	31	2.515	120	7.486	189	8.049	54	1.469	0	0	400	21.077

Table 13: Accommodation units per category in North Aegean region (2009)

	5-stars		4-stars		3-stars		2-stars		1-star		Camping		Total	
	Units	Beds	Units	Beds	Units	Beds	Units	Beds	Units	Beds	Units	Beds	Units	Beds
Lesvos	2	631	10	685	55	4.019	63	2.575	16	541	0	0	146	8.396
Samos	2	808	5	588	45	3.202	120	5.251	30	764	0	0	202	10.613
Chios	2	119	13	1.112	26	799	12	532	6	112	0	0	59	2.674
Total	6	1.558	28	2.385	126	7.965	195	8.358	52	1.417	0	0	407	21.683

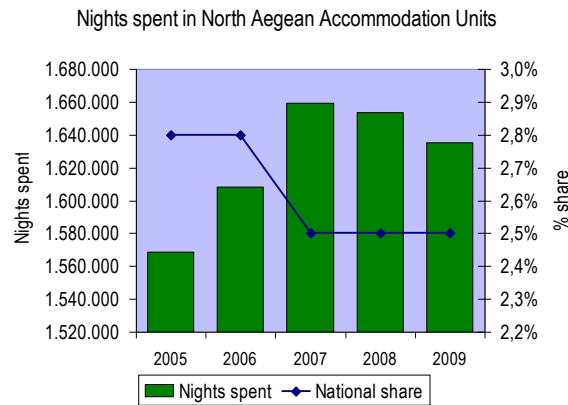


Figure 18: Total nights spent in North Aegean accommodation units

Following the trends presented in previous paragraphs, total nights spent in North Aegean accommodation units decline in both absolute (from 2007 onwards) and relative numbers (with regard to the national statistics).

3.4.2 Cyprus

Cyprus has far more developed tourism product and offered services than North Aegean region (almost ten times more nights spent in accommodation units of Cyprus than in those of North Aegean). In this context, average hotel units are larger and more luxurious offering specialized services. At the end of 2008 there were in operation 869 collective accommodation establishments registered by the Cyprus Tourism Organization with a total capacity of 90.398 beds. Of the tourist accommodation 225 were hotels with stars, 209 hotel apartments, 22 tourist villages, 146 tourist villas, 123 traditional buildings, 114 tourist apartments, 11 furnished apartments, 9 hotels without star, 6 guest houses and 4 tourist campsites.

A historic overview of the number of accommodation units shows that their number is slowly but steadily declining since 2003. The main contributors to his decline have been the 2-stars hotels and tourist apartments. On the other hand, there is a steady increase in the number of traditional buildings and tourist villas.

The total number of nights spent in collective accommodation establishments reached 14.380.375 in 2008. In 2008, 13.208.954 nights were spent by non-residents and 1.171.421 by residents of Cyprus. Ammochostos was the district with the highest proportion of nights spent 6.165.724, followed by Pafos with 4.736.059, Lemesos with 2.004.856, Larnaka with 1.042.128, Lefkosia with 277.176 and hill resorts with 154.432.



Table 14: Accommodation units per category in Cyprus

	2003		2004		2005		2006		2007		2008	
	Units	Beds	Units	Beds	Units	Beds	Units	Beds	Units	Beds	Units	Beds
5-stars hotels	20	9.443	20	9.443	22	10.463	22	10.461	22	10.461	22	10.573
4-stars hotels	57	20.863	57	21.197	58	21.057	59	21.407	59	21.675	58	21.377
3-stars hotels	88	17.173	88	17.087	85	16.465	82	16.070	84	16.393	83	16.536
2-stars hotels	53	4.415	54	4.431	54	4.387	51	4.268	47	3.889	40	3.296
1-star hotels	24	1.080	23	1.060	23	1.060	23	1.060	23	1.060	22	1.013
Hotel apartments	264	23.313	261	23.313	254	22.991	243	22.189	220	20.407	209	19.519
Tourist villages	19	5.718	22	6.926	22	6.698	22	6.698	22	6.812	22	6.812
Traditional buildings	75	672	80	724	86	755	94	866	109	935	123	1.033
Hotels without star	11	275	11	275	11	275	10	246	9	226	9	226
Guest houses	7	157	7	157	7	157	7	157	6	138	6	138
Tourist apartments	192	8.030	180	7.626	163	6.956	140	6.068	134	5.808	114	5.158
Tourist villas	118	958	128	1.230	130	1.320	137	1.423	146	1.685	146	1.691
Furnished apartments	19	280	20	258	18	256	15	236	17	272	11	218
Tourist campsites	4	2.808	4	2.808	4	2.808	4	2.808	4	2.808	4	2.808
Total	951	95.185	955	96.535	937	95.648	909	93.957	902	92.569	869	90.398



Table 15: Accommodation units and beds by locality (2008)

	Lefkosia		Lemesos		Larnaka		Ammochostos		Pafos		Hill resorts		Total	
	Units	Beds	Units	Beds	Units	Beds	Units	Beds	Units	Beds	Units	Beds	Units	Beds
Hotels and similar establishments ⁹	23	2.296	101	12.065	108	6.887	272	36.195	167	26.185	37	2.053	708	85.681
Other collective accommodation ¹⁰	0	0	5	1.544	3	126	7	456	146	2.591	0	0	161	4.717
Total	23	2.296	106	13.609	111	7.013	279	36.651	313	28.776	37	2.053	869	90.398

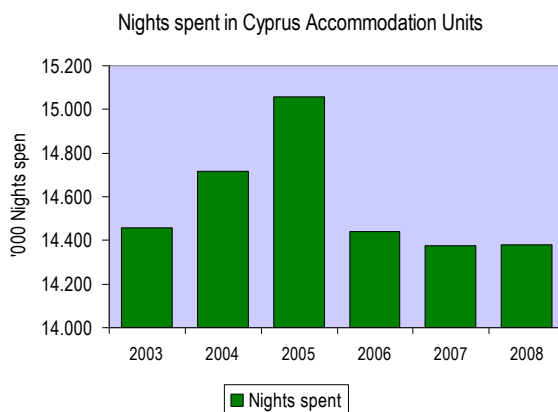


Figure 19: Total nights spent in Cyprus accommodation units

Since 2006, Cyprus has seen a drop of 500.000 in the nights spent in its accommodation units, indicating a mature market that needs to explore new products and services in order to enter again a phase of development.

3.5 Contribution of tourism industry to global warming

Tourism and travel is one of the largest global economic sectors and is a significant contributor to many national and local economies around the world. In 2008, there were 922 million international tourist arrivals with tourism receipts of US\$944 billion. It is estimated that the global

⁹ Category includes hotels with stars, hotel apartments, tourist villages, traditional buildings, hotels without stars, guest houses and tourist apartments

¹⁰ Category includes tourist villas, furnished apartments and tourist campsites



travel and tourism industry contributed 9,6% of global Gross Domestic Product (GDP) and 7,9% of worldwide employment in 2008. However, tourism demand has slowed substantially over the last year as a result of the global economic crisis. International tourism and travel is a vital contributor to the economy of many developing countries. Between 1995 and 2007, tourism and travel in emerging and developing markets grew at twice the rate of industrialized countries. Indicatively, international tourist arrivals are projected to reach 1,6 billion by 2020.

By far the lion's share of tourism activity takes place in Europe. This consists predominantly of tourist flows between the sub-regions of northern Europe (ie Northern Europe, Western Europe and Central and Eastern Europe), plus flows within those sub-regions. Together these accounted for 162 million arrivals in 2000. However, the largest single flow is the mass transfer of tourists from the colder northern regions of Europe southwards to countries bordering the northern coast of the Mediterranean - primarily a summer sun market. This amounted to around 116 million arrivals in 2000 - about one-sixth of all tourist trips worldwide.

The tourism industry uses energy in several activities – for transport to and from, as well as within the destination, in accommodation establishments and in a range of other tourism activities. Most energy use in tourism, as in many other economic sectors, is based on fossil fuels, with only a fraction of energy being generated through renewable energy sources. The contribution of tourism industry to global warming depends on the amount of CO₂ emissions or CO₂ equivalent emissions that can be attributed to tourism. The reported amount of CO₂ emissions attributed to tourism varies considerably, depending on, among others, the definition of what constitutes 'tourism'. In 2008, UNWTO prepared a set of approximations in an attempt to estimate CO₂ emissions from both international and domestic tourism and, thus, the contribution of tourism to human-induced climate change.

3.5.1 Transport

Total CO₂ emissions from tourism transport are estimated to be in the order of **980 Mt CO₂**, 52% of these is estimated to be caused by air travel (515 Mt CO₂), 43% by car (420 Mt CO₂), and 5% by other means of transport – coach, rail and water borne – (45 Mt CO₂). Simultaneously, from the 982 Mt CO₂ emissions, 86% originate from tourist trips (i.e., from overnights visitors) and the remaining 14% from same-day tourists. Within emissions generated by tourists (850 Mt CO₂), 56% comes from domestic tourist trips and the other 44% from international tourist trips. Nonetheless, it is important to stress that emissions per trip vary substantially. While 4 billion domestic tourist trips generate 479 Mt CO₂ emissions (120 kg per trip), 750 million international tourist trips are responsible for almost the same level of emissions (371 Mt CO₂ or 494 kg per trip).



3.5.2 Accommodation

Internationally, more than 80 different accommodation categories can be identified, including hotels, hostels, motels, pensions, bed and breakfast, self-catering accommodation, bungalows, vacation homes, holiday villages, campsites and farms, to give just some examples. Energy use in the different types of accommodation includes heating/cooling, cooking, illumination, cleaning, and, in tropical or arid regions, the desalination of seawater. Average energy use has been found to vary substantially by type of accommodation

Type of accommodation	Energy use per guest night (MJ)	Emissions per guest night (kg CO ₂)
Hotels	130	20,6
Campsites	50	7,9
Pensions	25	4,0
Self-catering	120	19,0
Holiday villages	90	14,3
Vacation homes	100	15,9
Estimated average	98	15,6

Table 16: Average energy use by type of accommodation

The calculation of emissions from accommodation can be achieved by multiplying the number of tourists by length of stay and an emission factor (CO₂ per guest night). The total number of international guest nights is estimated by UNWTO to be in the order of 6,1 billion. For domestic tourism, the total number of guest nights is estimated at 13,7 billion. While an average of 19 kg CO₂ per international guest nights is estimated, the emissions for domestic tourism are assumed to be at 11,5 kg CO₂ per guest night, because of lower emission levels in accommodation used by domestic tourist in developing countries. Total CO₂ emissions associated with accommodation are estimated at **274 Mt CO₂**.

3.5.3 Other tourism activities

Tourists visit attractions and participate in a wide range of activities at the destination. Emissions caused by these activities vary widely between various categories of attractions, such as museums or theme parks, outdoor-oriented activities and events (e.g., sport events or concerts)



or shopping. Unfortunately, data on energy use and emissions caused by these tourist activities are rarely available.

With no systematic international data on tourism activities being available, the breakdown of travel purposes for international tourism was based on UNWTO, with 50% arrivals estimated in 2004 for leisure purposes, 26% for VFR¹¹, health, religion and other and 16% for business. The weighted average energy consumption for tourist activities is thus estimated to be 170 MJ per trip, corresponding to emissions of 27 kg of CO₂ per trip. For domestic tourists in high income economies the international per day emissions have been multiplied with the average length of stay to calculate the per trip emissions for activities, resulting in a 11 kg of CO₂ per domestic trip. For domestic tourists in developing countries, the amount of energy associated with tourist activities is assumed to be one quarter of the amount consumed by tourists from high income economies, resulting in a 2,7 kg of CO₂ per trip. Extrapolated to all 4,75 billion tourist trips in 2005, emissions from 'other tourism activities' are estimated to be in the order of **48 Mt CO₂**.

3.5.4 Total CO₂ Emissions from Global Tourism

IPCC has estimated the annual global CO₂ emissions (2007) to be **26.400 Mt CO₂**. Thus, tourism, with **1.302 Mt CO₂**, has a contribution of approximately **4,9%** to the annual global emissions. Of this, 40% can be attributed to air transport, 32% to car transport, 3% to other transport, 4% to other tourism activities and **21%** to the accommodation sector.

3.5.5 Greece

To help assess the contribution of Greek tourist accommodation units to global warming, data on the final energy consumption are presented. In 2005, services sector accounted for 10,5% of the total final energy consumption in Greece.

¹¹ Visit to friends and relatives

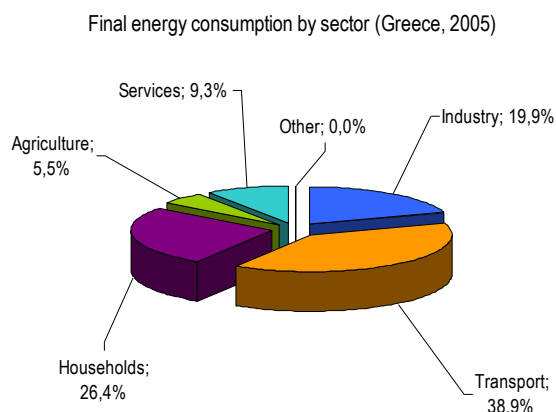


Figure 20: Final energy consumption, Greece

For the period 2001 – 2005, Ministry of Development of Greece estimated that, in average, hotels consumed 29% (4.044 GWh) of the total final energy consumed by the private services sector (13.894 GWh), which in turn, accounted for 71% of the energy consumed by the whole tertiary sector in Greece (19.465 GWh). For the same period, an analysis of the final energy consumption by fuel and use was performed.

Table 17: Hotels' final energy consumption by fuel and use (2001 – 2005, GWh)

Use	Natural Gas	LPG	Diesel	Fuel Oil	Electricity	Total
Space cooling – mainland	4				366	370
Space cooling – islands					330	330
Space heating – mainland	109		281	68	239	697
Space heating – islands			253		215	469
Lighting – mainland					271	271
Lighting – islands					244	244
Other electric – mainland					525	525
Other electric – islands					473	473
Hot water – mainland	14		70		111	195
Hot water – islands			63		100	164
Cooking	10	141			151	302
Total	136	141	668	68	3.027	4.040

(table might contain summing errors due to rounding)



3.5.6 Cyprus

To help assess the contribution of Cypriot tourist accommodation units to global warming, data on the final energy consumption are presented. In 2008, services sector accounted for 10,3% of the total final energy consumption in Cyprus.

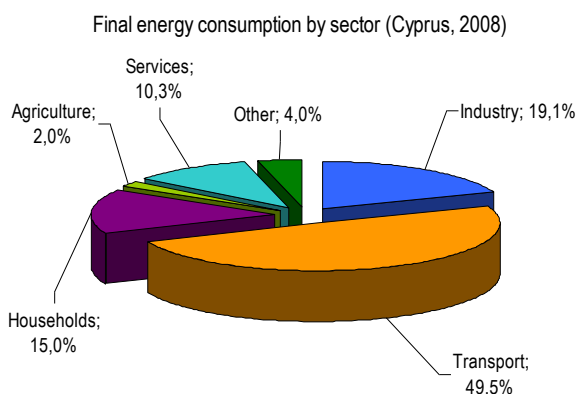


Figure 21: Final energy consumption, Cyprus

With regard to the energy source, in 2007, 74% of the final energy consumed in services sector came from electricity, 21% comes from oil and 5% from RES. The energy intensity of the services sector has increased from 0,022 koe/€05p in 2003 to 0,024 koe/€05p in 2007. The energy intensity of the tourism sector has also increased from 0,049 koe/€05p in 2003 to 0,051 koe/€05p in 2007. Electricity intensity of the hotel branch has also increased from 566 kWh/k€05p in 2003 to 599 kWh/k€05p in 2007. The explanation of the electricity intensity increase in hotels can be found in the increasing air conditioning energy needs.

3.6 The impact of climate change to tourism development

Climate change is thought to be one of the most serious threats to society, the economy and the environment. The environmental and economic risks of the magnitude of climate change projected for the 21st century are considerable and have featured prominently in recent international policy debates. The IPCC concluded, with very high confidence, that climate change would impede the ability of many countries on sustainable development by mid century and become a security risk that would steadily intensify, particularly under greater warming scenarios. With its close relationship to the environment and climate, tourism and travel is considered to be a highly climate sensitive economic sector.



As a consequence, the integrated effects of climate change are anticipated to have far – reaching impacts on tourism and travel businesses and destinations. Indeed, climate change is not some distant, future threat to tourism and travel, as the varied impacts of climate change are increasingly becoming evident in various destinations around the world and affecting the tourism and travel industry and the communities who depend upon it. Climate change is also already altering the decisions of travellers in terms of the destinations they choose and the timing of their trips. Climate change will result in both negative and positive impacts for the tourism and travel sector and its impacts will vary substantially by geographic region and sector. There are four broad pathways by which climate change will affect the global tourism and travel sector:

1. **Direct climate impacts:** Changes in the length and quality of climate dependent tourism seasons (i.e. sun and sea or winter sports holidays) could have considerable implications for competitive relationships between destinations and intra regional tourism flows. Other impacts will include increased infrastructure damage, additional emergency preparedness requirements, higher operating expenses (e.g. insurance, backup water and power systems, and evacuations), and business interruptions. Similarly, key cultural heritage assets that are also important attractions for tourists are also increasingly threatened by extreme climatic events and projected climate change.
2. **Indirect environmental change impacts:** Tourism is often based on a high quality natural environment. Changes in water availability, biodiversity loss, reduced landscape aesthetic, altered agricultural production (e.g. wine tourism), increased natural hazards, coastal erosion and inundation, damage to infrastructure and the increasing incidence of vector-borne diseases will all impact tourism to varying degrees. In contrast to the varied impacts of a changed climate on tourism, the indirect effects of climate induced environmental change are likely to be largely negative. Mountain, island, and coastal destinations are considered particularly sensitive to climate-induced environmental change, as are nature-based tourism market segments. Visitors may be deterred from visiting if the quality of the attractions decreases markedly.
3. **Impacts of mitigation policies on tourism mobility:** National or international policies to reduce GHG emissions will potentially impact tourism flows by causing an increase in transport costs and fostering environmental attitudes that lead tourists to change their travel patterns (e.g. shift transport mode or destination choices).
4. **Indirect societal change impacts:** The impacts of, and adapting to, climate change will have an economic cost. If not tackled, climate change may also threaten future economic growth and even the political stability of some nations. Any reduction of global GDP due to climate change would have negative implications for anticipated future growth in



tourism. Tourists are averse to political instability and social unrest, and there would be negative repercussions for tourism in the climate change security hotspots.

The tourism and travel sector is characterized by considerable diversity and consequently, there are extensive differences in the nature of climate sensitivities and adaptive capacities of tourism and travel operators and destinations. Furthermore, the implications of climate change for any tourism business or destination will also partially depend on the impacts on its competitors, with a negative impact in one part of the tourism system constituting an opportunity elsewhere. Regardless of their relative vulnerability to climate change, all tourism and travel businesses and destinations will need to adapt to climate change in order to minimize associated risks or capitalize upon new opportunities, in an economically, socially and environmentally sustainable manner.

Currently, the elements driving climate change are having and will continue to have many diverse effects, but the three most important are:

- rising average air temperatures
- rising sea levels (mainly due to thermal expansion - water expands as it gets hotter)
- increased frequencies of extreme climatic events, notably storms, associated precipitation changes, sea surges etc.

More specifically and regarding the region of Mediterranean basin (project area) other important predictions on the implications of climate change are:

- Temperature
 - 0,3 – 07 °C rise in temperature per decade
 - Increase in heat index
 - Increase in number of days over 40 °C
- Precipitation
 - Decrease in summer rainfall (-15%)
 - Increase in desertification
 - Increase in winter rainfall
 - Increase in erosion and runoff
- Other key variables
 - Increased risk of forest fires
 - Increased risk of flash floods
 - Water resource pressures increase
 - Coastal areas and infrastructure vulnerable to sea level rise



The composition of a travel market (i.e. the reason for travel), the level of climate change in a tourist's origin market and the changing weather conditions in the destination will each have a bearing on the way in which tourism behaviour alters. Since 84% of tourist arrivals in Greece and 94% of tourist arrivals in Cyprus come from Central and Northern European countries, suggestions on how climate change will affect tourism can be made.

Broadly speaking, Greek and Cypriot tourism markets serve a single purpose. A European tourist leaves behind an unpredictable summer climate in northern Europe – possibly little sun, plenty of rain and cool temperatures – in search of an annual dose of certain warmth and sunshine. Altered weather patterns induced by climate change could mean that northern Europe becomes more attractive and reliable during the summer months, while the Mediterranean generally deteriorates in its appeal for the holidaymaker: the temperatures may become too hot, tropical diseases may become prevalent, there may be water shortages, the landscape may become arid, and freak events in the form of flash floods and forest fires may become more frequent. The coast may become eroded and low lying coastal amenities such as resort complexes and golf course inundated. As a result, this mass movement of tourists could gradually slow, with northern Europeans holidaying either domestically or at least increasingly within northern Europe. Equally, southern Europeans may travel north to escape uncomfortable summer conditions at home.

3.7 EU and national adaptation and mitigation strategies and initiatives for the promotion of sustainable tourism development

Evidence suggests that the climate is already changing at an unprecedented rate within human history and the IPCC projects that global mean temperatures will increase between 1,8° C and 4,0° C degrees by the end of the 21st century, compared to the 1980–1999 period. Key impacts of climate change on the tourism sector range from direct impacts on the climate resources of destinations, to indirect environmental impacts (e.g., biodiversity, water resources and landscapes).

The climate change mitigation potential is thought to be relatively high in the tourism sector because efforts to reduce energy consumption and GHG emissions are still largely in their infancy and thus far have been taken without any vision of a coordinated sector-wide strategic response. Climate change mitigation policies within tourism will have to find a balance between potentially conflicting objectives. Clearly, there is the need to promote sustainability in local, regional and global scale; however, such policy options must be weighed carefully against the other socio-economic benefits of tourism.

It is a fact that all tourism businesses and destinations will need to adapt to climate change in order to minimize the risks and to capitalize upon the opportunities brought about by climate



change in an economically, socially and environmentally sustainable manner. The capacity of the tourism sector to adapt to climate change is thought to be relatively high due to its dynamic nature and ability to successfully respond to major challenges. The most vulnerable destinations will nonetheless require assistance to adapt, particularly those whose adaptive capacity is relatively low due to limited financial resources and technical knowledge.

Tourism has the responsibility to minimise harmful GHG emissions and there are many technological, behavioural, managerial and policy initiatives that can bring tourism to a more sustainable emissions pathway.

3.7.1 EU strategies

EU has worked actively to combat climate change in a global scale, leading the way to international actions and agreements, and has taken domestic action to mitigate and adapt to climate change. Given the international and institutional nature of EU, respective policies, actions and measures are regulative frameworks that guide countries-members to certain directions and targets, leaving space for a variety of implementation regulations, funding mechanisms and time plans. In this context, EU strategies regarding mitigation and adaptation might not be specific to tourist accommodation or even tourism sector but aim at the broader tertiary sector or set, even broader, national targets. The following paragraphs describe contemporary strategies and policies that can affect the tourist accommodation sector and its contribution to global warming:

White Paper on Climate Change Adaptation

In April 2009 the European Commission presented a policy paper known as a White Paper which presents the framework for adaptation measures and policies to reduce the European Union's vulnerability to the impacts of climate change. The White Paper presents a framework within which the European Union and its Member States can prepare for the impacts of climate change. A first phase of the strategy will run until 2012 and will lay the groundwork for preparing a comprehensive EU adaptation strategy from 2013 and beyond. It will focus on increasing our understanding of climate change and possible adaptation measures and how adaptation can be embedded in key EU policies. Decisions on how best to adapt must be based on solid scientific and economic analysis, yet information content and availability differs widely across regions. The paper outlines the need for a Clearing House Mechanism in which to exchange information on climate change risks, impacts and best practices. The White Paper establishes a framework for action, focusing on:

- building a stronger knowledge base on the risks and impacts of climate change



- taking account of climate change impact in key EU policies
- combining different policy measures to best effect – innovative funding (including market-based schemes) may be required to facilitate adaptation
- supporting wider international efforts on adaptation
- working in partnership with national, regional and local authorities

EU Climate and Energy Package

In March 2007, the EU's leaders endorsed an integrated approach to climate and energy policy that aims to combat climate change and increase the EU's energy security while strengthening its competitiveness. They committed Europe to transforming itself into a highly energy-efficient, low carbon economy. To kick-start this process, the EU Heads of State and Government set a series of demanding climate and energy targets to be met by 2020. These are:

- A reduction in EU greenhouse gas emissions of at least 20% below 1990 levels
- 20% of EU energy consumption to come from renewable resources
- A 20% reduction in primary energy use compared with projected levels, to be achieved by improving energy efficiency.

Collectively they are known as the 20-20-20 targets. In January 2008 the European Commission proposed binding legislation to implement these targets. This 'EU climate and energy package' was agreed by the European Parliament and Council in December 2008 and became law in June 2009. The core of the package comprises four pieces of complementary legislation:

- A revision and strengthening of the Emissions Trading System (EU ETS), the EU's key tool for cutting emissions cost-effectively. A single EU-wide cap on emission allowances will apply from 2013 and will be cut annually, reducing the number of allowances available to businesses to 21% below the 2005 level in 2020. The free allocation of allowances will be progressively replaced by auctioning, and the sectors and gases covered by the system will be somewhat expanded.
- An 'Effort Sharing Decision' governing emissions from sectors not covered by the EU ETS, such as transport, housing, agriculture and waste. Under the Decision each Member State has agreed to a binding national emissions limitation target for 2020 which reflects its relative wealth. The targets range from an emissions reduction of 20% by the richest Member States to an increase in emissions of 20% by the poorest. These national targets will cut the EU's overall emissions from the non-ETS sectors by 10% by 2020 compared with 2005 levels.



- Binding national targets for renewable energy which collectively will lift the average renewable share across the EU to 20% by 2020 (more than double the 2006 level of 9.2%). The national targets range from a renewables share of 10% in Malta to 49% in Sweden. The targets will contribute to decreasing the EU's dependence on imported energy and to reducing greenhouse gas emissions.
- A legal framework to promote the development and safe use of carbon capture and storage (CCS). CCS is a promising family of technologies that capture the carbon dioxide emitted by industrial processes and store it in underground geological formations where it cannot contribute to global warming. Although the different components of CCS are already deployed at commercial scale, the technical and economic viability of its use as an integrated system has yet to be shown. The EU therefore plans to set up a network of CCS demonstration plants by 2015 to test its viability, with the aim of commercial update of CCS by around 2020. Revised EU guidelines on state aid for environmental protection, issued at the same time as the legislative package was proposed, enable governments to provide financial support for CCS pilot plants.

Effort Sharing Decision

The Decision 406/2009/EC on effort sharing aims to reduce greenhouse gas emissions from sectors not included in the EU Emission Trading System (EU ETS) – such as transport, buildings, agriculture and waste. Each Member State will contribute to this effort according to its relative wealth (GDP/capita), with national emission targets ranging from – 20% for the richest Member States to + 20% for poorer ones in 2020 compared with 2005 levels. Less wealthy countries will be allowed to emit more than they did in 2005 in these sectors because their relatively higher economic growth is likely to be accompanied by increased emissions. Nevertheless positive targets still represent a limit on emissions and a reduction effort will be required in all Member States. At the Community level the Effort Sharing Decision will deliver an approximately 10% reduction of emissions from the non-ETS sectors in 2020 compared with 2005 levels. Together with the 21% reduction of the EU ETS during the same period it will accomplish the overall emission reduction goal of the EU Climate and Energy package (20% cut below 1990 levels by 2020).

End-use Efficiency & Energy Services

The European Union has adopted a framework for energy end-use efficiency and energy services. Among other things, this includes an indicative energy savings target for the Member States, obligations on national public authorities as regards energy savings and energy efficient



procurement, and measures to promote energy efficiency and energy services: Directive 2006/32/EC on energy end-use efficiency and energy services and repealing Council Directive 93/76/EEC. According to the Directive, Member States shall submit their first National Energy Efficiency Action Plan (NEEAP) to the Commission describing how they intend to reach the 9% indicative energy savings target by 2016. NEEAPs shall describe the energy efficiency improvement measures that are aimed at achieving the savings targets set out in Article 4(1) of the Directive. Furthermore the NEEAPs shall describe how Member States intend to comply with the provisions on the exemplary role of the public sector and the provision of information and advice to final consumers.

Energy Efficiency in Buildings

The Directive on energy performance of buildings (2002/91/EC) is the main legislative instrument at EU level to achieve energy performance in buildings. Under this Directive, the Member States must apply minimum requirements as regards the energy performance of new and existing buildings, ensure the certification of their energy performance and require the regular inspection of boilers and air conditioning systems in buildings. On 18 May 2010 a recast of the Directive on energy performance of buildings was adopted (Directive 2010/31/EU) in order to strengthen the energy performance requirements and to clarify and streamline some of its provisions.

Funding mechanisms

EU has shown a strong support for funding research, innovation, demonstration and dissemination projects related to the climate change adaptation and mitigation policies and measures. Funding has been realised, among others, mainly through the **“Framework Programme”** (European Commission), **“Intelligent Energy Europe”** (DG Energy) and **“LIFE / LIFE+”** (DG Environment) mechanisms. A large number of projects, funded by these mechanisms, are related to the sustainable development of tourism activities, accommodation included.

3.7.2 National strategies (Greece)

Greece complied with Directive 2002/91/EC by Law 3661/2008 and Law 3851/2010 and with Directive 2006/32/EC by Law 3855/2010. A number of subsequent Ministerial Decisions and Presidential Decrees that have or will be issued regulate a number of issues and procedures that are described in these Laws (e.g. National Targets and Policies, National Reports, Energy Audits and Buildings Certification, Body of Energy Auditors, Technical Specifications, etc).



End-use Efficiency & Energy Services

On June 2008, Greece compiled and submitted its first NEEAP, in accordance with the requirements of Directive 2006/32/EC. The energy efficiency measures which are included can be classified as institutional, regulatory, management and technological. The measures were designed taking into account their immediate applicability and overall cost, having in view the anticipated annual saving targets of 9% until 2016, and 20% until 2020. The energy efficiency improvement measures, in all sectors, is expected to result in energy savings of at least 16,41 TWh in 2016. Measures are divided in six categories: Horizontal, Cross-sectoral, Household, Tertiary, Industry and Transport. Measures that can be related to tourism and specifically to tourism accommodation sector can be found in three categories:

- Horizontal
 - HOR2: Targeted education campaigns, provision of information and rewarding of “good practices”
 - HOR3: Programmes to provide financial support for investment in energy-saving technologies and research
- Cross-sectoral
 - CS1: Energy performance of buildings
 - CS2: Further promotion of the integration of natural gas and LPG
 - CS3: Energy labelling of appliances and minimum energy efficiency requirements
 - CS4: Implementation of an energy management system (EMS) in the tertiary and public sectors
 - CS6: Installation of electronic and intelligent metering of electricity and natural gas consumers
 - CS7: Promotion of cogeneration of heat and power (CHP) and district heating systems
- Tertiary
 - T1: Compulsory installation of central solar thermal systems in tertiary sector buildings larger than 1000 m²
 - T2: Promotion of voluntary agreements for energy upgrading interventions in tertiary sector buildings



Energy Efficiency in Buildings

Under the Law 3661/2008 on “Measures for the reduction of energy consumption in buildings, Energy Audit and Certification of buildings” was harmonized with Directive 2002/91/EC. In this context a Body of Energy Auditors, comprised of private energy audit professionals and engineers will perform energy audits in buildings according to the Greek Regulation for the Energy Performance of Buildings. The Regulation describes the minimum technical characteristics that new and renovated buildings must have in order to be certified as “energy efficient” of grade “B” or higher.

Accordingly, new or renovated accommodation units will have to comply with the minimum technical specifications and follow recommendations that promote energy efficiency and conservation.

Investment Law

Incentives Investment Law 3299/2004 provisions financial incentives for private investments over 100.000 €, in all sectors of economic activity, that are implemented within Greece by enterprises of all categories. Incentives have a strong regional character, in that the level of public support depends strongly on the particular geographic region, in which the given private investment is planned to materialize. Regions with high unemployment rates and low incomes per capita receive the highest public investment incentives.

Investments in RES installations (both electricity- and heat - producing ones) have a favoured status under Law 3299/04, similar to the one for other selected categories of investments, such as investments in high technology, environmental protection, tourism, etc.

Currently, a new Investment Law is being formulated and has been set in public discussion by the Ministry of Economy, Competitiveness and Shipping.

National Strategic Reference Framework

The NSRF (National Strategic Reference Framework) 2007 – 2013 constitutes the reference document for the programming of European Union Funds at national level for the 2007 – 2013 period and was elaborated within the framework of the new strategic approach to the Cohesion Policy of the European Union. The new scheme is characterized by a number of Operational Programmers (OP) in relation to the previous 2000–2006 period, leading to a more flexible management scheme: the country’s strategic planning for the 2007 - 2013 period will be implemented through eight (8) Sectoral OPs, five (5) Regional OPs and twelve (12) European Territorial Co-operation OPs.



The allocation of Community resources for Cohesion Policy of period 2007-2013, was decided at the session of the European Council held in December 2005. Greece is allocated 20,4 billion € (in current values). These resources will be used to finance interventions through the European Regional Development Fund (ERDF), the European Social Fund (ESF) and the Cohesion Fund.

North Aegean Regional Operational Programme

The North Aegean Regional Operational Programme, within the category “Diversification of the production standard”, foresees a number of activities for the improvement of tourism related services. Aiming at the expansion and enhancement of the tourism product, actions like the creation of public tourism infrastructure that will help in the enhancement of the tourism product and extensive promotion of the enhanced tourism product are included. The respective Environmental Assessment Report suggests certain environmental indicators and their probable change (positive or negative) in case the activities of the Operational Programme are financed and implemented. The Report suggests a number of necessary conditions for the implementation of these activities in order to move towards a sustainable tourism development that is more environmental friendly and less energy intense.

3.7.3 National strategies (Cyprus)

Ministry of Commerce, Industry and Tourism is responsible for the adoption and implementation of energy efficiency policy including RES, RUE, and Energy efficiency. The Cyprus Institute of Energy was founded in 2000 to assist the Government in the promotion and implementation of policies and measures in RES and energy efficiency. One of the main tasks of Cyprus Institute of Energy is the operation of the Government’s financial support scheme for investments in RES/energy efficiency, the participation in IEE projects and assisting the Government with the transposition, promotion, implementation of EU energy policies in Cyprus.

End-use Efficiency & Energy Services

The first National Energy Efficiency Action Plan has been adopted in July 2007 in conformity with EU Directive on Energy Services (2006/32/EC). The target, set in the Plan, consists to 10% end-use energy savings by 2016. The target will be reached by applying cost effective energy efficiency improvement measures and domestic RES production. Measures are divided in six categories: Horizontal / Cross-sectoral, Household, Tertiary, Industry, Agriculture and Transport. Measures that can be related to tourism and specifically to tourism accommodation sector can be found in one category:



- Tertiary
 - T5: All new buildings of tertiary sector (apart from the described exceptions) must comply with the defined minimum requirements of energy performance
 - T6: All renovated buildings of tertiary sector (apart from the described exceptions) must comply with the defined minimum requirements of energy performance
 - T7: Regular inspection and maintenance of boilers and heating systems according to the defined specifications
 - T8: Regular inspection and maintenance of cooling systems (>12 kW) according to the defined specifications
 - T9: Plan of financial incentives for energy efficiency and the promotion of RES use in existing buildings of tertiary sector
 - T10: Plan of financial incentives to promote the end-use of RES energy in tertiary sector

Energy Performance of Buildings

Cyprus has enacted a primary legislation for the energy performance of buildings (Laws 101(I)/2006 and 142(I)/2006 in compliance with directive 2002/91/EC). Secondary legislation/regulations for setting minimum efficiency requirements, thermal building codes are not yet enforced. Cyprus, prior to accession did not have any mandatory building codes for energy efficiency in buildings. Therefore after the full implementation of the EPBD the impact in terms of energy savings is expected to be high.

Funding

The main financial instrument used for funding energy efficiency actions is the Governmental Special Fund for the promotion of RES/RUE/energy efficiency. The fund is created by imposing a levy of 0,22 cents/KWh for all categories of electricity consumers (10 million euro/year). All sectors are eligible for funding: households, industry and tertiary. The financial incentives are provided in the form of grants and subsidies for energy efficiency investments (30% - 50%, based on the technology) and feed in tariffs for CHP/RES electricity sold to the national grid. The basic criterion used for the evaluation of any energy savings investment proposal is to achieve a 10% primary energy saving after the investment.



4 Selection of eligible accommodation units for CARBONTOUR

The first step of the methodology followed for the selection of the eligible accommodation units for participating in the large scale application of the carbon footprint evaluation software was collection of data concerning (a) selected characteristics of the units from available databases as well as (b) requirements prescribed for the different types of accommodation units in the examined areas and their rating classes according to the existing legislation. The data collected were evaluated and the screening criteria for the categorization of the accommodation units into five groups were defined. In specific, one single criterion was used for the initial screening of the units and the elimination of those that are not of interest for the project objectives. Following, the remaining units were evaluated based on a second stage screening with the use of six basic criteria and seven optional criteria categorized into five groups. The units that met this set of criteria constitute the eligible accommodation units for participating in the large scale application of the carbon footprint evaluation software (activity 4.b). At the final stage, 80 accommodation units were selected by means of a set of additional criteria.

Data directly linked to the energy and water consumption, water and wastewater treatment of each unit (area of the building sites, size of the facilities offered, quantities of waste generated etc) were not available in the databases used while their collection through personal communication with each of the units was decided to be avoided at this phase of the project.

On the other hand, specifications set by the existing legislation for the classification of the accommodation units in Greece and Cyprus into the various types of accommodation and their respective rating categories refer to minimum requirements and thus they are not indicative of the characteristics of the units.

As a result, it was decided to evaluate and make use of the available data that are indirectly connected to energy and water consumption, water and wastewater treatment for the categorization of the units.

4.1 Recording of the accommodation units established in North Aegean, Greece and in Cyprus

The starting point for the selection of the accommodation units that will participate in the CARBONTOUR evaluation procedure was to draw up a 'longlist' of all the accommodation units established in the region of North Aegean, Greece and in Cyprus. For the development of this list, the information available in the databases of the Greek and Cypriot Tourism Organizations, local associations of hotels and rented rooms was evaluated and the necessary data for the screening procedure were recorded. These data included information on the identification of each unit such as the name and location, as well as additional characteristics which could link (directly or indirectly) to the energy and water consumption of the units or their waste production. These characteristics refer to the capacity of the units, type of accommodation, rating, services offered



such as cooling and heating of rooms, facilities such as restaurants, swimming pools and sport fields as well as certifications of environmental management the units have obtained such as the ISO 14001 standard or others.

For this purpose, a database was developed using simple software (EXCEL) where all the collected data were inserted. The data were organized per column as follows:

Column A – Name: Name of the accommodation unit

Column B – Region: The options are (i) North Aegean, Greece and (ii) Cyprus

Column C – Cyprus District / N. Aegean Island: For Cyprus the options are the districts of Famagusta, Larnaca, Limassol, Nicosia and Pafos while for the RNA are the islands of Lesvos Peripheral Unit (Lesvos, Limnos, Agios Efstratios), the islands of Samos Peripheral Unit (Samos, Icaria, Fournoi) and the islands of Chios Peripheral Unit (Chios, Inousses, Psara).

Column D – Municipality: Name of municipality

Column E – Type of accommodation: The types of accommodation units in Greece are hotels and apartments while in Cyprus are hotels, hotel apartments, furnished apartments, tourist apartments, tourist villas, tourist villages and guesthouses

Column F – Rating: In Greece, hotels are rated with a 1-5 star system and hotel apartments with a 1-4 key system. In Cyprus, hotels are rated with a 1-5 star system, hotel apartments are rated as Lux, A' Class, B' Class and C' Class, tourist villas as Lux, A' Class and B' Class and tourist villages as A' Class and B' Class. For the types of accommodation that are not rated based on an official rating system (tourist apartments, furnished apartments, guesthouses), the indication "N/A" is used. Furthermore, for the hotels and hotel apartments in Cyprus that are characterized as traditional houses, the indication "T.H." was used.

Column G – Operation period: The data concerning the operation period of the units were available for most of the units in Greece but not for Cyprus. Where there was lack of data the symbol "-" was used.

Column H – Number of beds: The capacity of the unit is shown in terms of beds

Column I – Air conditioned rooms: For the units with rooms that are equipped with cooling/heating system the indication "YES" was used while for those that do not have such a system the indication "NO" was used.

Column J – Centrally heated rooms: For the units with central heating system the indication "YES" was used while for those that do not have such a system the indication "NO" was used. This information was not available for the accommodation units in Greece, therefore the symbol "-" was used.

Column K – Restaurant: The units that offer restaurant were marked with the indication "YES" while those that do not offer were marked with the indication "NO".

Column L – Bar: The units that offer bar were marked with the indication "YES" while those that do not offer were marked with the indication "NO".



Column M – Swimming pool: The units that offer at least one swimming pool were marked with the indication “YES” while those that do not offer were marked with the indication “NO”. The kind of swimming pool is further specified in columns N-P.

Column N – Outdoor swimming pool: The units that have at least one outdoor swimming pool were marked with the indication “YES” while those that do not have were marked with the indication “NO”.

Column O – Outdoor swimming pool heated: The units that have at least one outdoor swimming pool which is heated were marked with the indication “YES” while those that do not have were marked with the indication “NO”. This information was not available for most of the accommodation units in Greece, therefore the symbol “-” was used.

Column P – Indoor swimming pool: The units that have at least one indoor swimming pool were marked with the indication “YES” while those that do not have were marked with the indication “NO”. This information was not available for most of the accommodation units in Greece, therefore the symbol “-” was used.

Column Q – Sport fields: The units that have at least one sport field (tennis, volleyball, golf etc) were marked with the indication “YES” while those that do not have were marked with the indication “NO”.

Column R – Water sports: The units that offer water sports were marked with the indication “YES” while those that do not offer were marked with the indication “NO”.

Column S – Gardens: The units that have gardens were marked with the indication “YES” while those that do not have were marked with the indication “NO”. This information was not available for the accommodation units in Greece, therefore the symbol “-” was used.

Column T – Fitness room: The units that offer fitness room were marked with the indication “YES” while those that do not offer were marked with the indication “NO”.

Column U – Sauna/Jacuzzi: The units that offer sauna or jacuzzi were marked with the indication “YES” while those that do not offer were marked with the indication “NO”.

Column V – Spa: The units that offer spa services were marked with the indication “YES” while those that do not offer were marked with the indication “NO”. This information was not available for the accommodation units in Cyprus, therefore the symbol “-” was used.

Column W – Conference room: The units that offer conference room were marked with the indication “YES” while those that do not offer were marked with the indication “NO”.

Column X – Number of conference rooms: The number of conference rooms was available only for Cyprus.

Column Y – ISO 14001: The units that have been certified with the environmental management standard ISO 14001 were marked with the indication “YES” while those that have not been certified were marked with the indication “NO”.



Column Z – Green Key: The units that have been awarded with the international eco label Green Key¹² were marked with the indication “YES” while those not were marked with the indication “NO”.

Information regarding hotel occupancy and type of rooms was not available and therefore not used in the classification process. Furthermore, information regarding the certification of units with the ISO 9000 standard, though available, was not considered necessary. Instead, certification standards on environmental management were taken under consideration, such as the ISO 14001 standards and the Green Key.

4.2 Characteristics and minimum requirements of the accommodation units recorded

With the completion of the list, all data collected were processed in order for the associated results to be drawn. In total 1.347 accommodation units were recorded, from which 60% are established in Cyprus and the rest 40% are located in the region of North Aegean, Greece. The respective number of beds of the accommodation units recorded is 110.547 (76% in Cyprus, 24% in North Aegean Region).

In Cyprus, 811 accommodation units in total were recorded while their average capacity was estimated in 104 beds per unit. The tourism activity is concentrated mainly in the districts of Pafos where 35,9% of the accommodation units in Cyprus are established and Famagusta which concentrates 32,3% of the accommodation units. Next are the districts of Larnaca and Limassol with 13,3% and 12% respectively, while Nicosia has the smallest share (6,5%).

The total number of units recorded in the North Aegean Region is 536 with an average capacity of 49 beds per unit which is approximately half of Cyprus' estimated average capacity. In the peripheral unit of Lesvos 198 accommodation facilities were recorded which corresponds to 36,9% of the prefecture. Its main islands, Lesvos, Limnos and Agios Eftraios have a tourism capacity of 156, 39 and 3 accommodation units respectively. The peripheral unit of Samos concentrates almost half the tourist activity of the region (46,6%) with 250 accommodation units established in its islands. In specific, 210 accommodation units were recorded in Samos, 39 in the island of Ikaria and 1 in the island Fournoi. The peripheral unit of Chios has the smallest share of the tourism activity of the region (16,4%) with 88 accommodation facilities. It consists of three main islands, Chios, Psara and Inousses in which 82, 5 and 1 accommodation units are established, respectively.

The distribution of the accommodation units and beds recorded in the examined areas is presented in Figure 22.

¹² The Green Key is an ecolabel awarded to tourism and leisure establishments by the Foundation of Environmental Education (FEE). It aims to contribute to the prevention of climate change and to sustainable tourism by awards and promoting good initiatives. Currently, the Green Key programme is running in 20+ countries.

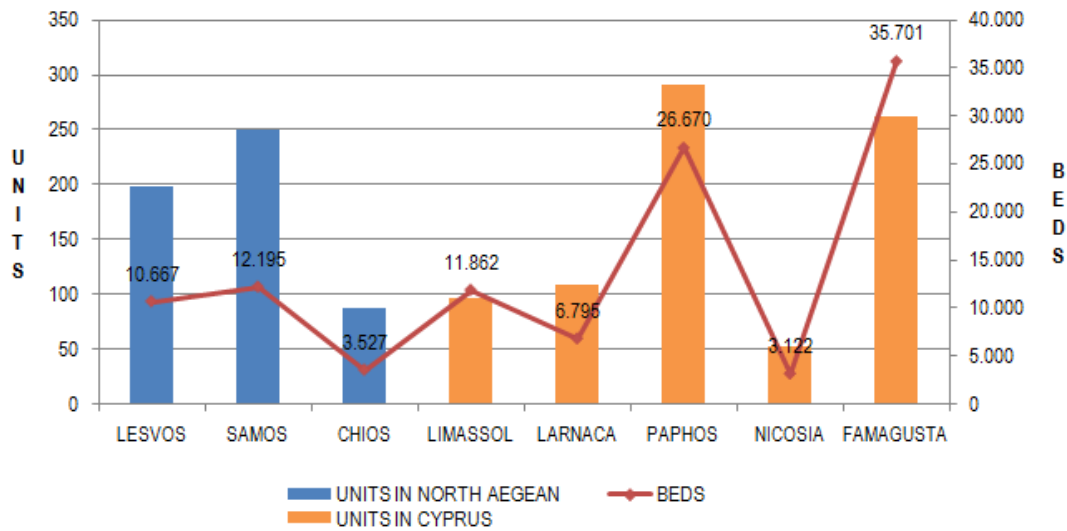


Figure 22: Distribution of accommodation units and beds in North Aegean Region and Cyprus

4.2.1 Accommodation units in Cyprus

The accommodation units recorded in Cyprus are categorized into seven main types: hotels, hotel apartments, tourist villages, tourist villas, tourist apartments, furnished apartments and guest houses. Hotels and hotels apartments concentrate the biggest share of the total accommodation units established in Cyprus with 29,7% and 37,4% respectively. Tourist villas and tourist apartments follow with 16,8% and 12,1% respectively while the rest types of accommodation have a very small share (tourist villages 2,7%, furnished apartments 1%, guest houses 0,4%).

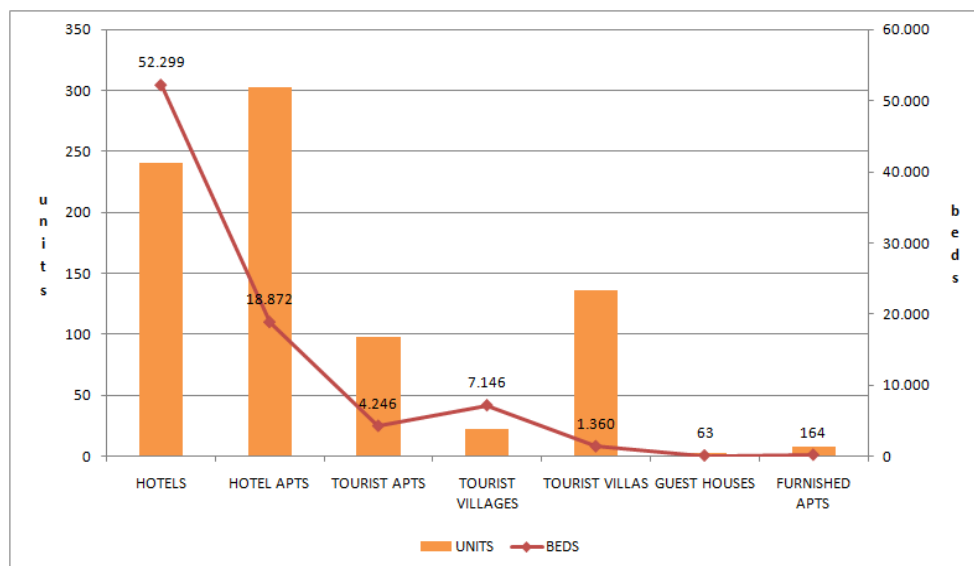


Figure 23: Accommodation types in Cyprus

However, data processing showed that tourist villages have the biggest average capacity in beds, namely 325 beds per unit. Next in the capacity ranking are hotels with 217 beds per unit and hotel



apartments with 63 beds per unit. Last in the ranking are tourist villas with an average capacity of 10 beds per unit (Table 18).

Table 18: Accommodation units and beds in Cyprus per type of accommodation

TYPE OF ACCOMMODATION	UNITS		BEDS		BEDS PER UNIT
	number	percentage	number	percentage	
Hotels	241	29,7%	52.299	62,1%	217
Hotel apartments	303	37,4%	18.872	22,4%	62
Tourist apartments	98	12,1%	4.246	5,0%	43
Tourist villages	22	2,7%	7.146	8,5%	325
Tourist villas	136	16,8%	1.360	1,6%	10
Guest houses	3	0,4%	63	0,1%	21
Furnished apartments	8	1,0%	164	0,2%	21
TOTAL	811	100%	84.150	100%	104

4.2.1.1 Hotels

According to the Hotels and Tourist Establishments Laws 1969 to 2005 of the Republic of Cyprus, hotels or hotel units are sub-divided into (a) hotels, (b) motels, (c) groups of bungalows, (d) traditional buildings, and (e) any other hotel premises as may be prescribed. These categories are further specified as follows:

(a) A hotel is erected as a single self-contained main building or a number of buildings constituting a centralised whole in a centralised space, specially erected or arranged in this space, having a unified functional organisation, and including the spaces furniture equipment and installations appropriate to the class in which it is classified.

(b) A motel is situated outside a residential area, or on its outskirts, having in other respects the characteristics specified for hotels, and aiming, principally, at serving people travelling by car.

(c) A bungalow hotel consists in whole or in part of a group of detached bungalows and is erected at a distance from each other in a centralised space, served from one or more central buildings provided with the indispensable communal and ancillary spaces, having, in other respects, the characteristics of a hotel.



(d) A traditional building is housed in a self-contained building or part of a building which is declared to be preserved and is arranged appropriately so as to provide temporary accommodation and possibly food to customers.

Hotels, motels and bungalows are classified by means of a star rating system from 1 to 5 stars. A hotel is classified in one of the classes if it complies with the conditions prescribed for that class as regards position, appearance, number of beds, building lay-out, value and quality of construction, technical finish, furniture, equipment, staff, perfect functional organization and, in general, services and facilities offered.

According to the Hotels and Tourist Establishments (General) Regulations from 1985 to 2005 of the Republic of Cyprus, every hotel in Cyprus offers - inter alia - communal areas such as a lobby, a breakfast room, halls offering a multitude of amenities for the guests (ball room, conference room, seminar halls) of an area 1sq.m/bed, gardens and areas of green. The following additional requirements are considered indispensable for each class:

5 star hotels: The area of the building site of the hotel is at least 13.000 sq.m (dimension analogy is not less than 1:2). Every business has at least 160 beds available. Towels and bed linen in rooms are replaced daily. Additional communal areas are available such as lounge, bar (at least 40 sq.m), dining-room (at least 1sq.m/bed) and television room and a closed hall of multiple use (0,3 sq.m/bed, at least 50 sq.m). Cooling installations are indispensable with the exception of those units operating in mountain regions. The provision for a sauna and at least one indoor athletic hall, such as squash, badminton or a gymnastics hall as well as of a tennis court is compulsory. The availability of a swimming pool (150 sq.m) which is heated during winter season with a temperature of at least 20 degrees Celcius is compulsory. Furthermore, an indoor heated swimming pool of an area of at least 80 sq.m is offered. Gardens and green areas satisfy the analogies of 15 sq.m. for every bed.

4 star hotels: The area of the building site of the hotel is at least 8.000 sq.m (dimension analogy is not less than 1:3). Every business has at least 100 beds available. Towels and bed linen in rooms are replaced every two days. Additional communal areas are available such as a lounge, a bar (at least 40 sq.m), a dining-room (at least 1sq.m/bed) and television room, a closed hall of multiple use (0,3 sq.m/bed, at least 50 sq.m). Cooling installations are indispensable with the exception of those units operating in mountain regions. The provision for a sauna and at least one indoor athletic hall, such as squash, badminton or a gymnastics hall as well as of a tennis court is compulsory. The provision of a tennis court for a hotel situated in a built-up area is optional. The availability of a swimming pool (at least 120 sq.m) which is heated during winter season with a temperature of at least 20 degrees Celcius is compulsory. Furthermore, an indoor heated swimming pool of an area of at least 70 sq.m is offered. Gardens and green areas satisfy the analogies of 12 sq.m. for every bed.

3 star hotels: The area of the building site is at least 2.000 sq.m for a hotel which is situated in a densely populated area or mountainous area and 3.000 sq.m. for a hotel which is situated outside a densely populated area (dimension analogy is not less than 1:3,5). Every business has at least 50 beds available. Towels and bed linen in rooms are replaced every two days. Additional



communal areas are available such as lounge, bar (at least 40 sq.m), and closed hall of multiple use (0,25 sq.m/bed, at least 50 sq.m). Cooling installations are indispensable with the exception of those units operating in mountain regions. The provision for a sauna and at least one indoor athletic hall, such as squash, badminton or a gymnastics hall is compulsory for hotels of a capacity beyond 240 beds. The availability of a swimming pool is compulsory (at least 100 sq.m) which is heated during winter season with a temperature of at least 20 degrees Celcius. Furthermore, an indoor heated swimming pool of an area of at least 60 sq.m is offered.

2 star hotels: The area of the building site is at least 2.000 sq.m. for a hotel which is situated in a densely populated area or mountainous area and 3.000 sq.m. for a hotel which is situated outside a densely populated area. Every business has at least 25 beds available. Towels and bed linen in rooms are replaced every three days. Additional communal areas are available such as lounge and a closed hall of multiple use (0,25 sq.m/bed, at least 50 sq.m). The spaces not served by air cooling installations during the hot periods of the year, are provided with fans of sufficient capacity. The availability of a swimming pool is optional (80 sq.m).

1 star hotels: The area of the building site is at least 2.000 sq.m. for a hotel which is situated in a densely populated area or mountainous area and 3.000 sq.m. for a hotel which is situated outside a densely populated area. Every business has at least 15 beds available. Towels and bed linen in rooms are replaced every three days. The spaces not served by air cooling installations during the hot periods of the year, are provided with fans of sufficient capacity. The availability of a swimming pool is optional (80 sq.m).

The dimensions of the swimming pool apply to units of up to 240 beds. The dimension of the swimming pools increase depending on the capacity of the hotel by an analogy of 10 sq. m. for every additional 100 beds.

The hotel units recorded in Cyprus consist mainly of 3-star and 4-star hotels, 31% and 24% respectively. The distribution of hotels into their rating categories is presented in Figure 24.

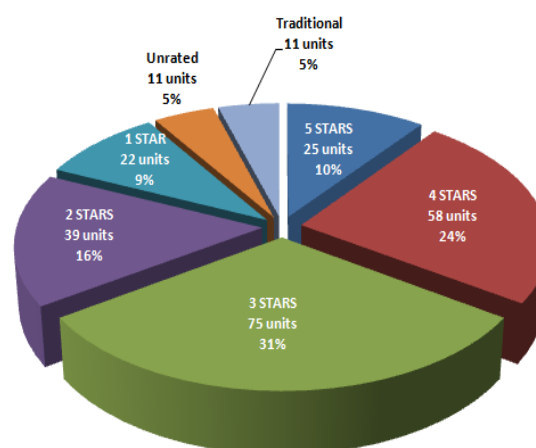


Figure 24: Distribution of hotels recorded in Cyprus according to their rating



The capacity of hotels in beds appears to increase as the rating of the units increases. 1-star hotels are characterized by an average capacity of 46 beds while 5-star hotels have an average capacity of 459 beds. The results in detail are given in Table 19.

Table 19: Number of hotels and beds recorded in Cyprus per rating class

Rating	Number of units	Number of beds			Beds per unit
		minimum	maximum	total	
5 stars	25	194	842	11.472	459
4 stars	58	106	835	21.091	364
3 stars	75	27	802	15.065	201
2 stars	39	28	230	3.218	83
1 star	22	17	118	1.022	46
Unrated	11	2	34	177	16
Traditional	11	10	37	254	23
Total	241	2	842	52.299	217

The characteristics of the hotels recorded concerning the facilities and services offered per rating class are presented in Table 20.

Table 20: Services and facilities offered in hotels recorded in Cyprus per rating class

Hotels	Air conditioned rooms	Centrally heated rooms	Restaurant	Bar	Outdoor swimming pool	Outdoor swimming pool heated	Indoor swimming pool	Sport fields	Water sports	Gardens	Fitness room	Sauna/ jacuzzi	Conference room	Average
5 stars	100%	100%	100%	100%	96%	36%	92%	100%	88%	100%	100%	100%	100%	93%
4 stars	100%	97%	100%	100%	93%	14%	67%	95%	41%	97%	95%	97%	97%	84%
3 stars	100%	96%	96%	97%	85%	11%	28%	68%	16%	85%	59%	67%	64%	67%
2 stars	87%	87%	69%	82%	46%	3%	0%	10%	5%	54%	23%	21%	15%	39%
1 star	95%	77%	77%	64%	0%	0%	0%	5%	0%	41%	5%	9%	14%	30%
Traditional	82%	73%	55%	55%	9%	0%	0%	0%	0%	64%	0%	18%	27%	29%
Unrated	91%	82%	73%	45%	27%	0%	0%	0%	0%	64%	0%	36%	0%	32%
Total	96%	92%	88%	88%	70%	11%	34%	56%	25%	78%	56%	61%	59%	63%

4.2.1.2 Hotel apartments

Hotel apartments consist of a single building or buildings constituting a centralised whole in a centralised space, with furnished flats of at least two rooms and limited public and ancillary spaces, offering to their customers, temporary sleeping accommodation services of a limited nature (a concierge, reception, cleanliness). Hotel apartments according to their value and structural quality, the amenities provided and the services rendered, as well as the adequacy of



their functional organization, are distinguished into luxury, first, second and third class. In addition, there are some hotel apartments that are not subject to this rating system which are characterized as traditional buildings. Traditional buildings are establishments housed in a self-contained building or part of a building which is declared to be preserved and are arranged appropriately so as to provide temporary accommodation and possibly food to customers.

The allocation of hotel apartments recorded in Cyprus according to their rating categories is presented in Figure 27.

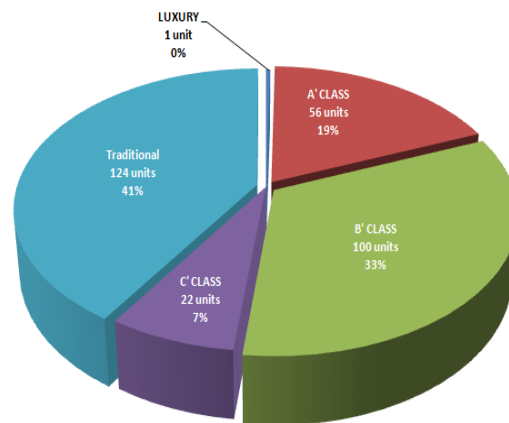


Figure 25: Distribution of hotel apartments recorded in Cyprus according to their rating

According to the Hotels and Tourist Establishments (Organised Apartments and Tourist Villages) Regulations 1993 and 2000, every hotel apartment offers – inter alia – entrance lobby, reception hall, lounge, reading and television room, gardens and areas of green. Units with a capacity beyond 50 apartments also offer multiple use room of a size 50 sq.m minimum. Every apartment has at least the following spaces: (a) one or at the maximum three bedrooms, (b) a sitting and dining space, (c) a kitchen, (d) a private bathroom or shower with sanitary installations. The building site occupies an area of at least 2000 sq.m when it is situated in a built-up area and 3000 sq.m when situated outside a built-up area. Additional requirements for each class are the following:

Luxury: The dimension analogies of the sides of the building sites are not less than 1:2 while the buildings do not cover beyond 25% of the area of the building site in which they are built (unless stricter percentage is provided under the town planning zones). Every business has at least 40 apartments available. The linen of every apartment is replaced with clean ones every two days. Air cooling installations to all apartments and places of common use are indispensable (unless the unit is operating in mountain areas). The provision of at least one tennis court and another athletic hall (indoor or outdoor) is compulsory (optional if situated in built-up areas). The availability of a swimming pool (at least 120 sq.m) which is heated with a temperature during winter months must be at least 20 degrees Celsius is compulsory.

A' Class: The dimension analogies of the sides of the building sites are not less than 1:3 while the buildings do not cover beyond 30% of the area of the building site in which they are built (unless stricter percentage is provided under the town planning zones). Every business has at least 30



apartments available. The linen of every apartment is replaced with clean ones every two days. Air cooling installations to all apartments and places of common use are indispensable (unless the unit is operating in mountain areas). The provision of at least one tennis court and another athletic hall (indoor or outdoor) is compulsory (optional if situated in built-up areas). The availability of a swimming pool (at least 100 sq.m) which is heated with a temperature during winter months must be at least 20 degrees Celsius is compulsory.

B' Class: The dimension analogies of the sides of the building sites are not less than 1:3,5 while the buildings do not cover beyond 35% of the area of the building site in which they are built (unless stricter percentage is provided under the town planning zones). Every business has at least 20 apartments available. The linen of every apartment is replaced with clean ones every three days. The parts not served by means of air conditioning installations are provided with fans of sufficient capacity during the hot periods of the year. The provision of one tennis court for businesses with a capacity of over thirty apartments is compulsory (optional if situated in built-up areas). The availability of a swimming pool (at least 80 sq.m) is compulsory.

C' Class: The linen of every apartment is replaced with clean ones once a week.

The dimensions of the swimming pools apply to units with a capacity of 200 beds. These are increased 10sq.m for every additional 100 beds. Average capacity of hotel apartments appears to decrease from 161 beds per unit in A' Class hotel apartments to 52 beds per unit in C' Class hotel apartments. However, traditional houses that consist 41% of the hotel apartments usually have a smaller capacity of approximately 8 beds per unit. The results in detail are given in Table 21.

Table 21: Number of hotel apartments and beds recorded in Cyprus per rating class

Rating	Number of units	Number of beds			Beds per unit
		minimum	maximum	total	
Luxury	1	114	114	114	114
A' Class	56	42	696	8.996	161
B' Class	100	20	288	7.642	76
C' Class	22	14	94	1.152	52
Traditional	124	2	26	968	8
Total	303	2	696	18.872	62

The characteristics of the hotel apartments recorded as regards the facilities and services offered per rating class are presented in Table 22.



Table 22: Services and facilities offered in hotel apartments recorded in Cyprus per rating class

Hotel apartments	Air conditioned rooms	Centrally heated rooms	Restaurant	Bar	Outdoor swimming pool	Outdoor swimming pool heated	Indoor swimming pool	Sport fields	Water sports	Gardens	Fitness room	Sauna/jacuzzi	Conference room	Average
Luxury	100%	100%	100%	100%	100%	0%	100%	100%	0%	100%	100%	100%	100%	85%
A' Class	100%	71%	63%	95%	96%	7%	11%	64%	14%	91%	48%	59%	25%	57%
B' Class	99%	57%	36%	81%	83%	2%	0%	20%	7%	72%	9%	17%	4%	37%
C' Class	95%	68%	23%	68%	55%	0%	0%	5%	0%	45%	0%	5%	0%	28%
Traditional	81%	70%	11%	7%	33%	1%	1%	0%	1%	63%	1%	13%	3%	22%
Total	92%	66%	30%	52%	63%	2%	3%	19%	5%	70%	13%	22%	8%	34%

4.2.1.3 Tourist villages

Tourist villages are premises consisting of a number of small ground-floor or two-floor houses, of permanent construction, constituting a centralised whole in a centralised space, having the necessary public and ancillary spaces, shops supplying the guests with food and other goods of daily use and consumption, free spaces and yards as well as athletic grounds, which are offered for temporary residence. According to their value and structural quality, the amenities provided and the services rendered, as well as the adequacy of their functional organisation, are distinguished into luxury, first and second class. Tourist villages of first and second class are considered as hotel apartments of first and second class, respectively.

According to the Hotels and Tourist Establishments (Organised Apartments and Tourist Villages) Regulations 1993 and 2000 tourist villages, irrespective of class, are provided with at least 30 apartments, additional athletic spaces (indoor and outdoor), kids playground and a central square, where shops, workshops, recreation clubs are concentrated, as well as the remaining public spaces of the business. The minimum area of the building, irrespective of class and size of the business, is at least 15.000sq.m.

All but one of the tourist villages recorded in Cyprus are rated as A' Class and are characterized of big capacity (334 beds/unit). The B' Class tourist village has a capacity of 128 beds. The results in detail are given in Table 23.

Table 23: Number of tourist villages and beds recorded in Cyprus per rating class

Rating	Number of units	Number of beds			Beds per unit
		minimum	maximum	total	
A' Class	21	144	534	7.018	334
B' Class	1	128	128	128	128



Total	22	128	534	7.146	325
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The characteristics of the tourist villages recorded as regards the facilities and services offered per rating class are presented in Table 24.

Table 24: Services and facilities offered in the tourist villages recorded in Cyprus per rating class

Tourist villages	Air conditioned rooms	Centrally heated rooms	Restaurant	Bar	Outdoor swimming pool	Outdoor swimming pool heated	Indoor swimming pool	Sport fields	Water sports	Gardens	Fitness room	Sauna/ jacuzzi	Conference room	Average
A' Class	100%	86%	100%	90%	90%	14%	86%	100%	24%	100%	95%	95%	86%	82%
B' Class	100%	100%	100%	100%	100%	0%	0%	100%	0%	100%	0%	0%	0%	54%
Total	100%	86%	100%	91%	91%	14%	82%	100%	23%	100%	91%	91%	82%	81%

4.2.1.4 Tourist villas

Tourist villas are a group of at least two self-contained residences forming a comprehensive entity in a single space. These are situated outside a densely built-up area or on its outskirts, in seaside locations or other summer resorts. According to their value and structural quality, the amenities provided and the services rendered, as well as the adequacy of their functional organisation, are distinguished into luxury, first and second class.

According to the Hotels and Tourist Establishments (Complex of Tourist Villas) Regulations 1993, the minimum area of the building site of the tourist villas, irrespective of class of the business, is 5000sq.m. At least 25% percent of the total area of the building site is arranged into a garden or green area. The existence of at least one tennis court is compulsory. Every business has at least five villas. As regards heating during the cold months of the year, in the case of a business not suspending its operation during the winter months, this is provided either by means of an air conditioning system or by means of a central heating system.

Luxury: The minimum total surface area of the floor of every tourist villa is 150 sq.m. Bed linen is replaced with clean ones every two days. Air-cooling installations are indispensable, with the exception of those operating in mountain regions. The availability of a swimming pool is compulsory (at least 75sq.m).

A' Class: The minimum total surface area of the floor of every tourist villa is 120 sq.m. Bed linen is replaced with clean ones every two days. Air-cooling installations are indispensable for luxury and first class businesses, with the exception of those operating in mountain regions. The availability of a swimming pool is compulsory (at least 75sq.m)

B' Class: The minimum total surface area of the floor of every tourist villa is 100 sq.m. Bed linen is replaced with clean ones every three days.



At most cases, tourist villas recorded in Cyprus have a capacity of approximately 10 beds/unit irrespective of the rating class (Table 25).

Table 25: Number of tourist villas and beds recorded in Cyprus per rating class

Rating	Number of units	Number of beds			Beds per unit
		minimum	maximum	total	
Luxury	13	6	8	90	7
A' Class	10	6	30	94	9
B' Class	113	4	132	1.176	10
Total	136	4	132	1.360	10

The characteristics of the tourist villas recorded as regards the facilities and services offered per rating class are presented in Table 26.

Table 26: Services and facilities offered in tourist villas recorded in Cyprus per rating class

Tourist villas	Air conditioned rooms	Centrally heated rooms	Restaurant	Bar	Outdoor swimming pool	Outdoor swimming pool heated	Indoor swimming pool	Sport fields	Water sports	Gardens	Fitness room	Sauna/ jacuzzi	Conference room	Average
Luxury	92%	85%	0%	0%	92%	0%	0%	0%	0%	92%	0%	23%	0%	30%
A' Class	100%	80%	10%	10%	90%	10%	0%	10%	0%	100%	10%	30%	10%	35%
B' Class	75%	50%	1%	1%	66%	3%	0%	4%	0%	76%	1%	7%	0%	22%
Total	79%	55%	1%	1%	71%	3%	0%	4%	0%	79%	1%	10%	1%	24%

4.2.1.5 Tourist apartments

Tourist apartments are a group consisting of at least five apartments in a building of multiple ownership. The characteristics of the tourist villas recorded as regards the facilities and services offered per rating class are presented in Table 27.

Table 27: Services and facilities offered in tourist apartments recorded in Cyprus per rating class

Tourist apartments	Air conditioned rooms	Centrally heated rooms	Restaurant	Bar	Outdoor swimming pool	Outdoor swimming pool heated	Indoor swimming pool	Sport fields	Water sports	Gardens	Fitness room	Sauna/ jacuzzi	Conference room	Average
Total	86%	36%	3%	17%	22%	0%	0%	1%	1%	38%	0%	0%	0%	16%



4.2.2 Accommodation units in North Aegean, Greece

The accommodation units in Greece are categorized into two main types, hotels and apartments. Hotels are subdivided into standard hotels, motels, furnished apartments and mixed type hotels and furnished apartments (studios/suites/bungalows). Apartments include all kinds of rooms to let, furnished apartments, as well as furnished houses and mansions, as tourist accommodation. However, the accommodation units listed in the databases used are categorized into the two main types. In specific, 82% of the units recorded are hotels and 18% are apartments.

4.2.2.1 Hotels

According to the Presidential Decree 43/2002 “Classification of principal hotel accommodations in categories according to a star system and technical standards there of”, hotels or hotel units are sub-divided into (a) standard hotels, (b) motels, (c) furnished apartments type hotels and (d) mixed type hotels binding standard hotels and furnished apartments. Hotels are classified by means of a star rating system from 1 to 5 stars. A hotel is classified in one of the classes if (i) it satisfies specific mandatory technical requirements prescribed for that class and (ii) concentrates a number of credits from a set of optional scaled criteria prescribed for that class (type of swimming pool -outdoor heated, indoor, private-, additional equipment of rooms, dimensions of facilities, sport fields, energy and environmental management certificates, full renovation of building and equipment). Hotels ranked in the 1-star category come from the conversion of existent buildings and not newly erected buildings

(a) Standard hotels include public areas such as reception, lobby, dining halls, recreation rooms and at least 10 rooms with private bathrooms and auxiliary areas.

(b) Motel type hotels are located on high circulation motorways and include public areas such as reception, lobby, dining halls, recreation rooms, extended parking areas and at least 10 rooms with private bathrooms and auxiliary spaces. They are ranked into the 3 star or the 4 star category.

(c) Furnished apartments type hotels include communal areas (reception, lobby), auxiliary areas and apartments of one, two or more main rooms with full bathroom and small kitchen.

(d) Standard hotel and furnished apartments mixed type hotels include communal areas such as reception, lobby, dining halls, recreation rooms, stores, auxiliary areas as well as overnight stay in rooms with bathroom or apartments of one, two or more main areas with full bathroom and small kitchen. They are ranked into the 4 or 5 star category and have a minimum capacity of 300 beds.

Every hotel in Greece and subsequently in the Region of North Aegean offers - inter alia - communal areas such as lobby and reception. The following additional mandatory requirements are prescribed for each class:

5 star hotels: Lounge, bar, television room, multiple use room of a size at least 200 sq.m, dining room at least 70sq.m, cooling installations to all reception areas and dining rooms and to 100% of the rooms, fitness room for at least 6 exercise machines, sauna, swimming pool at least 100sq.m



for a capacity up to 100 beds, 150sq.m for a capacity between 100-300 beds and 200sq.m for a capacity beyond 300 beds, tennis court (provided that the total area of the building site is beyond 10.000 sq.m).

4 star hotels: Lounge, bar, television room, multiple use room of a size at least 200 sq.m, dining room (at least 50sq.m), cooling installations to all reception areas and dining rooms and to 100% of the rooms, swimming pool (200 sq.m), fitness room for at least 6 exercise machines and sauna for hotels with a capacity beyond 300 beds, tennis court (provided that the total area of the building site is beyond 10.000 sq.m).

3 star hotels: (max 200 beds): Lounge, bar, television room.

2 star hotels: (max 100 beds): Lounge, bar, television room.

In addition, the requirements in electricity and water supply per person for the different hotel rating classes as set by the Greek National Tourism Organization are given in Table 28.

Table 28: Requirements in electricity and water supply for the different hotel rating classes in Greece

Capacity \ Rating	Daily electricity supply (KW/person)							Daily water supply (lt/person)
	<50 beds	51-100 beds	101-200 beds	201-300 beds	301-400 beds	401-500 beds	>501 beds	
5 stars	2,8	2,5	2	1,75	1,5	1,4	1,25	450
4 stars	2	1,5	1,3	1,1	0,85	0,77	0,75	350
3 stars	1,7	1,0	0,85					300
2 stars	0,80	0,75						250

The hotels recorded in RNA are mainly 2-star hotels (48%) and 3-star hotels (31%). The distribution of hotels according to their rating categories is presented in Figure 26.

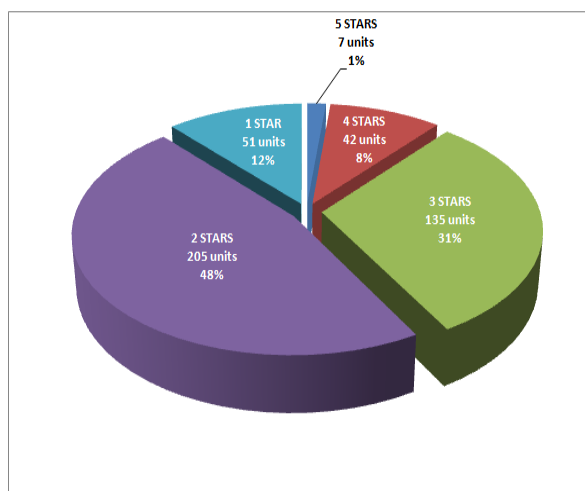


Figure 26: Distribution of hotels recorded in RNA according to their rating class



The capacity of hotels in beds appears to increase as the rating of the units increases. 1-star hotels are characterized by an average capacity of 27 beds while 5-star hotels have an average capacity of 252 beds. The results in detail are given in Table 29.

Table 29: Number of hotels and beds recorded in RNA per rating category

Rating	Number of units	Number of beds			Beds per unit
		minimum	maximum	total	
5 stars	7	33	599	1.762	252
4 stars	42	9	266	3.474	83
3 stars	135	5	243	8.604	64
2 stars	205	8	200	9.053	44
1 star	51	8	71	1.367	27
Total	440	5	599	24.260	55

The characteristics of the hotels recorded as regards the facilities and services offered per rating class are presented in Table 30.

Table 30: Services and facilities offered in hotels recorded in the RNA per rating class

Hotels	Air conditioned rooms	Restaurant	Bar	Swimming pool	Sport fields	Water sports	Fitness room	Sauna/ jacuzzi	SPA	Conference room	Average
5 stars	100%	100%	100%	100%	71%	57%	43%	43%	57%	100%	79%
4 stars	93%	57%	79%	64%	31%	7%	12%	12%	10%	26%	42%
3 stars	93%	63%	81%	59%	20%	1%	4%	6%	1%	17%	38%
2 stars	82%	24%	52%	26%	8%	0%	0%	0%	0%	4%	22%
1 star	61%	14%	25%	6%	2%	0%	0%	2%	0%	0%	12%
Total	84%	39%	61%	39%	14%	2%	3%	4%	2%	11%	29%

4.2.2.2 Apartments

According to the Presidential Decree 337/2000 "Classification of rooms and apartments to let in class by the system of keys" rooms to let have a capacity of up to 10 rooms (15 rooms for units erected before 28/9/1999), furnished apartments and mixed type rooms and apartments have a capacity of up to 20 rooms. This type of accommodation is classified by means of a key rating system from 1 to 4 keys. They are classified in one of the classes depending on (i) the class-specific mandatory technical requirements they satisfy and (ii) the number of credits they concentrate from a set of optional scaled criteria prescribed for that class. Minimum mandatory equipment and services requirements include inter alia 24 hour cold and hot water supply, heating during winter to all areas, room dimensions, frequency of linen replacement while scaled



criteria include air cooling installations, additional communal areas such as reception, bar, living room, gardens, swimming pool, sport fields, laundry, additional room equipment etc.

The allocation of apartments recorded in the RNA according to their rating categories is presented in Figure 27.

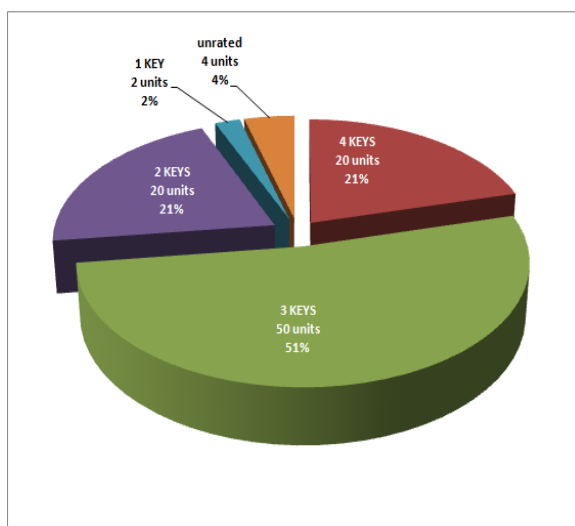


Figure 27: Distribution of apartments recorded in RNA according to their rating class

The capacity of apartments in terms of beds appears to vary from 15 to 25 beds irrespective of the rating. The results in detail are given in Table 31.

Table 31: Number of apartments and beds in RNA per rating category

Rating	Number of units	Number of beds			Beds per unit
		minimum	maximum	total	
4 Keys	20	12	44	489	24
3 Keys	50	5	60	1.016	20
2 Keys	20	10	55	507	25
1 Key	2	11	16	27	14
Unrated	4	20	28	98	25
Total	96	5	60	2.137	22

The characteristics of the hotels recorded as regards the facilities and services offered per rating class are presented in Table 32.



Table 32: Services and facilities offered in apartments recorded in the RNA per rating class

Apartments	Air conditioned rooms	Restaurant	Bar	Swimming pool	Sport fields	Water sports	Fitness room	Sauna/ jacuzzi	SPA	Conference room	Average
4 Keys	80%	5%	20%	20%	10%	0%	0%	0%	0%	0%	15%
3 Keys	68%	8%	18%	18%	2%	0%	0%	0%	0%	0%	13%
2 Keys	65%	10%	20%	15%	0%	0%	5%	0%	0%	0%	13%
1 Key	0%	50%	0%	0%	0%	0%	0%	0%	0%	0%	6%
Unrated	100%	0%	25%	25%	0%	0%	0%	0%	0%	0%	17%
Total	70%	8%	19%	18%	3%	0%	1%	0%	0%	0%	13%



4.3 Determination of the CARBONTOUR classification system

Initial screening of the accommodation units recorded was carried out with the use of one single criterion. All accommodation units with a capacity of less than 10 beds were eliminated, as those are not characterized by significant consumptions in energy, water or substantial amounts of waste generated. The initial criterion was met by 1.117 units, and as a result the list was narrowed by 330 units (1347 units in total). The units that met this criterion were passed through the second stage screening for further evaluation. Second stage screening was conducted by means of six basic criteria which consist of selected basic services and facilities offered by the accommodation units according to the type of the accommodation and the rating class. They are related mainly with the following three sectors: (i) energy consumption, (ii) water consumption and (iii) waste and wastewater generation. The criteria in detail are presented below with specific mention in the respective columns of the “CARBONTOUR accommodation units’ database” (excel sheet “units in RNA, Cyprus”) where further information for each unit can be found:

Basic Criterion 1: Air conditioned rooms (Column I) This characteristic was selected as a basic criterion as it is related to one of the main parameters of energy consumption of the accommodation units, especially those operating during the hot months of the year.

Basic Criterion 2: Outdoor swimming pool (Column N) Swimming pool was selected as a basic criterion as it requires substantial quantities of water supply for its operation, especially during the summer season.

Basic Criterion 3: Bar (Column L) This characteristic contributes to a lesser extent to the energy and water consumption as well as to the generation of waste (e.g. glass, paper, metal) of an accommodation unit.

Basic Criterion 4: Restaurant (Column K) This characteristic was selected as it constitutes the main source of waste generation (e.g. biodegradable, glass, paper, metal) of an accommodation unit. Furthermore, it contributes to the unit’s energy and water consumption.

Basic Criterion 5: Sport fields (Column Q) This characteristic was selected considering that according to their nature may require large quantities of water (golf) or electricity supply for lighting during night.

Basic Criterion 6: Sauna/jacuzzi (Column U) Sauna and jacuzzi facilities are characterized by substantial energy demand as they require the supply of heat for their operation.

In addition, a set of seven optional criteria was set which refers either to characteristics that are met by a few accommodation units and thus not constitute basic criteria, or to information that was not available in both Greek and Cypriot databases. The aforementioned criteria are presented below:

Optional Criterion 1: Centrally heated rooms (Column J) This characteristic was selected as a basic criterion as it is related to one of the main parameters of energy consumption of the



accommodation units, especially those operating during the cold months of the year. This characteristic was set as optional criterion given that it was available only for the case of Cyprus.

Optional Criterion 2: Conference room (Column W) This criterion was selected as these rooms are usually of big dimensions where a variety of events are organized and subsequently require extra energy supply. This characteristic was set as optional criterion in order to be applied in conjunction with optional criterion 2 (fitness room).

Optional Criterion 3: Fitness room (Column T) This characteristic was selected considering that fitness rooms require energy for the operation of the exercise machines as well as the ventilation of the room. It was set as optional criterion in order to be applied in conjunction with optional criterion 3 (conference room).

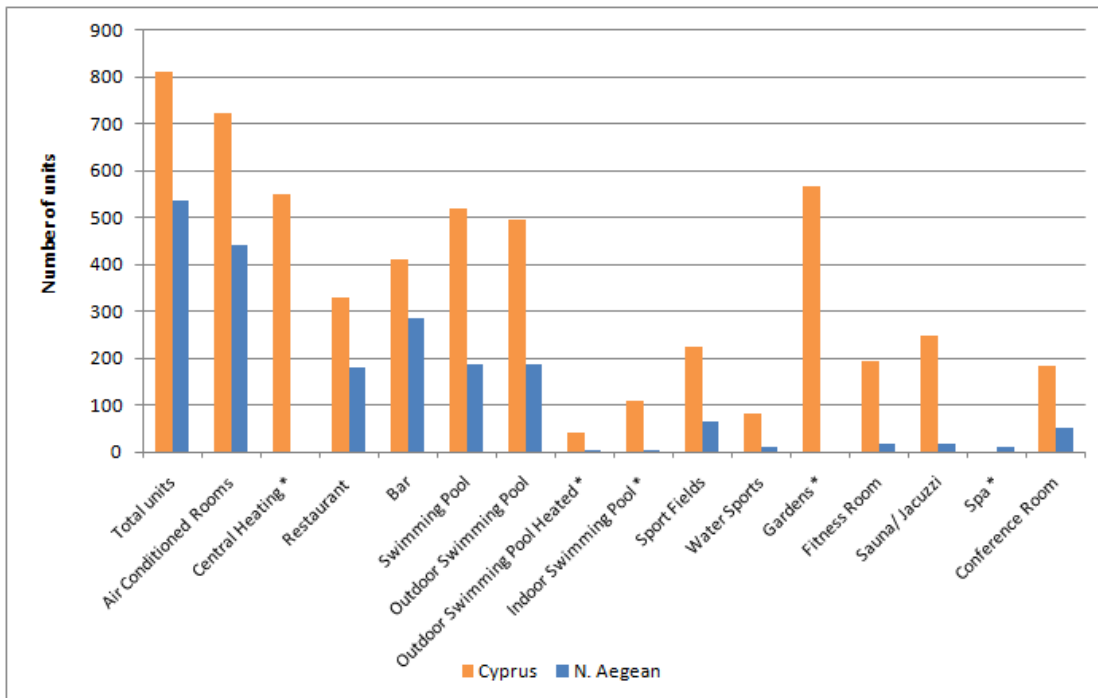
Optional Criterion 4: Water sports (Column R) This characteristic refers to a variety of water sports that depending on the type of sport is categorized as energy consuming (e.g. jet skiing) or non-energy consuming (e.g. wind surfing).

Optional Criterion 5 Outdoor heated swimming pool (Column O) This characteristic was selected considering that this kind of swimming pool is characterized by significant consumption in energy, especially during periods with low temperatures. It was set as an optional criterion as this kind of information was not available for most of the cases in the Greek databases used.

Optional Criterion 6: Indoor swimming pool (Column P) This characteristic was selected although not specified whether it is heated or not as it contributes to the water consumption of the unit and possibly to energy consumption (if it is heated). It was set as an optional criterion as this kind of information was not available for most of the cases in the Greek databases used. It is applied in conjunction with optional criterion 4.

Optional Criterion 7: SPA (Column V) This characteristic refers to a variety of services and facilities offered by wellness center that depending on the type of the facility/service is categorized as energy consuming (e.g. solarium) or non-energy consuming (e.g. massage). This characteristic was available only in the Greek databases.

Each of these criteria was applied sequentially in order to categorize the eligible accommodation units. The criteria were grouped by taking into consideration the number of units that have this particular characteristic (Figure 28) and, at the same time, the correlation of the characteristics with the sectors examined.



* This information was available only for one of the examined areas

Figure 28: Number of units that have selected facilities and services

The groups were formulated as follows:

First group: This group consists of those accommodation units that meet **only** basic criterion 1 (air conditioned rooms) and optional criterion 1 (central heated rooms).

Second group: This group consists of those accommodation units that meet, in addition to the criteria required for the previous group, criterion 2 (outdoor swimming pool) and 3 (bar).

Third group: This group consists of those accommodation units that meet, in addition to the criteria required for the previous group, criterion 4 (restaurant).

Fourth group: This group consists of those accommodation units that meet, in addition to the criteria required for the previous group, criterion 5 (sport fields) and optional criterion 2 (conference room) and/or optional criterion 3 (fitness room) and/or optional criterion 4 (watersports).

Fifth group: This group consists of those accommodation units that meet, in addition to the criteria required for the previous group, criterion 9 (sauna/Jacuzzi) and optional criterion 5 (outdoor swimming pool heated) and/or optional criterion 6 (indoor swimming pool) and/or optional criterion 7 (SPA).

The classification system followed for the categorization of the accommodation units into groups is also presented in Table 33.



Table 33: CARBONTOUR classification system of the accommodation units

Facilities/services	1st group	2nd group	3rd group	4th group	5th group
Basic criterion: Air conditioned rooms Optional criterion: Central heated rooms	X	X	X	X	X
Basic criteria: Outdoor swimming pool (not heated) and Bar		X	X	X	X
Basic criterion: Restaurant			X	X	X
Basic criterion: Sport fields Optional criteria: Conference room and/or fitness room, Water sports				X	X
Basic criterion: Sauna/Jacuzzi Optional criteria: Outdoor heated swimming pool, Indoor swimming pool, SPA					X

The accommodation units that met the set of criteria set above comprise the eligible accommodation units for participating in the large scale application of the carbon footprint evaluation software that will take place during Action 4 of the project. The total number of the eligible units accounts to 616 (353 units in Cyprus, 263 units in RNA). This number is 7,7 times bigger than the target number of the selected units (80), considering that a reserved list must be available in case some accommodation units do not wish to participate. The synthesis of the groups as far as the type of accommodation units and their rating classes is concerned, is presented in Table 34.

The outcome of the classification showed an ascending trend in the rating classes of the accommodation units (star, class, keys) from the 1st group to the 5th group.



Table 34: Synthesis of the five groups of eligible accommodation units

	1st group	2nd group	3rd group	4th group	5th group	Total
Number of units in Cyprus	91	55	36	23	148	353
Tourist villas	2	0	0	0	0	2
b' class	2	0	0	0	0	2
a' class	0	0	0	0	0	0
Luxury	0	0	0	0	0	0
Tourist apartments	58	11	0	1	0	70
Hotel apartments	25	41	27	8	21	122
traditional	12	0	2	0	0	14
c' class	4	7	3	0	0	14
b' class	9	31	16	3	3	62
a' class	0	3	6	5	17	31
Luxury	0	0	0	0	1	1
Tourist villages	0	0	0	1	17	18
b' class	0	0	0	1	0	1
a' class	0	0	0	0	17	17
Hotels	6	3	9	13	109	140
traditional	2	0	0	0	0	2
without star	2	0	0	0	0	2
1 star	1	0	1	0	0	3
2 stars	1	2	5	2	1	11
3 stars	0	1	3	11	34	49
4 stars	0	0	0	0	50	50
5 stars	0	0	0	0	24	24
Number of units in North Aegean	124	33	60	35	11	263
Apartments	37	6	5	0	0	48
0 keys	3	1	0	0	0	4
1 key	0	0	0	0	0	0
2 keys	7	2	1	0	0	10
3 keys	18	2	3	0	0	23
4 keys	9	1	1	0	0	11
Hotels	87	27	55	35	11	215
1 star	17	1	0	0	1	19
2 stars	54	15	16	9	0	94
3 stars	13	8	33	18	4	76
4 stars	3	3	6	6	4	22
5 stars	0	0	0	2	2	4



	1st group	2nd group	3rd group	4th group	5th group	Total
Number of units in Cyprus	91	55	36	23	148	353
Total	215	88	96	58	159	616

4.4 Selection of eligible accommodation units in North Aegean and Cyprus

The methodology followed for the selection of eight (8) units from the region of North Aegean and eight (8) from Cyprus from the five groups formed has elaborated based on the following steps:

Step 1: Selection of the units that meet the optional criteria set for each group. In this stage optional criteria play the role of basic criteria. If the number of units that meet the criteria is less in relation to the required number then the remaining units follow the procedure described in Step 2. If the number of units that meet the criteria is bigger than the required number, then all units pass through Step 2 of the selection procedure. If the number of units that meet the criteria is equal to the required number the synthesis of the group is completed.

Step 2: Selection of all accommodation types available for that type of group.

Step 3: Selection of at least one unit of every rating class of the accommodation types. If the number of rating classes available is bigger in relation to the required number, then more units from each rating class are selected proportionally. In this case the group synthesis has been completed. If the number of rating classes available is less in relation to the required number of units, then the procedure is continuing in Step 4.

Step 4: Selection from each rating class of the accommodation units with a capacity equal to the average capacity of the rating class.

The selection was also based on additional characteristics such as environmental certification standards (ISO 14001, Green Key) that the units may have obtained, period of operation and location, in order for a greater variety and representativeness of the selected sample to be achieved.

The selected accommodation units from North Aegean and Cyprus for each of the five groups are presented in Tables 35-39.



Table 35: Synthesis of the first group of the selected accommodation units

No	Region	Cyprus District/ N.Aegean Island	Municipality	Name	Type Of Accommodation	Rating	Number Of Beds
First Group							
1	Cyprus	Famagusta	Agia Napa	Mike's	Hotel Apartments	B'	40
2	Cyprus	Famagusta	Agia Napa	Agrino	Hotel Apartments	C'	46
3	Cyprus	Larnaca	Pano Lefkara	Aunt Maria's	Hotel Apartments	T.H.	12
4	Cyprus	Nicosia	Aglantzia	Denis	Hotels	1 Star	51
5	Cyprus	Larnaca	Larnaka	Easy Hotel	Hotels	2 Stars	107
6	Cyprus	Larnaca	Tochni	Socrate's House	Hotels	T.H.	18
7	Cyprus	Famagusta	Agia Napa	Koutsou	Tourist Apartments	N/A	48
8	Cyprus	Famagusta	Agia Napa	Panas Annex	Tourist Villas	B'	52
9	N. Aegean	Limnos	Limnos	Petradi Studios	Apartments	0 Keys	24
10	N. Aegean	Chios	Komi	Fakiri Petroula Apartments	Apartments	2 Keys	18
11	N. Aegean	Samos	Agios Konstantinos	Christina Apartments	Apartments	3 Keys	22
12	N. Aegean	Chios	Volissos	Aigiali Studios	Apartments	4 Keys	26
13	N. Aegean	Chios	Chios (Poli)	Filokseneia	Hotels	1 Star	27
14	N. Aegean	Lesvos	Neapoli	Akti Neapolis	Hotels	2 Stars	28
15	N. Aegean	Limnos	Moudros	Aithaleia	Hotels	3 Stars	22
16	N. Aegean	Chios	Volissos	Lithos	Hotels	4 Stars	15



Table 36: Synthesis of the second group of the selected accommodation units

No	Region	Cyprus District/ N.Aegean Island	Municipality	Name	Type Of Accommodation	Rating	Number Of Beds
Second Group							
17	Cyprus	Pafos	Neon Chorion	Andreas Tavros	Hotel Apartments	A'	60
18	Cyprus	Pafos	Polis	Bougenvilea	Hotel Apartments	B'	56
19	Cyprus	Famagusta	Agia Napa	Florence	Hotel Apartments	B'	20
20	Cyprus	Famagusta	Agia Napa	Takkas	Hotel Apartments	B'	112
21	Cyprus	Famagusta	Paralimni	Pola Costa	Hotel Apartments	C'	60
22	Cyprus	Famagusta	Agia Napa	Kalypso	Hotels	2 Stars	230
23	Cyprus	Limassol	Lemessos	Kapetanios	Hotels	3 Stars	102
24	Cyprus	Famagusta	Agia Napa	Alonia	Tourist Apartments	N/A	52
25	N. Aegean	Lesvos	Plomari	Sea Sun Apartments	Apartments	0 Keys	28
26	N. Aegean	Lesvos	Eresos	Eleftheria Studio/Apartments	Apartments	2 Keys	46
27	N. Aegean	Samos	Kamos	Chris Apartments	Apartments	3 Keys	48
28	N. Aegean	Lesvos	Gera	Aeolis Luxury Apartments	Apartments	4 Keys	16
29	N. Aegean	Samos	Pithagorio	Ebelin	Hotels	1 Star	71
30	N. Aegean	Samos	Samos (Poli)	Matina	Hotels	2 Stars	49
31	N. Aegean	Chios	Chios (Poli)	Emporios Bay Hotel	Hotels	3 Stars	48
32	N. Aegean	Samos	Marathokampos	Kyma	Hotels	4 Stars	30



Table 37: Synthesis of the third group of the selected accommodation units

No	Region	Cyprus District/ N.Aegean Island	Municipality	Name	Type Of Accommodation	Rating	Number Of Beds
Third Group							
33	Cyprus	Famagusta	Protaras	Melini	Hotel Apartments	A'	98
34	Cyprus	Famagusta	Paralimni	Astreas	Hotel Apartments	B'	86
35	Cyprus	Famagusta	Agia Napa	Eleana	Hotel Apartments	B'	42
36	Cyprus	Limassol	Germasogias	Estella	Hotel Apartments	C'	72
37	Cyprus	Pafos	Nikoklia	Vasilias Nikoklis Inn	Hotel Apartments	T.H.	16
38	Cyprus	Famagusta	Agia Napa	L'eros	Hotels	1 Star	45
39	Cyprus	Famagusta	Agia Napa	Karas	Hotels	2 Stars	84
40	Cyprus	Famagusta	Agia Napa	Nissi Park	Hotels	3 Stars	152
41	N. Aegean	Lesvos	Neapoli	Dolphin Apartments	Apartments	2 Keys	32
42	N. Aegean	Lesvos	Mithimna	Gorgona	Apartments	3 Keys	44
43	N. Aegean	Lesvos	Vatera	Pouloudia Villa	Apartments	4 Keys	30
44	N. Aegean	Lesvos	Agios Isidoros	Akti Botsala	Hotels	2 Stars	112
45	N. Aegean	Ikaria	Armenistis	Daidalos	Hotels	2 Stars	50
46	N. Aegean	Samos	Kalami	Ino	Hotels	3 Stars	105
47	N. Aegean	Samos	Kokkari	Ormos Armonia	Hotels	3 Stars	45
48	N. Aegean	Samos	Kalami	Ionia Maris Hotel	Hotels	4 Stars	90



Table 38: Synthesis of the fourth group of the selected accommodation units

No	Region	Cyprus District/ N.Aegean Island	Municipality	Name	Type Of Accommodation	Rating	Number Of Beds
Fourth Group							
49	Cyprus	Famagusta	Paralimni	Ausonia	Hotel Apartments	A'	100
50	Cyprus	Famagusta	Paralimni	Elamaris	Hotel Apartments	A'	320
51	Cyprus	Limassol	Germasogias	Azur	Hotels	3 Stars	183
52	Cyprus	Famagusta	Paralimni	Cavo Maris Beach	Hotels	3 Stars	403
53	Cyprus	Larnaca	Pervolia	Faros Holiday Village	Hotels	3 Stars	250
54	Cyprus	Limassol	Agios Tychonas	Golden Arches	Hotels	3 Stars	209
55	Cyprus	Nicosia	Kakopetria	Makris	Hotels	3 Stars	99
56	Cyprus	Famagusta	Agia Napa	Marina	Hotels	3 Stars	192
57	N. Aegean	Samos	Pithagorio	Prigkipissa - Prinsesa	Hotels	2 Stars	120
58	N. Aegean	Chios	Vrontados	Aipos	Hotels	3 Stars	98
59	N. Aegean	Lesvos	Mithimna	Ilioxarama	Hotels	3 Stars	152
60	N. Aegean	Lesvos	Mytilini	Silver Bay - Asimenios Kolpos	Hotels	3 Stars	150
61	N. Aegean	Samos	Karlovasi	Samaina Inn	Hotels	4 Stars	236
62	N. Aegean	Chios	Karfas	Chrisi Ammos	Hotels	4 Stars	198
63	N. Aegean	Limnos	Mirina	Akti Myrina Hotel	Hotels	5 Stars	259
64	N. Aegean	Limnos	Limnos	Lemnos Village Resort Hotel	Hotels	5 Stars	268



Table 39: Synthesis of the fifth group of the selected accommodation units

No	Region	Cyprus District/ N.Aegean Island	Municipality	Name	Type Of Accommodation	Rating	Number Of Beds
Fifth Group							
65	Cyprus	Famagusta	Agia Napa	Sunwing Sandy Bay Village	Hotel Apartments	A'	696
66	Cyprus	Pafos	Pafos	Athena Beach	Hotels	4 Stars	835
67	Cyprus	Limassol	Agios Tychonas	Atlantica Bay	Hotels	4 Stars	402
68	Cyprus	Limassol	Agios Tychonas	Amathus Beach	Hotels	5 Stars	488
69	Cyprus	Nicosia	Lefkosia	Hilton Cyprus	Hotels	5 Stars	596
70	Cyprus	Limassol	Pirgos	Le Meridien Limassol Spa & Resort	Hotels	5 Stars	678
71	Cyprus	Pafos	Geroskipou	Aliathon	Tourist Villages	A'	516
72	Cyprus	Pafos	Pegeia	Aqua Sol	Tourist Villages	A'	296
73	N. Aegean	Lesvos	Pirgoi Thermis	Lesvos Inn	Hotels	3 Stars	68
74	N. Aegean	Lesvos	Skala Kallonis	Malemi	Hotels	3 Stars	89
75	N. Aegean	Lesvos	Molyvos	Aphrodite Hotel	Hotels	4 Stars	106
76	N. Aegean	Lesvos	Kerami	Aioliki Gi	Hotels	4 Stars	53
77	N. Aegean	Samos	Kokkari	Arion	Hotels	4 Stars	210
78	N. Aegean	Chios	Karfas	Theretro Thea Thalassa	Hotels	4 Stars	58
79	N. Aegean	Samos	Pithagorio	Doryssa Parathalassio Theretro	Hotels	5 Stars	599
80	N. Aegean	Samos	Pithagorio	Proteas	Hotels	5 Stars	209





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