LIFE09 ENV/GR/000297

STRATEGIC PLANNING TOWARDS CARBON NEUTRALITY IN TOURISM ACCOMMODATION SECTOR

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Introduction

Project CARBONTOUR - "Strategic Planning Towards Carbon Neutrality in Tourism Accommodation Sector" is co-funded by the E.C.

Area of implementation: North Aegean, Greece and Cyprus

Duration: 28 Months (September 1, 2010 – December 31, 2012)

Budget: 1.324.139,00 € (50% EC funding)

Partners

Coordinating Beneficiary:

Region of North Aegean (RNA)

Associated Beneficiaries:

National Technical University of Athens (NTUA)

Cyprus Hotel Association (CHA)

Environmental Consultants – Engineers (EPTA)

Aeolian Village Lesvos Greece (AEOVI)

Mayfair Hotel Paphos Cyprus (MAF)

Objectives

Main objectives of CARBONTOUR are:

- **to develop a robust carbon footprint model** to evaluate the CO2 equivalent emissions generated from the operation and maintenance of accommodation facilities.

- **to develop a strategic approach for CO2 offsetting and carbon neutrality** for the tourist accommodation industry, in order to:

  - ✓ provide guidelines for the reduction of tourism contribution to climate change
  - ✓ deliver cost savings, through the reduction of energy, water consumption and waste/wastewater production.

CARBONTOUR Tool (1/4)

CarbontTour Tool is a robust and innovative software tool, which is able to quantify and evaluate the primary energy consumption and CO2 equivalent emissions resulting from the various tourism accommodation activities .

Energy and CO_2 calculations can be very complex and input data demanding. Thus one of the main objectives was **to simplify the whole possess** in a way that the final model could be easily adopted and used. It does not require significant scientific knowledge to operate and maintain the application.

The main challenge was not only to simplify the calculations, but to **maintain an acceptable level of accuracy,** which was achieved by comparing the theoretical results with the ones obtained during audits that were performed.

Sectors: **Energy – Wastewater management – Waste management**

CARBONTOUR Tool (2/4)

A. Energy

A combination of the methodology described in the Greek and Cypriot Regulations for the Energy Efficiency in Buildings and empirical parameters was used in the process.

CARBONTOUR model input parameters were structured on the following categories:

1. Energy Consumption

Heating (including pump for water circulation etc) - Cooling (including pumps etc) – Ventilation - Hot Water Production (including hot water for a Heated Pool) - Artificial Lighting - Electric / Electronic Appliances (including pumps, secondary systems etc) - Road Vehicles - Motorized Water Sports - Water and wastewater treatment (desalination, wastewater treatment plant etc)

2. Energy Production

Photovoltaic system - Wind generators - CHP generators - Solar Water Heater

CARBONTOUR Tool (3/4)

B. Wastewater treatment

The methodology used for the quantification of emission sources from the treatment of wastewater is structured upon the following two basic steps:

- ✓ Determination of the quantity of BOD in wastewater produced. The quantity of BOD is calculated for both the guests and the personnel of the tourist accommodations with the use of a mean value of per capita wastewater production (g/person/day).

- ✓ Identification of GHG emissions from wastewater treatment. For the calculation of GHG emissions, appropriate emission factors are used.

CARBONTOUR Tool (4/4)

C. Waste management

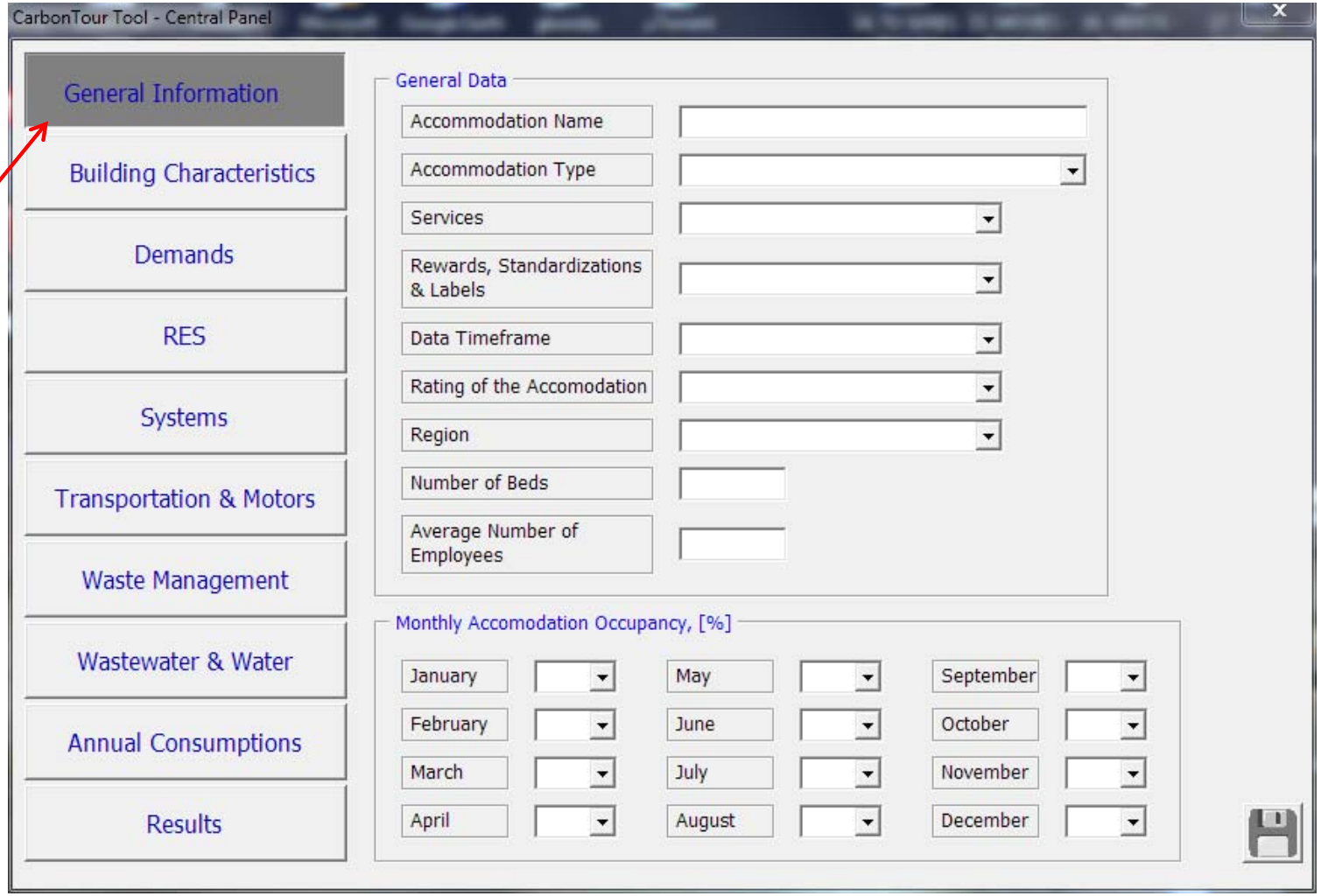
The methodology followed for the determination of CO_2 equivalent emission sources from waste management was structured upon the following steps:

- ✓ Determination of waste sources and types in tourist accommodations.
- ✓ Determination of waste composition. According to the facilities and services that a tourist accommodation offers, the synthesis of waste may differentiate - ourist accommodations were split into three categories namely bed & breakfast, hotels with and without restaurants.
- ✓ Assessment of the quantity of waste generated in a tourist accommodation. When data are not available from the user, a default value for waste generation per guest per night is used.
- ✓ Identification of GHG emissions from waste management, where appropriate emission factors are used.

Screenshots (1/3)

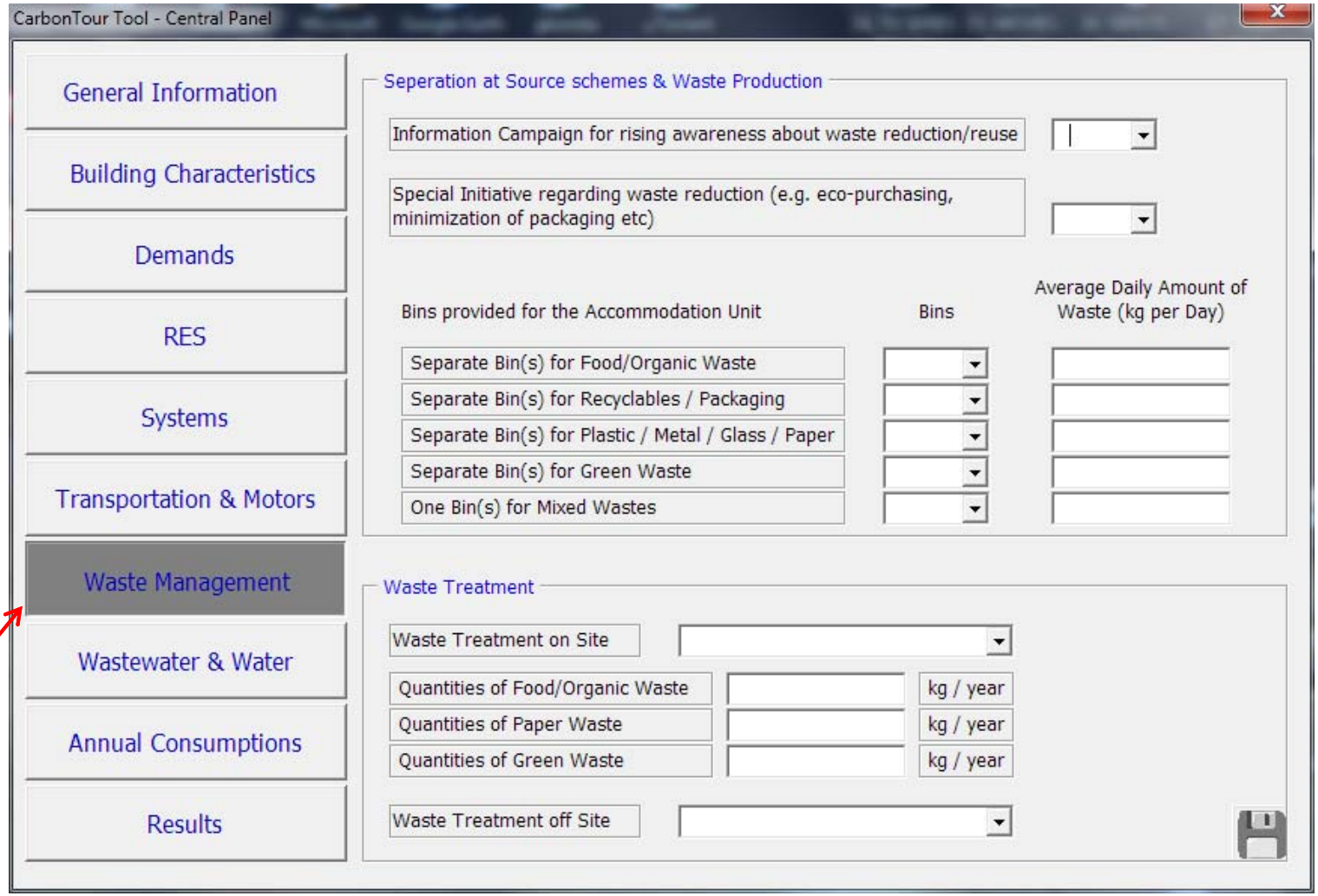
Introductory Screen

Screenshots (2/3)



Main Window – General Data

Screenshots (3/3)



Main Window – Waste Management

Example of Results (1/5)

Hotel main characteristics for the specific example

Rating: 4 Stars
Services: All inclusive
Season: All year round
Number of Rooms: 240
Data Timeframe: 2010 – 2011

City Waste Management: Landfill

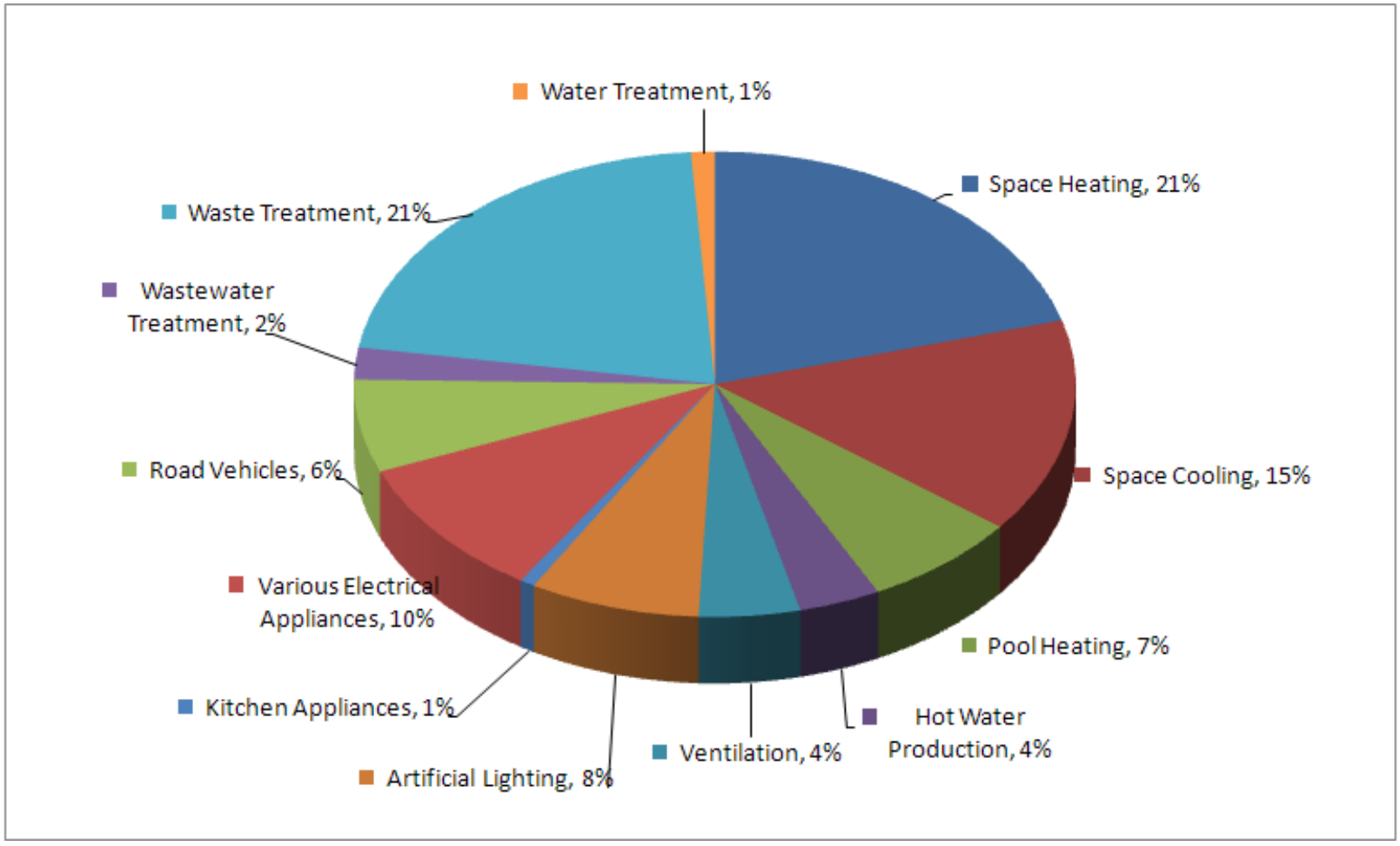
City Wastewater Management: Secondary biological treatment

Example of Results (2/5)

Sector	Normalized Total Primary Energy Consumption (kwh / year)	Percentage	Normalized CO2 Emissions (t per year)	Percentage
Space Heating	1.463.564	26%	351,26	21%
Space Cooling	1.088.932	19%	255,13	15%
Pool Heating	499.936	9%	119,98	7%
Hot Water Production	275.207	5%	62,38	4%
Ventilation	329.922	6%	77,36	5%
Artificial Lighting	555.818	10%	130,33	8%
Kitchen Appliances	50.406	1%	11,57	1%
Various Electrical Appliances	716.188	13%	167,93	10%
Road Vehicles	458.150	8%	109,96	6%
Wastewater Treatment	124.920	2%	37,85	2%
Waste Treatment	43.155	1%	365,60	21%
Water Treatment	62.460	1%	18,15	1%
SUM	5.668.658	100%	1.707,50	100%

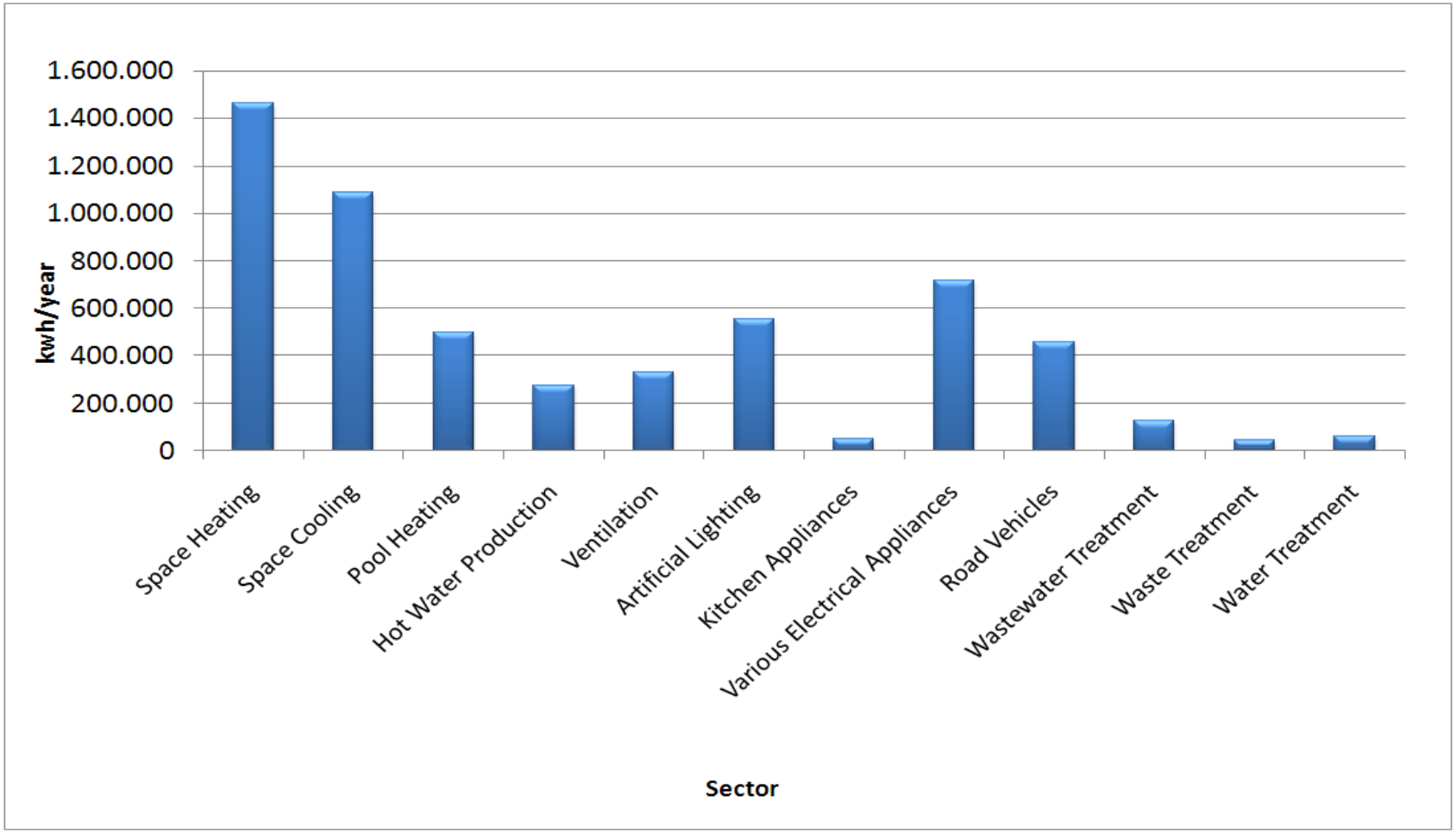
- **Normalized Primary Energy Consumption and CO2 Emissions per Sector**

Example of Results (3/5)



Normalized Total CO2 Emissions allocation per Sector (%)

Example of Results (4/5)



- **Normalized Total Primary Energy Consumption per Sector (kwh/year)**

Example of Results (5/5)

Indicators		
Primary Energy Consumption*	**44,65** **374,66**	kwh / overnight stay kwh / m2 & year
CO2 Emissions (Total)	**13,45**	kg / overnight stay

Energy and CO2 Emissions Indicators

****Average Values for Primary Energy Consumption:***

65 kwh / overnight stay

345 kwh / m2

Future Steps

- ✓ Demonstration and (first) optimization of the carbon footprint software has already completed and at this point is taking place the implementation of the large scale application of the software tool, in 80 tourism accommodation units in RNA and Cyprus

- ✓ Findings of the abovementioned action will lead to the development of guidelines for the identification of appropriate measures, recommendations and specifications for significant CO2 offsetting for both the tourist accommodation sector and the tourists.

Thank you for your attention.

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