The LED Project

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A 5 star hotel is working towards sustainable business through innovation, following this idea, we have taken the following measures up till now:

1. ENERGY SAVINGS = CO2 OUTPUT REDUCTION

1.1 THE LED PROJECT: ORIGINS

At the Hotel we have been looking for ways to conserve energy in order to reduce our greenhouse gas emissions. In the hotel we spend the majority of our energy expenses on electricity as we are hosting guests 24 hours a day. A large part of this energy is used for lighting in guestrooms, public areas etc. The last couple of years we have been working on investing in energy efficient

products and offer environmentally friendly alternatives for our guests.

We came up with an ambitious project: changing the normal light bulbs to energy saving bulbs so we can reduce the consumption considerably. Nonetheless our objective is to make some significant savings in electricity. Therefore we talked to some experts in the field. Their advice was to look at the new LED lights that could save up to 80% in energy.

We formed a “LED” team with supplier, who very much liked our idea to convert the hotel into a green “LED” hotel. The
Hotel was adopted as their European Pilot hotel to change all traditional bulbs in LED ones and to be able to share the results with the rest of the world in order to promote their high quality LED products.

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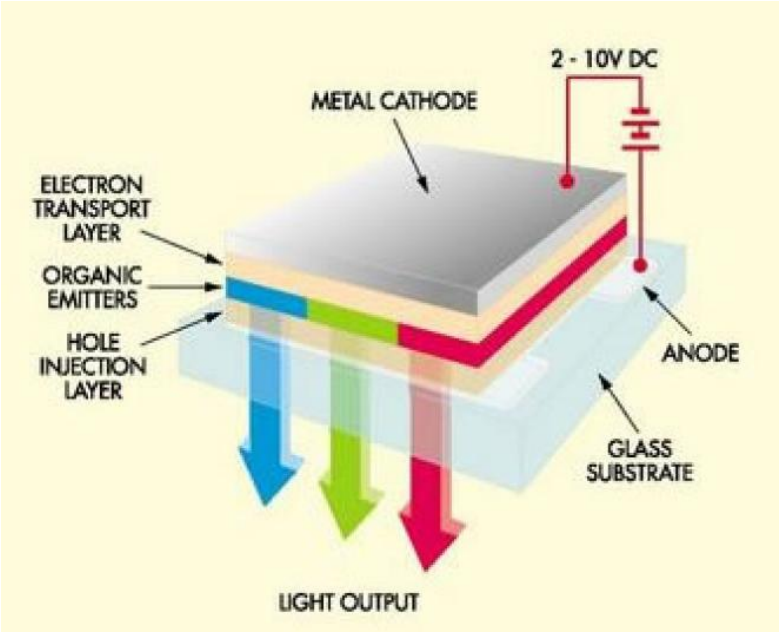
1.2 WHAT IS “LED” A TECHNICAL APPROACH

LED is defined as Light Emitting Diode. It works by the effect of electroluminescence and are available across the visible, ultraviolet and infra red wavelengths, with very high brightness.
LED is based on the semiconductor diode. When the diode is switched on, electrons are able to recombine with holes and energy which will create the light. This effect is called electroluminescence. The color of the light is determined by the energy gap of the semiconductor. The LED is usually small of size (less than 1 mm^2) with integrated optical components to shape its radiation pattern and assist in reflection.



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1.3 THE LED PROJECT: IMPLEMENTATION

The implementation part of the project started with selecting the LED lights for the different areas of the hotel. Many different LED light bulbs are available on the market and we had to set out some selection criteria:

- Sufficient intensity (strength) of the LED light
- Correct colour (tone) for the different areas
- Deliverable within timeframe of project
- Adaptable to current light socket (no change needed in hardware)
- Approved by EU consumer commission

The first LED light bulbs which we wanted to change, were the halogen light bulbs in the hotel because they consume a lot and they were not replaced yet for energy saving ones. The hotel received **2.400 LED GU10** free of charge with the first shipment, which was enough for all the rooms, main hall, banquet lobby and public restrooms. The GU10 LED only consumes 3 Watt in comparison with the 50Watt of the traditional bulb. On the second shipment were the bulbs for the remainder of the rooms (standing lamp, bedside and desk lamp) and the fluorescent for the parking, public areas and offices. To show what the impact on the energy consumption, cost and CO2 reduction is we have prepared the following graphs which represents the year 2009 with all traditional light bulbs changed by LED which is currently not the case yet.

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1.4 YEARLY CONSUMPTION FIGURES IN GRAPHS

KW before: Yearly electricity consumption with traditional bulbs
KW LED: Yearly electricity consumption with LED

Difference: Electricity savings per area
CO2 reduction: The CO2 reduction per area for a year

	KW before	KW led	difference	CO2 reduce in Kg
Bedrooms	109463	10574	98889	63091
Parking	26333	17555	8778	5600
Corridors	42363	13035	29328	18712
Hall	35916	2155	33761	21540
Offices	38868	25912	12956	8266
Banquets	15943	4341	11602	7402
Total	***268.887***	***73.573***	***195.314***	***124.610***

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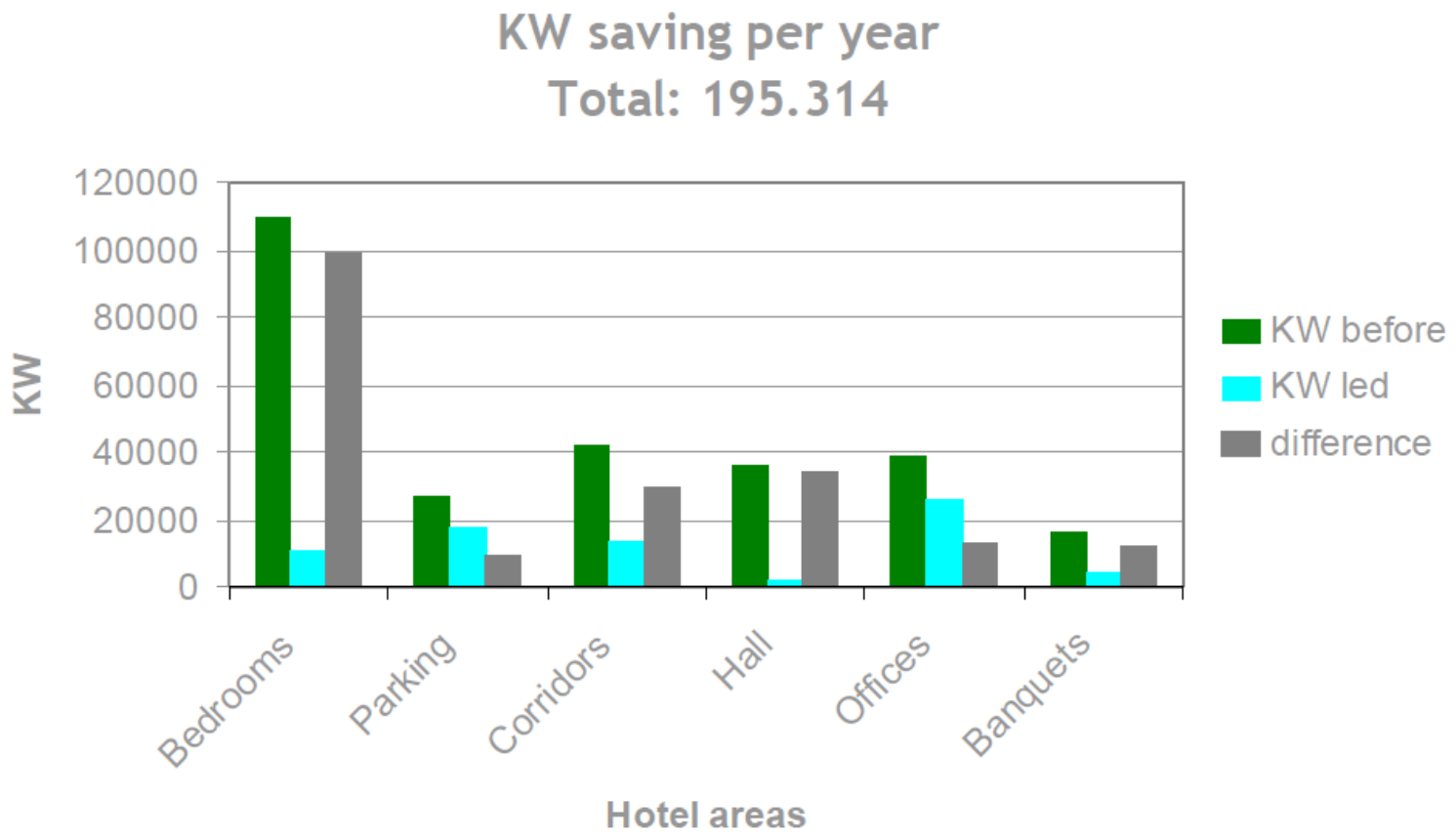
1.5 GRAPHS



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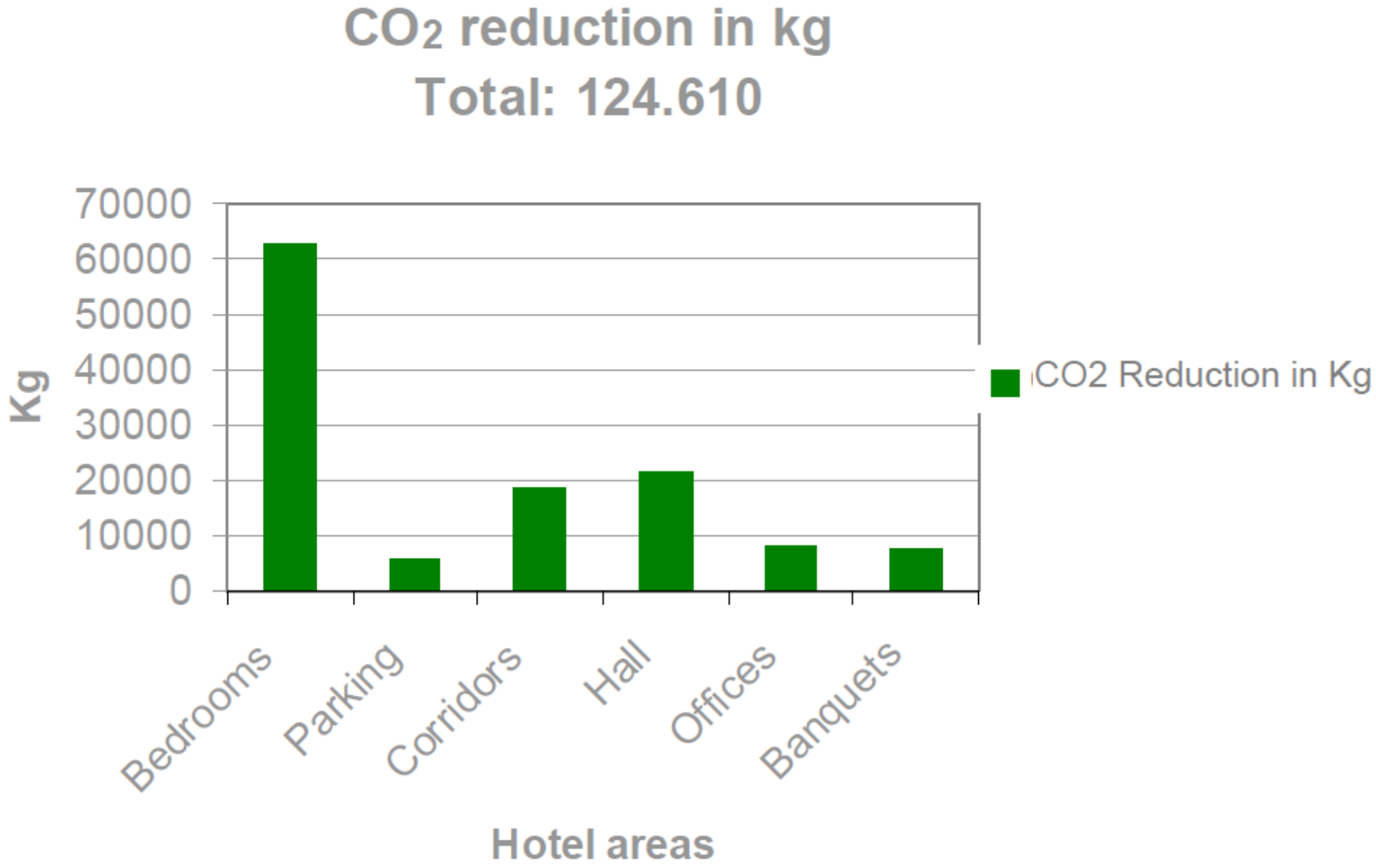

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1.6 SOME MAJOR ADVANTAGES ABOUT LED LIGHTING:

- Savings up to 80% of energy
- Less heat emission which means a saving on A/C costs
- They can last up to 50.000 hours, even at skyscrapers lighting
- Waste decrease because the lifespan of the equipments is longer
- Much more resistant to shock and impact, will not shatter when dropped
- Are not sensitive to voltage fluctuations
- Doesn't suffer in performance when light is switched on and off frequently
- No color changing when dimmed, unlike conventional bulbs
- Doesn't contain mercury or other hazardous materials

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1.7 THE PROJECT BY IMAGES

	TYPE OF LAMP	CONSUMPTION WITH STANDARD BULBS	CONSUMPTION WITH LEDS
	Table lamp Floor lamp	21W	6W
 	Room ceilings and Public areas	50W	3W
	Bedside table lamp	11W	6W

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	TYPE OF LAMP	CONSUMPTION WITH STANDARD BULBS	CONSUMPTION WITH LEDS
	Back office, garage, kitchen	36W	24W
 	Table lamp	21W	5W

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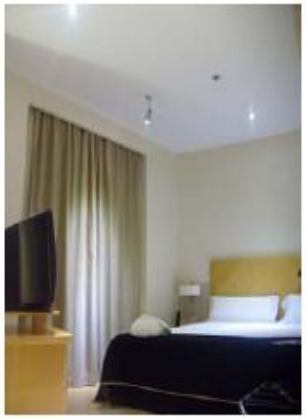
HALOGEN LIGHT





LED LIGHT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1.8 THE LED PROJECT: AN OVERVIEW SUMMARY

➢ ENVIRONMENT CONTRIBUTION

Considerable CO_2 emission reduction per year, achieving a total reduction of: **124.610 kg CO_2**

Total CO2 emission before LEDs ⟶ **170.000 Kg CO_2**
Total CO2 emission with LEDs ⟶ **45.390 Kg CO_2**

A "domestic" approach: *3 washings in our home washing-machines produce:* ***5 Kg CO_2***
Therefore, with our annual CO_2 emission reduction, we are reducing the CO_2 emission equal to:

73.652 washings per year

Or

When a car produces ***0,14Kg CO_2*** *per km*

With our annual CO_2 output reduction, we are reducing the CO_2 emission equal to:

30 times around the world by car

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➢ GUEST PARTICIPATION AND CONTRIBUTION

The LED project also responds to the growing level of interest from guests who are looking for sustainable hotels that manage their environmental impact. As well as location, price or amenities, our guests are now factoring in a hotel's environmental credentials when booking a room.

Therefore, our regular guests are being informed about the project. Because they use to stay in the same preferred rooms, they are being asked for their feedback. The opinions are already very positive: they prefer the new lighting because the style is more up-to-date and the fact that they are contributing with the Environment when staying on our "green hotel" pleases them.

➢ HOTEL PERCEPTION

The new lighting provides the hotel a trendy and more modern style. Especially in the rooms the LED bulbs become an extra decor element.

The overall impression is a fresher and renovated look/charisma of our class.

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1.8 HELPING THE PLANET

How to convert a hotel in Trees?

- CO_2 Reduction per year: **124.610 kg**
- To neutralize the effects of **124.610 kg** CO_2 emission on atmosphere: the planet needs **3,845 TREES!**

WITH THIS CHANGE Hotel TAKES OVER THE WORK OF 3,845 TREES EVERY YEAR!!!

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