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SUSTAINABLE HOSPITAL



Energy saving in the Hospital of Fuenlabrada.

Municipality: Fuenlabrada, (Madrid).

Starting Date: 2006

Participants:

- University Hospital of Fuenlabrada
- Acciona Solar

Description

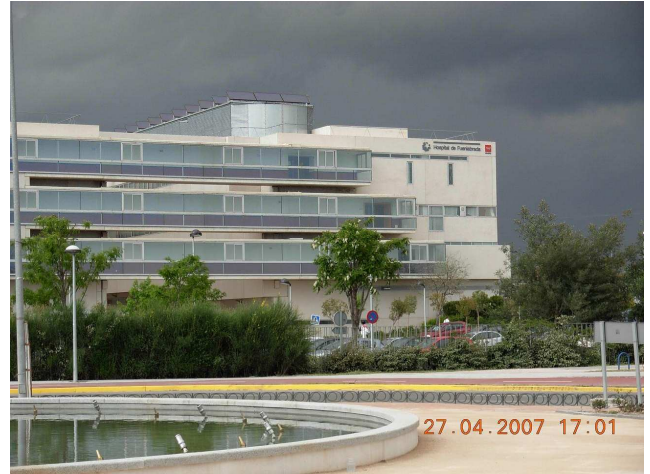
The big size of the hospitals, together with the big amount of patients that have to be assisted, makes necessary that even a medium size hospital like the Fuenlabrada one, has to assist more than 4.000 inhabitants per day.

Due to the hospitals structure and its managing system, it is easy to see that a hospital consumes a huge quantity of natural resources, produces residues, sewage water, sound emissions and contaminant gases to the atmosphere.

In the other hand, the environmental problems affect directly to health and life quality, so the Fuenlabrada Hospital has to work in all this negative points and try to solve them or at least reduce them.

This was the reason why the Fuenlabrada Hospital launched a project of sustainable hospital. It started in 2005 with a Preliminary Plan based in the analysis of the factors that were affecting the environment, such as: residues, energy waste, chemical spills, emissions, etc. It continued with an

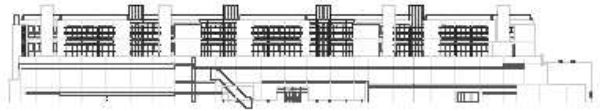
Improvement Plan started in 2006, for minimizing the impact in the preliminary activities of the hospital (supplies and maintenance) and in the results (residues, spills and emissions), finding the environmental balance.



The higher waste of natural resources of the hospital is due to the thermal power station, the cooling system, and the transformer centre, necessary for the demand of electricity in the hospital.

Hospital areas	
Medical area	13.450,92 m ²
Outpatient area	6.260,08 m ²
Central services	10.178,09 m ²
General services	13.466,13 m ²
Teaching and Research	1.019,82 m ²
Facilities	12.095,62 m ²
TOTAL	56.859,64 m²

Structural resources	
Beds	406
Surgery	11
Consultation rooms	64
Examination/exploration rooms	15
Day workstations	31
Birth rooms	3



Results

Thermo-solar power

Thermo-Solar Installation	
Solar surface	223,38 m ²
Production	16.000 l/day of hot water (50°)
Natural gas saving	18.375 m ³
Installed power	156 kW
Produced energy	190.419 kWh/year
Prevented CO ₂ emissions	177.090 kg/year
Prevented SO ₂ emissions	1.904,20 kg/year



The results obtained in the thermo-solar installation are equivalent to:

- The energy necessary for 54 houses.
- Would be like having a forest of 5,14hectare or 22.200 trees (= 7 football fields).
- The prevented emissions would be equivalent to the emissions that a new car produces in 885.000km.

Water consume

Installing flow regulators in taps, the results obtained were:

	Without regulators	With regulators
Shower	20 l/min	7 l/min
Toilets	25 l/min	5 l/min
Dump	25 l/min	6 l/min

Electricity

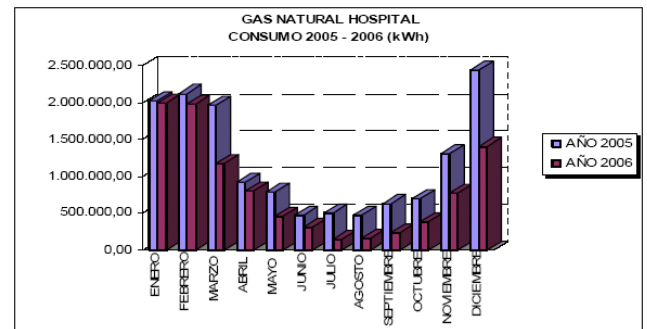
Carried out actions:

- Installation of low consume light bulbs.
- Section of the lighting circuits.
- Programming of the lighting in the common-areas.
- Installation of presence detectors.
- Electronic timing of the lighting.

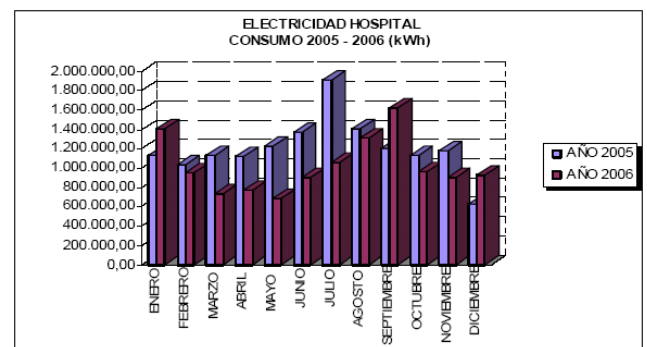
Benefits

Natural gas

Natural gas is used in DHW (domestic hot water) boilers, heating and kitchens.



Electricity



To sum up, the reduction of energy consumes between 2005 and 2006 are shown in the next table:

Year	Gas (kWh)	Electricity (kWh)	Total (kWh)
2005	14.348.186	14.505.168	28.853.354
2006	9.836.851	12.259.828	22.096.679
Difference	-31,44%	-15,48%	-23,41%