

## Energy Efficiency Division

*Hospital*

Save energy,  
get profit





## MEASUREMENT

### Temperature - Refrigeration

What's first necessary in an Hospital Operating Room is to guarantee the aseptic ambient. The control of temperature is fundamental, so it's necessary to provide a refrigeration system. Plus, there are patients rooms. How do these system works in terms of efficiency, especially when these units are very big and their consumption is important?



## DATA ANALYSIS

- Output temperature from the 3 refrigeration units: 9 °C.
- Minimum input temperature inside the operation rooms before the exchange point: 14.5 °C
- Difference lost: 5,5°C
- Electrical Efficiency: 48% (low)

Every 1°C of temperature lost for the entire circuit corresponds to 370 kWh/day.  
Total losses cost to the Hospital more than 149.000 Euro/year.



## ACTION

- Restructure some principal pipes
- Full open the radiator windows
- Change the polarity of radiator fans

Another action will be to change the cold water pumps.  
The electrical efficiency will be increased of about 6%.



## MONITORING

The system is now supported by a continuous monitoring to prevent problems (specific alarms settled as per customer requirements) and at the same time to verify that the efficiency level reached is maintained.



## RESULTS

The electrical consumption of this application has been reduced by about 23%.

### RESULTS

BEFORE: 3.244.700 kWh per year  
 AFTER: 2.498.400 kWh per year  
 DIFFERENCE €: 149.256,20 Euro/year  
 ROI: 12 months