

Casino Caribe

Solar Thermal VRF Installation in
Medellín, Colombia



Picture 1. Casino Caribe La Playa, Medellín, Colombia

The purpose of this project was to demonstrate unequivocally the fact that solar assisted air conditioner systems consume less energy than any regular systems.

The project consisted of replacing 150 tons of R22 air conditioners, the electrical supply and system control. The whole process had to be done without halting the operation of the casino. After months of preparation the exchange of systems was successfully completed .

THIS PROJECT WAS MADE POSSIBLE BY

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OLD AIR CONDITIONING SYSTEM

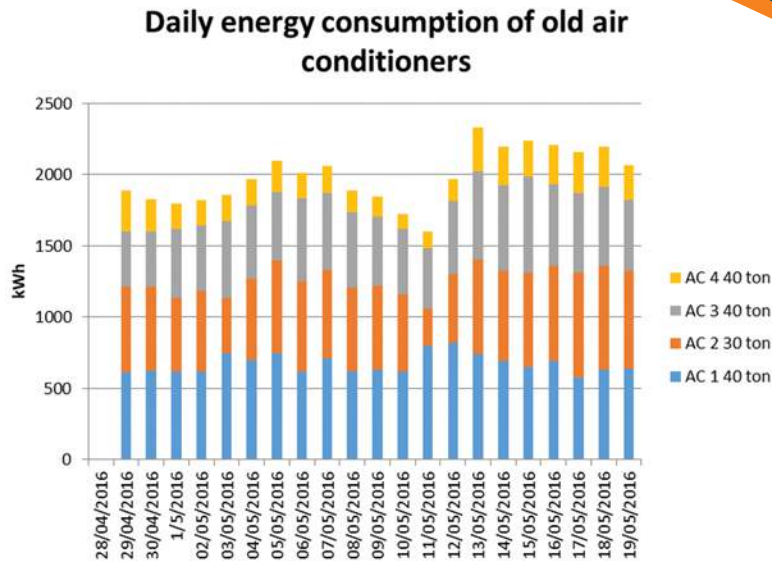


Figure 1. Measured consumption of old air conditioners

Of the 150 nominal tons, only 130 nominal tons were in operation. In addition, the temperature inside was averaging 25°C, reaching peaks of 27°C.

Average energy consumption for the whole system was around 2000 kWh/day with an irregular operation schedule. The air conditioners were constantly being repaired, with compressors being changed every month.

NEW AIR CONDITIONERS – BEFORE AND AFTER SOLAR PANELS

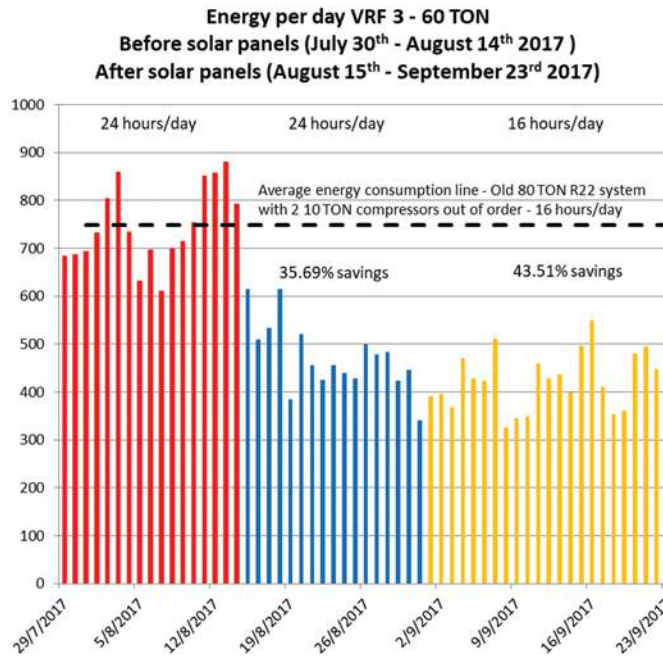


Figure 2. VRF consumption before and after solar panels

The old system was replaced by a state of the art, 130 ton, VRF system. The energy consumption was measured first without the use of solar thermal panels, and later with the panels, in order to determine the contribution.

Results show a 35% reduction in energy consumption when comparing the same VRF system before and after solar thermal panels; and up to 43% reduction when submitting it to the same regime of operation of the old air conditioners.

Preliminary results, two weeks after installation, show direct savings of 41% on the whole system, and up to 55% when taking into consideration the improved comfort inside the casino, with temperatures averaging 23°C with the new air conditioners.

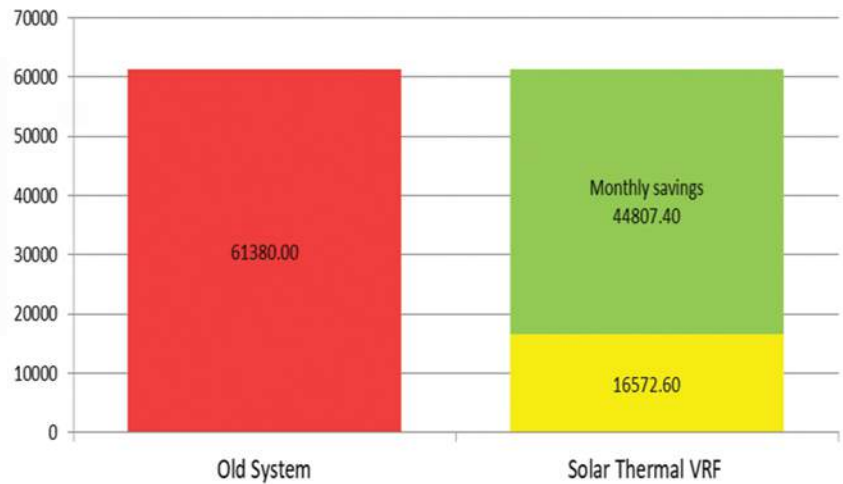
| AREA | AVERAGE kWh/DAY OLD AC | AVERAGE kWh/DAY SOLAR COOL | REDUCTION kWh/DAY | SAVINGS | SAVINGS DUE TO COMFORT IMPROVEMENT (7%/°C) |
|---------|------------------------|----------------------------|-------------------|---------|--|
| LEVEL 1 | 1359.5 | 775 | 584.5 | 42.99% | 56.99% |
| LEVEL 2 | 686.5 | 423 | 263.5 | 38.38% | 45.38% |
| TOTAL | 2046 | 1198 | 848.0 | 41.44% | 55.44% |

Table 1. Preliminary results

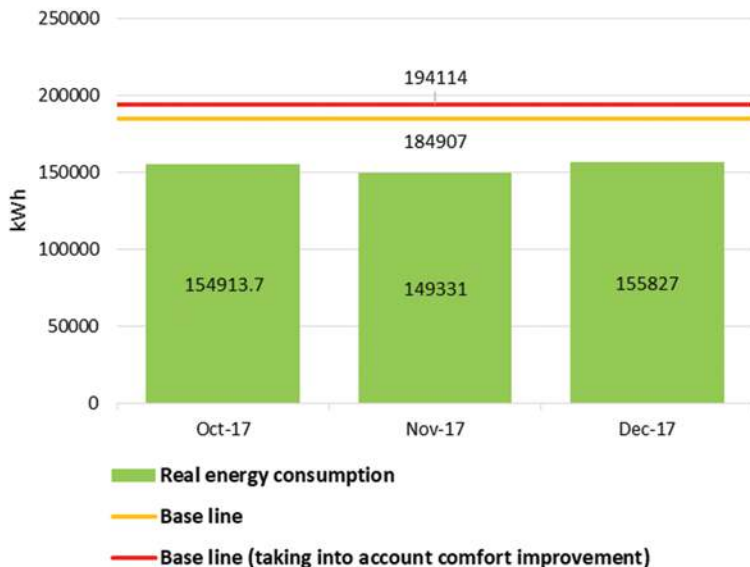
Three months after installation, results show savings up to 23% from the total electric bill and a 3C degrees comfort temperature improvement.

Figure 3. Air conditioner energy consumption. Three months after installation

Air conditioner monthly energy consumption (kWh/month)



Total energy consumption per month



The savings of the new Solar Thermal VRF systems are 73%

Figure 4. Total energy consumption of the casino



Picture 2. Mounting the SolX Panels and personnel



Picture 3. Configuring the VRF systems



Picture 4. Installation. Before (left) and after (right)