

# Solar Thermal HVAC Performance Report



## CASE STUDY - VACATION VILLA, LONG BAY, Providenciales, Turks and Caicos Islands

ThermX HVAC Solar Panel installed on an Existing HVAC  
condenser unit. Measure cost savings.

CONTACT: Green Revolution

+1 649 431 4242 / +1 649 331 1393



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## **CASE STUDY - VACATION VILLA, LONG BAY, PROVIDENCIALES, TURKS AND CAICOS ISLANDS**

### INTRODUCTION

Air temperature control and refrigeration are two of the largest consumers of the world's total energy usage.

ThermX solar thermal HVAC system, is installed in 6 out of the 7 continents and in 48 countries worldwide. The system is a tried and tested worldwide energy saving solution.

In a typical residential home in the TCI, air-conditioning accounts for approximately 60% of the power bill. ThermX installations in the TCI and Bahamas are achieving savings greater than 30% on HVAC running costs.

The ThermX collector (panel) can be installed inline with new or existing HVAC system. A single 5'x5' collector is suitable for up to 5tons of cooling, additional collectors can be added in series, for larger systems.

### HOW IT WORKS

In simple terms, the ThermX HVAC solar collector is added to your existing Staged or VRF/VRV HVAC system. The solar collector heats the refrigerant gas through solar thermal transfer. This heating process is usually carried out by the compressor(s) alone. The internal logic of the system recognizes the supplied heat, and therefore stages down the compressor(s), reducing the energy consumed, which accounts for approximately 80% of HVAC running costs. This results in HVAC running cost savings >30%.

## SCOPE OF WORKS

Green Revolution were appointed by the client to reduce HVAC running costs in a 6 bed Vacation Villa in Long Bay, Providenciales, Turks and caicos Islands.

Through the use of energy monitoring, it was calculated that the running costs for the HVAC were confirmed as approximately 60% of the overall household electricity costs.

The client requested that an initial ThermX collector be installed on one of the 7 Mitsubishi variable speed HVAC units at the Villa. Green Revolution monitored power consumption before and after the ThermX installation. The results were split into two different states of the villa ie. occupied by guests, and unoccupied.

The Condenser used is a Mitsubishi PUMY P36 NHMU-BS (3RTon) approx. 3 years old.

A pergola structure was built on site, within 10 feet of the HVAC condensers, for the purpose of supporting the ThermX panels.

## HVAC RUNNING COSTS BEFORE THERMX

### Consumption Information.

The selected Mitsubishi PUMY condenser was monitored for an agreed period, the recorded results were as follows (prior to ThermX installation):

#### Villa Status: Villa Unoccupied (before ThermX)

Thermostat Setpoint: Drying Mode 83°F

Ave daily Running Cost: \$16.68

#### Villa Status: Villa Occupied (before ThermX)

Thermostat Setpoint: **Cooling Mode** – assume 70 °F (actual Temp selected by guest)

Ave daily Running Cost: \$22.60

The average daily consumption was broken down into hourly data, see diagram 1 comparing the 2 sets of data over a 24hr period.

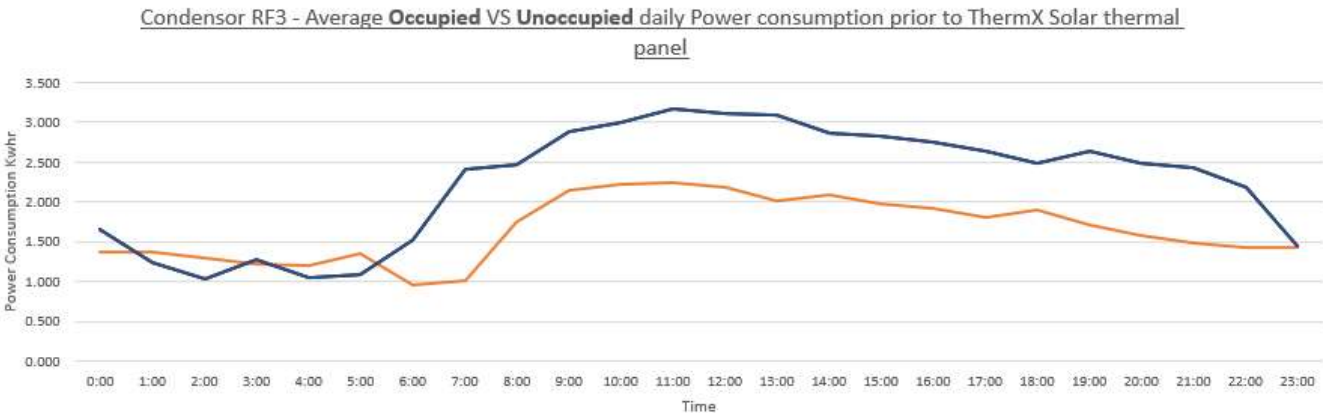


Diagram 1 – Condenser RF3: hourly energy consumption over 24 hour period (Kwhr), Unoccupied (orange line) vs Occupied (blue line) – BEFORE THERMX

## HVAC RUNNING COSTS AFTER THERMX

### Consumption Information.

After the ThermX Collector was installed the following results were recorded, using the same previously agreed setpoints at the thermostat:

### Villa Status: Villa Unoccupied (after ThermX)

Setpoint: **Drying Mode** 83°F

Ave daily Running Cost: \$9.73

*Saving with ThermX: \$6.96 per day or 42%*

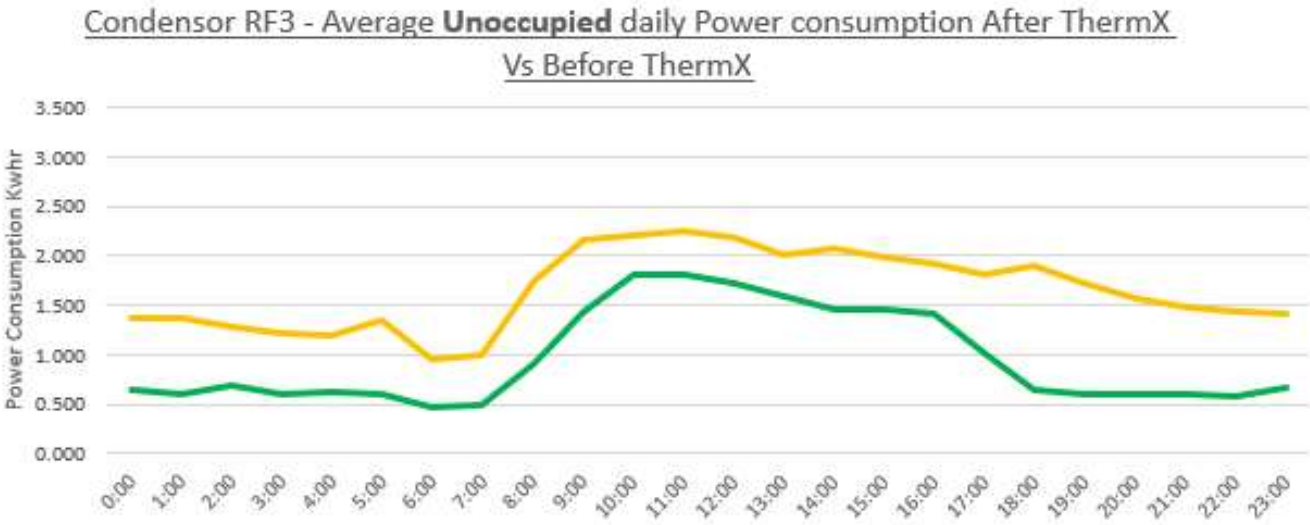


Diagram 2 – Condenser RF3: Unoccupied daily energy consumption (Kwhr) After Thermx (green line) Vs Before ThermX (orange line)

**Villa Status: Villa Occupied (after ThermX)**

Setpoint: Cooling Mode – assume 70°F (actual Temp selected by guest)

Ave daily Running Cost: \$12.18

*Saving with ThermX: \$10.42 per day or 46%*

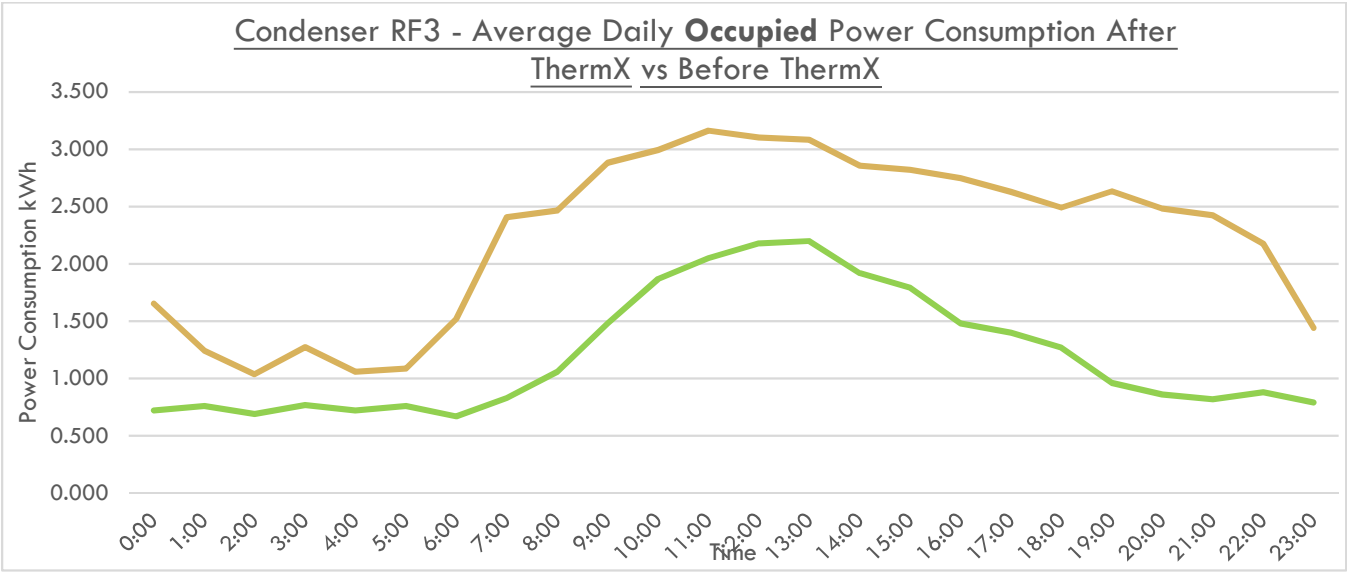


Diagram 3 – Condenser RF3: Occupied daily energy consumption (Kwhr) after Thermx (green line) vs Before ThermX (yellow line)

**NOTES TO THE RESULTS**

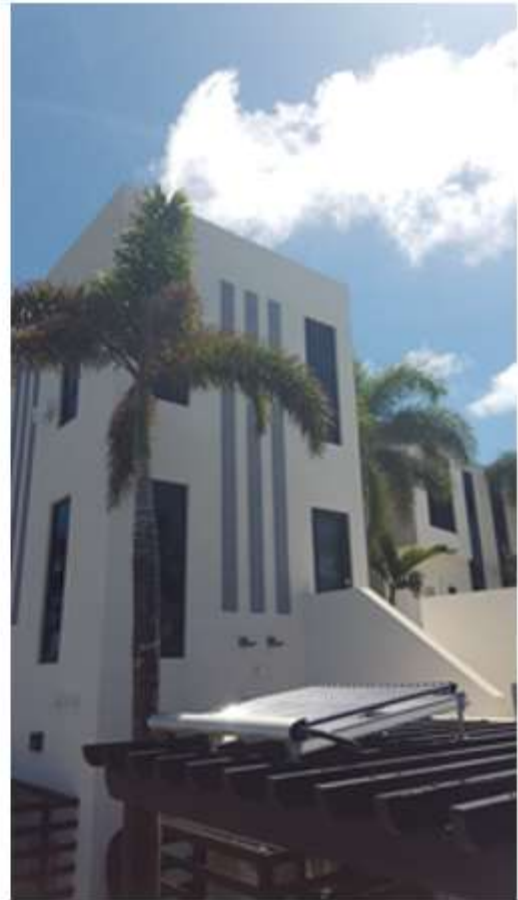
Due to some shading issues that has been noted on the collector from about 10-12am. We believe that curve would be improved if the collector was in direct sun all day.

**CONCLUSION**

The consumption data gathered shows that the addition of the ThermX solar collector significantly reduces HVAC running costs.

Based on the data received so far, and the known occupancy rates of the villa, the projected savings for the owners will be approximately 46% on their annual HVAC running costs.





### Benefits and Uses of the ThermX technology:

- Can be used on Commercial refrigeration.
- No moving parts
- Saves vast amounts of energy, and therefore lowers your energy bill significantly.
- Massively reduces CO<sub>2</sub>, helping you reduce your carbon footprint.
- Eliminates compressor failure due to overheating, reducing your maintenance costs and increasing lifespan.
- Phenomenal ROI with an unprecedented lifespan.
- HVAC and refrigeration (existing and new installations), savings are even larger in commercial scale installations.
- COP figures (heating capacity versus power consumption) of over 8 are possible.
- 10 Year warranty