



CASE STUDY:
20.58 kWp Solar PV System
Starbucks St. Charbel, Quezon City, Philippines

Transnational Uyeno Solar Corporation
Penthouse, Net Quad Building
4th Avenue corner 30th Street
E-Square Crescent Park West
Bonifacio Global City, Taguig, 1634
Philippines

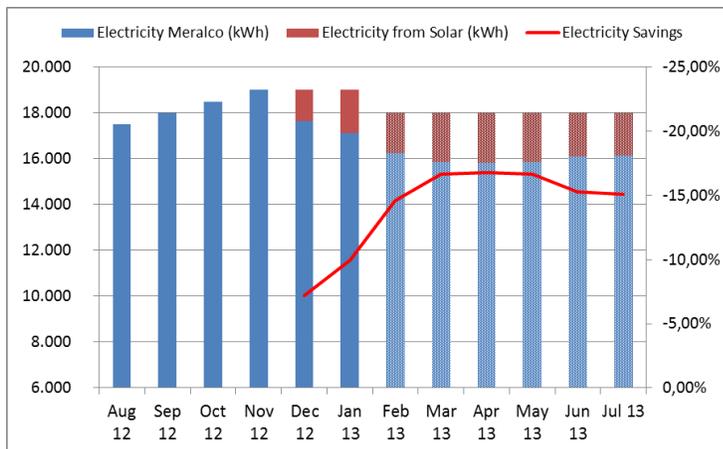
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Starbucks St. Charbel – Why Solar Makes Sense

The Starbucks St. Charbel store in Quezon City, Philippines, is a single-storey standalone structure with a flat roof, which is typical of many restaurants and commercial outlets in and outside of Metro Manila. This coffee shop, which operates 20 hours a day, requires a substantial amount of electricity to run its appliances, air-conditioning units, refrigerators, freezers, microwaves and lighting. In addition, owing to its flat roof, a very large amount of electricity is used for air-conditioning to maintain the store at a comfortable temperature for the customers.

A solar photovoltaic (PV) system was considered for this store primarily as a means to reduce costs, and also to promote Starbucks' green advocacy. There are two ways by which solar PV reduces electricity consumption in this store: 1) directly, by replacing expensive electricity sourced from the grid with power generated from the solar panels during the daytime; and 2) indirectly, by cooling the temperature of the roof and interior of the store through the cover provided by the panels. With these, solar PV can reduce the electricity consumption of the store by up to 20%, which creates significant savings for the owner.

Given the size of the roof, a 20.58 kWp solar PV system was designed using 84 Monocrystalline panels. The system was constructed in ten weeks and was commissioned on 11 December 2012. Actual results have shown that the system is able to directly reduce the electricity purchased from the grid and, at the same time, reduce the amount of electricity consumed by the store. During the first two months of operation the system produced a total of 3,671 kWh, displacing 10.6% of electricity sourced from the grid. This was equivalent to PHP 34,000 in savings which otherwise would have been a cash expense to the company.



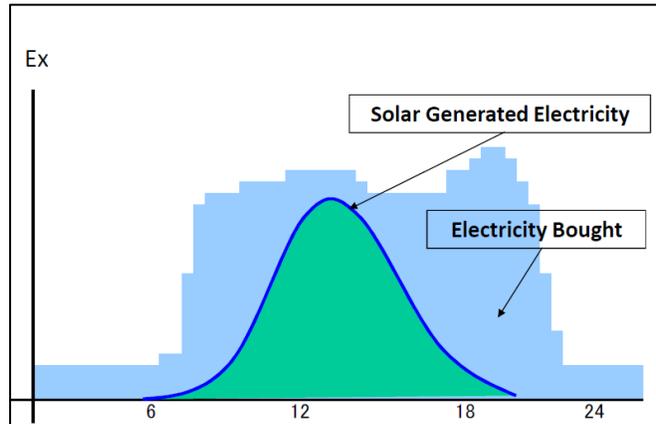
Moving forward, the system will not only offset grid electricity, but also shadow the roof of the building thereby reducing the overall demand for electricity inside the building. Together, this will create savings of around 17% which will allow the owner to pay back its investment in less than eight years and generate free electricity for the store thereafter. Given the 25-year economic life of the system, the owner will enjoy the savings over a significant amount of time, with the savings becoming even higher as grid electricity prices increase over the years.

Why choose solar?

- **Solar power allows you to displace expensive electricity from conventional sources.**

Solar systems produce electricity during the day, coinciding with peak demand when grid power prices are highest. Solar power displaces this expensive grid power, allowing the owner of the solar system to replace expensive and carbon-heavy grid electricity with cheaper, clean power.

Given the high cost of grid electricity in the Philippines, a solar system can pay back within eight years or less, after which the electricity becomes free.



- **Solar power is already cheaper than conventional sources of power.**

Whether you are grid-connected or off-grid, solar power is already cheaper than your current source of power. The *Levelized Cost of Electricity* (LCOE) is the industry-accepted method of measuring the cost of solar power by factoring the capital cost, operation and maintenance costs, operational lifespan, and annual degradation of output. Due to the steady decline in the costs of solar PV systems and the rising cost of fuel, the LCOE of solar is now around PHP 7.00 /kWh. This is significantly lower than average grid rates of PHP 10.50/kWh and the cost of running diesel generator sets in off-grid areas, which is more than PHP20.00/kWh.

