

Laundry in Goa realises large benefits with solar thermal

Background

Lakaki Drycleaners was the first power laundry to be set up in Goa, and currently handles more than 1000 clothes each day for different customers. The laundry operates on a mix of diesel and electricity for the washing, calendaring and steam ironing processes. Faced with mounting operational cost, Lakaki's owners were exploring solutions to reduce their dependence on these utilities.

Challenge

Being a production operation, the challenge for any solution was to account for the intermittent nature of the different batch processes in the laundry and their different demands: some washing operations require hot water, steam ironing required dry steam at 2 bar (g) and the calenders operated with dry steam at 4 bar (g). In addition, the steam for these processes must be devoid of water because that could lead to staining of the clothes. The overall solution had to be cost-effective despite these varied and varying demands.

Solution

The processes at Lakaki Drycleaners were audited to quantify the average daily thermal demand and its variation on a typical day. A.T.E. then proposed a solar thermal-based process heating solution to supply 72000 kcal/day, using a double-axes tracking solar thermal concentrator of aperture area 25 m² along with hot water storage. The solar thermal system was integrated with the existing system, and designed to provide the "base load". In order to maximise the use of the solar thermal system, the laundry's processes were scheduled to balance the heat demand. During the days when solar radiation is not available, the existing system was used.

Results

The integrated solar thermal concentrator system with hot water storage was commissioned in February 2015. Before the commissioning of the solar thermal system, Lakaki Drycleaners consumed about 20 litres of diesel each day and about 80 kWh of electricity. On sunny days, after their investment in the solar thermal process heating solution, Lakaki Drycleaners is able to almost save on its entire diesel usage and reduce the electricity consumed by nearly 50%. Even in a location such as Goa, India, with its high humidity and long monsoon season, the payback period for the entire project is attractive at less than 5 years.

