

CST BEING USED IN LAUNDRY AT LAKAKI DRYCLEANERS, GOA

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Established in 1962, Lakaki was the first power laundry in Goa. This laundry was established by Mr Venkatesh Naik Dalal at Margaon, South Goa. Since its inception Lakaki had crossed many milestones in terms of quality. Presently, it handles around 1,000 clothes per day. Earlier the fuel used for boilers was diesel and electrical energy was required for ironing. The daily fuel consumption was 20 litre/day and 80 units/day of electricity. Diesel is a costly fuel and not environment-friendly. Around 2011, Mr Venkatesh thought of replacing its conventional fuel operated system with renewable energy resources. He wanted to switch to solar technology for meeting steam requirement for various processes in laundry. In February 2015, solar steam generating system was commissioned with the help of Goa Energy Development Agency (GEDA) and the Ministry of New and Renewable Energy.

Operation Philosophy

Project developer—ATE enterprises has installed a 25 m² paraboloid dish at the premises of Lakaki. It is a dual axis automated system. The steam generated at 5 bars is sent to the laundry application points through a common steam header. So this solar system caters hot water for washing clothes and starch preparation, and steam for

ironing process at 2–4 bar pressure. In Lakaki, total steam requirement at peak hour is 100 kg/hour and hot water requirement is around 400 litre/day.

Cleaning and drying of around 1,000 clothes per day takes place in the laundry with eight hours of work every day. There are 20 workers who are trained to operate the solar

steam powered system. There are five tables for steam pressing, four tables for electric ironing, and about two lengthy tables for the sarees. Generally, the plant runs for eight hours and steam is required for all eight hours of the day. On the basis of this schedule, the installed solar system completely replaces diesel and 50 per cent of electrical energy.

Table 1: Details about the installation at Lakaki Drycleaners

Name of Installation	Lakaki Drycleaners
Year of commissioning	February 2015
Project developer	ATE Enterprises Private Limited
Project cost	₹12.5 lakh with 1.5 lakh MNRE subsidy
Operating temperature	120°C
No. of dishes	1 dish (25 m ²)
Total collector	25 m ²
Daily steam requirement	90–100 kg/day
Payback of project	4.5 years
Annual saving	₹340,200
Average operation/day	6-8 hours
Daily heat delivery	72,000 kcal/day.



Picture 1: Steam ironing process

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Picture 2: Solar Concentrator at Lakaki Drycleaners

Feedback by User

Sweta Dalal, daughter-in-law of Venkatesh Dalal said, “We are very satisfied. It is very economical. Earlier, we were using diesel and had to spend ₹30,000 per month. This money is saved entirely now.” Lakaki installation is a green initiative that hopefully will be taken up by the rest of the industry in the future. The Dalal family added, “The plus point about this technology is that earlier in case of power outage, our production would drop, which is not the case anymore.”



Picture 3: Dalal family with solar concentrators

Total annual saving of diesel is 5,400 litre and electricity saving on ironing process is 10,800 units.

Performance

In Goa, average 240–250 days are good sunny days. During this time, the solar system can generate sufficient steam for laundry. Total operation hour is 6–8 hours/day. Figure 1 depicts the working of the solar system throughout a day. In the figure shown, three high peaks are the steam requirement periods and the lower ones are hot water generation through steam. Steam at 2 bar is used for hand ironing and 4 bar steam is maintained for ironing by calendaring machine. Automated steam pressure regulation system ensures the required pressure at

the user end. The provision to convert the extra steam into hot water, which can then be used for washing, is excellent. This way there is no wastage.

Overall, there were no issues in operation and maintenance. Only once, they faced a problem and the service provider came from Pune within two days and fixed it. Cost of maintenance is very low around, i.e., ₹2600/year.

Challenges

Clouds and monsoon are challenges for this technology. Generally in Goa, there are 90 monsoon days which are non-sunny and during this time the CST does not work. So, to meet the steam requirement demands is a challenge which is currently being fulfilled by the existing electrical system. Also, dust coming from nearby industrial area also cause soot deposition on mirrors. Therefore, daily cleaning of mirrors is essential. 🟡

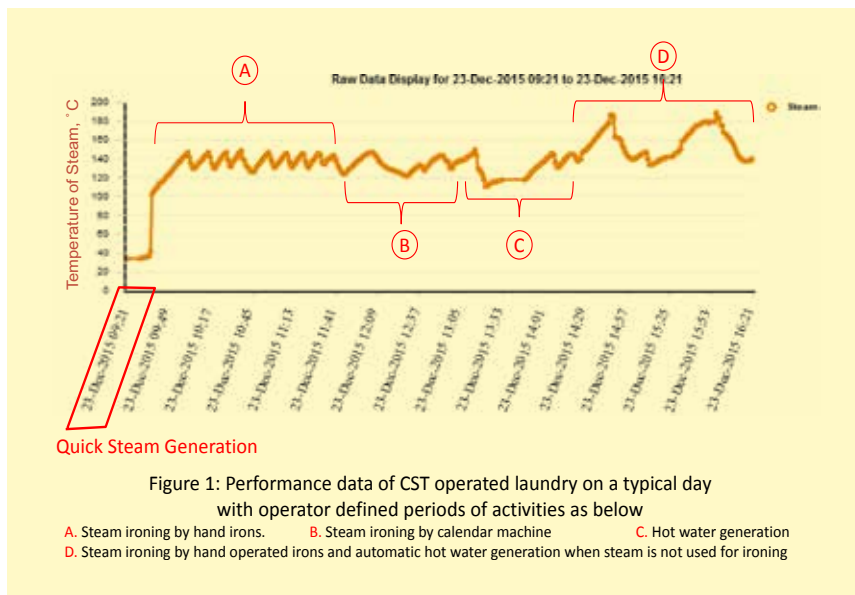


Figure 2: Performance data of CST operated laundry on a typical day

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