



INDUSTRIAL APPLICATION



Dear Industry Colleague,

The Climate is Changing.

Yes, we are talking about global climate change. But not just that, the technology adoption climate is also changing. As the fossil fuel costs and the resultant pollution keep increasing, there is an increasing need for the users of these fuels, mainly industries, to adopt newer, more efficient, and less polluting technologies to meet their energy demands. We are proud to be doing our part in mainstreaming a technology that meets all the above requirements – more efficient, less polluting, and saving costs.

We are happy to share that many firms in the industrial sectors today have been decarbonizing their heating demand, thanks to the adoption of Heat Pumps. And we are proud to have facilitated the decarbonization of Heat through our ThermaGenX Heat Pumps.

In this case study booklet, we present to you some of the success stories of Heat Pumps in the industrial sector. The sheer versatility of Heat Pumps can be observed from the fact that the Heat Pumps are


- Used in Manufacturing companies and in Hotels
- To replace different types of energy sources – Diesel, Super Kerosene Oil, LPG, Natural Gas, and Electricity
- Different climatic conditions – the hot, humid dry, and cool regions.
- To serve different applications like preheating for a Paint Shop, generating hot water for bathing applications in Hotels and to keep the Diesel Gensets warm.

We hope that you find the case study booklet useful. If you have any questions or feedback, do contact us.

Happy reading!!

Aspiration Energy

Aspiration Cleantech Ventures



COMBINED HEATING AND COOLING USING HEAT PUMPS

Application – Pre-Treatment
 Fuel Replaced – LPG
 Customer – A 3 Wheeler Manufacturer
 Sector – Automotive

BACKGROUND

Painting is one of the most important processes in an automotive manufacturing plant. All the components that require painting are pre-treated by passing them through high temperature liquid tanks before the painting process begins. At our customer's manufacturing plant, the pretreatment tanks were maintained at a temperature of about 55°C and the required heat was generated by LPG Boilers

. The annual fuel cost (LPG cost) was quite significant, and the customer was exploring ways to reduce energy costs.

SOLUTION

After conducting a thermal energy audit, Aspiration Energy proposed to install a 260kW capacity water source Heat Pumps (65kW(th)* 4no.s), which would be connected to the existing pretreatment process tanks of combined volume of 1,58,500 Litres and the Chiller of 40 tonnes of refrigeration capacity was completely turned off saving 600 - 800 kWh of electricity per day. ·

INSTALLATION

Design:

The existing LPG boiler and chiller was replaced by 260 kW (65kW(th)* 4no.s) Heat Pumps.

Integration:

Two integrations were done - one was a centralized integration for both heating and cooling requirement, and the second one was a parallel connection of Heat Pump for proper load handling.

The cooling side was utilized using an Air Handling Unit.

The total project including the Design, Procurement, Installation & Commissioning was completed in record time and the Heat Pump started delivering energy savings better than the projected savings.

INSTALLATION



DESCRIPTION	BEFORE	AFTER
HEATING SOLUTION	Boiler	Heat Pump
ENERGY SOURCE	HSD	Electricity
CAPACITY	100000 kCal	48160 kCal
OPERATIONAL COST	Rs.18.6 Lakhs/yr	Rs.3.9 Lakhs/yr
CONSUMPTION PER YEAR	22,312.5 liters.	47,495 kWh.

BENEFITS



TECHNICAL

- Heating was used in existing process
- The byproduct cooling from the Heat Pump was also utilized effectively.



FINANCIAL

- More than 50% energy savings.
- Payback period of less than 1 year.



ENVIRONMENTAL

- The Heat Pump system reduces CO2 emission by about 3,43,000 kgs of CO2/year

Annual savings of Rs. 82,00,000 is achieved by eliminating both Boiler and Chiller unit consumption.

HEAT PUMPS IN THE HOTEL - SAFER AND MORE ECONOMICAL

Application – Washing Machine
 Fuel Replaced – Electricity
 Customer – 2 Wheeler Manufacturer
 Sector – Automotive

BACKGROUND

In automobile manufacturing, millions of components are forged, machined, assembled and tested every day to remove the greasy oil, burrs and other impurities stuck on the surface of the components with water-based oil solution. For effective cleaning and surface finish of components, these solutions are heated and maintained at 50-60°C

SOLUTION

After the site assessment, we grind out to develop a cost-effective solution to integrate 3 washing machine tanks. Because of our technical expertise and history of similar installation, we engineered a hybrid heating solution that uses both the heat pump and the electric heater to meet the client without any downtime.

The control of the electric heater was designed in such a way that the electric heater will turn on only if the heat pump is under maintenance.

INSTALLATION

Design:

The centralized 28kW Air Source Heat Pump system was designed to cater the heat requirement of 3 washing machines.

Integration:

Based on the data acquisition, the system has the potential to reduce 50% of their energy bill. We offered to supply our heat pump system with a temporary piping skid for 2 months to see the benefits for themselves.

After the end of this trial, the client was highly satisfied with the performance of our heat pump solution and the performance report convinced the client to replace their electric heaters in 3 of their washing machines with our centralized heat pump solution.

The heat pump system was successfully integrated with 3-component washing machine and started delivering heat to 3 tanks as per their requirement.



DESCRIPTION	BEFORE	AFTER
HEATING SOLUTION	Electric heater	Heat Pump
ENERGY SOURCE	Electricity	Electricity
CAPACITY	108 kCal	28kCal
CONSUMPTION PER/day	1560 kWh	771kWh
OPERATIONAL COST	Rs.8 kWh	Rs.8/kWh

BENEFITS



TECHNICAL

- The hybrid system made toggling between Heat Pump and Electric Heater easy.
- The Heating system is centralized.



FINANCIAL

- More than 40% energy savings compared to the baseline.



ENVIRONMENTAL

- The Heat Pump system reduces CO2 emission by about 32,000 kgs of CO2/year.

Heat Pump is saving around Rs.20,00,000 per year on running about 16 hours / day.

OUR CLIENTS

Thank You!

Hopefully, we can work together and this project will be successful.

Let's Get In Touch

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