



TERNA ENGINEERING COLLEGE

Design and Development of Solar Air Conditioning System for TEC Campus to Reduce Carbon Emission

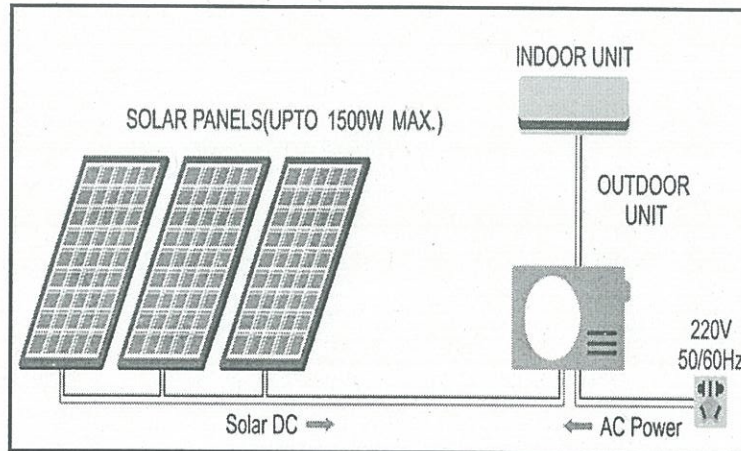
TEC is keen about the environment sustainability and supports faculty and students to work on the issues related. One of such activities which will be able to make a good impact at global level is supported by TEC to reduce carbon footprint. TEC is working in the direction of implementation of the Solar based Air Conditioning System campus wide.

Dr C M Choudhari, HoD, Mechanical Engineering Department, has successfully implemented Solar Air Conditioning System in his department. The same Solar Air Conditioning System will be implemented in campus of Terna Engineering College phase wise which will be helpful in cutting down carbon emission.

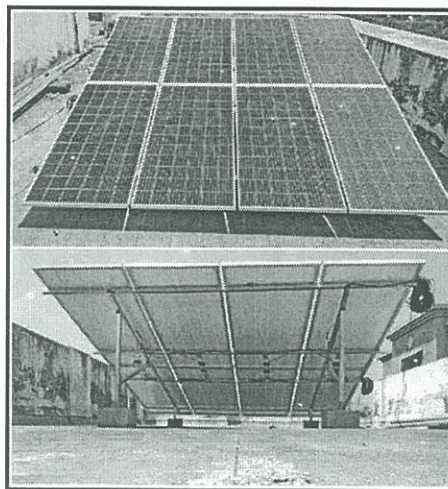
The demand for air conditioning is increasing due to the effects of climate change and global warming. If we still rely on conventional electric air conditioning it will be harmful in future because electricity is generated from fossil fuels, the greenhouse gas emission would continuously worsen global warming, and in turn the demand of air conditioning would be further increasing. Also the rate of electricity has increased by 8-10% which will continue increasing in the future. So in order to reduce global warming and the greenhouse gas emission effect we should adopt the renewable method for the generation of electricity which in turn reduces the cost of electricity by conventional way.




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Therefore, this project focuses on the design and development of solar powered air-conditioning system. The solar energy is received by the PV module and transform into electrical energy. The electrical energy is then being regulated by charge controller. As the electrical energy coming from the PV module is in DC, inverter will convert it into AC as the compressor needs AC to operate. A solar on grid Air Conditioning system was designed for 3 Ton capacity. The solar Air Conditioning system required 18kwh/day, assuming 8 hours of continuous working.

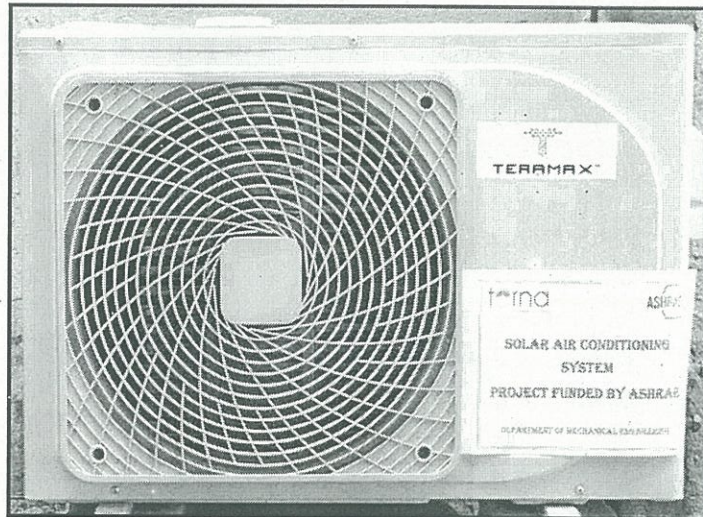


These energy demand is fulfilled using 8 panels with generating capacity of 11.390kwh/day and the rest of the energy is supplied by grid as shown in following




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figure. After successful implementation of this project, we propose a similar system for entire engineering campus of TEC.



Photograph of implemented Solar Air Conditioning System

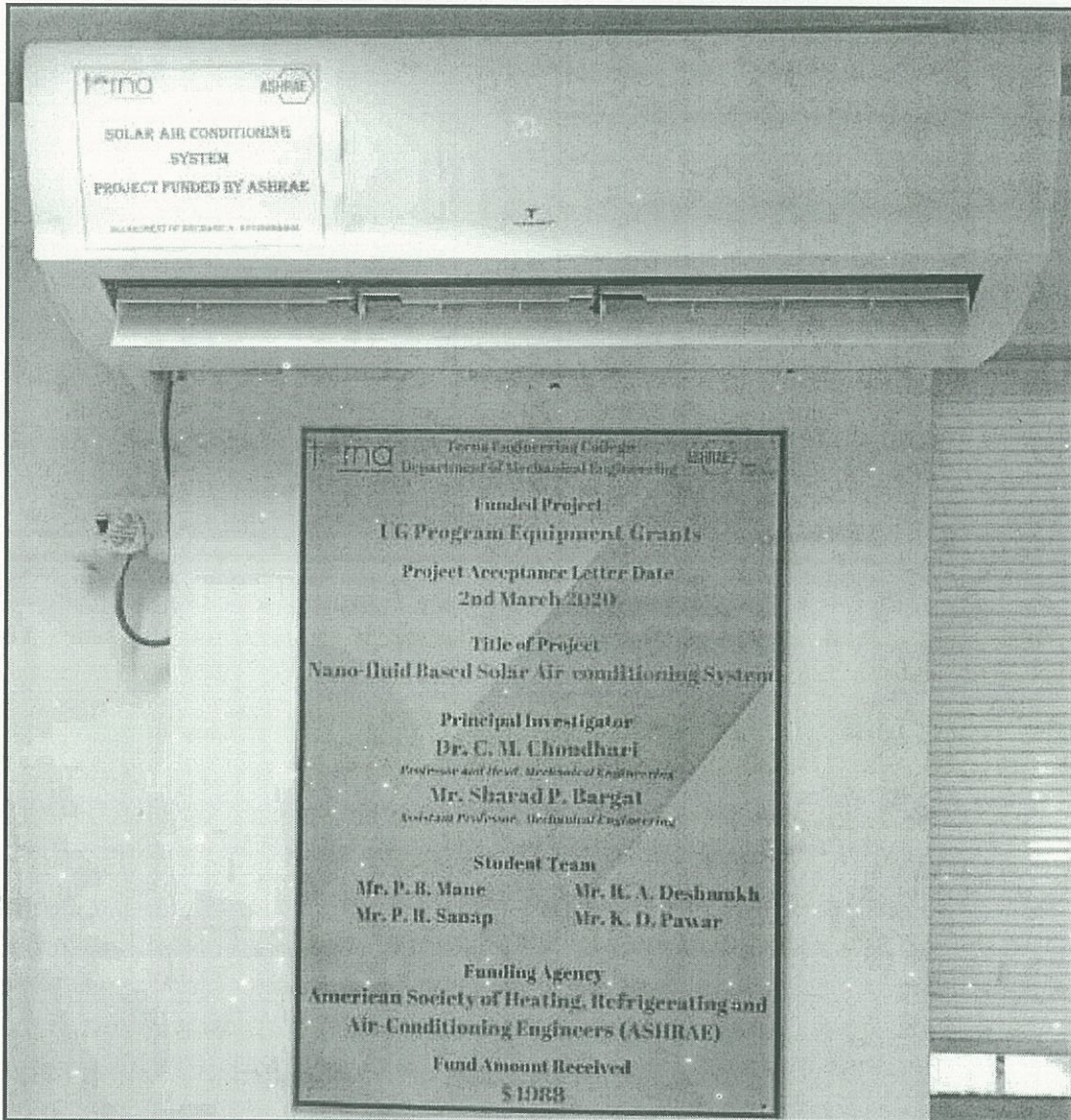
Total 45 conventional electric air conditioning units of 1 Ton capacity is available in campus. Cost per Ton of solar on grid Air Conditioning system is approximately Rs 1,40,000/-. Therefore the project cost for total 45 conventional electric air conditioning units of 1 Ton capacity replaced by solar on grid Air Conditioning system will be approximately Rs 63,00,000/-in TEC campus.

This will save large electricity consumption approximately by Rs 35,00,000/- per year. Therefore, Total cost invested will be recovered in two years span with green initiative. This will help to get 225 metric tons of Carbon Foot Print.

(0.02 metric tons:24 kWh of electricity at 0.85 kgCO₂e/kWh)





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Carbon emission calculator




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This carbon calculator is provided free to use

Show your care for the environment and communities across the World by Carbon Offsetting.

You can support Carbon Offsetting Projects that both tackle climate change and support impoverished communities across the world. Just click the Offset button after you have finished your calculation. It takes only a few easy clicks and costs only a few Pounds to balance out your carbon footprint. You also get a personalised certificate recognising your offsetting - makes an ideal gift too!



Language: English (United States)

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Household carbon footprint calculator

Enter your consumption of each type of energy, and press the Calculate button.

Your individual footprint is calculated by dividing the amount of energy by the number of people in your house.

How many people are in your household?

To calculate your full household footprint, select 'Y'.

Electricity	<input type="text" value="24"/>	kWh as a factor of 0.05	kgCO ₂ e/kWh (units kWh)
Natural gas	<input type="text" value="1576"/>	kgCO ₂ e/kWh	
Heating oil	<input type="text" value="128"/>	kgCO ₂ e/gallon	
Coal	<input type="text" value="1576"/>	kgCO ₂ e/kWh	
LPG	<input type="text" value="1576"/>	kgCO ₂ e/gallon	
Propane	<input type="text" value="1576"/>	kgCO ₂ e/gallon	
Wooden pellets	<input type="text" value="1576"/>	kgCO ₂ e/ton	

Total House Footprint = 0.83 metric tons of CO₂e

0.83 metric tons, 18.14kg of electricity at 0.05 kgCO₂e/kWh (average)




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