International Journal of Environmental Engineering and Management
ISSN 2231-1319 Volume 3, Number 3 (2012), pp.

Solar Air conditioning a hope of future

Authors: G. C. Mishra*, Prabhat Johl*,Sumit Gulati ** and prashant joh****

Dept. of Civil Engineering, Lingaya's University, Faridabad,

****B.Tech 3rd Year Student, Dept. of Civil Engineering, Lingaya's University, Faridabad.***

*****B.Tech 3rd Year Student, Dept. of Electronics and communication Engineering, Lingaya's University, Faridabad.***

***Abstract*- comparison between the solar air conditioning and normal air conditioning economically and environmentally**

I. INTRODUCTION

What role does air conditioning play today? Almost all city people have air conditioning in homes today. Air conditioning has changed the way people live on a daily basis. Air conditioning has affected the way temperature; humidity and indoor air quality are controlled indoor.

Willis carrier invented air conditioning in 1902 (Wright, 1996). Using energy transfer, the ability to remove a heat or cooling load from a given space can be achieved. Today thermostats are used to monitor a given space temperature. The persons occupying the space can change the temperature with the press of a button.

One by-product of the invention of air conditioning is the ability to change moisture content in the air. The energy transfer that takes place with an air conditioning system now adds or removes moisture from the air

Solar Air-Conditioner absorbs solar energy to heat the inside medium by using a vacuum solar collector. The refrigerant from the compressor goes through the copper coil inside the collector and undertake a heat exchange. The refrigerant heated by the medium inside the solar collector will go through a cycle inside the system cooling and heating.

It use a smaller compressor instead of standard compressors to run our system which saves electricity dramatically. A smaller compressor consumes much less electricity and works together with solar collector technology saving electricity and improving our environment.

II. ADVANTAGE OF SOLAR AIR CONDITIONING

* Solar Air-Conditioner by far fits many environments seasonal demand, which means, the COP (coefficient of performance) is increased as the solar energy is most plentiful in the summer.

* Freon, widely used by conventional air-conditioners, is damaging our atmosphere. Solar Air-Conditioner works with special medium and newest refrigerant which is completely environment friendly.

* Solar Air-Conditioner is cost-effective in energy savings and Environmental Improvement eliminating pollution.

* Solar Air-Conditioners can combine air-conditioning and solar hot water systems together, therefore enhance market attractiveness.

* Solar Air-Conditioners have all the functions as conventional Air-Conditioners do. Such as dehumidification and bacteria free ventilation to help refresh the air inside your home or business.

* Easy installation, making operation time less consuming.

Economic view

for calculation following data is considered –

* cost of electricity – Rs 5 per unit for 10 years.

* 50% efficiency is considered for solar air conditioning.

* Total Cost = cost of installation + cost of service + electricity

For Normal AC (10 years)

* Cost of installation for AC =

50x28,000 +50x1,000 = Rs 14,50,000

* Cost of maintenance for AC =

50x1000x10 = Rs 5,00,000

* Cost of electricity consume by AC =

(5x2x8x30x12x10)x50 = Rs 1,44,00,000

* Total Cost = Rs 1,63,50,000

For Solar Air Conditioning (10 years)

* Cost of installation for solar AC =

50x71,000 + 50x1000 = Rs 36,00,000

* Cost of maintenance for Solar AC =

50x1000x10 = Rs 5,00,000

* Cost of electricity consume by Solar AC =

(5x1x8x30x12x10)x50 = Rs 72,00,000

* Total Cost = Rs 1,13,00,000

NET SAVING FROM SOLAR AC

= 1,63,50,000 – 1,13,00,000

= Rs 50,50,000

PROFIT-

=50,50,000/1,63,50,000x100

=30.88%

Comparison Chart

S.No	Description	Normal Air conditioner	Solar Air Conditioner
1	Quantity	50	50
2	Price	Rs 28,000	Rs 71,000
3	Installation cost	Rs 1,000	Rs 1,000
4	Usage period	10 years	10 years
5	Electricity saving	-	50 % - 75%
6	Maintenance cost	Rs 1000 yearly	Rs 1000 yearly
7	Electricity usage	2 unit per hour	1 unit per hour
8	Total cost(installation + running for 8 hour a day for 10 years)	Rs 1,63,50,000	Rs 1,13,00,000

.

CONCLUSION

Solar air conditioning has a strong potential for significant primary energy saving. In particular, for India, solar assistant cooling system can lead to primary energy saving in the range of 40-50%. In above research it has been estimated that around 30% monetary cost is saved by installing solar based comfort system in long run. If this type of system is applied at mega-scale the profit margin will increase many fold and in this way reduce the consumption of conventional fossil fuel based electricity and simultaneously indirectly saving our environment.

.REFERENCES

[1] History of Air Conditioning Source: Jones, Jr. Malcolm. "Air Conditioning" Newsweek Winter 1997 v130 n24-A p42(2). Retrieved 1 January

2007M. Young, *The Technical Writer's Handbook*. Mill Valley, CA: University Science, 1989.

[2] San, J. Y., Lavan, Z., Worek, W. M., Jean-Baptiste, Monnier, Franta, G. E., Haggard, K., Glenn, B. H., Kolar, W. A., Howell, J. R. (1982). "Exergy analysis of solar powered desiccant cooling system". Proc. of the American Section of the Intern. Solar Energy Society: 567-572R. Nicole, "Title of paper with only first word capitalized", *J. Name Stand. Abbrev.*, in press.