

Dear Sir,

We thank you for showing interest in Blue Star's energy conserving solutions.

Blue Star, India's leading central airconditioning company, formed its Energy Management Cell three years ago with an objective of providing integrated Energy Efficient Solutions for energy conscious organisations. Companies are becoming more committed to energy savings and there are scientific tools and processes available to maximise energy savings. When a large percentage of your energy bill is due to airconditioning, who better than an airconditioning expert to help you?

Blue Star has a dedicated team of 11 energy management professionals along with a strong back-end support of HVAC engineers. The Company has about 30 Energy Managers / Auditors accredited by the Bureau of Energy Efficiency (BEE). Blue Star is the only HVAC Company in the country having so many certified energy managers / auditors.

The Company is accredited by various state level agencies like MEDA, GEDA, and TNSEB, as well as by PCRA.

Services offered by Blue Star's Energy Management Cell

- Energy Modeling and Energy Accounting
- Detailed Energy Audit for all energy consuming utilities
- Implementation of the audit recommendations backed by guaranteed savings
- Services for Monitoring & Verification (M&V)
- Performance Contracting for Energy Efficiency Improvement

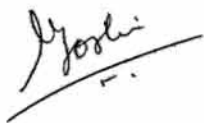
The Blue Star Advantage

- Experience of over 100 energy audits for both Indian as well as multinational companies catering to various segments like IT, Process Industry, Pharma, Engineering and Government establishments.
- Equipped with sophisticated instruments / software for data gathering and analysis.
- Strategic tie-ups with manufacturers of international repute for supply of energy efficient equipment / devices.

For more details, and a presentation on our capabilities and experience in the field of energy audit and implementation, please email us at powersavings@bluestarindia.com. You can also visit us at: www.bluestarindia.com.

Thanking you,

Yours sincerely



Nitin Joshi

General Manager,
Airconditioning & Refrigeration Service Division,
Blue Star Limited



BLUE STAR



Blue Star Service

Energy management

Blue Star at a Glance



- India's largest central airconditioning and commercial refrigeration company
- Annual turnover over Rs. 1600 crore in FY 06-07. (USD 380 million)
- 2200 employees
- Network of 23 offices and over 680 dealers across India
- 4 Modern manufacturing facilities , 5th manufacturing facility, the largest in the group under progress



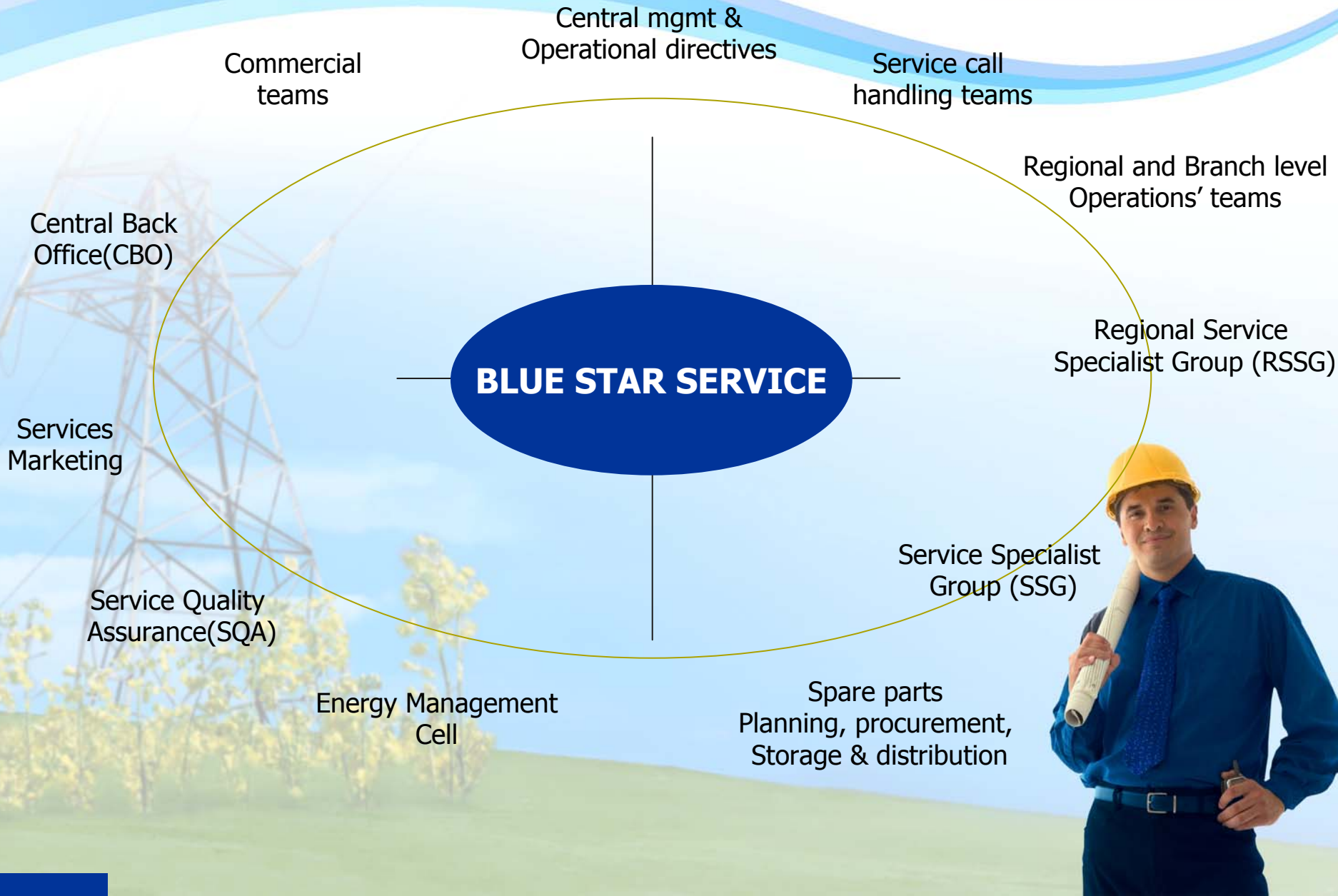
Blue Star Service



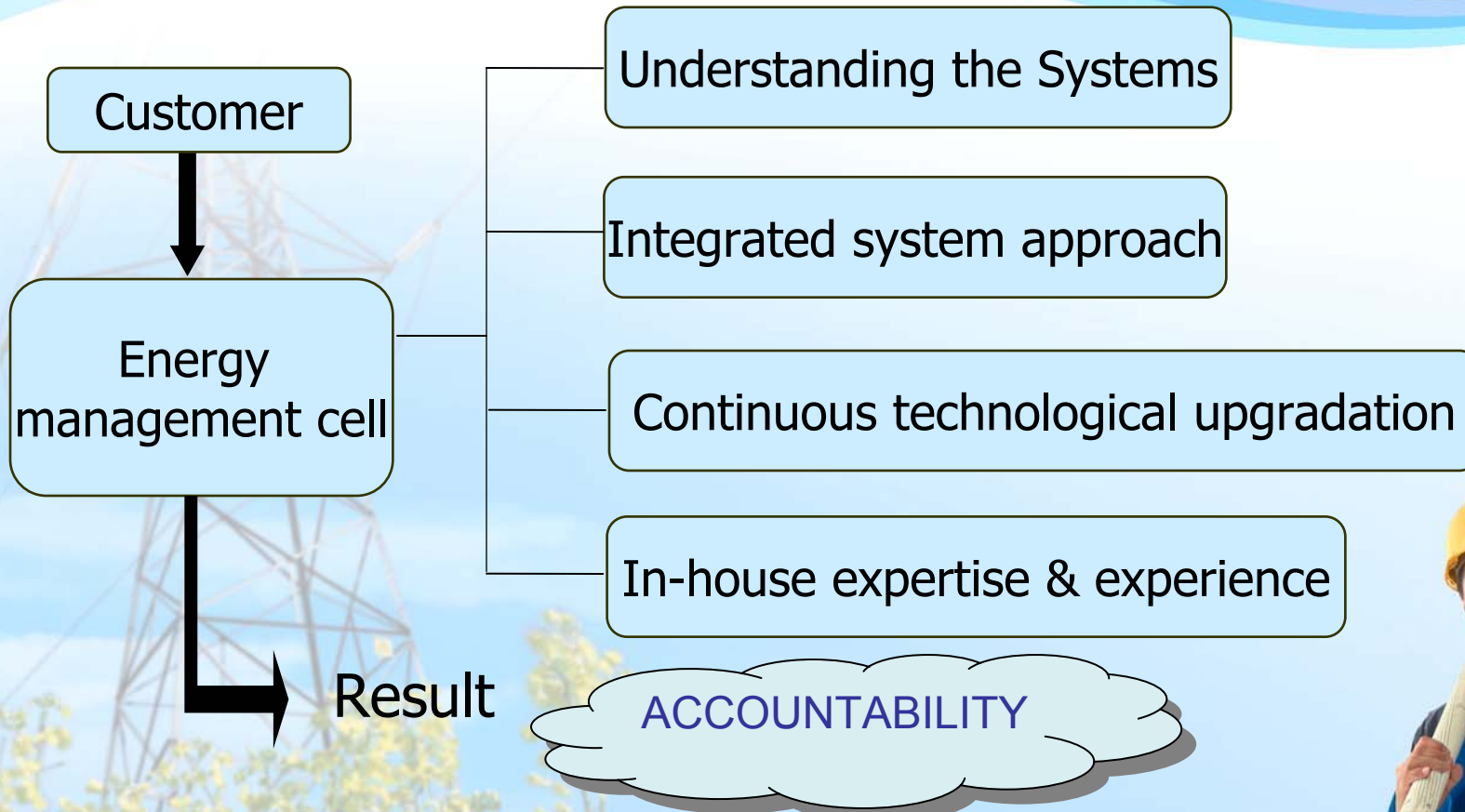
- Central Plants over 0.7 million tons
- Packaged ACs over 1 million tons
- Cooling products over 0.4 million tons
- Covering approximately 12,000 customers
- About 350 engineers
 - Over 4000 technicians
 - Over 3000 support personnel
- Dedicated specialists and contractors for special maintenance needs



Service Organization



Why Blue Star Energy Management Service?



Objective



- ⚡ To address the customer's concern for higher operating expenses for HVAC and other energy intensive utilities
- ⚡ To provide an 'Energy Efficient Solution' for Lighting system & other energy intensive utilities
- ⚡ Integrated Solution backed by guaranteed savings
- ⚡ To provide 'Turn Key' solution



Energy management Cell - Strengths



- ⚡ Cell is accredited by MEDA, GEDA, PCRA & TNSEB.
- ⚡ A team of Energy Management Professionals
- ⚡ All members are certified **Energy Auditors by Bureau of Energy Efficiency**
- ⚡ Good mix of Mechanical, Chemical & Electrical Engineers
- ⚡ Handled various energy efficiency projects
- ⚡ Command on energy audit on account of rich experience
- ⚡ Equipped with sophisticated instruments
- ⚡ Backed by advanced softwares



List of Instruments



Major Instrumentation support, few of them are :

- ⚡ Power Analyser
- ⚡ Flue Gas Analyser
- ⚡ Ultrasonic Flow Meter
- ⚡ Lux Meter
- ⚡ Electronic Flowhood
- ⚡ Anemometer
- ⚡ Thermography (Infra Red thermometer)
- ⚡ Sling Psychrometer
- ⚡ Digital Thermometer with RH facility
- ⚡ Pressure Gauge with Syphon



Software /Simulation



- ⚡ E-20 carrier (Hourly Analysis Program)
- ⚡ AHU Design
- ⚡ WeDCo (Weather data & Design Conditions)
- ⚡ Duct sizer
- ⚡ Pump flow
- ⚡ Elite HVAC software



Services offered



- ⚡ Energy Modeling and Energy Accounting
- ⚡ Detailed Energy Audit for all energy consuming utilities.
- ⚡ Implementation of the audit recommendations backed by guaranteed savings.
- ⚡ Services for Monitoring & Verification (M & V).
- ⚡ Performance Contracting for Energy Efficiency Improvement



Scope of audit



- ⚡ HVAC System
- ⚡ Lighting System
- ⚡ Demand Side Management (DSM)
- ⚡ Power Quality Analysis
- ⚡ Other Utilities in the facility like Compressed air, Steam generation & distribution, Motors & etc.
- ⚡ Possible shift over from Conventional to Non-conventional Energy Sources



Converting Operating costs into savings



OPERATING COSTS	IMPROVEMENT	SAVINGS MEASUREABLE	MANAGEMENT
<ul style="list-style-type: none">• Electricity	<ul style="list-style-type: none">• New Technology	<ul style="list-style-type: none">• Reduced Consumption/ Demand	<ul style="list-style-type: none">• Measuring and Monitoring
<ul style="list-style-type: none">• Water	<ul style="list-style-type: none">• New Tech. / System Modification	<ul style="list-style-type: none">• Reduced Water & Energy Consumption	<ul style="list-style-type: none">• Measuring and Monitoring
<ul style="list-style-type: none">• Manpower	<ul style="list-style-type: none">• Controls/ Automation	<ul style="list-style-type: none">• Reduced Supervision	<ul style="list-style-type: none">• Easy Maintenance
<ul style="list-style-type: none">• Environmental	<ul style="list-style-type: none">• Reduced Consumption/ Ref. Conversion	<ul style="list-style-type: none">• Reduced Green House Gas Emission	<ul style="list-style-type: none">• Environmental Norms
<ul style="list-style-type: none">• Fuel	<ul style="list-style-type: none">• Process Upgrade	<ul style="list-style-type: none">• Higher Efficiency/ Productivity	<ul style="list-style-type: none">• Measuring and Monitoring



Blue Star Energy Management Solution



All our audits are backed by guaranteed energy savings



Energy Audit Report



- ⚡ Executive summary
- ⚡ Current scenario
- ⚡ Observations
- ⚡ Energy conservation opportunities
- ⚡ Savings calculations
- ⚡ Investment & payback calculations



Energy Savings potential



An example-

An organisation established a decade ago, spread over 15,000 sq. ft. and housing 180 employees

- ⚡ Cost of initial airconditioning & lighting system installed (Recip Chiller) Rs. 70 lakhs
- ⚡ Annual electricity cost Rs. 40 lakhs
- ⚡ Annual energy bill of the entire system was roughly 57% of the initial investment on the system
- ⚡ In order to cut down on power costs, the organisation decided to go for a detailed energy audit at a fee of Rs.1.5 lakh (less than 4% of the annual running cost)



Energy Savings potential



- Based on the recommendations of the audit, the organisation invested Rs. 26 lakhs on new equipment and several other enhancements needed to optimize energy consumption
- The organisation could save 232,000 kWh per annum, resulting in power savings of as much as Rs. 12 lakhs per annum, recovering the investment in just over two years



Case Study : I



Background

In one of the leading Commercial Establishment in Chennai, Tamil Nadu, facility Team was facing increase in energy consumption on HVAC system over a period of time. Blue Star has undertaken Detailed Energy Audit and it was observed that the Facility has installed 3 Nos. of 100 TR Reciprocating Chiller with 4 Nos. of 10 HP Chilled water pumps.

Facility operates Chiller and Auxiliaries from 8:30 AM to 9:30 PM to maintain temperature of 23 deg. C. Based on the Load Pattern Analysis it was observed that the system will require full load only for 50 – 60 % of the time.

Proposed System

Conversion of Primary to Secondary Chilled Water Pumping System with Variable Frequency Drive.

Results

Facility Team and Blue Star team has jointly implemented the proposal. Dedicated monitoring and verification has carried out on Energy Consumption, Running Hours and Temperature.

Facility team was impressed by the Reduction in Energy Consumption both on Chilled water pumps and Compressor Motor.

Cost Benefit Analysis

Annual Energy Cost Saving
-Rs. 8.2 Lacs

One time Investment
-Rs. 7.4 Lacs

Return on Investment (ROI)
-10.8 months

Reductions in CO2 level
- 185 T



Case Study : II



Background

Audit was conducted for one of the leading multiplex in Mumbai. The cooling requirement of the multiplex is catered by central plant which consist of air cooled screw chiller. The air is distributed through air handling units which are provided with VFD as well as three way balancing valves. With VFD in operation as only control mechanism they were facing suffocation problem in the theatre. Here 3 way valve was working as primary control function & VFD as secondary control function. Hence even with VFD in the system, they were not getting the benefits of VFD.

Proposed System

After Detailed Energy audit it was suggested to use the VFD at primary control function with setting of minimum achievable frequency at 35. Beyond these existing 3 way balancing valve will work as secondary control mechanism.

Results

This proposal was implemented with immediate effect. Dedicated monitoring and verification has carried out on Energy Consumption of AHU motors. Beyond that suffocation problem was also sorted out.

Facility team was impressed by the Reduction in Energy Consumption without facing any problem of suffocation.

Cost Benefit Analysis

Annual Energy Cost Saving
- Rs. 1.2 Lacs

One time Investment
- Nil

Return on Investment (ROI)
- Immediate



Case Study : III



Background

We conducted energy audit for one of the Leading Multi million Company located in Secunderabad, Andhra Pradesh. Client's EHS Team has conducted an Internal performance audit and they have come-out with increase in productivity due to absenteeism.

Based on our audit it was revealed that the building HVAC system was designed based on 10 CFM per person and it also established that the CO2 level was 1200 PPM more than normal ambient and there were no Fresh Air Supply.

Audit result came out with supply of 18,500 CFM fresh air and revised Heat Load requires increase in Tonnage of 85 TR.

Proposed System

Option I :

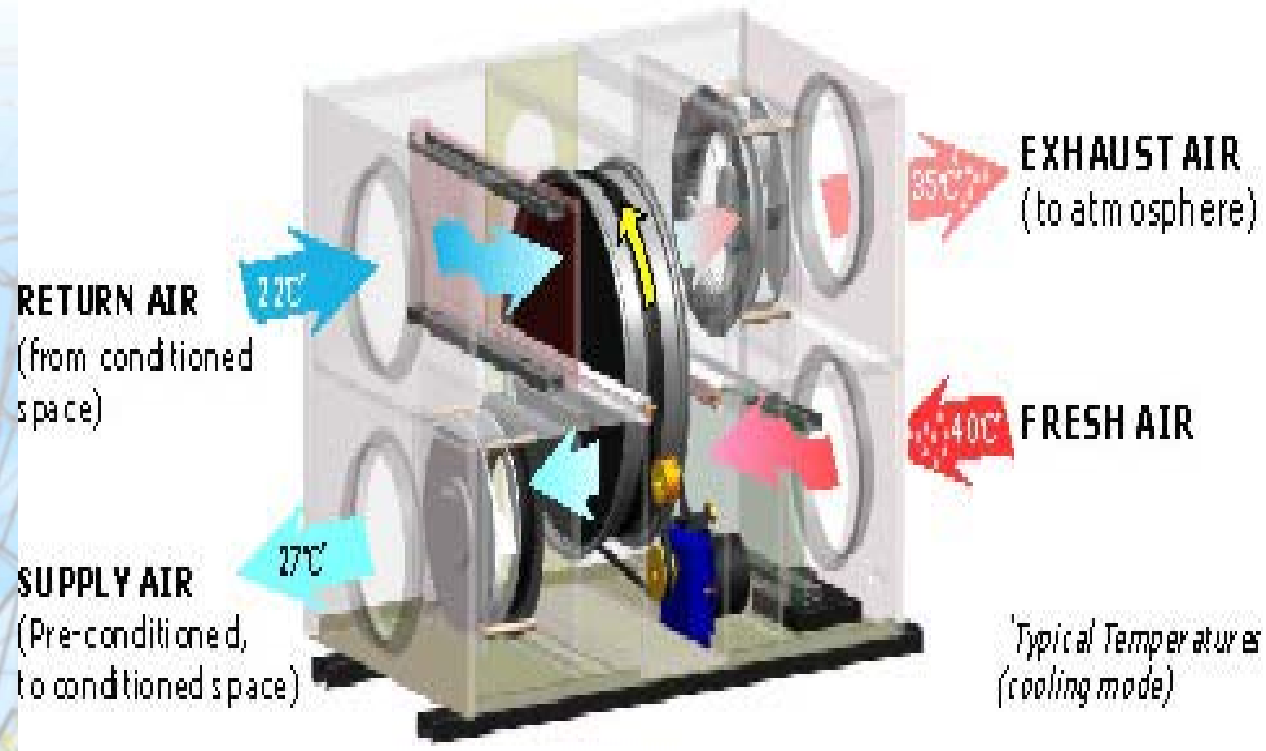
Increase in 85 TR Capacity, and Supply Fresh Air through common Treated Fresh Air AHU

Option II :

Install Energy Recovery Ventilators and Increase 40 TR to meet the fresh air requirement and heat load.



Case Study : III



Energy Recovery Ventilator



Case Study : III



Parameter	Option I	Option II
Capital Investment (Rs. Lacs)	23.46	33.87
Running cost per Annum (Rs. Lacs)	59.56	24.27
System Life (Yrs.)	10	8
Discount Rate (%)	18	18
Net Present Value (Rs.Lacs)	6.2	9.4

(As per ASHRAE 62.1 – 2004CIBSE Manual 10:2005)



Our esteemed customers



West

- ❑ 24 Karat Multiplex, Mumbai
- ❑ Coca Cola India, Pune
- ❑ Trac Mail, Navi Mumbai
- ❑ Colorcon Asia , Goa
- ❑ Indoworth , Nagpur
- ❑ Zyduz Cadila, Ahmmedabad
- ❑ Lanxess India , Thane
- ❑ Deepak Fertilizer, (WNS) Pune
- ❑ Global Tele Systems, Navi Mumbai
- ❑ Gaula Closure, Goa
- ❑ KEM Hospital, Mumbai
- ❑ Bhopal Memorial Hospital, Bhopal
- ❑ SABIC Research & Technology Pvt. Ltd., Vadodara
- ❑ Mahindra & Mahindra, Nashik

- ❑ Candico Ltd, Nagpur
- ❑ HSBC, Mumbai
- ❑ Colorcon Asia , Goa
- ❑ Patni Computers
- ❑ UTI House, Vashi
- ❑ Grasim Cement, Raipur
- ❑ McKinsey & Company
- ❑ Shopper's Stop, Mumbai

East

- ❑ Exide House, Kolkata
- ❑ Hotel Maurya, Patna
- ❑ Firtolay India, Kolkata
- ❑ Eastern Bakeries, Kolkata
- ❑ Asian Leathers, Kolkata
- ❑ IPCL, Kolkata
- ❑ East Tower, Kolkata



Our esteemed customers



South

- ❑ GE India Innovation Centre, Hyderabad
- ❑ The Hindu, Chennai
- ❑ The Indian Bank, Chennai
- ❑ Hotel Windsor Manor, Bangalore
- ❑ Wrigleys' India, Bangalore
- ❑ Linea Fashion, Chennai
- ❑ Perfetti Van Melle Pvt. Ltd., Chennai
- ❑ Intimate Fashion, Chennai
- ❑ Ispahani Centre, Chennai
- ❑ Ramoji Film City, Hyderabad
- ❑ Reuters Pvt. Ltd., Bangalore
- ❑ IBM, Bangalore
- ❑ HPCL, Chennai
- ❑ Chennai Silk, Chennai
- ❑ Pricol, Coimbatore
- ❑ Indira Gandhi Centre for Atomic Research, Kalpakam
- ❑ Danfoss Industries , Chennai
- ❑ Hotel Radha Park Inn, Chennai
- ❑ Hotel Taj Malbar, Cochin
- ❑ Southerland Global Services, Chennai

North

- ❑ Nirman Bhawan
- ❑ Udyog Bhawan
- ❑ Shree Balaji Action Medical Institute, New Delhi
- ❑ DLF Plaza Tower, Gurgaon
- ❑ National Archives of India, Delhi
- ❑ Delhi Jal Board, New Delhi

