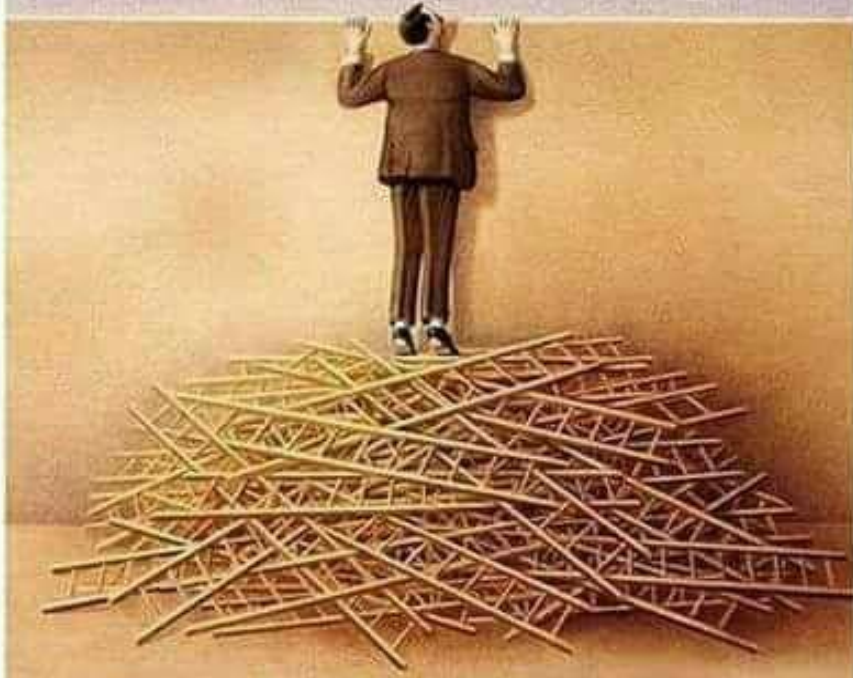


## CHALLENGES

HOW MANY RESOURCES ...  
DOES NOT MATTER.....



NEVER ENOUGH...  
IF ONE DOESN'T KNOW HOW TO USE IT.....



**EXISTING TODAY --- RETROFIT TOMORROW CHALLENGES & OPPORTUNITIES**  
**Rumi Engineer .. Godrej Energy Management & Greener Initiatives**

# NATIONAL SCENARIO

**12.8% Increase**  
in population from 2010-  
2025



Floor space in Cities  
expected to increase by  
**8.7%** from 2010-2025



Nearly **15.8%**  
increase in municipal  
water demand by 2025



# Evolution of the Corporate Response to Social Issues and Challenges



**Pre-2000**

**2000-2005**

**2005-2010**

**2010+**

***“It is not a problem”***

***“It is a problem”***

***“Let’s address the problem”***

***“It’s an opportunity”***



# The Key Drivers of Business Mega Trends & Market Shifts

## Mega Trends



Infrastructure Spending



Urbanization



Renewables



Water

## Market Shifts

**Product Performance**  
'Energy Efficiency', a key driver

**Choice of Vendor**  
'Total Solution Provider'

**Technology Changes** 'Digital Integration', the mainstay

**Supplier Qualification** Certification & References a must

**Legislation Driving Green**  
Certified Products & Professional Services

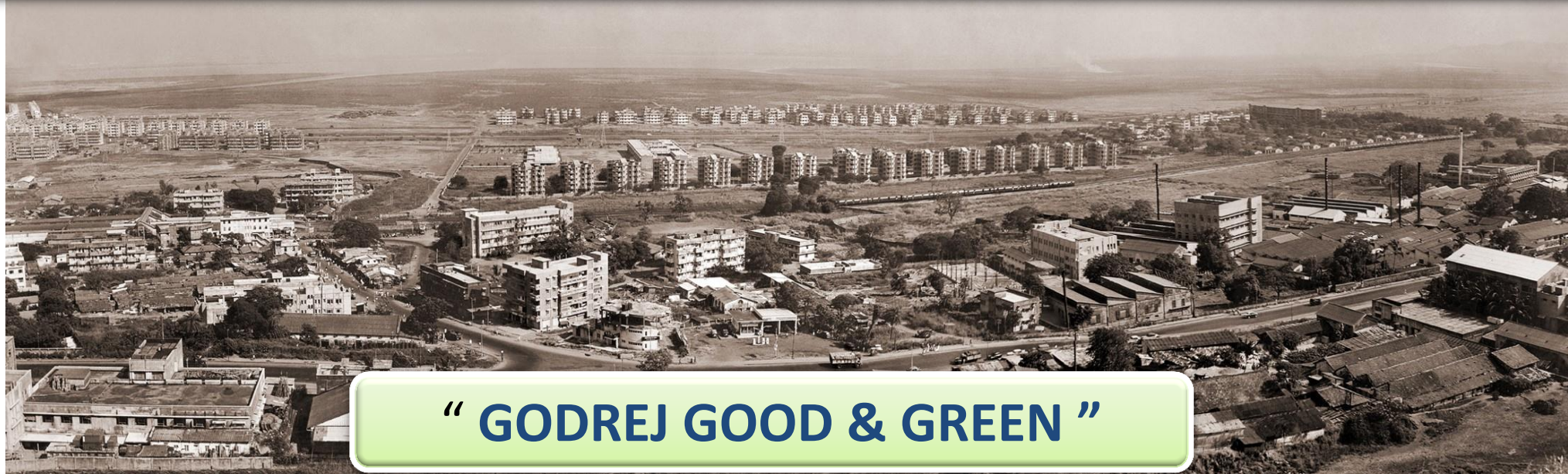
**Project Management** Speed & Quality a potential differentiator

**Industrial Productivity**  
Automation & System Integration

**New emerging Business**  
Renewables & Recovery Systems for Heat, Water & Waste



# Beyond Business : Godrej Garden Township@ Vikhroli – Inclusive Growth.



**“ GODREJ GOOD & GREEN ”**

**Ensuring  
Employability**

**Creating a  
Greener India**

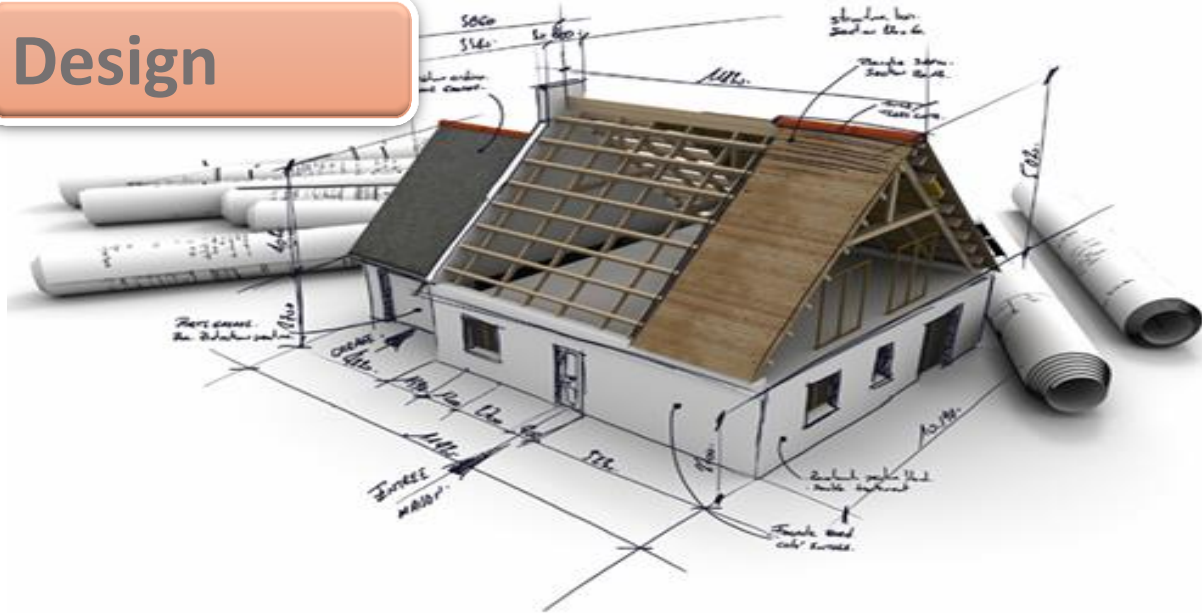
**Innovating for  
Good and Green  
Products**





# Energy Efficiency...?

Design



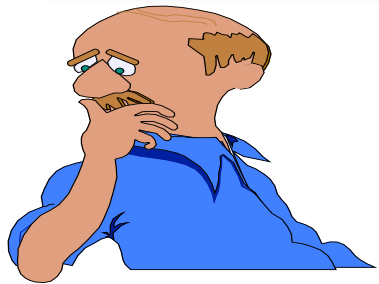
Technology



Operation  
and Maintenance



# 'DESIGN EFFICIENCY' V/S 'PERFORMANCE EFFICIENCY' .....



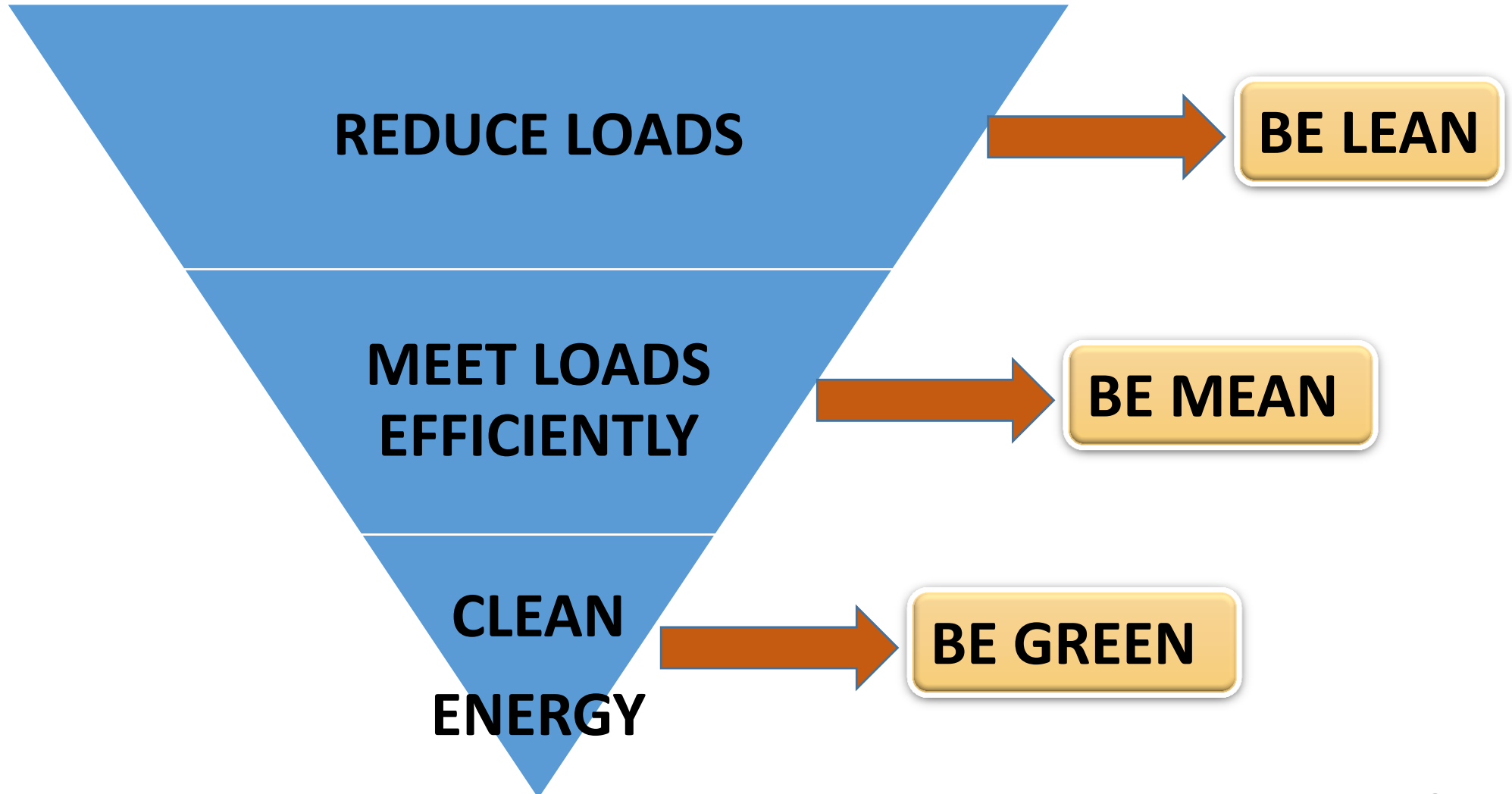
## INTEGRATED 'SYSTEMIC APPROACH' .....



## SYMPHONY .....ORCHESTRATED APPROACH

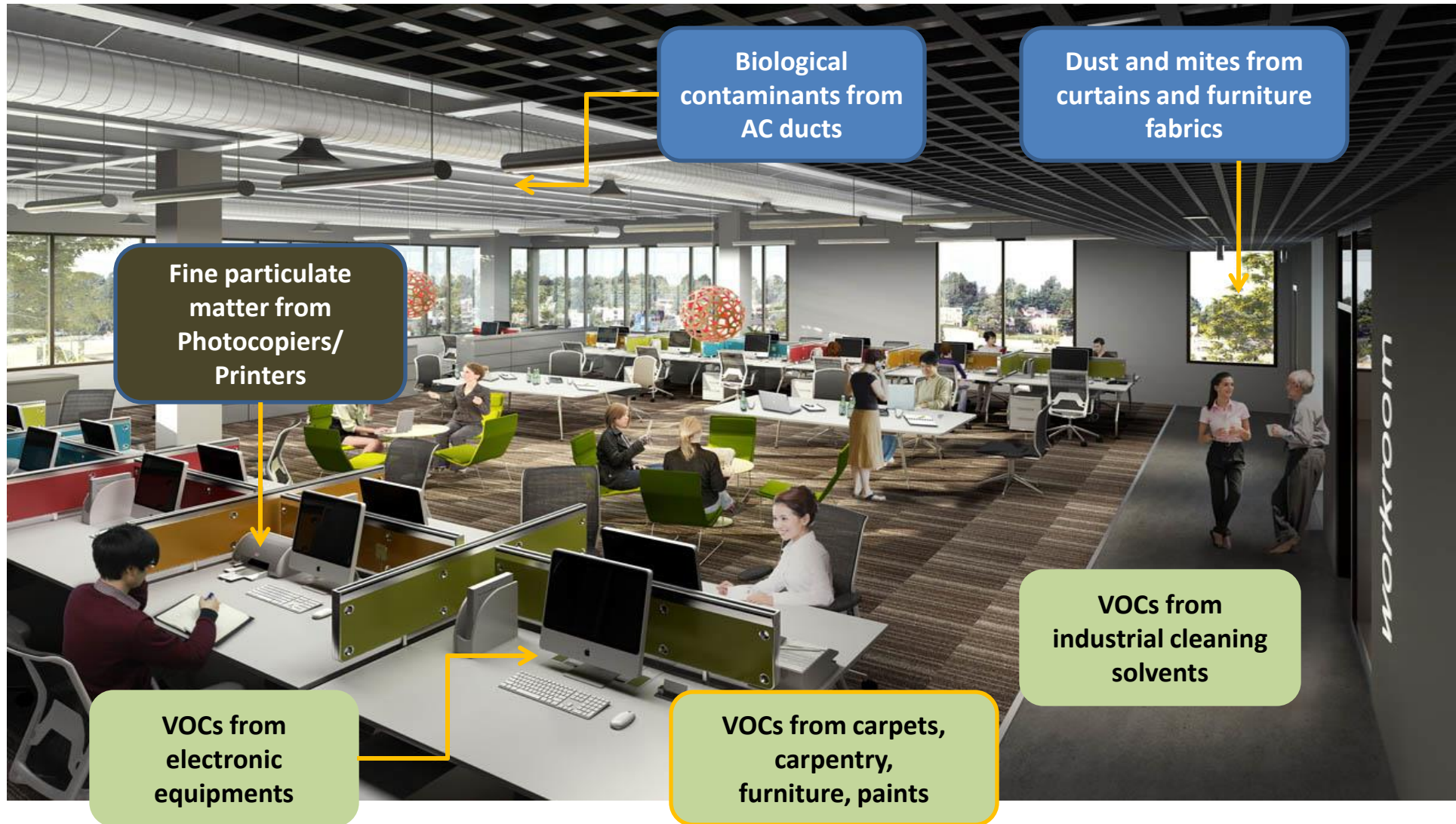


**STRATEGY :RIGHT STEPS IN THE RIGHT ORDER**





# A TYPICAL OFFICE : POTENTIAL SOURCE OF CONTAMINANTS

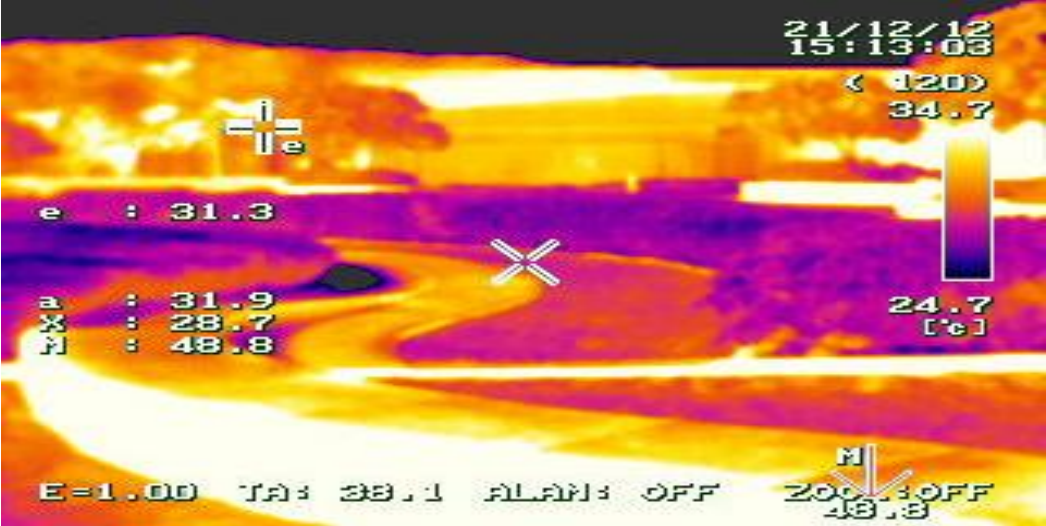


# Building Envelope

Sr. No.	Building Components	Conventional	"U" value	EE Bldg.	"U" value	% Reduction in Heat Gain
1.	External Wall	Clay Bricks	2.03 w/sq.m.*k	AAC Blocks	0.79 w/sq.m.*k	61%
2.	Roof	No Insulation	3.92 w/sq.m.*k	2" XPS/PUC/PI R	0.33 w/sq.m.*k?	92%
3.	Glazing	Single Glazing SHGC: 0.67	5.7 w/sq.m.*k	Double Glazing SHGC: 0.3	1.7 w/sq.m.*k	70%



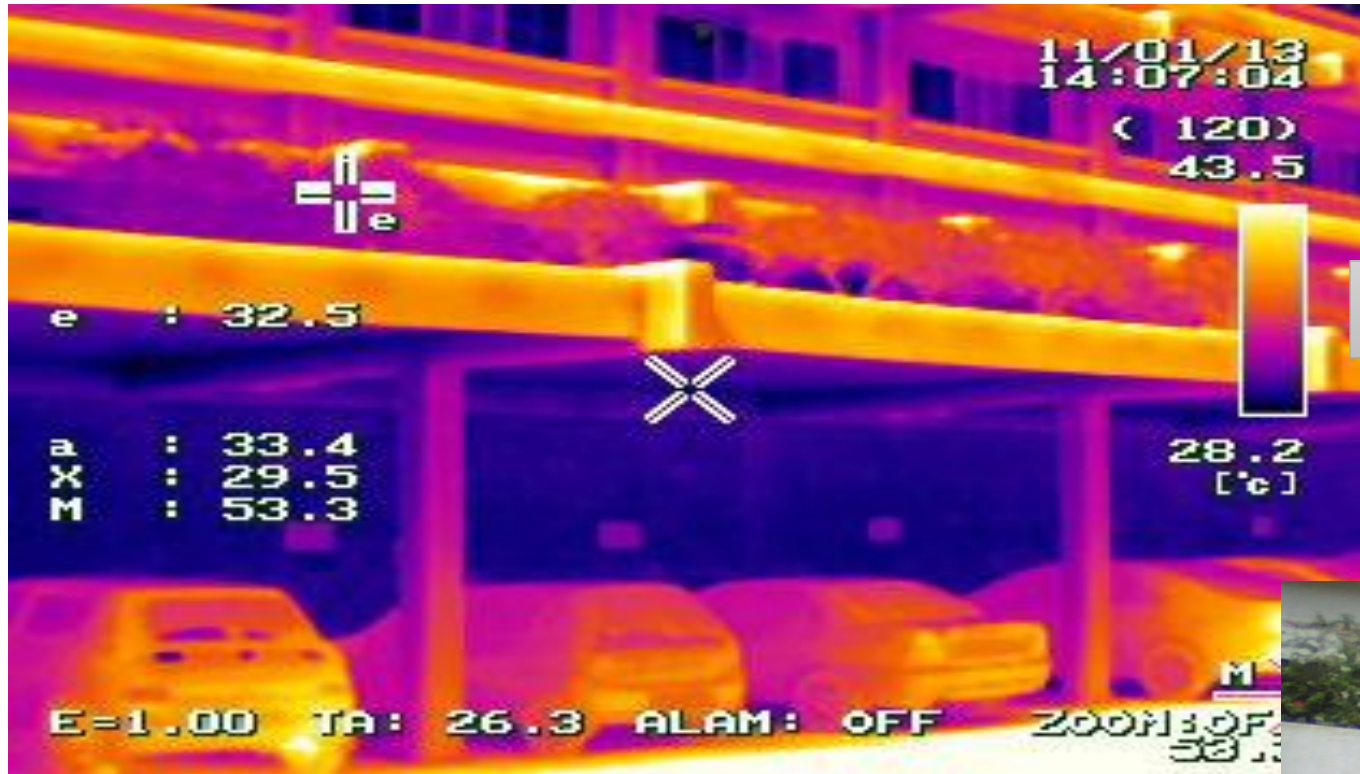
# Reducing Heat Island Effect by Roof Garden



Project: Godrej IT Park at Mumbai  
Platinum Rated CS project



# HEAT ISLAND EFFECT NON-ROOF



Thermal Gradient : 28 to 43 ° C





# INTEGRAL ARCHITECTURAL DESIGN : SOLAR SYSTEM CUM DAYLIGHTING



North : Day Lighting

Solar PV

# ATRIUM ILLUMINATED WITH SKYLIGHT







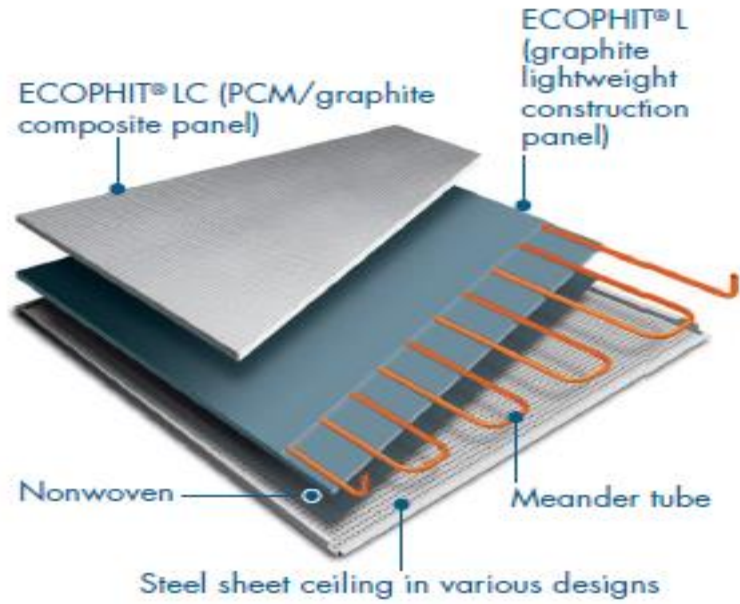
# Water Pumping System- An Efficient Pumping Solution



- ↗ Monthly Energy Consumption Reduction : 44%
- ↗ Water Pumping Efficiency Improvement(kWh/KL) : 12.34 to 3.96
- ↗ Annual Energy Saving (Estimated) : 78,000 kWh
- ↗ Annual Energy Bill Reduction : Rs. 4,90,000
- ↗ Investment on Project : Rs. 12 Lacs
- ↗ Payback (months) : 30
- ↗ Annual Reduction in CO2 Emission : 62.4 MT



# RADIANT COOLING SYSTEM





**RADIANT COOLING INTERIOR FIT OUT PERSPECTIVE**





# Godrej Plant 13 Annexe

*A Journey Towards Efficiency – Breathing New Life into an Existing Building*

PLANT 13 ANNEXE BUILDING	VIKHROLI EAST, MUMBAI
--------------------------	-----------------------

# Building Profile

Built	2008
Built up Area	24443 Sq Mt (B+G+4) Floors
Air- Conditioned Area	16050 Sq Mt
Area for BEE	14,851 Sq Mt (Appx. 100% A/c)

### Building Usage – Floor Wise

Basement Floor	Utilities & Parking
Ground Floor	Kitchen and Canteen
First Floor	Cafeteria & Office
Second Floor	Office
Third Floor	Conference Rooms
Fourth Floor	Auditorium and Banquet



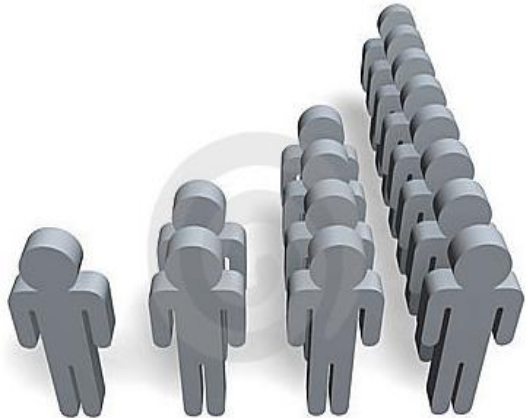


# Challenges

## Diverse Usage of Building



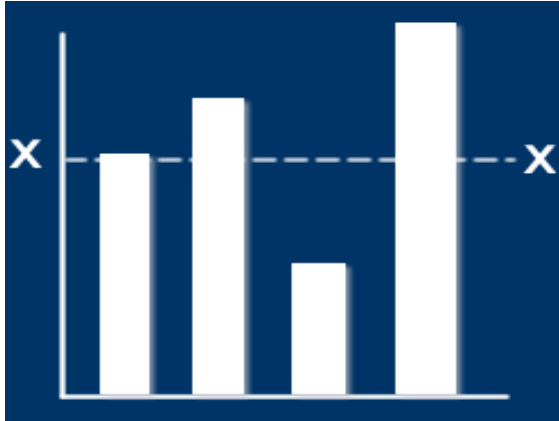
## Varying Occupancy Profile



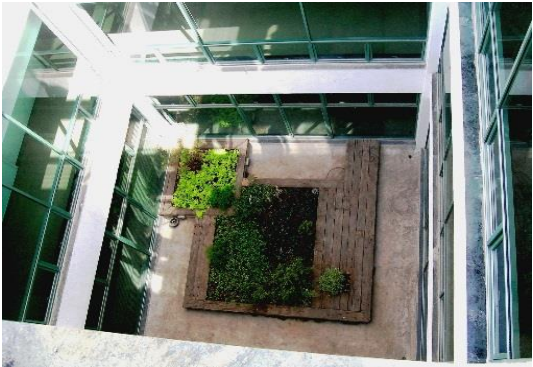
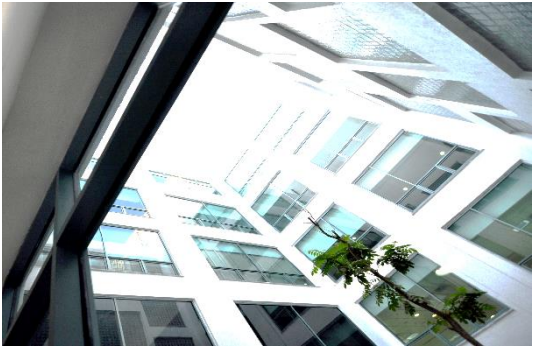
## Formation of Team



## Benchmarking



# Building Envelope : Daylight at Various Level and Locations



Daylight Tunnel



At the Entrance



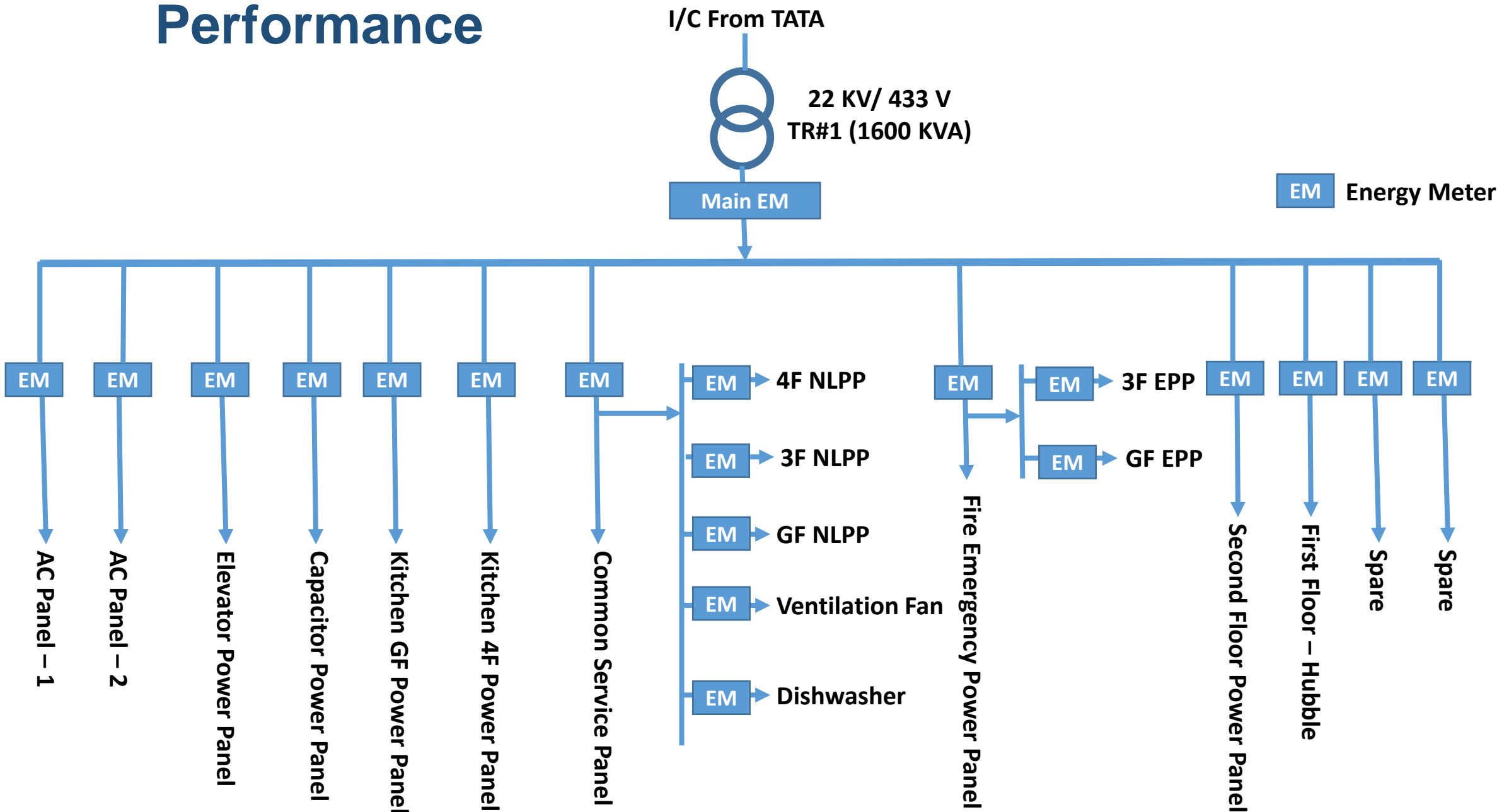
At Various Level



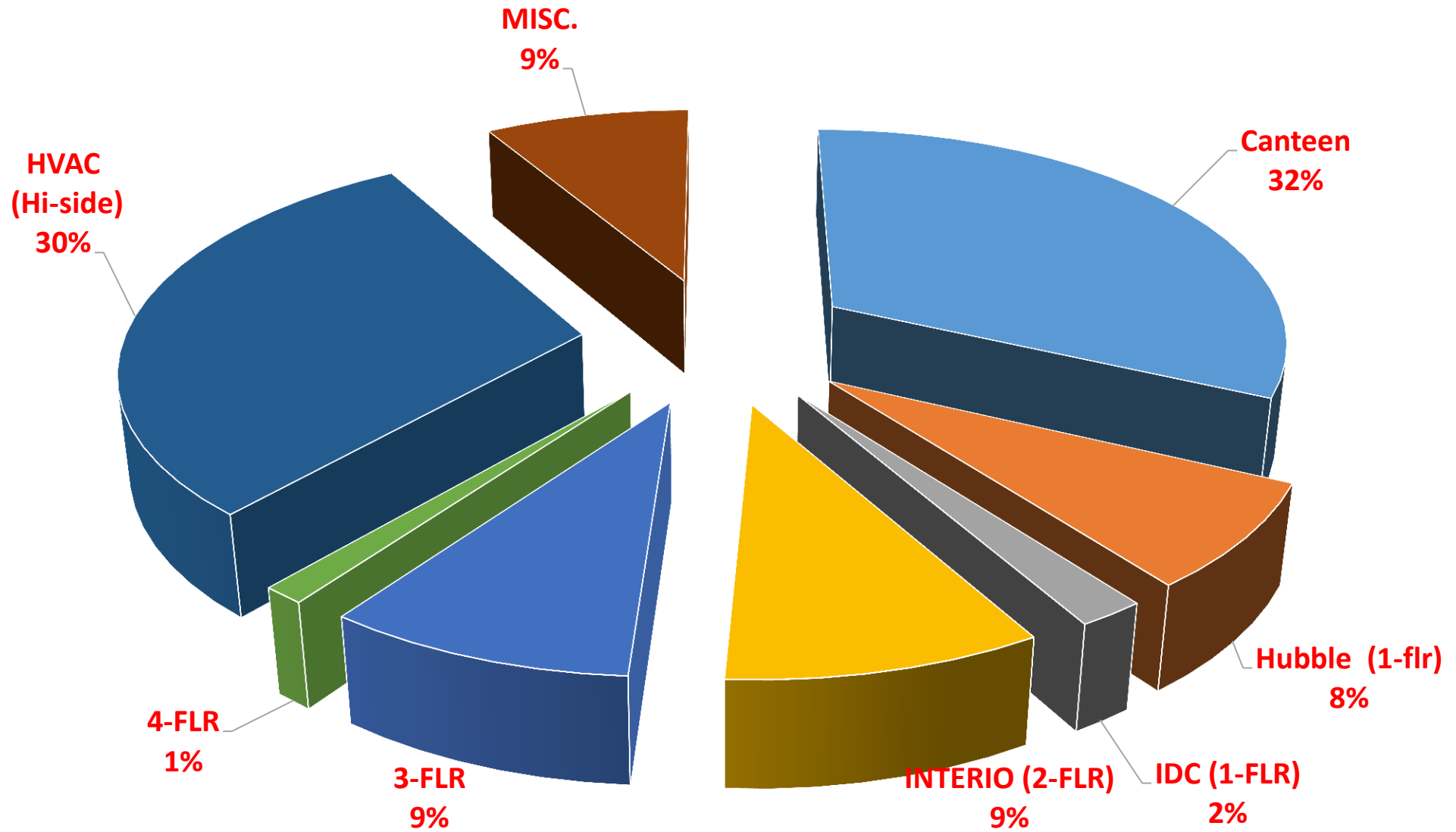
Max. Use of Daylight



# Sub Metering : Monitor & Enhance Energy Performance



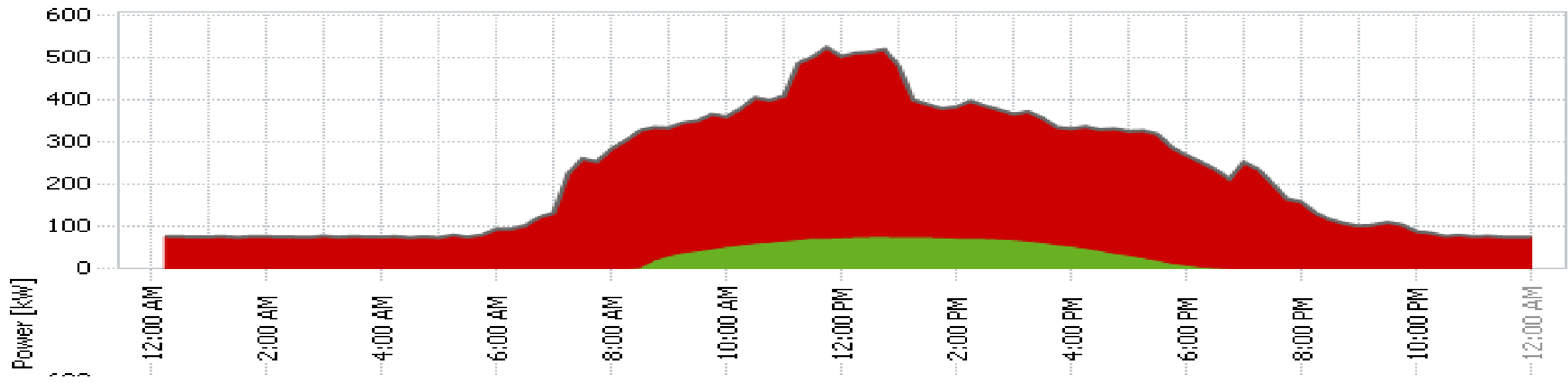
# % BREAKUP OF ENERGY USE BY ENTITY



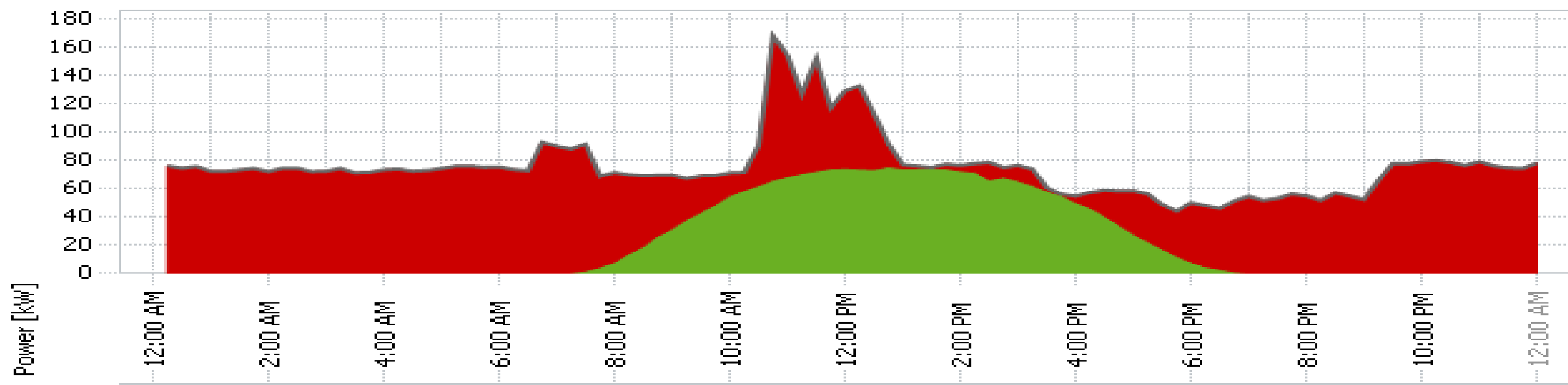


# ENERGY PROFILE (TIME OF THE DAY)

### Consumption



### Consumption



**WASTE : RESOURCE MISPLACED  
UPCYCLING**

**CANE + PLASTIC STRIPS- CHAIR / COASTERS**



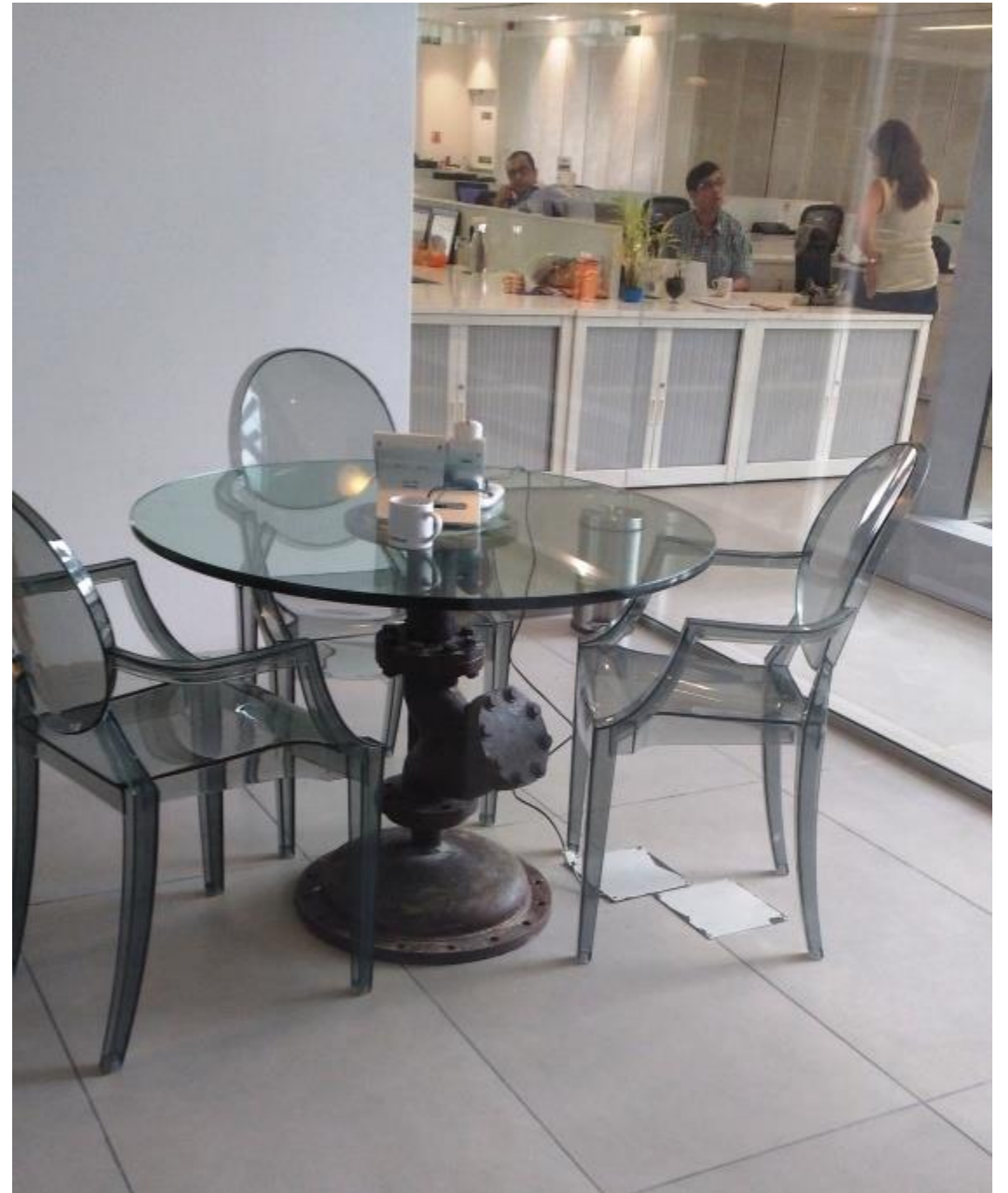
**PLASTIC STRIPS- PACKAGING WASTE**



**PLASTIC STRIPS + POTTERY**

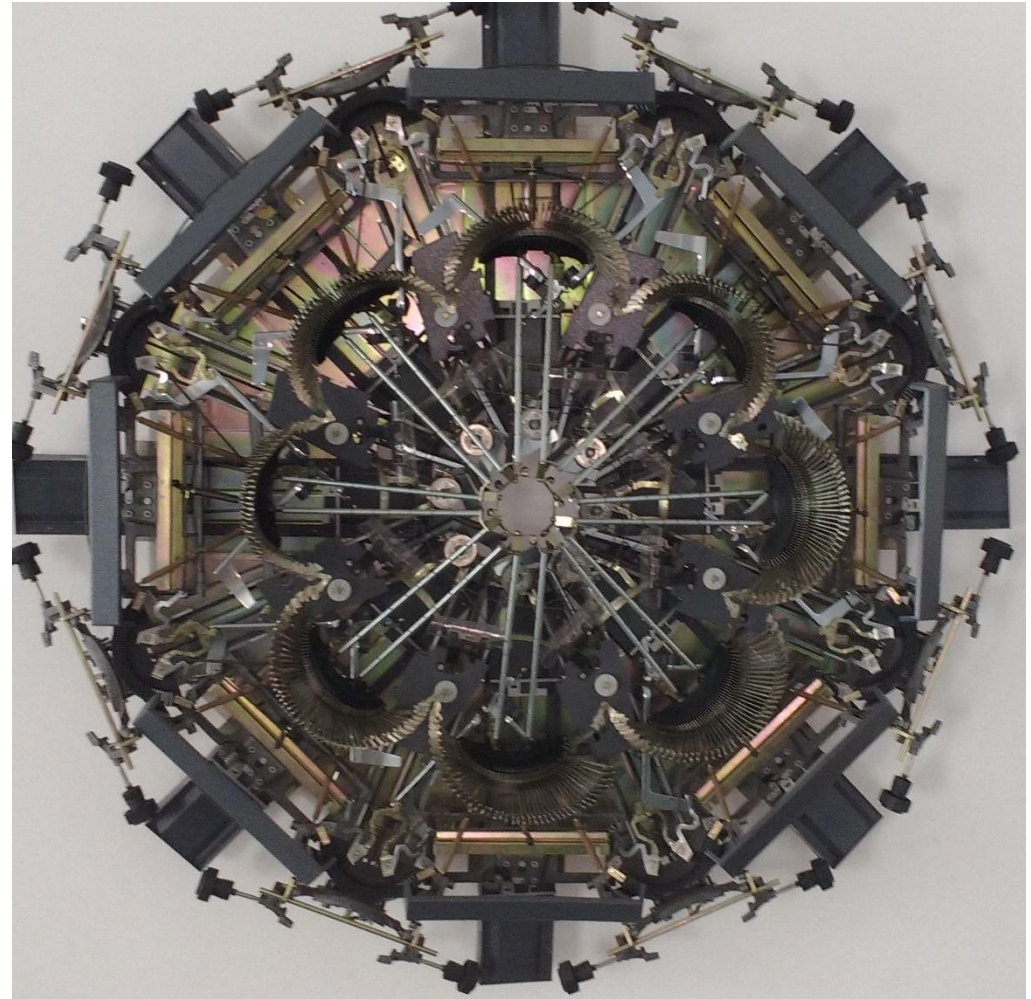








# Typewriter Sculpture @ Hubble: last stock of Godrej's Type Writers







**WE ALL SHARE THE SAME SKY  
MORE IMPORTANT  
MUST ALSO SHARE THE SAME HORIZON**