EXISTING TODAY --- RETROFIT TOMORROW CHALLENGES & OPPORTUNITIES

Rumi Engineer .. Godrej Energy Management & Greener Initiatives

CHALLENGES

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

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

Source: Mc Kinsey Report
Evolution of the Corporate Response to Social Issues and Challenges

Pre-2000: “It is not a problem”
2000-2005: “It is a problem”
2005-2010: “Let’s address the problem”
2010+: “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 EFFICIENCY’ V/S ‘PERFORMANCE EFFICIENCY’ .......?

INTEGRATED ‘SYSTEMIC APPROACH’ .....  

SYMPHONY ......ORCHESTRATED APPROACH
STRATEGY: RIGHT STEPS IN THE RIGHT ORDER

1. **REDUCE LOADS**
   - BE LEAN
2. **MEET LOADS EFFICIENTLY**
   - BE MEAN
3. **CLEAN ENERGY**
   - BE GREEN
A TYPICAL OFFICE: POTENTIAL SOURCE OF CONTAMINANTS

- Fine particulate matter from Photocopiers/Printers
- Biological contaminants from AC ducts
- Dust and mites from curtains and furniture fabrics
- VOCs from carpets, carpentry, furniture, paints
- VOCs from electronic equipments
- VOCs from industrial cleaning solvents
## Building Envelope

<table>
<thead>
<tr>
<th>Sr. No.</th>
<th>Building Components</th>
<th>Conventional</th>
<th>“U” value</th>
<th>EE Bldg.</th>
<th>“U” value</th>
<th>% Reduction in Heat Gain</th>
</tr>
</thead>
<tbody>
<tr>
<td>1.</td>
<td>External Wall</td>
<td>Clay Bricks</td>
<td>2.03 w/sq.m.*k</td>
<td>AAC Blocks</td>
<td>0.79 w/sq.m.*k</td>
<td>61%</td>
</tr>
<tr>
<td>2.</td>
<td>Roof</td>
<td>No Insulation</td>
<td>3.92 w/sq.m.*k</td>
<td>2” XPS/PUC/PIR</td>
<td>0.33 w/sq.m.*k?</td>
<td>92%</td>
</tr>
<tr>
<td>3.</td>
<td>Glazing</td>
<td>Single Glazing</td>
<td>5.7 w/sq.m.*k</td>
<td>Double Glazing</td>
<td>1.7 w/sq.m.*k</td>
<td>70%</td>
</tr>
</tbody>
</table>
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
WAS EXISTING’ YESTERDAY

RETROFITTED TODAY
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

ECOPHIT® LC (PCM/graphite composite panel)

ECOPHIT® L (graphite lightweight construction panel)

Nonwoven

Meander tube

Steel sheet ceiling in various designs
RADIANT COOLING INTERIOR FIT OUT PERSPECTIVE
Godrej Plant 13 Annexe
A Journey Towards Efficiency – Breathing New Life into an Existing Building
<table>
<thead>
<tr>
<th>PLANT 13 ANNEXE BUILDING</th>
<th>VIKHROLI EAST, MUMBAI</th>
</tr>
</thead>
<tbody>
<tr>
<td>Built</td>
<td>2008</td>
</tr>
<tr>
<td>Built up Area</td>
<td>24443 Sq Mt (B+G+4) Floors</td>
</tr>
<tr>
<td>Air-Conditioned Area</td>
<td>16050 Sq Mt</td>
</tr>
<tr>
<td>Area for BEE</td>
<td>14,851 Sq Mt (Appx. 100% A/c)</td>
</tr>
</tbody>
</table>

### Building Usage – Floor Wise

<table>
<thead>
<tr>
<th>Basement Floor</th>
<th>Utilities &amp; Parking</th>
</tr>
</thead>
<tbody>
<tr>
<td>Ground Floor</td>
<td>Kitchen and Canteen</td>
</tr>
<tr>
<td>First Floor</td>
<td>Cafeteria &amp; Office</td>
</tr>
<tr>
<td>Second Floor</td>
<td>Office</td>
</tr>
<tr>
<td>Third Floor</td>
<td>Conference Rooms</td>
</tr>
<tr>
<td>Fourth Floor</td>
<td>Auditorium and Banquet</td>
</tr>
</tbody>
</table>
Challenges

Diverse Usage of Building
- Canteen
- Office
- Training

Formation of Team

Varying Occupancy Profile

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

I/C From TATA

22 KV/ 433 V
TR#1 (1600 KVA)

Main EM

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EM   EM   EM   EM   EM   EM   EM   EM

AC Panel – 1
AC Panel – 2
Elevator Power Panel
Capacitor Power Panel
Kitchen GF Power Panel
Kitchen 4F Power Panel
Common Service Panel

EM

4F NLPP
3F NLPP
3F EPP
GF NLPP
GF EPP
Ventilation Fan
Fire Emergency Power Panel
Dishwasher

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EM

EM

Second Floor Power Panel
First Floor – Hubbell

EM

EM

Energy Meter

EM

Spare

Spare
% BREAKUP OF ENERGY USE BY ENTITY

- Canteen: 32%
- Hubble (1-flr): 8%
- IDC (1-FLR): 2%
- INTERIO (2-FLR): 9%
- HVAC (Hi-side): 30%
- 3-FLR: 9%
- 4-FLR: 1%
- MISC.: 9%
ENERGY PROFILE (TIME OF THE DAY)
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