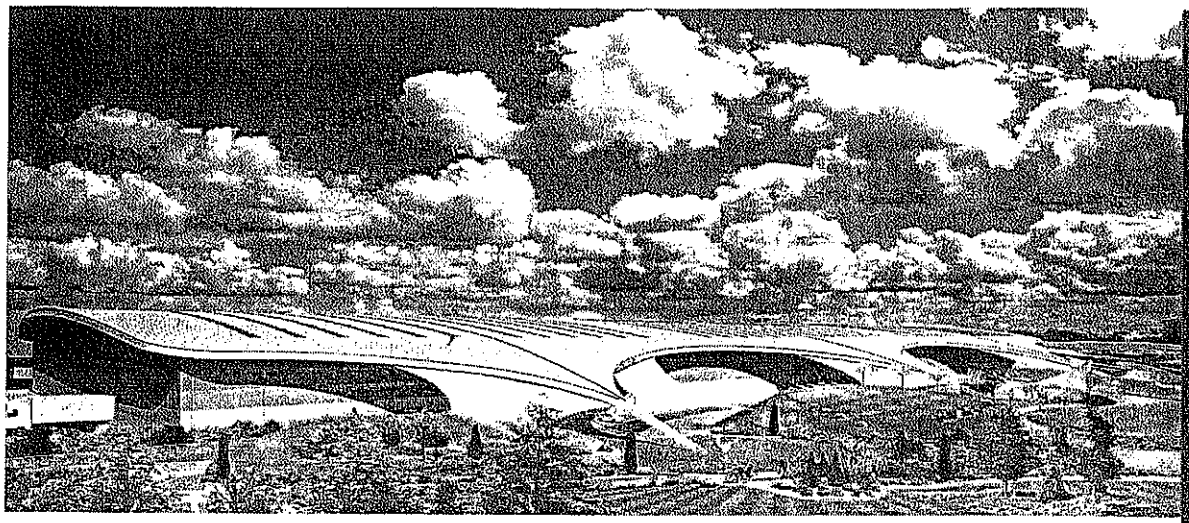


SUSTAINABLE FACILITY MANAGEMENT

- A Strategy for Business Success

James NG Kuan Hwee
MSc in Facility and Environment Management (UCL)
Email: james.ng7@gmail.com

About myself...

- 18-Yrs of experience in the FM industry;
- Involved in FM industries including
  - *Data Center*
  - *Financial institution*
  - *Manufacturing*
  - *Commercial and Business Park*
  - *Healthcare & Aviation Sector*
- Experience in the Facilities Management, Maintenance and Operation as well as Business Development of FM services, PPP Project and involved in FM Sustainability development since 2005;
- Greening of Commercial Buildings and Offices, achieving Green Mark Awards and Accreditations;
- Current appointed as the BCA Ambassador for Sustainability;

Content Page –

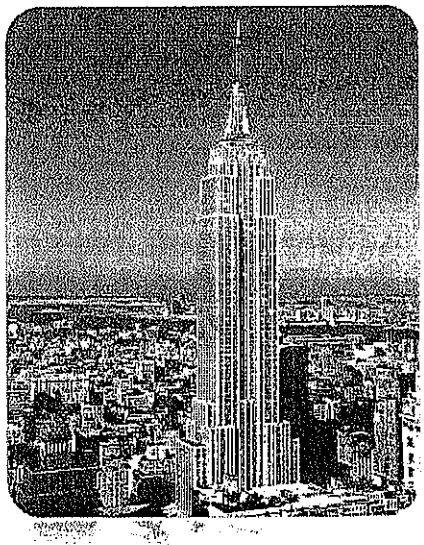
How Sustainable FM flows...

1. Introduction of Sustainability
2. Evolution of Facilities Management
3. Sustainable FM Program
4. Strategic Facilities Management
5. Case Studies (New and Existing)
6. Challenges – FM in Sustainability
7. Future of Facilities Management
8. Tips on Sustainability
9. Conclusion

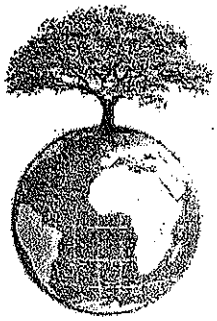
Introduction of Sustainability –

Video Presentation

- **Empire State Building:**
  A retrofitting project of a commercial building in US;



INTRODUCTION OF SUSTAINABILITY



Introduction of Sustainability –

What is SUSTAINABILITY?

- *"Defines the development that meets the need of the present without compromising the future generations needs..."*
- *"Open the opportunities for government to offer full ownership to private sectors on its property developments through Public Private Partnership (PPP) program..."*
- *"Everything that we need for our survival and well-being depends, either directly or indirectly, on our natural environment..."*
- *"Create and maintain the conditions under which humans and nature can exist in productive harmony, that permit fulfilling the social, economic and other requirements of present and future generations"*
- *"Is important to making sure that we have and will continue to have, the water, materials, and resources to protect human health and our environment."*

Introduction of Sustainability –

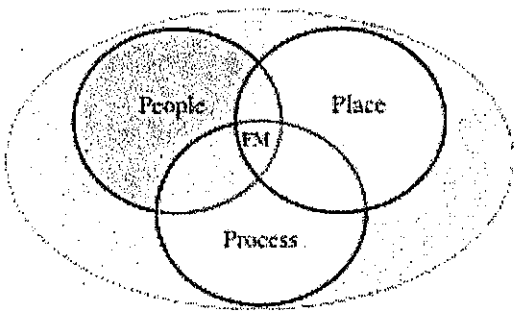
Triple Bottom-Line (TBL)

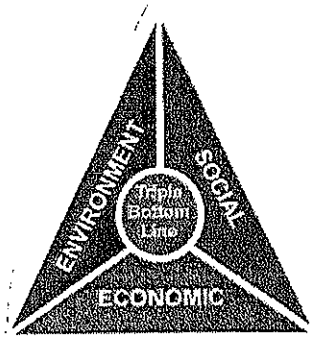
- **Traditional FM in Sustainability (3P's)**

  ~~ The convergence of people, place and process.

- **Today Sustainable Facility Management**

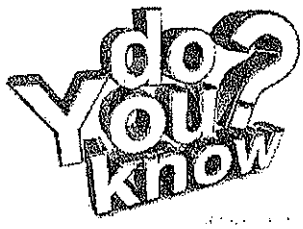
  ~~ A life-cycle approach to facility stewardship that integrates the people, place, and business of an organization with the **Economic**, **Environmental**, and **Social** benefits of sustainability.



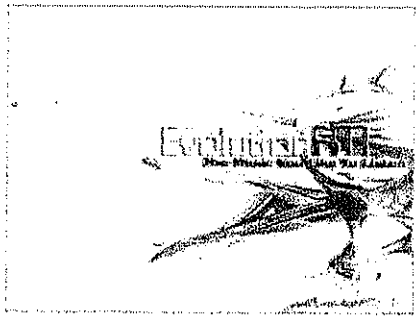


Introduction of Sustainable FM –

How much do you know?



1. Sustainable practices are not just about savings but it is about C_U_T_I_N G W_A_S_T_A_G_E_S
2. What is the most recent launch in BCA Green Mark Scheme? Green D_ _ _ C_ _ _ _ _
3. Do you get green mark point for having a GMFM for your premises? (Yes) / No
4. How much more do you think it will cost you if you were to build a sustainable building? __ %
5. How can you start Sustainability? _____

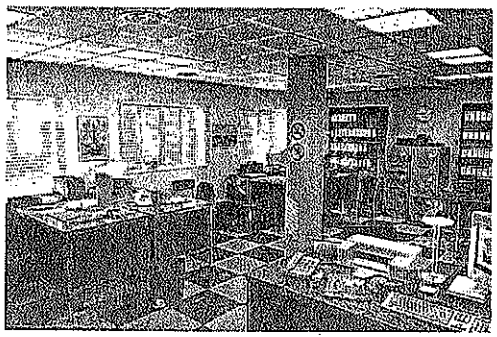


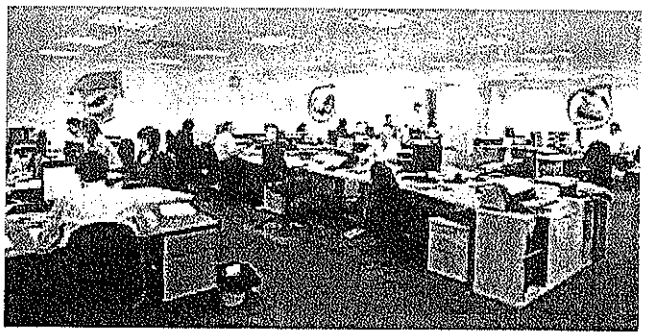
EVOLUTION OF FACILITIES MANAGEMENT

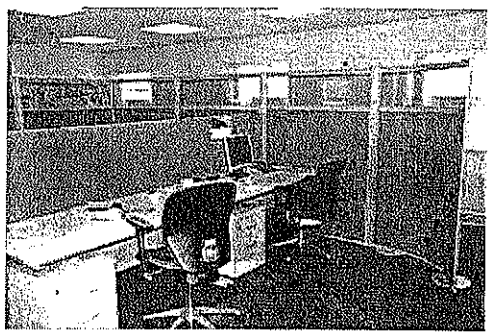
Evolution of Facilities Management –

The Traditional of FM



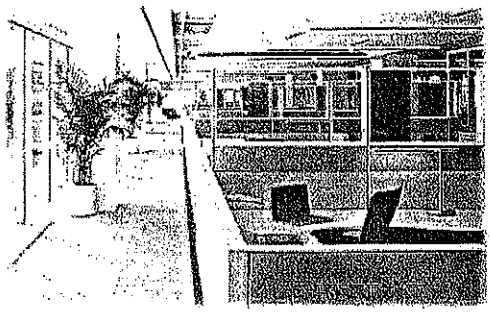




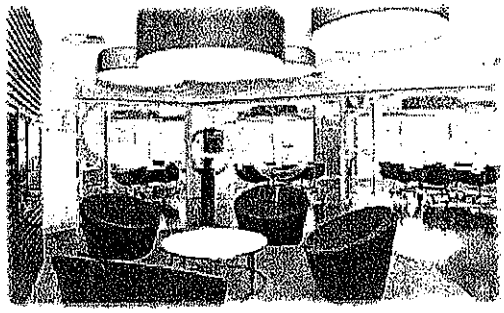


Evolution of Facilities Management –

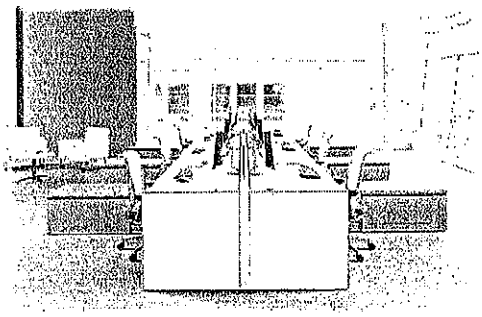
Today's Environment



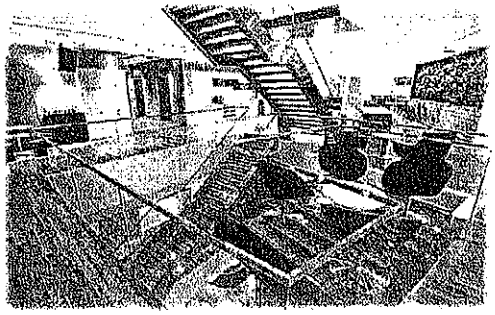
1. Open Space



2. Meeting Space



3. Agile Workstation



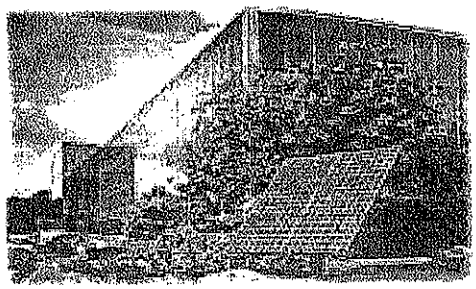
4. Connecting Spaces

Evolution of Facilities Management –

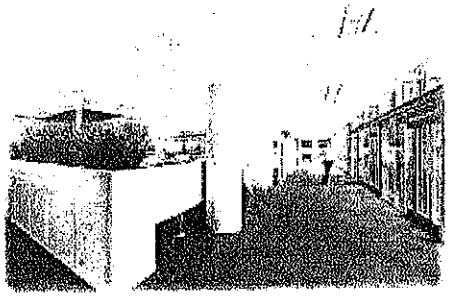
Today's Environment



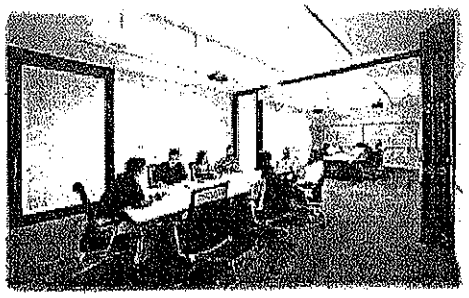
1. Open & Green



2. Renewable and Innovation



3. Open Office Design



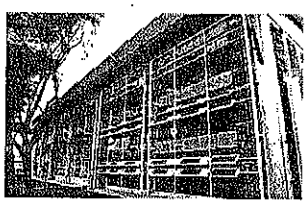
4. Flexibility and Mobility

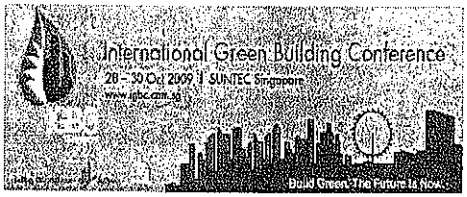
Evolution of FM –

The Trend of Sustainability

- BCA introduced Green Mark program to the industry in Year 2005;
- Masterplan, Policy making, Conferences and Seminars, Training, Profession as Green manager, SCEM, Green Label, Energy Labels etc...

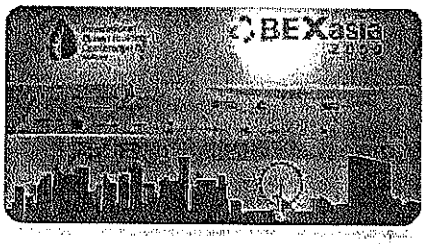
BCA GREEN MARK

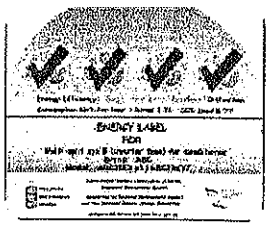




GreenLabel SINGAPORE







BCA GREEN MARK

Evolution of FM –

Sustainable Infrastructure Plans

This story was printed from channelnewsasia.com channelnewsasia.com

Title : Govt to spend S$1b on sustainable development projects
By :
Date : 26 January 2009 17:56 hrs (SGT)
URL : http://www.channelnewsasia.com/stories/singaporelocalnews/view/404920/1.html

SINGAPORE : S$1 billion has been earmarked for greening Singapore's infrastructure over the next five years.

Experts said the real challenge lies not in new developments, but in retrofitting existing buildings.

Lee Siew Eang, head, Energy Sustainability Unit, School of Design and Environment, National University of Singapore, said: "That forms approximately about 80 per cent of our existing building stocks and these lots of buildings will be operating for a long time to come, perhaps for the next 20, 30 years... we really should look into making sure that they are more energy efficient, more sustainable."

One area to target is air conditioning systems, which consume about 60 per cent of energy in most buildings.

For buildings that are inefficient, this number can go up to 80 per cent.

A government subsidy for landlords to become more energy efficient will certainly help to reduce the nation's carbon footprint.

Other initiatives to consider include more solar-powered public lighting, or motion sensor lights that remain off when no one is around.

But one problem that Singapore faces in the implementation of clean or renewable energy projects is the lack of local expertise.

Many of these projects currently rely on foreign consultants. But the government hopes to change that by subsidising professional conversion courses, so that a mechanical engineer retrenched in the manufacturing sector, for example, can undergo training, and then play a part in greening Singapore.

The Building and Construction Authority plans to train at least 8,000 specialists in areas like sustainable building design and energy management, over the next five years. - CNA/ms

S$1 billion for Infrastructure

Air-conditioning systems – 60% of energy used in most building

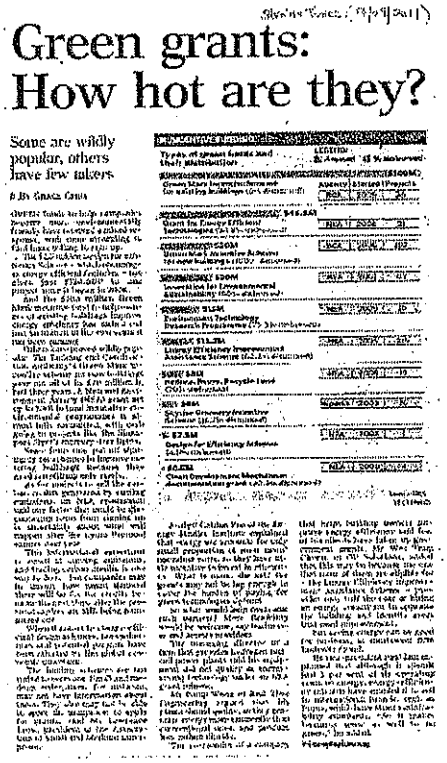
Initiatives – Solar Powered lighting, intelligent sensors

8,000 specialists will be trained

BCA GREEN MARK

Evolution of FM –

Green Funding in Singapore



Green grants: How hot are they?

Some are wildly popular, others have few takers

By Grace Chua

- Green Mark Incentive Scheme (S$100mil)
- Grant for Energy Efficient Technology (S$46.8mil)
- Green Mark Incentive Scheme (S$20mil)
- Innovation for Environmental Sustainability (S$20mil)
- Environment Technology Research Programme (S$15mil)
- Energy Efficiency Improvement Assistance Scheme (S$12.3mil)
- Reduce, Reuse, Recycle Fund (S$8mil)
- Skyrise Greenery Incentive Scheme (S$6mil)
- Design for Efficiency Scheme (S$2.5mil)
- Clean Development Mechanism Doc Grant (S$0.5mil)
- Water Efficiency Funding (up to S$15k per project)

BCA GREEN MARK

SUSTAINABLE FACILITY MANAGEMENT PROGRAM

Economic

Sustainable Solutions

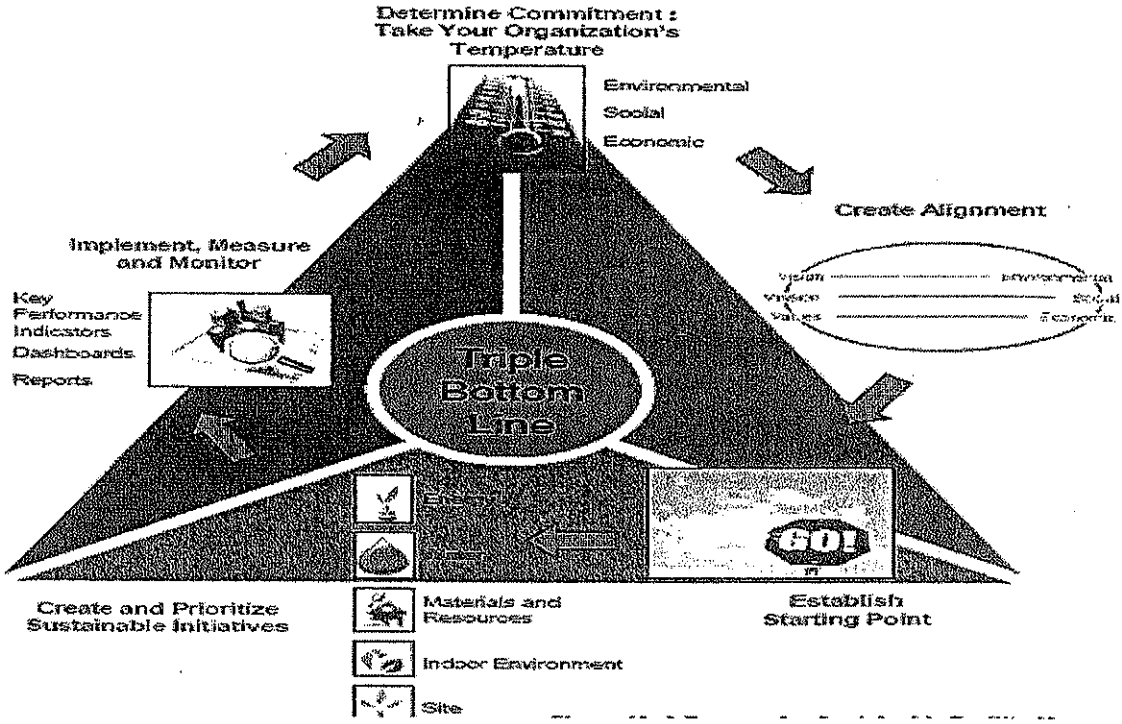
Environmental

Social

BCA GREEN MARK

Sustainable FM Program –

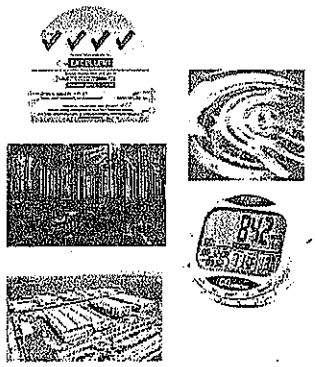
Sustainable FM Framework



Sustainable FM Program –

Sustainable FM Framework

- Looks into the strategic and operational functions as a long-term guide;
- Determine commitments, create alignment, establish start point, prioritize sustainable initiatives, implement and measure then monitor;
- 5-Key focus areas mainly :-
  - *i. Energy Efficiency*
  - *ii. Water Conservation and Management*
  - *iii. Materials and Resource Management*
  - *iv. Indoor Air Quality Management*
  - *v. Site Management*



FACILITIES MANAGEMENT & OPERATIONS

-- Delivering a Professional Service



FM Operations –

What is FM made up of?

FACILITIES MANAGEMENT

"HARD" Services

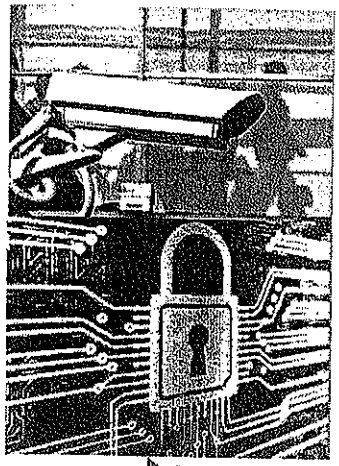
- Plant Operations (Chillers, pumps, cooling towers, AHU)
- Mechanical and Electrical System
- Operations, Maintenance & Repair
- Critical Facilities (DC) Management
- Additional and Alteration Projects
- Fire and Safety Management & Compliance
- FM Security Management
- FM Technology and its Innovation
- Facility Security and Emergency Management
- Facilities Planning & Forecasting
- Technical Audit
- Energy Monitoring and Management
- FM Sustainable Operations and Management

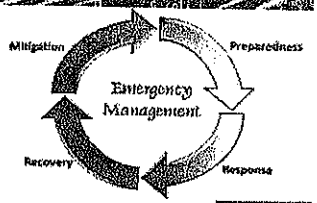
"SOFT" Services

- Front Desk Customer Service
- Room Booking Management
- Contract & Procurement Management
- Transport Management
- Cleaning and Janitorial Services
- Mail Room Management
- Pest Control Management
- Waste Disposal and Recycling Management
- Disaster Recovery Management
- Workplace Planning, Allocation, and Management
- Leasing and Tenant Management
- CAPEX & OPEX Management
- Continuous Improvement
- Greening your Premises

FM Operations –

Security and Emergency



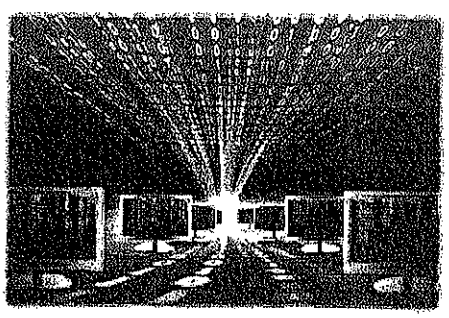


- Hold Regularly scheduled Physical Security Meetings These meetings help keep security elevated in everyone's mind
- Use Intelligent video, as a technical surveillance tool, which will help make preemptive decisions
- Information technology groups are now involved with examining how various technologies can be integrated
- Implement a Building Security Council (BSC) to promote building security
- Closed circuit television cameras (CCTV) now have wireless capabilities and are connected to the organization's server.
- Magnetic stripe and Proximity cards are currently used extensively for access
- Budget plan of security for the long-term. Best to project 3–5 years
- Video surveillance allows the FM to tour and operate the facility remotely

FM Operations –

Technology

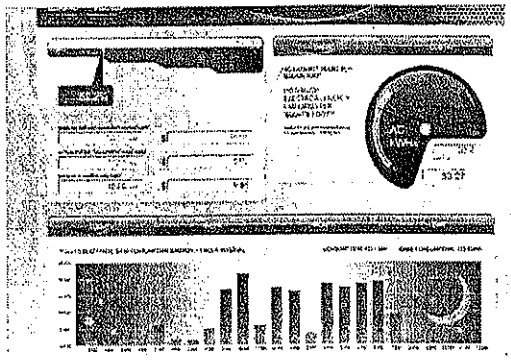
- Advanced technologies available in the FM market
- Able to collect, analyze, and maintain tremendous amount of diverse information
  - When implementing green building diversity
- Track and manage sustainability for facilities
  - Usually in early & evolving state of development
- Examples:
  - *CAFM or CMMS*
  - *BAS or BMS*
  - *EMS*



Facilities Management and Operations –

Technology

- Energy management is important
  - contributes about 30% of a typical office building's expenses
- Technologies supporting sustainable facilities
  - Environmental Monitoring System
  - Building Information Modelling (BIM)
    - 3 dimensional model that facilitates the analysing of building designs for sustainability equipment



Sustainability in Practice –

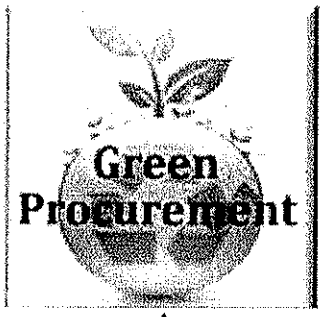
Procurement

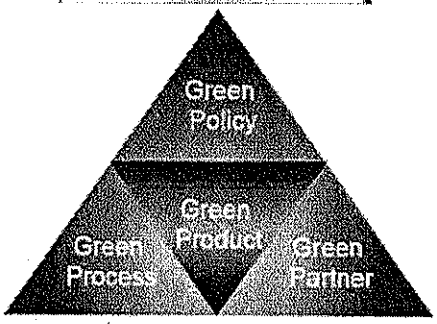
- Sustainability: Green products & services
- Require the support from procurement to work with FM
- Help negotiate to pay the lowest price for the best quality
- Assess and benchmarking
- Select potential suppliers
  - Risk Assessment
- Evaluate quotation
  - Quality,
  - Pricing,
  - Value-added,
  - Local presence, etc.



Sustainability in Practice –

Policy





FM Green Procurement & Purchasing Guidelines

These environmental purchasing guidelines of **Company** have been set up to provide guidance in the purchasing of products & services that meet the environmental goals of our company. Purchasing preference, wherever feasible, will be given to products that:

- Are Singapore Green Labeling Scheme (SGLS), Energy Star, Singapore Environment Council (SEC) or Forest Stewardship Council (FSC) certified or certified by any other equivalent certification body;
- Contain the highest possible percentage of post-consumer recycled content (at least 25%);
- Are recyclable and if possible, repeatedly so;
- Have a reduced chemical content (i.e. formaldehyde-free, Total Chlorine Free (TCF), Processed Chlorine Free (PCF), Elemental Chlorine Free (ECF)) by first looking into the material composition of potential purchases;
- Are reusable and/or comprise of a high proportion of parts that are so (e.g. rechargeable batteries, recyclable toner cartridges, refillable pens etc.); and
- Are multifunctional (e.g. three-system multifunctional copiers) and have a lifespan of more than 2.5 years so as to minimize/reduce the total number of electrical products purchased by the company.

In addition, **Company** will, whenever feasible, ensure that:

- Suppliers who offer environmentally-friendly products & services of similar quality and price to their non-environmentally-friendly counterparts and/or are able to show documentation of their supply-chain environmental/social impacts by life-cycle analysis will in principle gain a purchasing preference;
- The amount of waste associated with our purchasing methods is kept at a minimum (e.g. by considering the amount of packaging associated with the purchase, larger shipments to reduce transport & delivery volumes etc.);
- Items, furniture or equipment that are to be disposed of are either recycled via a registered recycling collection service provider or donated to a charity/charitable organization or equivalent;
- A cost-to-environmental-benefit analysis will be carried out should the most environmentally-friendly option be not available due to only financial constraints; and
- A special waiver report is to be submitted if the final purchase decision does not comply with the above-stated guidelines.

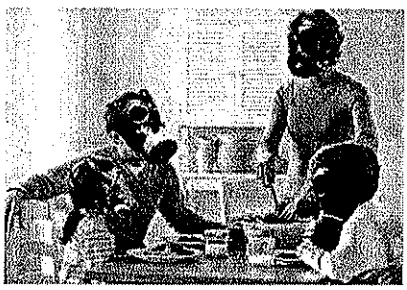
Company's FM green procurement & purchasing guidelines are in line with the company's commitment to Health, Safety, Security & Environmental (HSSE) performance. By adopting these guidelines **Company** hopes to enhance our use and support of producers & suppliers of environmentally responsible products & services as part of our long-term commitment to reducing our impact on the environment.

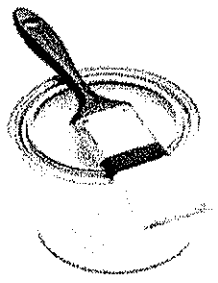
Sustainability in Practice –

Indoor Environment Quality

- Improvements in Indoor Air Quality (IAQ) are a major issue for facility management
- Any facility manager who has dealt with "funny smells" in the office OR employee reactions after television news shows relating "sick building syndrome" information, knows how important employee comfort and safety can be in the workplace
- US Environmental Protection Agency (EPA) estimates that indoor air quality averages 2 – 5 times worse than outdoor air, and can cause negative productivity impacts in commercial buildings
- VOCs found in many products like carpet or wall covering adhesives, paints, cleaning products and copier emissions



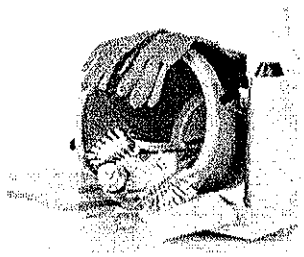


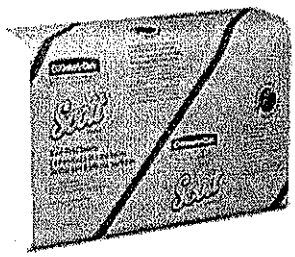


Sustainability in Practice –

Green Products

- Since mid-1990s Sustainable or green products and service have been on the rise
- Today, Green Products are more readily available and continue to grow in number and quality as more users demand green products
- Pricing is also falling as more products create competitive pricing in the marketplace



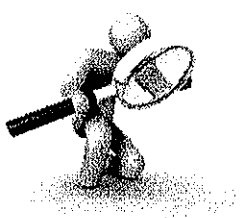


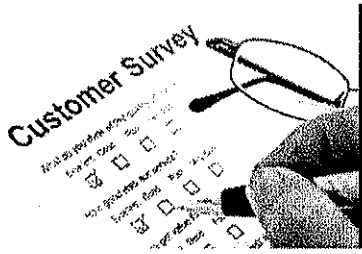


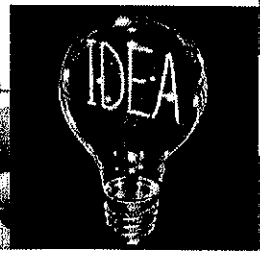
Sustainability in Practice –

Continuous Improvement

- To ensure the premises are constantly refresh with new ideas and look
- Challenging yourself regularly on the work achievement
- If you don't continuously improving, you will be moving backward
- Suggest an improvement idea each year
- Ideas could be generated from surveys and feedbacks (e.g. operation issues, improvement etc.)
- CI contributes to Motivation of Users, Continuous Availability assurance and ensure a Quality Workplace



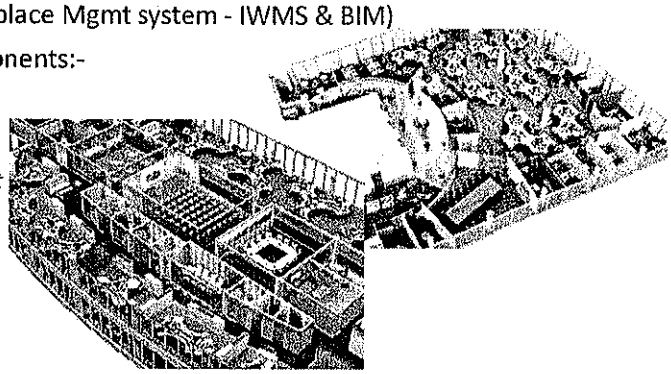




Sustainability in Practice –

Space Planning and Management

- Every management must have a Space Strategy that supports the organization's objectives and reflects its culture
  - *Occupy Owned Space, permits maximum Control*
  - *Occupy Leased Space, permits maximum Flexibility*
- Establish Ownership of Space for accountability, else you will never be able to manage it
- Forecasting of Space requirement is a challenge for FM if the business does not know the expansion/contraction plan
- Modern office uses Technology to give FM the ability to manage space efficiently and effectively (e.g. Integrated Workplace Mgmt system - IWMS & BIM)
- An IWMS integrates 5 key components:-
  - *Real Estate Management*
  - *Project Management*
  - *Facilities and Space Management*
  - *Maintenance Management*
  - *Environmental Sustainability*

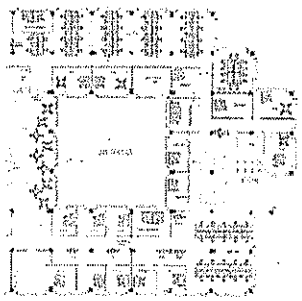


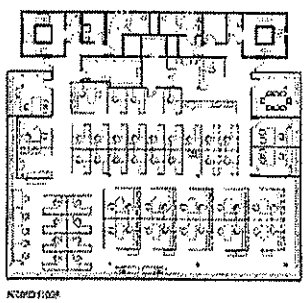
Sustainability in Practice –

Space Planning and Management

Key Space Challenges for FM:

- What type of system furniture is efficient?
- Should contractors be given a seat? Or agile workstation?
- How do we implement Agile working in organization?
- How much space should be carved out for agile and permanent seating?
- Increase capacity but with lesser space required?
- Will you get less recognized in performance if you mobile working?

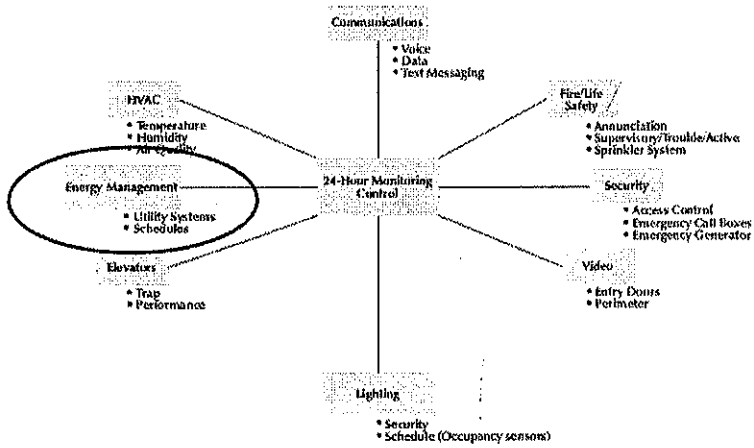




Sustainability in Practice –

Energy Monitoring and Management

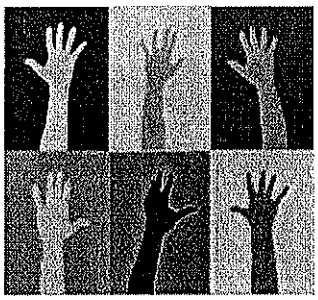
- It is part of the entire 24-hr monitoring control in a premises
- Monitors the entire building or office utilities, integrating with SMS paging system
- You can't manage energy if you don't understand it (need to measure)
- If you can measure data, you can analyze the problem/compare
- An Energy Committee should be setup to monitor and review the energy consumption monthly
- Energy monitoring and management is an important role in FM to ensure the sustainability of the premises
- Challenge ourselves to reduce the amount of energy utilized yearly through monitoring



Sustainability in Practice –

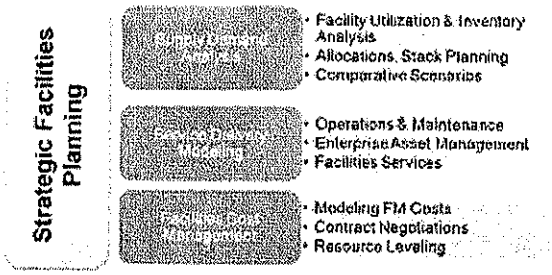
Green Committee

- Sets the key performance indicators that the company will like to achieve
- Monitor and report annually the results achieved as compared with KPI
- Established activities relating to sustainability and greening of your premises
- Recognized as the key drivers and supported strongly by the Senior leaders in the organization
- Must be voluntary instead of following instruction







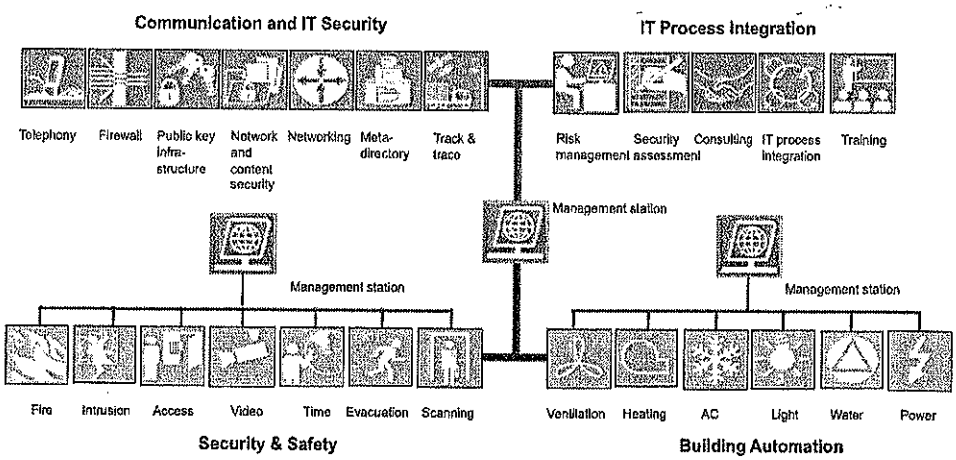


STRATEGIC FACILITIES MANAGEMENT

-- A Sustainable Solution towards efficient environment

Strategic FM –
Integrated Management & Operations

INTEGRATED FACILITY MANAGEMENT



SOURCE: Siemens Building Automation Systems

Strategic FM –

Auditing your premises

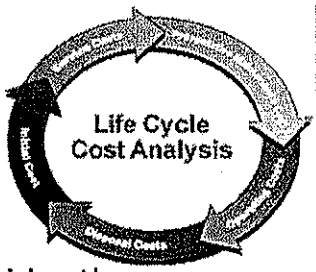


A building audit describes the current condition of all buildings and provides major projections of operational costs, maintenance costs, major repairs and capital improvements.

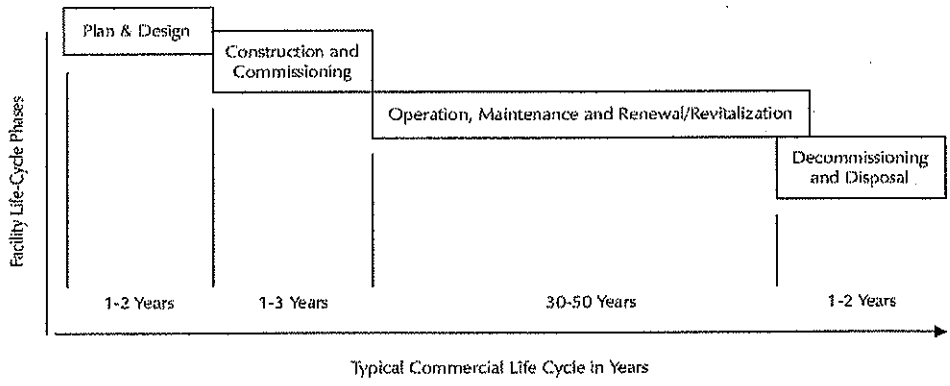
- *Know your energy consumptions including electricity and water (Monthly monitoring and reporting)*
- *Plant room Energy Auditing – Do you have an energy team? (Monthly meeting)*
- *Performance of the M&E equipment (Yearly)*
- *Facilities documentations and filings including finance (Yearly)*
- *Space utilization rate (Quarterly)*
- *Security Audit (Yearly)*

Strategic FM –

Life Cycle of a Building



- The ongoing green operation of a building provides the biggest impact facility managers can bring to sustainability
- The life cycle of a building reflects the largest investment of time and resources during the occupancy and operations and maintenance phases

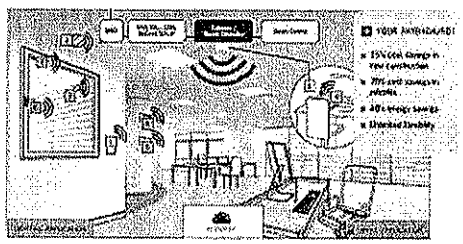


Strategic FM –

Adapting with Users

- Occupancy and operation of a green building is still a new experience for many employees
- Time used to educate employees moving into a sustainable building or spent training facility staff on highly integrated equipment is essential to maximize the benefits that can be obtained with proper usage and operation
- Employees unfamiliar with automated sensor controls that turn-off lighting may need to be educated to plan periodic movement to avoid having the lights go out on them
- While it might be a brief distraction, reoriented habits can result in tremendous savings for organizations
- No need to keep a room or area lit if no one is onsite. Sensors enable FM to do this without manual setbacks



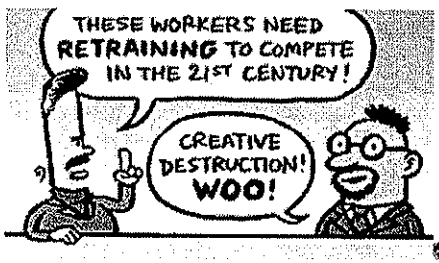


Strategic FM –

Re-Training



- Retraining facility management staff for new automated or integrated systems is required, especially if this is the first major change that your organization has experienced
- It may be difficult for some "wrench-turner" to learn new electronic or wireless relay setups and configurations
- Manufacturers often provide needed training with or supplemental to the purchase of these systems
- The changes that automation and integrated systems provide can sometimes require re-organization within the facility staff





Strategic FM –

Continuous Learning (Productivity)

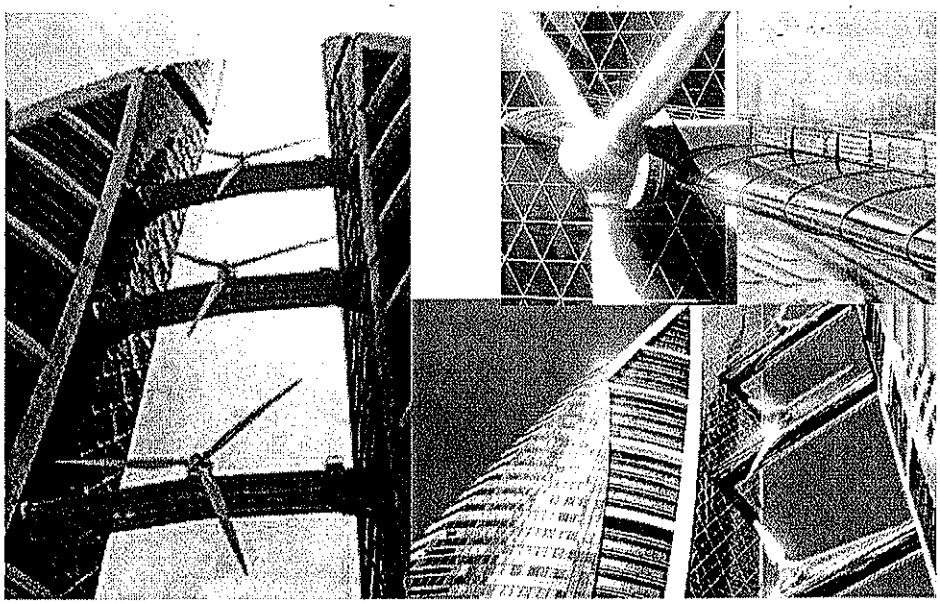
- Certificate & Diploma in FM related courses (GMFM, GMM, GMP, BIM, CFM, SCEM)
- Degree in Facilities and Events Management
- Degree in Project and Facilities Management
- MSc in Facility and Environment Management
- MSc in Sustainable Building Design Management
- Increase productivity allow Sustainable operations (uplift staff capabilities, maintained/reduced headcount with additional job scopes)

TEMASEK POLYTECHNIC
NGEE ANN POLYTECHNIC
SINGAPORE POLYTECHNIC
BCA ACADEMY of the built environment
UCL
SIM UNIVERSITY
NUS National University of Singapore
Singapore Chapter IFMA International Facility Management Association
FMWorld
RICS

Strategic FM –

Innovation in FM Sustainability

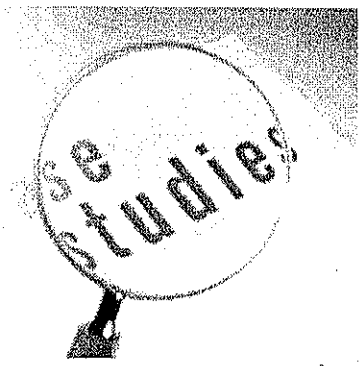
- 3 Wind Turbine blades installed on the Bahrain World Trade Center – a Twin Skyscraper Complex



Strategic FM –

Innovation in FM Sustainability

- Innovation in FM Sustainability is different in Design Sustainability
- FM Innovation normally comes after the building or office completion
- It can cost much lesser in FM Innovation for some ideas
  - **Example** – it may just cost a security access card reader to be innovative (i.e. common staircase between floors)
  - **OR** – it may just cost a S$30/- for a sensor that can automatically cut-off electricity (i.e. task lighting)
- Innovation in FM Sustainability doesn't just happen thru' spending money but thru' some "thinking" or "brainstorming"
- No Limit for Innovation in FM Sustainability



CASE STUDIES

- Building a New Sustainable Premises

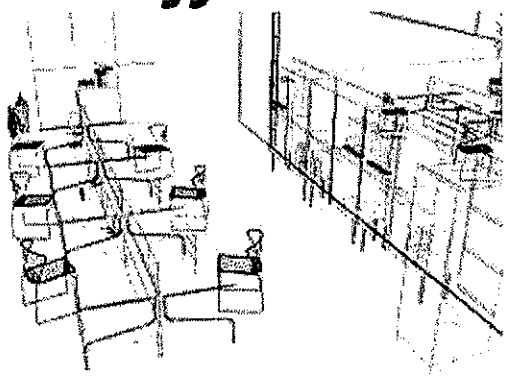
- Greening your Existing Premises

Case Study 1–

Green Office in Sustainability

An example of Green Mark Office Interior Award

– "New" Office Workplace

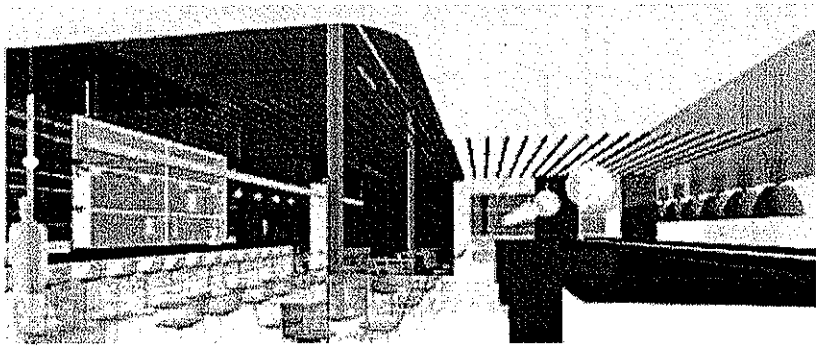


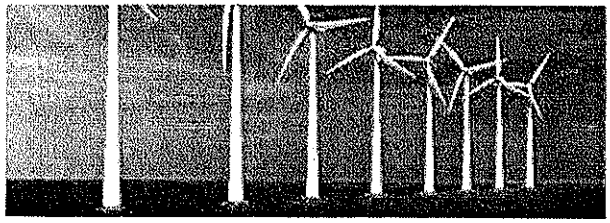
Case Study 2 –

Green Office in Sustainability

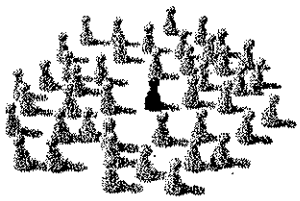
An example of Green Mark Office Interior Award

– "Existing" Workplace



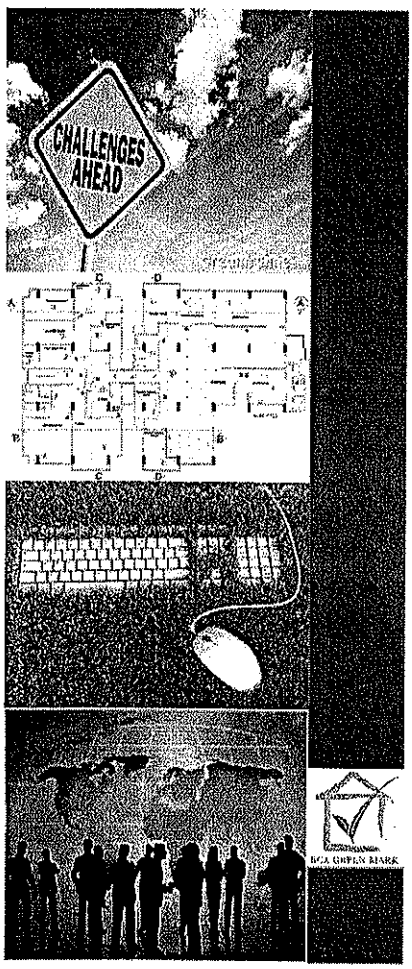


CHALLENGES – FM IN SUSTAINABILITY

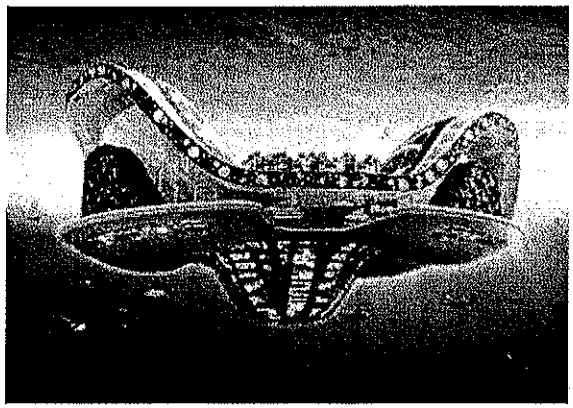


Challenges of FM –

Do you know?



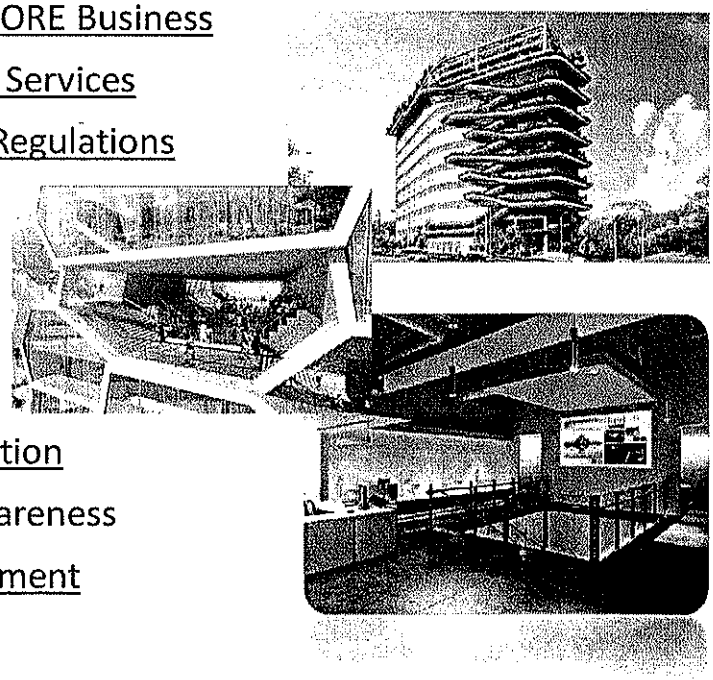
1. Understanding & translating CFO's Financial strategy for the organization
2. Developing & implementing a Global Workplace Strategy, aligned with IT and HR;
3. Bridging the relationship between Workplace Real Estate Strategy and Delivery of Sustainable Projects
4. Bridging the Gap in Sustainability Design and Operation;
5. Outflow of Skilled or Experienced FM;
6. Increasing demand on Green Buildings, Offices, Parks and Data Centers;
7. Develop an environment to "Attract & Retain" Human Talent
8. New Technologies flooding the market



FUTURE OF FACILITIES MANAGEMENT

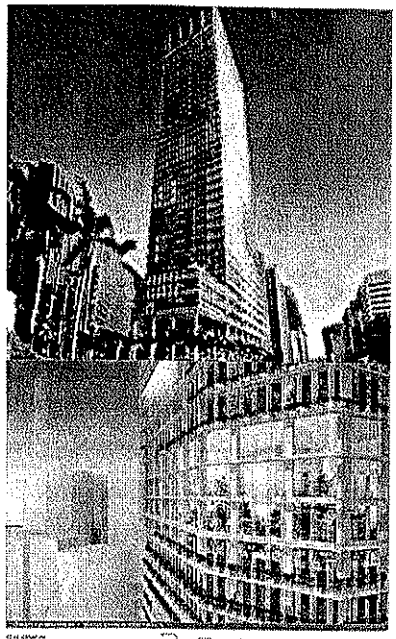
Future of FM –
Key Focuses

- Aligned to support CORE Business
- Encompassing More Services
- Global Standards & Regulations
- Flexibility
- Continuity
- Customer Focus
- Mgmt reporting
- Supply Chain Integration
- Whole Life-cycle Awareness
- Continuous Improvement

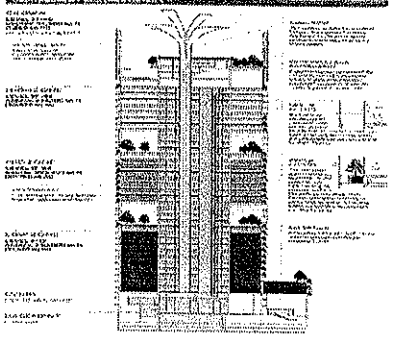


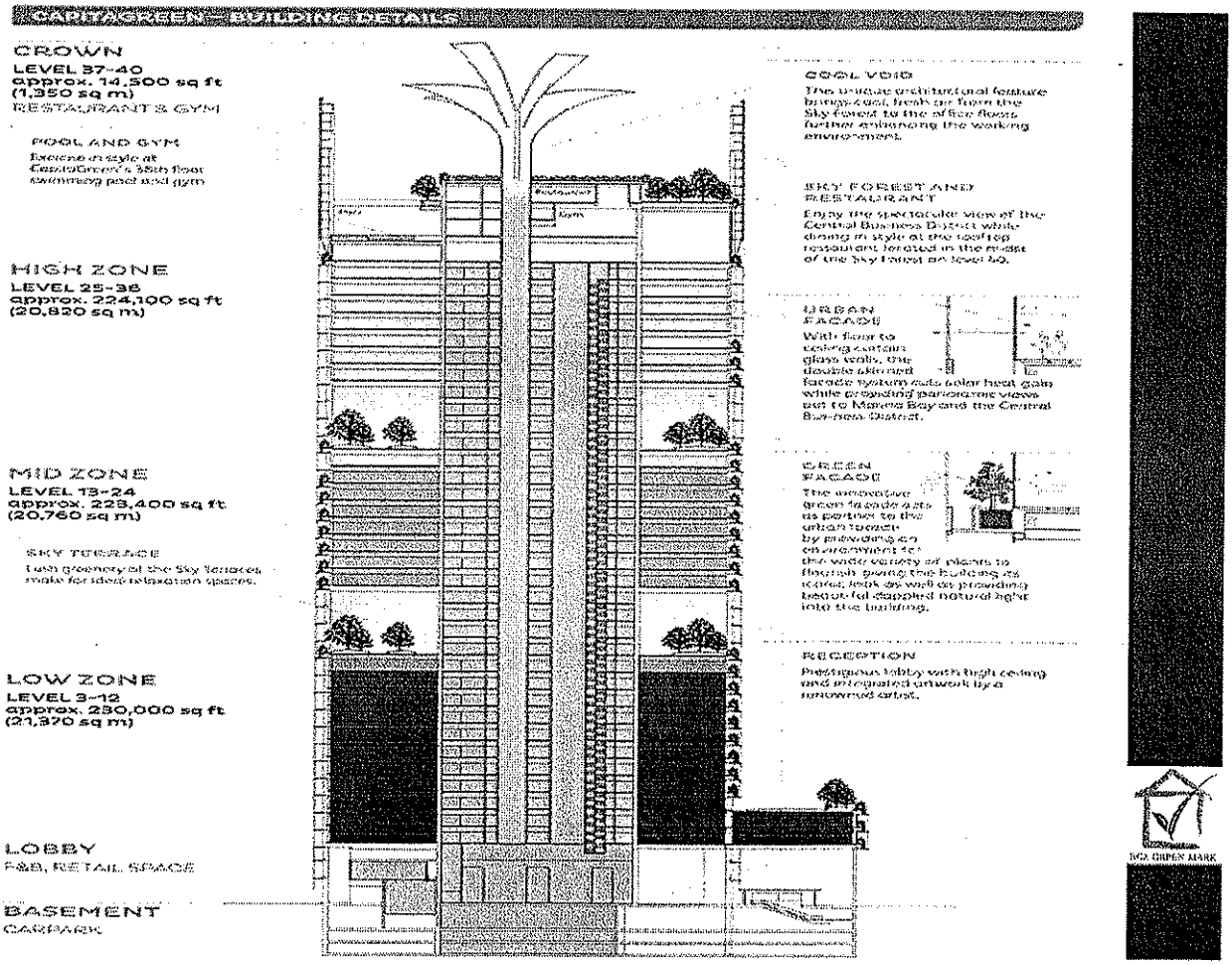
Future of FM –

Capital Green - Platinum



- A Grade-A Commercial building in Singapore's CBD district
- Innovative and stunning facade design minimizes solar heat gain with an energy-efficient double-skin high-performance glass with low emissivity and extensive vertical greenery, 55 per cent green ratio which helps to reduce heat gain and a cool void in the center core which channels air through the building
- State-of-the art energy-saving features:-
  - Rainwater harvesting to irrigate the building's plants
  - Efficient chillers
  - Zoning to reduce energy consumption
  - Motion sensors at staircases and toilets
  - Photo-sensors at offices
  - Sun pipes at restaurants and gyms to channel natural light

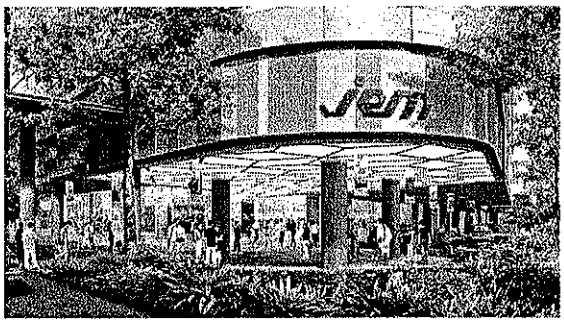


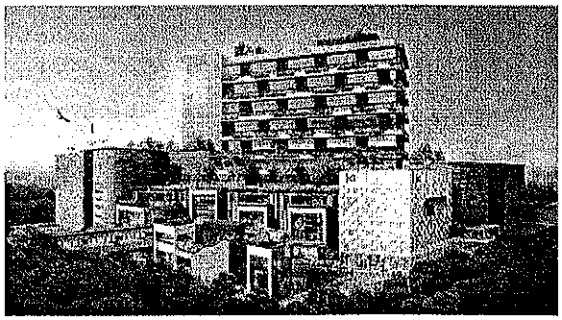


Future of FM –

JEM (Platinum award)

- JEM Project in Jurong Lakeside
- One of the most **sustainable** mixed-use development achieving **BCA Green Mark Platinum Award** by Lend Lease
- Expected to cut down on energy consumption equivalent to that which is generated by about 2,400 HDB apartments annually through special features such as a **highly efficient air-conditioning system**, **regenerative lifts** and the extensive use of **LED lighting**



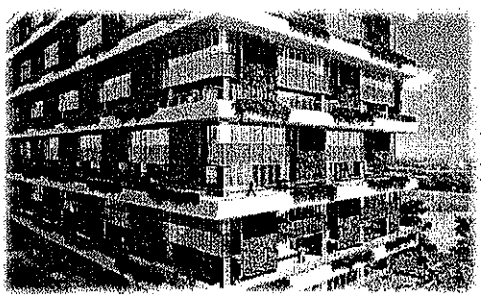


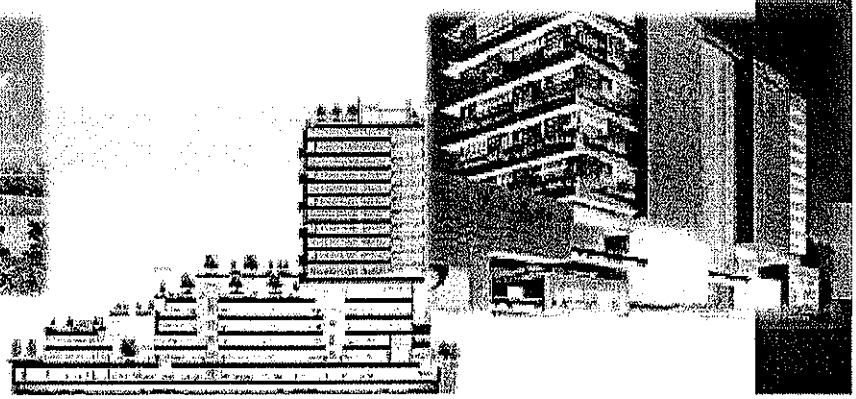
Future of FM –

JEM (Platinum award)

- **Reduction in water consumption** to the volume of about 100 Olympic-sized swimming pools (or approximately 250,000 cubic metres) per yr

- "Cascading Skypark" spread across 3 floors (Levels 5, 6 and 7), providing variety of passive and active recreational spaces that the community can enjoy, includes children's play spaces, meeting areas, quiet reflection zones, a cafe and education

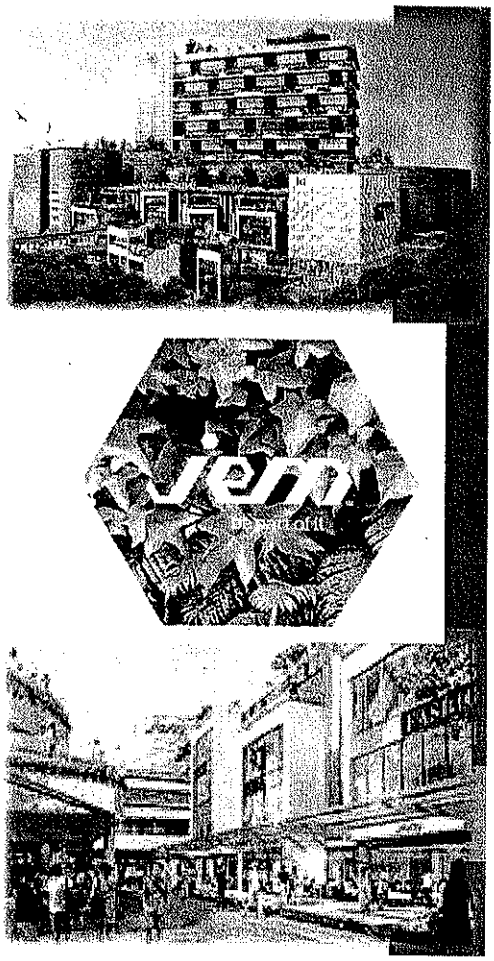




Future of FM –

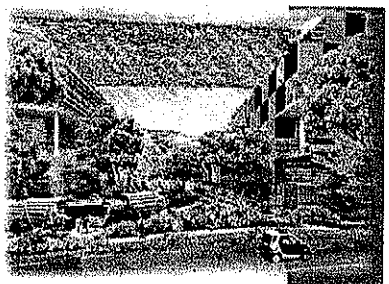
JEM (Platinum award)

- Office design incorporates a dramatic side atrium to deliver natural light into the office space, reducing the need for artificial lighting near the perimeter areas of the floor plate.
- Atrium will be activated by a suspended interconnecting stair, minimising the need for staff to rely on lifts to travel between adjacent floors, further improving energy savings for the new office

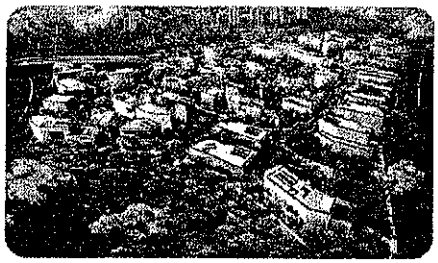


Future of FM –

CleanTech Park



- First Eco-Business Park in Singapore
- Proposed total completion Year 2030
- Developed with emphasis on **retaining the natural environment and biodiversity** of the area.
- An R&D and test-bedding site for early adoption of technology and solutions.
- CleanTech Park is the first project to clinch the BCA's Platinum Green Mark for Districts Award in 2012.
- CleanTech Park has been awarded the BCA-NParks Green Mark Platinum Award for the Park's Green Core and a Green Mark Platinum for Non-Residential New Buildings for CleanTech One in 2011.





CleanTech Park –

Test- bedding Projects

3 Key Areas

- ✓ **Resource Efficiency**
  Solutions to improve energy and water efficiencies as well as clean energy generation solutions at both estate and building level.
- ✓ **Sustainable Urban Solutions**
  Innovative urban solutions to mitigate the various urban challenges such as urban heat, transportation and recycling
- ✓ **Building Efficiency & Maintenence**
  Solutions to improve building efficiency and lower cost of operation and maintenance of green buildings



CleanTech Park –

Test- bedding Projects



1MW PEM Fuel Cell System

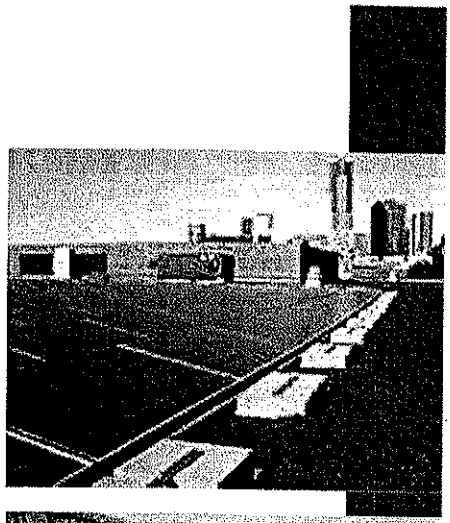
JTC will be test-bedding a 1MW hydrogen fuel cell system in CleanTech One, the first building in CleanTech Park. The fuel cell system is expected to supply clean energy to power close to 20% of the building's electrical load.

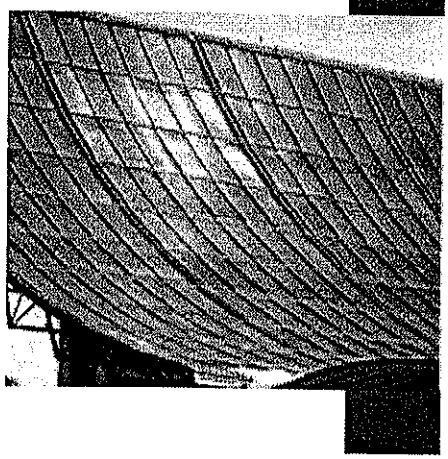
Storm Water Management System

- CleanTech Park's unique topography allows JTC to test-bed a unique storm water management system in an urban environment.
- Through the conservation of the natural environment at strategic locations in the park, storm water runoffs will be channeled through 3 extended green fingers. The channeled storm water will be naturally conveyed through bioswales and cleansing biotopes for treatment before being stored in the low central wetland retention pond.
- Cleansed water will then be used for irrigation and toilet flushing, and overflow to the perimeter drain when it is in full capacity.
- During a storm, the swales and retention pond acts as a flood measure control to slow down the flow to the perimeter drains, reducing the peak runoff during storm events.

CleanTech Park –

Test- bedding Projects





Solar Photovoltaic System

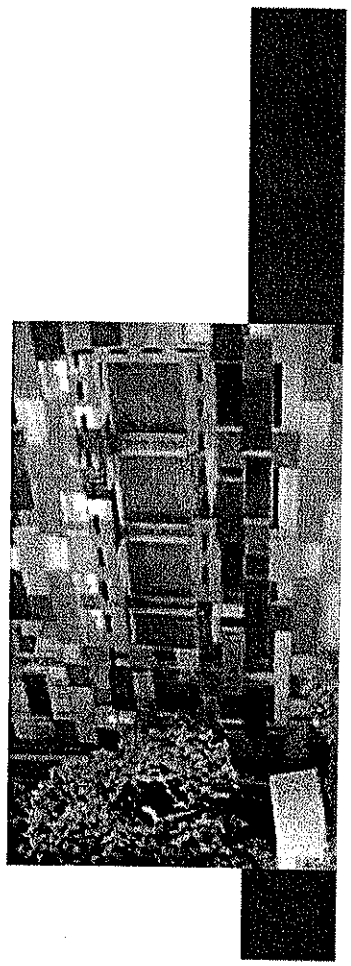
- Tap on the natural power of the sun, CleanTech One will host several Solar Photovoltaic Panels to supplement the building's electricity needs.

Solar Thermal Collectors

- Being one of the tenants in CleanTech One, Solid Asia Pte Ltd has embraced the Living Lab Initiative and would be test-bedding their innovative solar thermal collectors in Singapore's tropical climate.
- Solid Asia's customized thermal collector system is expected to be more efficient for use in the tropics than currently available commercial collectors.

CleanTech Park –

Test- bedding Projects



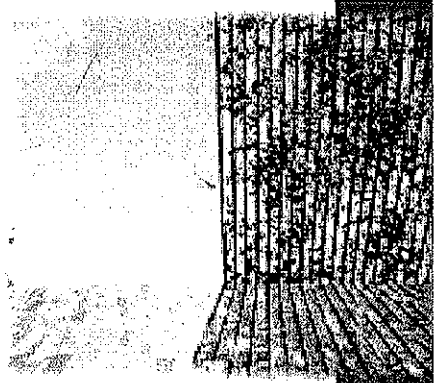
Solar Thermal Façade

- Located at both the eastern and western staircases to provide shading from the sun.
- At the same time, the captured heat energy would provide heated water that could be used for washing and bathing.
- The Solar Thermal Façade also **reduces the overall envelope temperature and minimizes re-radiation** of trapped solar energy outwards from the façade wall.

CleanTech Park –

Test- bedding Projects





Sky Trellis

- Located between tower blocks in CleanTech One.
- A large part of energy consumption of a building goes to the air-conditioning, thus by reducing the temperature of the common area, we can expect savings in electricity bills.

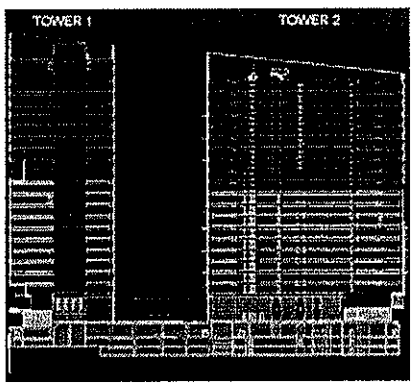
Low Voltage Direct Current

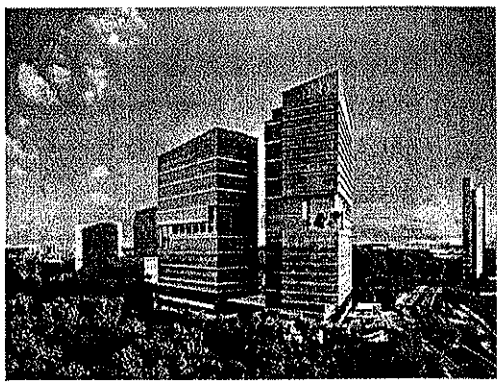
- The smart grid prototype automatically controls individual Philips LED panels on the ceilings by the use of wireless motion sensors embedded at strategic locations to achieve energy savings.

Future of FM –

The Metropolis

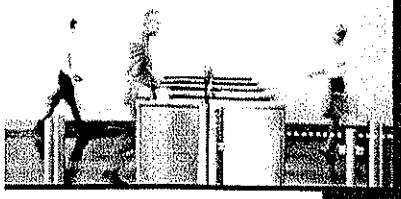
- Awarded BCA Green Mark Platinum
- One-north precinct at Buona Vista
- Due for completion in third quarter of 2013
- 2 towers - > one million sf of net lettable area
- Column-free spaces to provide **space maximization, flexibility** & **efficiency**
- 19.2 metres core-to-window depth offers **optimal space efficiency**





Future of FM –

The Metropolis



- Raised flooring of 150mm enables **efficient cable management**
- Large windows to **provide ample natural lighting** for bright work environment
- **Central core** built to house service and maintenance elements which aid **ease of maintenance** by workers and **minimize disturbance**

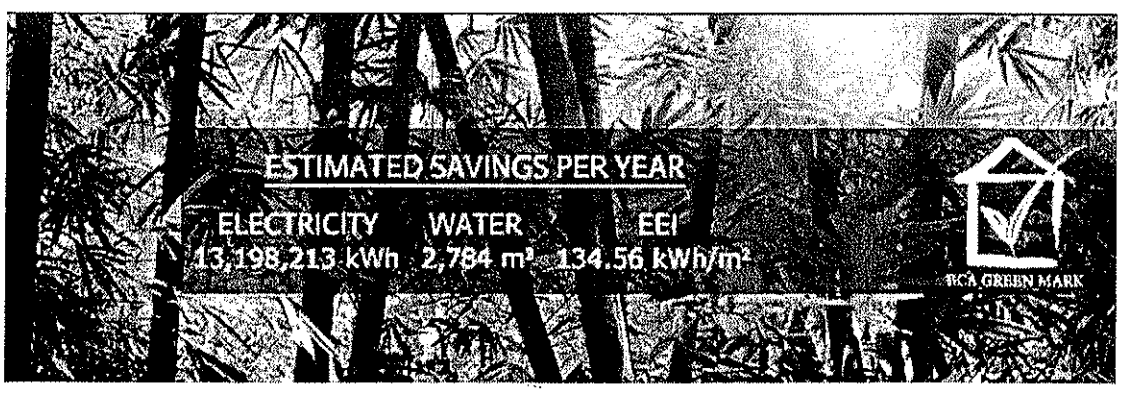


Future of FM –

The Metropolis

Green Features:-

- Awarded BCA Green Mark Platinum Certification
- Focus in water & energy conservation, carbon dioxide emission reduction, & sustainable construction
- Designated high-rise & low-rise lift zones to save energy and reduce waiting time
- Efficient Car Park Guidance System

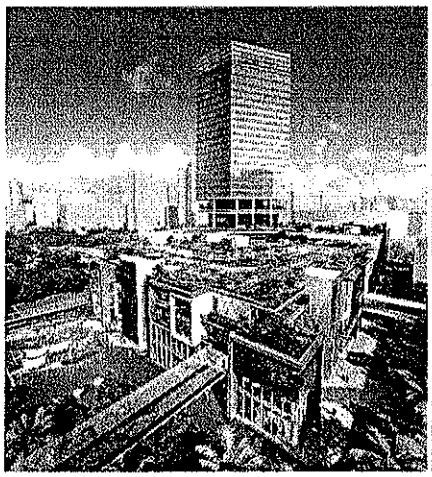


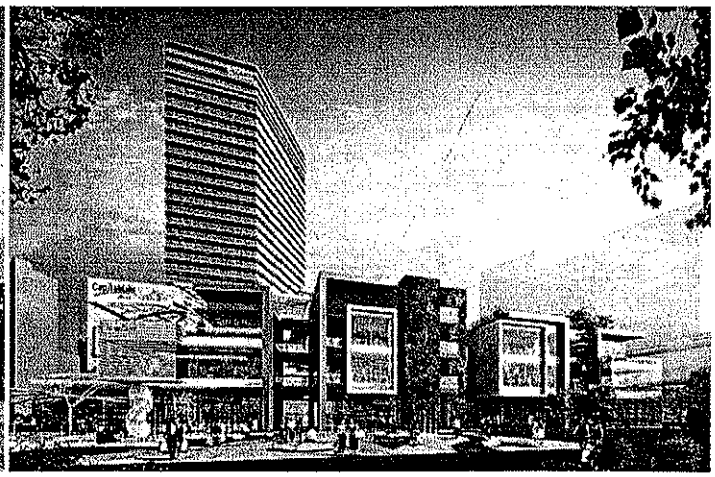
Future of FM –

Westgate Tower

- Located beside Jurong East MRT
- Part of Jurong Lake District - largest regional centre with population of 1 million
- Completed in end-2014

❖17,000 sq foot with efficient column-free floor plates to **allow flexible workspace design**





Future of FM –

Westgate Tower

❖Floor-to-ceiling height of 2.8 metres which creates spacious environment for users

❖Grade A building lift provisions and integrated security management

❖Green roof at the top of tower

❖Provide vertical greenery to replace the greenery removed from the land constructed on



Example of green roof



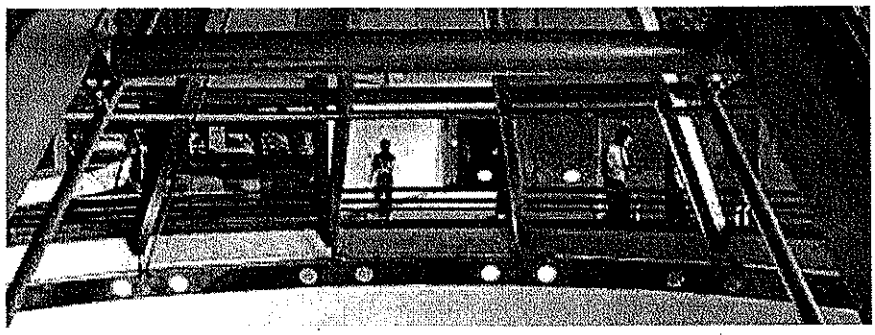
Example of vertical greenery

Future of FM –

A building of the Future (Siemens)

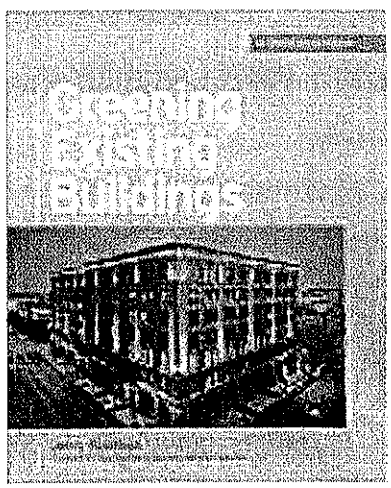
- A **video** clip of future building management and operation
- Focusing on the Energy, Security and Safety of the building

http://www.youtube.com/watch?v=gCuPx9shWT0



TIPS ON SUSTAINABILITY

-- Greening your Facilities





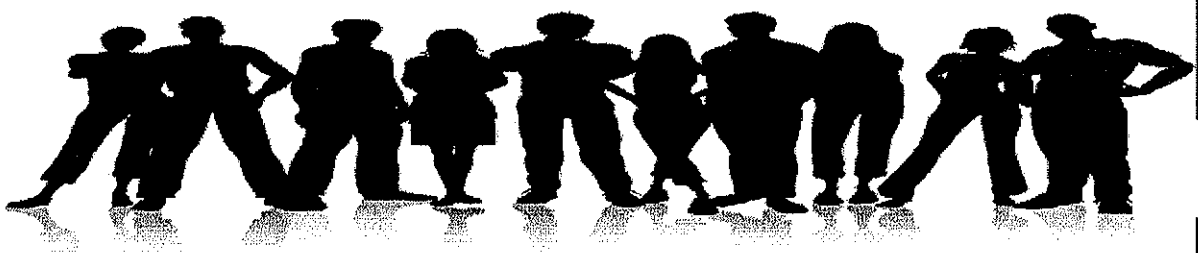
Tips on Sustainability –

To be a Professional in FM

1. FM needs to know what we are managing
   - *Preparedness and price to deliver*
   - *To meet the required performance and expectations (KPI, SLA)*
2. Synchronize the direction of business with FM
   - *The business of the organization is important*
   - *FM will need to support the business direction to create a sustainable environment*
   - *Organization leadership needs to know the FM business as well*
3. Audit your Critical FM Systems and Processes
   - *When did you last audit your facilities?*
   - *Are they performing according to its design?*
4. Risk Registry for all facilities equipment and services
5. Constantly improvement your premises like MAA, upgrading and replacement
6. Energy consumptions over the last 3 years and the next 3 years targets
7. Have you reduced your energy wastages in you premises?
8. Start practicing sustainability FM by looking around you ... light, ceiling, door, partition, tables and chairs, meeting rooms, floor, policy, standards etc...

Conclusion

- There is No One Correct Answer as to how to make an existing building Sustainable, BUT there is no doubt that the Facility Manager should be the Primary Driver in this area
- There is no other person who knows better in making the Facility More Safe, More Efficient, More Comfortable, and More Productive
- Doing this, takes Commitment, Time, Effort, and Monetary and Human Resources
- **FM** is all about **PEOPLE**, and it is the **PEOPLE** that makes the **DIFFERENCE**



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