



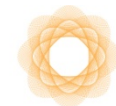
The Greenest Commercial Interior in the Middle East

SEED

Sustainable Energy & Environment Division

April 2009

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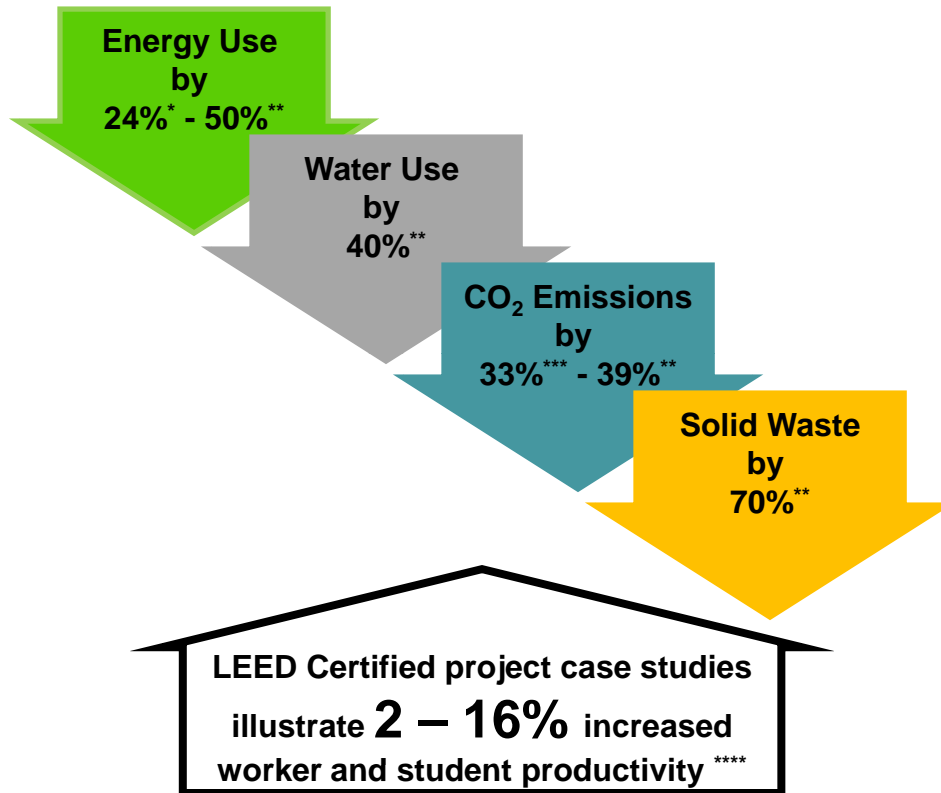
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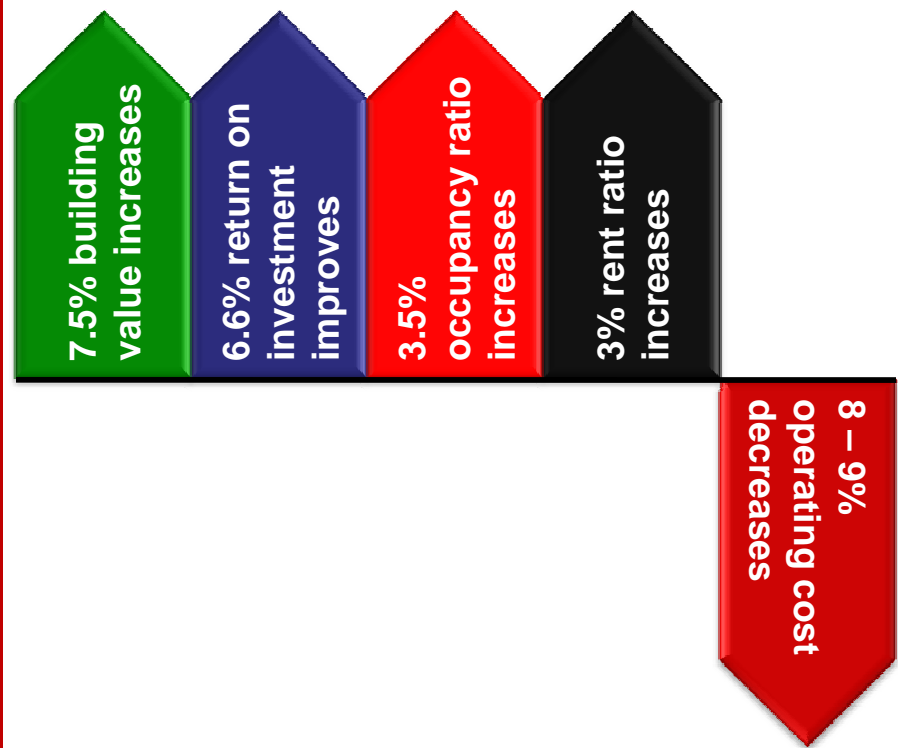
Sustainable development is a process of developing land, cities, business, communities, and so on that "meets the needs of the present without compromising the ability of future generations to meet their own needs - **Brundtland Report – UN 1987**

Why build green?

Green buildings can reduce



Perceived business benefits of green



* Turner, C. & Frankel, M. (2008). *Energy performance of LEED for New Construction buildings: Final report.*

** Kats, G (2003). *The Costs and Financial Benefits of Green Building. A Report to California's Sustainable Building Task Force.*

*** GSA Public Buildings Service (2008). *Assessing Green Building Performance. A post occupancy evaluation of 12 GSA buildings.*

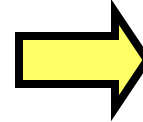
**** LEED project data, USGBC.

* Source: McGraw Hill Construction, *Key Trends in the European and U.S. Construction Marketplace Smart Market Report 2008.*

** Source: McGraw Hill Construction, *Greening of Corporate America Smart Market Report, 2007.*

Why is TECOM building green?

Key Areas for Consideration



Implications

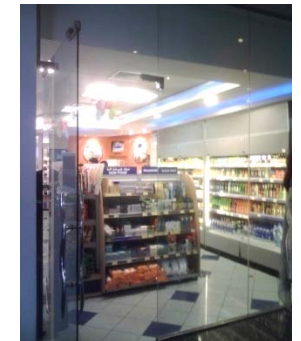
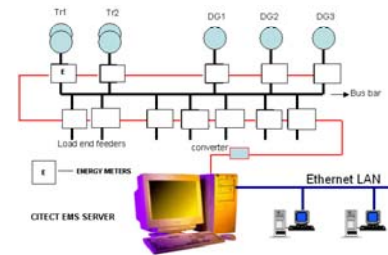
- | | | |
|---|---------------------------------------------------------------------------------|-------------------------------------------------------------------------------------------------------|
| 1 | TECOM is the premier knowledge economy developer in the Middle East | • Sustainable development has to be made mainstream for such profile |
| 2 | TECOM's utility consumption is increasing exponentially due to its rapid growth | • Carbon footprint is increasing in proportion |
| 3 | Occupants spend significant amount of time inside the office premises of TECOM | • Indoor environmental quality will have significant impact on all occupants |
| 4 | Significant number of TECOM buildings are more than 5 years old. | • High probability that office layouts have changed over the years causing changes to original design |

Conclusion

TECOM not only needs to build green, but also make green mainstream, thereby achieving high profitability, employee productivity & health and contribute to the society through generating awareness on its achievements and sustainable development activities.

Existing green features of TECOM

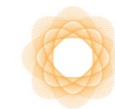
- Shaded/ basement Parking
- RTA (Roads & Transport Authority) bus lines
- Adjacent retail & services
- Green landscaping & lakes
- Non-smoking buildings
- Bicycle racks & showers
- Water conservation efforts
- Recycling efforts
- Laptops & Energy star labeled equipment
- Energy management initiatives (BMS system)
- Daylight access
- Energy Efficient lighting
- Use of local materials



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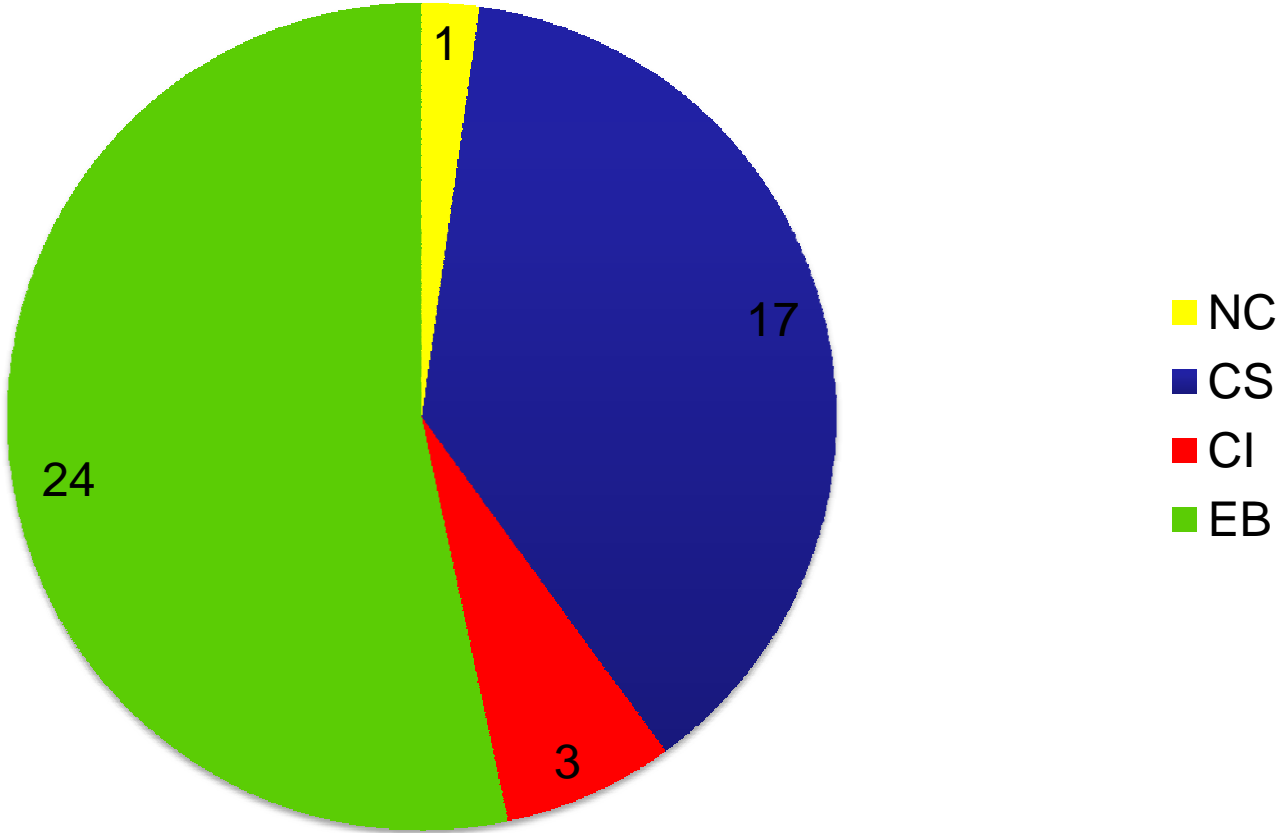


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TECOM projects undergoing LEED certification

LEED Projects

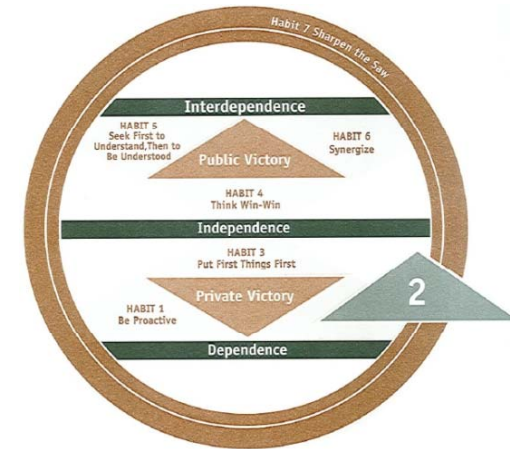


Green goals for TECOM Management Office

Green targets were set out during the initiation stage of the project. These targets were included in the contract documents as well.

- 100%**
 - of all office equipment to be Energy Star labeled.
- 40%**
 - reduction in water and sewage costs over EPA 1992 standards.
- 30%**
 - less installed lighting power compared to ASHRAE 90.1-2004 recommended levels and less lighting energy costs.
- 90%**
 - of all occupants to have access to daylight and views.
- 0%**
 - of C&D (Construction & Demolition) waste to be sent to landfill.

Begin with the end in mind



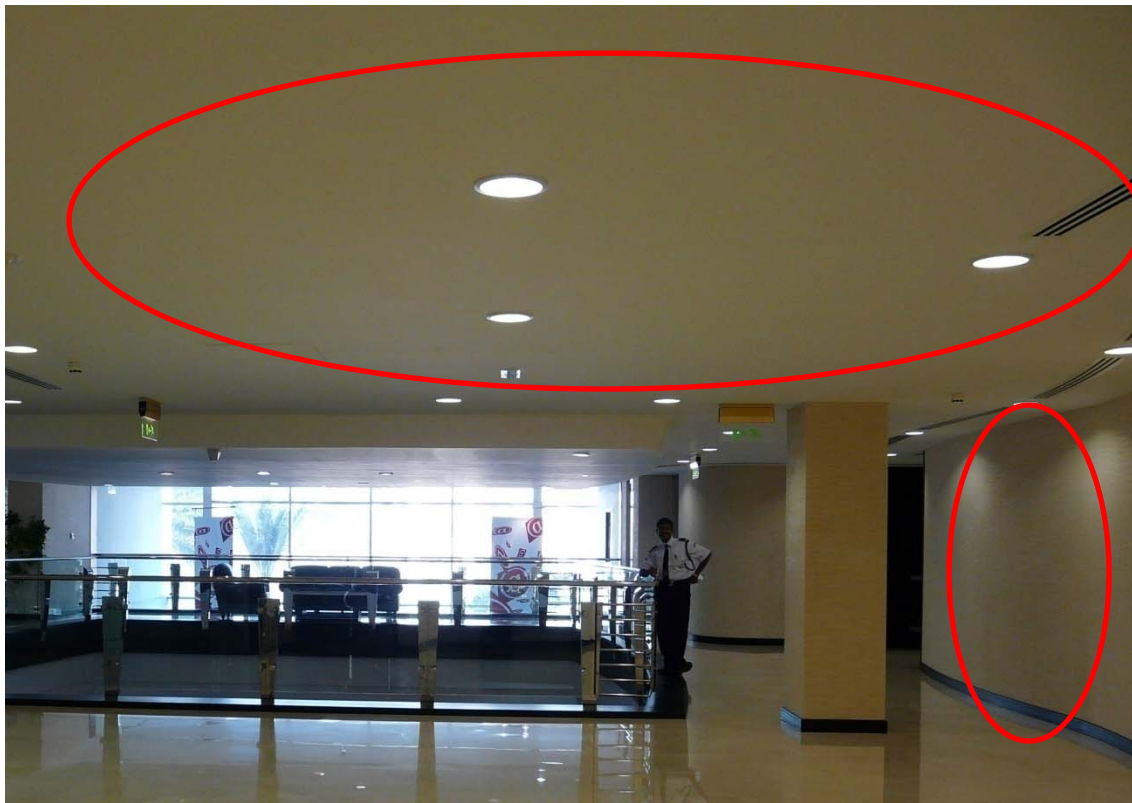
Team Workshop in daylight

Regular charettes with all stakeholders were conducted during the entire design-development process in order to ensure a clear understanding of the project's green intents at all stages of the project and to ensure that set out targets were being achieved.

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Green features: materials re-use.

Intent: Extend the life cycle of existing building stock, conserve resources, retain cultural resources, reduce waste and reduce environmental impacts of new buildings as they relate to materials manufacturing and transport. (source: USGBC)



77%

of existing structures were retained & reused

- Flooring
- Ceilings
- Wall partitions

This initiative not only helped achieve LEED™ points, but also had a positive impact on the project costs.



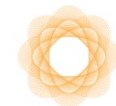
“Ever since we moved here I felt my energy level go up” – Nidal Yousef

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Green features: C&D waste

Intent: Divert construction, demolition, and packaging debris from landfill disposal. Redirect recyclable recovered resources back to the manufacturing process. Redirect reusable materials to appropriate sites. (source: USGBC)



15%

of construction and demolition waste went to landfill!



TECOM Investments' Management Office to Give Away Used Material as Part of LEED™ Certification

The management office of TECOM Investments is undergoing LEED™ CI Certification. As part of its efforts to use resources to meet its needs without depriving the resources for future generations, many existing items and material are either being re-used within the same project, or in other construction projects. While many such items have already been ear-marked for re-use, the following items are still available for anyone to collect and utilize:-

GI materials like Track, stud, ceiling grids	10.44 m ³
60 X 60 cm ceiling decorative aluminum tiles	2.34 m ³
60 X 60 cm metal ceiling tiles	3.86 m ³
6 mm thick glass partitions	0.46 m ³



In addition to the regular LEED requirements of diverting C&D waste away from landfills, TECOM also undertook the following initiatives:-

1. 650 sq. m. of used carpets were donated to Al Ihsan Charity, Ajman as part of this activity.
2. Some of the existing materials that could not be re-used in the project, were diverted to other in-house projects of TECOM.
3. Previously used decorative showpieces were distributed to company staff.

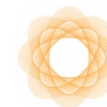
All these steps helped avoid waste being sent to landfills.

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Green features: commissioning

Intent: Verify and ensure that the tenant space is designed, constructed and calibrated to operate as intended. (source: USGBC)

TECOM Management Office is located in Building 4 of Dubai Internet City which is 9 years old. Over the years, the office layout has changed several times and temporary modifications have been done to the MEP systems due to varying demands of tenants. An enhanced commissioning exercise was therefore absolutely necessary, not only for LEED certification purposes, but also to align the systems with original design and resolve some of the persistent tenant complaints, particularly with regard to air-conditioning.



- 1 A third party commissioning agent was engaged to carry out re-commissioning of all MEP equipment that resulted in resolving air-conditioning problems like that existing in Group CEO's office.
- 2 Duct cleaning was also carried out through a specialized company during the final stages of the fit-out works in order to ensure that deposits in the ducts were cleaned out before occupancy.



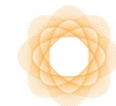
I don't know whether it's because of the green office but I have become more productive" - Rasha Al Kooheji

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Green features: water efficiency

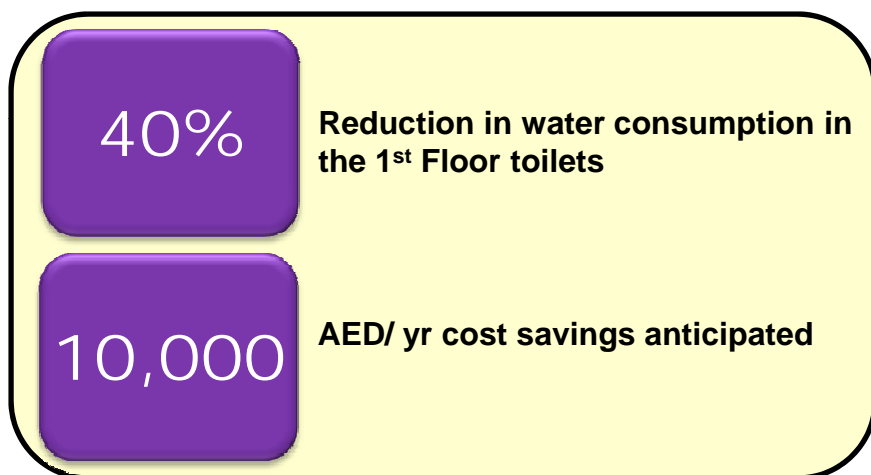
Intent: Maximize water efficiency within tenant spaces to reduce the burden on municipal water supply and wastewater systems. (source: USGBC)

As part of TECOM's ongoing energy and water conservation programme since April 2007, implementation of cost-effective conservation measures are always ongoing. Even before the LEED certification process started, all buildings were fitted out with water restrictors which helped reduce TECOM's overall water consumption by 26,232 million gallons between Jan – Dec 2008.

BEFORE
(7.6 lpm) →



AFTER
(1.9 lpm) →



3,500 litres of potable water go down the urinals every year per person. If all urinals of TECOM were replaced, how much will we save?

Conventional Urinals	Waterless Urinals
3 l/ flush	0 l/ flush

Green features: lighting power

Intent: Achieve increasing levels of energy conservation beyond the referenced standard to reduce environmental impacts associated with excessive energy use. (source: USGBC)

35%

Less lighting power measured against ASHRAE 90.1-2004 lighting standards

75%

More average lighting level compared to similar office. Calculated based on lux levels.

20,000

AED/ yr OPEX savings

How?

- Energy efficient light bulbs
 - No halogens have been used
- Utilization of daylight
- Selection of light colored interiors



Strategy and Excellence Department

SED		HC
1.8 W/ sq. ft.	Lighting Power Density (LPD)	0.7 W/ sq. ft.
200 lux	Average Lighting Level	350 lux



Human Capital Department

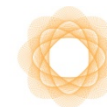


"The lights are quite bright and comfortable to work in." – **Natalie Sejean**

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Green features: equipment and appliances

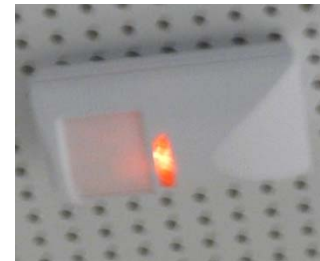
Intent: Achieve increasing levels of energy conservation beyond the prerequisite standard to reduce environmental impacts associated with excessive energy use. (source: USGBC)

90%

Energy star rated equipment



Daylight and motion sensors



"The office is much brighter compared to our old office and It's much more comfortable" – Femy Demetria

Green features: low-emitting materials

Intent: Reduce the quantity of indoor air contaminants that are odorous, potentially irritating and/ or harmful to the comfort and well-being of installers and occupants. (source: USGBC)

Materials used inside offices, like paints & coatings, adhesives & sealants, carpets, composite wood and laminate adhesives, may contain harmful Volatile Organic Compounds (VOCs) that off-gas and are potentially harmful for the occupants' health.

Materials used in the Management Office were carefully selected with less harmful chemicals and in some cases, like water based paints used, had 0 VOCs:

- Paints
- Chairs & workstations
- Carpets
- Adhesives



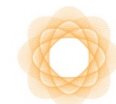
*"It was immediately noticeable when we moved, the office did not have any smell!" –
Rahmatullah Rowther*

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Green features: recycled content & regional materials

Recycled content intent: Increase demand for building products that incorporate recycled content materials, therefore reducing impacts resulting from extraction and processing of virgin materials. (source: USGBC)

Regional materials intent: Increase demand for building materials and products that are extracted and manufactured within the region, thereby supporting the regional economy and reducing the environmental impacts resulting from transportation. (source: USGBC)

10%
Recycled
content

- Chairs
- Workstations
- Gypsum

It is TECOM corporate policy to procure all office furniture with a minimum of 10% recycled content.

20%
regional
materials

- Glass
- Gypsum
- Ceiling grids

were all procured from within the city of Dubai itself, very much within the LEED required limit of 500 miles.



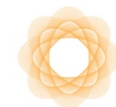
The office lighting is very conducive to my work. There is no smell of paint or new furniture which is amazing” – Sharala George

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Lessons learnt

TECOM Management Office project is a classic case study, particularly because it is one of the first such projects in the Middle East region. This project was a fast track project and was driven by collective desire to achieve the highest level of sustainability that would not only provide a very healthy indoor environment for the occupants, but also save resources for the organization through energy and water efficiencies.

Several lessons were learnt from this exercise and these lessons should be utilized by all similar projects, not only in the region, but also anywhere in the World.

- **Early coordination through Integrated Project Team**
 - *The importance of this cannot be stressed enough. The successful LEED certification of this project can be largely attributed to the integrated team work, specially starting at the very early stage of the project.*
- **Green fit out guidelines**
 - *A set of green fit-out guidelines would assist any organization the most, especially when a large number of offices are renovated every year. Standardizing the green features that are most important to an organization, can achieve smoother certification.*
- **Fit-out division will play a key role in implementing this across all offices in TECOM**
 - *For large corporations like TECOM, a well trained in-house fit-out division on green issues, would help in achieving the construction credits.*
- **Make “asset donation” a systematic CSR activity**
 - *Instead of spending large sums of money on a variety of CSR activities, large corporations could standardize asset donation as a systematic CSR activity. This will not only achieve LEED goals of diverting material from landfills, but also assist in other projects to utilize existing resources.*



“We are an exceptional company of exceptional people. Our people, our society and our environment deserve the best and a LEED® certified office is one of the best things we can give to all stakeholders. Since August 2006, we have sustained a successful journey in sustainability and it is time to take this initiative to the highest level of excellence. I want all employees of TECOM to get involved in this journey and enjoy the benefits.”

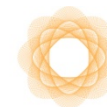
Abdullatif Al Mulla, Group CEO – TECOM Investments

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How did we perform

LEED™ Score

TECOM Investments Management Office, Dubai

Platinum 43/ 57

Sustainable Sites	6/ 7
Water Efficiency	2/ 2
Energy & Atmosphere	9/ 12
Materials & Resources	7/ 14
Indoor Environmental Quality	14/ 17
Innovation & Design	5/ 5

Initial target	Achieved
100%	90%
• of all office equipment to be Energy Star labeled.	
40%	40%
• reduction in water and sewage costs over EPAAct 1992 standards.	
30%	35%
• less installed lighting power compared to ASHRAE 90.1-2004 recommended levels and less lighting energy costs.	
90%	100% (daylight)
• of all occupants to have access to daylight and views.	92% (views)
0%	15%
• of C&D (Construction & Demolition) waste to be sent to landfill.	

LEED™ scorecard

LEED® CI v2.0 Scorecard: TECOM Management Office Renovation at DIC 4 - LEED Platinum CI

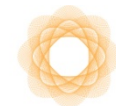
43 0 0 Final Project Score				Possible Points 57											
Certified 21 to 26 points				Silver 27 to 31 points				Gold 32 to 41 points				Platinum 42 to 57 points			
6 0 0 Sustainable Sites				Possible Points 7				7 0 0 Materials & Resources				Possible Points 14			
Y	?	N						Y	?	N		Y	?	N	
			Credit 1	Site Selection: Select a LEED Certified Building	1 to 3			Prereq 1	Storage & Collection of Recyclables	Required					
			OR	Option 1A: Brownfield Redevelopment	3.0			Credit 1.1	Tenant Space, Long Term Commitment	1					
				Option 1B: Stormwater Management, Rate and Quantity	1 to 3			Credit 1.2	Building Reuse, Maintain 40% of Interior Non-Structural Components	1					
0.5				Option 1C: Stormwater Management, Treatment	0.5			Credit 1.3	Building Reuse, Maintain 60% of Interior Non-Structural Components	1					
0.5				Option 1D: Heat Island Reduction, Non-Roof	0.5			Credit 2.1	Construction Waste Management, Divert 50% from Landfill	1					
				Option 1E: Heat Island Reduction, Roof	0.5			Credit 2.2	Construction Waste Management, Divert 75% from Landfill	1					
				Option 1F: Light Pollution Reduction	0.5 to 1			Credit 3.1	Resource Reuse, 5%	1					
				Option 1G: Water Efficient Irrigation, Reduced Potable Water Consumption	0.5			Credit 3.2	Resource Reuse, 10%	1					
				Option 1H: Water Efficient Irrigation, No Potable Use or No Irrigation	0.5			Credit 3.3	Resource Reuse, 30% Furniture and Furnishings	1					
				Option 1I: Innovative Wastewater Technologies	0.5			Credit 4.1	Recycled Content, 10% (post-consumer + 1/2 pre-consumer)	1					
0.5				Option 1J: Water Use Reduction, 20% Reduction	0.5			Credit 4.2	Recycled Content, 20% (post-consumer + 1/2 pre-consumer)	1					
				Option 1K: Onsite Renewable Energy	0.5 to 1			Credit 5.1	Regional Materials, 20% Manufactured Regionally	1					
0.5				Option 1L: Other Quantifiable Environmental Performance	0.5 to 3			Credit 5.2	Regional Materials, 10% Extracted and Manufactured Regionally	1					
1			Credit 2	Development Density & Community Connectivity	1			Credit 6	Rapidly Renewable Materials	1					
1			Credit 3.1	Alternative Transportation, Public Transportation Access	1			Credit 7	Certified Wood	1					
1			Credit 3.2	Alternative Transportation, Bicycle Storage & Changing Rooms	1										
1			Credit 3.3	Alternative Transportation, Parking Availability	1										
2 0 0 Water Efficiency				Possible Points 2				14 0 0 Indoor Environmental Quality				Possible Points 17			
Y	?	N						Y	?	N		Y	?	N	
1			Credit 1.1	Water Use Reduction - 20% Reduction	1			Prereq 1	Minimum IAQ Performance	Required					
1			Credit 1.2	Water Use Reduction - 30% Reduction	1			Prereq 2	Environmental Tobacco Smoke (ETS) Control	Required					
9 0 0 Energy & Atmosphere				Possible Points 12				5 0 0 Innovation & Design Process				Possible Points 5			
Y	?	N						Y	?	N		Y	?	N	
Y			Prereq 1	Fundamental Commissioning	Required			Credit 1	Outdoor Air Delivery Monitoring	1					
Y			Prereq 2	Minimum Energy Performance	Required			Credit 2	Increased Ventilation	1					
Y			Prereq 3	CFC Reduction in HVAC&R Equipment	Required			Credit 3.1	Construction IAQ Management Plan, During Construction	1					
Y			Credit 1.1	Optimize Energy Performance - Lighting Power	1 to 3			Credit 3.2	Construction IAQ Management Plan, Before Occupancy	1					
1				Option A: Reduce lighting power density to 15% below the standard	1			Credit 4.1	Low-Emitting Materials, Adhesives & Sealants	1					
1				Option B: Reduce lighting power density to 25% below the standard	2			Credit 4.2	Low-Emitting Materials, Paints & Coatings	1					
1				Option C: Reduce lighting power density to 35% below the standard	3			Credit 4.3	Low-Emitting Materials, Carpet Materials	1					
1			Credit 1.2	Optimize Energy Performance - Lighting Controls	1			Credit 4.4	Low-Emitting Materials, Composite Wood & Laminate Adhesives	1					
			Credit 1.3	Optimize Energy Performance - HVAC	1 to 2			Credit 4.5	Low-Emitting Materials, Systems Furniture and Seating	1					
				Option A: Equipment efficiency and zoning & controls	1 to 2			Credit 5	Indoor Chemical & Pollutant Source Control	1					
				Option B: Reduce design energy cost	1 to 2			Credit 6.1	Controllability of Systems, Lighting	1					
			Credit 1.4	Optimize Energy Performance - Equipment and Appliances	1 to 2			Credit 6.2	Controllability of Systems, Temperature and Ventilation	1					
1				70% of ENERGY STAR eligible equipment is ENERGY STAR rated	1			Credit 7.1	Thermal Comfort - Compliance	1					
1				90% of ENERGY STAR eligible equipment is ENERGY STAR rated	2			Credit 7.2	Thermal Comfort - Monitoring	1					
1			Credit 2	Enhanced Commissioning	1			Credit 8.1	Daylight & Views, Daylight / 5% of Spaces	1					
			Credit 3	Energy Use, Measurement & Payment Accountability	1 to 2			Credit 8.2	Daylight & Views, Daylight 90% of Spaces	1					
2				Case A: Projects with area less than 75% of total building area	1 to 2			Credit 8.3	Daylight & Views, Views for 90% of Seated Spaces	1					
				Case B: Projects with area 75% or more of total building area	2										
			Credit 4	Green Power	1										



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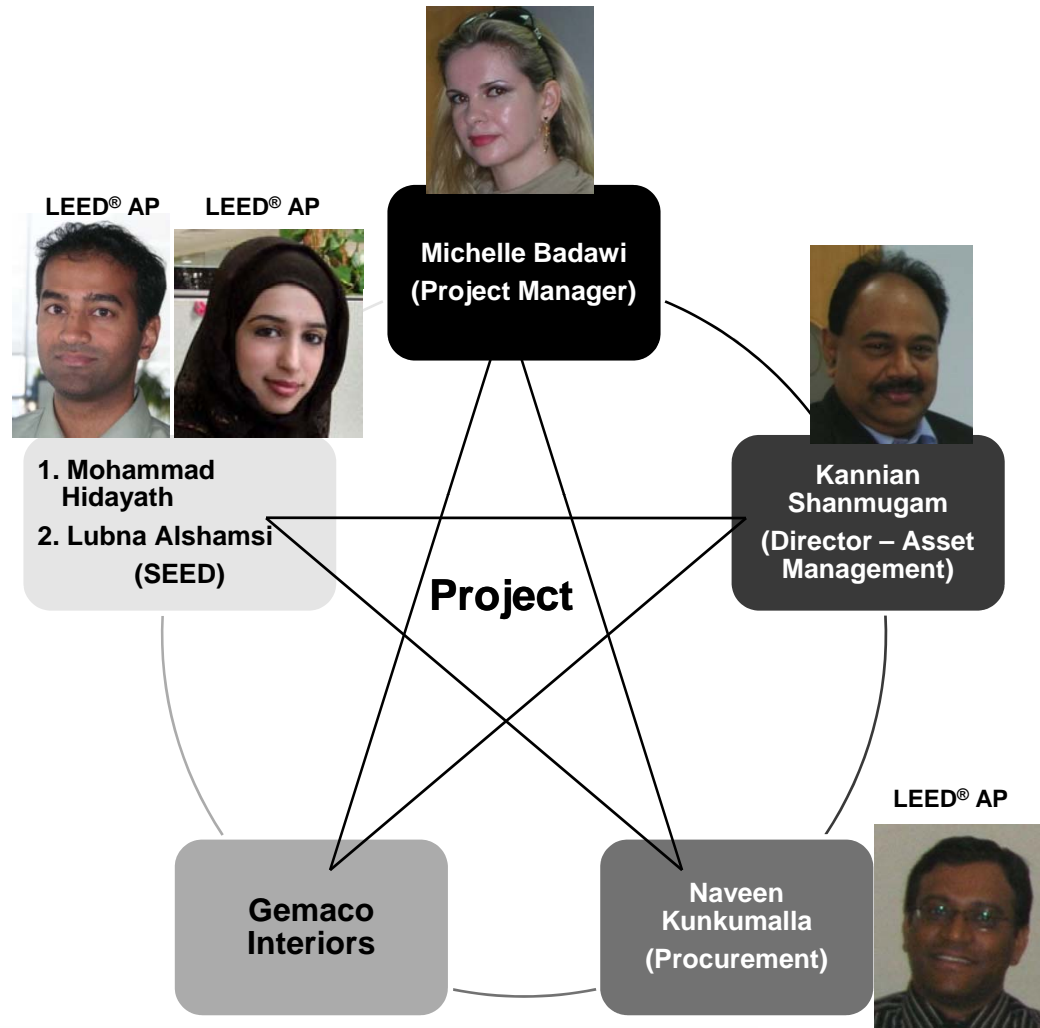


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Success factors

- Integrated project team
- Early involvement in contract negotiations
- PMP approach
- Fit-out guidelines
- Regular charettes
- Senior management support
- Personal commitment



The key factor for any successful LEED project is instilling an “Integrated Project Team” even at the concept stage of the project – Sougata Nandi, Director – Sustainable Development

Key project financials

Capex incurred (+) or saved (-) for LEED™ certification

SI	Item	AED
1.	LEED™ Certification Cost	(+) 4,600/-
2.	Enhanced Commissioning	(+) 20,000/-
3.	Sensors (occupancy and photo-sensor)	(+) 59,000/-
4.	Materials re-used in the project (false ceilings, partitions, blinds etc.)	(-) 40,000/-
5.	Lighting fixtures eliminated from original design in order to meet 0.7 W/ sq. ft.	(-) 22,000/-
NET TOTAL		(+) 21,600/-

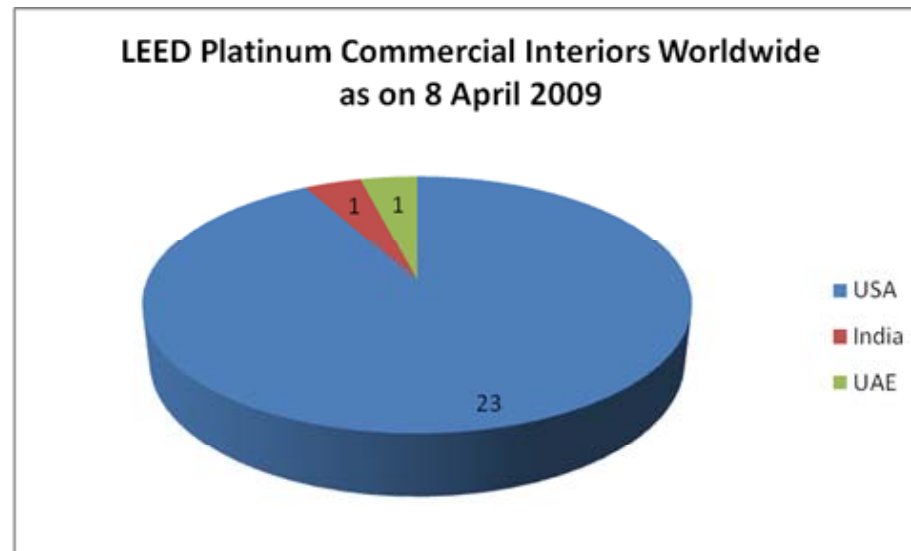
“Green Premium” = 0.48%

Anticipated Opex savings

SI	Item	AED/ yr
1.	Water cost savings	10,000/-
2.	Lighting energy cost savings	20,000/-
3.	Energy cost savings	10,000/-
TOTAL		40,000/-

Key project milestones

- 1st LEED™ Platinum Commercial Interior in Dubai, UAE and the Middle East
- 1st LEED™ Commercial Interior in Dubai, UAE and the Middle East within an Existing Building
- 2nd LEED™ Commercial Interior in Dubai, UAE and the Middle East
- 2nd LEED™ Platinum Commercial Interior in the World outside the USA
- 5th LEED™ certified project in Dubai, UAE and the Middle East



OUR ONGOING COMMITMENT TO SUSTAINABILITY



Ali bin Towaih

Executive Director – SEED, TECOM Investments

Executive Director – Enpark

Sustainability is a way of life and needs to be an integral part of everything we do – construction, O&M, fit-out and procurement.

In 2009, SEED is committed to achieve the following:-

1. Work in close collaboration with Asset Management to integrate sustainability in all office fit-out works; and
2. Work to standardize “green” features at all TECOM buildings.

Thank You

For further questions, please contact
seed@tecom.ae



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