“Finding The Right Balance”

Integrated Sustainable Design for Varied Projects and Budgets

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About En3 Consulting

- Engineering Environment Energy
- Co-located in Los Angeles, California and Chennai, India
- Consultant for over 30 million square feet of sustainable space (green buildings)

- Consultants for the International Code Council (ICC) USA, to establish a green product evaluation program for the United States
- Consultant for The World Bank and its sister organizations for their buildings in the U.S., Europe and Africa.
- Working with the Indian Green Building Council to develop standards for sustainable and green construction practice

Some of our LEED Certified Projects

GRUNDFOS

LEED NC - GOLD

ABN AMRO BANK

LEED CI - PLATINUM

ETL BUSINESS PARK

LEED CS - GOLD

THE WORLD BANK

LEED NC - SILVER

RANE INSTITUTE OF EMPLOYEE DEVELOPMENT

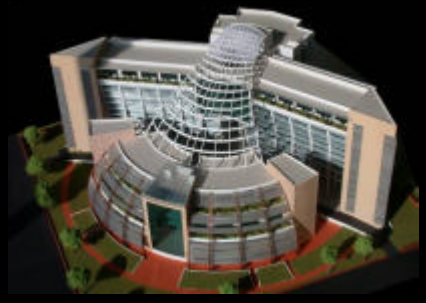
LEED NC - SILVER

Some of our Ongoing Projects

WIPRO CAMPUSES

SYNTEL CAMPUS

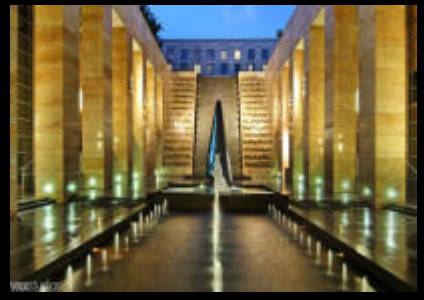
TATA BUSINESS PARK



SYNTHESIS

BUSINESS PARK

GREAT LAKES INSTITUTE
OF MANAGEMENT



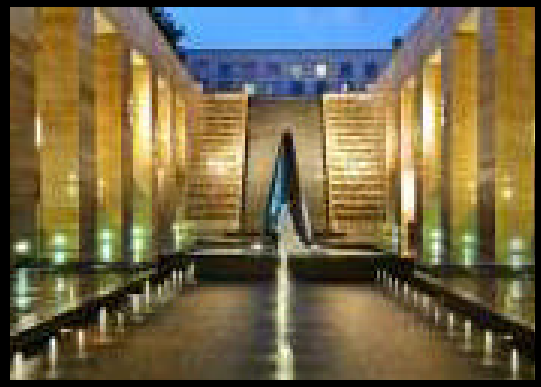
GRAND HYATT HOTEL

What is Sustainability?

United Nations World Commission on Environment and Development defines Sustainability as:

"Development that meets the needs of present generations without compromising the ability of future generations to meet their own needs."

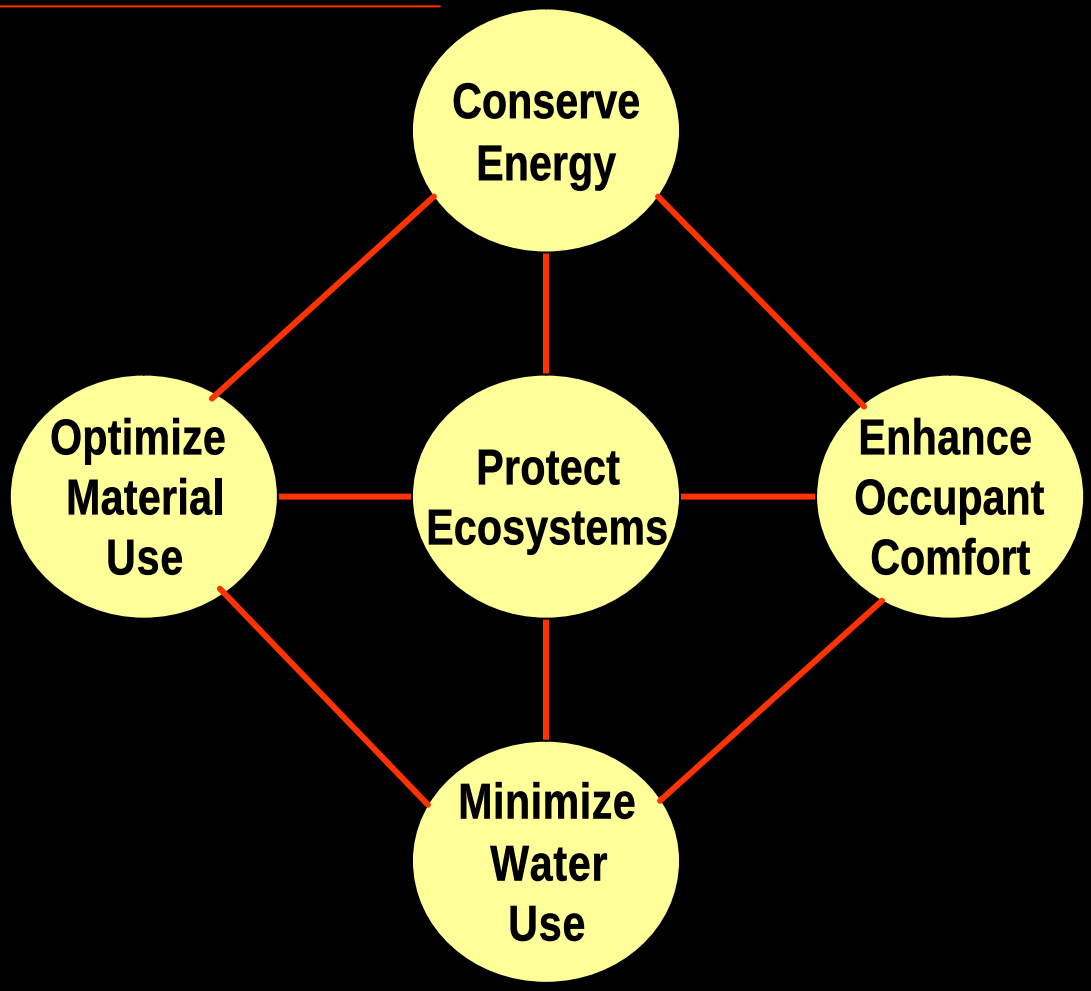
Size Does Not Matter



No matter the Size, Usage or Budget, every Project Can Make a Sustainable Difference to the Environment

WE NEED TO FIND THE RIGHT BALANCE !

Every Project Can:



Through smart site planning, efficient building design and strategic materials & systems selection <u>while recognizing regional environmental priorities</u>

LEED Family of Rating Systems

LEED for New Construction

LEED for Commercial Interiors

LEED for Core and Shell

LEED for Existing Buildings – O &M

LEED for Homes

LEED for Neighborhood Development

Market Sector Based Rating Systems

LEED for:
Schools, Retail, Campuses, Healthcare, Laboratories

Case Examples

ABN Amro – 8000 Sq ft

LEED Commercial Interiors - Platinum

The World Bank – 150,000 Sq ft

LEED New Construction - Silver

India Land Park – 2.4 million Sq ft

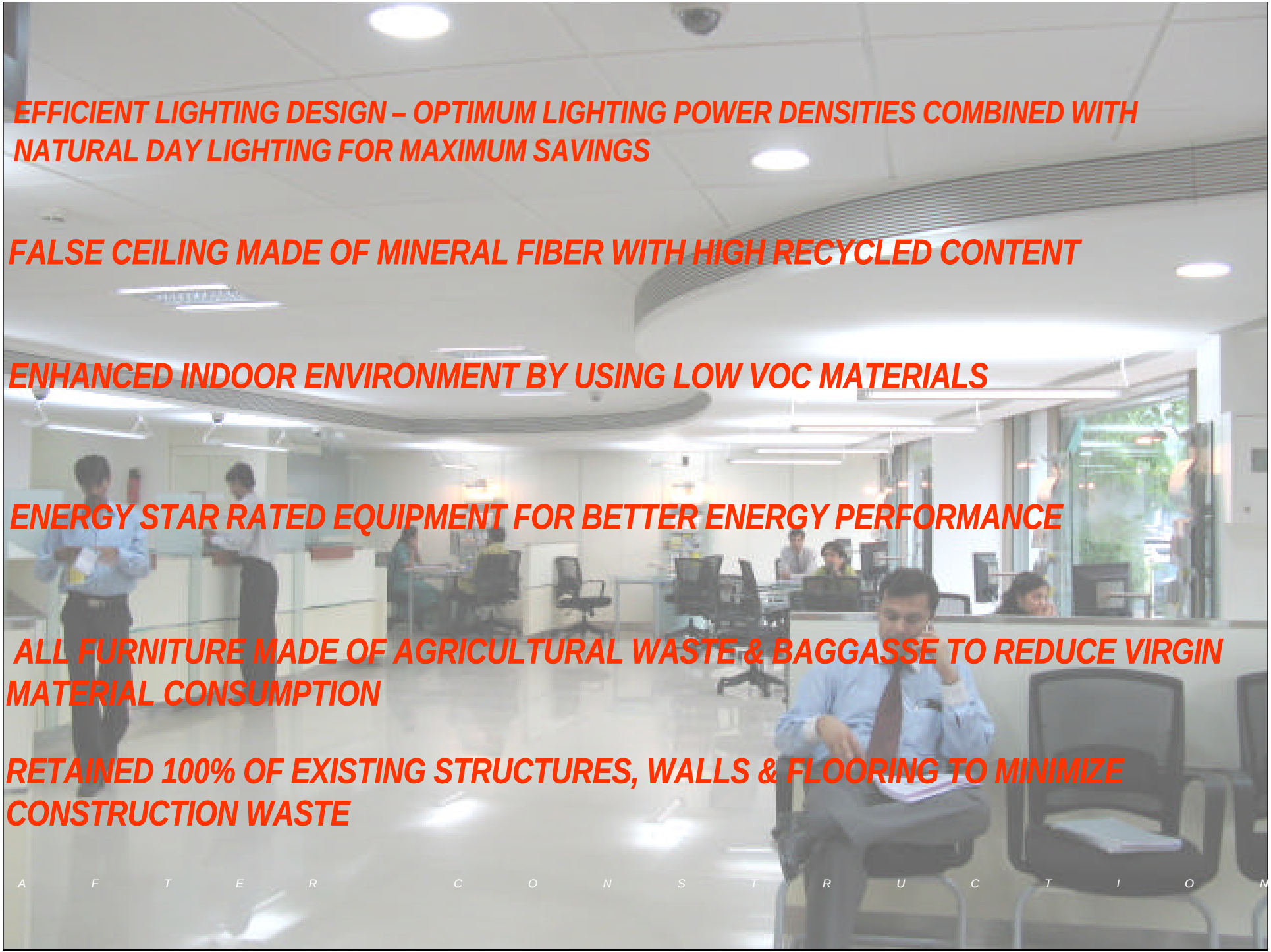
LEED Core and Shell - Gold

ABN Amro Bank – LEED Commercial Interiors

FACT SHEET

- FIRST PLATINUM INTERIORS OUTSIDE U.S. & 8th IN THE WORLD
- 8000 Sq ft of Leased Office Space
- Ground + 1 Floors
- Base building by Developer
- 7% increase in cost budget

REPLACED EXISTING GLAZING FOR IMPROVED ENERGY SAVINGS & DAYLIGHTING
SIGNAGES - MINIMIZED LIGHT POLLUTION
24 hrs ATM
ABN·A
એબીએન એમ્રો



EFFICIENT LIGHTING DESIGN – OPTIMUM LIGHTING POWER DENSITIES COMBINED WITH NATURAL DAY LIGHTING FOR MAXIMUM SAVINGS

FALSE CEILING MADE OF MINERAL FIBER WITH HIGH RECYCLED CONTENT

ENHANCED INDOOR ENVIRONMENT BY USING LOW VOC MATERIALS

ENERGY STAR RATED EQUIPMENT FOR BETTER ENERGY PERFORMANCE

ALL FURNITURE MADE OF AGRICULTURAL WASTE & BAGGASSE TO REDUCE VIRGIN MATERIAL CONSUMPTION

RETAINED 100% OF EXISTING STRUCTURES, WALLS & FLOORING TO MINIMIZE CONSTRUCTION WASTE

A F T E R C O N S T R U C T I O N

FSC CERTIFIED VENEER & WOOD

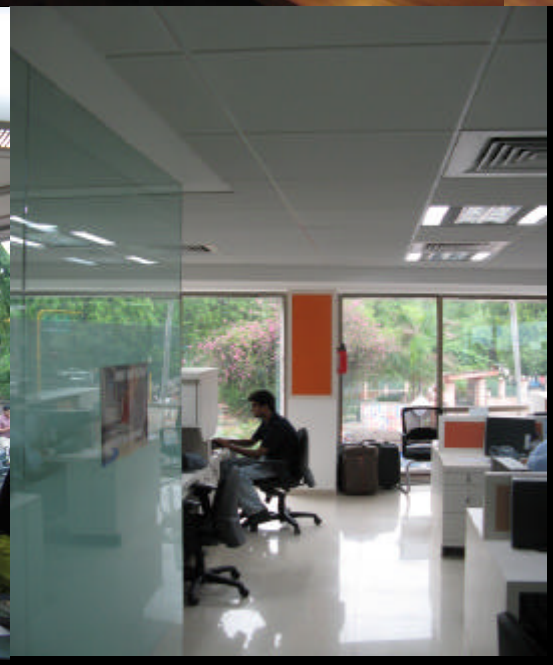
PAINT: CERTIFIED LOW VOC PAINTS

LAMINATES: CERTIFIED WOOD LAMINATES FROM “GREENLAM”

CARPET: CRI GREEN LABEL PLUS CERTIFIED

FSC CERTIFIED VENEER & WOOD

FSC CERTIFIED VENEER & WOOD

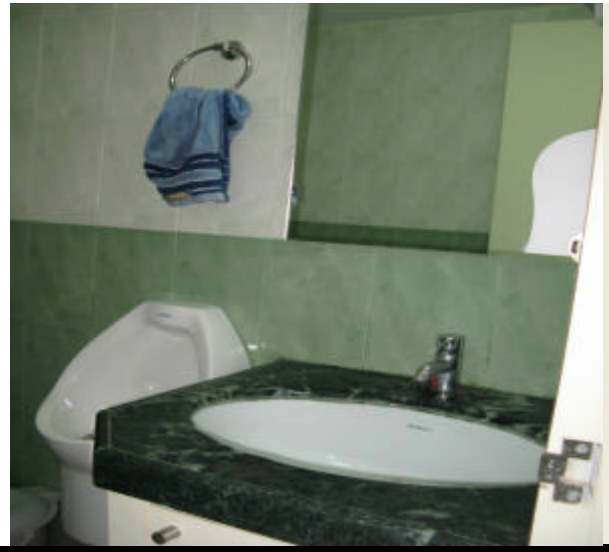


AUTOMATIC LIGHTING SENSORS IN DAY LIT AREA

34 %

reduction in energy used for lighting

En3 Consulting



45 % reduction in consumption of potable water

19 %

less consumption of HVAC energy compared to conventional buildings

More than 75 %

of spaces have day lighting

90 % occupants have views

to the outdoors

The World Bank – LEED New Construction

FACT SHEET

- LEED Silver Building
- 150,000 Sq ft of Office Space
- Ground + 3 Floors
- New construction including interiors
- 1.9% increase in cost budget

The World Bank – Green Concepts

- Extensive landscaped space to promote biodiversity
- Effective rain water harvesting system and Zero discharge from site
- 100% recycled / grey water use for landscaping and water features
- Over 20% water use reduction
- Use of high performance glazing, reflective roofs & high efficiency HVAC and lighting systems for energy savings
- More than 85% of all building materials are procured locally / regionally to reduce transportation pollution
- High % of building materials have recycle content including 180 workstations and other materials

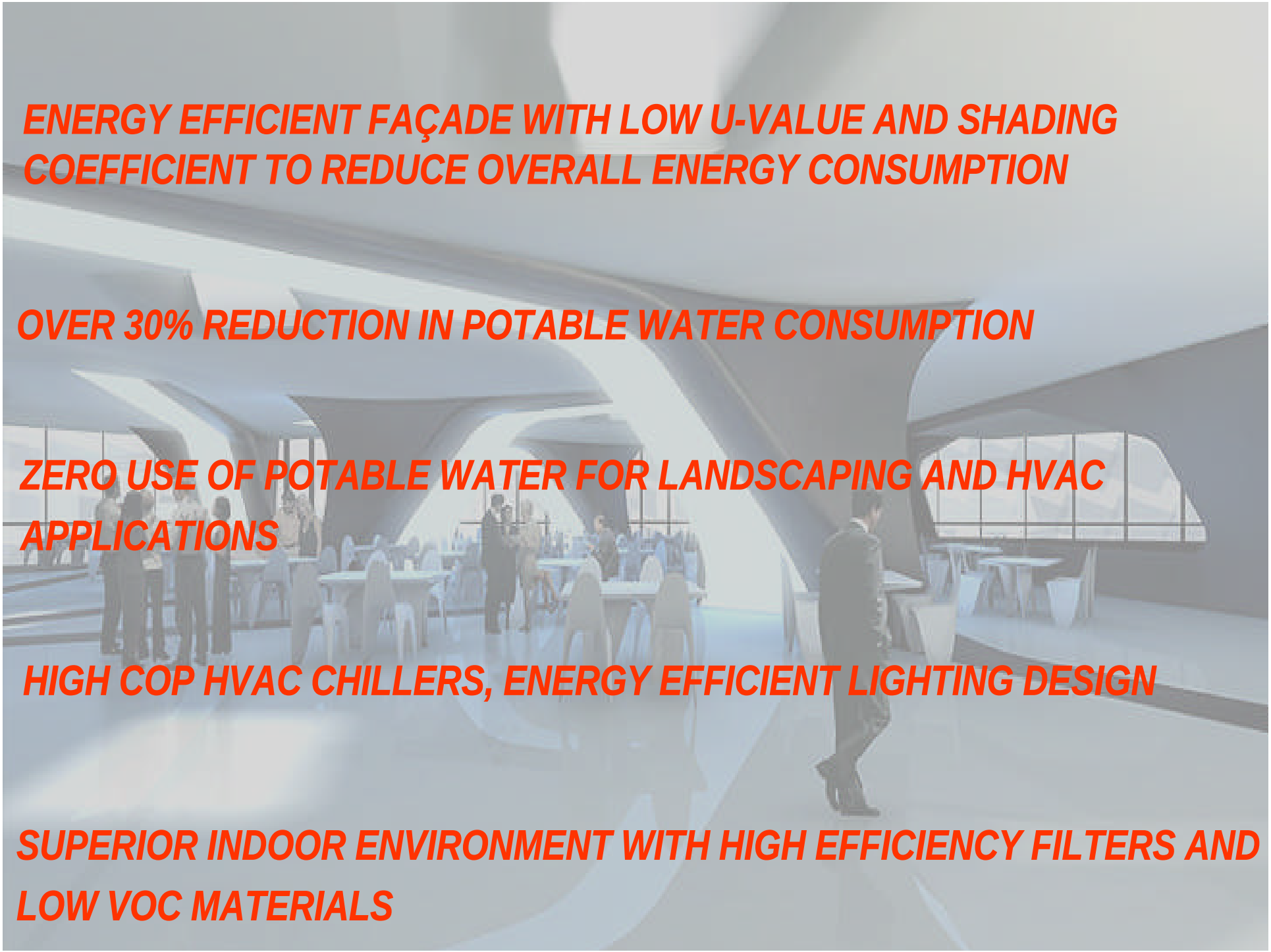
The World Bank – Green Concepts

- Chairs are GREENGUARD certified with the frames having high % of recycled content
- Almost 98% of site construction waste either re-used at site or salvaged for re-use off-site and diverted from landfills
- Extensive use of refurbished workstations, chairs, door hardware, ceiling tiles etc. to reduce virgin material exploitation
- Superior indoor air quality management during construction safeguarding worker health and well being
- Use of low VOC paints, carpets, composite wood and agrifiber products to reduce contaminants

IL Business Park – LEED Core and Shell

FACT SHEET

- LEED Gold Building *
- 2.4 Million Sq ft of Commercial Space
- 3 Towers each Ground + 16 Floors
- Core and Shell development
- 6% increase in cost budget



ENERGY EFFICIENT FAÇADE WITH LOW U-VALUE AND SHADING COEFFICIENT TO REDUCE OVERALL ENERGY CONSUMPTION

OVER 30% REDUCTION IN POTABLE WATER CONSUMPTION

ZERO USE OF POTABLE WATER FOR LANDSCAPING AND HVAC APPLICATIONS

HIGH COP HVAC CHILLERS, ENERGY EFFICIENT LIGHTING DESIGN

SUPERIOR INDOOR ENVIRONMENT WITH HIGH EFFICIENCY FILTERS AND LOW VOC MATERIALS

Over 20% recycled content in materials used

Over 40% materials are manufactured locally

Cost of Green Buildings

Today, with integrated design and balance of materials and systems, initial cost of green buildings can be as effective as conventional buildings, while the operating costs can be more than 30% lower

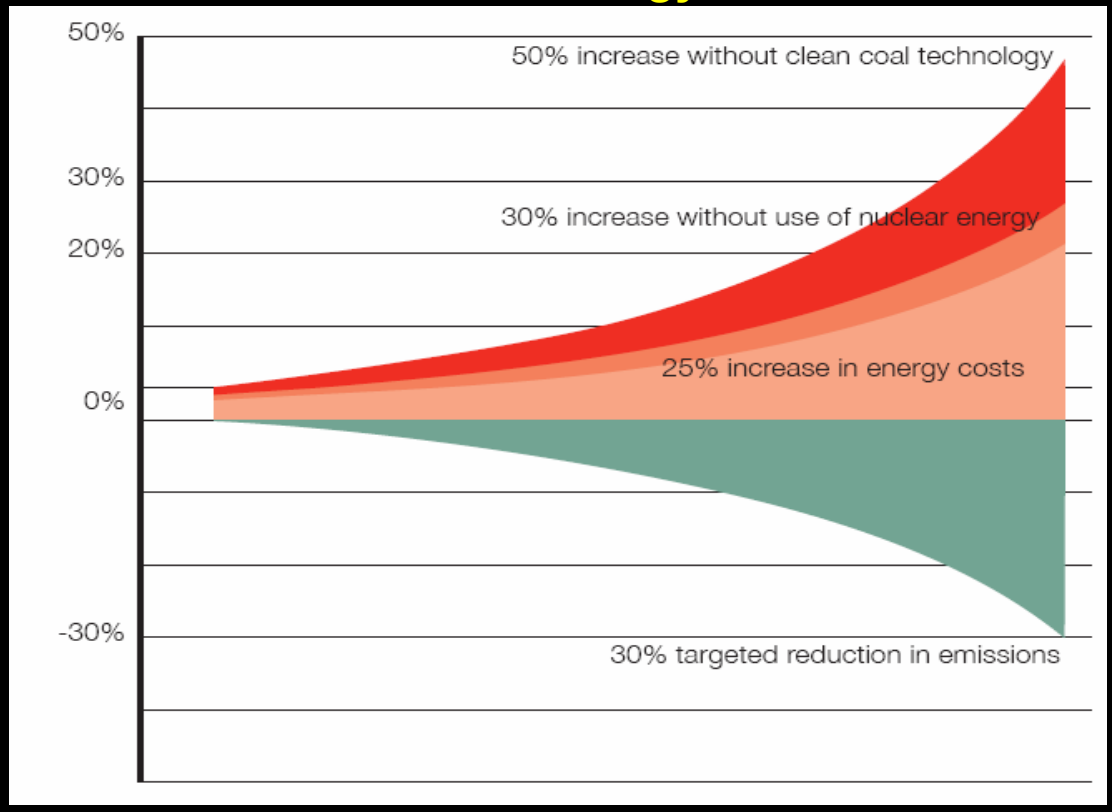
Typical Project Area (Sq.ft)	LEED Rating Achieved	Year of Completion	Incremental cost	Typical Payback
20,000	Platinum (56 points)	2003	20 %	7 years
175,000	Platinum (57 Points)	2005	8 %	5 years
40,000	Gold (42 Points)	2005	6 %	3 years
150,000	Silver (34 points)	2007	2%	1 year
540,000	Silver (30 points)	2008	0.5%	5 months
150,000	Platinum (54 points) **	2009	4.6%	3.6 years

The Cost of Not Going Green

Two factors that profoundly change the way we view green buildings are ENERGY and WATER

We are not only going to be looking at Initial and Operating costs but also at a Carbon Emissions Cost (even a Carbon Tax) in the future !

Cost of Energy



Year 2007 →

"Nobody made a greater mistake than He who did nothing because he could do only a little".

~ Edmund Burke ~

In Summary

- *Green design is not ADDITIVE to regular building design and should not be conceived as a separate feature with an add-on cost*
- *Integrated design approach amongst project team members is required to build green with little or no added cost*
- *Contracting communities need to embrace sustainability and no longer see this as an additional price burden*

Finding the right mix of green features for each project is the key. There is no 'one size fits all' solution but we need to build-in design solutions that will ensure every project, no matter the size, location or limitations, makes a "Sustainable difference" to the Environment !

THANK YOU!

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