





**GREEN BUILDINGS -
A SUSTAINABLE OPTION**

photo credit: Rhys Jones (<http://flickr.com/photos/rhys400d/420425672/>)

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Current Scenario

- **World energy demand is expected to grow by 30-40% in the next decade**
- **Buildings consume 40% of the world's energy ***
- **Buildings account for 50% of all Green House Gas emissions**
- **In following 15 years, more than 60% of the world's population will be living in cities of over 1 million inhabitants**
- **India will need 200 – 400 million new homes**
- **There is a growing preference for living & working in air-conditioned spaces**
- **India to take lead in Green Building in the next five to ten years given the increasing amount of real estate development happening in the country**

*source: United Nations Environment Program, March 2007

What is a Green Building?

"A green building is one which uses less water, optimizes energy efficiency, conserves natural resources, generates less waste and provides healthier spaces for occupants, as compared to a conventional building."



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Why Green Buildings?

- **"Where Green is Green" - reduces OPEX Costs and offers attractive ROI on CAPEX**
- **Improves health & productivity of the occupants through better IAQ and working environment**
- **Raises the quality & standard of buildings**
- **Inspires innovation & sets measurable performance standards with regard to reduced environmental impact and benefits**
- **Helps conserve energy and water and reduces cost**
- **It makes the building healthy and sustainable**



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Paharpur Business Centre's Journey towards Sustainable Development & Green Building Initiatives

➤ Paharpur Business Centre & Software Technology Incubator Park (PBC™-STIP) offers plug & play serviced office solutions to corporate planning expansion or setting up operations in Delhi NCR



➤ Is a 20 year old, 50,000 ft2 building



➤ Over 1,200 plants for 300 building occupants to take care of Indoor air quality

➤ Documents Submitted to USGBC & Expect to be the first LEED "EB" Platinum rated Green Building in India



➤ Rated as one of the healthiest building in Delhi, by Govt. of India, in a Govt. of India Report, September 2008



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Paharpur Business Centre – Nehru Place Greens, New Delhi

- Use biotechnology to 'Grow Fresh Air' Indoors
- Outstanding Indoor Air Quality - Amazing increase in human productivity resulting from use of special indoor green plants to be >20%
- Reduced 60% energy consumption over 20 years
- Management of Waste, Energy and Water
- Learn more about the study or check on today's indoor air quality at www.pbcnet.com



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Air Quality Data Indoor and Ambient at PBC

We update our daily IAQ data at our website
www.pbcnet.com

| DATE | PM10 in Paharpur Business Centre (Microgram/m ³) | PM10 in Outdoor DELHI (Microgram/m ³) | Co2 in Paharpur Business Centre (In PPM) | Co2 in Outdoor Delhi (In PPM) |
|------------|--|---|--|-------------------------------|
| 12/08/2010 | 38 | 275 | 490 | 405 |



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Research – IIT, TERI, NASA

Tried and tested these plants for 15 years at our Business Centre

The Discovery

With only three varieties of plants, we can
 “grow our own fresh air” indoors, to keep us healthy

This also allows us to have reduced fresh air supplied to buildings and yet meet Industry standards for healthy indoor air.



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Which are these plants?

“The Living Room Plant”

Areca Palm

(*Chrysalidocarpus lutescens*)



“The Bedroom Plant”

Mother-in-law's Tongue

(*Sansevieria trifasciata*)



“The Specialist Plant”

Money Plant

(*Epipremnum aureum*)



For information on these plants, please visit:

<http://www.greenspaces.in/blog/ted09/>



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Benefits

Study found that there is a 42% probability of increasing blood oxygen by 1% if one is inside the building for 10 hours

Compared to other buildings in Delhi, the incidence of :

| | |
|----------------------|-------|
| Eye irritation | ▼ 52% |
| Respiratory symptoms | ▼ 34% |
| Headaches | ▼ 24% |
| Lung impairment | ▼ 12% |
| Asthma | ▼ 9% |

These figures mean fewer sick days

Our experience points to an amazing increase in Human Productivity resulting from using these plants to be >20%, and Energy Costs to reduce by an extraordinary >15%

*Study published on September 8, 2008 by The Govt. of India, Central Pollution Control Board and Chittaranjan National Cancer Institute, Kolkata, India



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MicroManage

**Having a nice and swanky facility is not enough.
Maintenance is important.**

Paharpur Business Centre has a full fledged Green Integrated Facility Management Service Provider - managing facilities with maximum efficiency, safety & employee comfort.

Specialize in maintaining Healthy indoors

Offers end-to-end solution in facility & building services

- **Soft service**
- **Hard Service**
- **Single window service**
- **Indoor Air Quality Consulting**



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What next? GreenSpaces

- **We're now replicating the concept of Paharpur Business Centre in a much larger facility on NH2, 6KMs from Delhi with a METRO stop in front. USGBC LEED Platinum, TERI Griha, & BEE 5 Star.**
- **GreenSpaces will have 60,000 indoor plants.**
- **It is a 1.75 million ft2 , fully fitted out serviced SEZ Project, and will be ready for occupation by end 2013, for 1 - 10,000 work stations 24 x 7, suited to all, including SME's and MNC's with recreation, food, shopping, conference, & hotel**
- **It is being built as 'World's most energy efficient commercial building'.**



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Project Goals

Min. energy consumption - 75% reduction over a conventional A grade Commercial Building

Healthiest work place aimed at reducing attrition rate & creating social sustainability

Maximum use of daylight, high air quality, external views, secure environment & amenities for recreation, well-being & learning

International Certification - LEED 3.0 Platinum; TERI GRIHA 5 star rating; BEE 5 star & a CDM project saving over 36,000 tons pa of CO2.

Economically sustainable - To show that 'Green is Green'.

Sustainable designed commercial development is economically viable & profitable

Follow our progress at
www.greenspaces.in

Make suggestions at
www.greenspaces.in/challenge & www.greenspaces.in/ideas

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Support

We are supported by DOE, Lawrence Berkeley National Laboratory, National Renewable Energy laboratory, Oak Ridge National Laboratory in USA and CSIR Labs in India for achieving more than 75% energy efficiency.

Is an approved reference Flagship Project of Asia Pacific Partnership which comprise 7 countries – Australia, Canada, China, India, Japan, South Korea & USA

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We cordially invite you to visit us and experience mountain fresh air at our ConferenceSpa or restaurant – Café Einstein, by hosting your next conference /training /interview at our facility

Thank You



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