



COUNTRY REPORT

INSTITUTE OF ARCHITECTS PAKISTAN - IAP

ARCASIA COMMITTEE ON GREEN AND SUSTAINABLE ARCHITECTURE (ACGSA)



Sustainability has always been an integrated part of the Pakistani way of living and its architecture. While the **traditional ways** and means of sustainability have always been an influenced **contemporary architecture** in Pakistan, **rapid growth in economy and urban population** has put an enormous strain on the environment, resources and the traditional way of living.

REDUCE ▶ **REUSE** ▶ **RECYCLE**

- We reuse and recycle everything from rubber in tires, steel, fixtures and concrete/brick debris from demolished buildings, copper from electrical wires and computer chips, plastic, and even clothing.
- We are key player in the scrap trade. Scrap from around the worlds is dumped here for reuse and recycling





PREVAILING CORE ISSUES

1. Less focus on **REDUCE**. More on **Reuse** and **Recycling**.
2. **Low literacy** rate leads to “**Tragedy of the commons**”. Absence of “**Enlightened self interest**” and mindset issues.
3. Lack of **Government driven initiatives and support** . Most initiatives are coming from Private sector and professional bodies.
4. **Lack of capacity building at Government level**. Building energy code of Pakistan 2008 only apply to building envelope and mechanical systems. Site and land use development, building orientation, sunshade designs, building form, understanding of climatic charts and zones, wind analysis, natural ventilation have been completely missed out.
5. **Absence of law making and implementation** especially in regard to Green building.
6. No incentives to developers and other stakeholders and favorable legislation to promote Green building.



PAKISTAN BUILDING ENERGY CODE 2008

The **scope of this code** is to provide:

- a) Minimum energy-efficient requirements for the design and construction of:
 - New buildings and their systems,
 - New portions of buildings and their systems, and
 - New systems and equipment in existing buildings
- b) Criteria for determining compliance with these requirements.

Applicable Building Systems

The code applies to the following:

- Building envelopes,
- Building mechanical systems and equipment, including heating, ventilating, and air conditioning,
- Service water heating,
- Lighting, and
- Electrical power and motors



PAKISTAN ENERGY CONSERVATION BILL 2011

After the recent Energy crisis the Government of Pakistan came up with the Pakistan Energy Conservation Bill which has not been approved as yet.

STATEMENT OF OBJECTIVES AND REASONS

The **conservation and efficient use of energy** is pivotal for the development of Pakistan. It has great potential to alleviate the adverse effects of shortage of energy supply causing serious energy crisis in the country and for this purpose it is imperative to

1. **Establish institutions** and stipulate mechanisms and procedures for effective conservation and efficient use of energy in Pakistan.
2. In order to achieve the aforesaid objectives an Authority under the name **National energy Conservation Authority (ENERCON)** is established under the Bill. ENERCON shall act as focal Federal agency for initiating, catalyzing and coordinating the implementation of energy conservation activities in all sectors of the economy under the auspices of the Pakistan Energy Conservation Council (PECC) headed by the Prime Minister of Pakistan.



REQUIRED ACTION

1. A change in the mindset has to come about by creating Enlightened self interest in general public.
 - By Affective media campaigns and public awareness programs.
 - By incorporating courses on sustainability in schools. Introducing workshops on green building practices.

In this regard IAP has taken the initiative of conducting monthly lectures, seminars and annual events on the themes of energy efficiency, green materials, lighting and environment friendly architecture delivered by local and foreign professional of good standing. These lectures are for the professionals and IAP members but also open to general public.
2. On Government level, offering incentives to general public, developers and various stakeholders and making legislative acts that are favorable to green building.
3. Energy Conservation Bill 2011 has to be passed in the Assembly and duly implemented.
4. Capacity Building at Government level. Institutes and professional organizations to take the leadership role in providing technical support and assistance to the Government. IAP and Pakistan Green Building Council role would be instrumental in capacity building at the level of Government , education sector and service and product industry.

DEVELOPING GREEN BUILDING DESIGN MANUAL



Purpose:

A set of *guidelines* and *recommendations* that would assist IAP members and architects in general towards a better understanding of “green” concepts and goals, enabling the design of a built environment less heavy on energy, and more sustainable.

Objective:

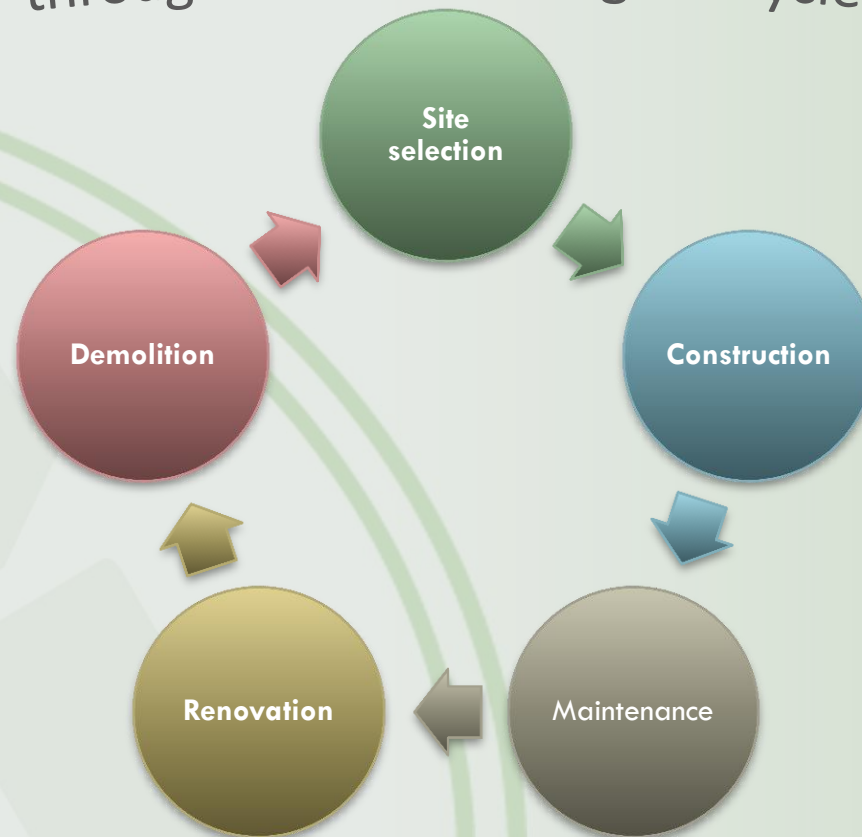
In view of the Pakistan energy code of 2008, which is biased approach to engineering systems only, it was important to address the *effects of architectural design* and land use development. The manual goes in depth of site selection, site development, building orientation, sunshade designs, building form, understanding of climatic charts and zones, wind analysis, natural ventilation.

Approach:



Focus is on *design interventions* that are environmentally conscious and reduce the adverse impact of the development.

WHAT IS A GREEN BUILDING?

A resource-efficient process throughout the building life cycle



STRUCTURE THAT BUILDS AROUND

-  Energy Efficiency
-  Water Conservation
-  Indoor Air Quality
-  Materials
-  Site Planning





- 1.1 General**
- 1.2 Site Selection**
- 1.3 Brownfield Redevelopment**
- 1.4 Existing Transportation**
- 1.5 Existing Utilities Infrastructure**



2.1 Development Densities

2.2 Site Planning

2.2.1 Building Orientation

2.2.2 Wind Direction

2.2.3 Distance Between buildings

2.2.4 Locations of Common Facilities

2.2.5 Walkable Distances

2.2.6 Pedestrian Friendly Planning

2.3 Building Footprints

2.4 Hard & Soft Landscaping

2.5 Roads & Paved Areas

2.6 Stormwater Management

2.7 Heat Island Effect

2.8 Light Pollution Reduction



3.1 Bioclimatic Chart – Comfort Zone

3.2 Climate Data

3.3 Building Orientation

3.4 Building Form/Mass

3.4.1 Buildings shading buildings

3.4.2 Courtyards

3.4.3 Heat Sink Principle

3.4.4 Footprint – number of storeys

3.5 Solar Radiation

3.5.1 Solar Path Diagram

3.5.2 Shading Devices

3.6 Natural Ventilation

3.6.1 Wind Direction – Climate Data

3.6.2 Wind Characteristics - Behaviour

3.6.3 Window Design



3.7 Insulation

- 3.7.1 Design – sandwich, cellular, ventilated
- 3.7.2 Materials
- 3.7.3 Roofs - earth

3.8 Building Materials

- 3.8.1 Fill – recycled material
- 3.8.2 Aggregate – reuse
- 3.8.3 Fly ash – better strength, less curing, faster setting – expensive?
- 3.8.4 Furnace slag
- 3.8.5 Reused Wood
- 3.8.6 Glass – low 'E' glass – double glazing
- 3.8.7 Reused masonry?

3.9 Colours

- 3.9.1 Reflective
- 3.9.2 Absorptive



3.10 Structure & Construction

- 3.10.1 Bearing Walls
- 3.10.2 Pre Fabrication
- 3.10.3 Water Conservation
- 3.10.4 Energy Conservation
- 3.10.5 Low maintenance

3.11 Daylighting

- 3.11.1 Direct Light
- 3.11.2 Reflected Light
- 3.11.3 Diffused Light
- 3.10.4 Sky vault



The first three chapter of the manual are complete.
Work is in progress on 4,5,6,7.

The Manual is also presented to Pakistan Green Building Council for further development of the engineering aspects of the manual pertaining to water, energy , HVAC and mechanical systems, lighting and illumination to be added as part of chapter 4, 5, 6, 7.

In the absence of the existence of any formalized Green, Sustainable or LEED standards, this Manual limits itself to the collection and rationalization of “Better by Design” Standards.



NEXT STEP

The move towards LEED Certification and institutionalizing green standards by way of enabling and empowering the Pakistan Green Buildings Council to introduce green measures as legislative acts would be a consequent step.



FORMATION OF PAKISTAN GREEN BUILDING COUNCIL

Institute of Architects Pakistan (IAP) along with Institute of Engineers Pakistan (IEP) have been instrumental participants in the formation of Pakistan Green Building Council and since then are key partners.



PAKISTAN GREEN BUILDING COUNCIL

KEY PARTNERS

IAP

IEP

ASHRAE

PEC

PCATP

World Green Building Council Members

ESTABLISHED	EMERGING	PROSPECTIVE	ASSOCIATE GROUP
UNITED KINGDOM	FRANCE	AUSTRIA	ALBANIA
ARGENTINA	HUNGARY	BULGARIA	BAHAMAS
AUSTRALIA	ISRAEL	CHILE	BELGIUM
BRAZIL	ITALY	COSTA RICA	BOLIVIA
CANADA	INDONESIA	CROATIA	BOTSWANA
CHINESE TAIPEI	JORDAN	DOMINICAN REP.	CAYMAN ISLANDS
COLOMBIA	SWEDEN	FINLAND	CHINA
GERMANY	TURKEY	GREECE	CZECH REPUBLIC
INDIA	PERU	GUATEMALA	DENMARK
JAPAN	PANAMA	MALAYSIA	ECUADOR
MEXICO	PHILIPPINES	MAURITIUS	EGYPT
NETHERLANDS	QATAR	MOROCCO	EL SALVADOR
NEW ZEALAND	RUSSIA	NIGERIA	GEORGIA
POLAND	SAUDI ARABIA	PAKISTAN	GHANA
ROMANIA	SERBIA	PALESTINE	HONG KONG
SINGAPORE	SLOVENIA	SOUTH KOREA	IRELAND
SOUTH AFRICA	THAILAND	SRILANKA	KENYA
SPAIN	TUNISIA	SWITZERLAND	KUWAIT
U.A.E	VENEZUELA	URUGUAY	MONTENEGRO
U.S.A		VIETNAM	NORWAY
			OMAN

OBJECTIVE



Service & Product Industry

- Develop Green Guidelines for Architects and Engineers
- Develop Green certification (LEED-Pakistan) program
- Publish papers on latest sustainable building practices and technologies
- Facilitate exchange of knowledge among building and construction industry
- Work with financial institutions in creating incentives for Green Buildings
- Support and collaborate with other groups espousing similar agenda

Government

- Lobbying at Government level for favorable legislation to promote Green Buildings
- Develop Policies for Green Buildings
- Promote and stimulate demand for Green Buildings

Education Sector

- Develop courses in sustainability at educational institutions
- Develop LEED certification curriculum for professionals

Consumers

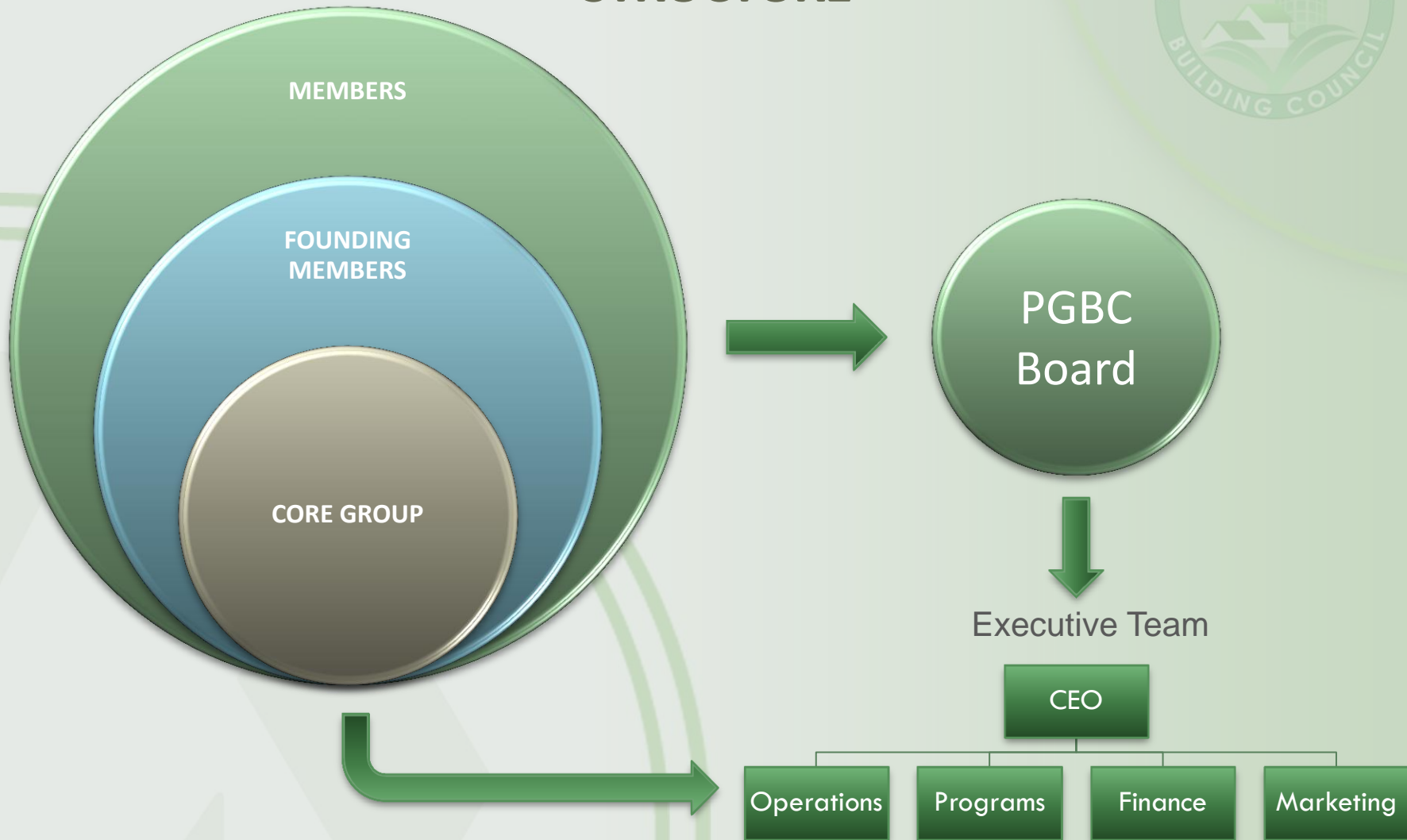
- Create awareness about sustainable lifestyles

MEMBER REPRESENTATION





STRUCTURE





PGBC TEAM ON BOARD

PGBC now has a fulltime team onboard to actively manage the organizational activity and lead the Green mission.

Chief Executive Officer: Aqrab Rana, Architect / LEED AP
Certified aqrab@pgbc.org.pk

Director Operations: Maliha Vahla , Architect
maliha@pgbc.org.pk



Project Registration with PGBC

- Currently we have the following prominent projects that have shown interest/support for PGBC registration:
- Ocean Towers/The Mall, Karachi –This is considered to be the tallest building in Pakistan today. The project is led by Ar. Yawar Jillani /ARCOP.
- Naya Nazimabad, Karachi – This is considered to be one of the largest community projects in Karachi. It covers 1200 acres of land accommodating over 4000 houses. The project is led by Ar. Yawar Jillani /ARCOP



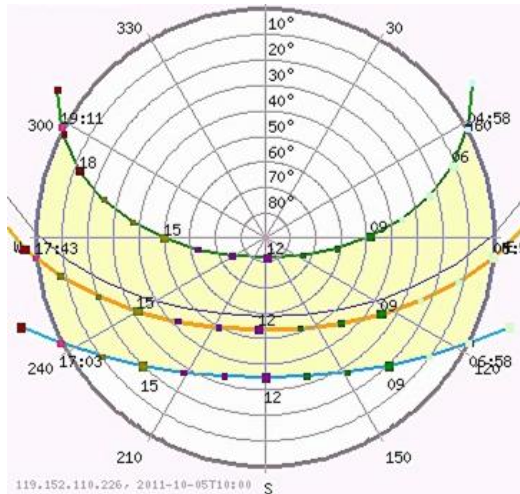
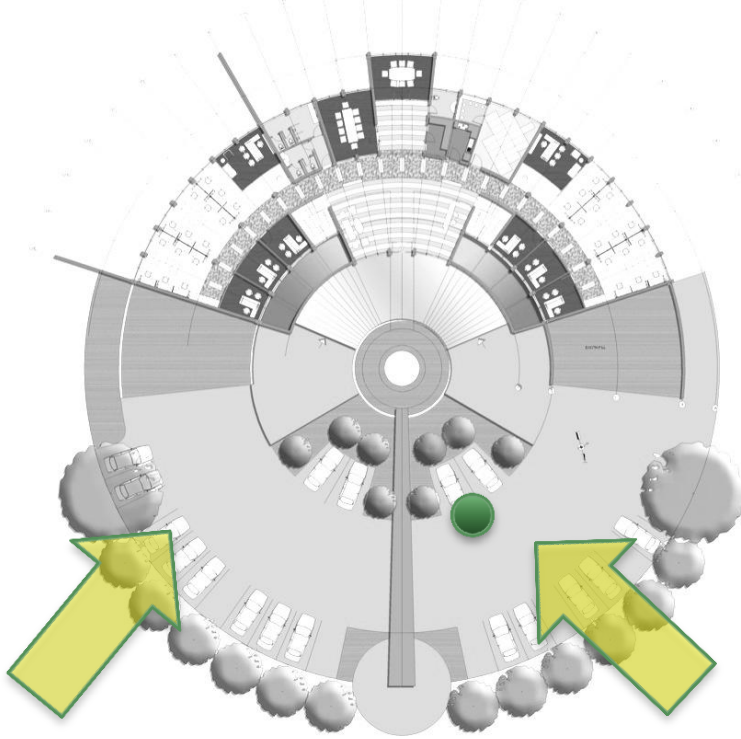
ECO HOUSING COMMUNITY, SHEIKHUPURA, BY DAWOOD GROUP

1. **Double glazed windows** on South and west
2. **Green roof system** (means, around 70% of the site area is green which will not add to the heat island effect)
3. **Large windows** for natural day lighting
4. **40% reduction in HVAC requirement** due to roof and envelop insulation
5. **Energy efficient HVAC system** which consumes 50% less energy than any other conventional HVAC units
6. **Solarized UPS** system for energy backup
7. Essential electrical loads on solar
8. **Energy simulation** of the complete house
9. **Water efficient irrigation system**
10. **Central courtyard** for hot air vent through natural circulation
11. **Green wood flooring** materials etc.

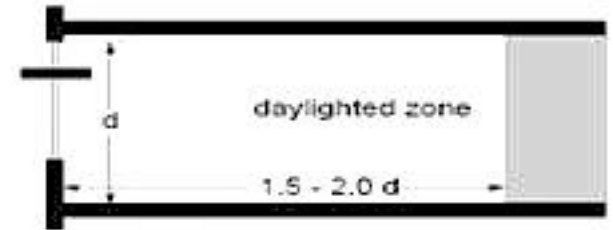




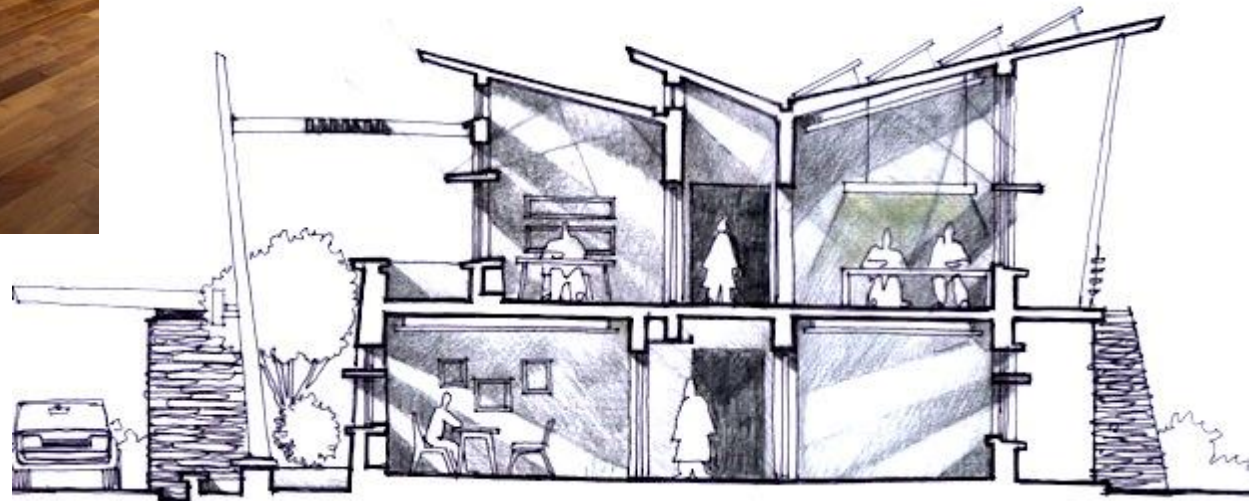
DG Cement Corporate Office (Nishat Group) - 27,000 sq. ft. corporate office, Kalar Kahar, Salt Range, Pakistan by SR Design Studio.



S



A rule of thumb for daylight penetration with typical depth and ceiling height is 1.5 times head height for standard windows. 1.5 to 2.0 times head height with light shelf, for south-facing windows under direct sunlight.





Beacon house TNS - 25,000 sq. ft. Educational Institution, Lahore





The TSM School, Ajnianwala, Sheikhupura- This project is designed and executed by RSM, an architectural firm in Germany and funded by Tipu Sultan Merkjez, an NGO. 95% of the school structure is constructed from locally available bamboo and mud, using native laborers.



A site visit was also conducted to this site. It was organized by IAP and funded by TSM.

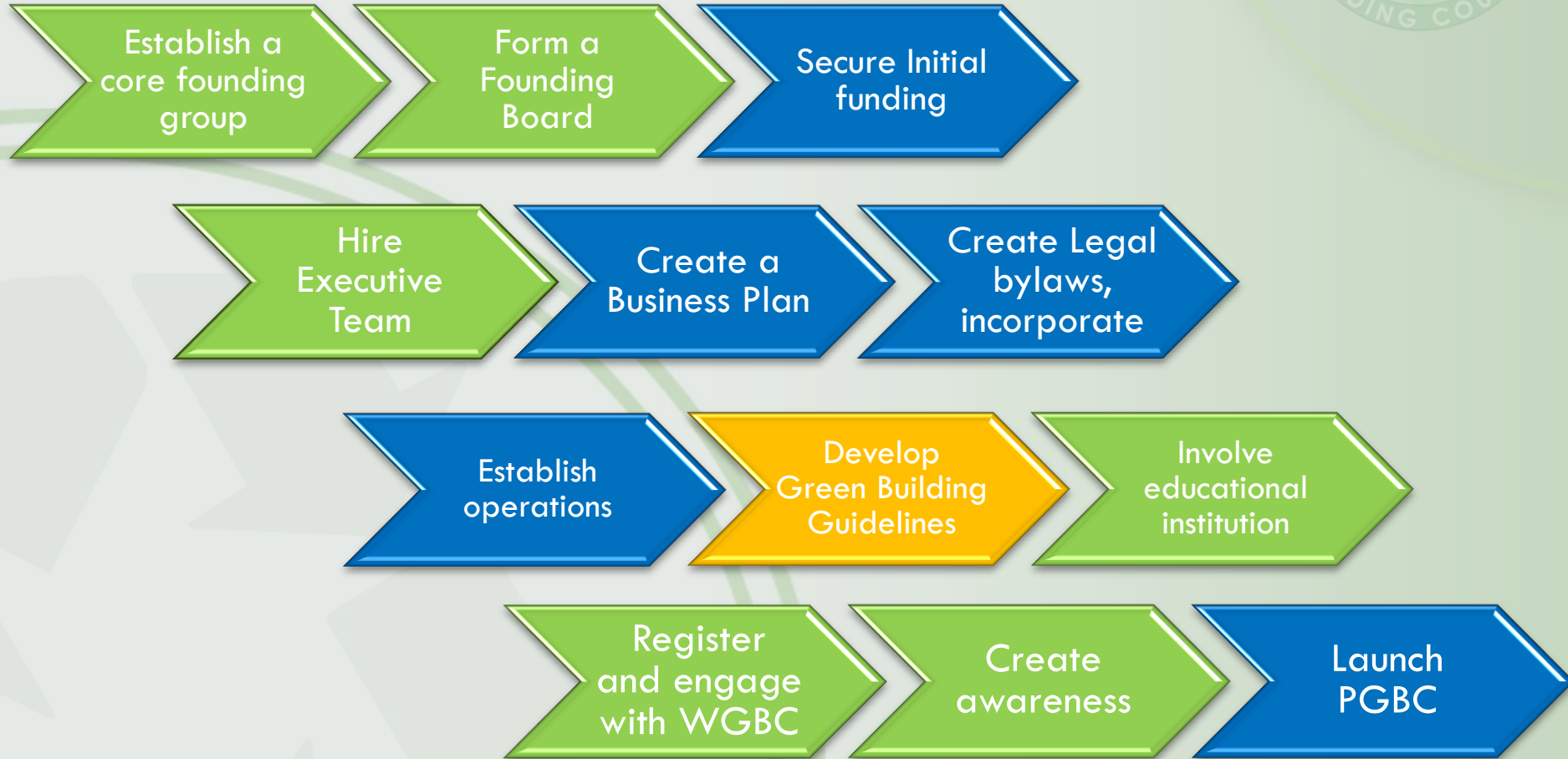


PGBC Representation in International GBC October 2012

Pakistan GBC was represented in International Green Building Conference held in Singapore. For the first time we had the representation of Government of Pakistan Official, company secretary of ENERCON (National Energy Conservation Authority) as part of PGBC to represent in the conference with us.



Prelaunch Roadmap





TARGET ROADMAP





**The future belongs to those who give the next
generation reason for hope.**

-Pierre Teilhard de Chardin (1881-1955)



- Acknowledgements for IAP Green Building Guideline
- Ar. Hassnain Lotia Convener IAP committee on Green Building Guideline and his team.