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Policy Recommendations for Implementation of Model Green Building Code Provisions for the Prime Minister's Five Million Naya Pakistan Housing

Acknowledgement

This study was prepared on behalf of the EU SWITCH-Asia Sustainable Consumption and Production Facility (SCP Facility) by green building expert Prof. Dr Sarosh Hashmat Lodi, with his team members including Dr Farrukh Arif, Faiz Ul Sibtain, Engr. Faiza Saeed, and Anton Barckhausen from adelphi consult GmbH, under the supervision of Cosima Stahr, and guided by Jawed Ali Khan from UN-Habitat. It was revised by Dr Zinaida Fadeeva, Team Leader, SWITCH-Asia SCP Facility.

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List of Abbreviations

ABAD	Association of Builders and Developers
AHJ	Authority Having Jurisdiction
ASHRAE	American Society of Heating, Refrigerating and Air-Conditioning Engineers
CDA	Capital Development Authority
CWHR	Council for Works and Housing Research
EIA	Environmental Impact Assessment
EU	European Union
GB	Green Building
GBC	Green Building Code
GBCP	Green Building Code of Pakistan
GHG	Greenhouse Gas
ICC	International Code Council, Inc
IgCC	International Green Construction Code
IEE	Initial Environmental Examination
MoCC	Ministry of Climate Change
MoHW	Ministry of Housing and Works
NDMA	National Disaster Management Authority
NEECA	National Energy Efficiency & Conservation Authority
Pak PWD	Pakistan Public Works Department
PCATP	Pakistan Council of Architects and Town Planners
PEC	Pakistan Engineering Council
PEECA	Punjab Energy Efficiency and Conservation Agency
PGBC	Pakistan Green Building Council
PSQCA	Pakistan Standards and Quality Control Authority
RE/SCP	Resource Efficiency and Sustainable Consumption and Production
SCPF	Sustainable Consumption and Production Facility
SEECA	Sindh Energy Efficiency and Conservation Agency
TMA	Tehsil Municipal Authority

1. Introduction

In 2018, the second phase of the SWITCH-Asia Sustainable Consumption and Production Facility (SCPF) was launched with European Union (EU) funding. The programme aims at providing a platform to promote sustainable consumption and production (SCP) policies and principles in Asia and enhance the awareness and dialogue of local stakeholders on the theme. To achieve these goals, the SCPF fosters exchange through platforms, key experts, entities and stakeholders who share the interest for impactful actions to further enable sustainable housing, a top priority for Asia and Asian countries, through relevant responsible consumption and production patterns, and to discuss ideas and lessons learned and, consequently, to identify and develop joint actions.

Sustainable housing came out as the top priority for Asia and Asian countries from the study of the second phase of the SWITCH-Asia Sustainable Consumption and Production Facility (SCPF) project, launched in 2018 and funded by EU. As a follow-up, this study aims to assess the current status of and demand for Green Buildings (GBs) in the context of Pakistan, with a focus on international good practices for green buildings and housing that could be transferred to the Pakistani context, and support an action plan on SCP implementation in the housing and buildings sector in the country.

This report aims to further support the integration of SCP principles in an Action Plan for Green Buildings in Pakistan and to present international and regional best practices to provide specific directions from the learning of their success.

The report describes a comprehensive implementation plan as policy recommendations for GBC (Green Building Code) provisions developed for the “Five-million housing” programme.

GBC provisions are an internationally recognized integration of all building codes developed so far to reduce the impact of buildings on climate change by using modernized green products and efficient technologies. The principal aim is sustainable production and consumption of resources. Green building is the practice of creating structures by using a process that is environmentally responsible and resource efficient throughout the life cycle of the building, starting from design, construction, operation, maintenance to revocation and demolition. The aim of GBC Provisions (GBCP) is to use environmentally responsible and resource efficient processes throughout the life cycle of the building, namely, (1) Energy efficiency and the use of renewable energy, (2) Water efficiency, (3) Use of environmentally friendly building materials, (4) Waste and toxics reduction, (5) Smart and sustainable growth, and (6) Enhancement of air quality.

SWITCH-Asia – EU, in collaboration with the Ministry of Climate Change, Pakistan Engineering Council, UN-Habitat, NED University, Karachi, and its long standing international strategic partner the International Code Council (ICC), has successfully developed Green Building Code Provisions for Pakistan, based on 2021 International Green Construction Code (IgCC-2021), ASHRAE 90.2 2018 and various research projects conducted in Pakistan. The provisions have been developed to meet the Sustainable Development Goals 7, 11, 12 and 13 for developing sustainable green buildings and cities, which was determined under the National Action Plan developed for strengthening Pakistan’s National Policy Frameworks to Facilitate Resource Efficiency and Sustainable Consumption and Production (RE/SCP). GBCP-2022 provides green, eco-friendly practices for a building’s design, construction and operation stages; and ensures the sustainable utilization of construction materials to save energy, conserve water, improve indoor environmental quality and lower greenhouse gas (GHG) emissions.

2. Key Concepts for Model GBC Provisions

The GBC provisions are based on the emerging green building approach, which unlike the conventional (non-green) building approach, aims to design, construct and operate a building with minimal use of resources. The main idea behind GB is to minimize unfavourable impacts of buildings on the environment through life cycle planning of a building, efficient use of resources, and environmental waste and pollution reduction. In addition to minimizing environmental disturbances and waste generation, minimizing the utilization of energy and other resources, its objectives are also to boost the use of renewable energy, and improve human health and comfort. Substantial savings can be achieved through integrated planning and adopting environment friendly designs in terms of materials and energy savings.

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3. Key Expert Inputs for GBC Provisions Implementation

A stakeholder workshop was held on 17 October 2022 at Serena Hotel, Islamabad. Through a working group exercise, the participants provided the following key inputs regarding the implementation plan for the GBC provisions.



Working Groups	Energy Efficiency	Water-use Efficiency
Stakeholders	<ul style="list-style-type: none"> • NEECA and Provincial Energy & Efficiency Departments • Federal Ministry of Housing and Provincial Housing Departments • Provincial and Capital Development Authorities and Local Governments • Private developers and builders • Pakistan Engineering Council (PEC) 	<ul style="list-style-type: none"> • End-users (in houses & public places) • Trained plumbers • Trained teams to ensure compliance of Water Standards (WS) and Pakistan Housing (PH) standards. • Regulatory bodies strengthening both quality and wastage
Prime Responsible Institutions	<ul style="list-style-type: none"> • Local governments (Development Authorities, Private developers and builders) • Housing Departments 	<ul style="list-style-type: none"> • PEC/Pakistan Council of Architects and Town Planners (PCATP) • Ministry of Housing and Works, Naya Pakistan Housing & Development Authority (NAPHDA), Subordinate Division • Provincial, Local (AJK, GB) Government departments
Proposed Structure	<p>The 'Proposed Structure' section contains two organizational charts. The first chart, for Energy Efficiency, shows a hierarchy starting with the 'National Energy Efficiency & Conservation Authority' at the top. Below it are 'Provincial Energy Departments' and 'Local Governments'. Under 'Local Governments' are 'CDA, MDA, FDA, LDA, TMA, Private Developers'. The second chart, for Water-use Efficiency, shows a hierarchy starting with the 'Development Authority' at the top. Below it are 'Urban', 'Cantonments', and 'Local'. Under 'Local' is the 'Municipal Committee', which is further divided into 'Town Committee' and 'Neighbourhood Committee'.</p>	

4. Policy Recommendations

Naya Pakistan Housing & Development Authority (NAPHDA) is a corporation established on 15 January 2020 through an Act of Parliament for the purpose of planning, development, construction and management of real estate development schemes and projects including housing. The Authority, being the development arm of the Government, is pursuing multiple objectives in the realm of housing and infrastructure development on both profit and non-profit basis throughout the country. The Authority will provide **one window operation through a Facilitation Centre to all the investors and builders**. The Authority is functioning under the patronage of **the Prime Minister of Pakistan** and is placed in the **Cabinet Division / Prime Minister's Secretariat**. The Policy Board, presently comprising 11 members, includes representation from both the Government and the Private Sector. The head office of the Authority is in Prime Minister's Secretariat, Islamabad. Its regional offices have been established in Islamabad, Lahore and Karachi, whereas in Peshawar, Quetta and Multan they are being established.

Promoting SCP implementation in Pakistan including around Pakistan's National Action Plan on SDG 12, the Green Buildings Code of Pakistan-2022 aims to promote efficient resource use in the building sector of Pakistan by developing, operationalizing and implementing the Code, which should be promulgated vide Statutory Regulatory Order (SRO) by the Government of Pakistan. In this regard, the EU SWITCH-Asia SCP Facility, in March 2022, developed a milestone document "Vision 2030 for a Green Building Code in Pakistan". The comprehensive implementation framework for the Green Building Code of Pakistan (GBCP-2022) is described in Figure 1.

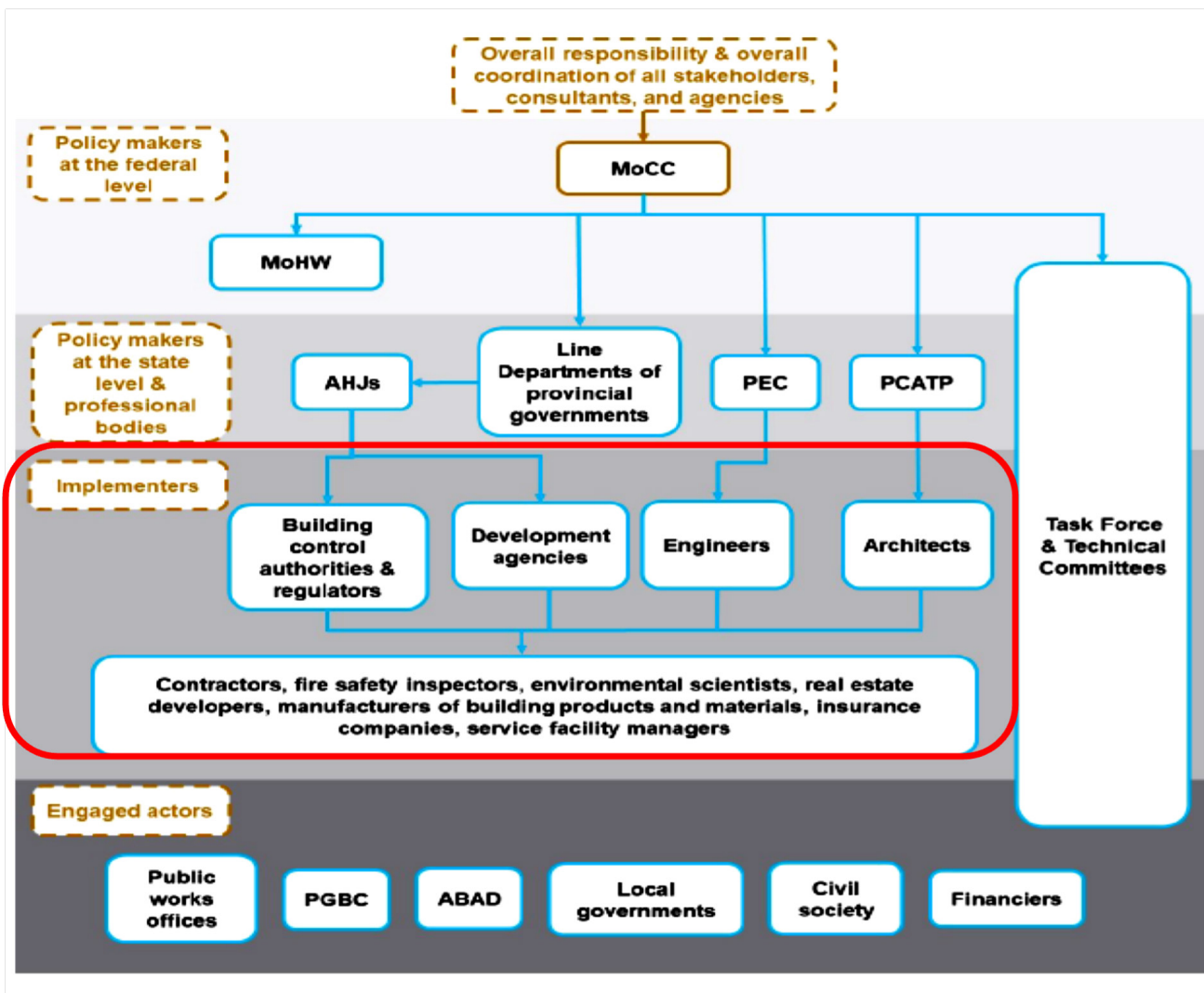


Figure 1: implementation framework for the Green Building Code of Pakistan-2022

5. Implementation Framework for the Green Building Code of Pakistan

Figure 1 describes the role of Development Agencies/Authorities Having Jurisdiction (AHJ) for the implementation of GBCP-2022, in letter and spirit, across Pakistan. After the 18th Amendment, relevant federal government authority/ powers were delegated to provincial governments. Accordingly, implementation of GBCP-2022 is a federal as well as a provincial responsibility. Similarly, the relevant stakeholders from all four provinces were taken on board during the development process of GBCP-2022 for its wider adoptability and implementation by introducing and promoting climate resilient green construction housing projects across Pakistan.

6. National Legal Framework for Implementation of Building Codes in Pakistan

Notwithstanding the 18th Amendment, as per PEC Act-1976, Pakistan Engineering Council has the national mandate to develop engineering-based codes. It has thus developed the following building codes for execution of professional engineering works. Under the provisions of PEC Byelaws-1976, all registered and professional engineers, constructors and consultants across Pakistan shall be responsible to perform professional engineering works as per the PEC Act and Byelaws,1976.

1. **Green Building Code of Pakistan (2022) (incorporated with GBC Provisions)**
2. **Building Code of Pakistan (2021)**
3. **Standardization of Building Codes, Standards and Specifications for Low-Cost (Affordable) Units – 2021**
4. Building Code of Pakistan - Fire Safety Provisions (2016)
5. Pakistan Electric and Telecommunication Safety Code (2014)
6. Building Code of Pakistan - Energy Provisions (2011)
7. Building Code of Pakistan - Seismic Provisions (2007)

7. Authority Having Jurisdiction

An organization, office or individual responsible for enforcing the requirements of the Green Building Code Provisions, or for approving design, building plans, equipment, materials, an installation, or a procedure is an Authority Having Jurisdiction. AHJ shall be the following, whichever has jurisdiction and circle:

1. Building Control, Housing and Development Authorities
2. District Administration
3. Tehsil or Town Administration
4. Municipal Administration
5. Station Headquarters (Army, Air Force and Navy)
6. Cantonment Administration
7. Union Council Administration
8. Autonomous Bodies
9. Industrial Estates
10. Directorates of Civil Defense
11. Export Processing Zones
12. Other Federal/Provincial Authorities as and when notified.

Sr. #	Stages/Duties to implement GBCP-2022	Implementing Institutions/ Organizations
1	Climate Zonation Site sustainability and environmental management planning through IEE and environmental impact assessment (EIA)	<ul style="list-style-type: none"> • Ministry of Climate Change • Pakistan Environmental Protection Agency • Pakistan Metrological Department
2	Research and development, and testing the quality of each construction material in Pakistan keeping in view the recommendations of GBCP-2022	<ul style="list-style-type: none"> • Council For Works and Housing Research (CWHR), Ministry of Science and Technology, Islamabad. • Pakistan Standards and Quality Control Authority (PSQCA), Karachi
3	Architects will design green buildings as per GBCP-2022	<ul style="list-style-type: none"> • Duly registered with Pakistan Council of Architects and Town Planners (PCATP) shall be liable to incorporate GBCP-2022 in designing of buildings across Pakistan
4	Geotechnical/ Structural Engineers	<ul style="list-style-type: none"> • Duly registered and licensed Engineers with Pakistan Engineering Council shall be liable to practice PGBC-2022 and allied Codes
5	Structural Design by the Engineer/ Consultant	

6	Constructors and Consultants	<ul style="list-style-type: none"> Duly registered with PEC Constructors/ Consultants are liable to implement PEC Byelaws while performing professional engineering works, which shall be carried out by PEC registered Constructors and Consultants across Pakistan.
7	Supervision by Authorities Having Jurisdictions, Building Control Authorities, Executing Agencies	<ul style="list-style-type: none"> For example, Capital Development Authority, Ministry of Housing, National Disaster Management Authority, Pak PWD Commissioner, Mayor etc.

8. Monitoring of Implementing and Executing Authorities

Monitoring of authorities responsible for effective implementation of the Green Building Code of Pakistan-2022 will be carried out by respective AHJ for implementation, planning and development. The suggested implementing/executive authorities may include:

a. At Federal Level

1. Ministry of Climate Change
2. Ministry of Planning and Development
3. Ministry of Housing and Works, at Federal and Provincial level
4. Ministry of Science and Technology
5. Ministry of Water Resources
6. Naya Pakistan Housing & Development Authority
7. Pakistan Engineering Council Registered Engineers, Constructors and Consultants, entire Pakistan
8. Pakistan Council of Architects and Town Planners, entire Pakistan
9. Pakistan Council of Research in Water Resources
10. Pakistan Environmental Protection Agency
11. Pakistan Green Building Council
12. Council For Works and Housing Research (CWHR), Ministry of Science and Technology, Islamabad.
13. Pakistan Standards and Quality Control Authority (PSQCA), Karachi
14. National Energy Efficiency & Conservation Authority (NEECA)
15. National Disaster Management Authority
16. Earthquake Reconstruction & Rehabilitation Authority/PERRA
17. Pakistan Public Works Department
18. Development Authorities/Municipal Corporations, such as CDA, LDA, SBCA, FATA Development Authorities etc.

b. At Provincial Level

1. Planning and Development Departments (Sindh, Punjab, KP, Baluchistan)
2. Housing and Works Departments (Sindh, Punjab, KP, Baluchistan)
3. Local Government/Departments (Sindh, Punjab, KP, Baluchistan)
4. Pakistan Council of Architects and Town Planners
5. Department of Housing and Works
6. Provincial Disaster Management Authority
7. Pakistan Council of Research in Water Resources (all Regional Offices in each province)
8. Sindh Energy Efficiency and Conservation Agency (SEECA)
9. Punjab Energy Efficiency and Conservation Agency (PEECA)
10. Development/Building Control Authorities, such as SBCA/LDA/KDA/KMC/Cantonment Boards/ Tehsil Municipal Authorities (TMAs)/ Commissioner etc.

c. District Government

1. District Administration
2. Municipal Administration
3. Tehsil Administration
4. Town Administration
5. Union Council Administration

9. Rating of Implementing and Executing Authorities

The rating of the implementing and executing authorities will be carried out by Pakistan Engineering Council, GBCP, National Energy Efficiency & Conservation Authority, and Pakistan Standards and Quality Control Authority, based on their capabilities, capacity and effectiveness in the enforcement of Green Building Code Provisions and Construction Byelaws and in field monitoring.

10. Punitive Measures for Non-Compliance

Following are the recommended punitive measures for non-compliance, if approved and applicable

- Non-Compliance of GBCP-2022 shall be identified to the respective controlling authorities (AHJ).
- AHJ shall report violations pertaining to respective regulatory bodies/authorities/ organizations such as Pakistan Engineering Council, GBCP and National Energy Efficiency & Conservation Authority.
- AHJ can recommend legal action for non-compliance to the respective implementing authorities or may take necessary punitive actions as per their prescribed Byelaws.

11. Legal Implementation Strategies for Green Building Code Provisions

Listed here are some of the strategies for implementation of the Green Building Code Provisions.

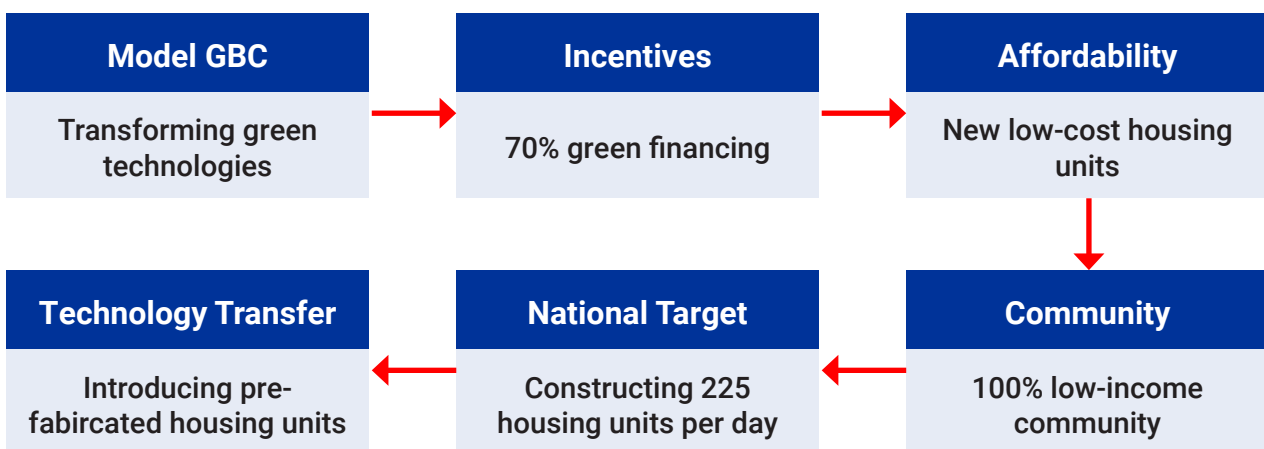
1. Issuance of a Draft Gazette Notification by the Ministry of Climate Change to impose adoption or adaptation of provisions whenever and wherever related codes, standards and regulations are developed at local, regional and national level.
2. Launch of Pakistan Green Building Code provisions.
3. Holding of National Workshops in all provincial capitals of Pakistan conducted by experts who developed this document.
4. Governance and implementation of the provisions through AHJs.
5. Capacity building of AHJs to be conducted by experts who developed this document, and to be organized and supported by the relevant AHJ.
6. Strengthening the role of Pakistan Green Building Council and National Energy Efficiency & Conservation Authority.
7. Launch of public awareness campaigns in social and print media.
8. A chapter on the concept of Green Buildings shall be added in the curriculum of schools and colleges,
9. Making academia and industry linkages for promotion and introduction of green construction materials.
10. Devising incentives for building owners and occupants on efficient use of water and energy, and reduction, reuse and recycling of waste generated in their buildings
11. Introducing energy audit incentives.
12. Developing and implementing a green building rating system.
13. Introducing Energy Star rating and incentives.
14. Devising a policy on tax rebates.
15. Holding an annual national-level competition for the best green building in Pakistan
16. Integrating technology in the design of houses based on green building provisions.

12. Proposed Compliance Framework

The following provisions of the GBCP shall be complied with in order to make them more effective and successful.

1. Model GBC for the Prime Minister's Five-Million Naya Pakistan Housing
2. Standardization of Building Codes, Standards and Specifications for Low-Cost (Affordable) Units – 2021
3. Green Building Code of Pakistan (2022)
4. Building Code of Pakistan (2021)
5. Building Code of Pakistan - Fire Safety Provisions (2016)
6. Pakistan Electric and Telecommunication Safety Code (2014)
7. Building Code of Pakistan - Energy Provisions (2011)

Following is the proposed incentive-based roadmap for encouraging compliance with the provisions of the GBC and its associated standards, codes and regulations for the Prime Minister's Five-Million Naya Pakistan Housing programme.



13. Conclusions

The study of international good practices can contribute greatly to guide the development of a roadmap and action plan for the implementation of GBC provisions in the context of Pakistan. SCP can be integrated into the four key themes: (1) Energy efficiency and the use of renewable energy, (2) Water efficiency, (3) Use of environmentally friendly building materials, (4) Waste and toxics reduction, (5) Smart and sustainable growth, and (6) Enhancement of air quality. The life cycle of a house can be evaluated through these SCP approaches in the context of Pakistan, as in other countries.

In the developed world, in particular in many countries in the EU, notable success has been achieved in the implementation of Green Building. The several years of experiences of establishment of GB in practice – the knowledge, experience, technology and methodology with practical outcomes – can be transferred to the local context of Pakistan. For speeding up the implementation of the GBC provisions, adoption of both bottom-up approach (voluntary measures) and top-down approach (mandatory measures) need to be considered while developing an Action Plan for adoption of the GBC provisions in the housing sector of Pakistan.

Lessons learned, recommendations and future provisions include, but are not limited to:

- Defining GBC provisions at the national level while leaving flexibility for regional needs is necessary for the implementation of the GBC.
- Post-occupancy controls can make compliance easier under a GBC framework to ensure buildings meet requirements not only in theory but also in practice. This should be tested on pilot housing projects so that thresholds and criteria can be set effectively.
- Establishment of a Green Building and Sustainable Construction Research Centre with the support of EU at an academic institution to continue research and development as well as for oversight of green building efforts.
- Stakeholders should be involved from an early stages of project definition.
- A bottom-up approach will be helpful in increasing awareness of the GBC for Pakistan. Awareness raising programmes can help to overcome barriers in implementation.
- Differentiating between building types and geographies can be useful in setting up codes for different energy needs.
- A variety of financing programmes or incentive mechanisms can be used to support both mandatory and voluntary GBC measures.
- Focusing on the business case can lead to higher compliance and accelerate implementation of GBC provisions.
- A holistic and harmonized approach can help create a market for inclusive and sustainable living spaces.



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