

Transformation of the Construction Sector to Promote Energy Efficiency in Buildings in Pakistan

Creating a sustainable construction sector in Pakistan by promoting Energy Efficiency in buildings.

Background

Pakistan has experienced the highest urbanisation rate in Asia, with urban dwellers increasing from 32% of the population in 1998 (42 million out of 132 million) to 37% by 2020 (81 million out of 220 million). This rapid urbanisation has spurred a substantial demand for new housing, especially in cities and urban areas. Currently, the country requires approximately 700,000 new housing units annually, yet only half of this demand is being met, resulting in an estimated housing deficit of around 10 million units.

The construction sector globally is responsible for nearly 40% of energy-related greenhouse gas (GHG) emissions. Notably, around 28% of emissions occur during the operational lifetime of buildings, mainly due to energy-intensive processes such as air conditioning (heating, cooling, dehumidifying). Pakistan's booming residential sector has mirrored this trend, with residential buildings now consuming about 53% of the country's electricity. Furthermore, the production, extraction and usage of building materials known as "grey energy" account for roughly 11% of emissions. This highlights the growing demand for energy-efficient, net-zero, and green building solutions across public and private sectors.

Our Approach

The Deutsche Gesellschaft für Internationale Zusammenarbeit (GIZ) GmbH, on behalf of the German Federal Ministry for Economic Cooperation and Development (BMZ) is assisting the Pakistani government and private sector stakeholders to achieve a transformation in the construction sector. The project, named 'Transformation of the Construction Sector to Promote Energy

Efficiency in Buildings in Pakistan (Bauwende)', focuses on developing environmentally friendly solutions for the construction industry, pertaining to material and energy flows, supply chains, emission data, building stock, functional lifespan of buildings, and planned construction projects.

Project name	Transformation of the Construction Sector to Promote Energy Efficiency in Buildings in Pakistan
Commissioned by	Federal Ministry for Economic Cooperation and Development (BMZ)
Project region	Pakistan, South Asia
Lead executing agency	National Energy Efficiency and Conservation Authority (NEECA)
Duration	10.2022 – 12.2024

This initiative aligns with 'Pakistan Vision 2025: One Nation - One Vision' and supports the Strategic Plan 2020-2023 of the National Energy Efficiency and Conservation Authority (NEECA), emphasising the importance of climate and resource friendly building methods for relevant actors in the energy and construction sectors. The project ensures that the:



Political instruments include aspects of sustainability in the buildings and construction sector.



Stakeholders are enabled to access evidence-based data for sustainable constructions and energy efficiency in buildings.



A pilot scheme shows the feasibility of selected measures to transform Pakistan's construction sector.



Pg. 1, Left: Inauguration of the Building Energy Research Center (BERC) at UET Peshawar.

Right: MoU signing between UET Peshawar and Peshawar Development Authority to support PDA to incorporate the Energy Conservation Building Code (ECBC) in the by laws.



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Pg. 2, Left: Participants in a group discussion at a consultative workshop on the "Transformation of the Construction Sector in Pakistan".

Right: Launch of the Manual for adoption of the Energy Conservation Building Code (ECBC).

Achievements of 2023-24

Policy instruments for sustainability in the buildings and construction sector.

The project has identified existing gaps in the political, legal, and regulatory framework for the transformation of the buildings and construction sector and developed recommendations for updating relevant regulatory documents at national and provincial level. The project provided technical expertise to the National Energy Efficiency & Conservation Authority (NEECA) to revise the Building Code of Pakistan, incorporating aspects of green building to promote energy efficiency and sustainable construction practices. As a result of the momentum developed by the project, the Government of Pakistan through Ministry of Energy officially notified via the Gazette of Pakistan, the **Energy Conservation Building Code (ECBC 2023)** as mandatory code for the construction of new buildings in Pakistan. The code was developed with the support of the German Development Cooperation and passed by the Pakistan Cabinet Committee on Energy last year as a first step towards the decarbonization process of the building sector.

Two major development authorities, Peshawar Development Authority (PDA) and Capital Development Authority (CDA) has committed to incorporate the Energy Conservation Building Code (ECBC) in their building by-laws and has started working on an action plan to carry out the capacity building of their staff with the support of the German Development Cooperation. Moreover, for knowledge dissemination on energy efficiency in the building sector, the project is organising webinars with building experts for public and private stakeholders.

Evidence-based data for sustainable constructions and energy efficiency in buildings.

To gather reliable digital data and information regarding the sustainable construction of new buildings and to roll out the implementation of ECBC 2023 the project has partnered with the

University of Engineering and Technology (UET) – Peshawar who has recently inaugurated a new institute **Building Energy Research Center (BERC)**. With the support of the German Development Cooperation, the center is envisaged to offer Master and PhD research topics on various building energy themes and foster collaboration and knowledge exchange with international institutes.

UET Peshawar has developed the ECBC Implementation Manual, a checklist for compliance of energy conservation in building codes and a set of publicly accessible online tools which allows individuals to assess buildings, determine material quantities and consumption levels, and ensure ECBC compliance. This includes: **Life Cycle Assessment (LCA) Tool, Building Performance Database (BPD), ECBC Compliance Web Tool**. Moreover, UET also conducted a detailed Life Cycle Analyses for 3 typical houses (151 Square Yards, 303 Square Yards and 605 Square Yards) in close coordination with relevant stakeholder.

Pilot scheme to transform Pakistan's construction sector.

Private sector stakeholders such as housing companies are recognising that adopting climate and resource friendly construction methods is both practical and economically viable. The project conducted a detailed analysis of the techno-economic aspects of the Energy Conservation Building Code (ECBC) to offer insights into the feasibility and economic implications of ECBC compliant constructions. Pilot projects have been selected with dissemination potential, high visibility, and fast implementation. International consultants have been working on architectural design and techno-economic analysis of a new green building of National Energy Efficiency & Conservation Authority (NEECA) as a potential pilot project.

Gender and Diversity

The project is promoting gender equality and diversity in construction by influencing decision-makers and guiding partners to create a more inclusive sector. This includes building networks of women experts and fostering gender-sensitive work environment.



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