Energy Efficiency Policy Toolkit Case Study

China

General Code for Building Energy Efficiency and Renewable Energy Utilization (GB 55015-2021)

OBJECTIVE

China's General Code for Building Energy Efficiency and Renewable Energy Utilization (GB 55015-2021) aims to significantly improve energy performance across the building sector. It targets a reduction in energy consumption and associated carbon emissions by establishing mandatory standards for the design, construction, and renovation of buildings.

The regulation promotes the integration of renewable energy systems into new and existing structures and supports China's national goal of carbon emissions peaking by 2030 and achieving carbon neutrality by 2060. The goal is to ensure that buildings meet energy consumption targets, whether through improved insulation, more efficient appliances, or renewable energy integration.

COUNTRY
China,
2021- ongoing

SECTOR AND APPROACH
Buildings; Regulation

SOURCE
GB 55015-2021

DESCRIPTION

The regulation applies to new construction, as well as the expansion and renovation of residential and public buildings. It sets technical standards for building envelopes, heating, ventilation and air conditioning systems, lighting, and renewable energy integration. However, it does not mandate rigid solutions, like specifying a certain type of insulation or specific energy-saving appliances. Instead, it provides performance criteria that the building must meet.

Stakeholders include government agencies such as the Ministry of Housing and Urban-Rural Development, provincial and municipal authorities, developers, design institutes, and energy efficiency service providers.

The code requires that construction projects meet minimum energy efficiency targets and encourages the use of advanced technologies such as high-performance insulation, passive design, and energy management systems.

UNIQUE ASPECTS OF THE POLICY

This regulation is the first national building code in China that combines both energy efficiency and renewable energy use in a single, comprehensive regulation. It adopts a whole-building approach for assessing thermal comfort, energy consumption, and carbon emissions performance. This approach accommodates building design flexibility while ensuring outcome-based compliance. The code also introduces carbon intensity benchmarks for buildings which is relatively new in national-level regulation. These aspects make it a relevant case study for other countries aiming to transition from prescriptive to performance-based standards.

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RESULTS

Since its implementation in April 2022, the regulation has led to a measurable improvement in energy efficiency. The energy consumption of new residential buildings has been reduced by approximately 30% compared to the previous standard, while public buildings have achieved a 20% improvement. The integration of renewable energy technologies, such as solar photovoltaics and ground-source heat pumps, has become a common practice, especially in urban developments. As a result, buildings constructed under the new code have reported average carbon emissions reductions exceeding 7 $kgCO_2$ per square metre per year.

LESSONS LEARNED

Initial implementation has revealed challenges in local enforcement capacity and technical expertise, particularly in smaller cities. Addressing these through training programmes and digital monitoring platforms has been critical. Early feedback also suggests that better integration with financing mechanisms could further accelerate adoption.

ALIGNMENT WITH REGULATORY AND POLICY FRAMEWORKS

The code complements China's broader energy and climate policies, including the 14th Five-Year Plan for Green Building Development and national targets for carbon peaking and neutrality. It supports other market mechanisms such as green building certification, financial incentives for low-carbon construction, and energy labelling schemes, creating a synergistic policy environment for energy efficiency in buildings.

IMPLEMENTATION AND ENFORCEMENT

The implementation of the code is overseen by local construction authorities and enforced through mandatory energy simulation assessments during the design stage and on-site inspections during construction. Compliance is verified through third-party evaluations and documented performance reviews, with penalties applied for non-compliance.