GBPN
Global Buildings Performance Network

Building Policies for a Better World

Executive Summaries

A COMPARATIVE ANALYSIS OF BUILDING ENERGY EFFICIENCY POLICIES FOR NEW BUILDINGS

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EXECUTIVE SUMMARY

Energy use in buildings is responsible for more than 30 % of CO2 emission and has a significant role to play in climate change mitigation as there are large potential savings as well in new as in existing buildings. A study completed by the Central European University commissioned by the Global Buildings Performance Network (GBPN) has demonstrated how far a transformative change of the building sector can bring us in terms of emissions reductions. In order to achieve this "deep" scenario, today's best practice/state of the art buildings must become the standard in less than ten years from now. For new buildings this means that all buildings should develop towards net zero energy or very low energy standards.

For new buildings building mandatory energy efficiency codes are a central element in achieving these savings. Such codes need to be dynamic and ambitious and they need to be supported by a policy package with long-term targets of achieving zero or positive energy for all new construction. The GBPN aims to support the development of dynamic and ambitious building energy efficiency codes by identifying elements that are critical in the development of best practice building energy efficiency codes.

One of the main outcomes of the project has been the development of criteria for identifying best practice elements of dynamic and ambitious building codes and policy packages. These criteria were developed with the support of 65 global building code experts from the different regions and large international organisations. 25 best practice building energy efficiency codes from the four GBPN regions and the rest of the world were scored based on these criteria. The results were used to form an interactive comparative tool that facilitates the analysis and comparison of best practice energy efficiency codes and supporting measures.

In the process of developing an interactive assessment of these 25 best practice building codes a set of themes were set up to define best practice in building codes. These themes included a holistic approach, a dynamic approach, good enforcement, individual elements of performance and over all performance. These five themes were selected in order to identify best practice in dynamic building codes and the capacity to reach for zero energy, but also to compare different elements of such practices.

For each of the themes sets of three criteria were developed to assess different aspects of each theme. This resulted in 15 criteria, which were the central point of the assessment. For each criterion some sub questions were developed in order to assess how well the different criteria were addressed in the individual codes. Each sub question was then assessed and scored in a way where each criterion could get up to 10 points in total.

Some of the sub questions address the same elements in different ways and it is not the aim that these criteria together form the assessment of the best building code and complementing policy packages. In contrary it is the aim to show how each code can learn from best practices in other codes and to show that there can be different solutions to each of the elements in codes depending on the local conditions and the legal framework.

A committee of GBPN experts and an external consultant did the scoring of the individual criteria in the assessment. Codes were scored by theme with one theme scored at a time across multiple codes. All points in each code were scored and reviewed in combination. Once all of the codes were scored a second round of committee meetings were initiated to ensure the consistency of scoring. Finally a workshop looked across all quality elements of the scoring by multiple code and criteria comparison. The network of GBPN and external experts were consulted in the scoring process. Information was collected from experts in each of the 25 jurisdictions at several parts of the process and when there was doubt further information and assessment were collected. This ensured the consistency in the scoring of each theme and the objectively validating the scores awarded.

A special tool was developed for the comparison of the multi criteria comparison of codes. This tool allows for comparison of individual or a random selection of criteria. The scores awarded to each code are illustrated on the GBPN website in the Policy Comparative Tool and can be reviewed by all users. This allows for an open feed back on selection of codes and the scoring of all the individual criteria or the sub questions. Users of website are encouraged to "play" with the tool, selecting and deselecting criteria/elements that are of interest to them, comparing the twenty-five codes selected by GBPN based on those criteria. The aim of the tool is to learn from scoring in different disciplines rather than determining who scores best overall.

The comparative tool aims to promote examples of dynamic and ambitious building energy efficiency regimes for new buildings with a particular focus on building energy efficiency codes. Twenty-five energy efficiency codes from across the GBPN regions (China, Europe, India and US) and some examples on codes from jurisdictions outside of the GBPN regions were selected to support this aim. Each code was selected based on their demonstration of elements of best practice as these were set in the 15 criteria. They were also selected in order to highlight regional differences in best practices relative to climate so that all jurisdictions globally could learn from these codes and policy packages.

Codes were selected following a literature review of current best practice energy efficiency codes from within the regions and information from other databases. The GBPN regional hubs, IMT (US), BPIE (Europe) and partners, Shakti (India), and CSEP (China) provided considerable support in the selection of codes by reviewing the codes selected following the literature review and suggesting additional examples of progressive and dynamic codes from their respective regions. All the selected codes are among the best in their region and in their level of development. To be selected among the 25 was hence already a large achievement in itself.

Because of the wide geographical spread of the codes included necessitated that climatic conditions were taken into consideration. A simplified climate model was developed based on heating and cooling requirements. Given the complex nature of comparing codes in relation to climate, the climate methodology is still underdevelopment and will be discussed further in the Positive Energy Buildings Laboratory section of the GBPN website. The comparison of the overall energy performance of these energy efficiency codes will also be discussed there as only very few codes included such values.

All of the data included in this tool will be available as open linked data on the GBPN website and experts will be encouraged to continue to collaborate on this project on an on-going basis. This way the launch of the tool will not be the end but the start to a collaborative and learning process.

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About GBPN The Global Buildings Performance Network (GBPN) is a globally organised and regionally focused network whose mission is to advance best practice policies that can significantly reduce energy consumption and associated CO_2 emissions from buildings.