Dear Contributor,

We are pleased to invite you to participate in the project ***“Leveraging Building Energy Codes and Standards for Climate Change Mitigation”***, a new World Bank Group knowledge product focused on green energy codes. Your expertise and extensive experience will allow us to better understand the current state of green building energy code adoption, enforcement and compliance in your city and to compare it to other cities around the world.

The World Bank Group is committed to producing research and data to promote the transition towards energy efficient infrastructure and to finding innovative ways to reduce carbon emissions and reliance on fossil fuels, including through the adoption of green building standards.

The intended outcome of the project is to create and make publicly available a new dataset of quantitative and comparable measures on the adoption, enforcement and compliance of building energy codes and minimum energy efficiency performance standards. This dataset, the first version of which we intend to publish by December of 2022, will be the most comprehensive and detailed in existence and will allow researchers and policymakers to identify and compare regulatory frameworks that achieve carbon emissions reductions and that are successful in transforming the construction industry and the built environment.

The purpose of the questionnaire below is to collect relevant data on your city. We ask that you complete as much of the questionnaire as possible. If you are unable to answer a particular question but know of an individual or organization with the relevant expertise, we ask that you provide us with the name and contact information (phone or e-mail) of that person or organization.

Please make sure to complete the section on the contributor’s information so that we can acknowledge your participation on our project website: www.worldbank.org/building-green. If you prefer, your contribution can also be anonymous.

We thank you in advance for your valuable contribution to the work of the World Bank Group. We reiterate our sincere appreciation for your participation and invite you to contact us regarding any questions or comments you may have.

Sincerely,

Building Green Team

Global Indicators Group

Development Economics Vice Presidency

World Bank Group

Email: [BuildingGreen@worldbank.org](mailto:BuildingGreen@worldbank.org)

*By voluntarily answering the below questionnaire, contributors are consenting that their name, firm affiliation, and contact information will be permanently retained in a password and access-restricted database by the World Bank Group’s Global Indicators Unit for the sole purpose of contacting respondents for conducting current and future research, in accordance with the World Bank Group Privacy Policy. This information will be retained in line with the applicable WBG Records Retention and Disposition Schedule and with the consent provided. Contributors can revoke at any time their consent for the processing of their name, firm affiliation and contact information by contacting DECIG. Contact information will remain strictly confidential within the Unit and will only be acknowledged on its website or publications per contributor preferences indicated below.*

**Contact Information:**

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| Please check the box next to information if you **do not** want us to publish on our website: |  | | | |  | | | | | |
|  | Title (Mr., Ms., Dr.) | |  | | | [     ] | | | | |
| Do not publish | First Name  Last Name | |  | | | [     ]  [     ] | | | | |
| *Never Published* | Position *(e.g. manager, associate, partner)*  Email | |  | | | [     ]  [     ] | | | | |
| Do not publish | Firm name |  | | | | | [     ] | | |
| Website |  | | | | | [     ] | | |
| Do not publish | Phone |  | | | | | [     ] | | |
| *Never Published* | Mobile phone |  | | | | | [     ] | | |
|  | Firm Address | | |  | | | |  |  |
| Street |  | [     ] | | P.O. Box | | | |  | [     ] |
| City |  | [     ] | | State/ Province | | | |  | [     ] |
| Zip/Postal code |  | [     ] | | Country | | | |  | [     ] |

**Additional Contributor(s):**

|  |  |  |  |  |
| --- | --- | --- | --- | --- |
| Name | Occupation | Email | Phone | Address |
| [title]  [first name]  [last name] | [firm]  [position]  [profession] | [     ] | [phone]  [mobile] | [street]  [state/province]  [city/country] |
| [title]  [first name]  [last name] | [firm]  [position]  [profession] | [     ] | [phone]  [mobile] | [street]  [state/province]  [city/country] |

If there are more people whom you would like us to acknowledge, kindly send us an e-mail.

**Referrals:** Please help us expand our list of contributors by referring us to other experts who can respond to the questionnaire.

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| --- | --- | --- | --- | --- | --- | --- |
| First name | Last name | Position | Firm | Address | Phone | E-mail |
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| 1. Mandatory Minimum Energy Efficiency Standards |
| 1. A) Does your city have mandatory minimum energy efficiency performance standards in its building code or in any of its building or environmental regulations?   Yes  No  If yes, please specify the name of the green building code or relevant regulations that are mandatory:        Please provide URL if it is available online:  B) Are the standards enforced in practice?  Yes  No  Yes, but inconsistently or partially  If yes or partially, please specify the year in which they were effectively first enforced:  If partially, what is the main barrier to implementation?  C) Is any update in the standards planned or in the process of development?  Yes  No  If yes, please provide details: |
| 1. Which party is *principally* charged with the enforcement of energy efficiency performance standards? *(Select all that apply)* |
| Local Building control authority  Environmental protection authority  Other public authority (please specify): \_\_\_\_\_\_\_  Single, non-governmental organization (please specify): \_\_\_\_\_\_\_  Third party (private) inspection system (for example - by authorized energy auditors): (please specify): \_\_\_\_\_\_\_  Self-certification by the applicant  Other: (please specify): \_\_\_\_\_\_\_ |
| 1. *Only if principal method of enforcement is third-party inspection system:* |
| 1. Does the code or relevant regulations specifically describe the requisite documentation to verify compliance based on third-party inspections?  Yes  No 2. Does the code or relevant regulations specifically describe the procedure to authorize third-party inspectors?  Yes  No 3. Does the code or relevant regulations specifically establish the professional qualifications required to register as a third-party inspectors?  Yes  No 4. Is there an independent body charged with developing guidelines, standards and/or codes of conduct for third-party inspectors?  Yes  No 5. Does the code or relevant regulations specifically establish a supervisory body to ensure third-party inspections are conducted appropriately and without conflict of interest?  Yes  No |
| 1. How would you describe the type of building energy code enforced in your city? |
| detailed standards for passive design and for equipment, appliances and systems (“prescriptive” code)  points-based system mandating a minimum energy performance of the building as a whole but not mandating specific standards for each component (“performance” code)  Combination of the two above: (please describe): \_\_\_\_\_\_\_  Other (please specify): \_\_\_\_\_\_\_ |
| 1. Which types of buildings are covered in the mandatory minimum energy efficiency standards in its building code or in its building or environmental regulations? *(Select all that apply)* |
| New buildings  Renovations, Additions, Alterations and/or Repair Project  Change of Occupancy  Other: (please specify): \_\_\_\_\_\_\_ |
| 1. In practice, which buildings are *exempted* from the enforcement of the minimum energy efficiency standards established in the building code or in its building or environmental regulations? |
| |  |  |  | | --- | --- | --- | | **Building Category** | **Exempted in practice** | **Criteria for exemptions (e.g. size threshold, project value threshold etc.):** | | **Commercial Buildings** |  |  | | Retail establishments (grocery stores, department stores, malls) | Yes No |  | | Office buildings | Yes No |  | | Public service establishments (post offices, public libraries, social security offices) | Yes No |  | | Medical services establishments | Yes No |  | | Education (schools, universities) | Yes No |  | | Storage facilities and Warehouses | Yes No |  | | Entertainment and recreation venues | Yes No |  | | **Residential Buildings** |  |  | | Single Houses | Yes No |  | | Townhouses (terraced housing) | Yes No |  | | Apartment buildings | Yes No |  | | Movable dwellings | Yes No |  | | **Other Buildings (please list below)** |  |  | |  | Yes No |  | |  | Yes No |  | |  | Yes No |  | |
| 1. Does your city accept internationally recognized Green Building Rating and Certification Systems as an alternative to complying with the local standards?  Yes  No     If yes, please specify the accepted systems: *(Select all that apply)*  [Leadership in Energy and Environmental Design (LEED)](https://new.usgbc.org/leed)  Building Research Establishment Environmental Assessment Method (BREEAM)  Green Mark  Green Star  EDGE  [Pearl Rating System](https://www.dpm.gov.abudhabi/en/Urban-Planning/Estidama-Pearl-Rating)  Living Building Challenge  Green Globes  Other: (please specify): \_\_\_\_\_\_\_ |
| 1. Pre-Construction Enforcement of Energy Efficiency Standards |
| 1. Does your city require proof of design compliance to the green building code as a pre-condition for the issuance of a building permit?  Yes  No     If yes, please provide the legal reference: |
| If yes, please specify which documentation is submitted in the context of a building permit application process to demonstrate compliance with the green building code:   |  |  |  | | --- | --- | --- | | **Required documentation** | **Mandatory** | **Enforced in Practice** | | Checklist of passive design  (daylight, orientation, and other features) | Yes No | Yes No Yes, but inconsistently | | Energy Verification Worksheet | Yes No | Yes No Yes, but inconsistently | | Energy Model | Yes No | Yes No Yes, but inconsistently | | Commissioning Plan | Yes No | Yes No Yes, but inconsistently | | HVAC Plan | Yes No | Yes No Yes, but inconsistently | | Lighting Plan and Schedule | Yes No | Yes No Yes, but inconsistently | |
| 1. Which of the following is verified as part of the building plan review process to ensure compliance to the building energy code or other relevant mandatory energy efficiency standards? |
| |  |  |  | | --- | --- | --- | | **Components** | **Mandatory** | **Enforced in Practice** | | Thermal transmittance or insulation calculations for building envelope | Yes No | Yes No Yes, but inconsistently | | Solar heat gain calculations for building envelope | Yes No | Yes No Yes, but inconsistently | | Glazing factors for fenestration | Yes No | Yes No Yes, but inconsistently | | Heating/cooling demand calculations | Yes No | Yes No Yes, but inconsistently | | Daylighting and orientation | Yes No | Yes No Yes, but inconsistently | | Permanent shading | Yes No | Yes No Yes, but inconsistently | | Air barrier, air leakage or air infiltration | Yes No | Yes No Yes, but inconsistently | | Efficiency of heating and cooling equipment and controls | Yes No | Yes No Yes, but inconsistently | | Efficiency of water heating equipment and controls | Yes No | Yes No Yes, but inconsistently | | Efficiency of lighting fixtures and controls | Yes No | Yes No Yes, but inconsistently | | Insulation and heat traps | Yes No | Yes No Yes, but inconsistently | |
| 1. Is energy modeling to ensure compliance to the building energy code or other relevant mandatory energy efficiency standards required?  Yes  No   If yes, how is compliance verified? *(Select all that apply)*  Building Plan Review by building control authority  Building Plan Review by third party specialized in energy modeling  Audit system- compliance is verified for a sample of buildings only  Compliance is assumed but not verified  Note: *By energy modeling, consider any computer-generated calculations that provides information predicting anticipated energy consumption of a building and its systems.* |
| 1. If energy modeling is required, which method is used to verify compliance? *(Select all that apply)*   Paper based Building Plan Review and verification of calculations  Digital building plan review and verification of calculations  Digital building plan review using plug-ins  Automated compliance checking using Building Information Modeling software  Other: (please specify): \_\_\_\_\_\_\_ |
| 1. If energy modeling is automated, which sort of building information modeling analysis and verification is utilized? *(Select all that apply)*   Building authority proprietary platform (e-permitting)  Building Information Modeling Analysis and Verification on open-source software  Building Information Modeling Analysis and Verification on proprietary software  (please specify software): \_\_\_\_\_\_\_  Other: (please specify): \_\_\_\_\_\_\_ |
| 1. Post-construction Enforcement of Energy Efficiency Standards |
| 1. Does your city require proof of compliance to the green building code as a pre-condition for the issuance of an occupation permit or prior to receive occupancy authorization?  Yes  No   If yes, please provide the legal reference: |
| If yes, please specify:   |  |  |  | | --- | --- | --- | | **Compliance mechanisms** | **Mandatory according to code** | **Enforced in Practice** | | *As-built* Energy Verification Worksheet or Compliance Report | Yes No | Yes No Yes, but inconsistently | | Visual/Walk through Inspection by building authority representative | Yes No | Yes No Yes, but inconsistently | | Energy audit | Yes No | Yes No Yes, but inconsistently | | Other: **(please specify): \_\_\_\_\_\_\_** | Yes No | Yes No Yes, but inconsistently | |
| *Only if city requires energy audits:*   1. Which diagnostic tools are commonly utilized to verify compliance?  |  |  |  | | --- | --- | --- | | **Diagnostic tools** | **Mandatory according to code** | **Enforced in Practice** | | Blower door test | Yes No | Yes No Yes, but inconsistently | | Duct leakage checks | Yes No | Yes No Yes, but inconsistently | | Static pressure tests | Yes No | Yes No Yes, but inconsistently | | Infrared Camera Scan | Yes No | Yes No Yes, but inconsistently | | Testing, adjusting, and balancing of the heating, cooling, and mechanical ventilation systems | Yes No | Yes No Yes, but inconsistently | | Testing, adjusting, and balancing of Water Heating Systems | Yes No | Yes No Yes, but inconsistently | | Testing, adjusting, and balancing of controlled receptacles and lighting control systems | Yes No | Yes No Yes, but inconsistently | |
|  |
| 1. Retrofitting, Retro-commissioning and Energy Performance Disclosure for Existing Buildings |
| 1. Does your city enforce retro-commissioning standards? Yes No   If yes, please provide the legal reference: |
| If yes, please specify which retro-commissioning requirements are currently being enforced:   |  |  |  | | --- | --- | --- | | **Retro-commissioning requirements** | **Mandatory** | **Enforced in Practice** | | Thermostats and sensors repair or calibration | Yes No | Yes No  Yes, but inconsistently | | Air balancing systems repair or calibration | Yes No | Yes No  Yes, but inconsistently | | Economizer repair or calibration | Yes No | Yes No  Yes, but inconsistently | | Air leakage tests | Yes No | Yes No  Yes, but inconsistently | | Air barrier integrity testing | Yes No | Yes No  Yes, but inconsistently | | Calibration of heating, cooling or lighting schedule and setpoints to match occupancy | Yes No | Yes No  Yes, but inconsistently | | Chilled-water resets | Yes No | Yes No  Yes, but inconsistently | |
| 1. Does your city enforce retrofitting requirements ? Yes No |
| *If yes*, please specify which enforcement mechanisms are currently being used:   |  |  |  | | --- | --- | --- | | **Retrofitting requirements** | **Mandatory** | **Enforced in Practice** | | Thermal bridging | Yes No | Yes No  Yes, but inconsistently | | Duct sealing | Yes No | Yes No  Yes, but inconsistently | | Envelope air gap sealing | Yes No | Yes No  Yes, but inconsistently | | Chilled-water resets | Yes No | Yes No  Yes, but inconsistently | | Installation of automatic sensors | Yes No | Yes No  Yes, but inconsistently | | Installation of solar water heaters or rooftop renewables | Yes No | Yes No  Yes, but inconsistently | | Replacement of fossil fuel heating/cooling with heat pumps | Yes No | Yes No  Yes, but inconsistently | |
| 1. Does your city enforce the public disclosure of energy efficiency performance ? Yes No |
| If yes, please specify which enforcement mechanisms are currently being used:   |  |  |  | | --- | --- | --- | | **Enforcement mechanisms** | **Mandatory** | **Enforced in Practice** | | Parametric energy use monitoring | Yes No | Yes No  Yes, but inconsistently | | Parametric energy performance | Yes No | Yes No  Yes, but inconsistently | | Building schedule of maintenance | Yes No | Yes No  Yes, but inconsistently | | Metered energy data display | Yes No | Yes No  Yes, but inconsistently | | CO2 emissions equivalents | Yes No | Yes No  Yes, but inconsistently | |
| 1. Are there mandatory requirements for the energy efficiency performance of construction materials? Yes No |
| if *yes*, specify the types of enforcement in place:  Mandatory laboratory testing  Mandatory labeling  Mandatory independent certification  Energy efficiency ratings  Other (please specify): \_\_\_\_\_\_\_ |
| 1. What resources are available to facilitate compliance and improve uptake of energy efficiency technologies and designs?   Designer guides for architects and engineers  Operator or maintenance guides  Occupant guides for HVAC or lighting systems  Consumer guides or databases for energy efficient appliances   Trainings for any of the stakeholders  Other (please specify): \_\_\_\_\_\_\_ |
| 1. What financial incentives are available to facilitate compliance and improve uptake of energy efficiency technologies and designs?  |  |  |  | | --- | --- | --- | | **Financial Incentives** | **Available** | **Name of Program** | | Grants | Yes No |  | | Fee Waivers | Yes No |  | | Tax Credits or deductions | Yes No |  | | Rebates | Yes No |  | | Loans | Yes No |  | | Preferential utility rates | Yes No |  | | Other (please specify): \_\_\_\_\_\_\_ | Yes No |  | |