

Mapping of Energy Efficiency Standards in Buildings in the UNECE Region

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Mapping of Energy Efficiency Standards in Buildings: objectives

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To examine the current status of the energy efficiency standards in buildings in the UNECE region

To form a basis to improve knowledge of UNECE member States of existing energy efficiency standards in buildings

To collect best practices related to existing standards

To provide a gap analysis and harmonization of data and standards

To prepare an initial assessment of energy efficiency technologies in buildings in relation to the existing standards (currently is being prepared)

Mapping of Energy Efficiency Standards in Buildings: methodology

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Questionnaire (26 January-28 February 2018)

Collecting information from 56 member States on the current status of the energy efficiency requirements and technologies in building codes

Desktop Study

Review of relevant policy documents, previously published studies, technological developments and best practices related to existing standards across countries of the UNECE region

Consultation with the members of the JTF

Collection of feedback and comments from the members of the Joint Task Force on Energy Efficiency in Buildings

Mapping of Energy Efficiency Standards in Buildings: survey

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- name
- address
- contact details
- country
- organization

Part 1 general information

- Existing standards
- Type of building covered
- Stringency
- Energy performance gap
- Kind of prescriptive requirements
- Inspections

Part 2: Building Energy Codes

- Type of buildings covered by EPC
- Policy requirements level for EPC
- Existence of national registry database for EPC

Part 3: Energy Performance Certification

- Existence of requirements
- Requirements to test the building materials

Part 4: Building Materials and Products

- Existence of incentives for compliance
- Penalties for non compliance
- Monitoring of energy performance in building energy codes

Part 5: Requirements for enforcement and compliance

- Deployment of technologies
- Which technologies exist
- Recent trends

Part Six – Energy Efficiency Technologies

Mapping of Energy Efficiency Standards in Buildings: gap analysis

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Objective: to evaluate the most effective policies and identify best practices to help member States learn from one another



Comprehensiveness and stringency of the building energy codes

Technical requirements of the building energy codes

Comprehensiveness and stringency of the EPC

Enforcement mechanisms, including incentive packages and penalties

Energy efficiency materials and products requirements in building energy codes

Mapping of Energy Efficiency Standards in Buildings: country profiles

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Poland

The residential sector in Poland is dominated by individual property (~ 60%), followed by Cooperative property (~20%). In addition to relevant government agencies, energy agencies, such as the National Energy Efficiency Agency, play an important role in promoting energy efficiency in the country's housing stock. In Poland, as early as 1994, a law was adopted that establishes requirements for buildings in terms of minimum requirements for energy efficiency, thermal insulation and other requirements relating to energy saving. In the development of the use of renewable energy in 2012, a Resolution that prescribes to analyse the possibility of the use of decentralized systems of energy supply based on renewable energy sources [37, 38].

Main regulatory documents related to building energy codes	Building Energy Code Stringency and Coverage
Technical regulations: Energy Savings and Thermal Insulation (2002) The Act of 7 July 1994, Concessions Law The Act of 18 August 2014, The Energy Performance of Buildings Law Regulation of the Minister of Transport, Construction and Marine Economy of 25 April 2012 concerning the detailed scope and form of construction: - 2002-2014 - Climate zones	Coverage: - Family residential building - Single-family residential building - Multi-family residential building - Collective residential building (apartment blocks) - Commercial buildings (Health-care building, Warehouse and production buildings) - Public buildings (Health-care building, Warehouse and production buildings) - new residential - new non-residential - existing residential - existing non-residential Stringency: Mandatory
Performance-based requirements in building energy codes	Prescriptive requirements in building energy codes
- Thermal characteristics and geometry of the building (envelope and internal partitions, etc.) - Daylightness - Space heating system and hot water supply units - Air-conditioning systems - Mechanical and natural ventilation - Built-in lighting system - Design position and orientation of buildings - Passive solar systems and solar protection - Indoor and outdoor climatic conditions - Passive cooling - Heat recovery - Thermal bridges	- Thermal insulation (including U-values for walls, floor, roof and windows) - Daylightness - Ventilation air quality - Daylighting requirements - Specified thermal comfort levels for summer and winter - Solar gains (G-values) - Artificial lighting system, lighting density - Built-in AC system - Renewables
Software: No data	Non-renewable primary energy use
Energy Performance Certification (EPC)/Energy Labelling/Energy Passport of the building	Energy Performance Certification (EPC)/Energy Labelling/Energy Passport of the building
Coverage: - Single family houses - Apartment blocks - Commercial buildings - Public buildings - new residential - new non-residential - existing residential - existing non-residential	Coverage: - Single family houses - Apartment blocks - Commercial buildings - Public buildings - new non-residential - new residential - existing residential - existing non-residential
Stringency: Mandatory	Stringency: Mandatory
EPBD Energy Performance Certificate (2006) Passive House (1992), Maximum cooling demand (kWh/m ² year): cooling+5; space heating+15; total primary energy+100. Voluntary Methodology for calculating the energy performance of buildings	Distance of national registry database for EPC: Yes Type of energy that the EPC refers to: Total primary energy, Non-renewable primary energy.
Distance of national registry database for EPC in your country: Yes	Distance of national registry database for EPC: Yes
Building Materials and Products	Building Materials and Products
Rating/certification of building materials: No data	Rating/certification of building materials: Yes
Harmonization with other technical standards: No data	Harmonization with other technical standards: European Union standards used for CE Marking
Requirements to test building materials and products by certified test laboratories: No data	Requirements to test building materials and products by certified test laboratories: Yes
Requirements for enforcement and compliance	Requirements for enforcement and compliance
Requirements for regular inspection of heating and air conditioning (A/C) systems: No data	Requirements for regular inspection of heating and A/C systems: Yes
Penalties, incentives and other mechanisms for improving compliance with building energy codes in your country: bonuses, grants	Penalties, incentives and other mechanisms for improving compliance with building energy codes in your country: bonuses, grants
Energy performance monitoring requirements: No data	Energy performance monitoring requirements: No data

Slovakia

The housing sector of Slovakia took third place in the overall balance of energy consumption of the country. The need to develop a strategy for the reconstruction of residential and non-residential buildings in Slovakia follows from Decision 2010/27/EC of the European Parliament and of the Council of 25 October 2010 on energy efficiency: a systematic approach to the reconstruction of buildings was made in the late 1990s, when it was found that many facilities built between 1992 and 1992 had insufficient thermal protection of structures and technical facilities of buildings had a high degree of wear and tear. For such buildings, there was a need to replace structures with quality components to create the necessary security and well-being in these buildings [36].

Main regulatory documents related to building energy codes	Building Energy Code Stringency and Coverage
NTC SR: 555/2005 Coll. Act on the Energy Performance of Buildings and on Amendments to Certain Acts of 2002/2012 Coll. Act amending Act No. 555/2005 Coll. on the Energy Performance of Buildings and on Amendments to some Acts as amended and amending ISO, European and Slovak Technical norms, Plan for the restoration of relevant (public) buildings, Update of the Energy Performance of Building Concept/2010 with a view to 2020. - The first law act to energy performance of buildings was adopted by 2005	Coverage: - Single family houses - Apartment blocks - Commercial - Public buildings - new non-residential - new residential - Existing residential (e.g. after substantial refurbishment) - Existing non-residential (e.g. after substantial refurbishment)
Performance-based requirements in building energy codes	Prescriptive requirements in building energy codes
- Thermal characteristics and geometry of the building (envelope and internal partitions, etc.) - Space heating system and hot water supply units - Air-conditioning systems - Mechanical and natural ventilation - Built-in lighting system - Design position and orientation of buildings - Passive solar systems and solar protection - Indoor and outdoor climatic conditions - Thermal bridge, mandatory requirement to assess post-construction requirement of the thermal bridge. Yes	- Thermal insulation (including U-values for walls, floor, roof and windows) - Daylightness - Ventilation air quality - Daylighting requirements - Specified thermal comfort levels for summer and winter - Solar gains (G-values) - Artificial lighting system, lighting density - Built-in AC system - Renewables
Non-renewable primary energy use	Non-renewable primary energy use
Energy Performance Certification (EPC)/Energy Labelling/Energy Passport of the building	Energy Performance Certification (EPC)/Energy Labelling/Energy Passport of the building
Coverage: - Single family houses - Apartment blocks - Commercial buildings - Public buildings - new non-residential - new residential	Coverage: - Single family houses - Apartment blocks - Commercial buildings - Public buildings - new non-residential - new residential
Stringency: Mandatory	Stringency: Mandatory
Distance of national registry database for EPC: Yes Type of energy that the EPC refers to: Total primary energy, Non-renewable primary energy.	Distance of national registry database for EPC: Yes
Building Materials and Products	Building Materials and Products
Rating/certification of building materials: Yes	Rating/certification of building materials: Yes
Harmonization with other technical standards: European Union standards used for CE Marking	Harmonization with other technical standards: European Union standards used for CE Marking
Requirements to test building materials and products by certified test laboratories: Yes	Requirements to test building materials and products by certified test laboratories: Yes
Requirements for enforcement and compliance	Requirements for enforcement and compliance
Requirements for regular inspection of heating and A/C systems: Yes, for both heating and A/C systems	Requirements for regular inspection of heating and A/C systems: Yes, for both heating and A/C systems
Penalties, incentives and other mechanisms for improving compliance with building energy codes in your country: bonuses, grants	Penalties, incentives and other mechanisms for improving compliance with building energy codes in your country: bonuses, grants
Energy performance monitoring requirements: Yes	Energy performance monitoring requirements: Yes

Armenia

Armenia introduced in 2016 a mandatory building energy code with the adoption of a new regulation "Thermal Protection of Buildings", which was developed based on Russian Building Energy Code from 2003 (updated in 2012) and European codes and methodologies. It links building envelope construction and heat losses with established energy limits, taking into account differences in climatic conditions. It also includes a requirement for a building energy passport and an energy efficiency label with energy efficiency classes [39].

Main regulatory documents related to building energy codes	Building Energy Code Stringency and Coverage
Law on Standardization, 22-01 (06.03.2015) Law on Technical Regulation, 22-19 (06.03.2015) Law on Licensing, the 22-149 (20.05.2007) Law on Energy Saving and Renewable Energy, 22-133 (2004) National Program on Energy Saving and Renewable Energy (2007) National Energy Efficiency Action Plan (2014) Amendments to RA Energy Saving and Renewable Energy Law (2016): - 2014-2017 - Climate zones, sub-region	Coverage: - Single family houses - Apartment blocks - Commercial - Public buildings - new non-residential - new residential - Existing residential (e.g. after substantial refurbishment) - Existing non-residential (e.g. after substantial refurbishment)
Performance-based requirements in building energy codes	Prescriptive requirements in building energy codes
- Thermal characteristics and geometry of the building (envelope and internal partitions, etc.) - Daylightness - Air-conditioning systems - Space heating system and hot water supply units - Mechanical and natural ventilation - Built-in lighting system (mainly in the non-residential sector) - Design position and orientation of buildings - Passive solar systems and solar protection - Indoor and outdoor climatic conditions - Thermal bridge	- Thermal insulation (including U-values for walls, floor, roof and windows) - Daylightness - Ventilation air quality - Daylighting requirements - Specified thermal comfort levels for summer and winter - Solar gains (G-values) - Artificial lighting system, lighting density - Built-in AC system - Renewables
Software used for compliance verification: Yes	Software used for compliance verification: Yes
The gap between predicted and actual performance levels: 60-90% There is mandatory requirement to assess post-construction requirement of the thermal bridge. Yes There is a mandatory requirement for air-tightness testing. Yes	The gap between predicted and actual performance levels: 60-90% There is mandatory requirement to assess post-construction requirement of the thermal bridge. Yes There is a mandatory requirement for air-tightness testing. Yes
Energy Performance Certification (EPC)/Energy Labelling/Energy Passport of the building	Energy Performance Certification (EPC)/Energy Labelling/Energy Passport of the building
Coverage: - Single family houses - Apartment blocks - Commercial - Public buildings - new non-residential - new residential - existing residential - existing non-residential	Coverage: - Single family houses - Apartment blocks - Commercial - Public buildings - new non-residential - new residential - existing residential - existing non-residential
Stringency: Mixed (both voluntary and mandatory)	Stringency: Mixed (both voluntary and mandatory)
Distance of national registry database for EPC: No	Distance of national registry database for EPC: No
Building Materials and Products	Building Materials and Products
Rating/certification of building materials: Yes	Rating/certification of building materials: Yes
Harmonization with other technical standards: European Union standards used for CE Marking	Harmonization with other technical standards: European Union standards used for CE Marking
Requirements to test building materials and products by certified test laboratories: Yes	Requirements to test building materials and products by certified test laboratories: Yes
Requirements for enforcement and compliance	Requirements for enforcement and compliance
Requirements for regular inspection of heating and A/C systems: Yes	Requirements for regular inspection of heating and A/C systems: Yes
Penalties, incentives and other mechanisms for improving compliance with building energy codes in your country: bonuses, grants	Penalties, incentives and other mechanisms for improving compliance with building energy codes in your country: bonuses, grants
Energy performance monitoring requirements: No data	Energy performance monitoring requirements: No data

Mapping of Energy Efficiency Standards in Buildings: recommendations

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1. To harmonize building codes and coverage of all kinds of buildings
2. To create a national EE target
3. To strengthen the requirements for insulation, ventilation and technical installations
4. To introduce or strengthen quality assurance measures, especially during the early stage of the certification process
5. To establish proper (electronic) monitoring systems of compliance, enforcement and quality control processes through a qualified workforce
6. To establish a regular inspection of boilers and air-conditioning systems
7. To continuously monitor, analyze and adjust energy usage in building energy codes
8. To create incentives for companies for improving EE through appropriate policies, tax incentives and low-interest loans
9. To facilitate the harmonization process of energy efficient materials and products testing and certification
10. To assist in the establishment of new harmonized building materials test mechanisms
11. To make codes publicly available

Thank you!

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