South Korea

Building Code Implementation - Country Summary


Section I: Code Development

History

Starting year

South Korea issued its first mandatory building standard on insulation thickness in 1977, followed by building energy standards for several types of buildings in the next two decades. These standards covered offices, hotels, hospitals and residential buildings. In 2001, the Korean government integrated the separate energy standards for various building types into the Building Design Criteria for Energy Saving, which is mandatory code for all types of buildings. The code contains three parts – architectural, mechanical and electrical – each with mandatory and “encouraged” requirements. The mandatory requirements represent basic responsible design, while the “encouraged” requirements represent more innovative and “best practice” strategies. The code focuses on large buildings, where high energy consumption is expected, and therefore, such buildings have more detailed provisions available.

The latest revision of the code took place in 2010.

Timeline/ road map
## Existing codes

### Structural coverage

<table>
<thead>
<tr>
<th>Scale (National, regional, local, etc.)</th>
<th>Building size threshold</th>
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</thead>
<tbody>
<tr>
<td><strong>Residential buildings</strong></td>
<td></td>
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<td>New buildings</td>
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<td>The code focuses on large buildings with expected high energy consumption, such as education/research or office buildings greater than 3,000 m², hotels/motels and hospitals over 2,000 m², public bathhouses and swimming pools over 500 m², wholesale/retail stores (e.g. department stores) with centralized cooling/heating systems and over 3,000 m², and performance halls, town halls and stadiums with total floor area over 10,000 m².</td>
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The Building Design Criteria for Energy Saving is South Korea’s mandatory building energy code for all types of eligible buildings. The code has both prescriptive requirements that building must comply with, and “encouraged” requirements to be calculated into the Energy Performance Index (EPI). In addition to the prescriptive requirements, buildings must also reach the minimum points required for their building types. Compliance checks are performed at the design stage by provincial and local governments.
Measures covered

- Envelope
- HVAC
- Lighting
- Electric power
- Renewable energy
- Maintenance
- Korea’s point system is like a trade-off system incorporating all energy –related building components [A government-created agency, the Korean Energy Management Corporation (KEMCO), developed simple software to help with compliance and calculations called the Energy Performance Index (EPI). All private buildings must satisfy all mandatory items of the code and at least some of the “encouraged” provisions, reaching at least 60 points of the EPI in Construction Design, Machinery Design, Electric Facility Design and Renewable Energy Facility Design. (For public building the minimum score is 74 points).]

Correction/new codes

Motivation/policies for improving existing building energy codes

The Korean government has set a 30% carbon reduction target by 2020 (2010 as the baseline year), including about 27% emission reduction from buildings. For this purpose, the Korean government is introducing an emission trading scheme in 2015.

The Korean government has additional requirements for public buildings and, in 2002, passed legislation requiring that all newly built public buildings (including central and local government buildings) with over 3,000 m² of floor space allocate at least 5% of their construction costs to new and renewable energy facilities.

Revision schedule
The Korean code has a four-year revision cycle.

Involvement of stakeholders in the development of codes
The Korean Institute of Construction Technologies has been involved in building code reviews.
Section II: Code Implementation

Administration

Administrative/enforcement structures

Mix of models

The property owner must fill out an energy-saving worksheet (Energy Conservation Plan) and submit it to local governmental offices to obtain a building permit. Local government building officials, sometimes with assistance from KEMCO, review construction plans and energy conservation plans as part of the building permitting process for new buildings. KEMCO provides voluntary help to local authorities, but the final decision and responsibility for approving an Energy Conservation Plan rests with the local authorities.

The roles of stakeholders (what do they do at each stage)

<table>
<thead>
<tr>
<th>Involvement of third parties and their role</th>
<th>Design</th>
<th>Construction</th>
<th>Pre-occupancy check</th>
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<td>The role of federal/central government</td>
<td>KEMCO helps review construction plans, if local government building officials lack experience or capacity.</td>
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<tr>
<td>The role of state/provincial and local government</td>
<td>Local government officials review construction plans.</td>
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<td>Involvement of third parties and their role</td>
<td>To get a building permit, the building owner must submit an energy conservation plan (signed by a licensed architect, a professional mechanical, and an electrical engineer) to the local government office in charge of building regulations.</td>
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Requirements for energy audits after occupancy

In 2007, the government mandated that energy audits should be conducted every five years for buildings where annual energy use is over 2,000 tons of oil equivalent. Buildings that have obtained the voluntary Building Energy Rating are exempt from this requirement.

Tools used for compliance checking

Software used for compliance checking
KEMCO developed simple, web-based software to help with compliance and calculations, called the Energy Performance Index (EPI). All private buildings must satisfy all mandatory items of the code and reach at least 60 points of the EPI in Construction Design, Machinery Design, Electric Facility Design and Renewable Energy Facility Design. (For public building the minimum score is 74 points). Use of this software is optional.

Capacity building and education

Education and capacity building programs that support code implementation
KEMCO provides training and educational courses for energy managers and operators.

Target groups for programs

Best-practice example of capacity building

Section III: Compliance & Enforcement

Penalties, incentives and other mechanisms for improving compliance

Penalties for non-compliance with energy provisions in codes
- Refusal of permission to construct

Incentives/rewards to go beyond minimum required performance level

Building that obtained an energy performance certificate are eligible for long-term and low-interest loans. KEMCO is planning to develop other financial support programs for energy-efficient activities including cogeneration, energy savings and the use of renewable energy in buildings.
For existing buildings, the government launched a Voluntary Agreements programs. Such voluntary agreements target buildings with annual energy consumption over 2,000 tons of oil equivalent. In order to enroll in the program, a building owner needs to submit an action plan to reduce energy use and related emissions. A 5% reduction target is recommended over five years. The government provides low-interest loans, tax incentives, technical support and public recognition to participating buildings.

Other mechanisms to encourage compliance

The mandatory energy audits for buildings consuming more than 2,000 tons of oil equivalent is expected to encourage compliance.

Section IV: Building Materials & Energy Performance Certificates

Building materials (e.g., windows, insulation, HVAC, lighting)

Rating of building materials

Energy Performance Certificates

Building codes and energy performance certificates

The government of Korea requires that apartment complexes with 500 or more households obtain a building energy performance certificate under the Housing Performance Grading Indication System. The Korean government introduced this building labeling scheme in 2006 to help prospective users select high quality homes. The system consists of 20 performance components, one of which is thermal performance.¹

Korea has other building labeling schemes. Even though they are voluntary, some requirements, such as mandatory energy audits, are waived for certified buildings.

- Korean Green Building Certification Program, launched in 2001 by Korean ministries and industry, offers rating tools for seven types of buildings (by their purpose). The system scores buildings in nine categories and assigns four classes. The certification is valid for five years, with the possibility of a five-year extension. The certification audits cover existing buildings, including residential and commercial complexes, public and private commercial buildings and remodeled buildings.

¹ http://www.irbnet.de/daten/iconda/CIB8291.pdf
• Building Energy Rating System, adopted in 2001, assesses energy-saving rates of houses in comparison with a reference house. It targets newly built or renovated apartment buildings with more than 18 households and classified them into three grades. The Korean Green Building Certification (above) uses the Building Energy Rating System as criteria in the energy category.

*Energy performance certificates replacing codes in some regions/areas*
Energy performance certificates do not replace codes, but, in some cases, excuse building owners from mandatory energy audits (for residential building with annual energy use over 2,000 tons of oil equivalent).

*Enforcement of codes and energy performance certificates*
The two are enforced together as noted above schemes.

*Existence of national database for energy performance certificates*
A national database of energy performance certificates exists.