Architecture & Urban Research Institute

auri research brief

No. 74

The Building Certification Systems in South Korea: Issue and Suggestions for Improvements

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Building certification systems (hereafter referred to as certification systems) have been the basis for improving building performance. Demands for buildings has been gradually diversified according to the changes in the social environments, which also have been reflected into diversified certification systems. Diversification of certification systems is inevitable in order to guarantee building performance above a certain level that meets the rapidly changing social demands. However, an excessive number of certification types and redundant processes among various certification systems can pose adverse effects.

The current laws and regulations mandate a total of six certification systems depending on the use and size of a building, which are operated in parallel with eight building standards. Each certification system has been introduced with its unique purpose. However, the certification systems have been operated for an extended time, and certification criteria introduced on the certification systems later time could overlap with those on other systems. Excessive building standards and certifications required for a single building can be regarded as obstacles for the growth of construction industry due to the cost and inefficiency.

[Table 1] Building certification systems and building standards

Governing Law	Type	Name of certification system or building standard
Green Buildings Construction Support Act	Certification system	Green Standard for Energy and Environmental Design (G-SEED)
		Building Energy Efficiency Rating System (BEERS)
		Zero Energy Building Certification
	Building standard	Energy-saving design standards for buildings
Housing Act	Certification system	Long-life housing certification
	Building standard	Construction standards for energy-saving eco-friendly housing
		Health-friendly housing construction standard
		Design standard for prevention of condensation in apartment houses
		Recognition and management standard for floor impact sound blocking structure
		Noise measurement standards for apartment houses
Building Act	Certification system	Intelligent building certification
	Building standard	Crime prevention building standard
		Structural standards for inter-floor floor impact sound blocking for noise prevention
Act on the Guarantee of Convenience Promotion of Persons with Disabilities, Senior Citizens, Pregnant Women and Nursing Mothers	Certification system	Barrier-free living environment certification

A survey and focus group interviews (FGIs) on experts were conducted to find issues related with above certification systems. The main issues in South Korea's building certification systems were indicated such as the redundancy of similar certification systems, a nominal implementation of mandatory building certifications and their doubted effectiveness, and the inefficiency caused by an increase of the cost and repeated administrative procedures. Suggestions for improvements by the FGIs include an integration of similar certification systems, unified reception of certification applications and its on-line accessibility, incorporation of standards deemed as general in the certification criteria into the general building standards, and non-governmental operation of the system.

In particular, certifications related to the energy use by a building were regarded as the most redundant according to a survey about redundancies of the certification systems. On a 5-point scale, the redundancy between the 'Building Energy Efficiency Rating System' and the 'Zero Energy Building System' received the highest score of 4.19 points, followed by that between the 'Energy Saving Design Standards of Buildings' and the 'Building Energy Efficiency Rating System,' which scored 4.10 points, then that between the 'Zero Energy Building Certification' and the 'Construction Standard of Energy-Saving Environmental Housing', which scored 4.04 points. Although the 'Green Standard for Energy and Environmental Design' did not score higher than 4, the redundancy between most of the certification systems were more than 'Moderate' (or 2.5 points) with the highest average score of 3.16 points. The 'Crime Prevention Through Environmental Design (CPTED)' and the 'Barrier Free' were found to score less than 'Moderate' (or 2.5 points) in relation to the other certification systems.

[Table 2] Redundancy between building certification systems and building standards

(Average, Unit: 5-point scale)

	[1]	[2]	[3]	[4]	[5]	[6]	[7]	[8]	[9]	[10]	[11]	[12]	[13]
[1]													
[2]	3.79												
[3]	3.77	4.10											
[4]	3.73	4.03	4.19										
[5]	3.77	4.03	4.03	4.04									
[6]	3.53	3.19	3.24	3.20	3.22								
[7]	3.06	3.11	3.03	3.06	3.17	3.03							
[8]	2.86	2.40	2.41	2.33	2.35	2.61	2.27						
[9]	2.84	2.35	2.29	2.22	2.30	2.58	2.16	3.54					
[10]	3.07	2.63	2.63	2.63	2.71	2.77	2.69	2.78	2.63				
[11]	2.32	2.15	2.14	2.03	2.07	2.22	2.04	2.08	2.05	2.13			
[12]	2.70	2.63	2.56	2.51	2.49	2.54	2.32	2.34	2.25	2.37	2.45		
[13]	2.48	2.20	2.16	2.06	2.14	2.33	1.99	2.02	2.01	2.14	2.15	2.18	
Average	3.16	3.05	3.05	3.00	3.03	2.87	2.66	2.50	2.44	2.60	2.15	2.45	2.16

[1] Green Standard for Energy and Environmental Design (G-SEED)
[2] Energy-saving design standards for buildings
[3] Building Energy Efficiency Rating System (BEERS)
[4] Zero Energy Building Certification
[5] Construction standards for energy-saving eco-friendly housing
[6] Health-friendly housing construction standard
[7] Design standard for prevention of condensation in apartment houses
[8] Recognition and management standard for floor impact sound blocking structure
[9] Noise measurement standards for apartment houses
[10] Long-life housing certification
[11] Crime prevention building standard
[12] Intelligent building certification
[13] Barrier-free living environment certification

[Table 3] Redundancy between the building certification systems and the building standards in Korea

Purpose	Evaluation criteria	Evaluation system or standard													
		[1]	[2]	[3]	[4]	[5]	[6]	[7]	[8]	[9]	[10]	[11]	[12]	[13]	[14]
Improvement in energy performance	① Evaluation of energy performance	●	●	●	●	●									
	② Installation and use of renewable energy facilities	●	●	●	●	●								●	
	③ Monitoring and management of energy consumption	●	●		●									●	
Environmental amenity	④ Prevention of indoor air pollutant emission	●					●								
	⑤ Thermostat for indoor environmental amenity	●	●			●								●	
	⑥ Noise from the traffics such as roads and railroads	●								●					
	⑦ Protection from floor impact sound	●									●				
	⑧ Protection from condensation	●	●		●	●		●							
Safety and Convenience	⑨ Variability of building	●										●		●	
	⑩ Evacuation	●												●	
	⑪ Durability	●										●			
	⑫ Ease of repair, overhaul, and inspection	●										●			
	⑬ Design for the socially disadvantaged	●													●
	⑭ Security and crime prevention	●											●	●	

[1] Green Standard for Energy and Environmental Design (G-SEED)
[2] Energy-saving design standards for buildings
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[11] Long-life housing certification
[12] Crime prevention building standard
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When certification systems and building standards are compared by the applied targets and the details of the certifications, it was possible to categorize certification systems and building standards by types due to the redundancy. There are also redundant evaluation criteria in the detailed certification items.

By the purpose, certification systems and building standards can be categorized into a few types: energy performance, amenity of indoor and outdoor environments, safety, and convenience. The evaluation criteria can be categorized into energy performance, installation and use of renewable energy facilities, monitoring and management of energy consumption, prevention of indoor air pollutant emission, thermostat for environmental amenity, indoor noise level from traffic noise, blocking performance of floor impact sound, prevention of water condensation, building variability, evacuation, durability, ease of repair, renovation and inspection, and design for the socially disadvantaged, and crime prevention and safety. Among the categories, some are described on multiple certifications or building standards.

From the issues and the results from the redundancy analysis of the certification systems, we could refine two aspects in improving the systems. First, the systems should be reorganized to meet their respective purpose. The building standards are mandatory for authorization and permission. Therefore, they should guarantee basic performance of buildings. On the other hand, certification systems, which are applied according to the client's choice, should have sophisticated evaluation criteria and performance standards to promote specilalization, allowing various types of incentives in return for the certification.

If there are redundant criteria in building standards and certification systems, the items should be removed or reorganized so that the relevant criteria in other systems could be applied. This change would deepen unique strengths of the individual certification standards and promote the synergies when combined. For certification systems not having unique characteristics when compared with the current building standards, reorganization that includes an abolition of such systems should be considered. Among the general building standards, those criteria regarded as excessive restrictions can be classified and reflected into relevant certification systems as incentives or recommendations. Thus, the degree of restrictions can be even strengthened. However, revisions to the standards and the systems may result in a change of the construction costs, which requires careful implementations that reflects the social costs and benefits.

Second, the revisions should be introduced in stages of short-term, medium-term, and long-term in order to improve the effectiveness of the revisions. An approach that introduces the revisions in stages, starting from minor regulations to the highest laws, would mitigate resistance or errors, which could happen if the change were abrupt.

In the short term, the evaluation criteria need to be differentiated in accordance with the purpose of the building standards and the certification systems. The basic level of building performance improvement needs to be generalized into the building standards, which are reviewed by the approval authority at the building permit stage. The reinforced performance level, then, needs to be adopted in line with the purpose of providing incentives.

In the mid-term, the certification systems and the building standards are categorized or integrate into each other according to building performances. They can be categorized into a few categories of health, amenity, energy performance, safety and convenience, and reorganized by the degree of performance.

In the long term, we propose a complete overhaul of the relevant laws and regulations. The primary building performance can be described by the 'Building Act' and the 'Housing Act,' and managed by means of authorization and permission. On the other hand, the 'Green Buildings Construction Support Act' incentivizes enhancement of performance with certification systems.

Keywords : Building Certification System, Building Standards, Building Performance, Laws and Regulations relevant to Building

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Publishing Organization Architecture & Urban Research Institute
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