

Green Building Rating Systems

A comparison of

LEED 2009 and SI5281

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GLOSSARY

USGBC - The U.S. Green Building Council. A nonprofit organization, and the developer of the LEED green building program.

LEED - Leadership in Energy & Environmental Design. A rating system for green buildings.

SI5281 – Israeli Standard for Sustainable Building developed by the Standards Institution of Israel.

INTRODUCTION

In 2011, the Standards Institution of Israel launched a major revision of the Israeli Standard for Green Building, SI5281.

The standard was modeled on leading existing rating systems, such as LEED and BREEAM, while being shaped by local environmental, regulatory and market conditions.

While the Israeli standard has become increasingly established, it is not uncommon for buildings in Israel to seek certification from other international rating systems.

The aim of this comparison is to assess the similarities and differences between SI5281 and other major rating systems.

With the overall goal of encouraging and facilitating the uptake of sustainable construction methods, it is hoped that the comparison will inform choices between the different methods and will ultimately encourage dialogue towards mutual recognition between green building rating systems.

A. GENERAL COMPARISON

1. STATUS OF ISSUING INSTITUTES

The *U.S. Green Building Council*, which develops the LEED rating system, is a nonprofit independent organization. The SI5281 is issued by *The Standards Institution of Israel*, which is Israel's official body for the preparation of standards. It is a non-Governmental Organization that operates under governmental supervision.

LEED certification is administered by the Green Building Certification Institute (GBCI). In Israel SI5281 certification is administered by the Standards Institution at present, while plans are being put forth to enable certification by other recognized institutes.

2. BUILDING TYPES

The LEED 2009 rating system applies to 9 building types which are partially matched by SI5281. SI5281 applies to 7 buildings types and specifies references to 3 additional types of building:

- *Office Buildings*: included in the LEED *New Construction and Major Renovation* version.
- *Public Assembly Buildings* refers to buildings such as museums, art galleries, public libraries, community centers and houses of worship, also included in the LEED *New Construction and Major Renovation* version.
- *Tourism Buildings*: not included in LEED 2009.

LEED 2009 Building Types			SI5281 Building Types		
1	New Construction and Major Renovation	√	√	Office buildings	1
			√	Public assembly buildings	2
2	Retail	√	√	Commercial buildings	3
3	Homes	√	√	Residential buildings	4
4	Schools	√	√	Education buildings	5
5	Healthcare	√	√	Healthcare	6
6	Commercial Interiors	√			
7	Neighborhood Development	√			
8	Existing Buildings Operations and Maintenance	√			
9	Core and Shell Development	√			
			√	Tourist industry buildings	7

There are other differences in building references. For example: LEED 2009 *School* version does not refer to academic institutions, which are addressed in the *New Construction* version. In contrast, the equivalent version in SI5281, "*Education buildings*", is broader and includes all levels of education. Another difference is that LEED permits a part of a building to apply for the certification (in the case of a renovation which does not include the whole building), while SI5281 has different definitions for the kinds of renovations to which it can be applied.

3. TESTING AND CERTIFICATION

Planning process

Both LEED and SI5281 reward the involvement of verified green building professionals, in the project, except for SI5281 *Residential buildings* version.

Certification process

Both LEED and SI5281 award certification after the completion of the project.

The LEED review process is performed either in one stage - at the completion of project construction, or in two phases - once at the end of the design process with a second iteration at the end of construction. The LEED certification process is based solely on the review of project information submitted online.

SI5281 also includes a two-phase review process of project information (at the end of design and at the end of construction). However, in addition, SI5281 includes site visits to verify actual execution of the plans.

4. SCORING CATEGORIES

LEED 2009 version for New Construction and Major Renovation includes 7 scoring categories, which are matched by SI5281 as follows:

	LEED CATEGORIES	SI5281
1	Energy and Atmosphere	√
2	Sustainable Sites	√
3	Indoor Environmental Quality	√
4	Materials and Resources	√
5	Water Efficiency	√
6	Innovation and Design process	√
7	Regional priority credits	

All LEED categories are therefore reflected in SI5281, except for *Regional priority credits*. *Regional priority credits* are a LEED category designed to allow the rating system to be applied in different countries, specified by the USGBC.

The SI5281 uses regional credits in reference to Israeli local data, such as existing and planned population density, rain, wind, solar radiation and shade planning. However, there is no reference to planned projects outside the country of Israel.

In LEED, *Innovation and Design process* credits are additional scoring point credits, and are referred to as bonus points, whereas in SI5281 they are included in the overall credit score.

The SI5281 version for Office Buildings includes 9 scoring categories, as follows:

SI5281 CATEGORIES			LEED 2009
1	Energy	√	
2	Sustainable Sites	√	
3	Transportation		currently incorporated in Sustainable sites, however will be its own category in LEED v4
4	Health and Welfare	√	
5	Materials	√	
6	Waste		incorporated in Materials & Resources
7	Site Management		incorporated in Materials & Resources and in Sustainable Sites
8	Water Efficiency	√	
9	Innovation	√	

Based on this comparison, SI5281 therefore specifies 3 topics in separate categories which do not have their own categories in LEED:

- *Transportation*
- *Waste*
- *Site Management*

LEED refers to these topics but does not specify them as an independent category: Transportation credits are included in the *Sustainable sites* category and *Waste and Site Management* credits are mentioned in the *Material and Resource* category.

In summary, the table below shows the comparison and point score of the matching categories applied by each rating system:

LEED 2009		SI5281		
Categories	Points	Points		Categories
Energy and Atmosphere	35	37	37	Energy and Atmosphere
Sustainable Sites	26	18	15	Sustainable Sites
			3	Transportation
Indoor environmental quality	15	11	11	Health and Welfare
Materials and Resources	14	15	8	Materials
			2	Waste
			5	Site management
Water efficiency	10	15	15	Water efficiency
Innovation and design process	6	4	4	Innovation
Regional priority credits	4			
Total points	110	100	100	Total points

Although one can find equivalence between the categories as shown, category credits in both systems are not necessarily equivalent. Some credits are not matched, and some are tested and scored differently. Further detailed are given in section B2.

B. VERSION COMPARISON

LEED 2009 for New Construction and Major Renovation and SI5281 Office Buildings

1. WEIGHT OF SCORING

Comparing the score of each category out of the total point score of the rating system demonstrates a difference in the weighting of the categories, as follows:

LEED 2009 New Construction and Major Renovation			SI5281 Office Buildings			
Categories	points	% of total	% of total	points	points	Categories
Energy and Atmosphere	35	31.8%	37.0%	37	37	Energy and Atmosphere
Sustainable Sites	26	23.6%	18.0%	18	15	Sustainable Sites
					3	Transportation
Indoor Environmental Quality	15	13.6%	11.0%	11	11	Health and Welfare
Materials and Resources	14	12.7%	15.0%	15	8	Materials
					2	Waste
					5	Site Management
Water Efficiency	10	9.1%	15.0%	15	15	Water Efficiency
Innovation and design process	6	5.5%	4.0%	4	4	Innovation
Regional priority credits	4	3.6%				
Total points	110	100.0%	100.0%	100	100	Total points

As there are differences in the content of the categories and in the way in which credits are tested and evaluated, this table cannot compare categories like for like between each system, but instead demonstrates the significance each category receives within each of the respective rating systems.

The most significant difference between the rating systems for particular topics:

- *Energy and Atmosphere:* LEED **31.8%** vs. SI5281 **37%**
- *Sustainable Sites:* LEED **23.6%** vs. SI5281 **18%**
- *Water Efficiency:* LEED **9.1%** vs. SI5281 **15%**

2. GENERAL DIFFERENCES BETWEEN CATEGORIES

2.1 Sustainable Sites

Differences in definition

- LEED Prerequisite: *construction activity pollution prevention* resembles SI5281 credit: *Minimizing the effects of the construction site*, which is mentioned in the *Site Management* category.
- As mentioned, LEED 2009 includes *Transportation* credits in this category, which are specified in SI5281 in a separate Transportation category.
- *Light pollution reduction* credit is also mentioned in this category but is referred to in SI5281 *Indoor Environmental Quality* category (Health and Welfare).

Unmatched credits

SI5281 credits which are not matched in LEED:

- Building according to maximum density principles
- Reuse of onsite earth surface
- Designated pedestrian paths and bicycle lanes.

2.2 Water Efficiency

Differences in definition

As mentioned, *storm water design-quantity and quality control* credits are mentioned in the LEED *Sustainable Sites* category, while in SI5281 they are referred to in the *Water Efficiency* category.

Unmatched credits

LEED credits which are not matched in SI5281:

- innovation wastewater technologies

SI5281 credits which are not matched in LEED:

- Water metering and control (3 specified options).

2.3 Energy and Atmosphere

LEED 2009 requires a whole building energy simulation, which demonstrates the building's performance compared to baseline building performance. LEED does not specify the means with which to achieve the building's performance.

SI5281 specifies technical credits with which the building energy performance is to be improved. These credits refer to the building's different parts and systems and do not refer to the building as a whole. SI5281 does not require a summarizing simulation.

Unmatched credits

LEED credits which are not matched in SI5281:

- fundamental refrigerant management
- green power

All SI5281 credits are matched in LEED.

2.4 Materials and Resources

Differences in definition

LEED refers to reuse and recycling, while SI5281 refers to both categories as recycled materials.

Credits unmatched by quantity

These credits are referred to in both rating systems; however the quantities of credited materials are considerably different:

- LEED Prerequisite: *storage and collection of recyclables*. LEED requires 6 specific materials, while SI5281 requires a minimum of 1.
- *Construction waste management*. LEED credits minimum recycling of 50% construction debris, while SI5281 credits the recycling of 35%.

Unmatched credits

LEED credits which are not matched in SI5281:

- building reuse: maintain existing walls, floors and roof
- building reuse: maintain 50% of interior non-structural elements
- rapidly renewable materials
- materials reuse

SI5281 credits which are not matched in LEED:

- use of materials manufactured in an environmental managed source (such as companies practicing ISO 14000)
- Onsite Separation and Storage of Recyclable Construction Debris
- industrial construction models
- instruction guide for building users
- stake holder participation in planning process

2.5 Indoor Environmental Quality

Differences in definition

- As mentioned, *thermal comfort-design and verification* credits are mentioned in LEED *Indoor Environmental Quality* category, while in SI5281 they are referred to in the *Energy and Atmosphere* category.
- LEED refers to indoor environmental quality during construction, before occupancy and after occupancy. SI5281 refers to it after occupancy only.
- LEED refers to low-emitting materials in relation to VOC only. SI5281 relates to VOC, Bromine and Radioactive materials.
- LEED credit 5: *indoor chemicals and pollutant source control*, refers to any pollutant source: ventilation systems, walk-off mats doorways, emissions from hazardous materials stored in the building, while SI5281 refers to ventilation systems only.

Unmatched credits

LEED credits which are not matched in SI5281:

- LEED Prerequisite: environmental tobacco smoke (ETS) control
- construction IAQ management plan - during construction
- construction IAQ management plan - before occupancy
- low-emitting materials - composite wood and agrifiber

- thermal comfort-verification

SI5281 credits which are not matched in LEED:

- natural ventilation planning based on wind regime
- indoor air quality performance based on Lonizer and Ozone release systems
- indoor and outdoor shading systems
- indoor and outdoor illumination standards
- CRI bulb standards (range of wavelengths)
- indoor and outdoor acoustic standards
- electromagnetic and micro magnetic standards
- NOx emitting standards

2.6 Innovation and Design process

Unmatched credits

LEED credits which are not matched in SI5281:

- exemplary performance: achieving double the credit requirements and/or the next incremental percentage threshold of a specified existing credit.
- pilot credit: completing the requirements of a specified pilot credit.

SI5281 credits which are not matched in LEED:

- The building as an educational instrument. The building will include educational media, which demonstrate its environmental performances.

2.7 Regional priority credits

As mentioned above, regional priority credits are a LEED category designed to allow the systems to be applied in different countries, specified by the USGBC.

The SI5281 also uses regional credits in reference to Israeli local data, such as population density, rain and wind regimes, solar radiation and shade planning. There is no reference to planned projects outside the country of Israel.

C. CONCLUSIONS

The comparison overall has distilled the similarities and differences between LEED and SI5281, as follows:

1. BUILDING TYPES

As outlined in section A2, both rating systems apply to parallel building types, with minor differences in content and definition. LEED has four additional topics which are not referred to in SI5281:

- Commercial Interiors
- Neighborhood Development
- Existing Buildings Operations and Maintenance
- Core and Shell Development

SI5281 also adds a topic which is not mentioned in LEED 2009:

- Tourist industry buildings

A wide variety of buildings are specifically catered for in each system and some of the major differences – Core and Shell development, and Existing Buildings – are areas which are in the process of being addressed by the standardization process in Israel.

2. CERTIFICATION PROCESS

While the LEED certification process is based solely on the review of project information submitted online, SI5281 includes site visits to verify actual execution of the plans.

3. SCORING CATEGORIES

All of the LEED categories are reflected in SI5281 and vice-versa. Overall, both rating systems account for similar environmental topics. The exception is Regional priority credits. As long as SI5281 is not implemented internationally, the regional credits are not relevant to its rating system.

4. VERSION COMPARISON – WEIGHT OF SCORING

Three categories stand out of this comparison:

1. **Energy and Atmosphere:** in both systems this is **the most significant** category. SI5281 emphasizes it greatly with **37%** of the total score, while in LEED it receives **31.8%**.
2. **Sustainable Sites:** In both systems this category is the **2nd most significant**. The LEED rating system awards this category with **23.6%** of the scoring, while in SI5281 it accounts for **18%** of the score.
3. **Water Efficiency:** in SI5281 this is the **3rd most significant** category, awarded **15%** of the total score, while in LEED it is rated **5th** and receives **9.1%**.

In addition to the conclusion, above, that both rating systems account for similar environmental topics, we conclude that the priority and weighting given to different topics is also very similar. The emphasis on water efficiency in Israel can be explained by the local climate and policy priority given to this topic.

5. GENERAL DIFFERENCES BETWEEN CATEGORIES

Although many topics in both rating system categories are similar, there are often differences in the content and definition of credits and in the way in which they are tested and evaluated. Furthermore, some credits in one rating system do not appear in the other.

6. FINAL CONCLUSION

This study sheds light upon the similarities and differences between two current green building rating systems. The findings demonstrate that there are certain differences in approach between the systems and in the weighting given to different resources and needs, and that these can be explained in part by local prioritization of environmental resources. Individual credits vary but overall, the comparison indicates a high degree of similarity with regard to the environmental topics and weightings included in the systems.

These fine-grained differences may assist individual project developers to understand the respective emphases of the different systems, and to select an approach which is most appropriate to their project and local climate. At the same time, at a policy level, the comparison suggests that these different green building rating systems approach the overall goal of encouraging sustainable construction in similar ways.

We hope that this finding will encourage property owners and authorities to recognize the overall similarities between different ratings systems, in order to allow flexibility with regard to the choice over which system is used, and to avoid the need for dual certification. Creating international cooperation in this field could lead to greater efficiency, meeting the overall goal of *Green Building* alongside adaptation to local environmental and institutional needs