

Pilot course on “Environmental labelling in circular economy”  
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# LEED

Janusz Strojny, PhD, DSc

Dariusz Wyrwa, PhD

Rzeszow University of Technology



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## ACRONYM

**LEED system = Leadership in  
Energy and  
Environmental  
Design**

It is one of most popular building certification system in the world

## History and development of the program

- In 1993 the U.S. Green Building Council has been established. Its mission was to promote sustainable development practices in construction.
- In July 1994, a draft of the green building rating system has been created. In 1998, work began as a result of which the LEED New Construction (NC) v1.0 pilot program was developed and launched, which was being implemented until December 1999.

## Historical applicability of LEED versions

Version	Years Applicable	Additional informations
1.0	1998-2000	First launched in August 1998, officially released in 1999. Beta version tested on a selected 19 projects
2.0	2000-2002	First published in 1999, officially released in March 2000.
2.1	2002-2005	Officially released in November 2002
2.2	2005-2009	First published in 2003, officially released in 2005
3.0 (LEED 2009)	2009-2016	Launched in April, 2009
4.0	2013	Released in November, 2013
4.1	2019	Released December 2018 as beta version LEED v4.1 is not a full version change. Instead, it is the next evolution for the rating system, using the existing credit requirements as a foundation.

- By the time LEED v2.2 was implemented in 2005, assessment criteria had become much more universal, and assessment system options had evolved to include not only LEED NC, but also Existing Buildings (EB), Commercial Facilities (CF), and Core & Shell projects (CS).
- Initially, the LEED system was gaining popularity very slowly, which resulted in the small number of certified projects.
- After 2008 there has been a significant increase in the number of issued certificates and since 2010 those numbers are constant at around 5000 – 7000 issued certificates level.

## Requirements and methodology of impact assessment

- Green Business Certification Inc. (GBCI) is the system operator responsible for LEED certification.
- When applying for building certification outside of the United States, there is a need to cooperate with an Accredited Professional (LEED AP)
- The most current list of almost 4,000 LEED AP operating in 167 different countries can be found on the United States Green Building Council website.
- The LEED rating systems establish specific framework and performance metrics by building type. They are grouped into six categories.

## LEED v4.1 rating systems

Rating system	Type of the projects
<b>LEED BD+C</b> <b>Building Design and Construction</b>	For new construction or major renovations
<b>LEED ID+C</b> <b>Interior Design and Construction</b>	For complete interior fit-out projects
<b>LEED O+M</b> <b>Building Operations and Maintenance</b>	For existing buildings that are undergoing improvement work or little to no construction
<b>LEED ND</b> <b>Neighborhood Development</b>	For new land development projects or redevelopment projects containing residential uses, nonresidential uses, or a mix
<b>LEED Residential</b>	For single family homes, low-rise multi-family or mid-rise multi-family
<b>LEED Cities and Communities (Pilot version)</b>	For entire cities and sub-sections of a city

In order to start the preparation work on LEED documentation the project needs to get registered with USGBC.

At that time the project team gains access to [www.leedonline.com](http://www.leedonline.com) website and as the work progresses they can upload the documents on the USGBC servers.

The project can be reviewed by the experts in three stages:

1. Pre-certification – during the project phase,
2. Design Review – after the gathering of project documentations is completed,
3. Construction Review – after the construction work is finished.

Projects are assessed in several categories.



## LEED certification proces:

1. LEED Project Feasibility Study
2. Registration
3. Submit Application for Design Review
4. GBCI Issues preliminary Design Review
5. Submit Response to preliminary Design Review
6. GBCI Issues Final Design Review decisions
7. Submit Application for Construction Review
8. GBCI Issues preliminary Construction Review
9. Submit Response to preliminary Construction Review
10. GBCI Issues Final Construction Review decisions
11. Credit Interpretation Ruling
12. Credit Appeal
13. Certification Awarded

## LEED v4 for BD+C: New Construction and Major Renovation



Material and Resources  
(MR)

### 2 pre-requisites:

- Storage and Collection of Recyclables
- Construction and Demolition Waste Management Planning



**13 credits**

Building Life-Cycle Impact Reduction	5
Building Product Disclosure and Optimization - Environmental Product Declarations	2
Building Product Disclosure and Optimization - Sourcing of Raw Materials	2
Building Product Disclosure and Optimization - Material Ingredients	2
Construction and Demolition Waste Management	2

## Categories and points difference in New Construction Rating Systems in LEED versions

Categories	LEED v2.2		LEED v3 (2009)		LEED v4	
	points	percent	points	percent	points	percent
Location and Transportation (LT)	-	-	-	-	16	14,5%
Sustainable Sites (SS)	14	20,3%	26	23,6%	10	9,1%
Energy and Atmosphere (EA)	17	24,6%	35	31,8%	33	30,0%
Water Efficiency (WE)	5	7,2%	10	9,1%	11	10,0%
Indoor Environment Quality (IEQ)	15	21,7%	15	13,6%	16	14,5%
Material and Resources (MR)	13	18,8%	14	12,7%	13	11,8%
Innovation (ID)	5	7,2%	6	5,5%	6	5,5%
Regional Priority (RP)	-	-	4	3,6%	4	3,6%

## Levels of LEED Ratings:

- Certified 40-49 points
- Silver 50-59 points
- Gold 60-79 points
- Platinum 80-110 points

All the points are granted in the binary type of system:  
the requirement is either fulfilled or not.

## Benefits and costs of participation in the program

- LEED certified buildings are more attractive for tenants, as they achieve up to **20% higher** than average rental rates (on average the rent is about 6% higher) and the **vacancy rate is 4% lower** than for real estate without a certificate.
- The research covering the years 2015 - 2018 indicated that buildings certified by the USGBC allowed for energy savings of \$1.2 billion, water savings of \$149.5 million, in maintenance savings of \$715.3 million and \$54.2 million in waste savings.

## LEED certified buildings in relation to non-certified buildings show on average

- 34% lower CO<sub>2</sub> emissions,
- 25% less energy consumed,
- 11% less water consumed.

A key aspect of the LEED certification impact on the environmental benefits is that 87,5% of the personnel supervising the construction of facilities participating in the LEED program did not identify any negative, unintended environmental impact.

## Selected cost of participation in the LEED program (Building Design and Construction)

Fees per Building	Silver, Gold and Platinum Level Members	Organizational or Non-members
Registration	1200 USD	1500 USD
Precertification	4000 USD	5000 USD
Combined Certification Review: Design and Construction	0,050 USD/sf - 0.068 USD/sf *	

\* The cost of certification depends primarily on the calculated building's square footage including the parking lot.

## Case study

An interesting example of LEED O+M certified facility in Europe is Rondo 1 building in Warsaw. Its first LEED Gold certificate has been awarded in 2011 (the building received a total of 61 point during the assessment).

It was first building in Europe which received this type of certification in a “Existing Buildings” category.

Despite the fact the this building had received many different awards it is the LEED certificate that has been promoted on the building’s official website.



During a recertification conducted in June of 2016, based on the LEED 2009 O+M system, building received 80 points which gave it a Platinum level certificate. In December of 2019, thanks to LEED v4.1 O+M recertification, the building received 85 points and a Platinum level certificate.

<https://www.rondo1.pl/en/about-building>

# References

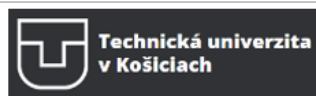
- Ade R., Rehm M., *The unwritten history of green building rating tools: a personal view from some of the 'founding fathers'*. Building Research & Information 2019, Vol. 48
- *LEED rating system*, <https://www.usgbc.org/leed>
- *LEED Certification Fees*, <https://www.usgbc.org/tools/leed-certification/fees>
- Ribero Ó., Garzón D., Alvarado Y., Gasch I., *Economic benefits of LEED certification: a case study of the Centro Ático building*, Revista Ingeniería de Construcción 2016, Vol. 31, No. 2
- Tapas K. Das, *Industrial Environmental Management: Engineering, Science, and Policy*, John Wiley and Sons, Inc., Hoboken 2020
- Ullah Z., Thaheem M.J., Waheed A., Maqsoom A., *Are LEED-certified healthcare buildings in the USA truly impacting sustainability?* Indoor and Built Environment, May 2019

# Thank you for attention



Project website: <https://ecolabelling.prz.edu.pl/en/>

The International Visegrad Fund website: <https://www.visegradfund.org/>



ECOLABELLING project  
Innovations in circular economy – environmental labels and declarations