

PROLOGIS WAALWIJK DC2BC

BREEAM CASE STUDY | 14.12.2022



Introduction

Sustainability has been integrated into the design, implementation and operation of the building. As a world leader in the development of industrial and logistics real estate, Prologis has a special social and economic responsibility. Therefore, Prologis is a participant of the Dutch Green Building Council. Please read all relevant information in Prologis' latest Sustainability Report (<http://www.prologis.com/en/sustainability.html>). To measure and certify the sustainability performance of the building, Prologis will apply the Breeam-NL assessment method. Prologis aims to qualify the building at least with the BREEAM 'Excellent' rating BREEAM BRL 2014 v2.0. This case study outlines our approach to the sustainable development of this unique project.

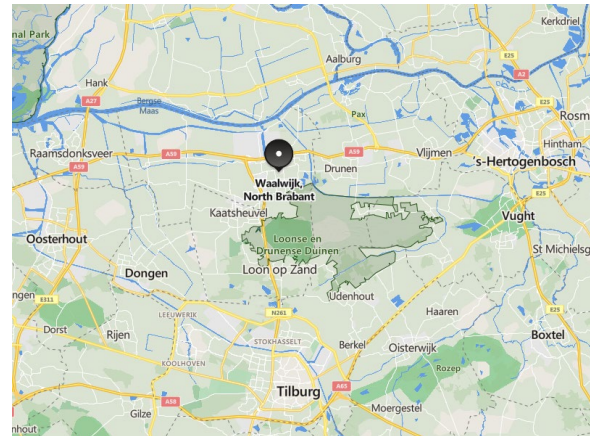


About the building

Prologis Park Waalwijk is located in the large scale Industrial Park Haven 8 in the municipality of Waalwijk and encloses 9 ha of land with a possibility to build out approximately 50,000 m² state-of-the-art and sustainable distribution centre. This second phase distribution centre can easily be divided into units from approximately 16,000 m² with a clear height of 12.2 m and an mezzanine above the loading area. Both units will have an office the interior of offices are flexible and can be determined in consultation with the needs of the customer.

Waalwijk is one of the Netherlands' logistics hot spots due to its strategic location close to the north-south and the east-west corridor. The city has excellent transport links by land, freight and waterways. It can be easily accessed from all directions and is complemented by an excellent road system including the motorway A59; which connects the east and west, and a direct connection to the North and South via the A27 and A2. This major connections do give the location quick access to Rotterdam Harbour and the Belgian Port of Antwerp with the Ruhr Valley region in Germany. Additionally, Waalwijk is served by an barge terminal.

By creating a high-throughput warehouse facility we can offer a unique product and within the design of Prologis Waalwijk DC2BC, the concepts of well-being, health, ecology, durability, quality, flexibility and appearance all play a decisive role.



Area overview:

Total site	DC2 B & C
User area	37.800 sqm
Warehouse	33.650 sqm
Mezzanine	3.510 sqm
Office	640 sqm

Project team

To achieve the Breeam Excellent rating, Waalwijk DC2BC will be carried out in conjunction with the following partners:

Developer:	Prologis
Architect:	Johan de Vries
General contractor:	ASK Romein
BREEAM expert:	M3E
Ecologist:	ATKB
Area developer:	City of Waalwijk
Electrical installation:	BRAS Elektrotechniek
Mechanical installation:	ZNI
Sprinkler installation:	VST Fire Solution
Interior architect	Johan de Vries
Customer:	

Approach

The dedicated Project Team has the ambition and drive to outperform the set level of sustainability and well-being. The Project Team recognizes creating a healthy and sustainable building being a joint-effort. The Project Team culture encourages to share new ideas and offers a platform to stimulate innovation.

Prologis has in-house Breeam Experts what allows us to consider the Breeam aspects in the preliminary stage of the project. The global expertise of Prologis with sustainability, is implemented in each stage of the project. This unique approach helps to reach high levels of sustainable performance from an idea to its exploitation. Sustainability will be a recurring topic on the agenda of customer, construction, site and toolbox meetings to involve all stakeholders through-out the project.

This will help the customer to integrate the Breeam requirements in the most efficient way.

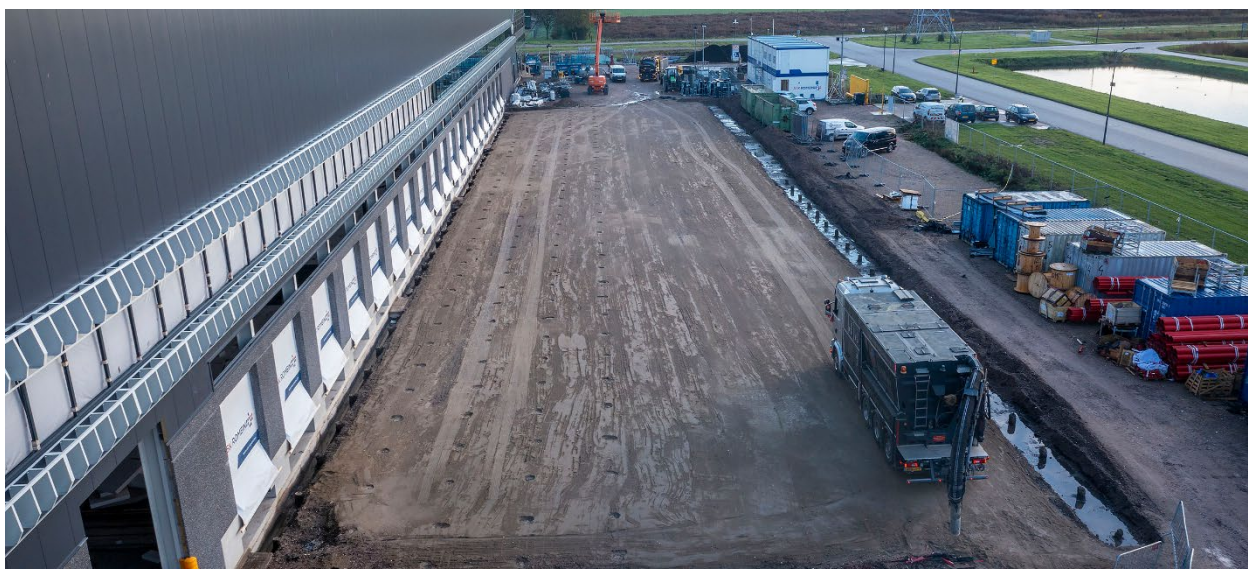
To maintain the BREEAM rating and optimize the efficient operation of the building a handover is scheduled at completion in which the Customer, Logistics Provider, Facility Manager, Service Companies and the Prologis Property Manager are closely involved.

Special attention will be given to guide and support the customer with Breeam aspects that are subject to the tenant specific fit-out and future operation in order to secure the Breeam certification at project completion.

Sustainability aspects

Although the building will be constructed as a 'Speculative' concept, for its first customer, the design of the building complies with the uniform European Prologis Specification. The generic set-up of the building can accommodate a wide variety of tenant-specific fit-outs with a normal and/or narrow-aisle racking configuration and multiple storage mezzanine floors. The possibility of installing a tailor-made-fit-out without needing significant adjustments to the building shell ensures future-proofing as the ultimate sustainability aspect. Furthermore, the following technical features will be implemented in the building design:

- High-grade insulated wall panels and a high-grade insulated roof system.
- Interior coating in bright white on the visible side of the roof and façade cladding to improve light reflection and with an easy-to-clean surface.
- Guaranteed air leakage rate of max. $2.5 \text{ m}^3/(\text{m}^2\text{h})$ in the warehouse, proved by door blower test and thermographic survey.
- Steel roof structure prepared for the installation of solar panels on the entire roof surface.
- High-quality (above standard) running plate of dock levellers; 8/10 mm thick with insulation.
- Dock levellers with gap sealing to prevent drafts as well as the escape of warm air.
- Dock shelters with bottom cushion for optimized energy efficiency.
- Dock envelop with flexible rubber sealing.
- Energy-saving mode for dock equipment control.
- High-grade insulated dock doors with a thickness of 67 mm, equipped with a thermoframe for a thermal break between frame and façade. Lip seals on both sides of the door and a double seal in the lintel area prevent heat and cold loss, with a thermal value of $U=0.6 \text{ W}/(\text{m}^2\text{K})$.
- Triple pane glazing in office façade.
- Energy-efficient LED lighting in the warehouse with dynamic DIM function and motion controls.
- Low flow ventilation system in warehouse to supply fresh and filtered air to ensure indoor air quality.
- Energy-efficient LED lights in offices with dynamic DIM function via daylight reflection control.
- Energy-efficient LED lights in sanitary and technical rooms with motion control for energy savings.
- Energy-saving LED emergency lighting pictograms.
- Energy-saving outdoor LED lighting.



- Daylight intrusion via rooflights in the warehouse for energy savings and well-being; system with three layers of polycarbonate.
- Daylight intrusion via window strip with HR++ insulating glass at the mezzanine level.
- All-electric heat pump VRF cooling system and ventilation system with efficient energy recovery.
- Building management system for installations.
- Smart energy meters for monitoring and managing energy consumption.
- Leak detection of water connections.
- Sprinkler system equipped with additional cut-off valves for water savings during test runs.
- Low-maintenance concrete paving in the loading/unloading zone.
- Oil water separator for rainwater of truck court.
- Water-saving measures in sanitary rooms.
- Encouraging carpooling.
- Charging stations on-site for electric cars and bicycles.
- Ecological survey of location and nature-inclusive landscaping to support biodiversity.
- Solar panels at the roof.

During the construction process, various measures will be taken to reduce the impact on the environment, such as:

- The registration and reduction of the consumption of water and electricity.
- Waste management to reduce waste and to enhance recycling by a certified waste treatment facility.
- The commissioning of an ecologist to assess the environmental impact of the construction and to minimize it.
- Dust and filth control during execution of works to minimize the impact on the surrounding.



Quality control

Along with the Breeam certification, the other measures that are used to control quality and assure sustainability are:

- Quality control of design and construction via external supervisor.
- Plan review and construction management of roofing system by Roof Management and the Roof Manager Web-based tool.
- Plan review and construction management of the concrete slabs by ABT.
- Environmental management system in line with ISO14001.
- Environmental site assessment survey 'zero base line soil and groundwater investigation' at commencement of lease.
- External Breeam expert and assessor.
- Air-tight construction with blower test to guarantee air leakage rate of max $2.5 \text{ m}^3/(\text{m}^2\text{h})$.
- Thermographic survey to ensure building shell insulation.
- Building site code of conduct: Bewuste Bouwers.
- FSC-wood certified project.

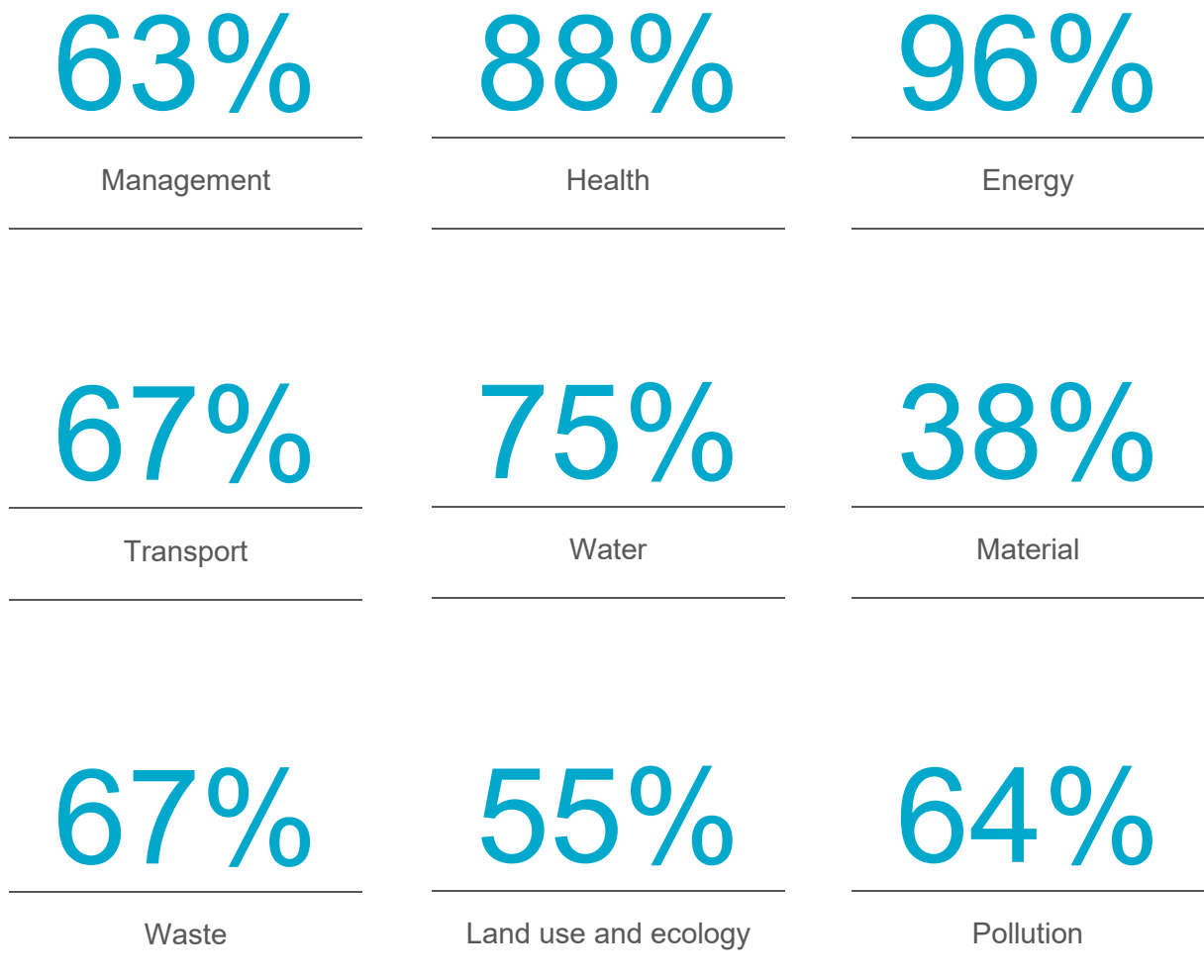


Energy consumption	
Expected electricity use by building:	32 kWh/m ² BVO/year
Expected electricity use of fossil fuels:	0 kWh/m ² BVO/year (all electric)
Expected use of sustainable resources:	32 kWh/m ² GFA (100%)
Expected water consumption:	6,5 m ³ /person/year
Percentage of 'grey' water usage:	0%



Key Breeam facts

The project team expects to achieve the following Breeam credits:



The project aims to perform well, with credits spread over the assessment criteria, as shown above. The precisely engineered foundation and building structure allow for the effective use of resources. In addition, the flexibility of the design and carefully chosen high-quality materials result in a future-proof building with low operational costs. Further, this project scores especially well in energy. Combined with the use of ISO 14001 and good waste

management during construction this gives a high score. In the future when the building is operational a further reduction of the running costs will be achieved with solar panels and a All-electric heating and cooling system on the roof structure. And last but not least the air quality is monitored real-time to for a healthy working environment.

Breeam credits



Project : Waalwijk DC2 BC
Opdrachtgever : ASK Ruimte / Prologis
Contactpersoon : N.L.L.
Plaats : Waalwijk
Projectnummer : 521.128
Datum : 16-02-2022
Versie : 1.0 excellent

Pass	***	≥ 30%
Good	***	≥ 45%
Very good	***	≥ 55%
Excellent	***	≥ 70%
Outstanding	***	≥ 85%

ruimte	Industrie	36000	98,21%
BVO m²	Kantoor/kantine	650	1,77%
BVO m²	Totaal	36650	100,00%

credit	onderdeel
12% Milieugevoel	
Milan 1	Prestatieborging
Milan 2	Bouwplaats en omgeving
Milan 3	Milieu-impact bouwplaats
Milan 4	milieu-impact performance
Milan 5	Gebruikers-handleiding
Milan 6	Consultatie
Milan 8	Veiligheid
Milan 9	Kennisoverdracht
Milan 11	Onderhoudsgedrag
Milan 12	Levenscyclus kostenanalyse
TOTAAL	
14% Gezondheid	
Misa 1	Daylighttoedeling
exemplary performance	
Misa 2	Uitzicht
Misa 3	Tegengaan lichtdoor
Misa 4	hoog frequent verlichting
Misa 5	functiewerking binnen en buiten
Misa 6	Lichtregeling
Misa 7	Natuurlijke lucht ventilatie
Misa 8	Interne luchtkwaliteit
Misa 9	ruichige organische verbindingen
Misa 10	Thermisch comfort
Misa 11	Temperatuurregeling
Misa 13	Acoustiek
Misa 14	Privacy/ruimte
Misa 15	Tegengang
TOTAAL	
19% Energie	
Ene 1	CO ₂ emissie-reductie
exemplary performance	
Ene 2a	Sub-metering energieverbruiken overige functies
Ene 2b	Sub-metering energieverbruiken woningen
Ene 4	Energiezuinig bouwen/wonen
Ene 5	Toekomst van duurzame energie
Ene 6	exemplary performance
Ene 7a	Minimale CO ₂ uitstoot / jaar
Ene 7b	Energiezuinig kool- en vriesopslag overige functies
Ene 7c	Energiezuinig kool- en vriesopslag wonen en logies
Ene 8	Energiezuinig liften
Ene 20	Waarborging thermische kwaliteit gebouwschil
TOTAAL	
8% Transport	
Tra 1a	Aanbod van OV kamers, scholen, industrie
Tra 1b	Aanbod van OV winkel, logies, bijeenkomst
Tra 1c	Aanbod van OV woonfuncties
Tra 2	Afstand tot busvoorzieningen
Tra 3a	Alternatief vervoer overige functies
exemplary performance	
Tra 3b	Alternatief vervoer woningen
Tra 4	Veiligheids- en fietsveiligheid
Tra 5	Vervoersplan en parkeerbeleid
Tra 7	Vervoersinformatiepunt
Tra 8	Toelating en manoeuvreren
TOTAAL	
8% Water	
Wat 1a	Waterverbruik overige functies
Wat 1b	Waterverbruik woningen
Wat 2	Watermeter
Wat 3	Hoofd lekdetectie
Wat 4	Defectuerende waterleverancier
Wat 5	Recycling van water
Wat 6	Regelingsystemen
TOTAAL	
12,00% Materialen	
Mat 1	Bouwmateriaal
exemplary performance	
Mat 5	Onderbouwde herkomst van materialen
exemplary performance	
Mat 7	Robuust ontwerpen
Mat 8	Gebruiksflexibiliteit
TOTAAL	
7,00% Afval	
Waf 1	Afvalmanagement op de bouwplaats
exemplary performance	
Waf 2	Gebruik van secundair materiaal
Waf 3a	Opslagruimte voor herbruikbaar afval overige functies
Waf 3b	Opslagruimte voor herbruikbaar afval woningen
Waf 5	Compost
Waf 6	Verlichting
TOTAAL	
10% Landschap en ecologie	
L21	Hergebruik van land
L22	Verontreinigde bodem
L23	Aanwezigheid planten en dieren op de locatie
L24	Planten en dieren als medegebruiker van het plangebied
L25	Duurzaam medegebruik van planten en dieren op de lange termijn
L29	Efficient grondgebruik
TOTAAL	
10% Verontreiniging	
Pol 1	GW van bodemdieren voor klimaatregeling
Pol 2	Verontreiniging van bodemdieren van bodemdieren
Pol 3	GW van bodemdieren voor waterkwaliteit
Pol 4	Ruimteverwarming gerelateerde NOx emissie
exemplary performance	
Pol 6	Minimalisering van vervuiling van afstromend regenwater
Pol 7	Minimalisering lichtvervuiling
Pol 8	Gebruiksverval
TOTAAL	

Industrie	perfuncties	Minimaal	Maximaal	Score	Score Gew.	MAX/MIN
Milan 1	3	2	2	1,47%		
Milan 2	2	2	2	1,47%		
Milan 3	4	2	2	2,95%		
Milan 4	1	1	1	0,74%		
Milan 6	1	0	0	0,00%		
Milan 8	1	0	0	0,00%		
Milan 9	1	0	1	0,00%		
Milan 11	1	0	0	0,00%		
Milan 12	2	0	0	0,00%		
TOTAAL						6,63%
Misa 1	0	0	0	0,00%		
exemplary performance						
Misa 2	1	0	0	0,00%		
Misa 3	0	0	0	0,00%		
Misa 4	1	1	1	1,84%		
Misa 5	1	1	1	1,84%		
Misa 6	0	0	0	0,00%		
Misa 7	0	0	0	0,00%		
Misa 8	2	2	2	3,68%		
Misa 9	1	1	1	1,84%		
Misa 10	2	2	2	3,68%		
Misa 11	0	0	0	0,00%		
Misa 13	0	0	0	0,00%		
Misa 14	n.v.t.	n.v.t.	0	0,00%		
Misa 15	n.v.t.	n.v.t.	0	0,00%		
TOTAAL						12,89%
Ene 1	15	15	15	11,66%		
exemplary performance						
Ene 2a	2	2	2	1,56%		
Ene 2b	n.v.t.	n.v.t.	0	0,00%		
Ene 4	1	1	1	0,79%		
Ene 5	3	2	2	2,33%		
Ene 6	1	0	0	0,00%		
Ene 7a	0	0	0	0,00%		
Ene 7b	n.v.t.	n.v.t.	0	0,00%		
Ene 7c	0	0	0	0,00%		
Ene 8	0	0	0	0,00%		
Ene 20	2	2	2	1,56%		
TOTAAL						17,89%
Tra 1a	2	0	0	0,00%		
Tra 1b	0	0	0	0,00%		
Tra 1c	n.v.t.	n.v.t.	0	0,00%		
Tra 2	1	0	0	0,00%		
Tra 3a	2	2	2	1,51%		
exemplary performance						
Tra 3b	n.v.t.	n.v.t.	0	0,00%		
Tra 4	2	2	2	1,51%		
Tra 5	3	3	3	1,96%		
Tra 7	1	1	1	0,60%		
Tra 8	1	0	0	0,00%		
TOTAAL						5,24%
Wat 1a	3	2	2	1,47%		
Wat 1b	n.v.t.	n.v.t.	0	0,00%		
Wat 2	1	1	1	0,74%		
Wat 3	1	1	1	0,74%		
Wat 4	1	1	1	0,74%		
Wat 5	1	0	0	0,00%		
Wat 6	1	1	1	0,00%		
TOTAAL						4,42%
Mat 1	8	8	8	0,94%		
exemplary performance						
Mat 5	4	4	4	2,83%		
exemplary performance						
Mat 7	1	1	1	0,94%		
Mat 8	0	0	0	0,00%		
TOTAAL						4,72%
Waf 1	3	3	3	3,68%		
exemplary performance						
Waf 2	1	0	0	0,00%		
Waf 3a	1	0	0	0,00%		
Waf 3b	n.v.t.	n.v.t.	0	0,00%		
Waf 5	0	0	0	0,00%		
Waf 6	1	0	1	1,23%		
TOTAAL						4,91%
L21	5	3	3	2,88%		
L22	2	0	0	0,00%		
L23	1	1	1	0,89%		
L24	2	1	1	0,89%		
L25	1	1	1	0,89%		
L29	n.v.t.	n.v.t.	0	0,00%		
TOTAAL						5,36%
Pol 1	1	0	0	0,00%		
Pol 2	2	0	0	0,00%		
Pol 3	0	0	0	0,00%		
Pol 4	3	2	2	1,79%		
exemplary performance						
Pol 6	3	1	1	0,89%		
Pol 7	1	1	1	0,89%		
Pol 8	1	1	1	0,89%		
TOTAAL						5,36%
TOTAAL						67,4%

Kantoor/kantine	perfuncties	Minimaal	Maximaal	Score	Score Gew.	MAX/MIN			
Milaan	3	2	2	0,01%	0,13%				
	2	2	2	0,01%					
	4	4	4	0,05%					
	1	1	1	0,01%					
	1	0	0	0,00%					
	1	0	0	0,00%					
	1	0	1	0,00%					
	1	0	0	0,00%					
	2	0	0	0,00%					
	16	8	10	0,12%					
Misa	1	0	0	0,00%	0,15%				
	1	0	0	0,00%					
	1	0	0	0,00%					
	1	1	1	0,02%					
	1	1	1	0,02%					
	1	1	1	0,02%					
	1	0	0	0,00%					
	2	2	2	0,04%					
	1	1	1	0,02%					
	2	2	2	0,04%					
	1	0	0	0,00%					
	1	0	0	0,00%					
	n.v.t.	n.v.t.	0	0,00%					
	n.v.t.	n.v.t.	0	0,00%					
14	8	8	0,15%						
Ene	15	15	15	0,21%	0,32%				
	2	2	2	0,03%					
	n.v.t.	n.v.t.	0	0,00%					
	1	1	1	0,01%					
	3	2	2	0,04%					
	1	0	0	0,00%					
	0	0	0	0,00%					
	0	0	0	0,00%					
	0	0	0	0,00%					
	2	2	2	0,03%					
	24	23	23	0,32%					
	Tra	2	0	0			0,00%	0,09%	
		n.v.t.	0	0			0,00%		
		1	0	0			0,00%		
2		0	2	0,02%					
n.v.t.		n.v.t.	0	0,00%					
2		2	2	0,02%					
3		3	3	0,04%					
1		1	1	0,01%					
1		0	0	0,00%					
17		8	8	0,09%					
Wat		3	2	2	0,01%	0,06%			
		n.v.t.	n.v.t.	0	0,00%				
		1	1	1	0,01%				
		1	1	1	0,01%				
	1	1	1	0,01%					
	1	0	0	0,00%					
	1	1	1	0,01%					
	8	8	6	0,08%					
	Mat	8	7	7	0,01%			0,02%	
		4	4	4	0,04%				
1		1	1	0,01%					
4		0	0	0,00%					
17		5	5	0,07%					
Waf		3	3	3	0,01%	0,02%			
	1	0	0	0,00%					
	1	0	0	0,00%					
	n.v.t.	n.v.t.	0	0,00%					
	0	0	0	0,00%					
	1	1	1	0,02%					
	6	4	4	0,09%					
	L21	5	3	3	0,05%			0,10%	
		2	0	0	0,00%				
		1	1	1	0,01%				
2		1	1	0,02%					
1		1	1	0,02%					
n.v.t.		n.v.t.	0	0,00%					
11		8	8	0,10%					
1		0	0	0,00%					
2		1	1	0,02%					
0		0	0	0,00%					
3	2	2	0,03%						
3	1	1	0,02%						
1	1	1	0,02%						
1	1	1	0,02%						
1	2	2	0,02%						
11	6	6	0,10%						
					1,1%				

Costs and benefits

Three types of costs – which are related to the Breeam process – can be differentiated in this project:

1. Costs concerning the BREEAM certification process itself
2. Cost of (energy-) reducing measures with a ROI
3. Additional investments in BREEAM credits that don't have a direct ROI

Examples of costs of the BREEAM certification process are the BREEAM expert and assessor, registration fees and the selection of a contractor capable of achieving the BREEAM credits.

Examples of energy-reducing measures are radiant ceiling panels, LED lighting and the solar panels.

Additional investments are made in ecological measures, water-loss prevention and energy monitoring of the building.

For Prologis, this translates into a more desirable building. Buildings built to the highest sustainability standards are more efficient to operate, reducing costs for tenants and encouraging extended occupancy. Over time, efficient buildings are better for customers, investors and communities.

Creating Sustainable Value for Our Stakeholders

Our forward-looking approach to sustainable design, development and operations delivers long-term value for all of our stakeholders.



Lessons learned and future plans

The building is an excellent reference of Prologis' current specification for all new developments in Benelux. The team has identified the following recommendations for the next project.

1. Some credits can only be achieved by starting early or with the help of the user and/or neighbors. Examples of this are consulting with the local community and future occupants. For future projects, the user should receive an information package to aid them in making choices that also lead to the BREEAM certification.
2. We have learned that it's feasible to create a surrounding that promotes biodiversity with expertise of an ecologist and a landscaping architect.
3. For the next project a Circular building design with eco-friendly, bio-based, re-usable and re-cyclable will be further explored to lower the environmental footprint of our developments.

Some final thoughts

For developers, contractors and architects, BREEAM has become the key inspiration to use the available resources in a more innovative, sustainable and efficient manner. Development projects with a BREEAM certification not only improve the quality of the environment for the people that work in them, but also result in more attractive investments for the long term property owner.

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