Climate Check

Product Book

Content

Climate Check

What is the Climate Check?

The Climate Check evaluates and optimizes the climate and environmental impact of real estate and open spaces

The greenpass Climate Check is part of the Environmental Impact Kit and enables the evaluation and optimization of climate-fit real estate, urban districts and open spaces. The software-based and scientifically developed Climate Check analyzes real estate and open spaces with regard to 5 urban challenges:

- **Climate**
- **Water**
- **Air**
- **Biodiversity**
- **Energy**

Comprehensive, fact-based climate check for buildings, city districts and open spaces

Digital twin as single source of truth (SSOT) for Environmental Impact Kit and expert simulations

Scientific KPIs and effective measures for optimizing impact performance and successful climate change adaptation

environmental impact kit

Where can the Climate Check be applied?

The Climate Check is universal and can be applied worldwide

The Climate Check can be applied in new and existing buildings. In addition, for a variety of use cases such as the development of individual buildings, high-rise projects and entire neighborhoods and districts with a size of up to approximately 200 ha.

The Climate Check can be combined with other checks from the Environmental Impact Kit in a modular way. The (pre)certification offers an optimization in terms of cost/benefit, as well as the official certification of the project. In addition, the EU Taxonomy Check can be used to fulfill the regulatory requirements and criteria of the EU Taxonomy.
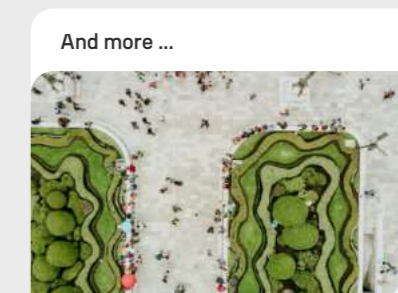
New   **Stock**

individual buildings or entire city quarters

Climate Check use cases

Project development

EU Taxonomy & ESG

Status quo & retrofit

Building portfolio analysis

Competition participation

Competition process support

Official certification

Regulation fulfillment
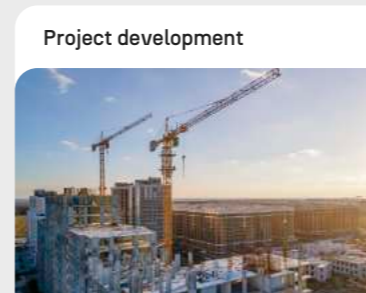

And more …
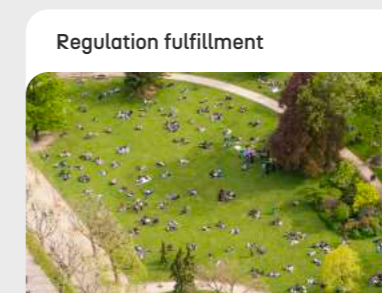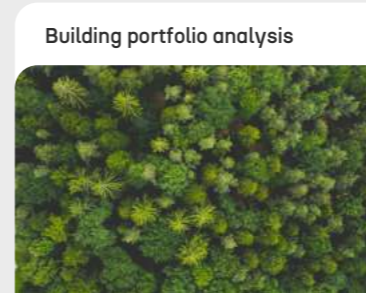
What are the advantages of the Climate Check?

Climate-fit real estate, urban districts and open spaces

The greenpass Climate Check brings many benefits to all stakeholders. In addition to the quantitative impact assessment, the Climate Check enables an optimization of the impact performance of adaptation measures based on fact-based decisions and consequently a higher climate resilience and quality of life. The quality confirmation of the Climate Check brings a clear market advantage with future and investment security.

In addition to the advantages mentioned, a large number of essential ecosystem services are achieved through the successful implementation of adaptation measures. The climate check demonstrates & quantifies the many advantages in everyday life.

Climate Check benefits

Quantitative assessment & analysis

Fact-based & well-founded basis for decision-making

Impact optimization

Data-driven quality assurance

To be a good neighbour

Substantial market advantage & valorization

Climate-fit real estate, urban districts and open spaces

Future & investment security

Higher climate resilience & quality of life

How does the Climate Check work?

State-of-the-art technology that enables fact-based performance optimization and climate-fit design

The climate check includes a data-driven and holistic 3D impact analysis with meaningful KPIs. The check is based on a digital twin from the greenpass editor software and a 3D microclimate simulation (powered by ENVI-met) in combination with area analyses.

Based on a standardized process, the climate check enables:

- a quantitative impact assessment
- a scenario comparison
- a performance optimization

In order to achieve the greatest leverage, it is advisable to start as early as possible and to check and optimize the project or planning in terms of effectiveness.
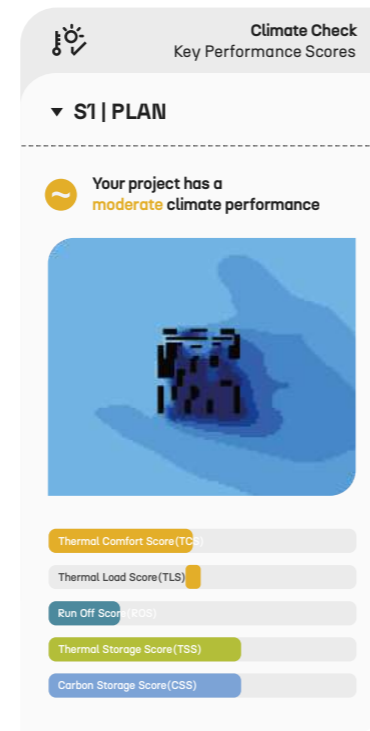
More information and examples of how to use the Climate Check can be found in the Use Case Book and the Reference Book.

Climate Check
Key Performance Scores

▼ S1 | PLAN

~ Your project has a
moderate climate performance

Thermal Comfort Score(TCS)
Thermal Load Score(TLS)
Run Off Score(ROS)
Thermal Storage Score(TSS)
Carbon Storage Score(CSS)

powered by

ENVI
_MET

Climate Check process

1 ● Data provision according to Data Book

2 ● Creation of a digital twin

3 ● Approval digital twin

4 ● Climate Check analysis & simulation

5 ● Results

optional: further add-ons

recommended: optimization loop with workshop & re-simulation

What is the result of the Climate Check?

Analysis and evaluation of real estate and open spaces with regard to climate resilience

The Climate Check includes an evaluation with impact figures, graphics and recommendations for optimization, which are summarized in an easy-to-understand report. The analysis is based on a high-resolution microclimate expert simulation (ENVI-met) for a hot day with LOD 1. The level of detail of the analysis or the report varies depending on the scope of services or the add-ons selected.

Fact-based results including effective optimization recommendations enable real estate and open spaces to be easily improved in terms of their impact performance as well as to officially quantify and demonstrate the project performance and environmental impact.

Climate Check product features

Comprehensive, fact-based climate check for buildings and open spaces

5 urban challenges climate, water, air, biodiversity & energy

12 meaningful & numerical KPIs for successful climate change adaptation

Digital twin as single source of truth (SSOT) for expert simulation & Area analysis

Level of Detail (LOD) 1 for digital twin & assessment

High-resolution microclimate expert simulation for a hot day with ENVI-met

Clear optimization recommendations for successful climate change adaptation

Clear graphics & heatmaps for a targeted performance optimization

Easy to understand & transparent report with all results including an executive summary

editor

Climate Check

Wind Check

Certification Check

EU Taxonomy Check

What is the greenpass editor?

The greenpass Editor (GP.e) software is the basis for the Environmental Impact Kit and the digital twin

The greenpass editor is a 3D and GIS-based software for a digital twin of real estate and open spaces. The digital twin serves as a uniform basis and single source of truth (SSOT) for the greenpass Environmental Impact Kit and the Impact Checks. This enables a holistic and valid assessment of the environmental impact of real estate and open spaces around the world.

More information and specifications of the necessary data basis for the Climate Check can be found in the Data Book.

3D & GIS-based modeling software for real estate and open spaces with import of common planning data (e.g. CAD, GIS)

Easy and fast modeling of projects with comprehensive database of 100+ materials and all types of vegetation

Digital twin as a single source of truth (SSOT) for environmental impact checks and high-resolution expert simulations

editor
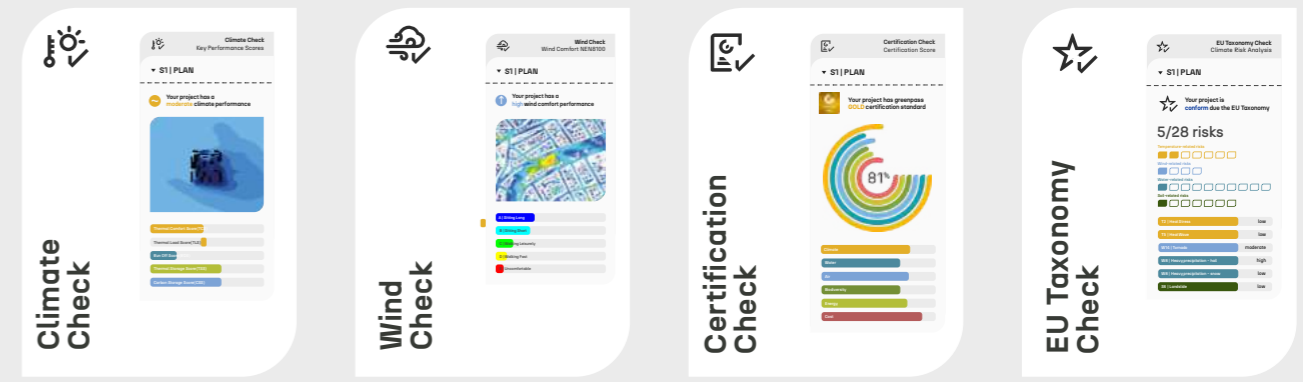
What is evaluated in the Climate Check?

Scientifically developed and meaningful impact indicators for the environment, climate and people

The standard scope of the Climate Check includes an evaluation of a selected scenario (e.g. planning draft, master plan, status quo situation) for a standardized hot day (approx. 30°C). The Climate Check evaluates 12 meaningful numerical key performance indicators (KPIs) from 5 urban challenges.

Through additional add-ons, the standard scope of the Climate Check can be extended to meet individual requirements and needs.

Climate Check
Key performance indicators (KPIs)

Climate

TCS | Thermal Comfort Score
TLS | Thermal Load Score
PET | Physiological Equivalent Temperature
RAD | Radiation
ALB | Albedo
EVA | Evapotranspiration
SAF | Shading Area Factor

Water

ROS | Run-Off Score

Biodiversity

LAR | Leaf Area

Air

CSS | Carbon Sequestration Score
WF | Wind flow

Energy

TSS | Thermal Storage Score

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greenpass Climate Check

	S1 PLAN	S2 OPT #1	S3 STATUS QUO
Key Performance Scores	52 %	78 %	38 %
Thermal Comfort Score (TCS)	45.9	45.9	32.1
Thermal Load Score (TLS)	-0.06°C	-0.08°C	+0.04°C
Run Off Score (ROS)	0.25	0.20	0.75
Thermal Storage Score (TSS)	12.4 MJ/m²	10.4 MJ/m²	18.3 MJ/m²
Carbon Storage Score (CSS)	2.3 kg/m²	2.3 kg/m²	1.2 kg/m²

18-23°C comfortable
23-29°C slightly warm
29-35°C warm
35-41°C hot
41-47°C very hot
47-53°C super hot
53-59°C extremely hot
> 59°C hottest
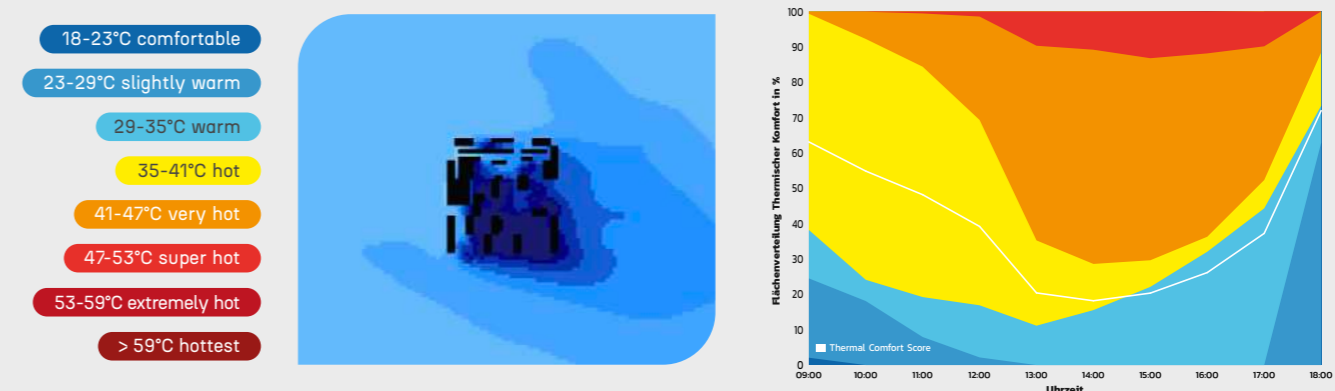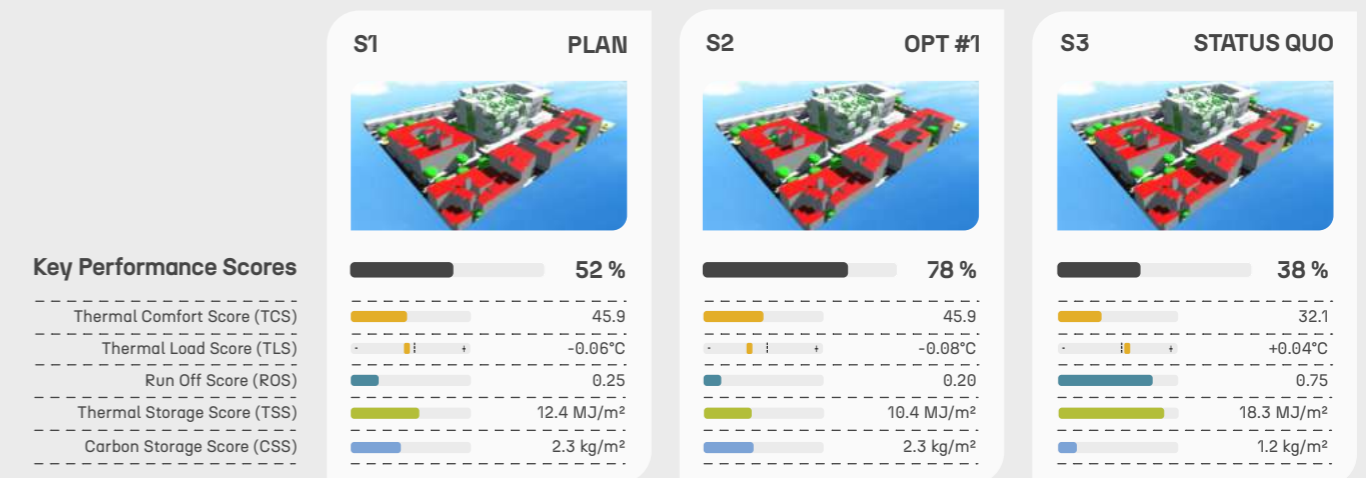
powered by

ENVI_MET

What do the results look like?

Briefly and comprehensibly summarized and all information at a glance

The results of the Climate Check are transparently summarized in the form of an easy-to-understand digital report.

The report contains the following chapters or summarizes the following content in an overview:

- **Intro**
- **Project information**
- **Scenario(s)**
- **Results in form of**
  - Numbers
  - Heat maps
  - Graphics
  - if possible - comparative graphics
- **Optimization recommendations**
- **Executive summary**
- **Annex**
  - Wiki

How can the Climate Check be extended?

One kit with add-ons for all your needs and requirements

In addition to the combination with other checks of the Environmental Impact Kit, the standard scope of the climate check can be expanded with add-ons as required - e.g. an optimization round, one or more reference scenarios (status quo - before/after comparison), further planning & climate scenarios, additional evaluations such as thermal comfort for youths or seniors, and much more.

The add-ons for the Climate Check are divided into the following categories:

• Scenarios
additional scenarios & variants
such as optimization, planning, status quo, worst, moderate or maximum

• Conditions
extended analysis conditions
such as future climate scenarios or seasons

• Analysis
additional analysis evaluations
such as building physics module or PET additional analyzes for specific target groups

• Services
additional services
such as processing time

Select add-ons and design Environmental Impact Kit modularly for the individual situation.

Our trained greenpass partners as well as the sales team are happy to support you in finding the ideal add-ons for your climate check.

contact@greenpass.io

Climate Check add-ons

Scenarios
Add-On: Optimization - nomal size (<=10.000m2)
Add-On: Optimization - large size
Add-On: Planning scenario extra - normal size (<=10.000m2)
Add-On: Planning scenario extra - large size
Add-On: Reference scenario Status Quo - normal size (<=10.000m2)
Add-On: Reference scenario Status Quo - large size
Add-On: Reference scenario Worst Case - normal size (<=10.000m2)
Add-On: Reference scenario Worst Case - large size
Add-On: Reference scenario Moderate Case - normal size (<=10.000m2)
Add-On: Reference scenario Moderate Case - large size
Add-On: Reference scenarioBest Case - normal size (<=10.000m2)
Add-On: Reference scenario Best Case - large size

Analysis
Add-On: Climate Resilience Handbook
Add-On: Building Physics Module
Add-On: Indoor Air Temperature Module
Add-On: PET - Child male
Add-On: PET - Child female
Add-On: PET - Youth male
Add-On: PET - Youth female
Add-On: PET - Senior male
Add-On: PET - Senior female
Add-On: Extra analysis level

Conditions
Add-On: Future climate scenario SSP2.6
Add-On: Future climate scenario SSP4.5
Add-On: Future climate scenario SSP6.0
Add-On: Future climate scenarioSSP8.5
Add-On: Spring season scenario
Add-On: Autumn season scenario
Add-On: Winter season scenario

Service
Add-On: Time-of-Service - Priority (within 4-5 weeks)
Add-On: Time-of-Service - High Priority (within 1-3 weeks)

What is the Climate Check based on?

Developed scientifically and practically for your purpose

The greenpass Climate Check was developed in more than 10 years of research and development with international universities and experts. Behind the greenpass technology are more than 16 national and international research projects as well as more than € 6 million in investments and funding.

More information about the development of greenpass can be found in the official Validation Book.
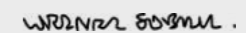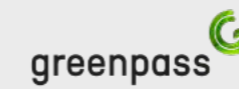
12+	16+	€6.0m
years of research & development	R&D projects	investment & fundings

Technology Development Partner

greenpass

G4C

BOKU — Universität für Bodenkultur Wien
University of Natural Resources and Applied Life Sciences, Vienna

ENVI_MET — DECODING URBAN NATURE

JGU — JOHANNES GUTENBERG UNIVERSITÄT MAINZ

UNI KASSEL VERSITÄT

UNIVERSITÄT BONN

TU Graz

Werner Sobek

Network Partner

international journal multilingual BIOTOPE CITY

ICLEI — Local Governments for Sustainability EUROPE

EFB — EUROPEAN FEDERATION GREEN ROOFS & WALLS — GREENER CITIES IN EUROPE

BuGG — Bundesverband GebäudeGrün e. V. — Dach-, Fassaden- und Innenraumbegrünung

GRÜN STATT GRAU

NATIONAL GREEN ROOF ASSOCIATION SERBIA

klimaaktiv Partner

ÖGNI

ELCA — EUROPEAN LANDSCAPE CONTRACTORS ASSOCIATION

Abb. 1: Visualization of design draft Beatrixkwartier The Hague © LOLA landscape architects
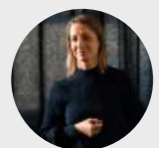
Sustainable urban district

The Beatrixkwartier in the city of The Hague is a modern financial district close to the city center. Under the direction of the national O-Team, the municipality invited two international architectural firms to design a green densification concept for the quarter. A climate resilience handbook served as a basis for the design teams and provided detailed information on climate resilient urban design and architecture. The numerical performance values served as a basis for the O-Team & the community to compare the two design drafts with worst & best case scenarios. The design drafts were checked by means of a climate check and analyzed with regard to their strengths and weaknesses. The design teams received individual & specific optimization measures to effectively improve their designs. The various results of the have been incorporated and taken into account in the design process and in the final recommendations of the decision-makers. The results of the process have been officially documented and serve as a showcase and springboard for climate-resilient urban developments in the Netherlands and worldwide.

For the further design phase of the Beatrixkwartier, the O-Team provided numerous recommendations and technical advice in order to continuously improve and optimize the city quarter in The Hague in terms of future security, climate fitness and sustainability.

"Greenpass supported us in accurately proofing the climate performance of the initial situation and the first concepts for the Beatrixkwartier. At a next step the design drafts were optimized – based on evidence through data-driven analysis – to make this urban district in The Hague more climate-proof and livable."

Wiebke Klemm
Senior Policy Advisor
City of The Hague

Den Haag

Application example
Beatrixkwartier The Hague

Project type
District

Area
approx. 21 ha

Location
City of The Hague

Customer
City of The Hague

Completion
TBD

Use Cases
Project development

Status quo & retrofit

Competition process support

Customer
• City of The Hague

Architecture/Landscape architecture
• PosadMaxwan
• LOLA Landscape Architects

Energy
• IF Technolgy - creating energy

Climate resilience
• greenpass

greenpass

Greenpass is a Viennese ClimateTech company founded in 2018 for climate-fit and sustainable real estate and open spaces. We are an interdisciplinary team of highly qualified and passionate climate resilience experts.

220+
climate-fit developments

180+
happy customers

50+
trained UCA partners

awarded by

STARTUP EUROPE AWARDS

STARTUP EUROPE

European Commission

AUSTRIA PRESTIGE AWARDS

PROPTECHMAP EUROPE 2021: TOP100
Presented by BUILTWORLD in cooperation with PwC. More info at www.proptechmap.com

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Get in touch
and find your local
Urban Climate Architect (UCA)

✉ contact@greenpass.io

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1190 Vienna, Austria

www.greenpass.io   in f ▶

urban
climate
architect

greenpass

design climate-fit real estate & open spaces **for the future now!**

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