Water Module

Product Book

greenpass

Content

Water Module

What is the Water Module?

Assessing and optimizing real-estate rainwater management made easy

The greenpass Water module is part of the greenpass Kit. It enables, in a comprehensible way, even non-experts to understand and optimize rainwater management situation of buildings and open spaces. The software-based & scientifically developed Water Module analyzes your project with regard to the urban challenge:

- Water

Comprehensive & fact-based rainwater management analysis for buildings & open spaces

Easy access to the power of state-of-the-art hydrological simulation tools even for non-experts

Fast extension to other analyses from the greenpass Kit thanks to a digital twin serving as the single source of truth

Where can the Water Module be applied?

Universal rainwater analysis for buildings & open spaces in all climates and neighborhoods

The greenpass Water Module can be used both in new and in existing developments worldwide and for a large number of use cases. It is suited for single-story individual buildings, for high-rise projects including vast open spaces, as well as for entire districts with a size of up to approx. 200 ha.

The Water Module can be combined with other analyses from the greenpass Kit. Together with the Climate Module, the quality of stay in projects can be optimized. With a (pre-)certification, projects can then be optimized in terms of cost/benefit and also officially certified. In addition, the regulatory requirements and criteria of the EU Taxonomy can be met with the EU Taxonomy Module.

New   **Stock**

Individual buildings or entire city quarters
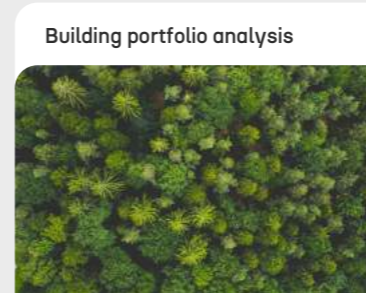
Use Cases
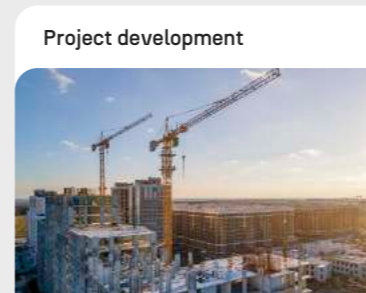
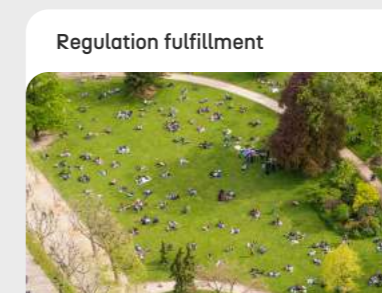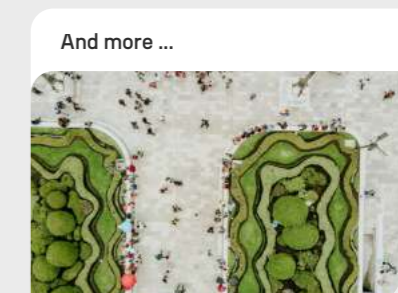|		
Project development	EU Taxonomy & ESG	Status quo & retrofit
Building portfolio analysis	Competition participation	Competition process support
Official certification	Regulation fulfillment	And more …

What are the advantages of the Water Module?

An easy way to make your real estate ready for future rainy days

The greenpass Water Module brings a comprehensible quantitative rainwater management assessment. It allows even non-experts to take advantage of state-of-the-art tools and enables them to understand the rainwater management of their project. It can thus serve as a solid fact basis for decision making,

The Water Module enables the rainwater management to be optimized towards risk reduction, cost-efficiency, and regulatory requirements. In this way, buildings and open spaces prepared to face future climate can be developed. The quality confirmation of greenpass Water thus brings a market advantage with future and investment security.

With the Water Module, you can guide rainwater management of your real estate towards sustainability, climate adaptation, and pluvial flooding prevention.

Benefits

Rainwater quantitative analysis & assessment

Fact-basis for decision-making

Impact optimization

Reducing the pluvial flooding risk

To be a good neighbour

Increasing evaporative cooling

Higher climate-change resilience

Future & investment security

...
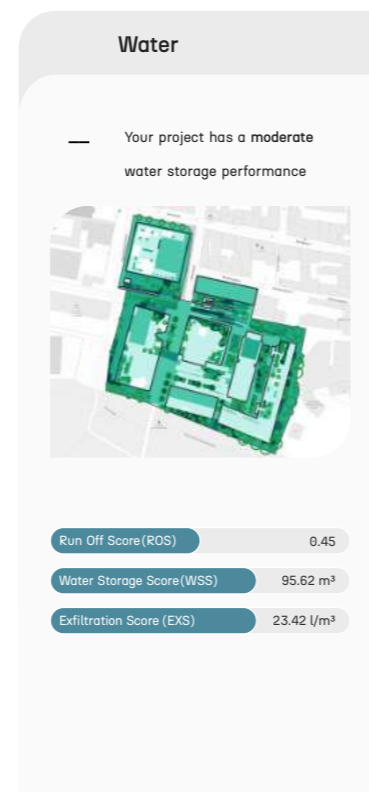and many more

How does the Water Module work?

State-of-the-art technology and expert knowledge enabling you make rainwater decisions

The greenpass Water Module is based on a leading expert-simulation tool SWMM. A digital twin of your project is created first using greenpass Editor. This digital twin is used as the single source of truth and transformed into a high-resolution SWMM hydrological model.

Multiple simulations are conducted using the hydrological model, following a standardized process for data input and processing, producing a vast amount of data. Different rain events with dynamic or static rainfall patterns and intensities are considered for return periods of up to 100 years.

The simulation results are plotted as thematic maps, temporal runoff curves and key performance indicators are calculated. The indicators correlate with regulations and guidelines regarding rain water management.

You can find more information and examples of how to use the Water Module in the Use Case Book and the Reference Book.

Water

Your project has a **moderate** water storage performance

Run Off Score(ROS)	0.45
Water Storage Score(WSS)	95.62 m³
Exfiltration Score (EXS)	23.42 l/m³

powered by

Process

1 ● Data provision according to Data Book

2 ● Creation and approval of a digital twin

3 ● Transformation of the digital twin into a hydrological model

4 ● High-resolution hydrological simulations

5 ● Result generation

optional: multiple Add-Ons (see page 21)

recommended: optimization loop with workshop & re-simulation

Water storage - Status quo
100-year rainfall

Water storage - Plan
100-year rainfall

What is the result of the Water Module?

Analysis & evaluation of real estate with regard to rainwater management and pluvial flood prevention

The greenpass Water Module delivers a comprehensive analysis of the rain water management based on an unique digital assessment methodology. It focuses on an optimal balance between water storage and runoff to minimize operational costs and reduce the risk of pluvial flooding.

We perform for you high-resolution hydrological simulations using a leading expert tool SWMM. The simulation results are presented as thematic maps and summarizing Key Performance Indicators (KPIs) providing easy understanding of the qualities of your design.

Enhancement of your project's rain water management is facilitated by pinpointing its improvement potential and by professional guidance on selection of effective measures.

Product features

Fact-based rainwater management analysis for buildings & open spaces

The urban challenge of Water addressed in detail

9+ meaningful KPIs for optimal balance of water storage and runoff

Digital twin as the single source of truth for state-of-the-art simulations

Additional in-detail info that can tailor the product according to individual requirements

High-resolution hydrological simulations using a leading expert tool SWMM

Clear recommendations for a targeted performance optimization

Visual representation on the basis of descriptive graphics and heat maps

Detailed report that summarises the most important results for non-experts

editor

What is the greenpass editor?

The greenpass Editor (GP.e) software is the basis for the greenpass 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 Kit and the Impact Modules. This enables a holistic and valid assessment of the environmental impact of real estate and open spaces around the world.

You can find more information and specifications for the necessary data basis for the greenpass Water Module 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

What is assessed with the Water Module?

Precise consideration of the consequences of rain events for your real estate

The standard scope of the greenpass Water Module includes an evaluation of a selected scenario (e.g. planning draft, master plan, status quo situation) for three standardized rainfall events. For each scenario and each event, we summarize the project performance using 9 meaningful numerical key performance indicators (KPIs). These focus on the real estate's capability to capture and store rainwater, thus reducing rainwater runoff and supporting evaporative cooling.

Additional add-ons can be used to tailor the standard scope of the Water Modul to individual needs.
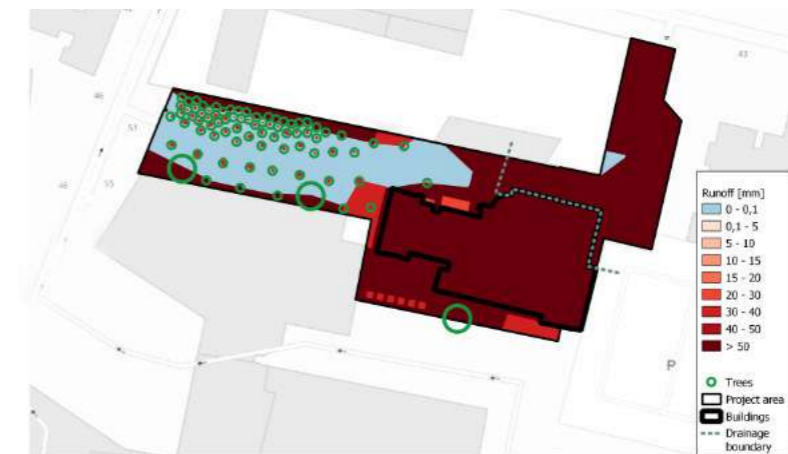
Water Module
# Key performance indicators (KPIs)

Water

ROG | Runoff Generation
ROS | Runoff Score
WAC | Water Capture
UWC | Unused Water Capture Potential
SSP | Subsoil Percolation
DWT | Total Drainable Water
DWD | Drainable Water in Detention Units
PWS | Posterior Water Storage
UWS | Unused Water Storage Potential

greenpass Water Module

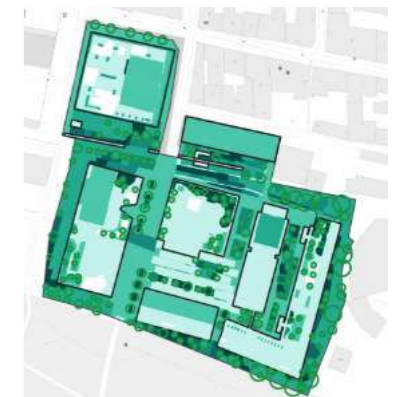### Runoff - Plan (100-year rainfall)

Runoff Generation
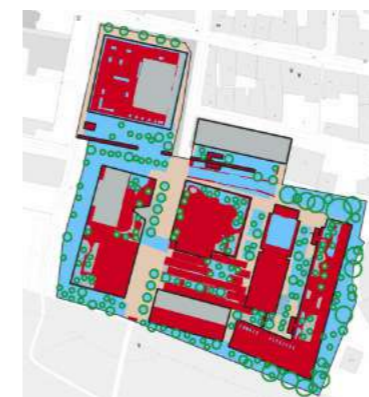
Water Capture

Posterior Water Storage

powered by

What do the results look like?

Briefly and comprehensibly summarized and all information at a glance

The results of the greenpass Water Module are transparently summarized and documented in the form of a clear and readable digital report. The scope of the Water Module report depends on the scope of services and is typically around 15-50 pages.

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 Water Module be extended?

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

In addition to the combination with other services of the greenpass Kit, the standard scope of the Water Module 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 preliminary evaluation or in-detail rainfall vs. runoff analysis, and much more.

Simply select your add-ons and assemble your greenpass Kit tailor-made exactly for your situation.

The add-ons for the Water Module 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 specific rainfall events or initial conditions

• Analysis
 additional analysis evaluations
 such as preliminary evaluation or in-detail rainfall vs. runoff analysis

• Services
 additional services
 such as processing time

Our trained greenpass partners and the sales team will be happy to support you in finding your ideal environmental impact kit for your situation and requirements.

contact@greenpass.io

Water Module Add-Ons

Scenarios

| Add-On: Status quo |
| Add-On: Optimization |
| Add-On: Extra plan |

Conditions

| Add-On: Specific initial conditions |
| Add-On: Double event |
| Add-On: x-year y-hour event |
| Add-On: Custom historical event |

Analysis

| Add-On: Internal routing |
| Add-On: Proof of flooding |
| Add-On: Water Capture - In Detail |
| Add-On: Water Storage - In Detail |
| Add-On: Rainfall vs. Runoff analysis |
| Add-On: Restoring of Detention Volumes |

Service

| Add-On: Scenario comparison |
| Add-On: Priority |

What is the Water Module based on?

Developed scientifically and practically for your purpose

The greenpass Water Module was developed in a practical manner over several years of research and development. Behind the greenpass technology are more than 16 national & international research projects as well as more than € 6 million in investments & funding.

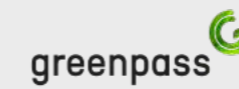Find out more information about the development of greenpass in the official Validation Book.

12+	16+	€6.0m
Jahre Forschung & Entwicklung	R&D Projekte	Investitionen & Förderungen

Technology Development Partner

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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

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