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VINGROUP  
VINHOMES

based on a decision of  
the German Bundestag



# Smart Urban Areas - SUA

Nachhaltige Systemlösungen für Urbane Quartiere

TECHNISCHE UNIVERSITÄT DORTMUND  
RAUMBEZOGENE INFORMATIONSVERRARBEITUNG UND MODELLBILDUNG - RIM  
TOBIAS KUESTER-CAMPIONI, SEPTEMBER 2024

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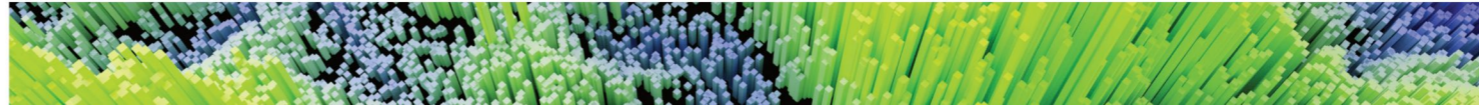


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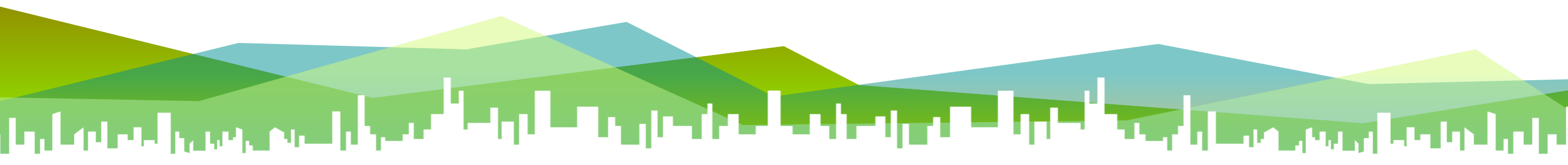
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## VORTRAG

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1. Projektinformationen
2. Projekt SUA
3. Projekt Pilot

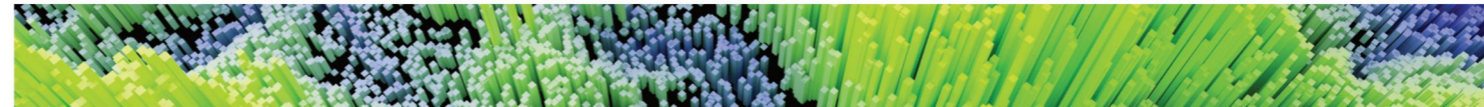




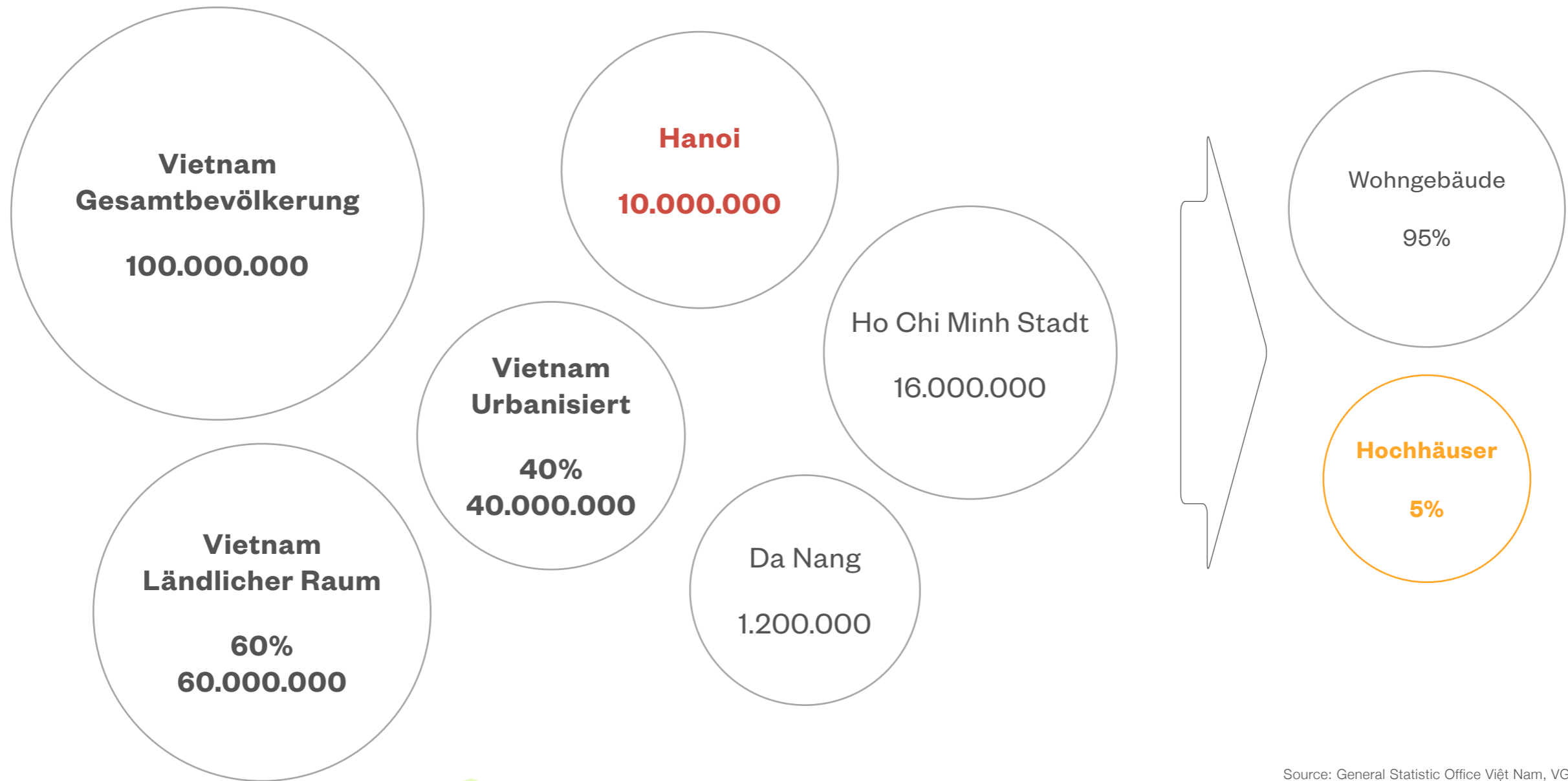
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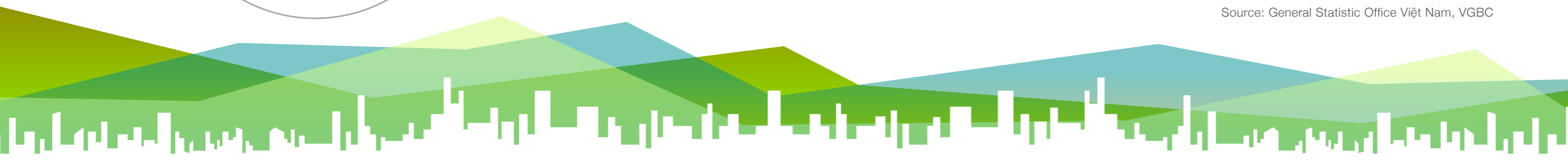
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# 1. PROJEKTINFORMATIONEN



Source: General Statistic Office Việt Nam, VGBC



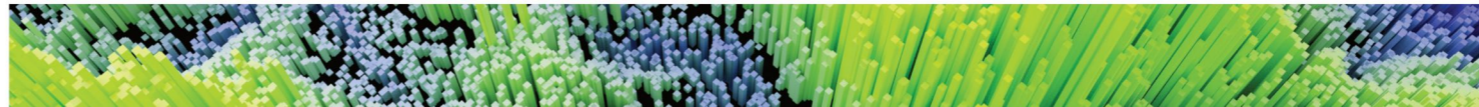
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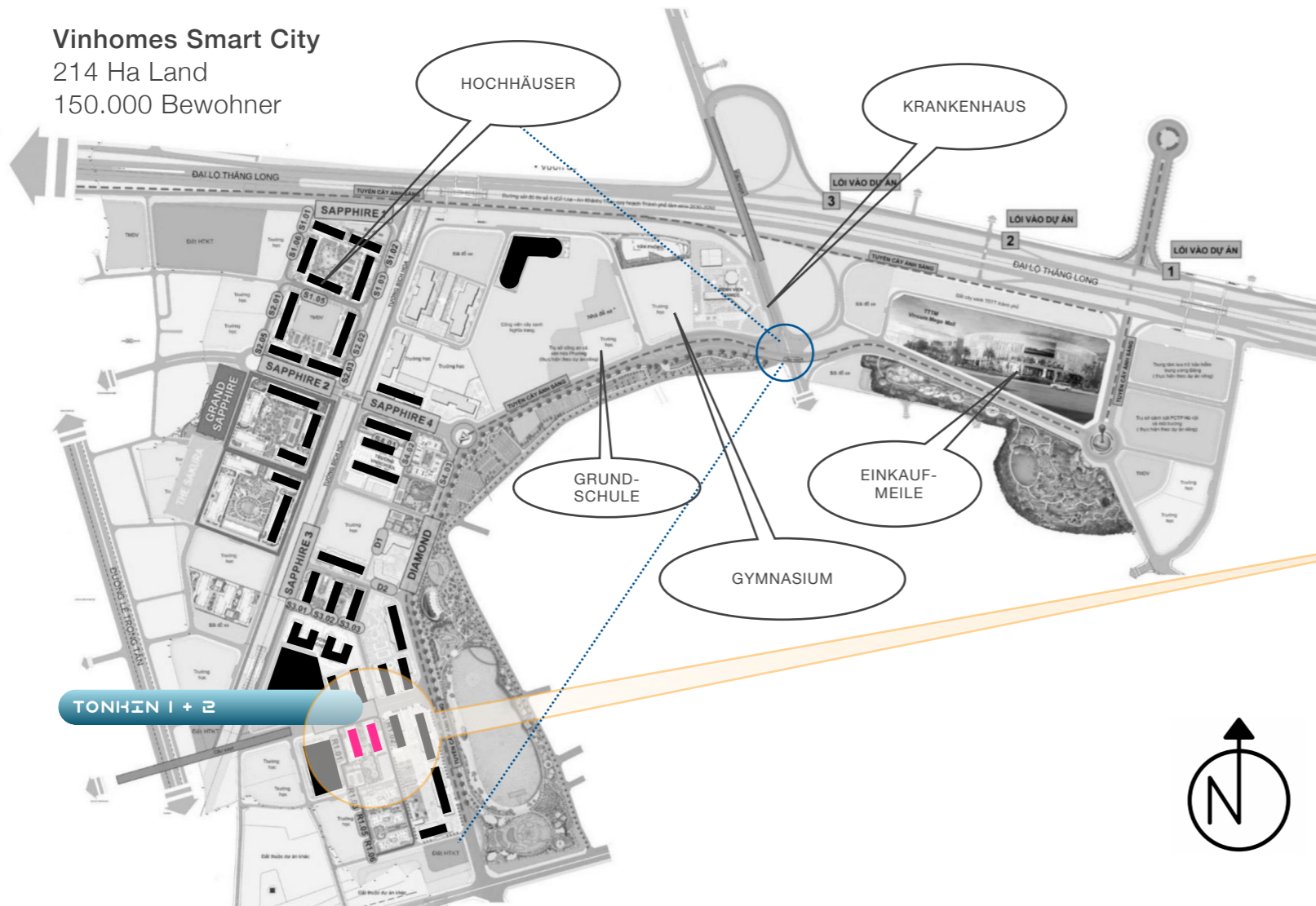
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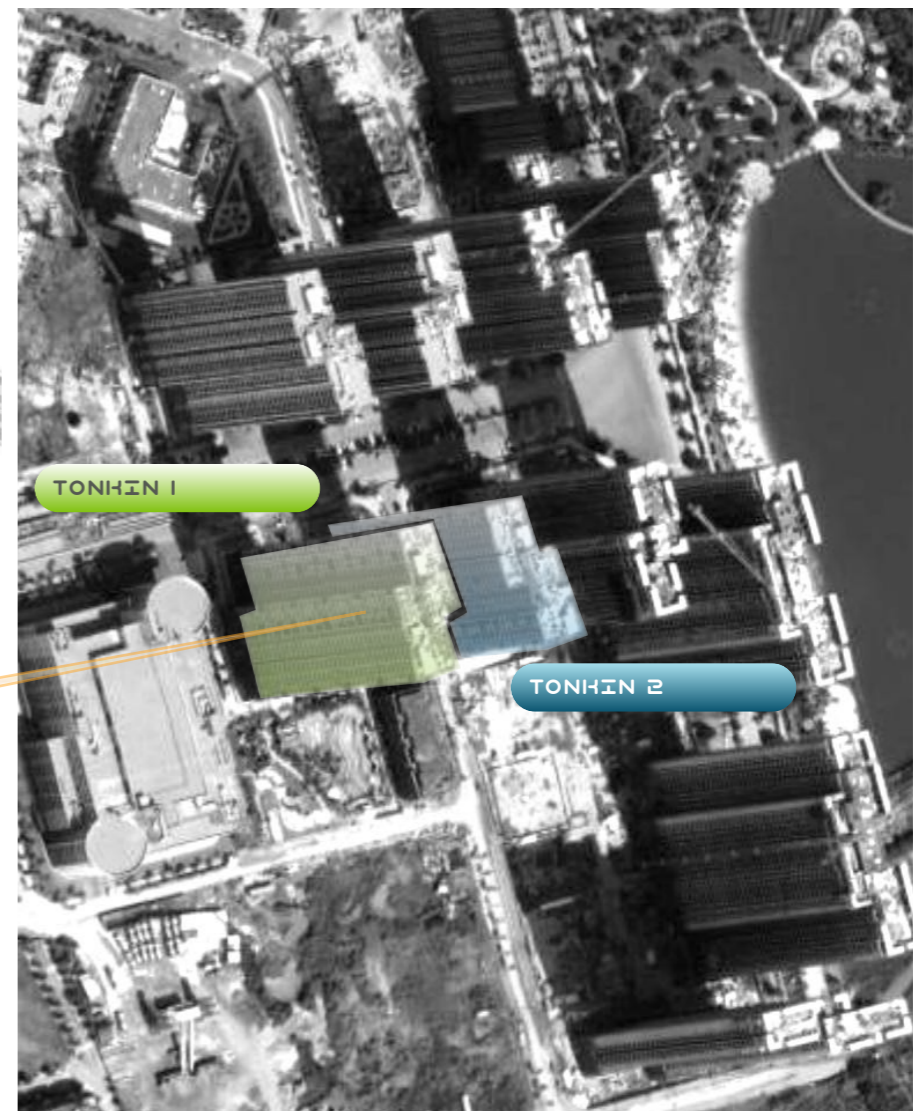
## 2. PROJEKT SUA

Lageplan

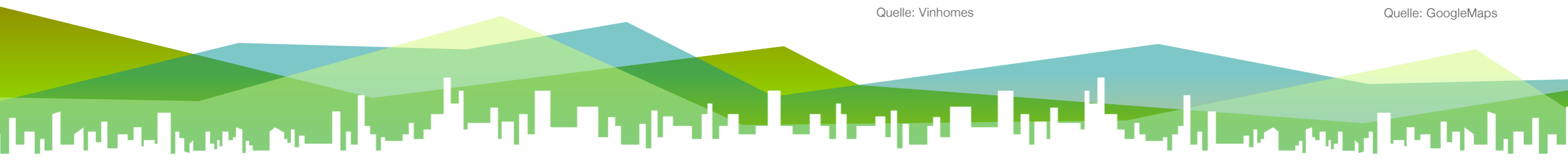
Vinhomes Smart City  
214 Ha Land  
150.000 Bewohner



Quelle: Vinhomes



Quelle: GoogleMaps





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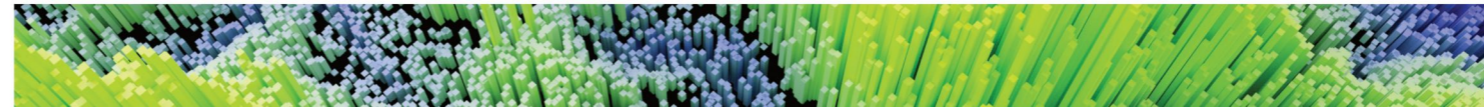
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# Der Wohnturm



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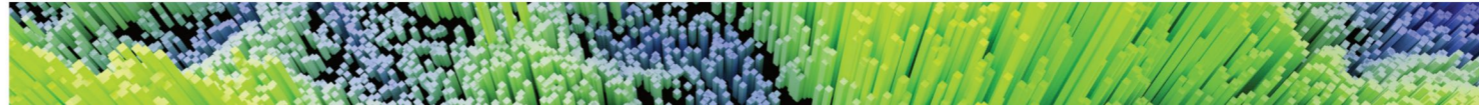
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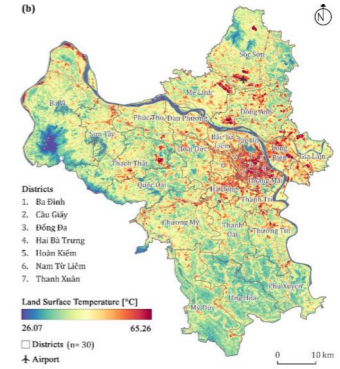
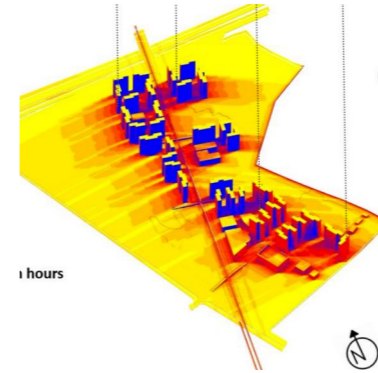
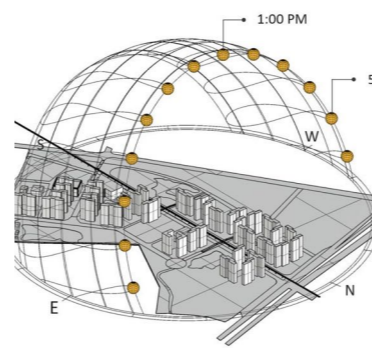
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# Forschungsthemen

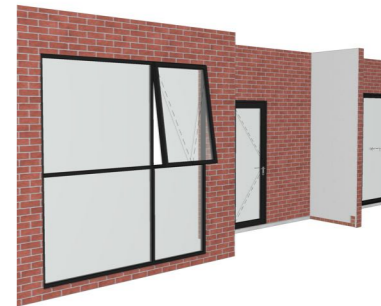
1

Mikroklima



2

Gebäudematerial

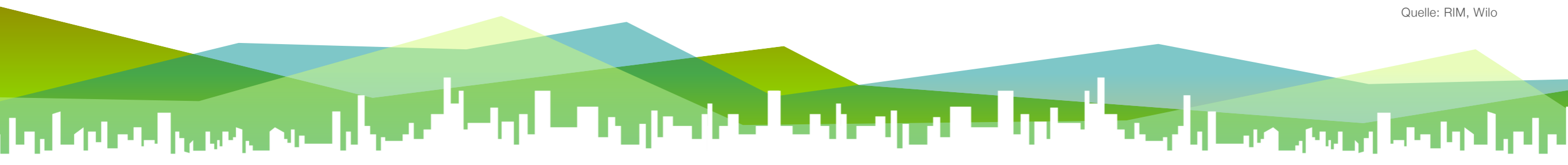


3

Gebäudeenergetik



Quelle: RIM, Wilo





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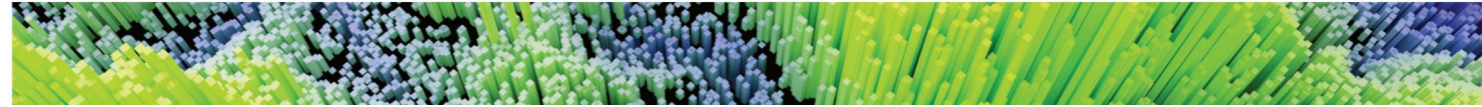
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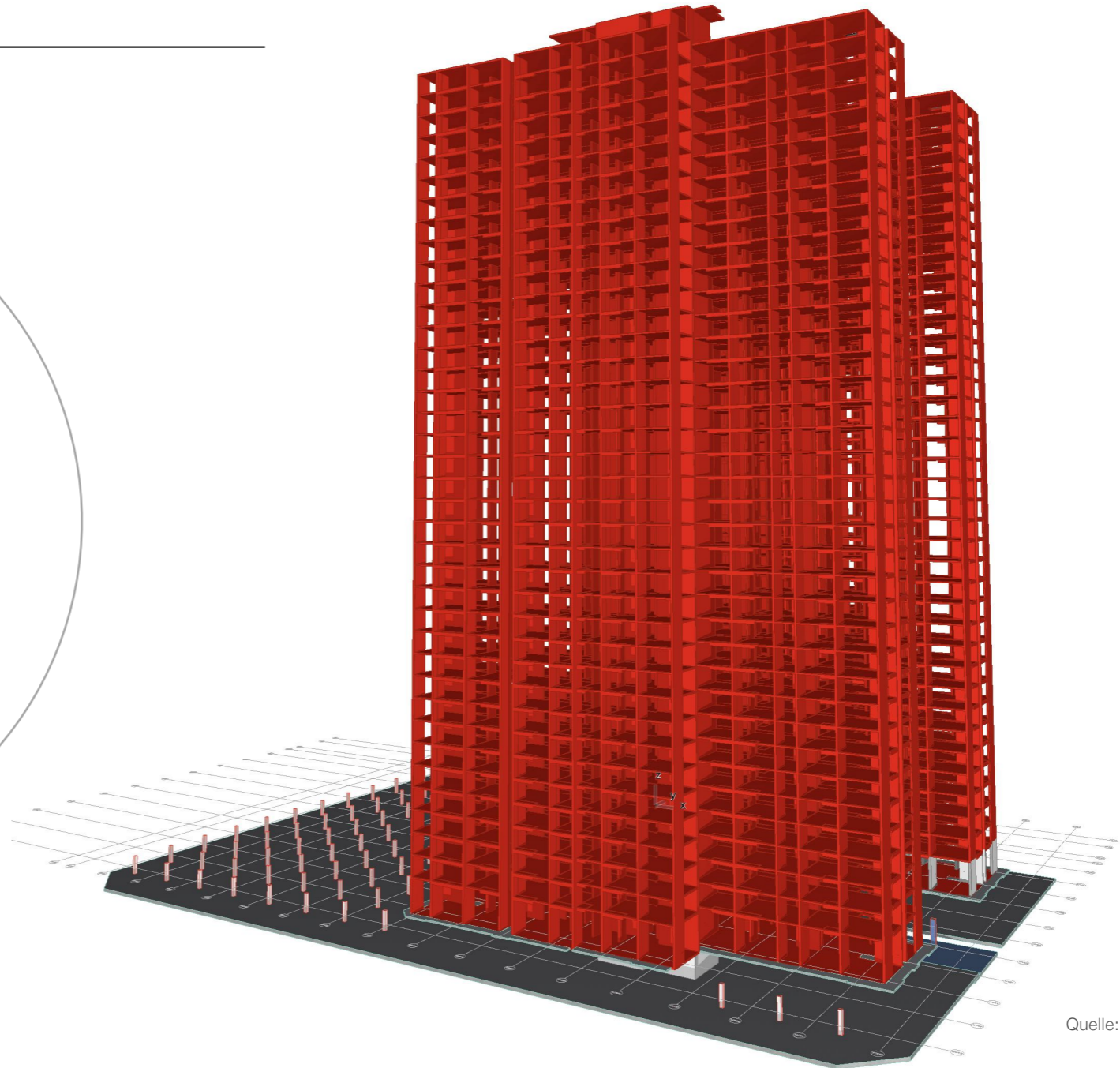


## Stahlbeton Rahmenwerk

Stahlbeton  
pro Turm  
(Hochhaus Klasse III)

**17.000 m<sup>3</sup>**  
**42.500.000 kg**

*Equivalent*  
*20.320.000 kg CO<sub>2</sub>/Jahr*



Quelle: RIM



Supported by:



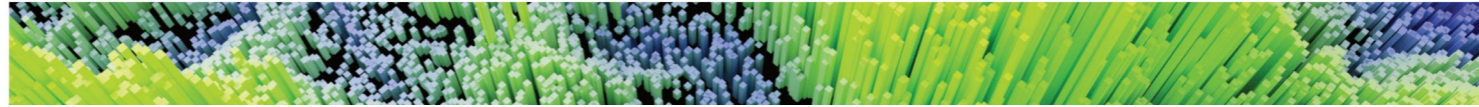
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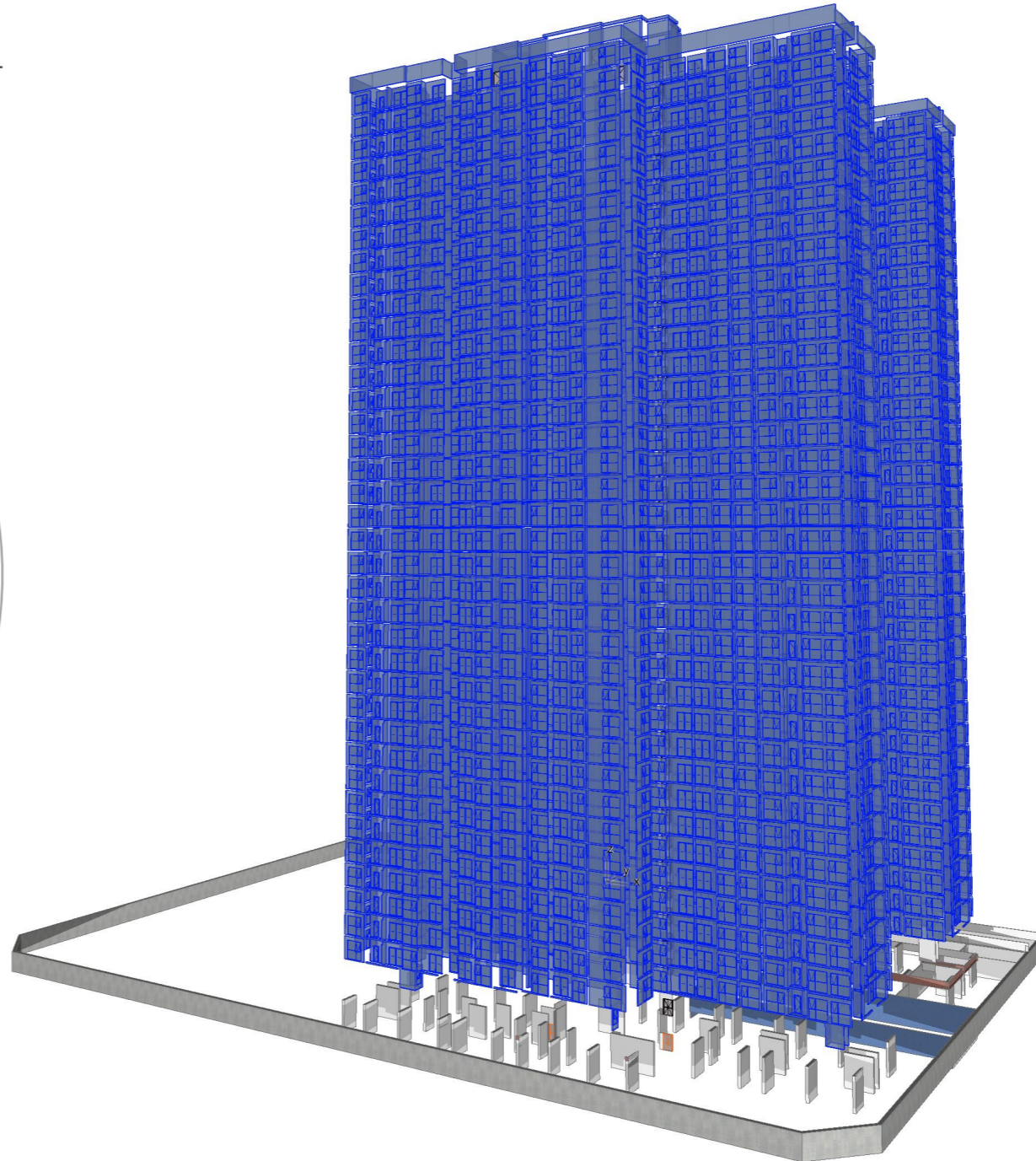


# Gebäudehülle

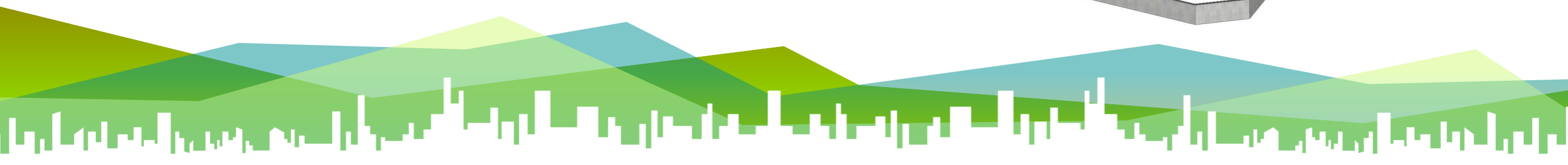
Ziegelstein-  
ausfachung

**5.000.000 Stk.**  
**7.500.000 kg**

*Equivalent*  
*2.570.000 kg CO2/Jahr*



Quelle: RIM





Supported by:



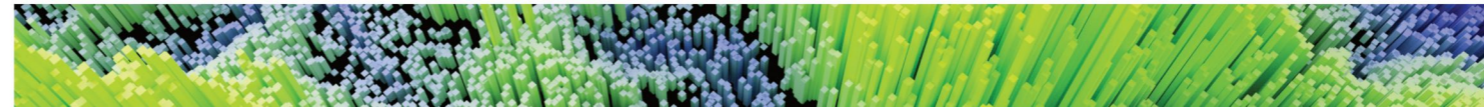
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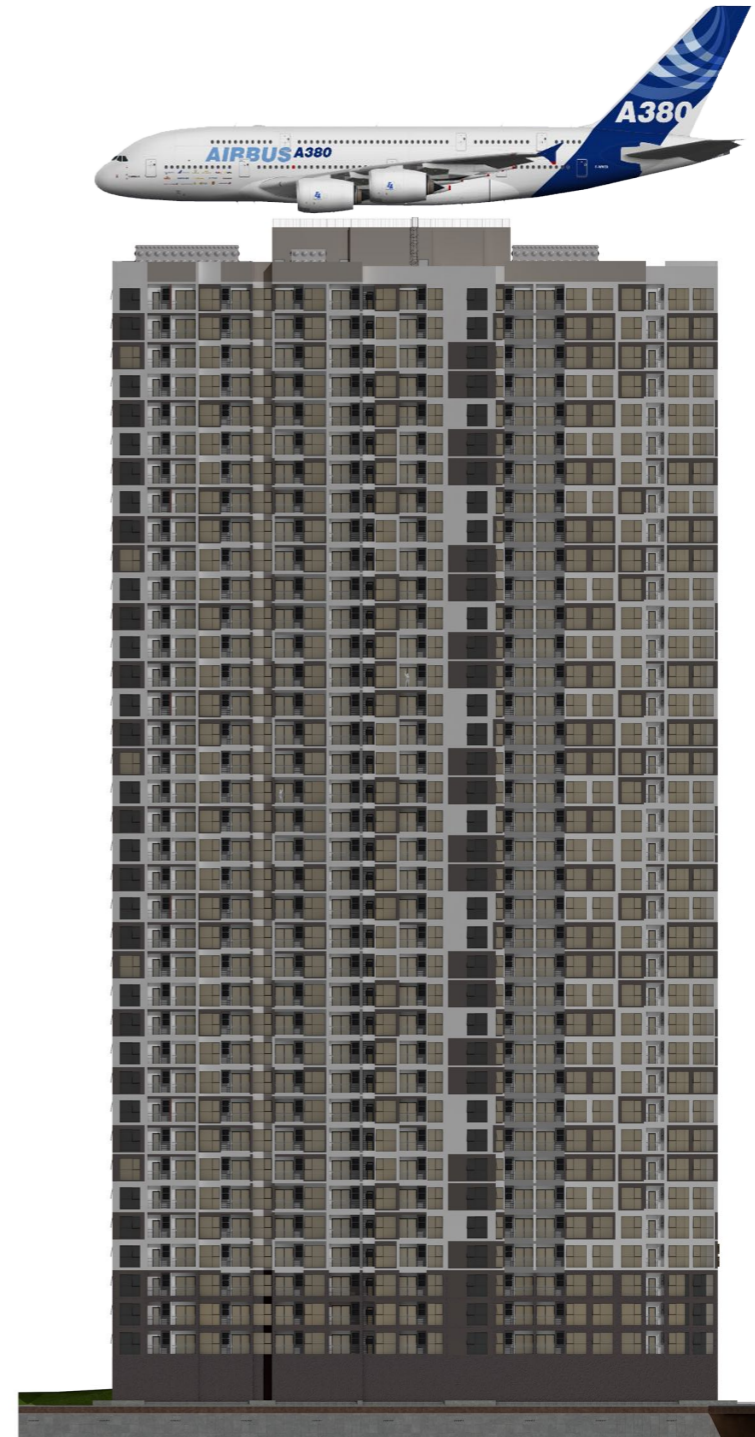
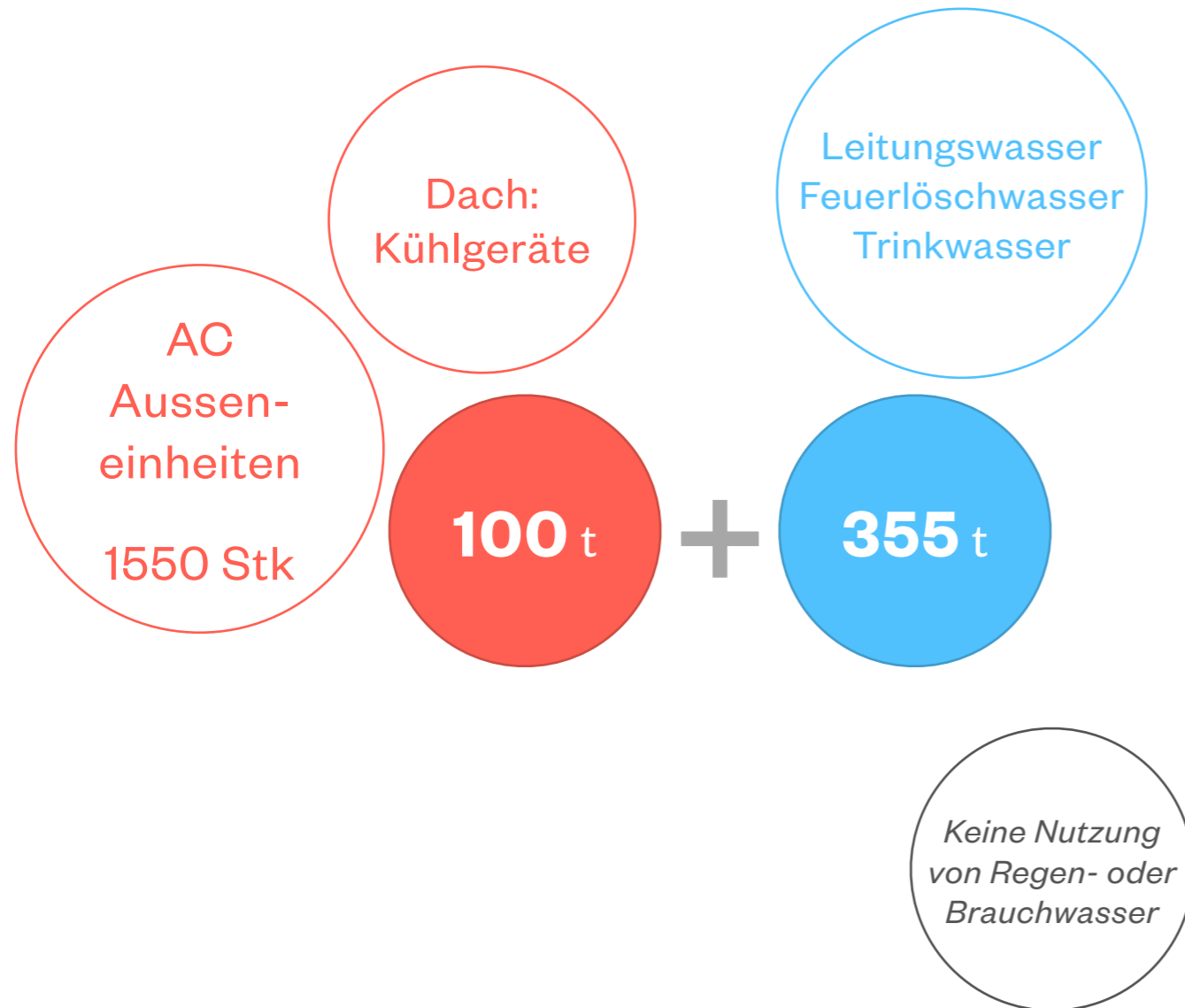
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## Technische Gebäudeausrüstung



Quelle: RIM

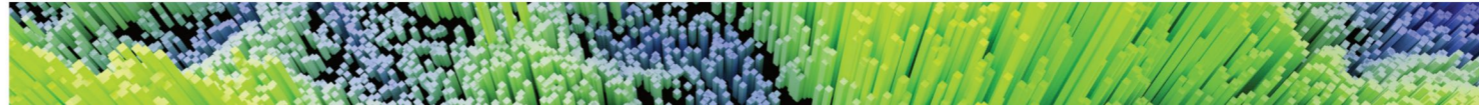
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# Ganzheitlicher Ansatz

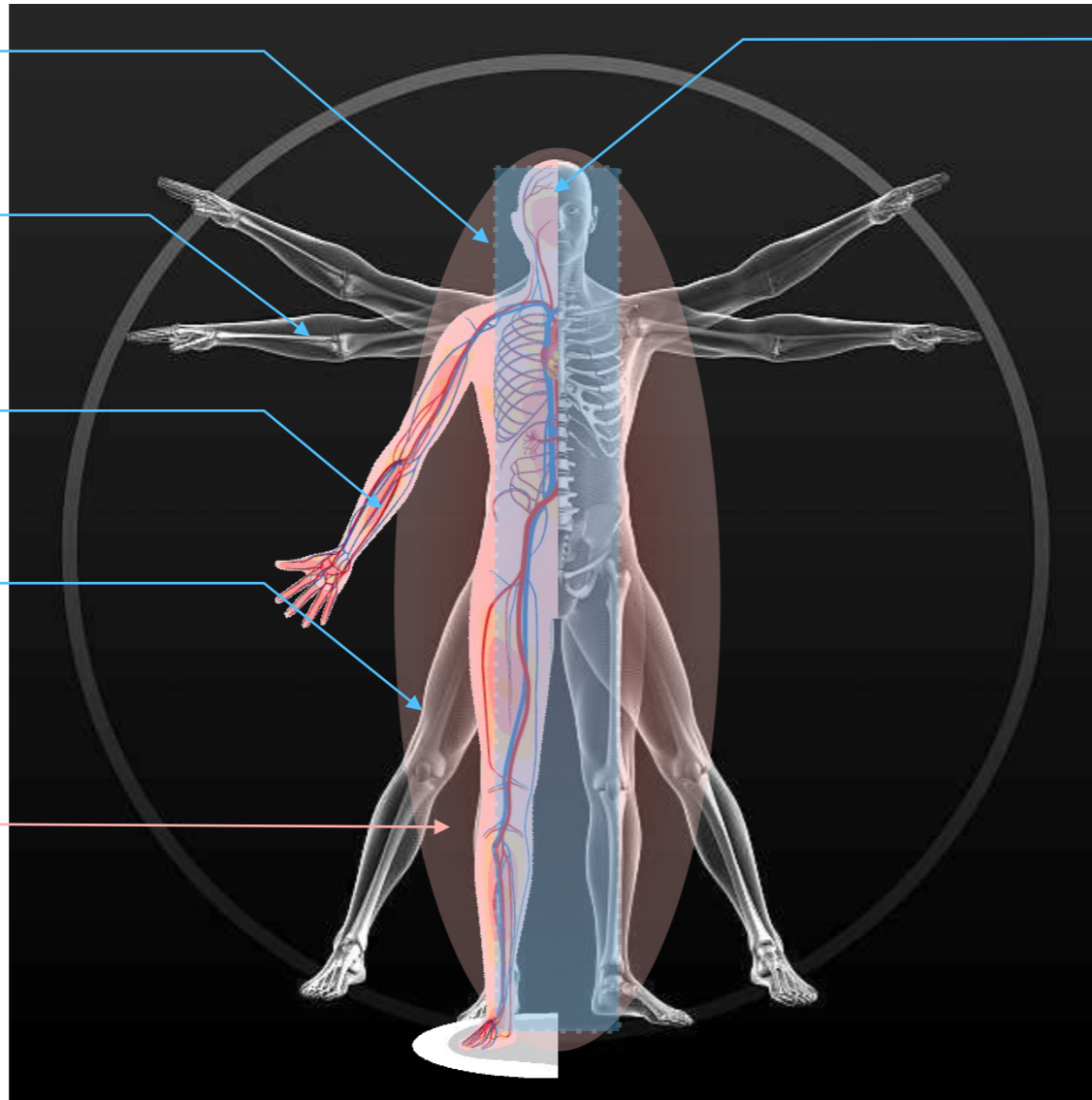
TONKIN 2

Skelett =  
Stahlbeton Rahmenwerk

Blutgefäße =  
Infrastruktur

Haut =  
Gebäudeoberfläche

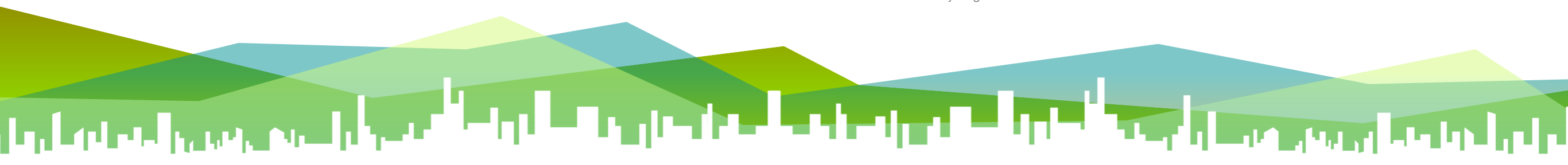
Mikroklima =  
Komfortzone



Gehirn =  
Gebäudemanagement



Source: Getty Images





Supported by:



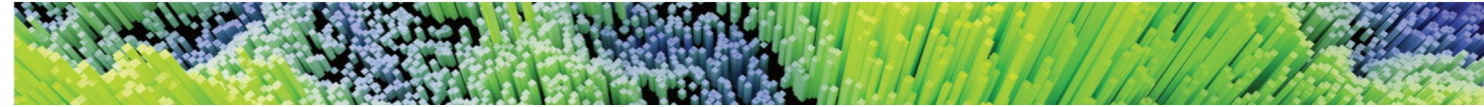
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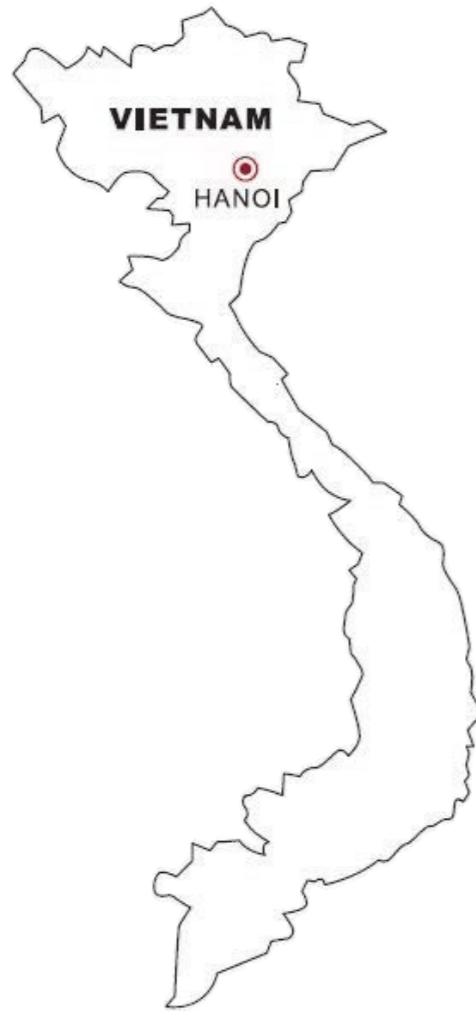
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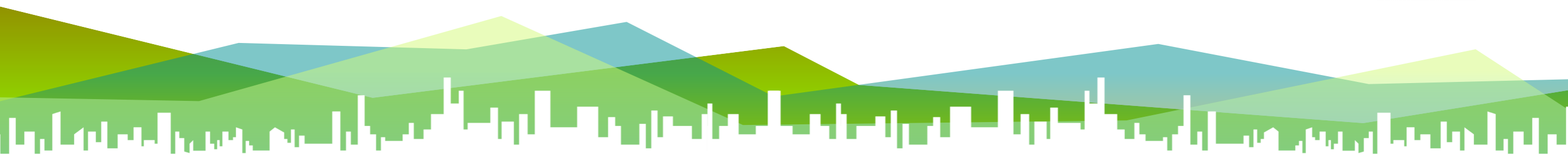
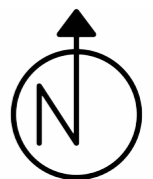


### 3. Projekt Pilot

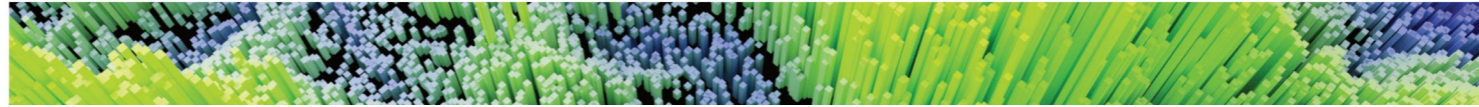


Untersuchungsgebiet, TestBed\_02

Quelle: Google Maps







# Planen & Bauen

**SUA - Smart Urban Areas**  
 ETEXIS/DIA  
 TU Dortmund University  
 Wilo SE  
 A.02

**SUA - Smart Urban Areas**  
 ETEXIS/DIA  
 TU Dortmund University  
 Wilo SE  
 A.03

**SUA - Smart Urban Areas**  
 ETEXIS/DIA  
 TU Dortmund University  
 Wilo SE  
 A.07.2

**Sensor placement - schematic / Vị trí cảm biến - sơ đồ**  
**Sensors / Cảm biến**  
**Plant container C on roof top / Trồng cây container C trên mái nhà**  
**Sensor level / Mức cảm biến**  
**Roof top weather station / Trạm thời tiết trên mái nhà**  
 A.06.1

**SUA - Smart Urban Areas**  
 ETEXIS/DIA  
 TU Dortmund University  
 Wilo SE  
 A.06.3

**SUA - Smart Urban Areas**  
 ETEXIS/DIA  
 TU Dortmund University  
 Wilo SE  
 A.06.4



Supported by:

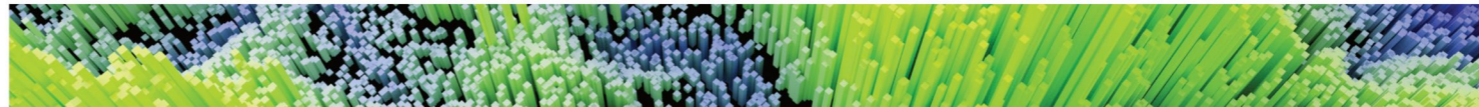


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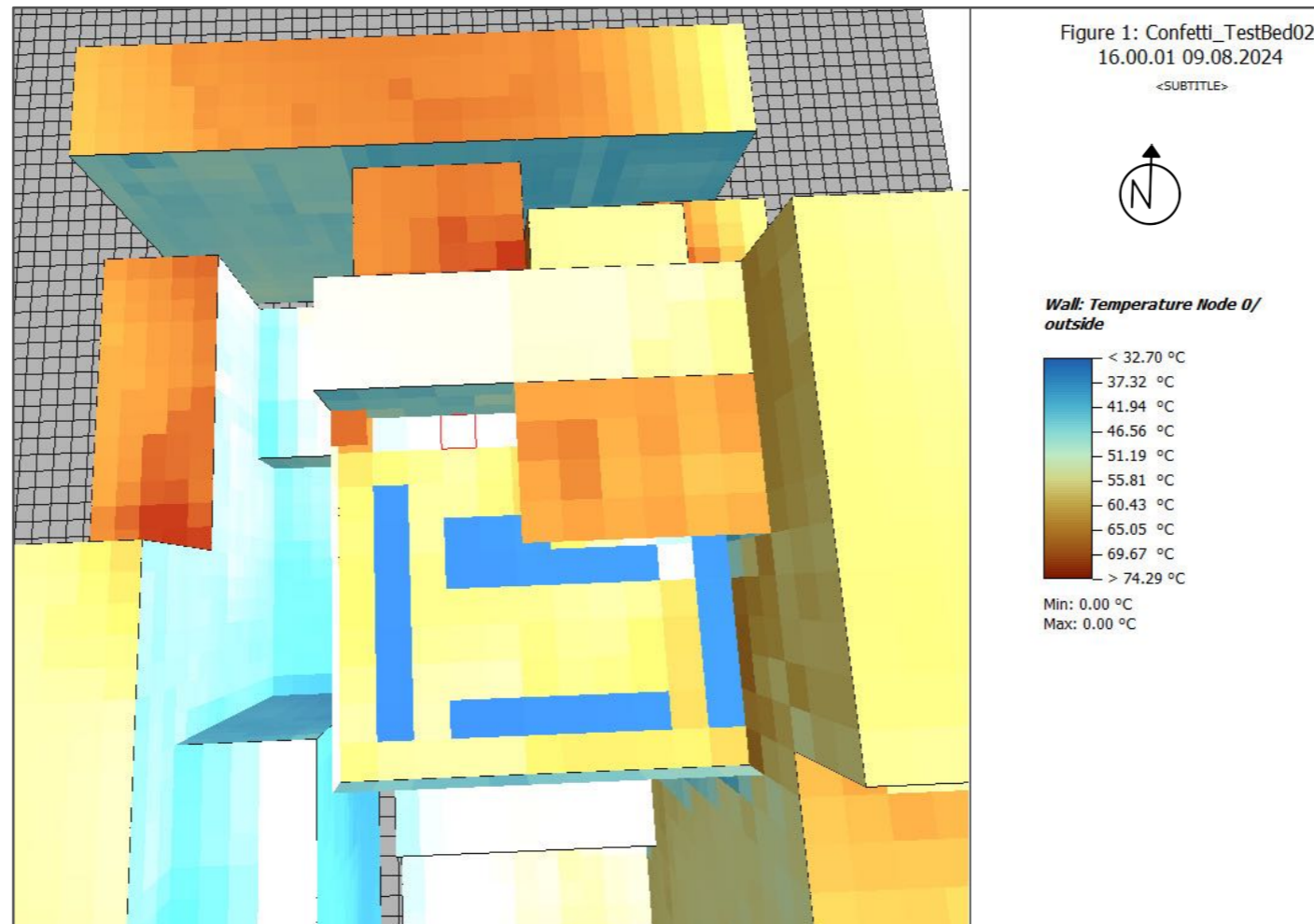
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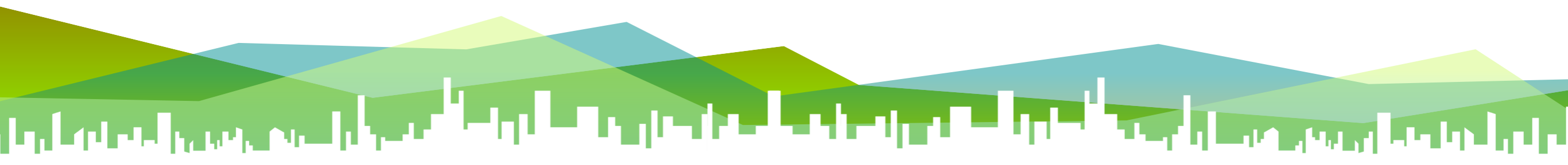


# ENVI\_met Simulation



Oberflächentemperatur Dachgeschoss, Draufsicht

Quelle: RIM





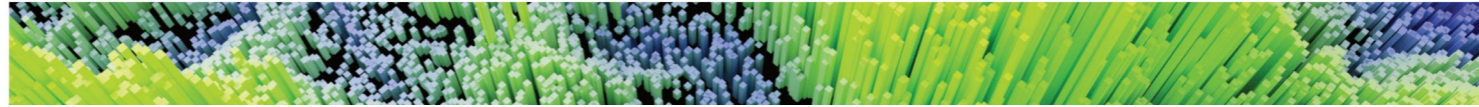
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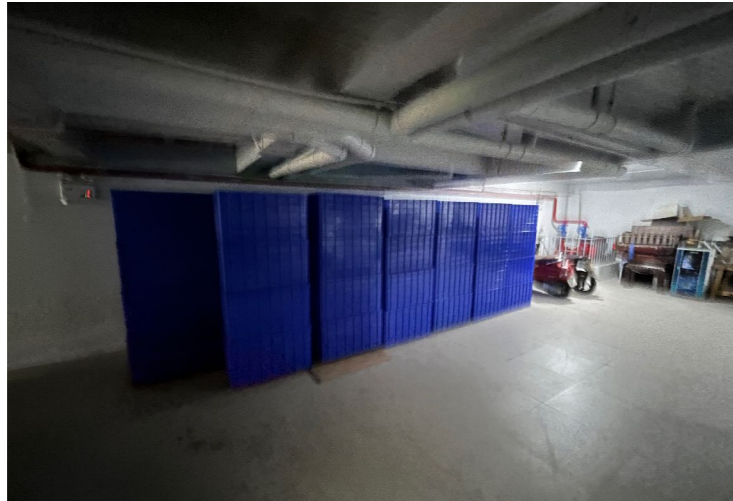
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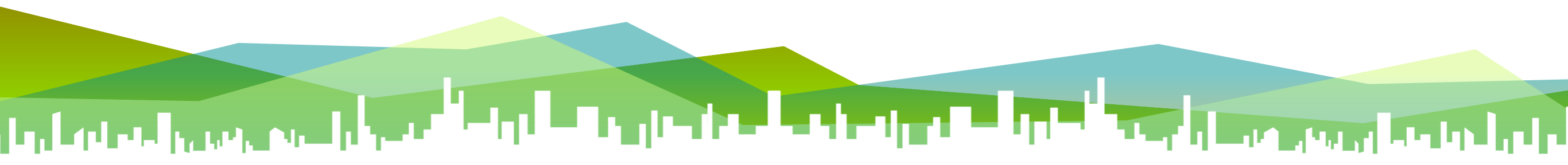


# Begrünung



Materialrecherche, Angebot & Vergabe, Einbau vor Ort

Quelle: RIM





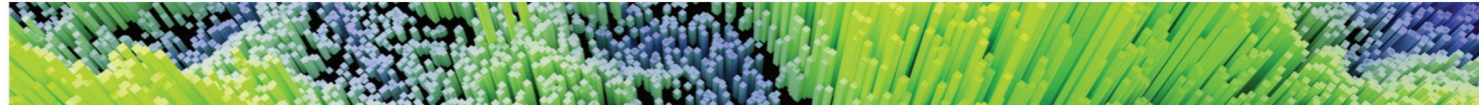
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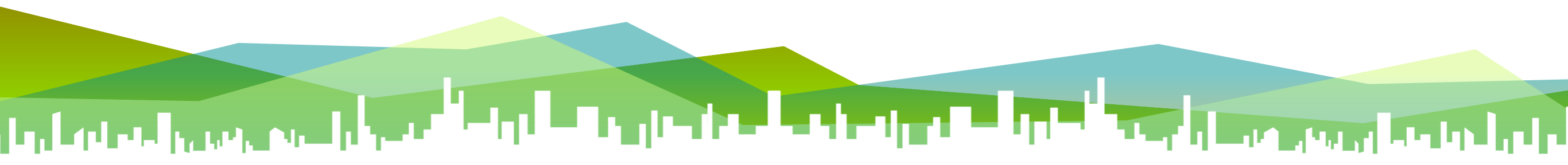


## Sensor Platzierung



Vom Import der Sensoren, Ausrichtung, Installation und System Check.

Quelle: RIM





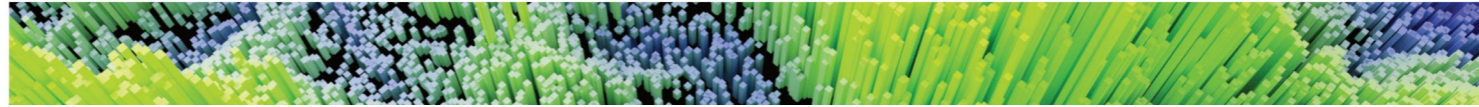
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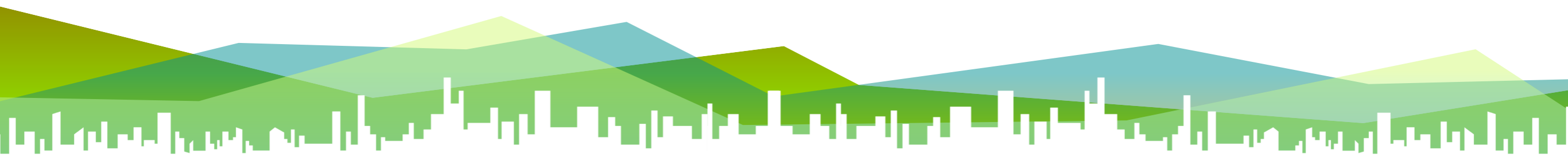


## Blattflächenindex (LAI)



Die Blätter werden von der Pflanze einzeln entfernt und vermessen.

Quelle: RIM





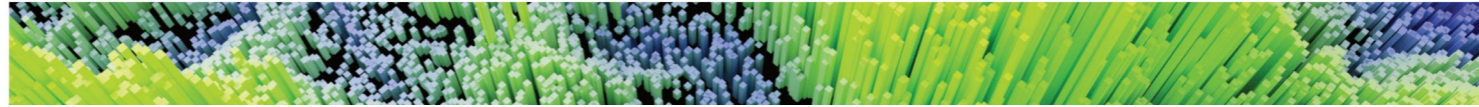
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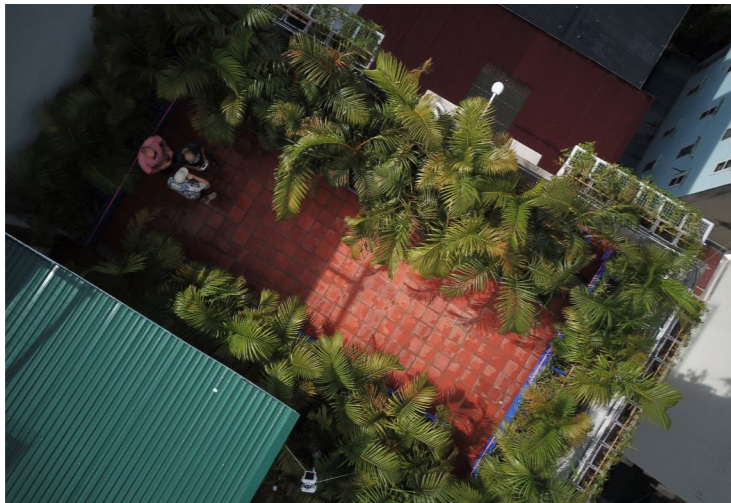
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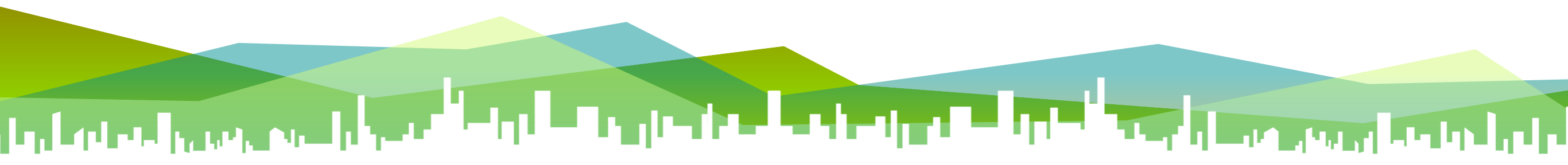


# Drohnenbefliegung



Ansichten aus der Luft. Die weissen Apparaturen der Sensoren sind gut ersichtlic

Source: RIM

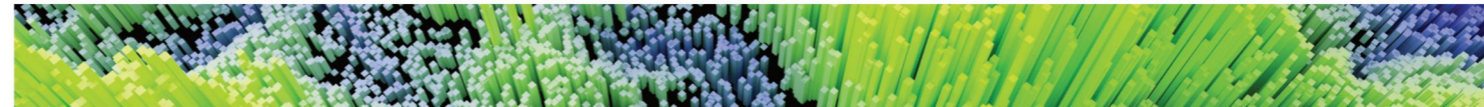




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## Visualisierungen im Vorfeld

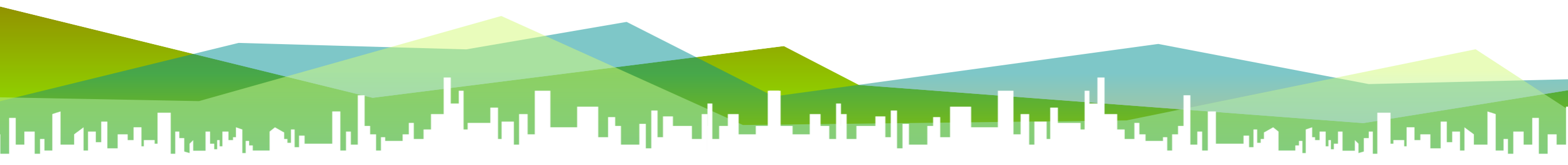


TestBed\_02 - Virtual Reality Simulation vor der Begrünung



TestBed\_02 - Drohnenbefliegung nach der Begrünung

Quelle: RIM





Supported by:



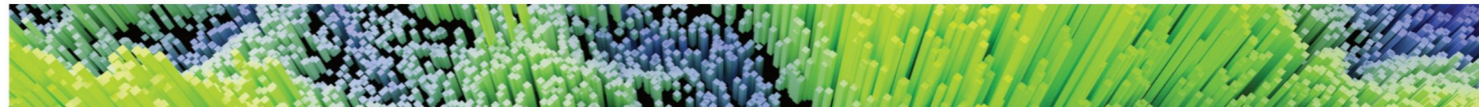
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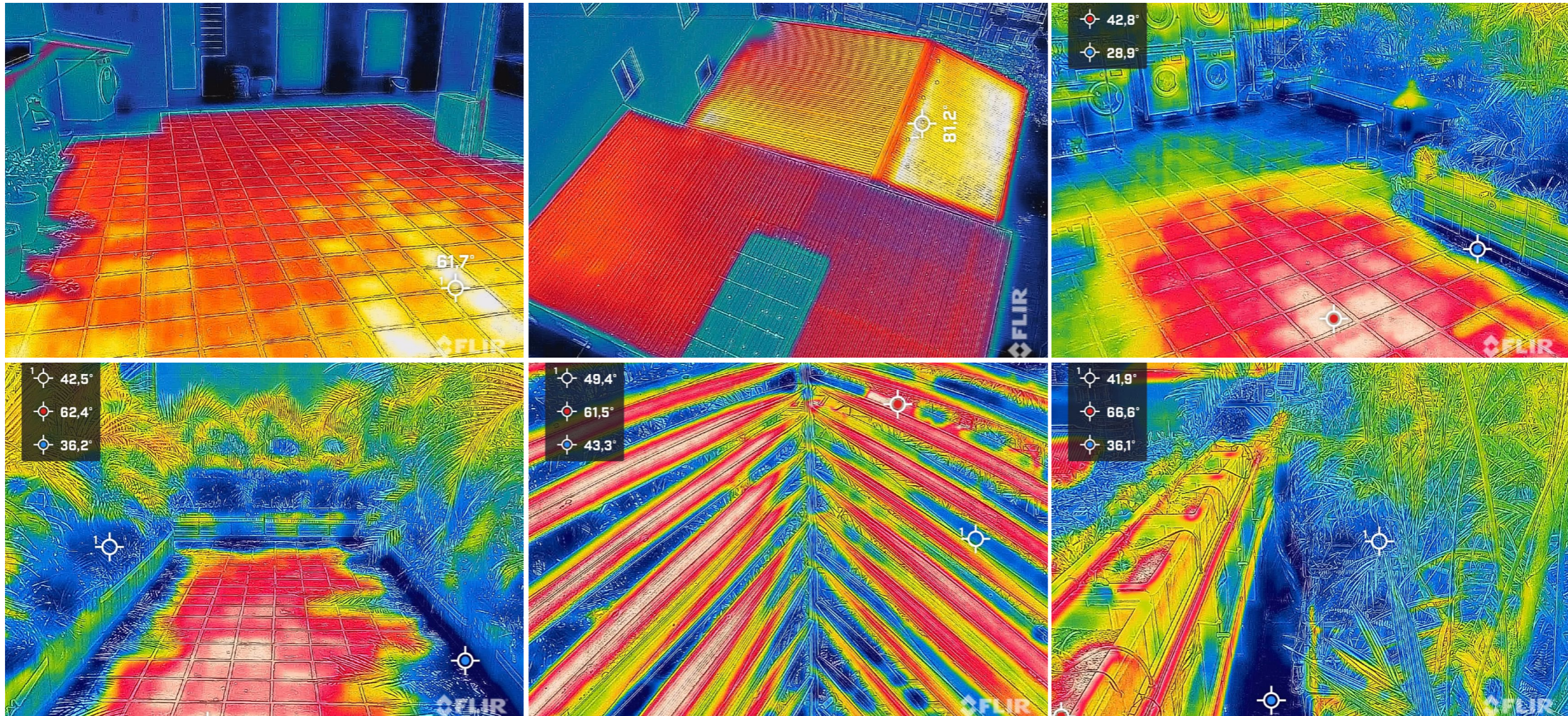
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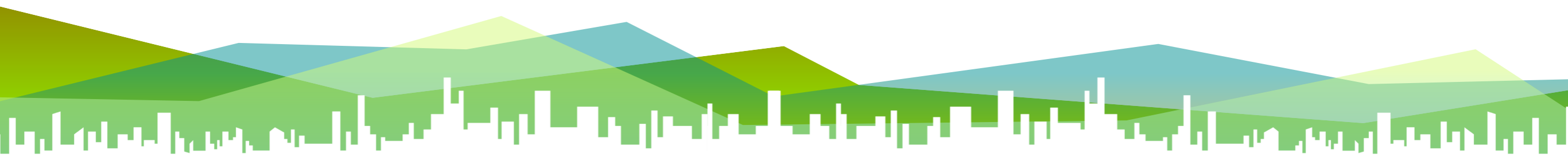


# Thermalbilder



Die Thermalbilder bilden Validierungsgrundlage für Simulationen.

Quelle: RIM





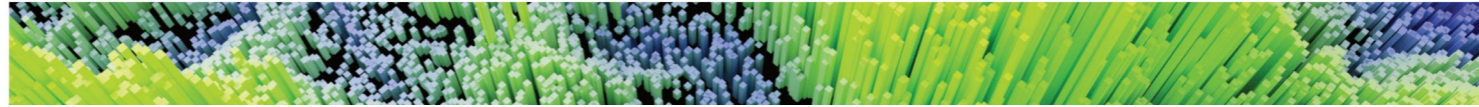
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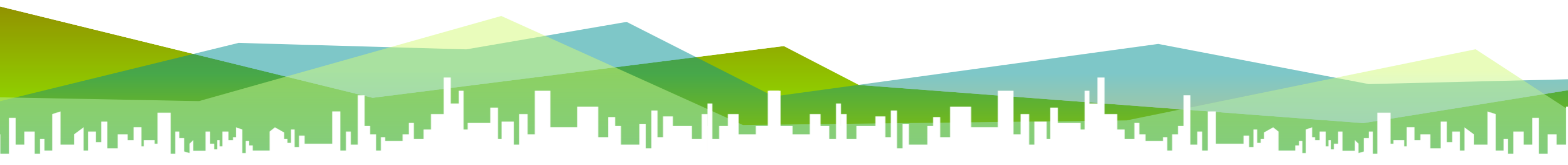


# Videoüberwachung



Aus der Ferne kann der Pflanzenwuchs mitverfolgt werden.

Source: RIM

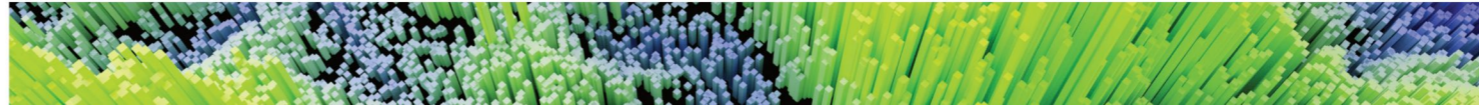




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# ENVI\_met Simulation

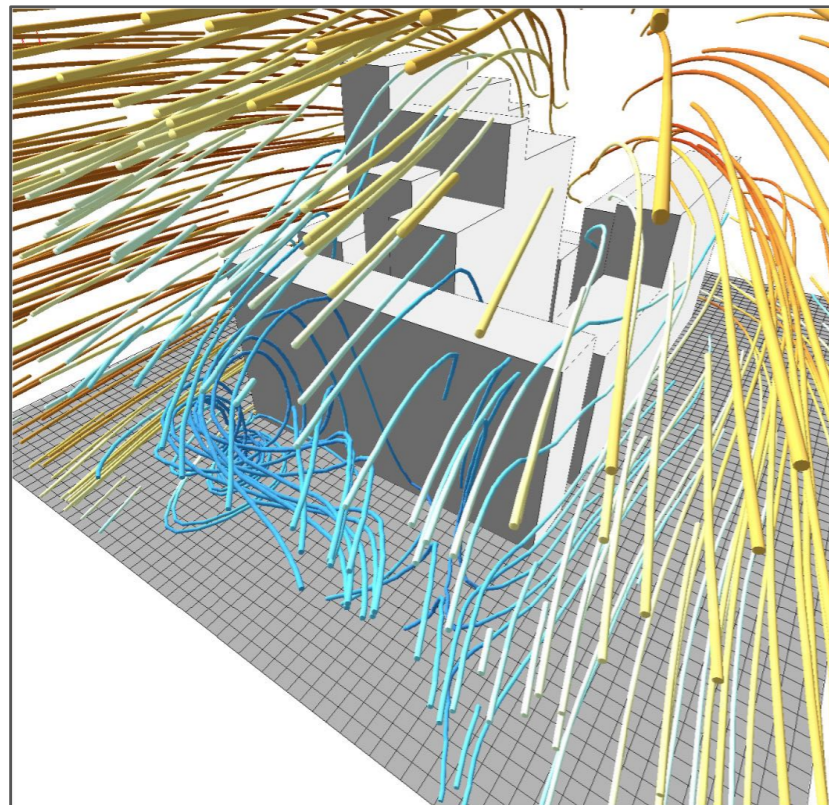
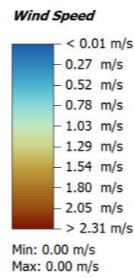


Figure 1: Confetti\_TestBed02  
13.00.01 09.08.2024  
x/y Cut at k=25 (z=21.5000 m)



Windanalyse, Südwestliche Sicht

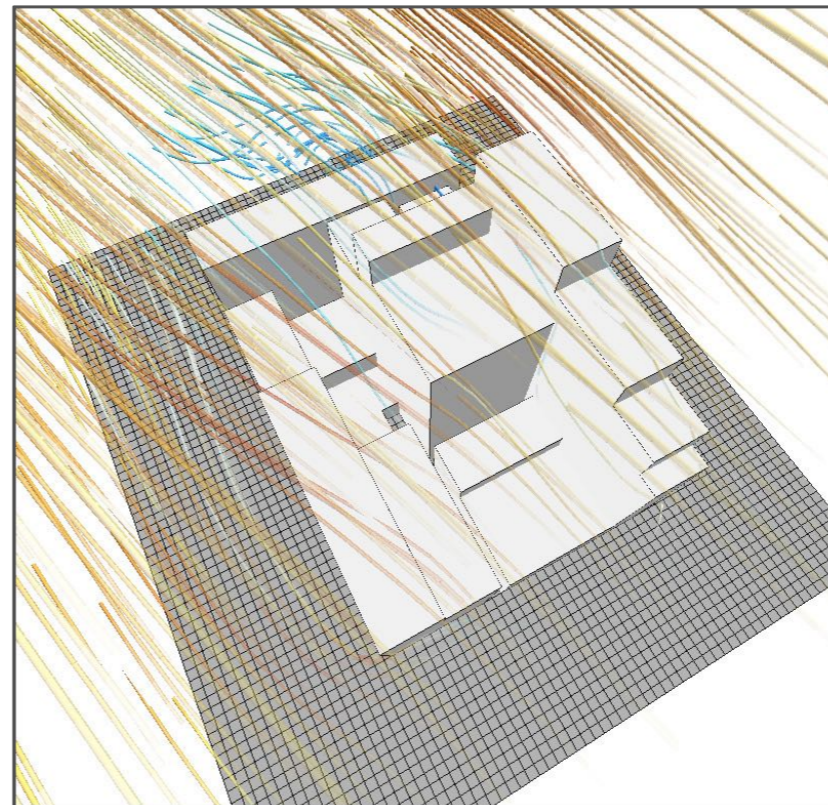
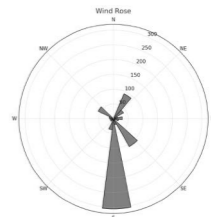
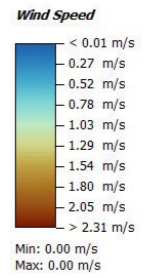
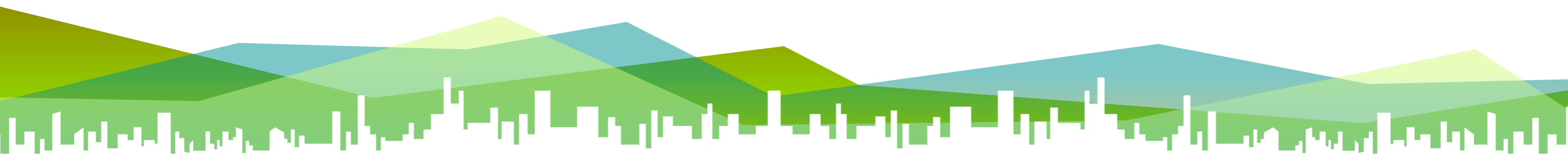


Figure 1: Confetti\_TestBed02  
13.00.01 09.08.2024  
<SUBTITLE>



Windanalyse, Draufsicht

Source: RIM

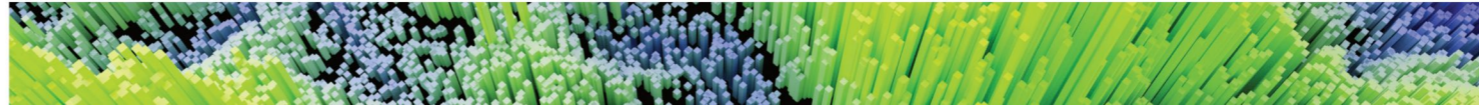




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# ENVI\_met Simulation

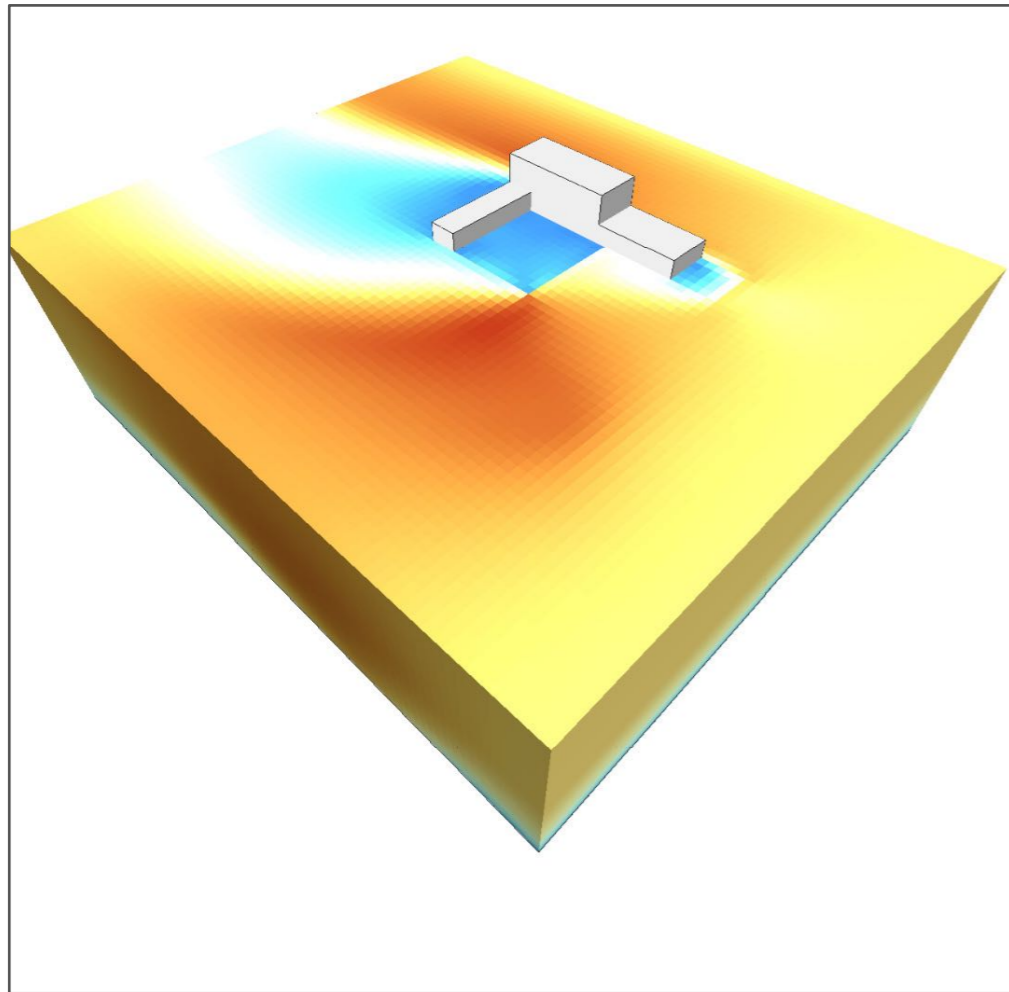
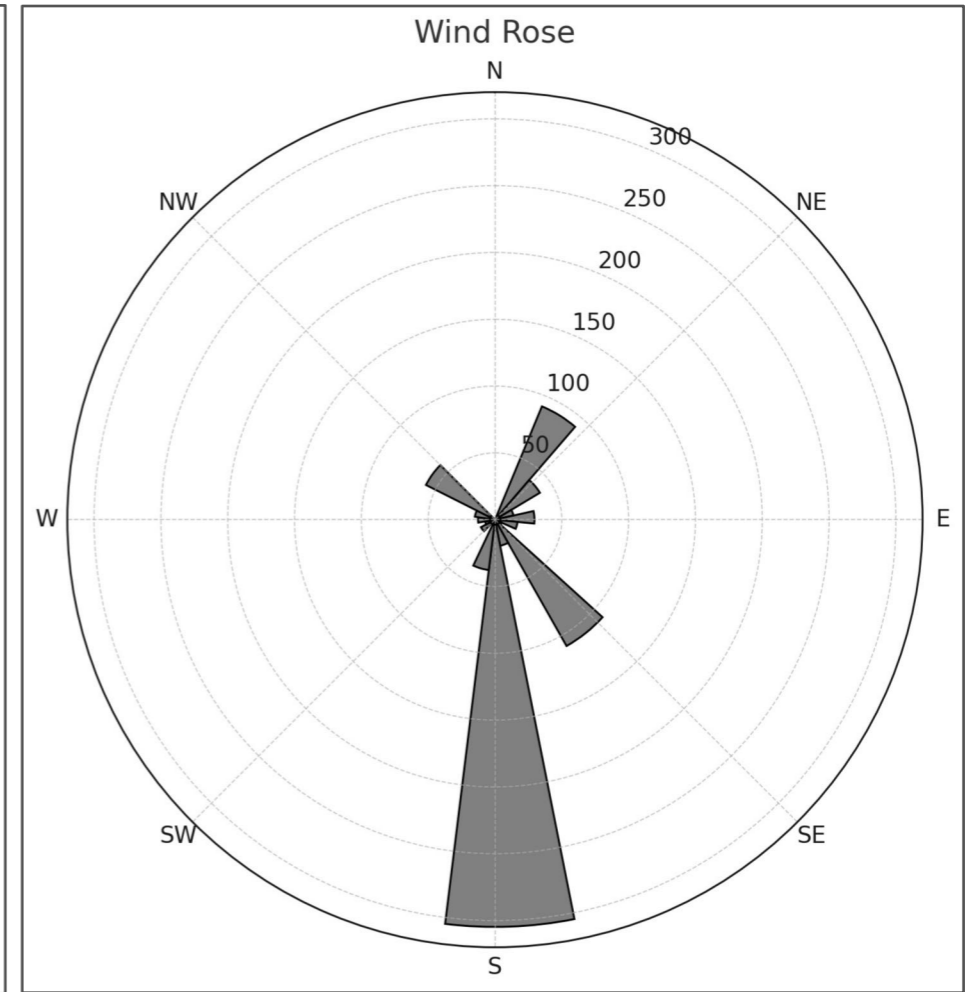
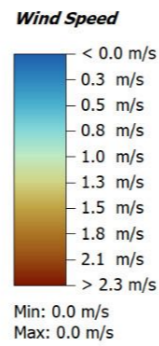


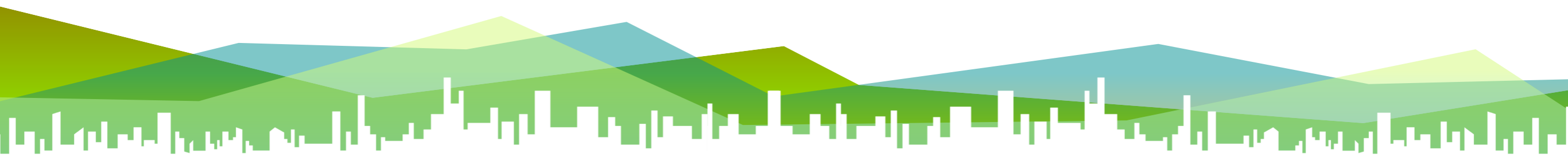
Figure 1: Confetti\_TestBed02  
13.00.01 09.08.2024  
x/y Cut at k=25 (z=21.5000 m)



Windanalyse, Südwest Sicht auf Niveau der Begrünung

Wind, 156°, Südost

Quelle: RIM





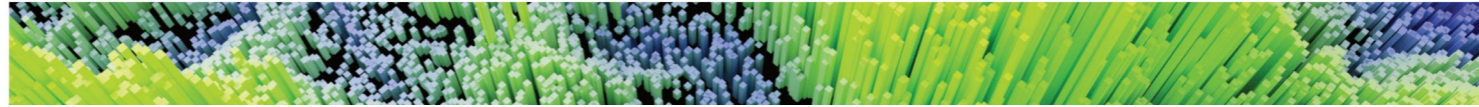
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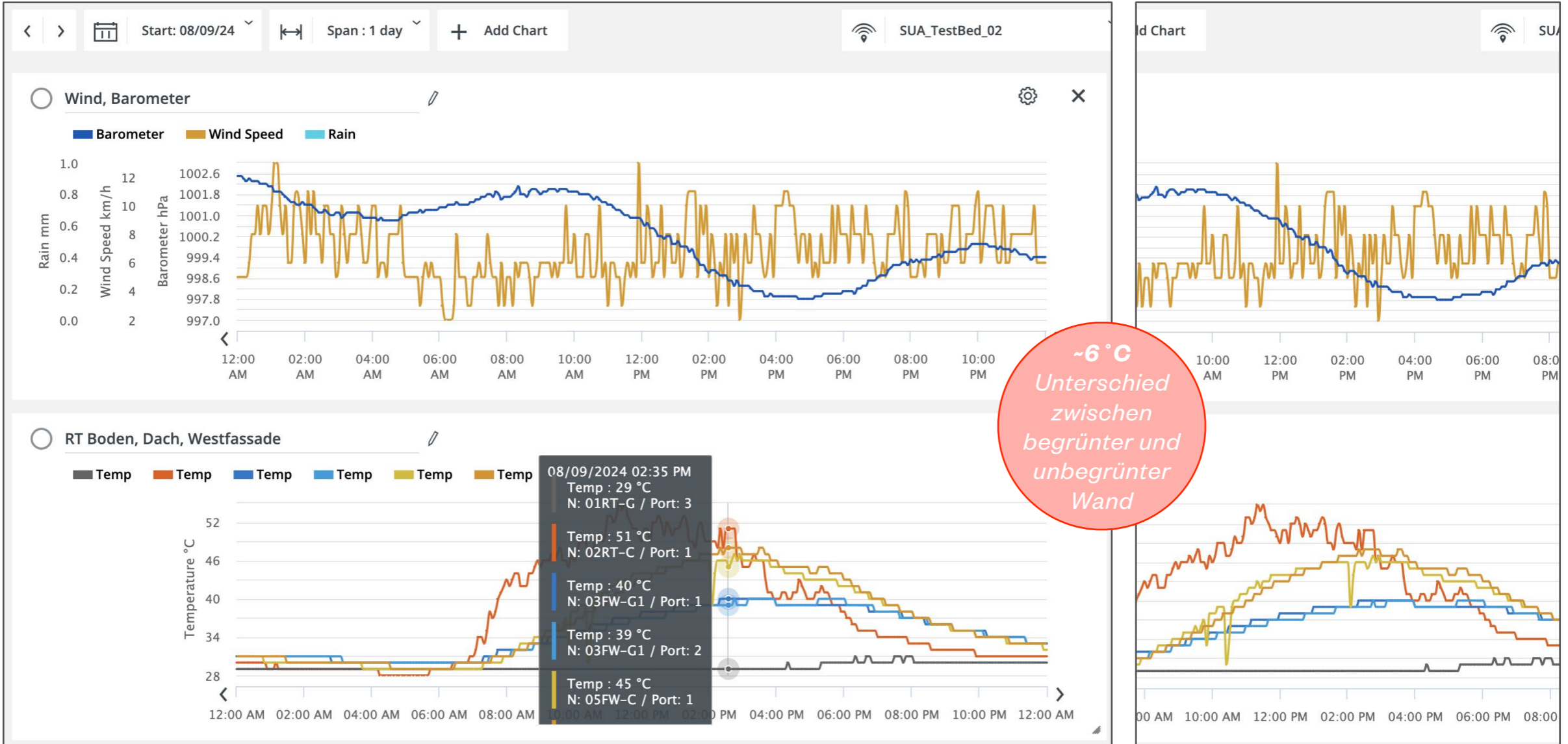
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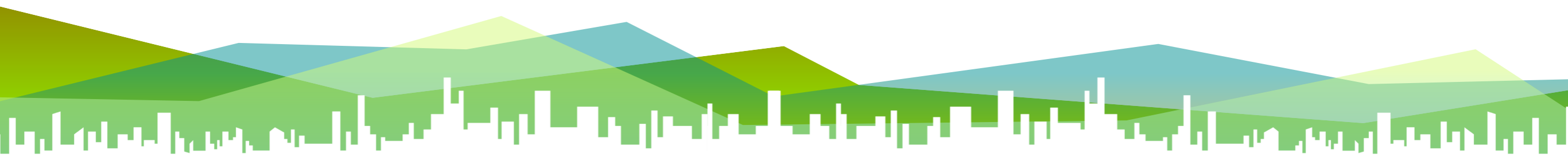


# Weatherlink



Mikroklimatische Informationen der Wetterstation

Quelle: Weatherlink





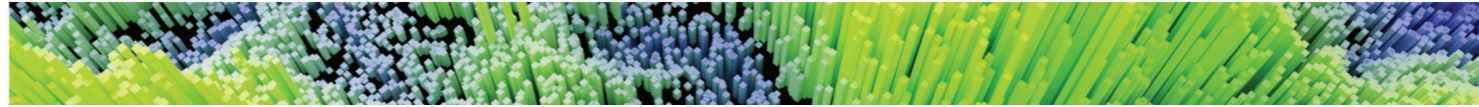
Supported by:



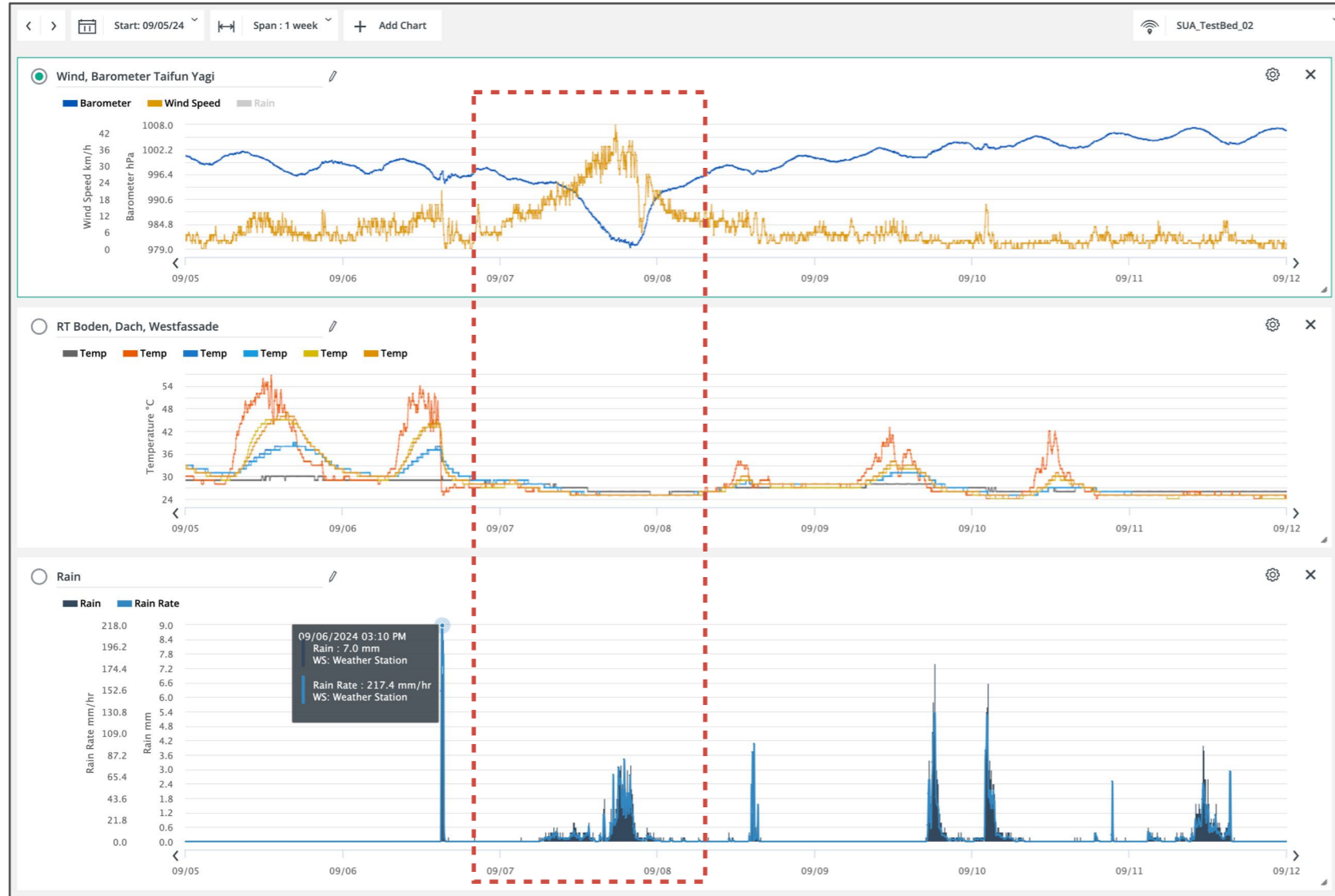
research group of spatial information management and modeling



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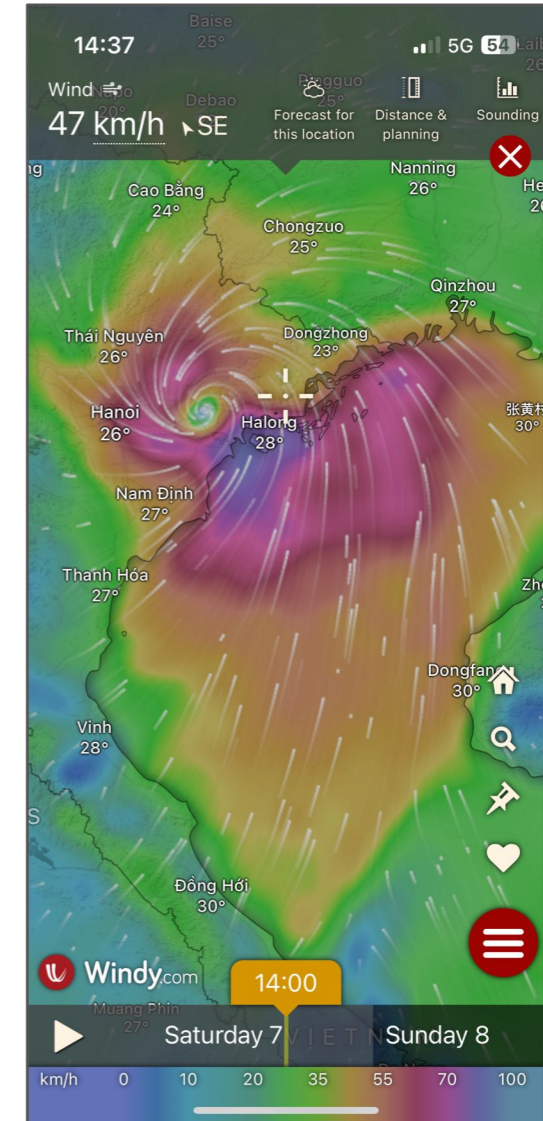


# Weatherlink Taifun Yagi

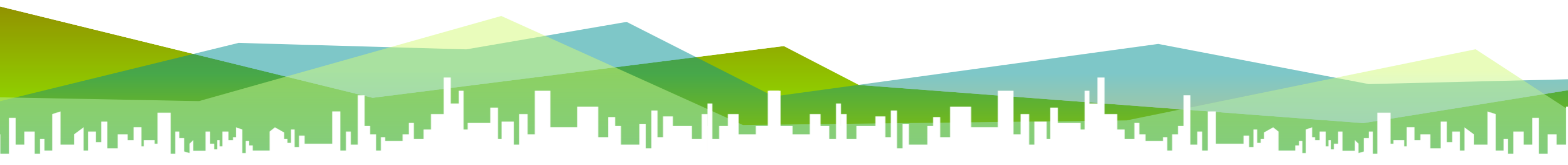


Mikroklimatische Information der Wetterstation

Quelle: Weatherlink



Quelle: Windy





Supported by:



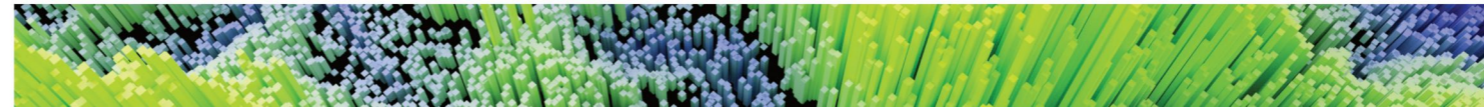
tu dortmund  
university

research group  
of spatial information  
management and modeling

rim wilo



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the German Bundestag

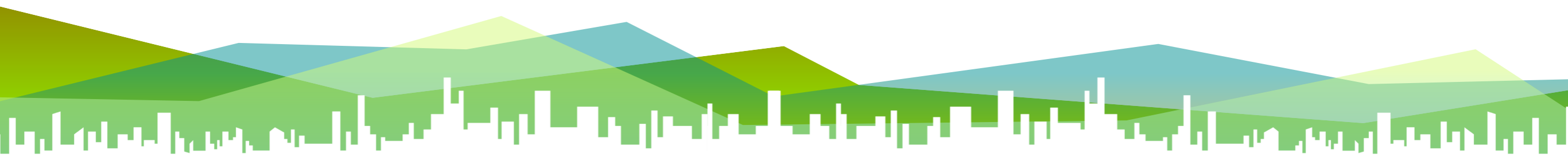


# Taifun Yagi



Videoaufnahme vom 7.9.2024

Quelle: IMOU

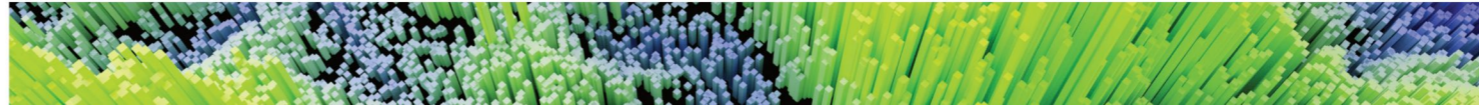




Supported by:

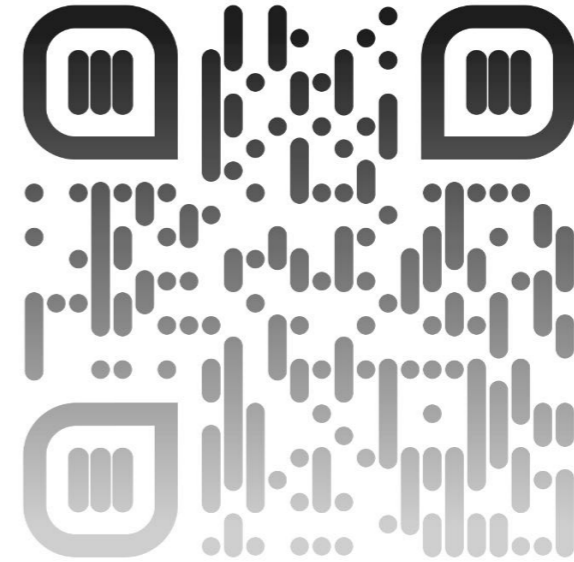


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Vielen Dank!

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SEPTEMBER 2024

