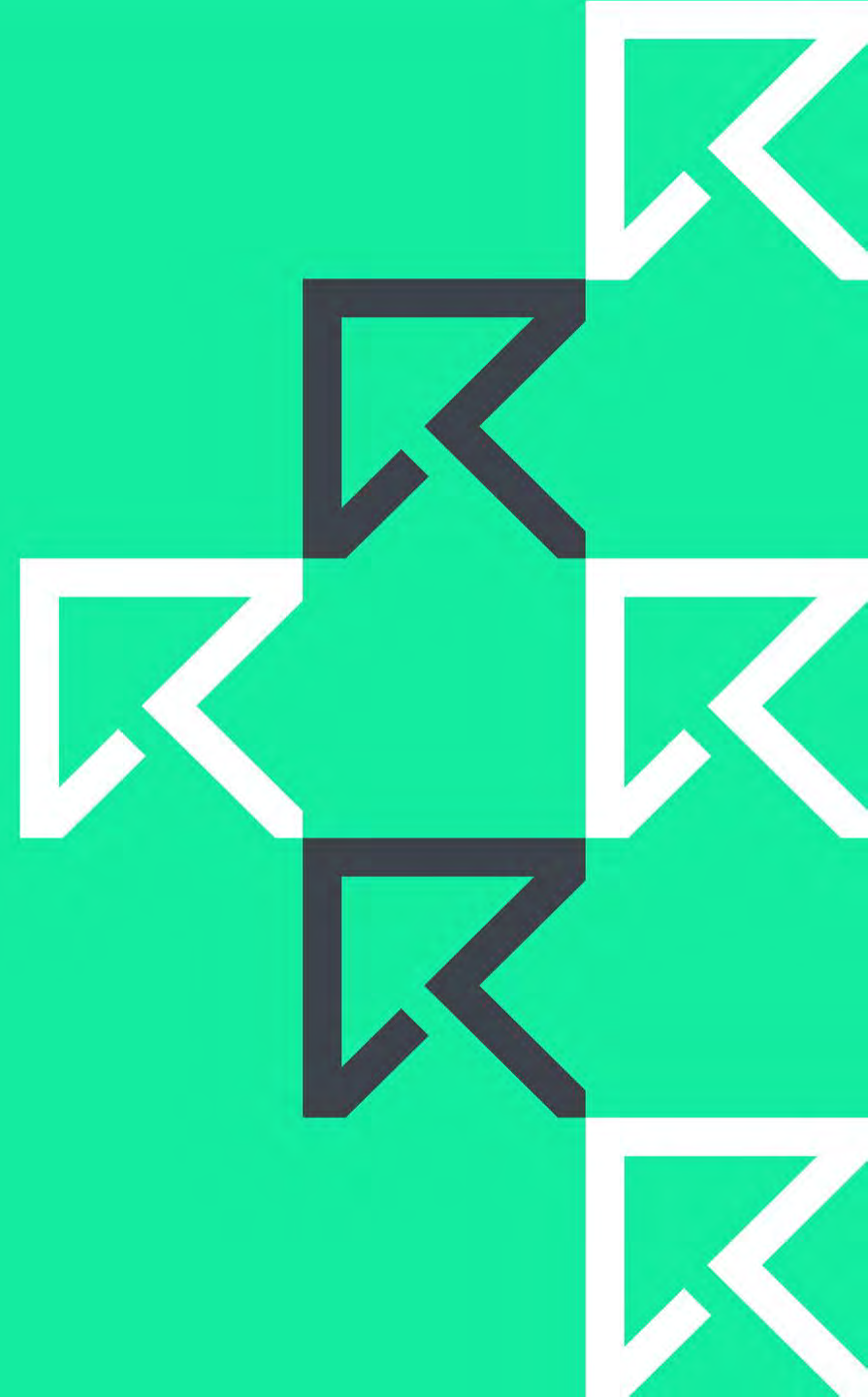


Climate-neutral and smart cities

7.12.2022

DI Susanne Formanek



RENOWAVE.AT is the innovation laboratory for climate-neutral building and neighborhood renovation in Austria.

It is the "independent contact point for innovations in the large-volume building renovation sector".



Austrian & European Green Market Report

...SUSTAINABLE GROWTH WITH GREEN INFRASTRUCTURE

Towards a pan-european Research initiative.

AN INITIATIVE OF THE



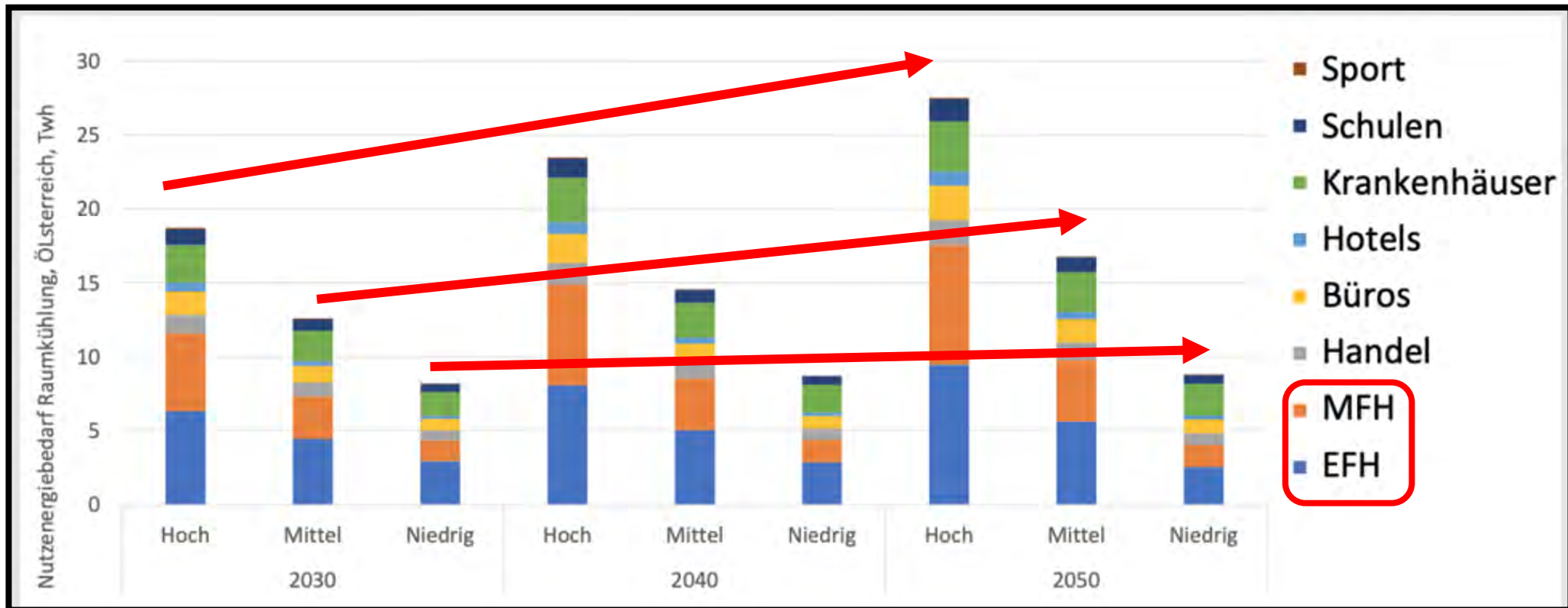
DRIVEN AND
SUPPORTED BY





- Different types of construction....from 400 Year old buildings to NZEB (Construction Engineering Regulations) and social housings
- Historic preservation, according to EPDB - OIB
- New Challenges!





Cooling demand by building category in Austria 2030 to 2050 in TWh - assumption that according to the IPCC report the global average temperature **will increase by 2 degrees Celsius** by 2050 (EFH = single-family houses, MFH multi-family house)

Cooling demand increases

WE KNOW HOW TO BUILD!



🏠 > Objekte > klimaaktiv Gebäude > Ikea Wien Westbahnhof



- District heating,
- Building component activation,
- Supply of daylight,
- Structural shading measures
- Simple, flexible building structure,
- Allows alternative uses at a later date
- Building consumes fewer resources than comparable furniture stores.
- Roof terrace, which can be accessed by the public,
- 160 trees
- Impact on the public, district....





image source © zoom.vp

[Vertikalbegrünung fürs Klima: MA 48-Grünfassade feiert 10. Geburtstag - Vienna Online](#)



MA 48 in Vienna: The facade of the office building creates the rather untypical impression of a colorful "herb meadow" in the middle of the Gürtel.

- 850 m² planted with grasses and herbs
- 17,000 plants were used.
- natural air conditioner, saves 45 air conditioners per year- cooling effect, cooling capacity: 135 kW (equivalent to 45 air-conditioning units with 3,000 watts each + 8 hours of operation) per year
- positive impact on the personal well-being of employees, neighbors and passers-by.
- Microclimate: The leaves increase the humidity and cool the surroundings as a natural air conditioning system.
- Protection of the building fabric against direct UV radiation, driving rain and dirt deposits.
- Noise protection: Sound waves are absorbed and reflected much less.
- Comfort: Increased humidity also lowers the temperature. * Climate protection: 5,600 kg of CO₂ bound per year.
- City of Vienna: this is part of its wide range of measures to combat urban heat islands.



urban cooling by up to

-2.2°C

CO₂

CO₂

CO₂

CO₂

CO₂

CO₂

BIOSTADTCITY

Wienerberg Vienna



New Regulation in City Vienna!
climate-sensitive planning



-0.7°C

-1.1°C

-1.8°C

-1.3°C

-0.6°C

-1.2°C

-1.4°C

-1.6°C

-1.2°C

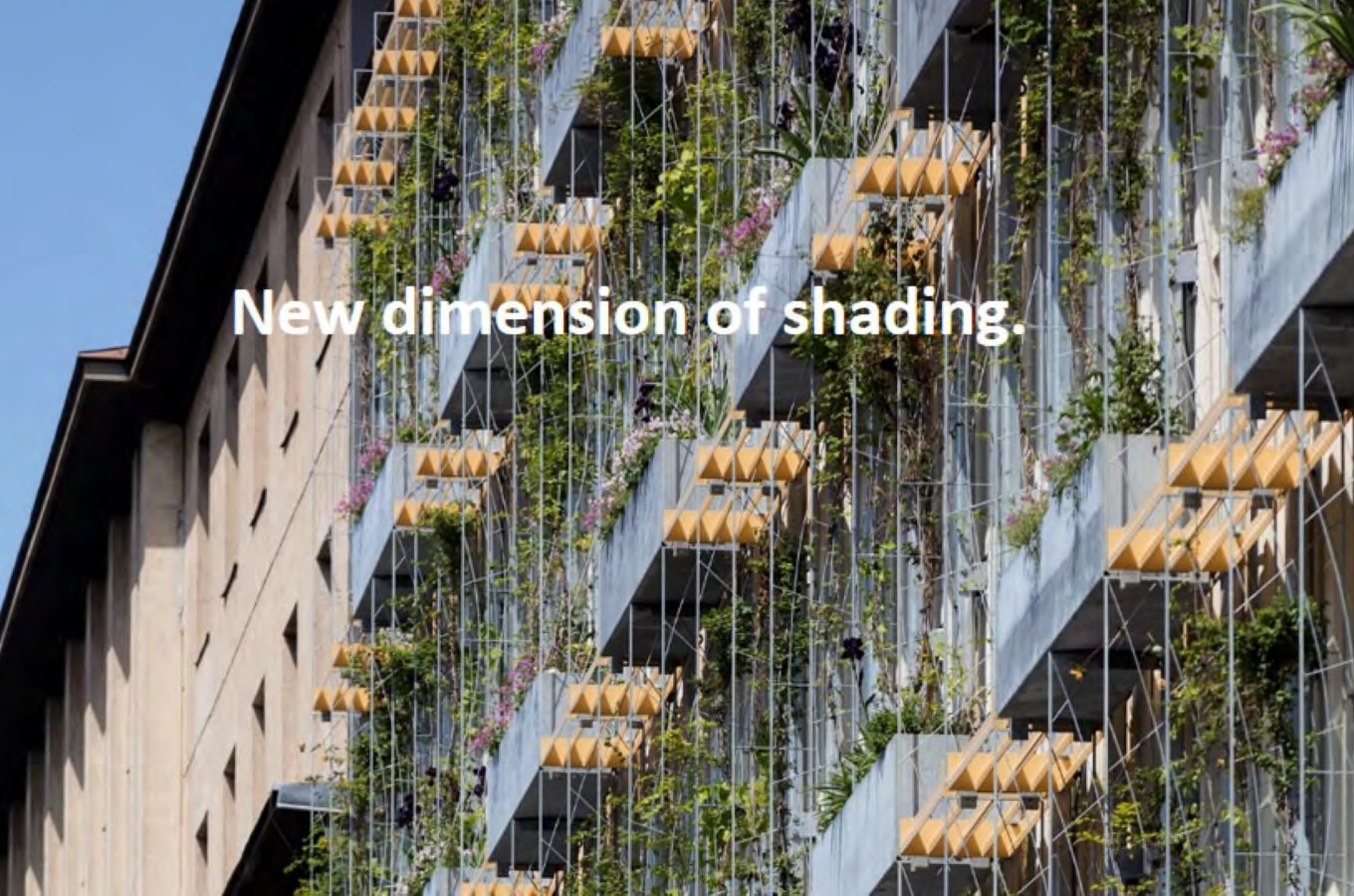
-2.2°C

-1.8°C



image source: © schreiner kastler





New dimension of shading.

© Anna Stöcher, Rataplan

PUBLIC

Hebwerk Laaerberg, Gudrunstraße 1100 Vienna

Rataplan - Architektur ZT GmbH



BUILDING GREENING

WHY?

© Pfoser

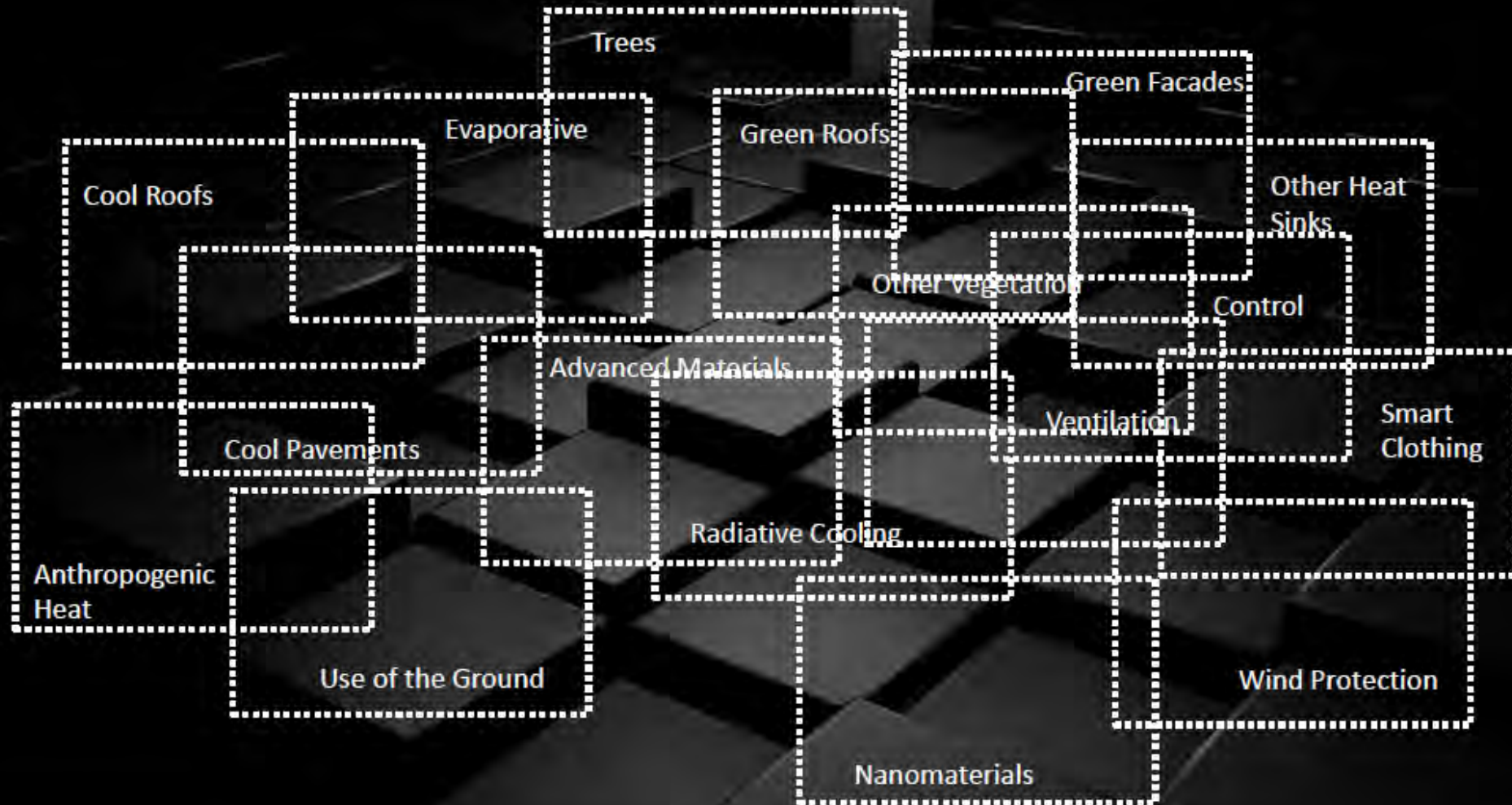
NEED	 Temperature	 Light	 Ventilation	 Energy Production	 Water	 Material, LCA	
METHOD	 Adiabatic cooling  Insulation, buffer	 External sunshading	 Preconditioning Natural/controlled ventilation	 Environmental energy	 Greywater use/filtering	 Co₂ balance	
Benefits of Nature Based Solutions	+ less overheating of surfaces through shading/evapo- transpiration + reduction heat loss +reduction windspeed +less humidity	+ anti glare +green technical shading +translucent by plant species	+ air purification +air humidity +air cooling summer +air buffer winter	+increased production rates +supporting passive and active energy production	+water savings +water cooling +pollutants filter +aesthetic value	+CO₂ storage +O₂ production +less energy need +material protection +extended LC	
SAVINGS GAINS	Reduction of cooling costs	Reduction of heat transfer	Reduction of primary energy substitution of technical systems	Support/substitution of technical airconditioning	Increased productivity PV, cooling energy savings, Biomass production	Savings depend on systematic approach	Substitution of roofing/facade materials, lifespan extension

Plus Energy Districts

- Distribution
- Generation
- Technology
- Mobility
- Storage
- Transformation



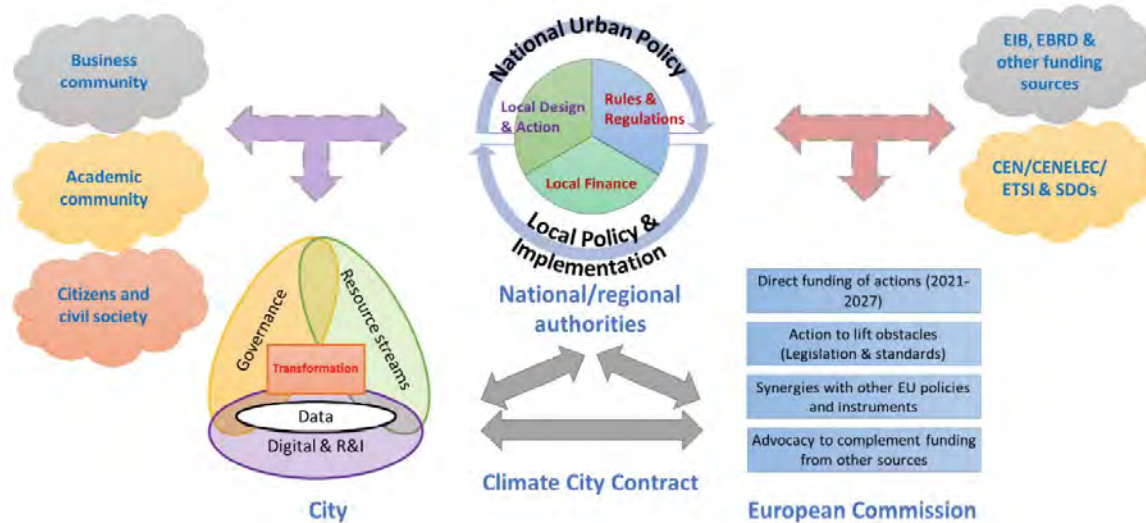
URBAN HEAT MITIGATION TECHNOLOGIES



Scientia Professor Mat Santamouris,
The Anita Lawrence Chair in High
Performance Architecture at UNSW Built
Environment

INNOVATION -> Reaching 100 climate-neutral cities by 2030

A central part of a Climate City Contract should be about unlocking the drivers to transformation. The Mission prioritises five main drivers: new forms of participatory and innovative governance, a new economic and funding model, integrated urban planning, digital technologies and innovation management.



Proposed Mission: 100 Climate-neutral Cities by 2030 – by and for the Citizens

Report of the Mission Board for climate-neutral
and smart cities

Independent
Expert
Report



GREENING & ENERGY GENERATION

Synergies instead of competition, Districts instead of buildings

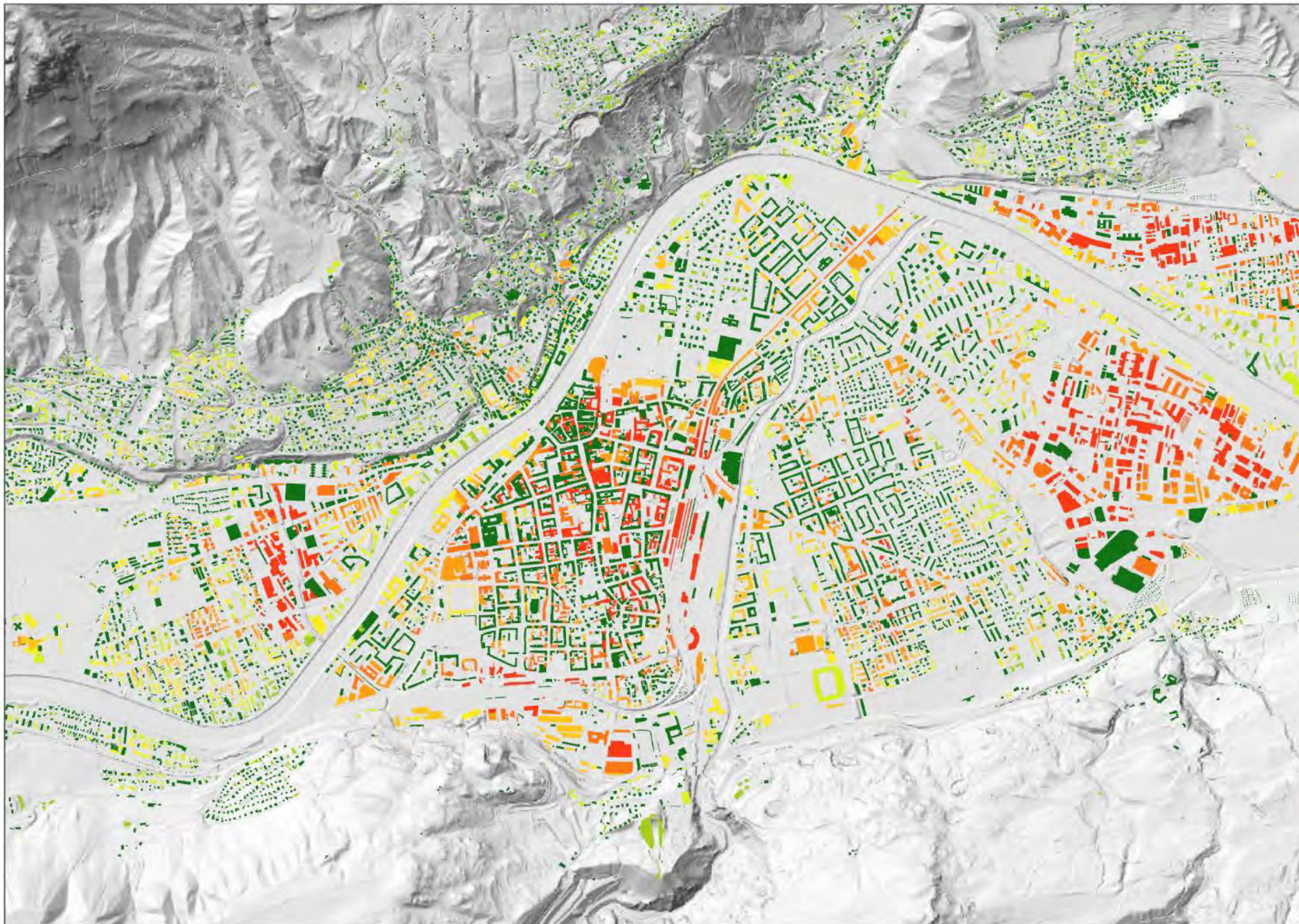


Gründach- und Solarpotentialkataster (© [Stadt Wien](#))



Am Weiher Salzburg

Stefan Roithmair

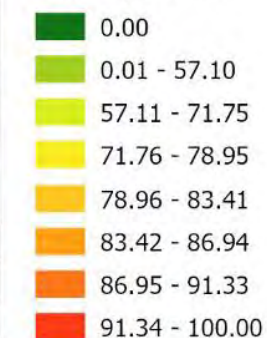


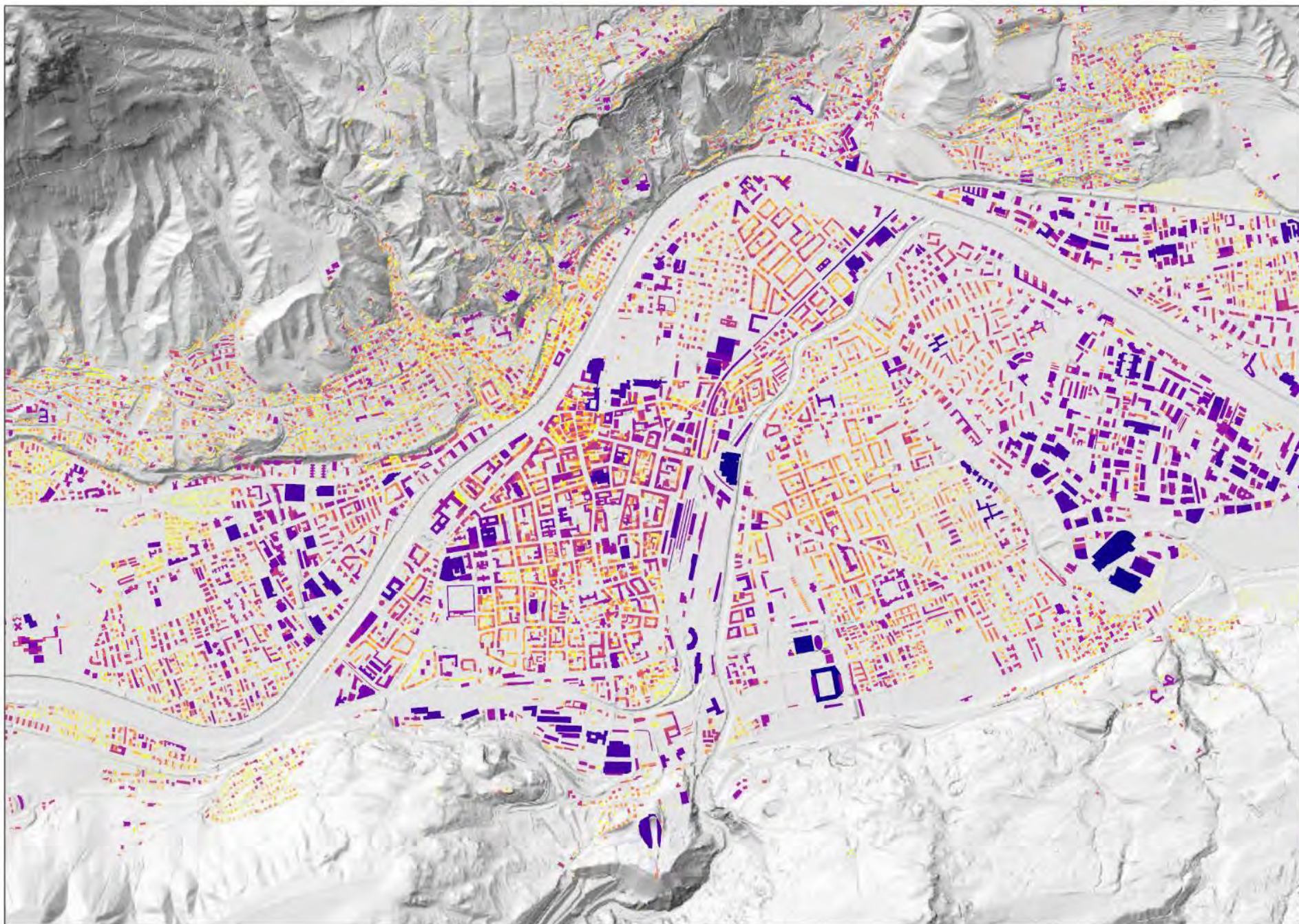
Green roof impact score

Green Roof Impact Score describes the impact of retrofitting a house with a green roof based on Land Surface Temperature and surrounding Greenness.



GRImpScore



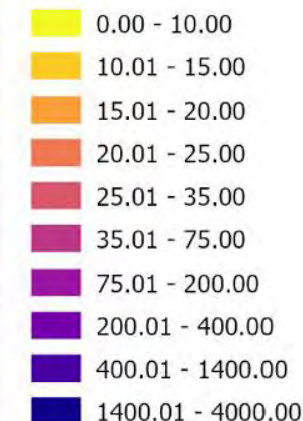


Total electric power production potential – Regular Performance

Total electric power production potential – Regular Performance describes the potential electric power in MWh that can be produced considering that the PV has a regular performance ratio [86%] and a regular efficiency [19%].



PVEPPMwhRP



VISUALISATION

Instruments

Regulations

Building Code OIB 6,
OIL-fired Heating forbidden in
most countries, energy pass,
energy efficiency law

Strategies Programs

climate,-energyprogramm (KEP)
waste-reducing construction
methods, new energy R&D
innovation Strategie, Urban Heat
Island Strategy, Open Innovation

Fundings -> Innovation!

Subsidies / Incencitives, R&D,
new instruments fundings –
Innovation Lab

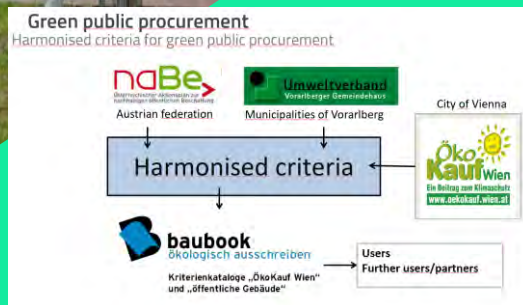


Benchmarks

Assessment
criteria,
Labelling



Net Zero Building 2017 Wind Energy HQ Ernstbrunn Architekt Reinberg



Participation



Tisch 2 Spielleiter: Erik Meinhardt



Tisch 1 Spielleiterin: Victoria Matejka



Tisch 3 Spielleiter: Johannes Brossmann





27.06.2023 Berlin

bis

29.06.2023

"Weltkongress Gebäudebegrünung 2023"



Berlin
27.-29.06.2023

Weltkongress Gebäudegrün

World Congress of
Building Greening

www.bugg-congress2023.com

3-tägiger Kongress mit internationalen Referenten rund um die Gebäudebegrünung und grüne Infrastruktur. Auf deutsch und englisch.

Veranstalter: BuGG

International Construction Kongress

 **BauZ!**

Vienna Congress on Sustainable Building

Less. But let's make more out of it!

International Congress, March 7th and 8th, 2023

English ▼

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metabuilding

METABUILDING PLATTFORM

KMUs im Visier: Die digitale Plattform METABUILDING sucht & fördert KMUs

Sind Sie ein KMU, das nach Finanzierungsmöglichkeiten sucht oder bereit ist, langfristige, transformative Partnerschaften aufzubauen? Benötigen Sie Unterstützung von Innovationsexperten, um Ihre Wettbewerbsfähigkeit zu steigern? All das finden Sie auf der METABUILDING-Plattform, aber auch die Möglichkeit, Ihre Lösungen sichtbar zu machen, Zugang zu innovativen Technologien zu erhalten und von einem Marktfindungsinstrument zu profitieren, um Ihr Unternehmen auszubauen.

Melden Sie kostenfrei Mitglied der METABUILDING-Plattform und schließen Sie sich den Innovatoren des Bauwesens und der 4 aufstrebenden Industriesektoren an: Recycling und Kreislaufwirtschaft, additive Fertigung, naturbasierte Lösungen und digitale Industrie. Melden Sie sich hier an!

Hier kannst Du eine
Mitteilung hinterlassen



Thank you for your attention!

Questions & Answers

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