

Datengestützte Methoden für Planung und Betrieb klimaresilienter Gebäude

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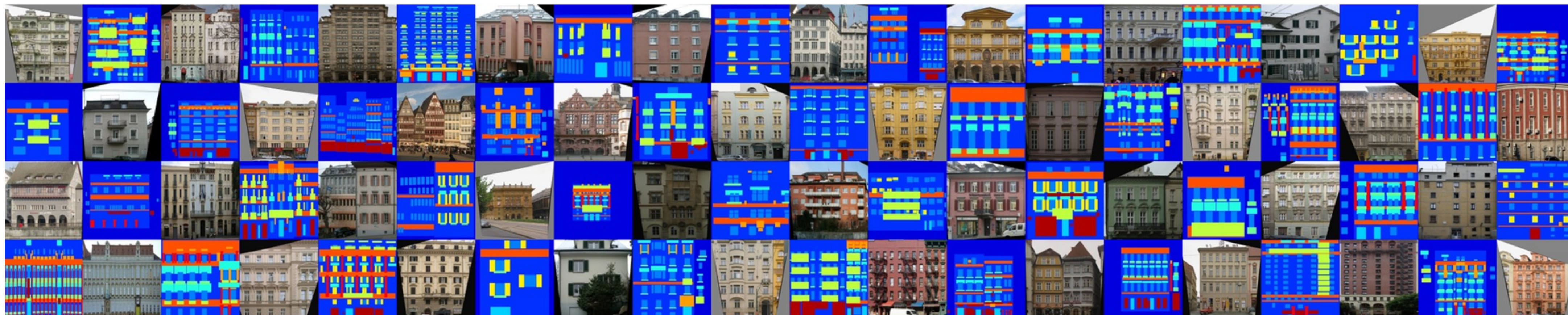
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ETH Zürich

SEC Future Cities Lab

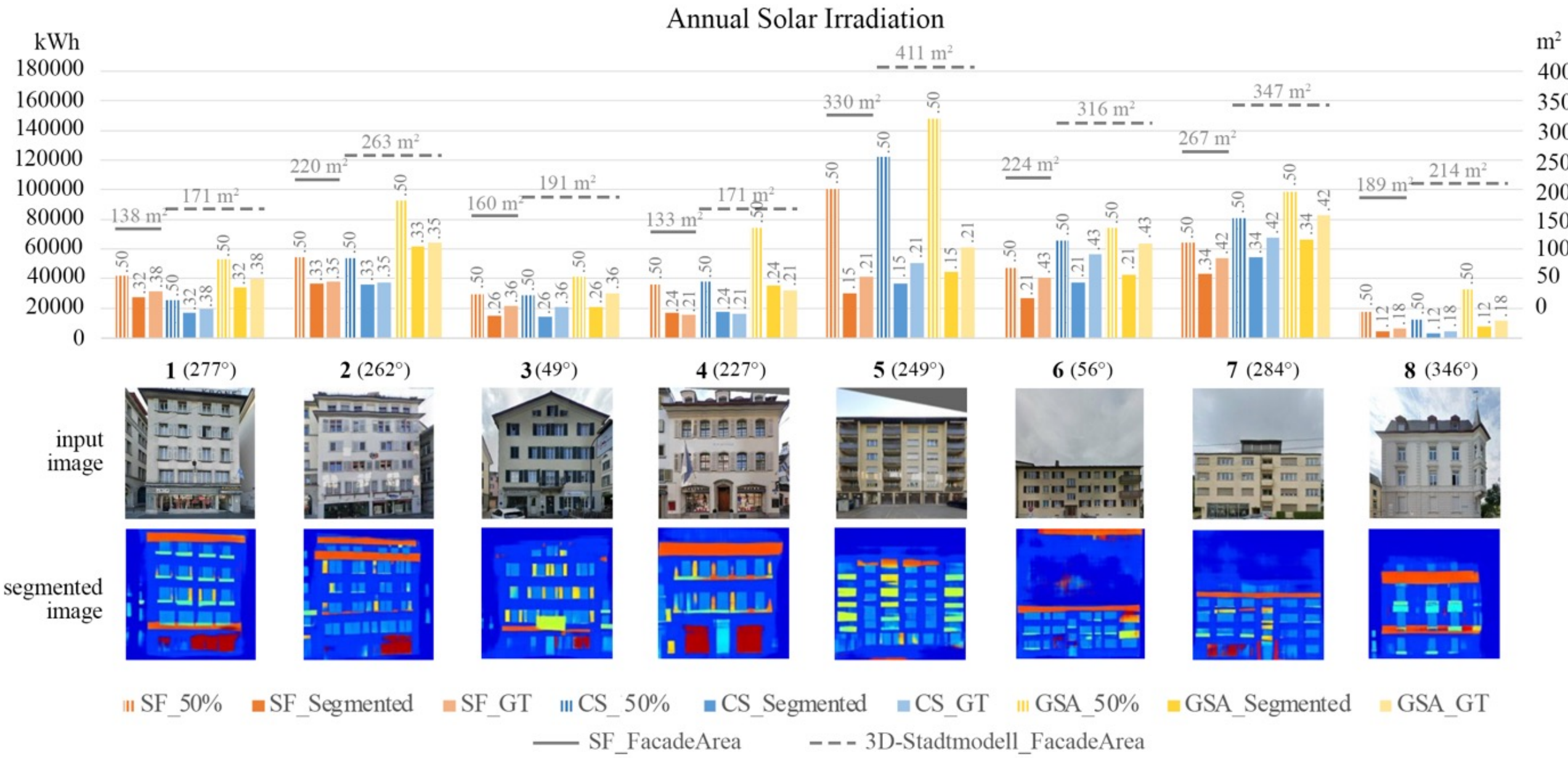
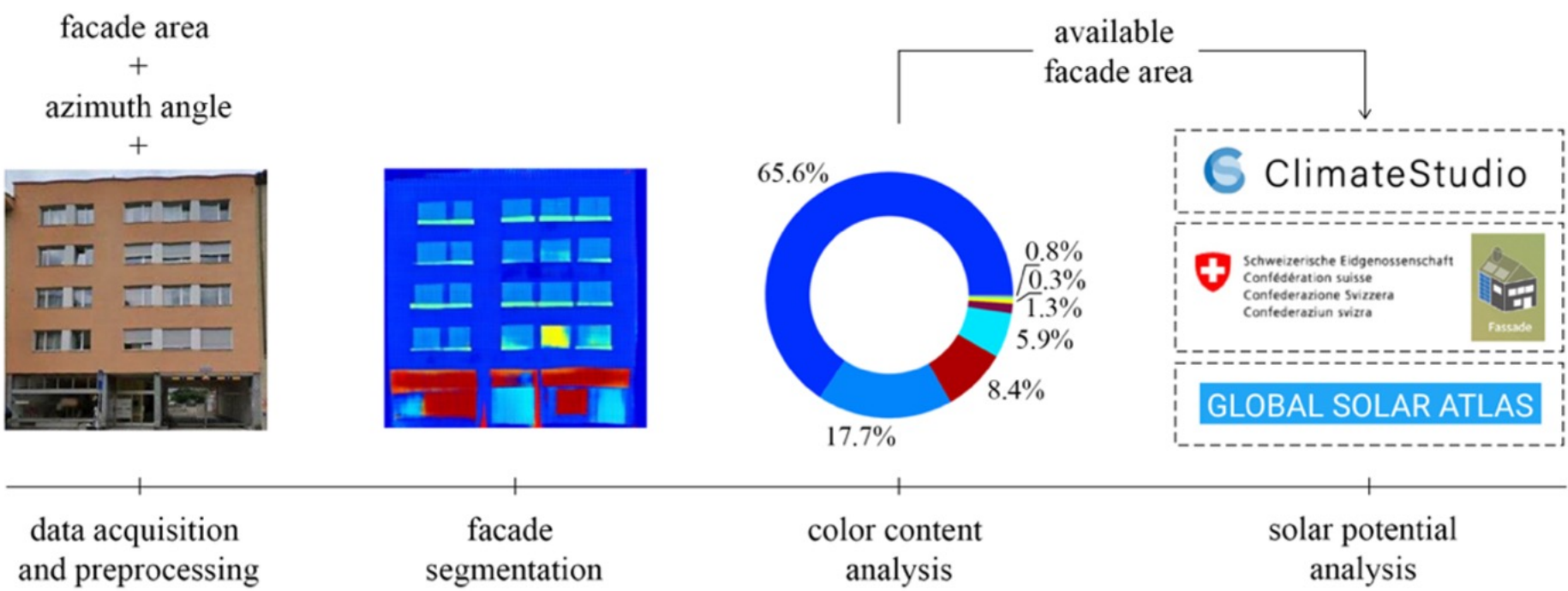
Bilder statt Zahlen

Schnelle Analysen von energie- und klimarelevanten Faktoren

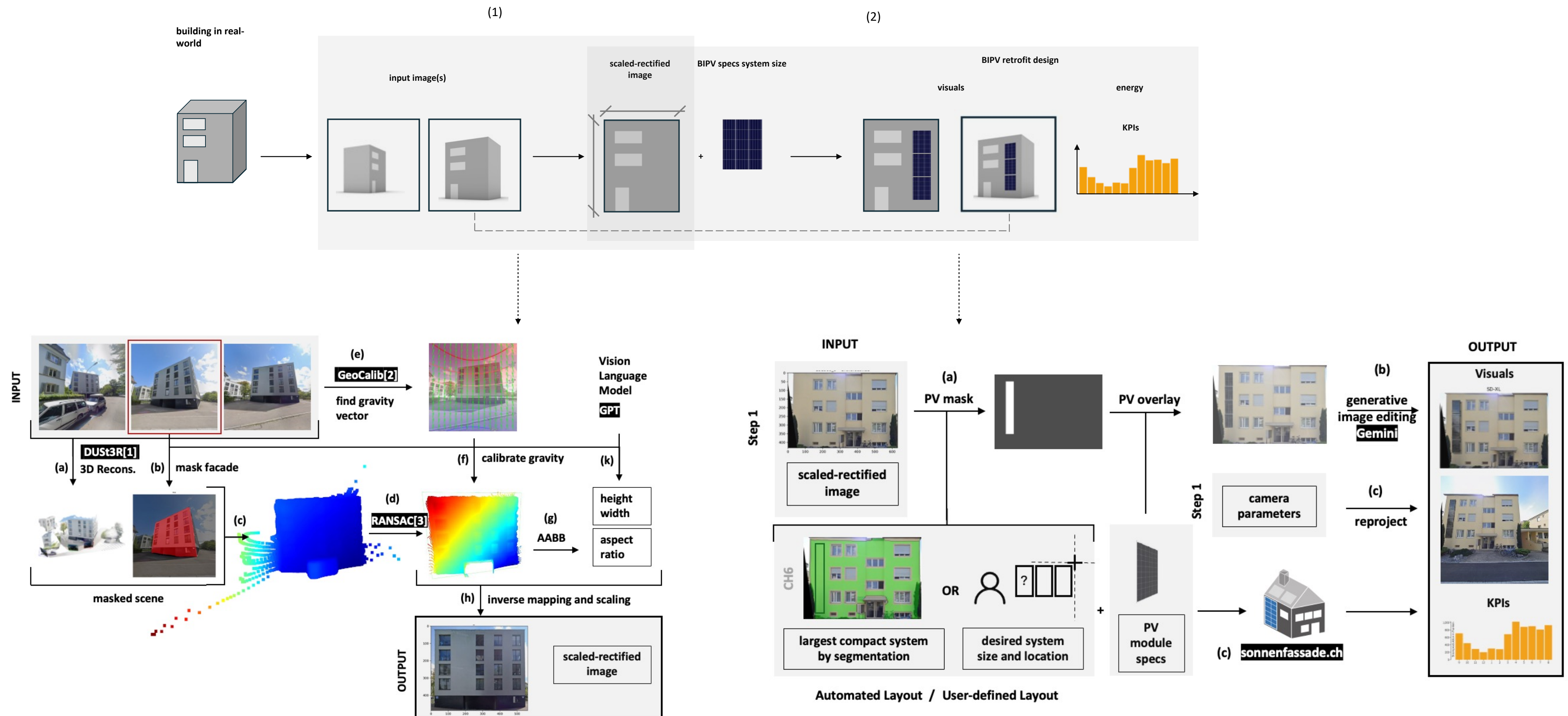
Segmentierung von Fassaden: Modelle, die verstehen



Solarpotential schnell, besser abschätzen: ein workflow mit generativer AI



Pipeline für die Planung von Solarinstallationen an Fassaden durch 3D-Rekonstruktion und generative AI



Lernen statt Steuern
Wie Gebäude von Ihren Nutzern lernen können

Living Lab @ United World College of South East Asia (UWCSEA)



Living Lab @ United World College of South East Asia (UWCSEA)



Passive chilled beams

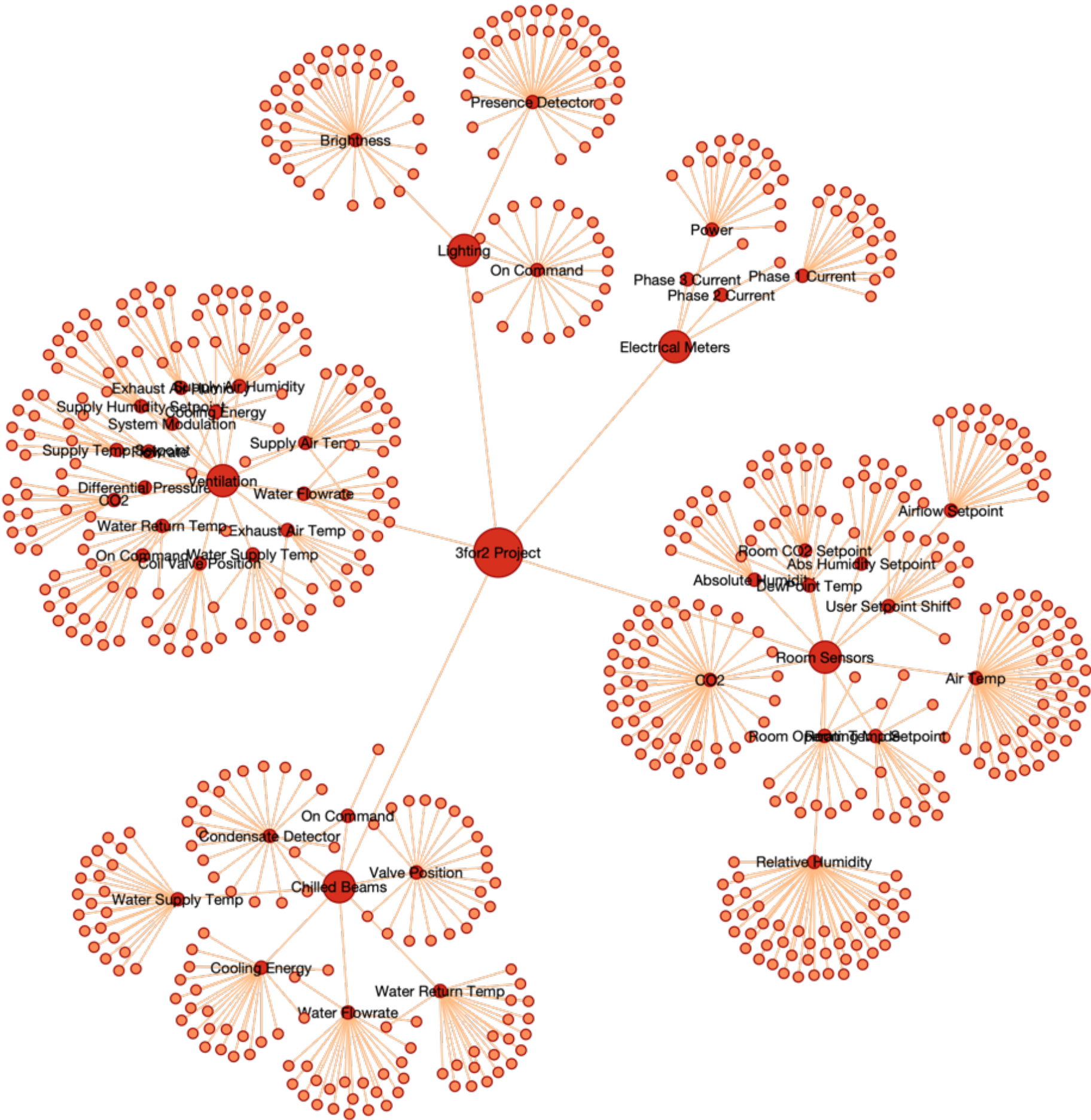
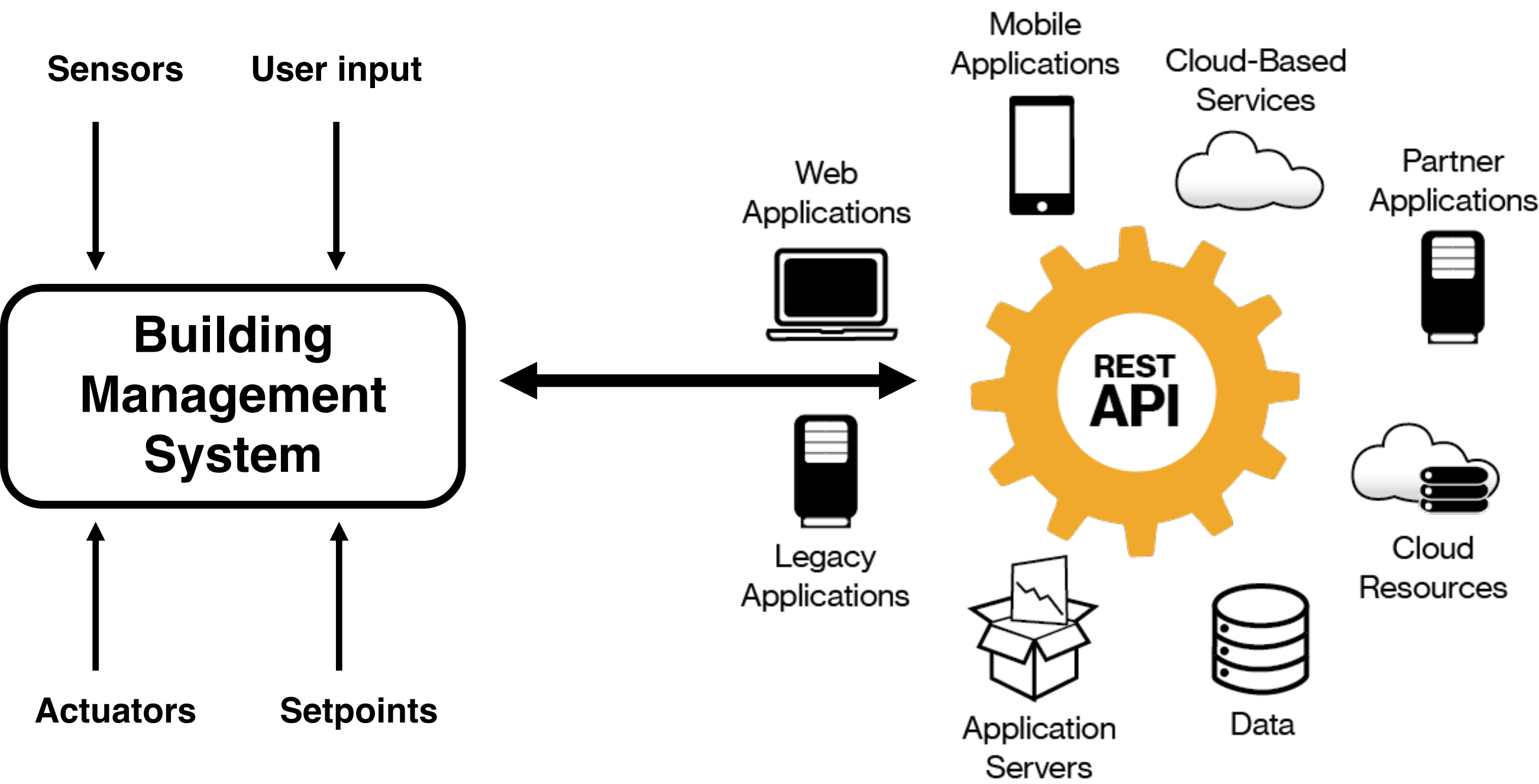


Dedicated Outdoor Air Unit



Cooling & Ventilation systems

Raum-zeitliche BMS Daten über REST API



Hierarchy, types and amount of sensors in '3for2'

Lernen von Nutzungspatterns: wissen, wann, wo und wie kühlen.

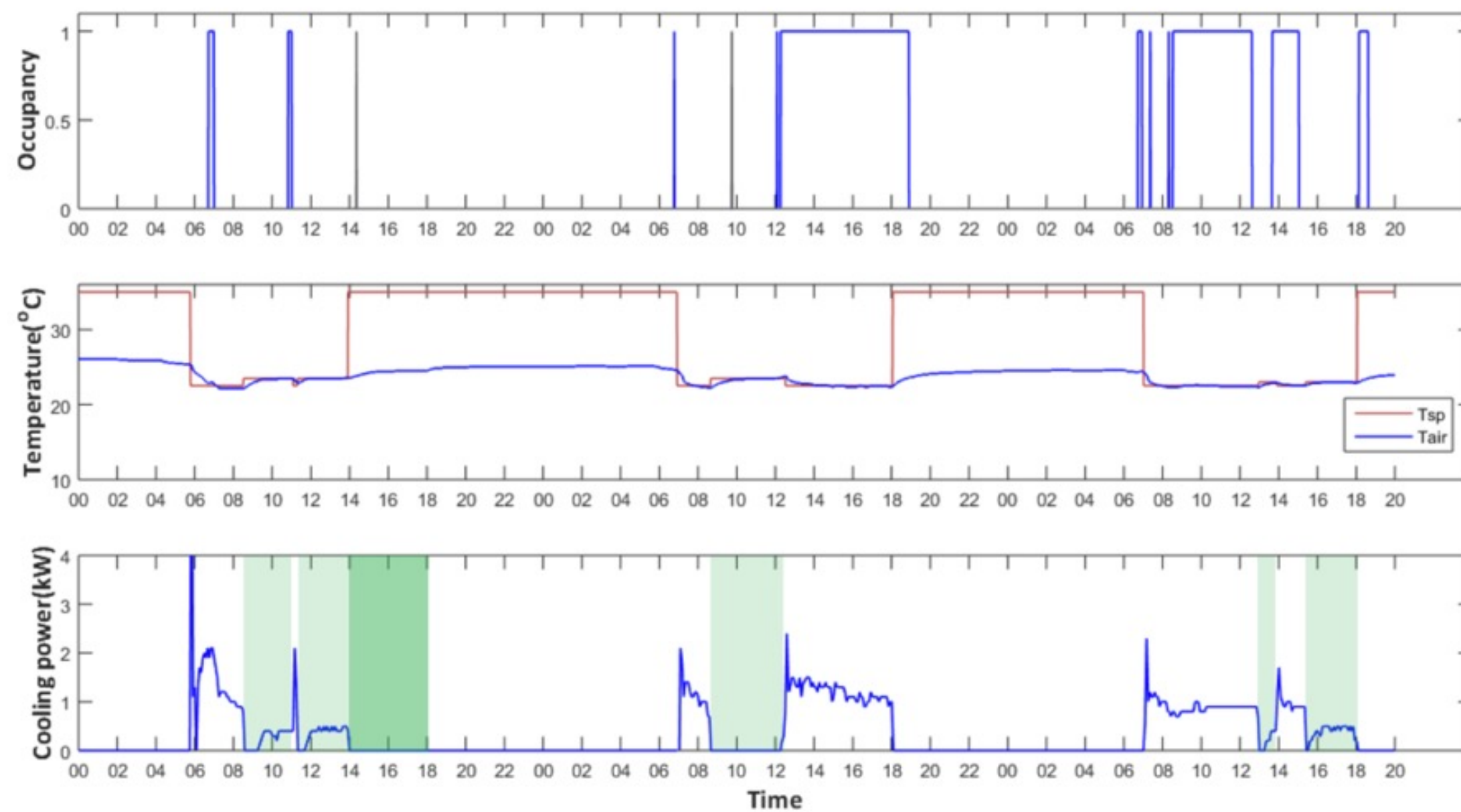
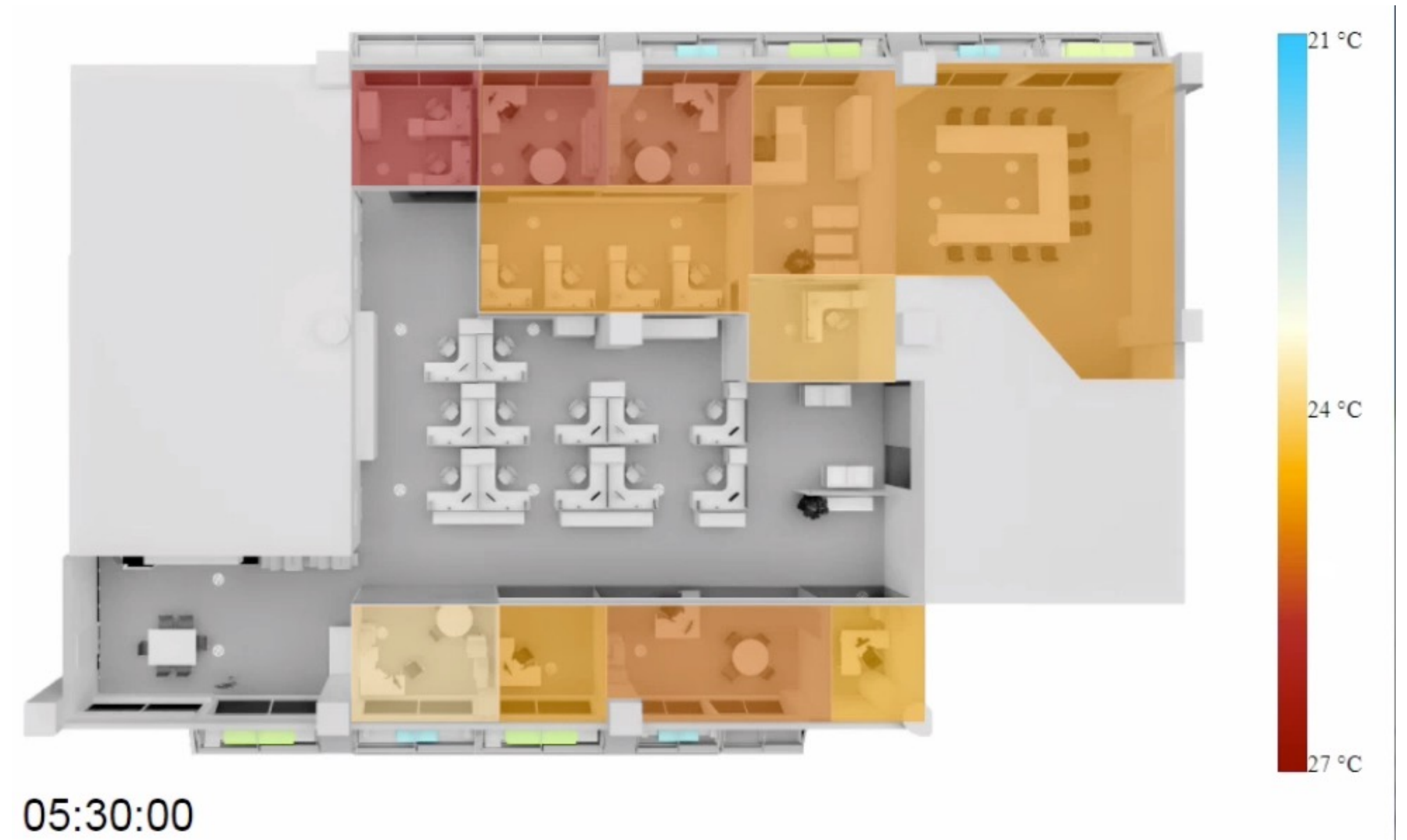
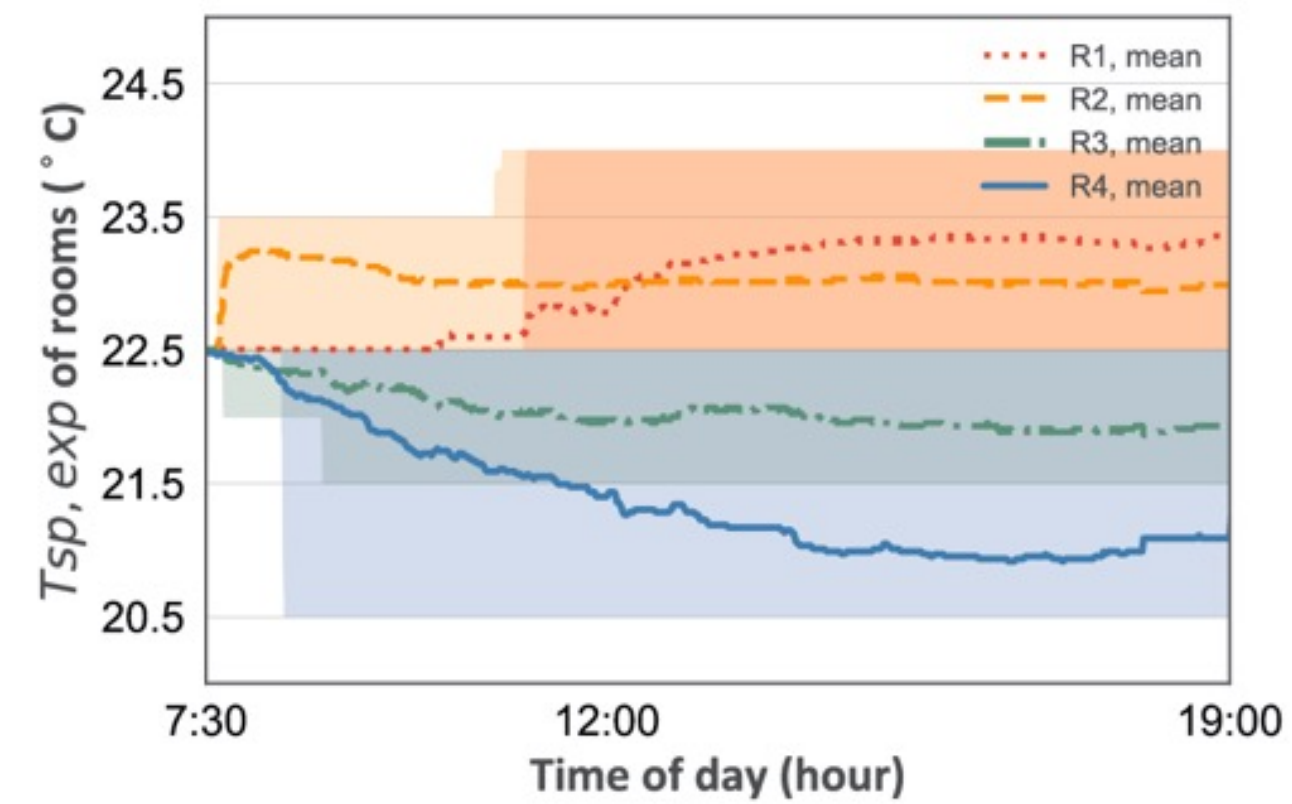


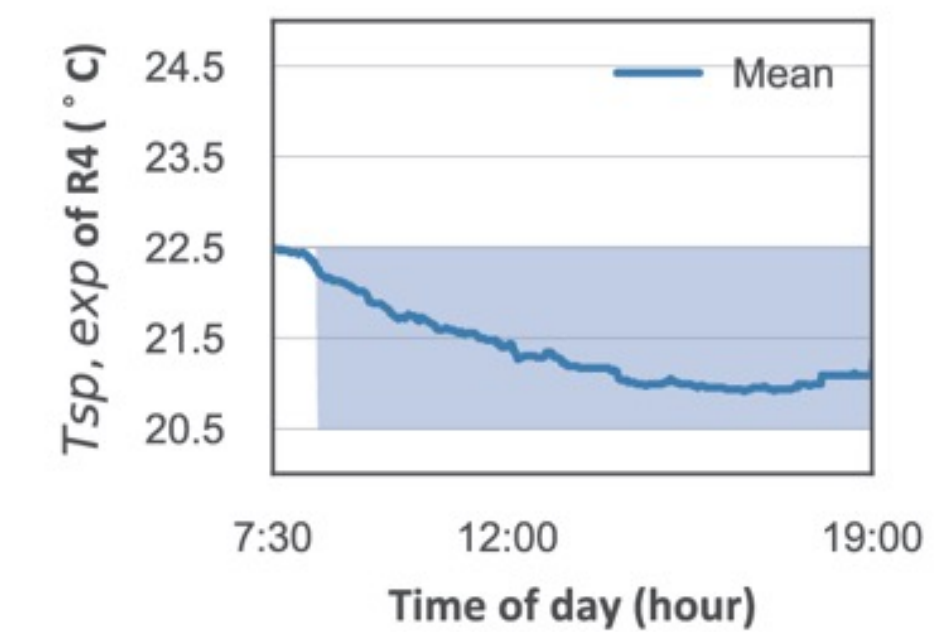
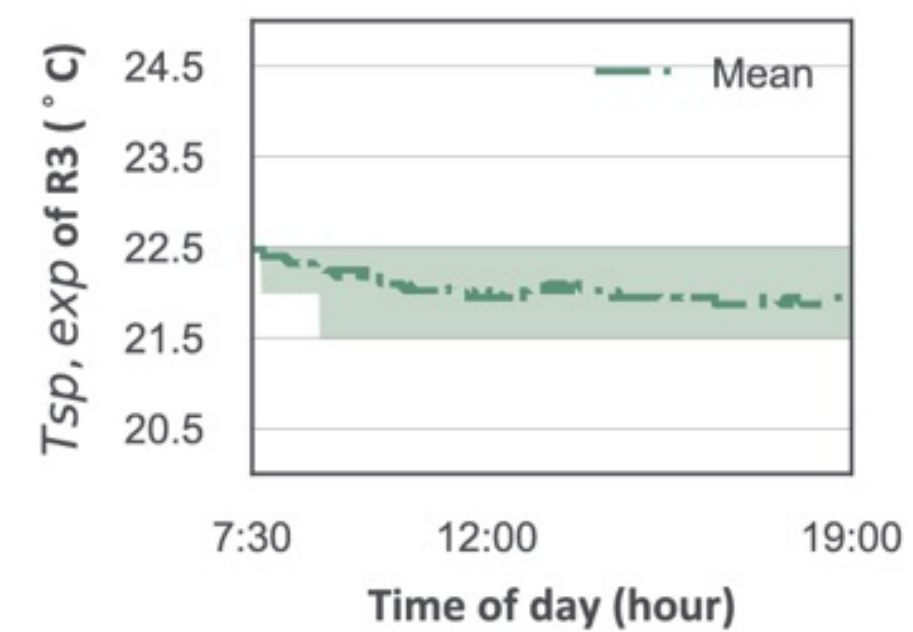
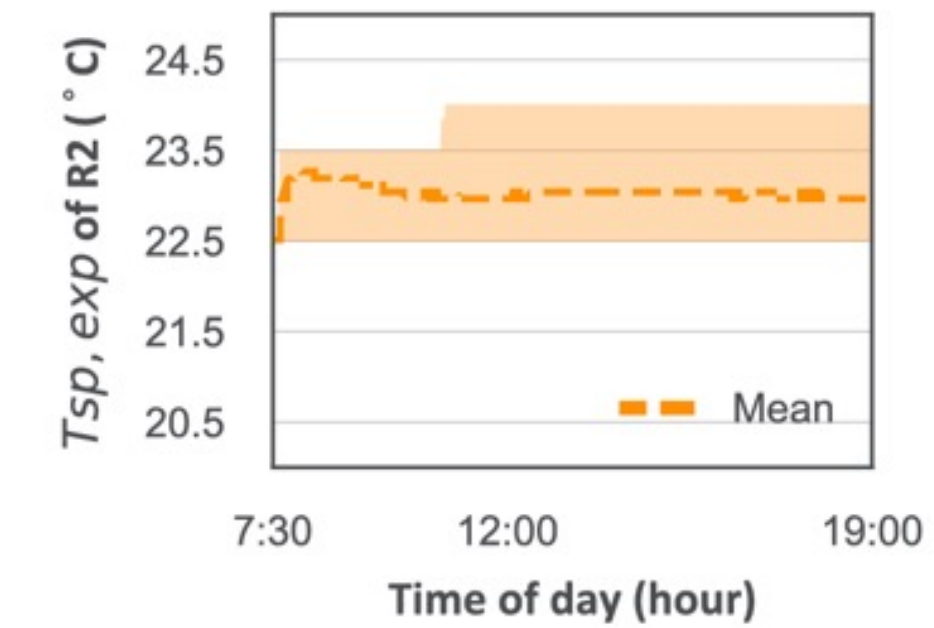
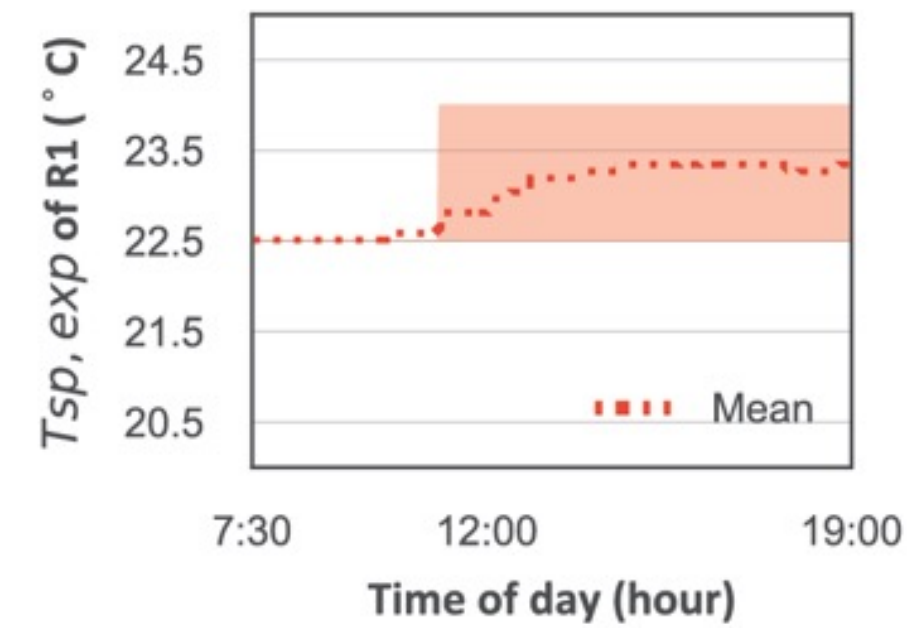
Fig. 14. Three-day sensible cooling control in the private office P3 during the DCC test



Lernen von Nutzerpräferenzen: wie kühl darf es denn sein?



(a)



(b)

Energieeinsparungen und Nutzerkomfort

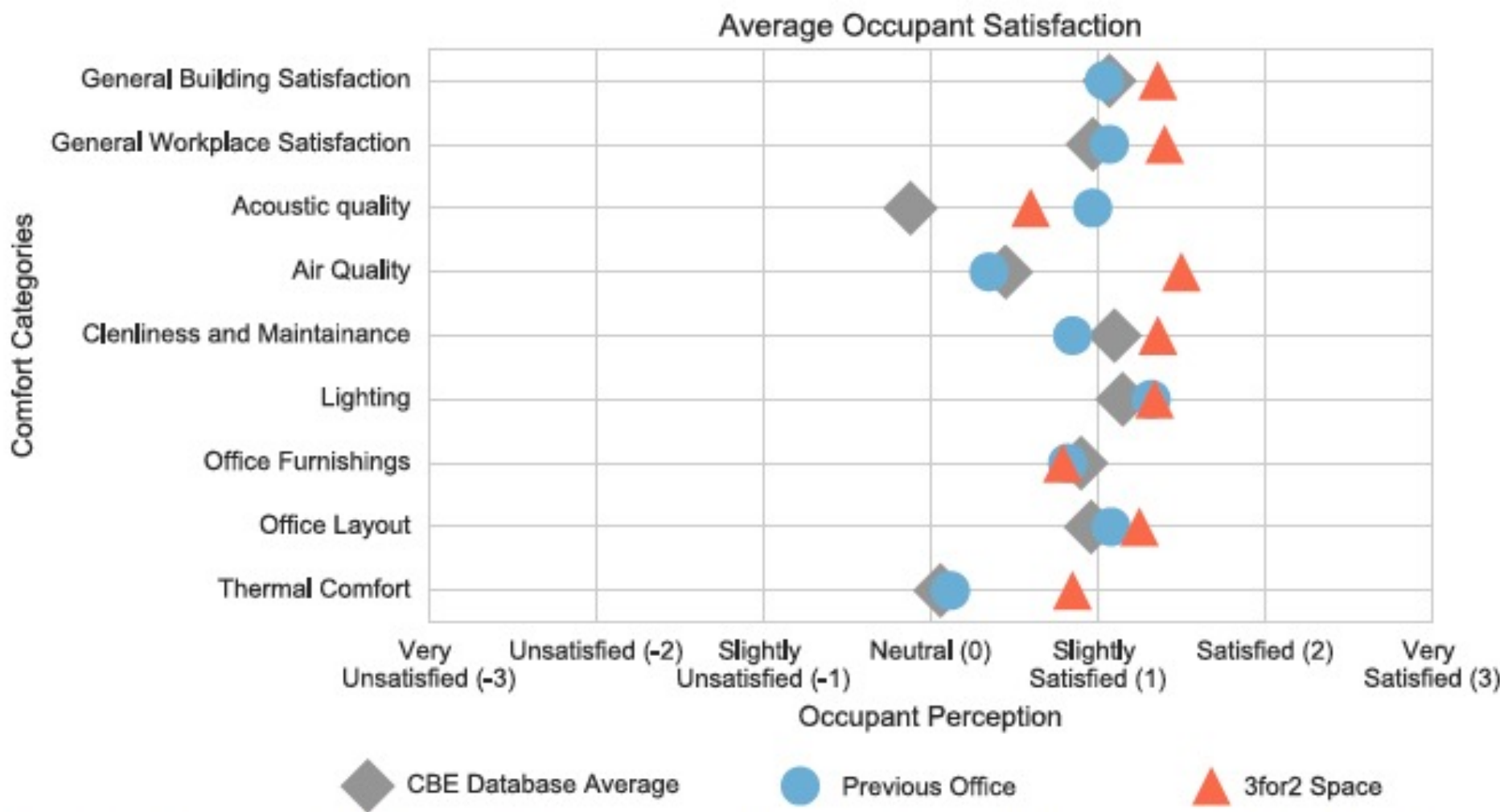
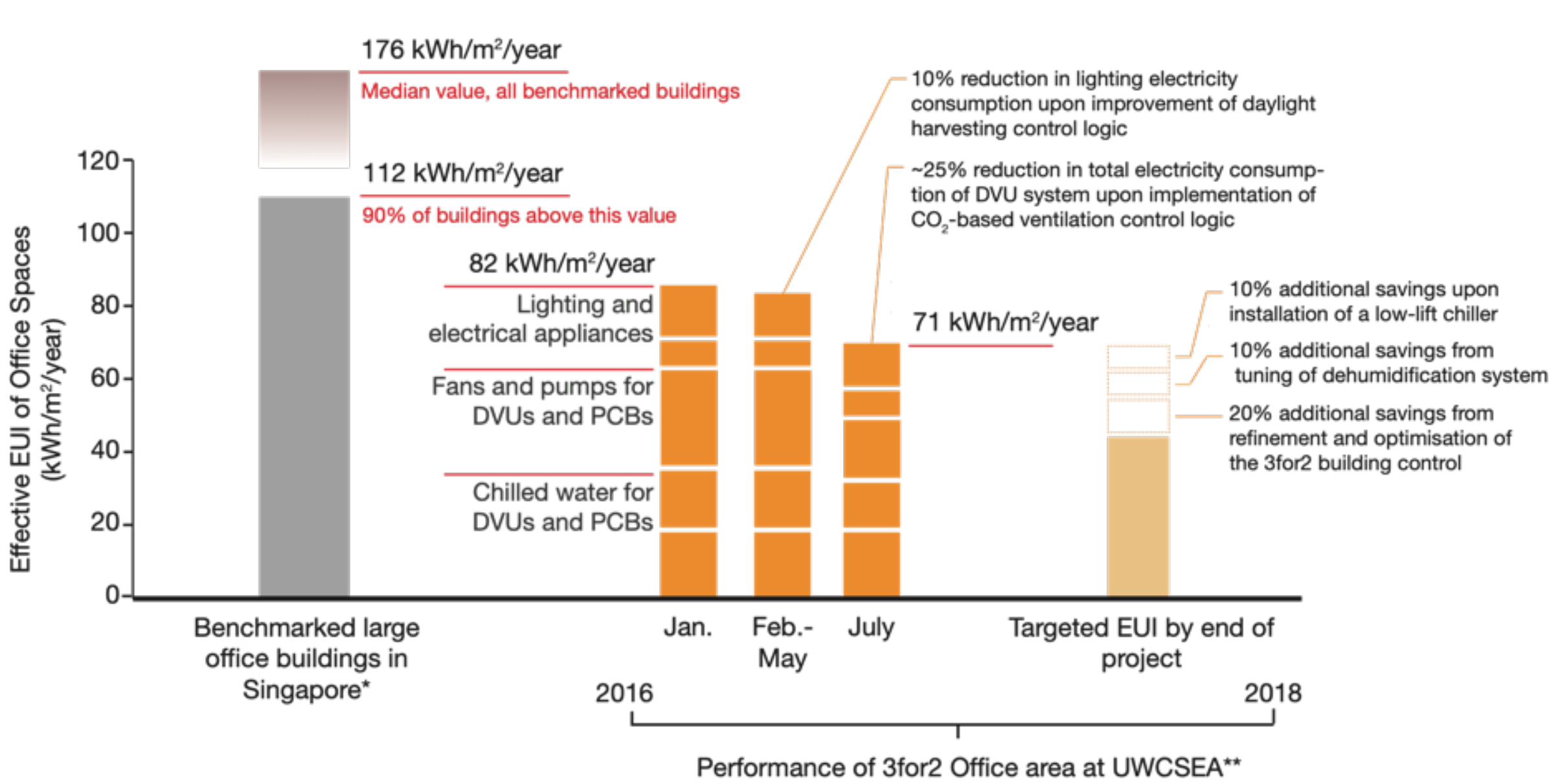


Fig. 18. Indoor Environmental quality survey results comparison between the CBE comfort survey database, the Previous Office and the 3for2 space.

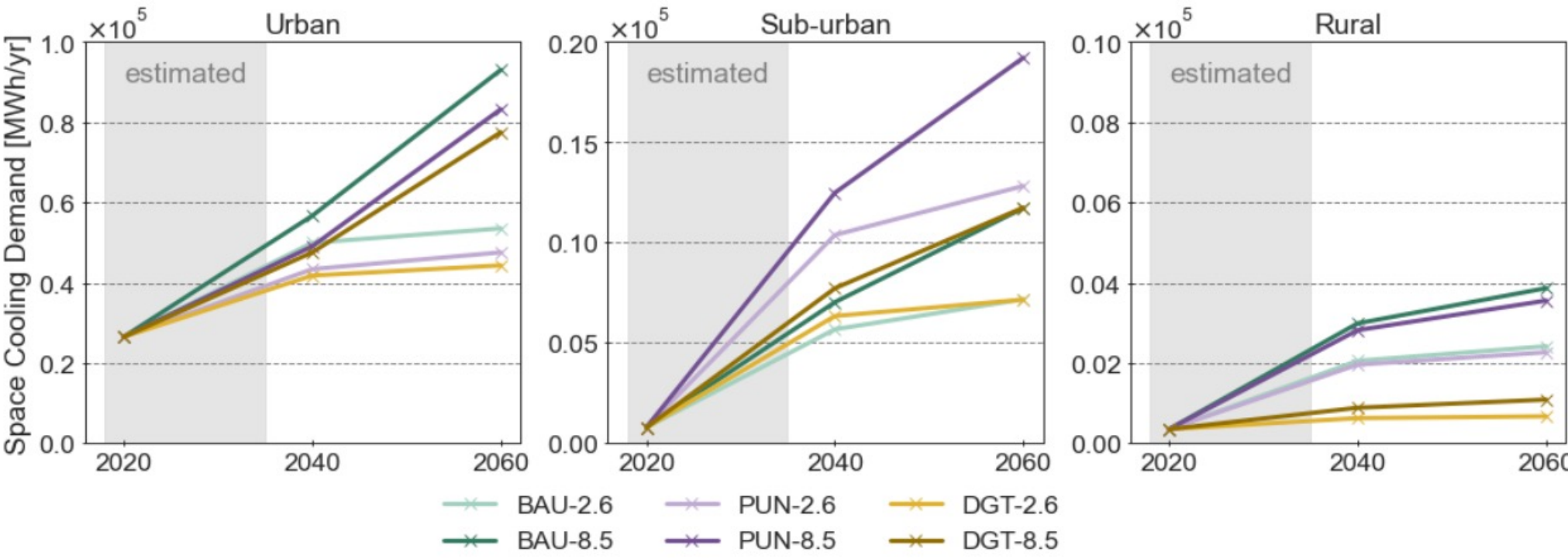
J. Pantelic, A. Rysanek, C. Miller, Y. Peng, E. Teitelbaum, F. Meggers, A. Schlüter, Comparing the indoor environmental quality of a displacement ventilation and passive chilled beam application to conventional air-conditioning in the Tropics, Building and Environment. 130 (2018)

Chatten statt Grübeln

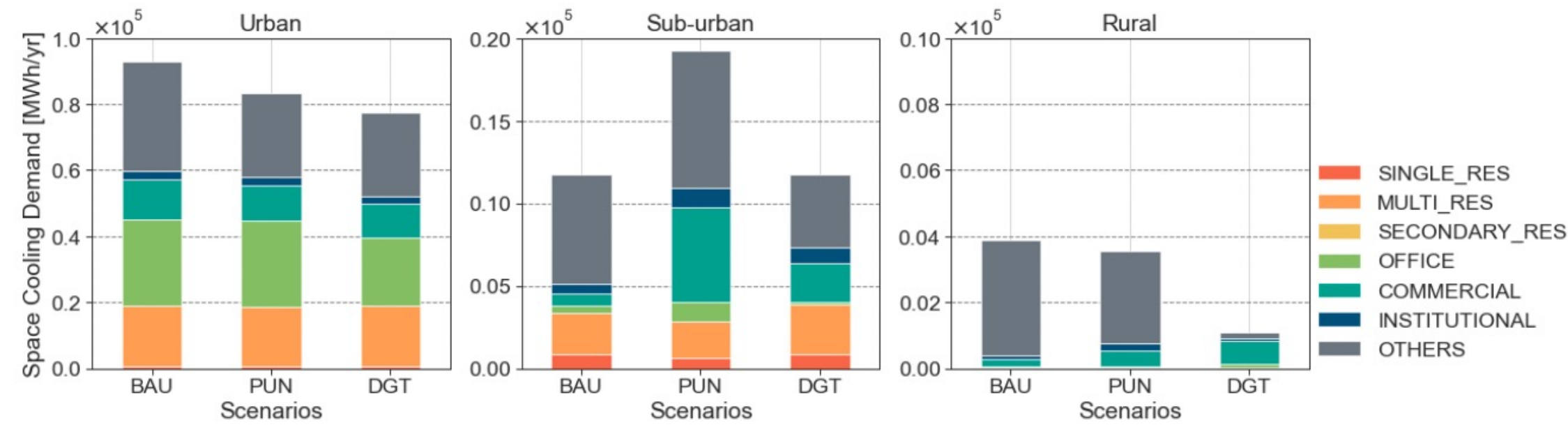
Mit Expertenmodellen und Simulationsergebnissen sprechen

Expertenmodelle & Simulationen

Cooling

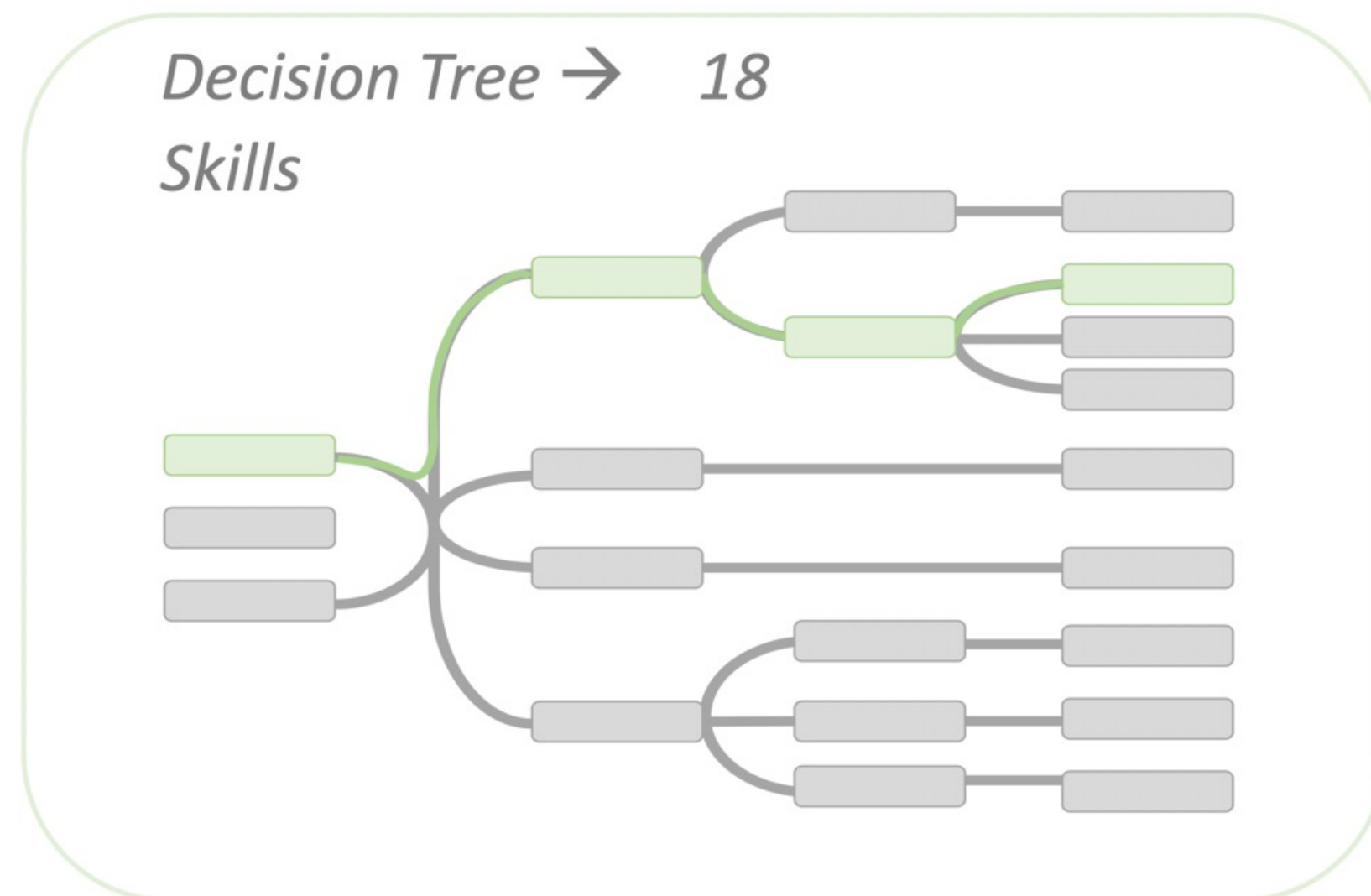


Projected annual space cooling loads of three community archetypes under three urban development scenarios (BAU, PUN, DGT) and two climate scenarios (RCP2.6, RCP8.5).



Space cooling load per building use-type under RCP8.5 in 2060.

LLM- unterstützte ‘skills’ für Interpretation und Interaktion mit Simulationsergebnissen



Skill = metadata + prompt instructions + calculation logic

Analysis Question

Required CEA Data

Output Mode & Visual Format

Hard-coded calculations

LLM Response Rules



CEA4 ZIP



Parser



Skill



Metrics



Prompt

groq™

Groq LLM



UI Output

Interaktion mit den Ergebnissen über LLMs: mehr Klarheit, Konfidenz und Effizienz

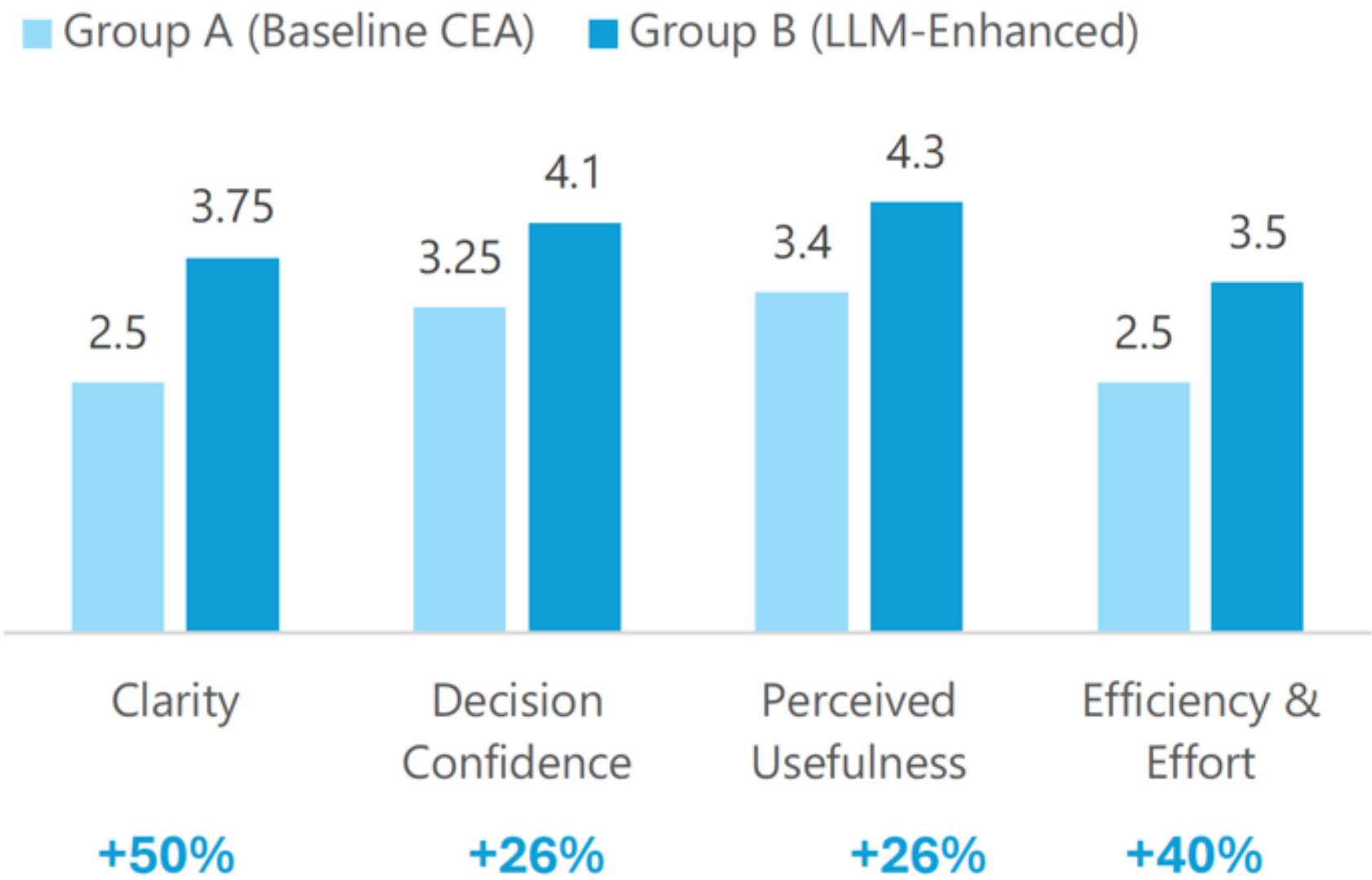
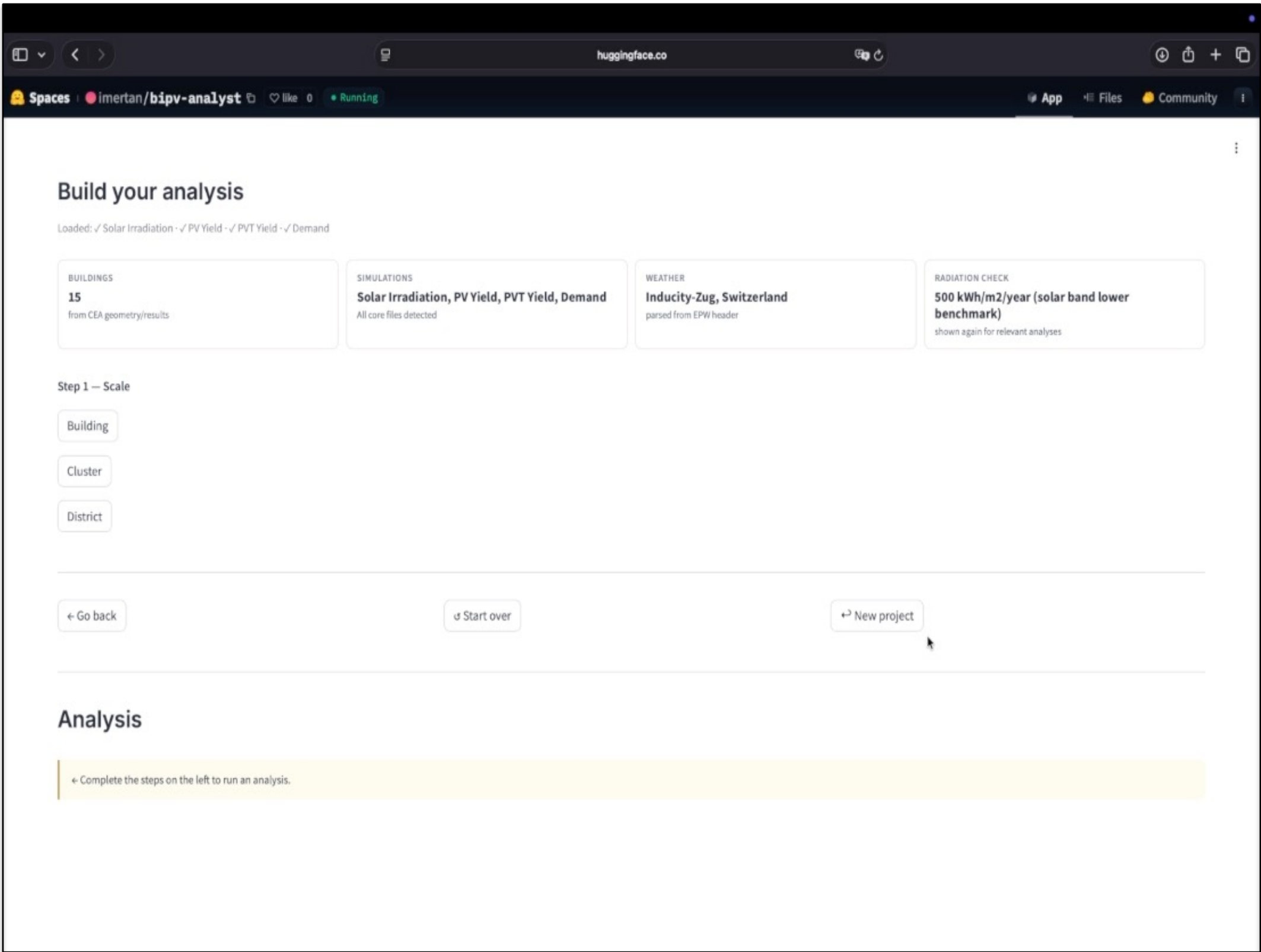


Figure 22: Average post-task questionnaire scores for Group A and Group B

Vielen Dank.