Federal Ministry
for Economic Affairs
and Climate Action

MITTELSTAND
GLOBAL
ENERGY SOLUTIONS
MADE IN GERMANY

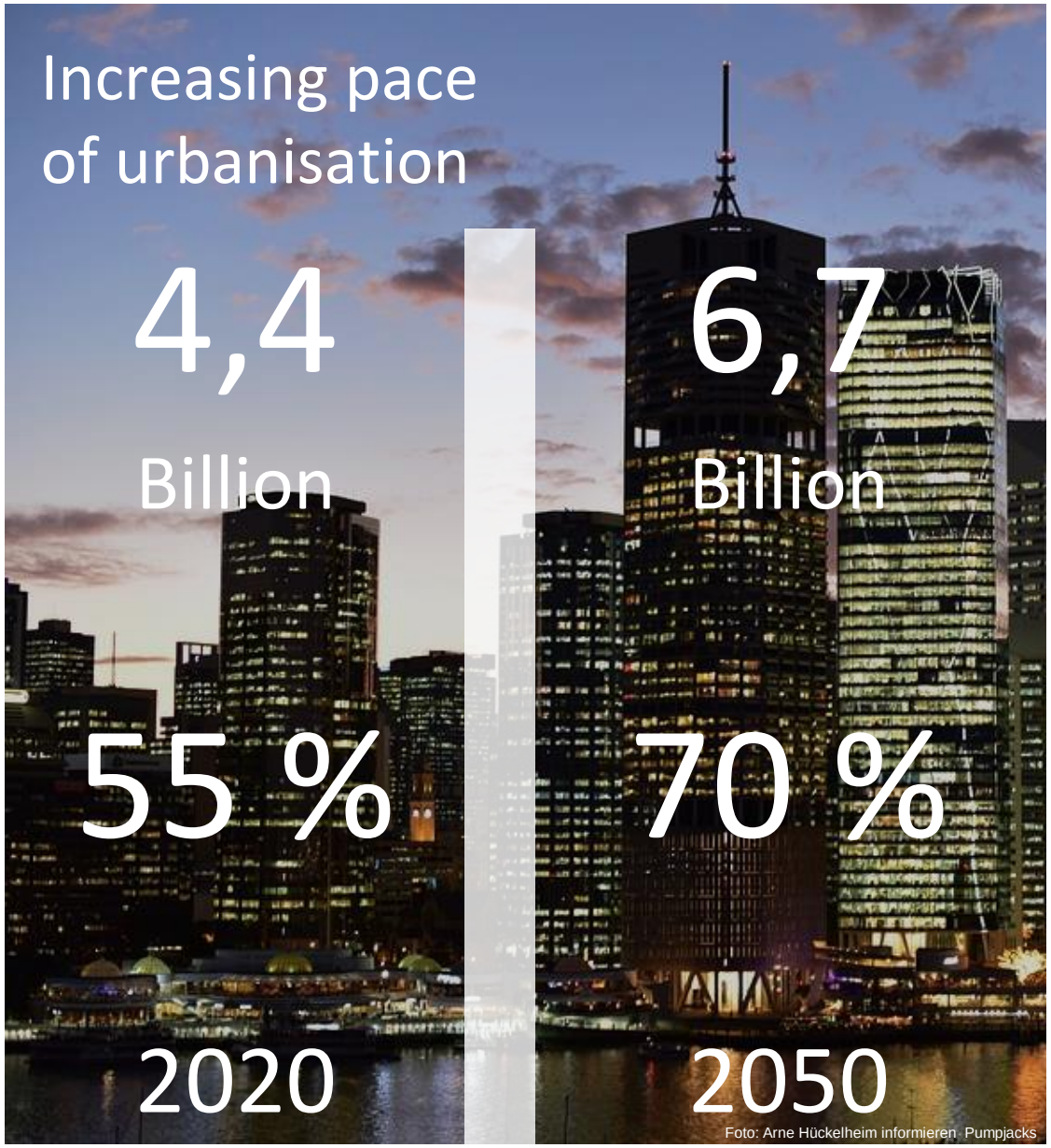
Energy Efficient Building Design from Germany

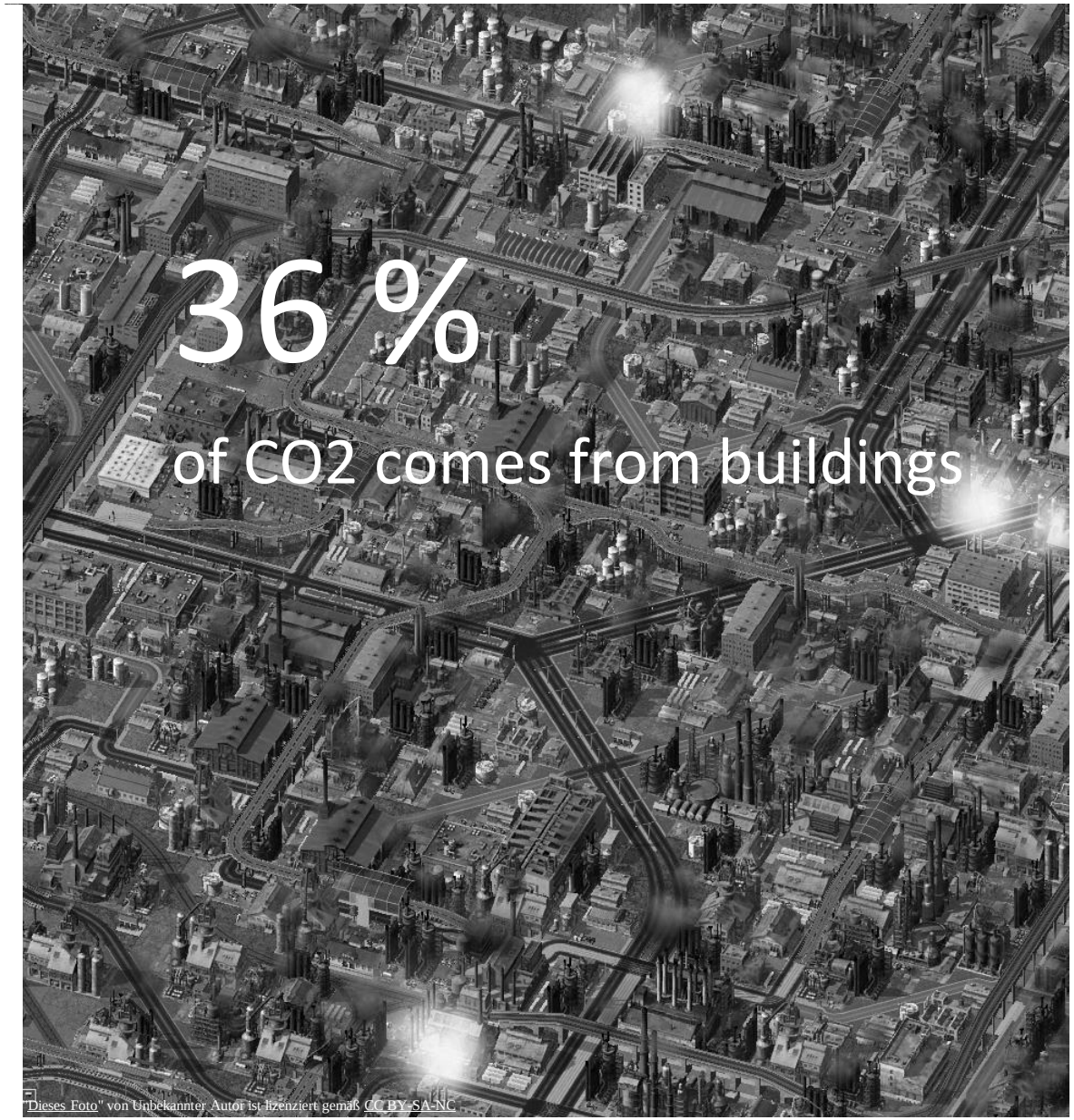
Dipl.-Ing. Johannes Hegger

13th September 2022

Facilitator

energie waechter


Increasing pace
of urbanisation
4,4
Billion
55 %
2020
6,7
Billion
70 %
2050
Foto: Arne Hückelheim informieren Pumpjacks


36 %
of CO2 comes from buildings
"Dieses Foto" von Unbekannter Autor ist lizenziert gemäß CC BY-SA-NC

global renewable energy resources/a

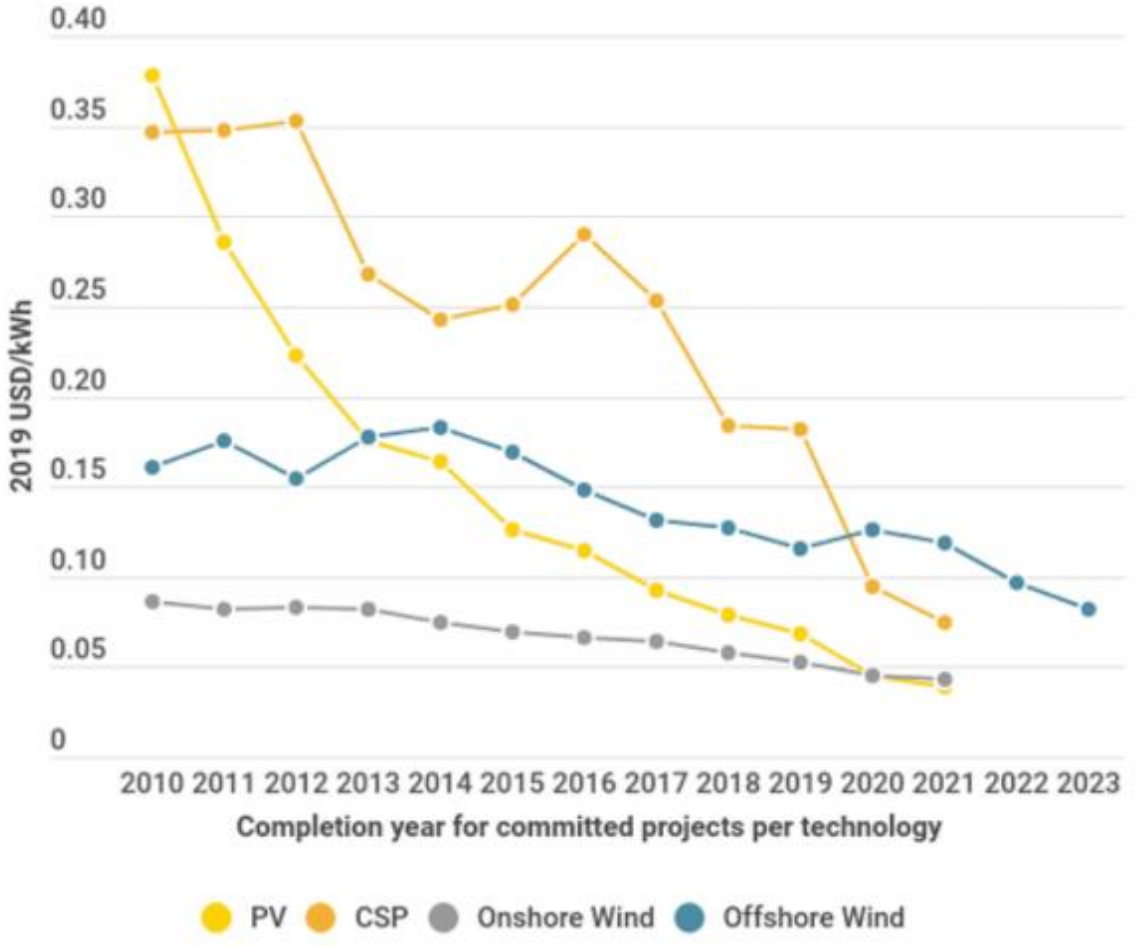


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Abbildung: IRENA - renewable power generation costs in 2019

Refurbishment
Office building, Kassel

Office building, Kassel

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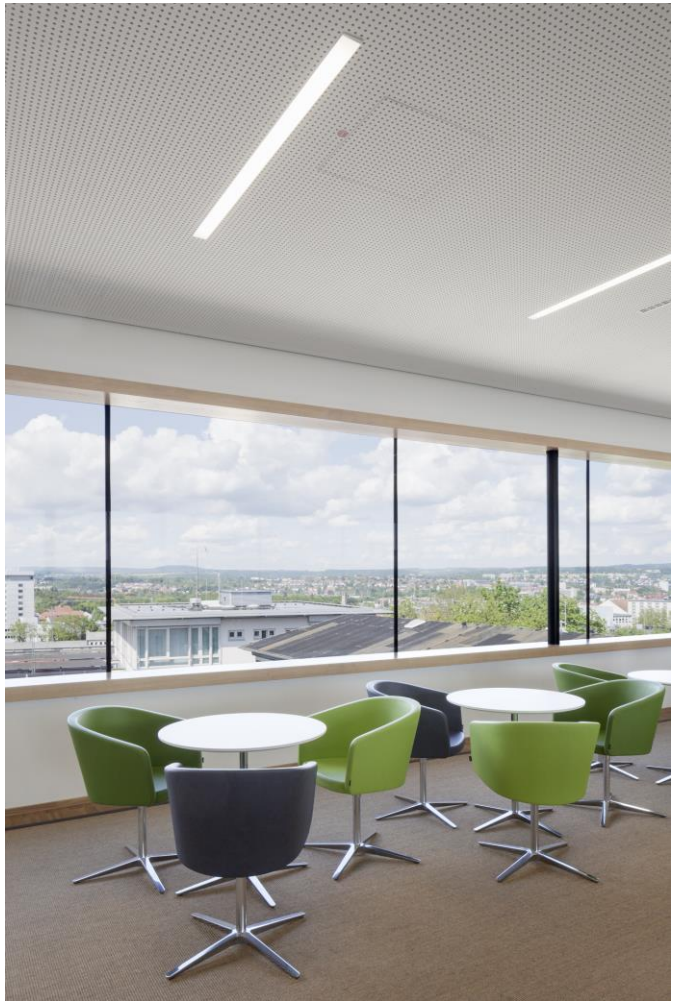
Office building, Kassel



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Refurbishment
Vocational training facility, Wolfhagen

Vocational training facility, Wolfhagen

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Vocational training facility, Wolfhagen

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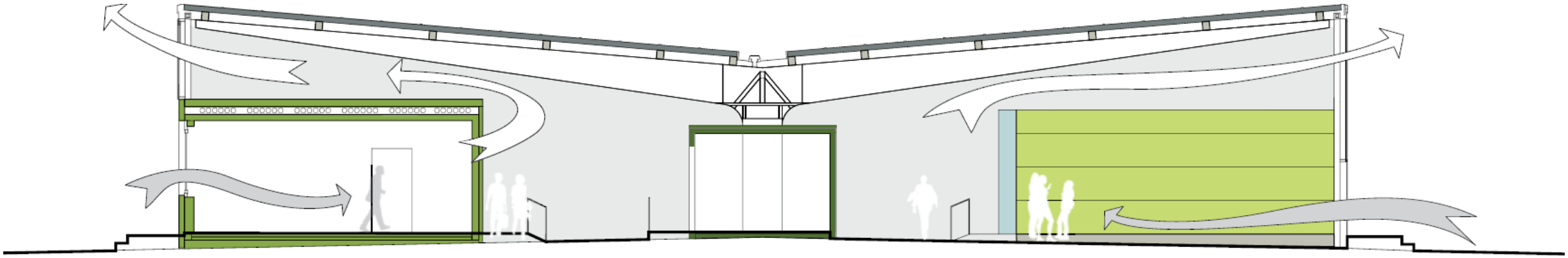

Refurbishment
Aktiv Stadthaus im Bestand

Aktiv-Stadthaus im Bestand, Frankfurt am Main

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Aktiv-Stadthaus im Bestand, Frankfurt am Main

Story

- Zukunft-Bau-Projekt established with „Aktiv-Stadthaus“ in 2012 – 2013 a basis for high efficient multifamily housing
- Now it‘s time to apply it to the inefficient building stock constructed between 1950-1969
- The environmental design approach building addresses both passive and active design features
- Concept should be
    - robust,
    - simple,
    - economic,
    - reasonable

      life-cycle costs (LCC)
- comparison between

  occupied and unoccupied building

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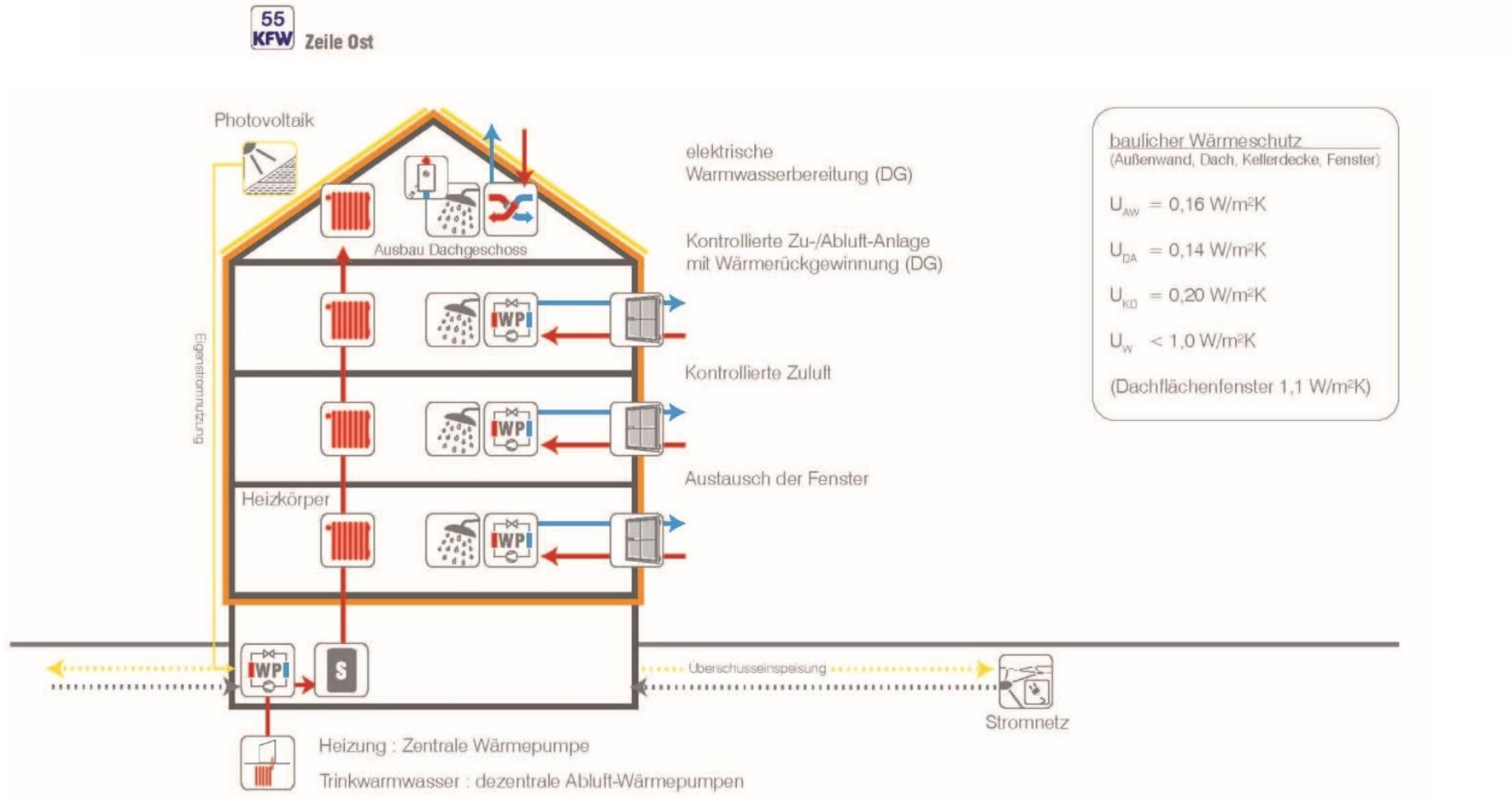

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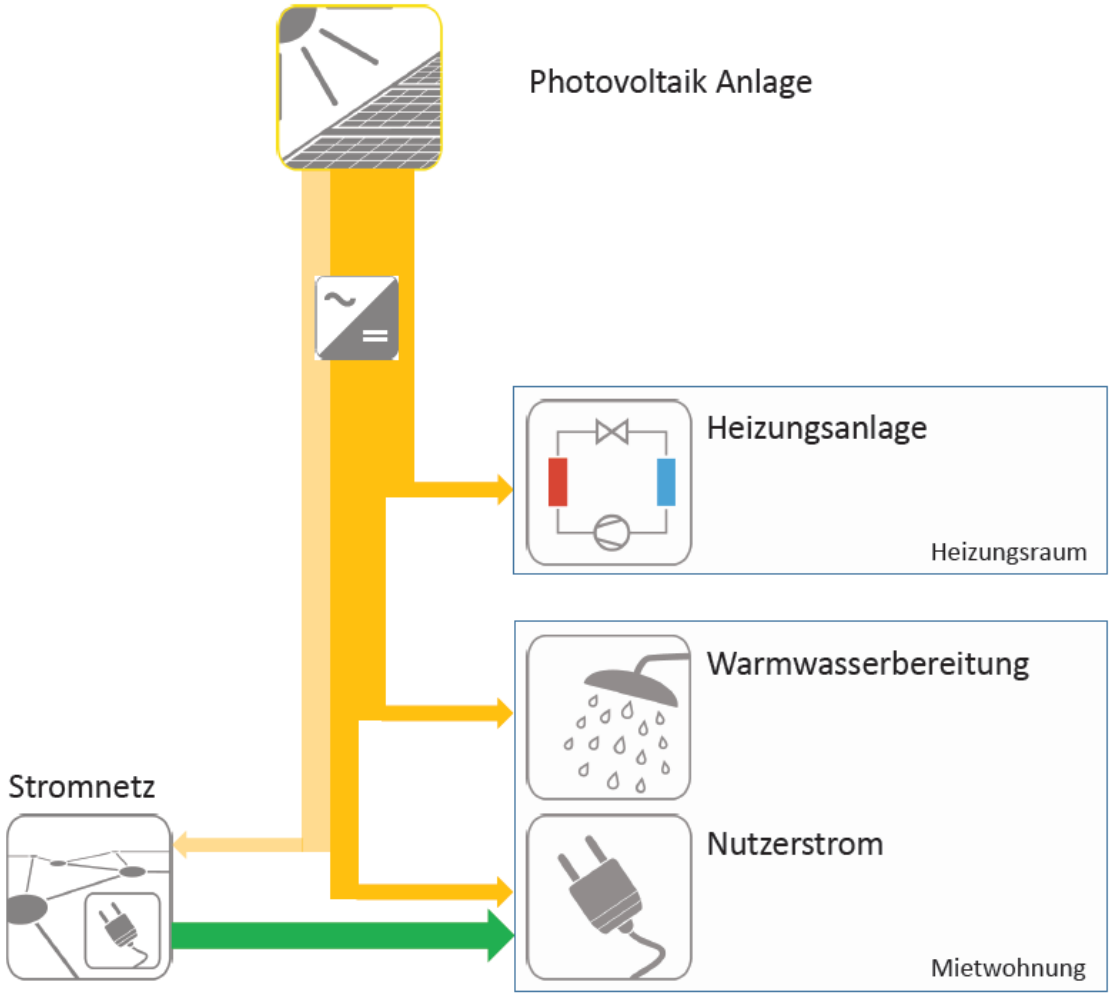

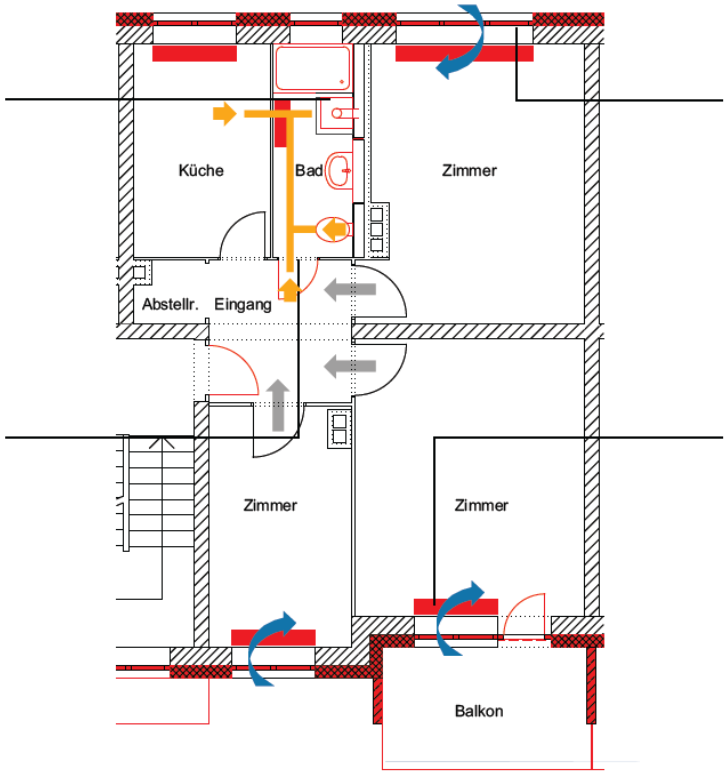

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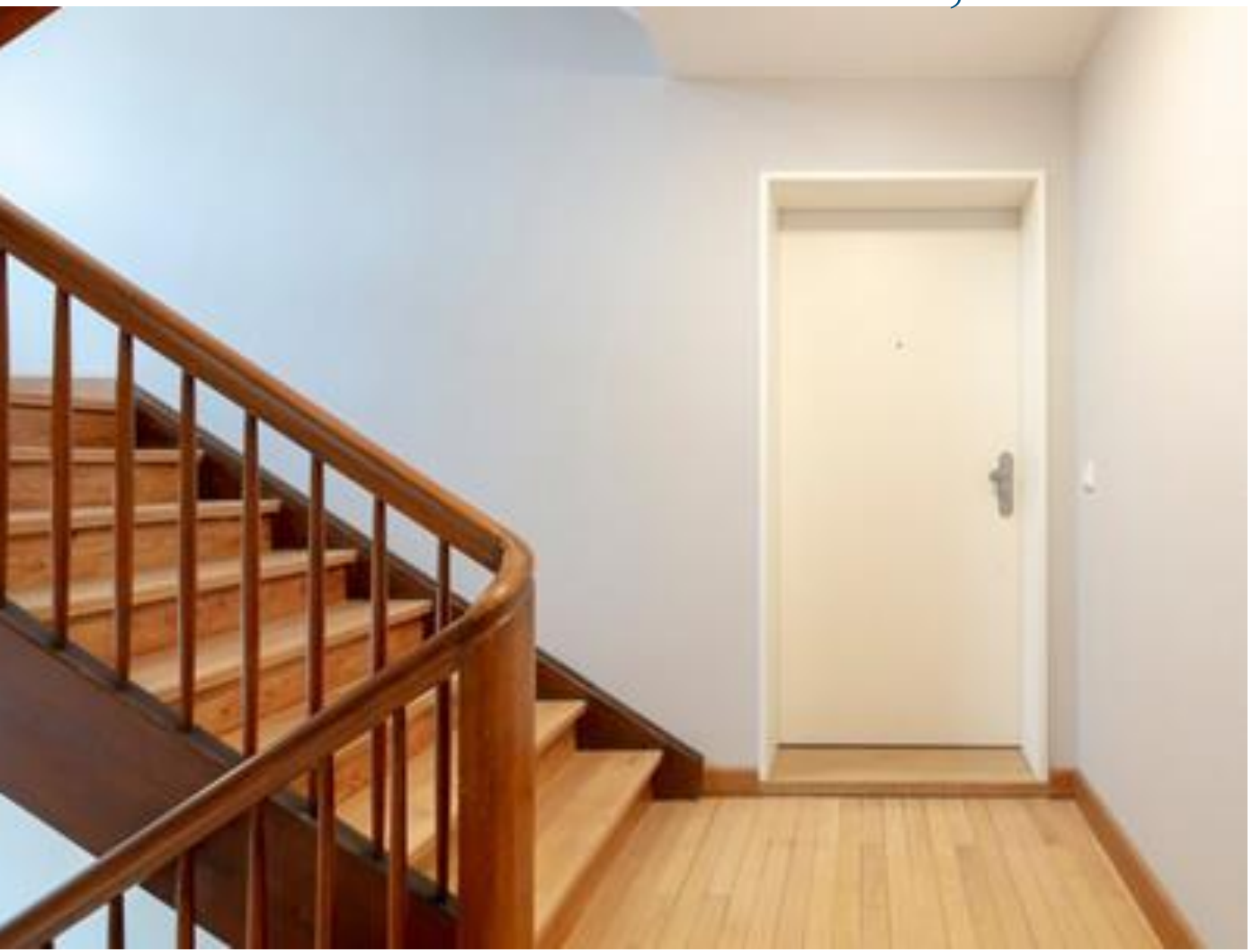

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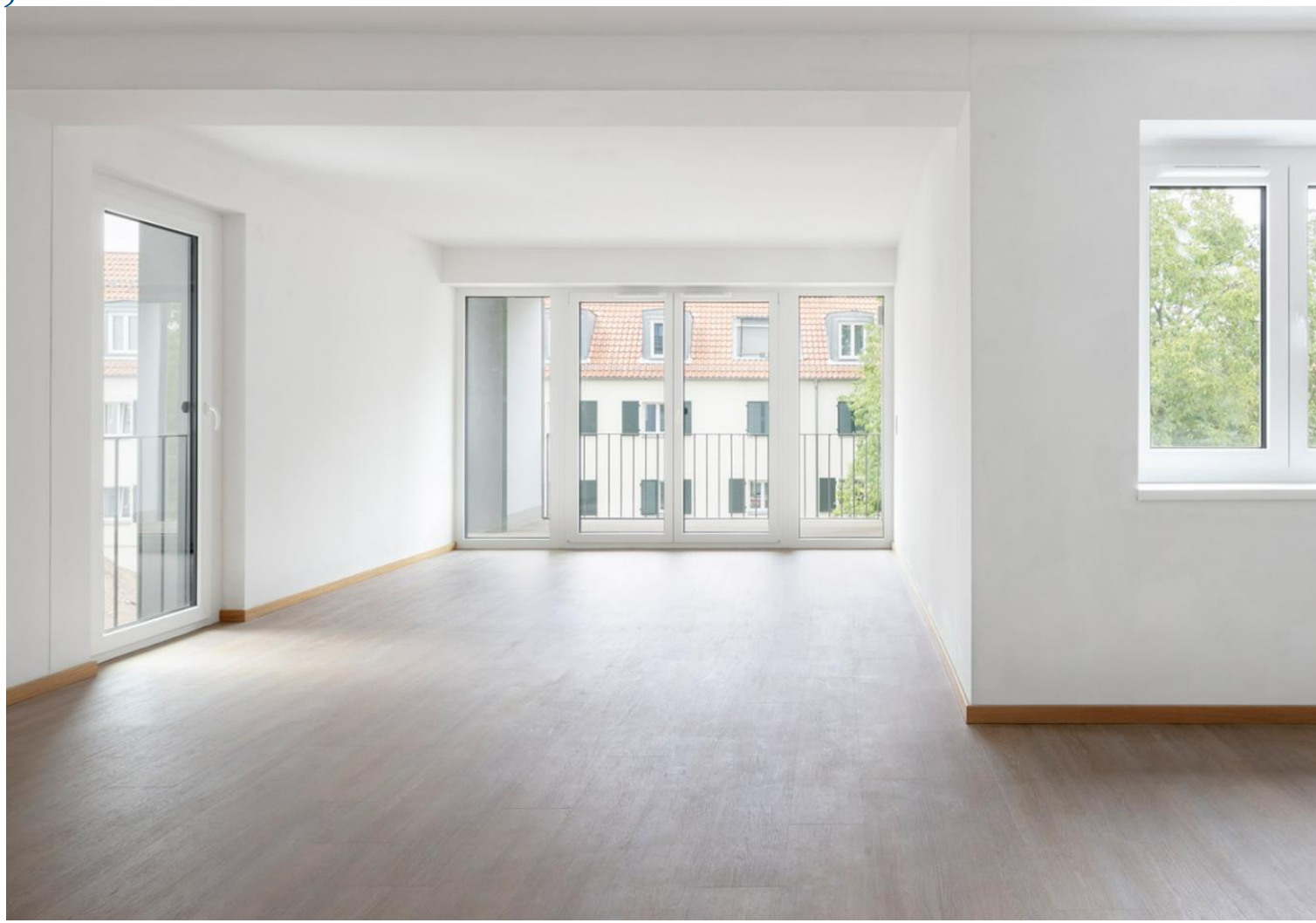

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Abbildung: HHS Planer + Architekten AG

Aktiv-Stadthaus, Frankfurt am Main

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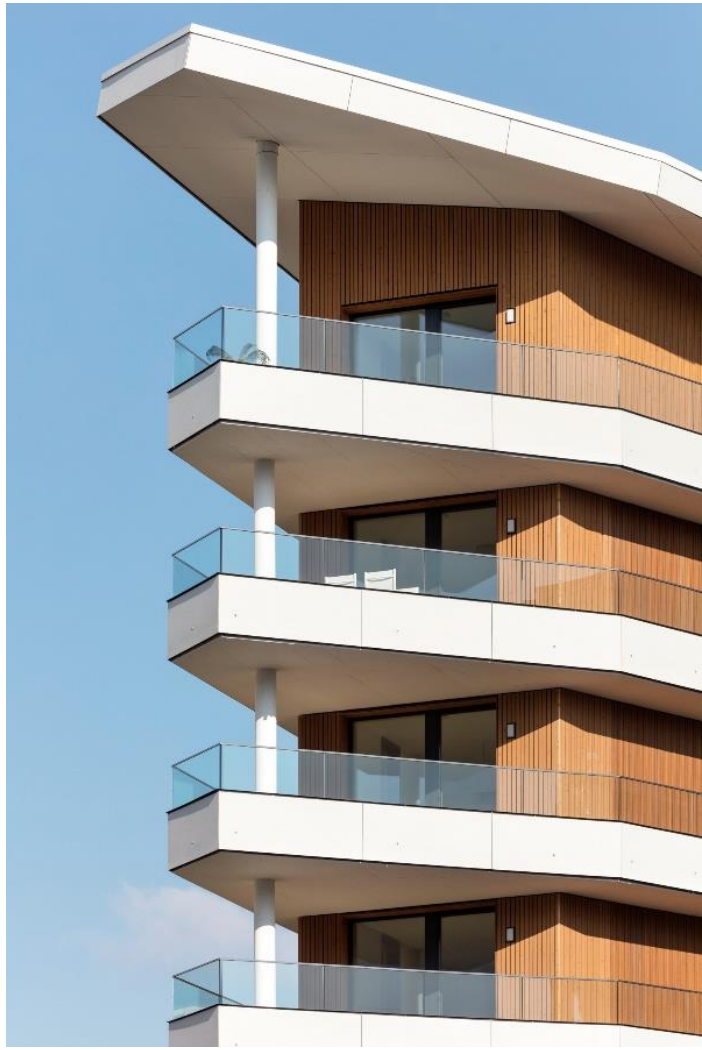

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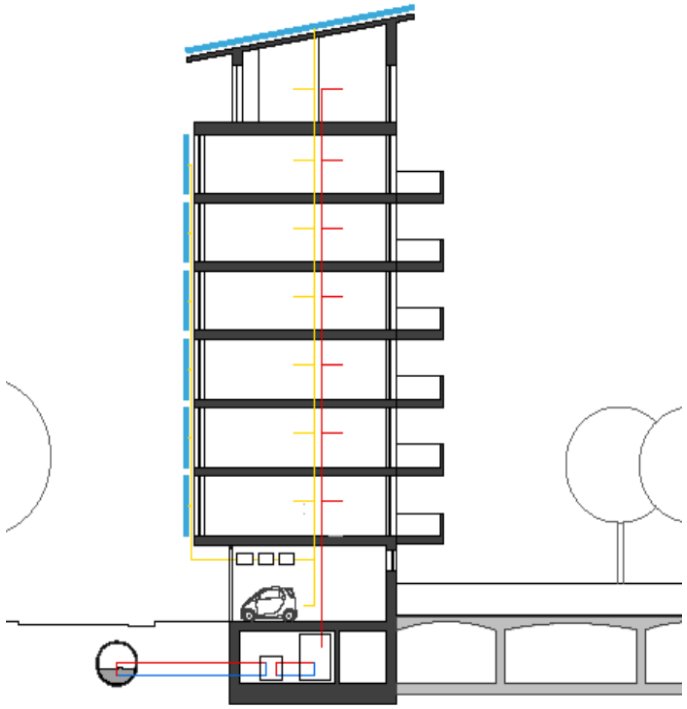

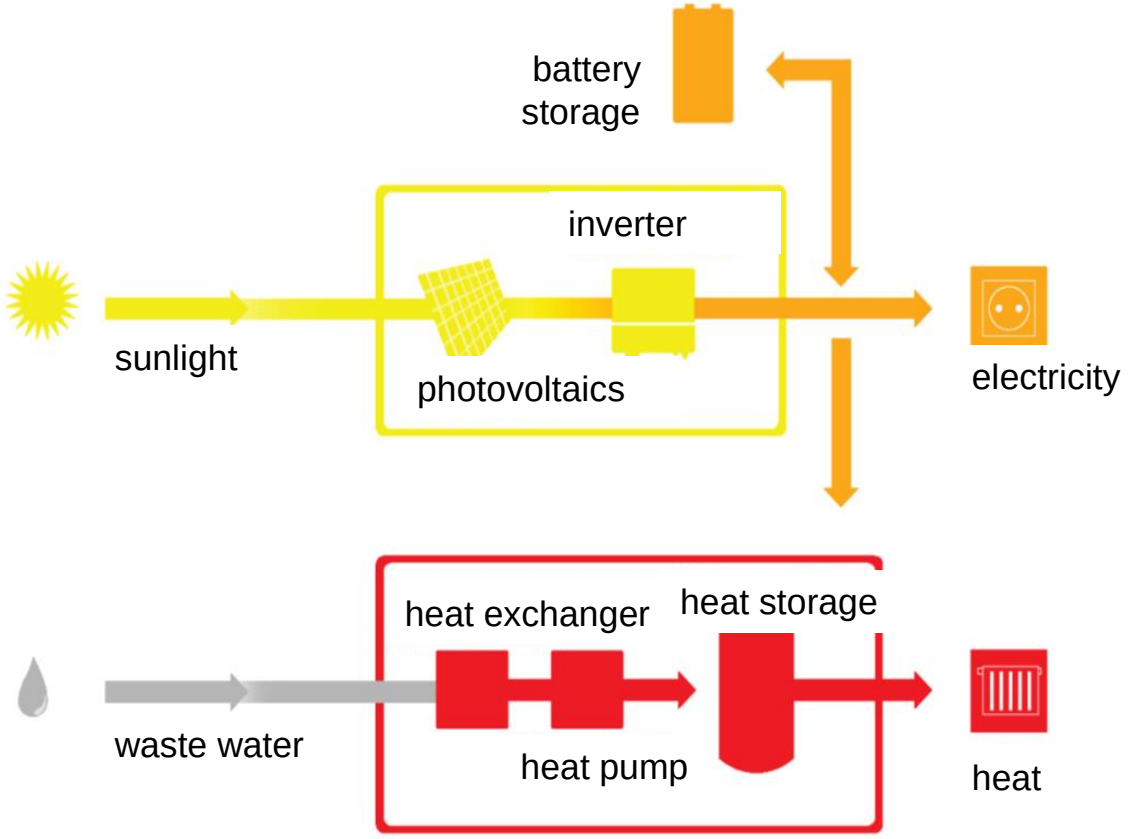

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Kreisarchiv, Viersen

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Ludwigshöhviertel, Darmstadt

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Abbildung: bau verein AG

Ludwigshöhviertel, Darmstadt

Goals

- carbon-neutral operation
- energy efficient buildings – KfW Effizienzhaus 40 Standard
- local Energy “harvesting” – PV on all roofs, heat pump (geothermal energy), CHP
- sector coupling – housing, businesses, mobility
- new Mobility Concepts – based on public transport, sharing, bikes and e-mobility

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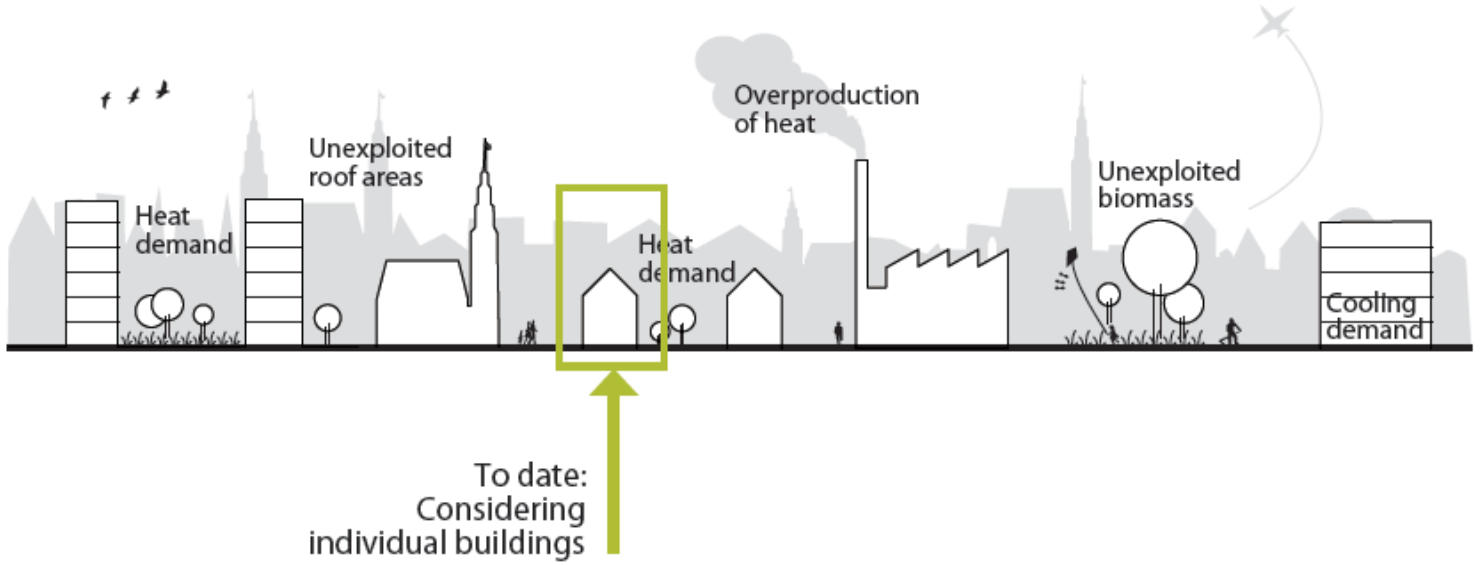
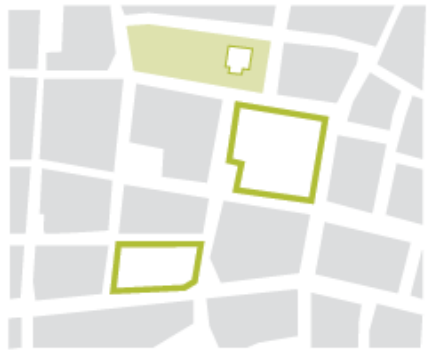
Ludwigshöhviertel, Darmstadt

Abbildung: HHS Planer + Architekten AG

Challenges

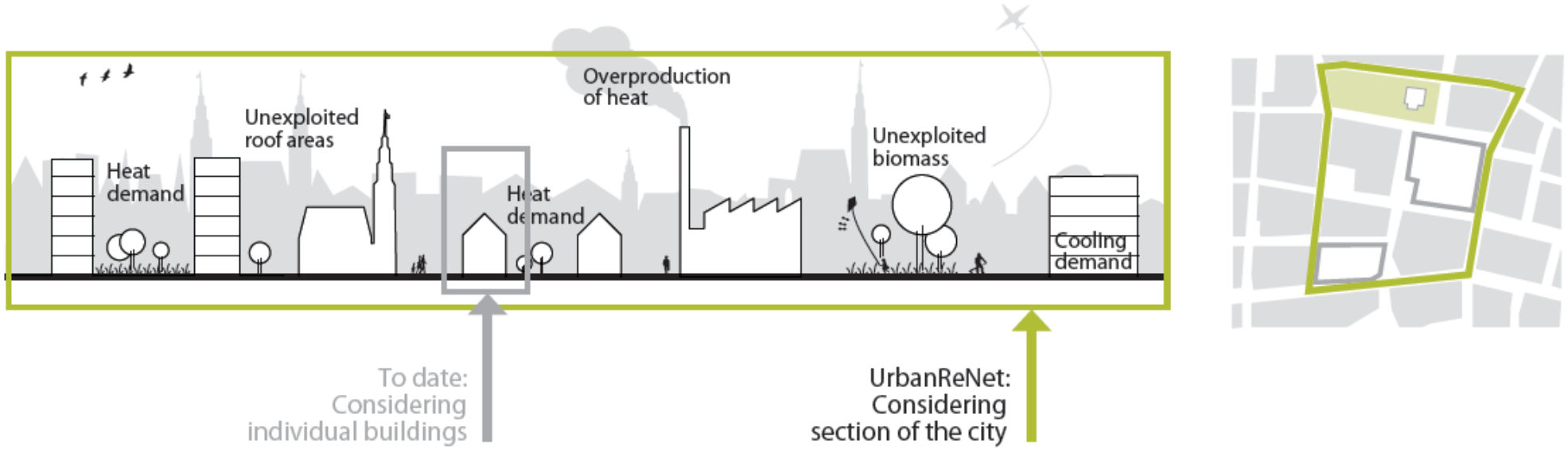
Challenges



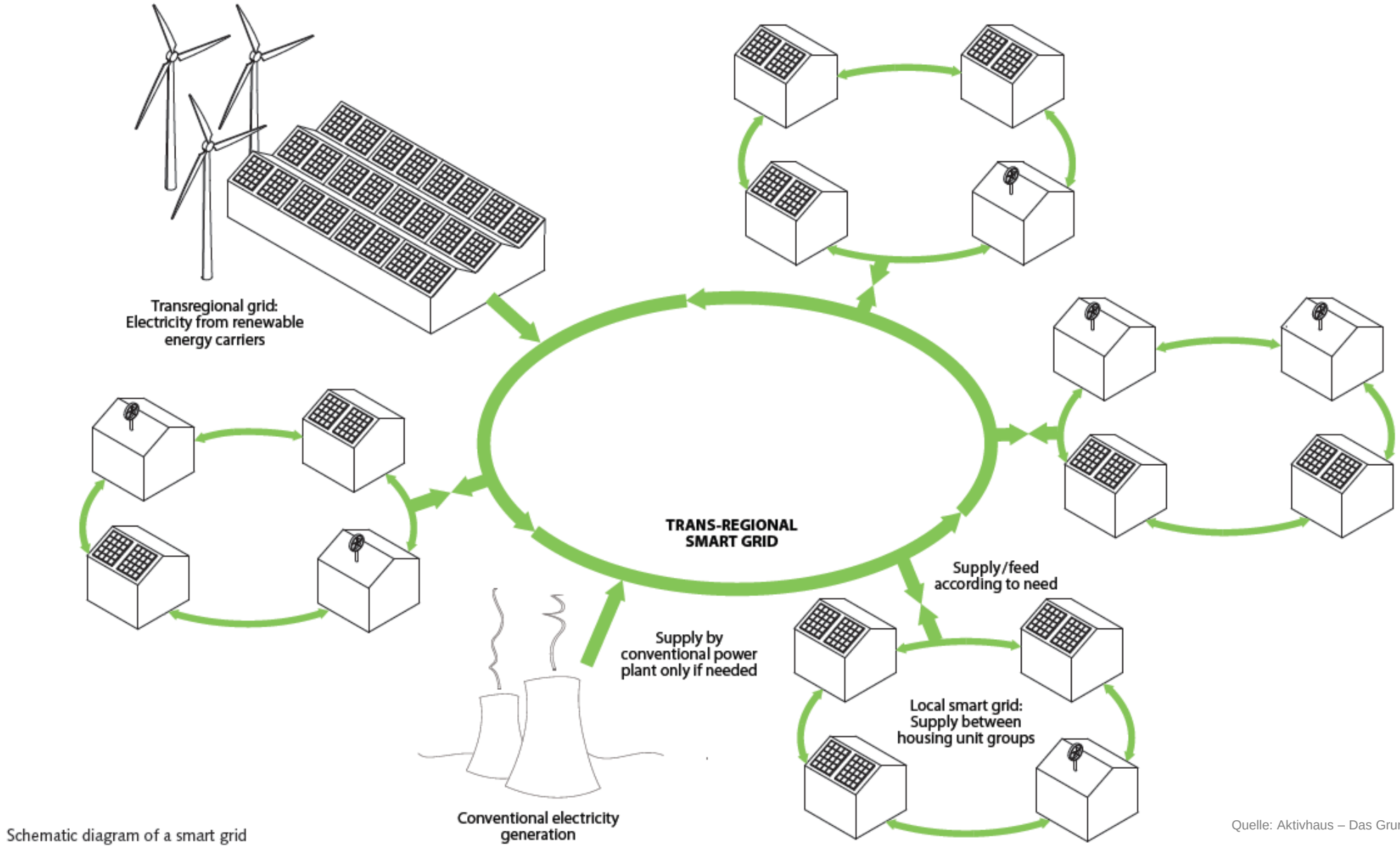


Quelle: Aktivhaus – Das Grundlagenwerk

Challenges



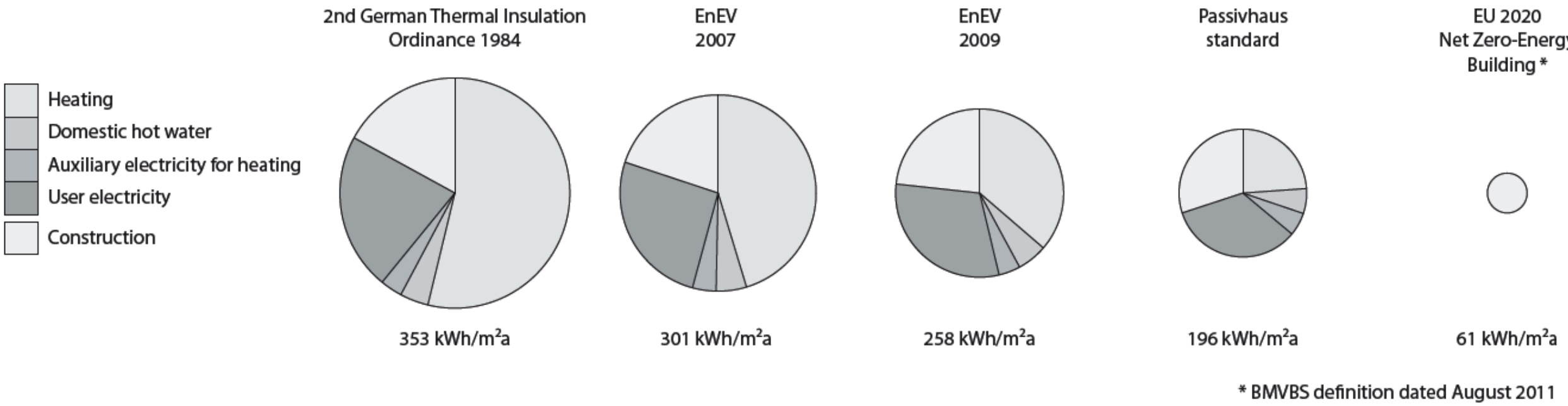
Quelle: Aktivhaus – Das Grundlagenwerk



Schematic diagram of a smart grid

Quelle: Aktivhaus – Das Grundlagenwerk

Challenges



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sustainability map

Strategies of building to conserve resources, sustainability map

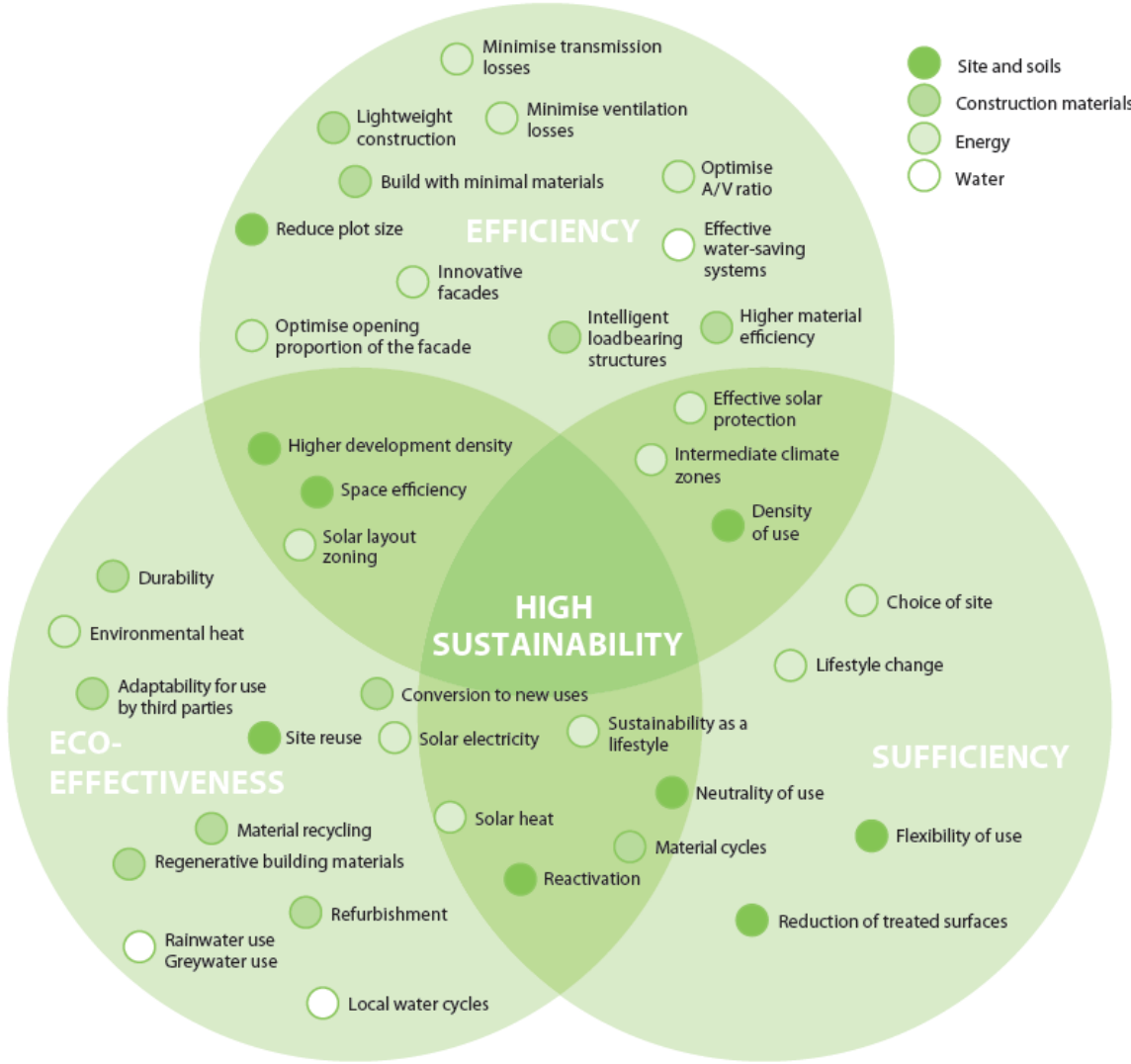

Abbildung: Aktivhaus; Das Grundlagenwerk

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Be smart