

TOWARDS A CERTIFICATION STANDARD FOR EUROPEAN CLIMATE NEUTRAL RESIDENTIAL BUILDINGS



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Purpose of the non profit foundation

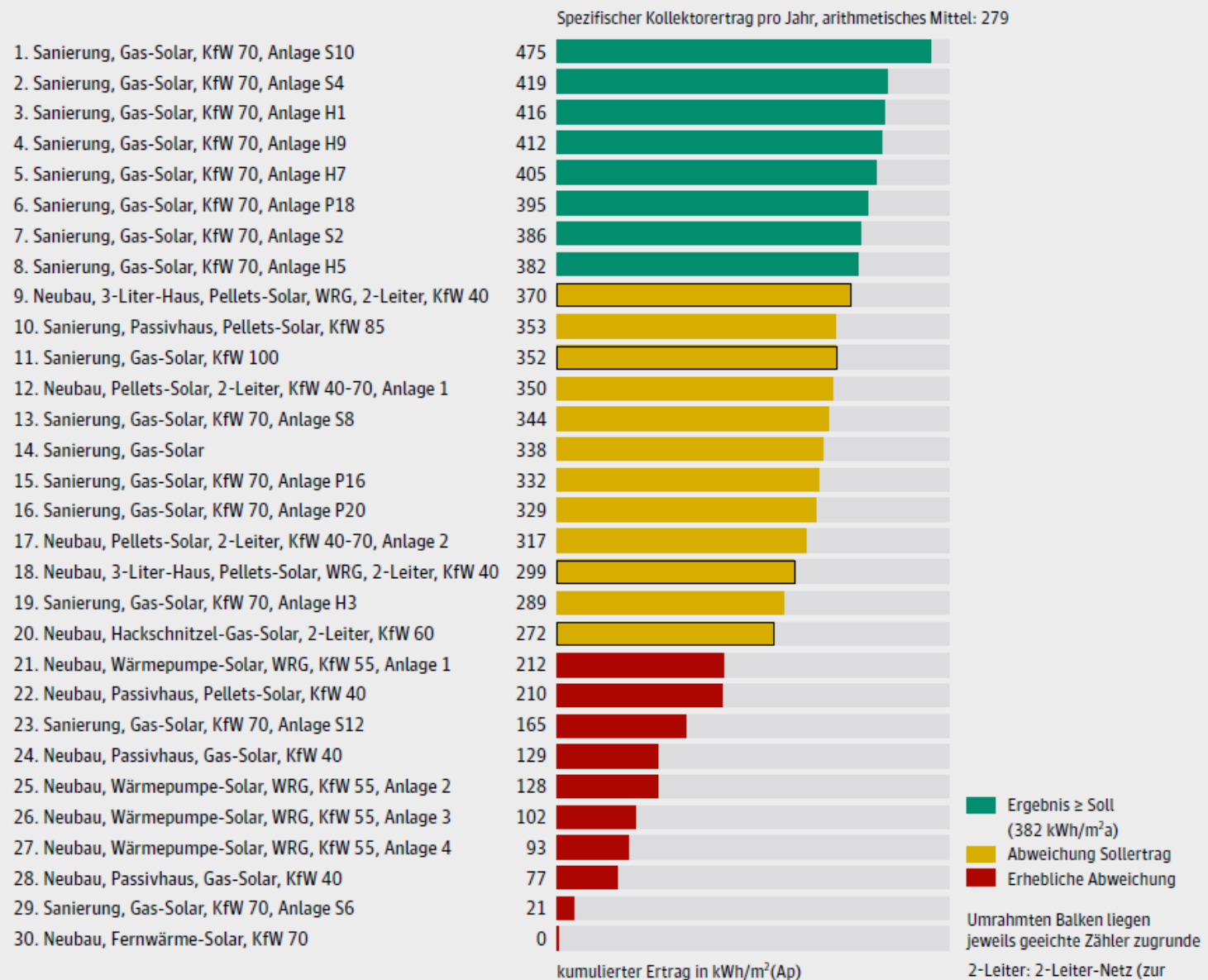
- Protection of nature and consumer
- Quality and efficiency in the building sector
- 100 % renewables asap
- Independent use of data as a common good



Activity: Monitoring



BEISPIEL FÜR EFFIZIENZPARAMETER: RANKING SOLARERTRÄGE

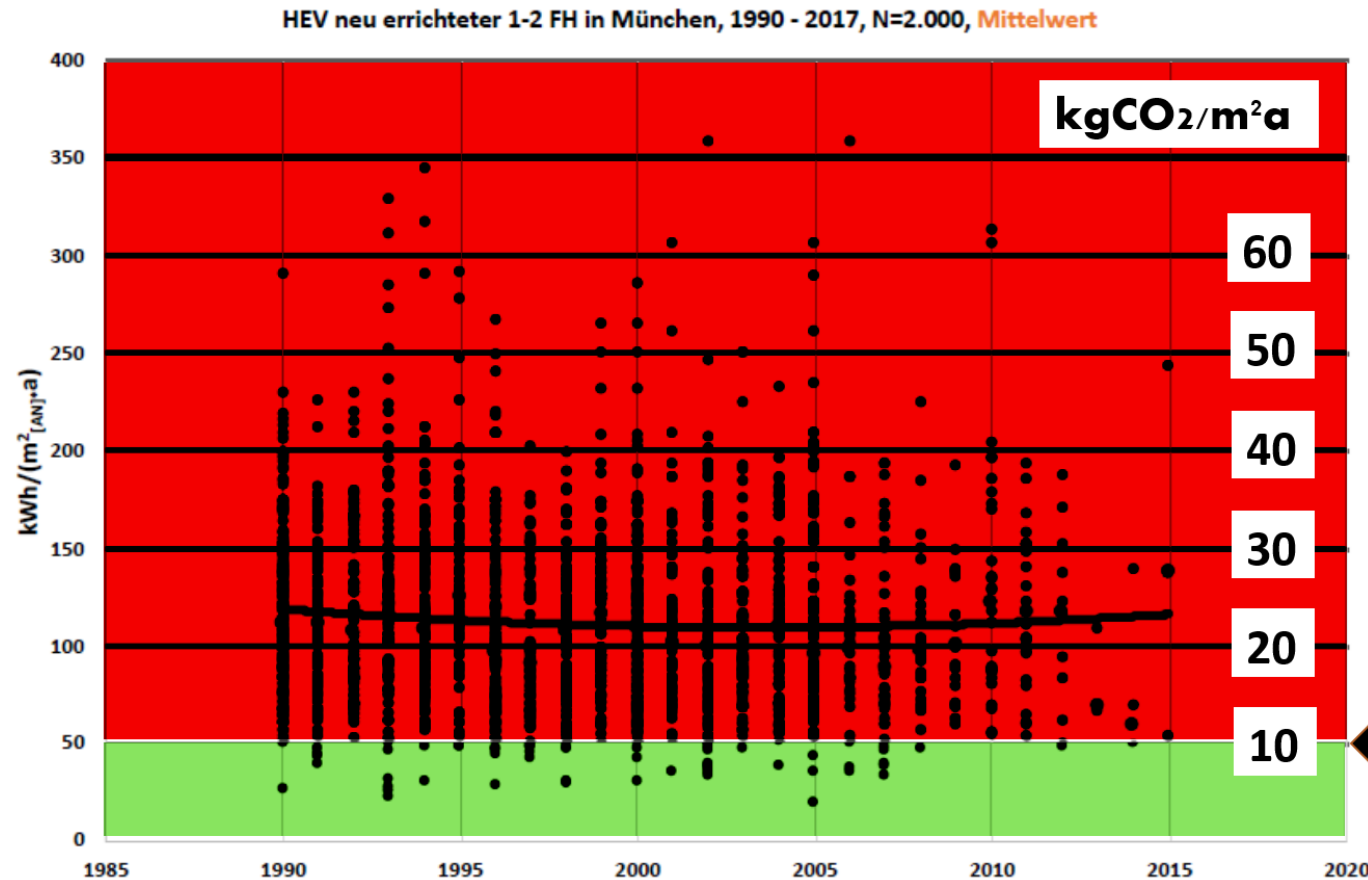


Dargestellt sind die spezifischen Solarerträge im laufenden Jahr, bezogen auf die Aperturfläche. Das Diagramm ist eine Trendaussage und bezieht sich auf den ungefähren Zeitraum. Ungenauigkeiten entstehen z. B. durch die nicht stichtagsgenaue Zählerauslesung. Die Sollwerte in solaren Garantieverfahren werden je Anlage

vereinbart. Die Werte werden durch die Auslegungsparameter, die Systemtechnik und das Risiko der Vertragspartner beeinflusst. Für eine laufende Überwachung und den Vergleich der Anlagen wird vereinfacht von Erfahrungswerten vermessener Anlagen und den Vorgaben der deutschen Förderung des Bundes ausgegangen.

Illustration of the "Implementation of the EnEV for newly built 1-2 family houses in Munich, average"

Data situation
example by
co2online



Data co2online /
SEnerCon

Assumption: Gas and
district heating with
approx. 10 kgCO₂/m²a
at 50 kWh/m²a

2 degree target (obsolete)
is met at a maximum of
10 kgCO₂/m²a

sdp participants

FEN Sustain Systems GmbH
– Green Energy Center Europe,
A-Innsbruck: Regional energy
monitoring,
**Fraunhofer Institute for Solar
Energy Systems ISE,**
D-Freiburg: Research for the
energy transition, **Fritz
Husemann GmbH & Co. KG,**
D-Gütersloh: Industrial energy
management systems,
**Gradeo Planung und Service
GmbH & Co. KG,** D-Ahaus:
Local and district heating,
system engineering,
greenventory GmbH,
D-Freiburg: Digital concepts
and scenarios,
HoWoGe Wärme GmbH,
D-Berlin: Energy management
of housing stock,
Peer4 GmbH, D-Waghäusel:
IoT for Existing Facilities,

**rapid prototyping
since 2020**

The open platform is being developed mainly on a voluntary basis, financed by donations and funds from participating stakeholders.





CO2-Avatar App

CO2-Avatar

DIE KLIMAWETTE
Wir machen's jetzt einfach!

comgy **CO₂COMPASS**

T·Systems **Stiftung EnergieWende**



WP-Cockpit Website

WP-Cockpit

energieagentur st. gallen **Engelmann**
an der Hochschule für Technik HTW

Fraunhofer ISE **Stiftung EnergieWende**



im Prototypbau

climate neutral buildings

greenventory **HOWOGE** **SKOPOS** **Stiftung EnergieWende**



in Vorbereitung

Open-Data Initiative für kommunale Klimaneutralität

Offene Angebote für Klimaräte, Bürger*innen und Kommunen
Eine Initiative mit GermanZero, Klimawatch und OK-Lab Karlsruhe

☐ Sustainable Data Platform

Open "data toolhouse" for evidence-based action and business models geared to it

At the core of the platform is valid data for evidence-based decisions to achieve affordable climate neutrality

Information:
sdp Code of Conduct
sdp self-image
sdp specification and data use
sdp Startup Methodology
sustainable-data-platform.org



Prototyp Testing

Climate neutral buildings

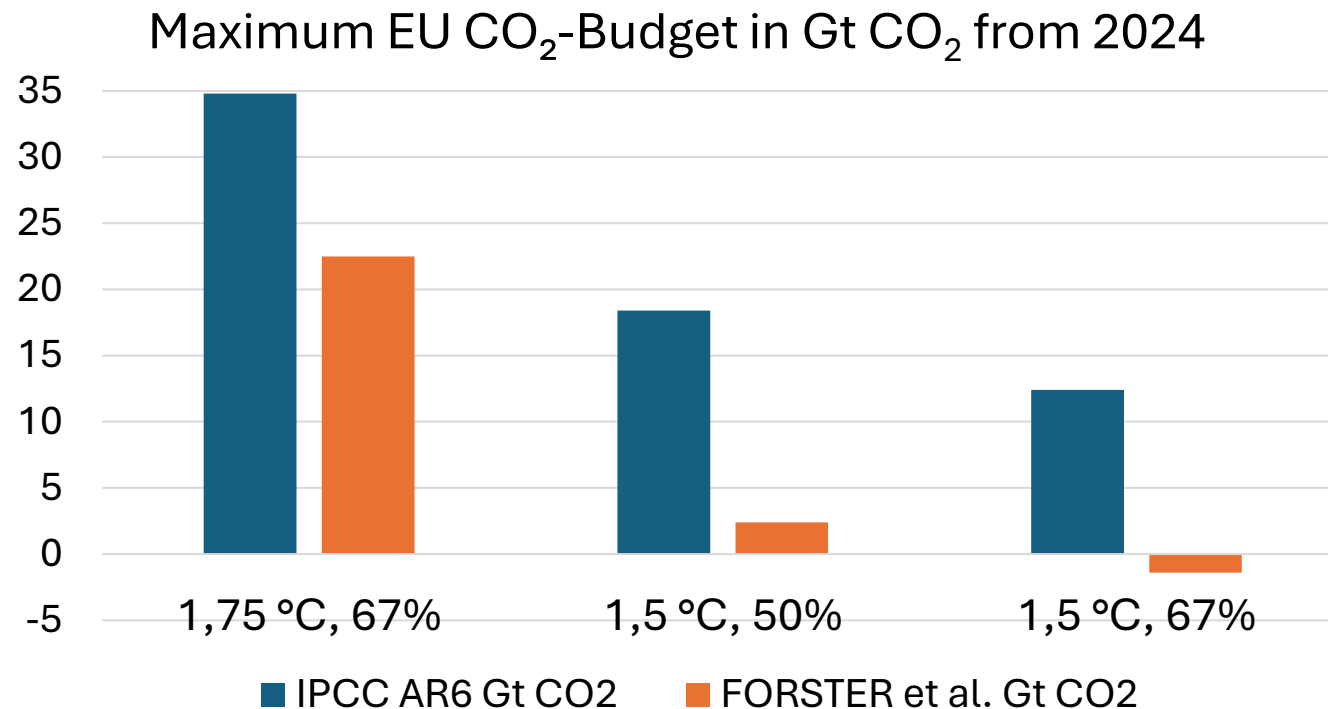
Teilnehmen um für einen Gebäudebestand, ein Quartier oder eine Kommune zeitnah bezahlbare Klimaneutralität zu erreichen

  **SenerCon**

Mitmachen

EU27 GHG emission 2022 (edgar): **3,6 Gt per year**
app. **40% building sector**
(14% direct, 15% indirect, 11% construction)



EU GHG Budget endangered

Findings

Analyses indicate gaps in achieving European and national climate protection targets and performance at building level.

Typ. performance gaps

SCOP: 2.5 (4.1) [-]

(O´Hegarty)

25 (60) % saving (Massimo)

Missing Net Zero Orientation

Findings

Target costs 80 m² apartment (D):
40 – 80 EUR per month (ReConGeb: tenant share)

Recent development: > **200 EUR per month**
(with regional variation)

For transition systems with district heating, heat pumps and hydrogen that are not embedded in **evidence-based regional strategies**, we expect heating costs and energy poverty to rise sharply by 2035

9.1% of EU households couldn't heat their homes in 2022 (tendency: rising). **Energy poverty** sharpens political “multi crisis”.



Findings

Increasing gaps lead to **pressure on actors**: Uncertified GHG emission factors and GHG reporting standards (e.g. municipal BISCO / GPC) enable “**wild west**” in methods.

While numerous initiatives like the **UN data revolution (2014)** call for feedback mechanisms and harmonized reporting standards (e.g. SDG process) the Paris Goal still remains a “disembeddet target”.

biomass ?
30 or 370 g CO_{2e}/kWh_{th}

district heat ?
6 or 240 g CO_{2e}/kWh_{th}

Window of opportunity in European ESG Regulation

SCDDD: Sustainability Due Diligence Directive

Key aspects (EU Commission's proposal)

Comprehensive due diligence obligations for the environment and human rights
National supervisory authorities in an European network
[Linking to the Paris Climate Agreement](#)
Civil liability

EU Taxonomy

Environmental targets [EU taxonomy](#)

1. [Climate change mitigation](#)
2. Adaptation to climate change
3. Sustainable use and protection of water resources
4. [Transition to a circular economy](#)
5. [Prevention and reduction of environmental pollution](#)
6. Protection of healthy ecosystems and restoration of biodiversity

Criteria: One contribution + “do not significant harm” principle + “minimum standards”

RED III

42.5 % share of renewables in 2030

49 % share of renewables in the building sector in 2030

CSRD: Corporate Sust. Reporting Standards

Environmental

[Climate-neutral real estate](#)
[Green areas](#)
[Green leases](#)
[Use of renewable energy](#)
Conservation of resources
[Heat efficiency](#)
Water & waste management
[Circular economy](#)

Social

Diversity
Inclusion
[Social housing](#)
senior housing
Student housing
[Municipal development](#)
Accessibility
[user-friendliness](#)
Safety in the building
Mobility offers

Governance

Exclusion criteria like child labor
Governance guidelines
Sustainability management
Implementation of sust. criteria
[Values management](#)
Compliance
[Transparency](#)

SFDR: Sust. Finance Disclosure Reg.

Categories of financial products

Article 6: "normal" funds (place no or no official emphasis on environmental or ethical aspects)
[Article 8](#): Light green financial products, funds take environmental and/or social aspects into account (also advertised as ESG products).
[Article 9](#): Dark green financial products, funds must pursue explicit sustainability goals with their investment instruments (e.g. reduction of CO2-emissions)

EPBD

Energy Performance Certificates (EPCs) shall [reflect the as-built state](#).

Inspections of heating and cooling systems

Databases

What we do

Monitoring of energy and efficiency using the open sdp-standard with publication of real housing emissions



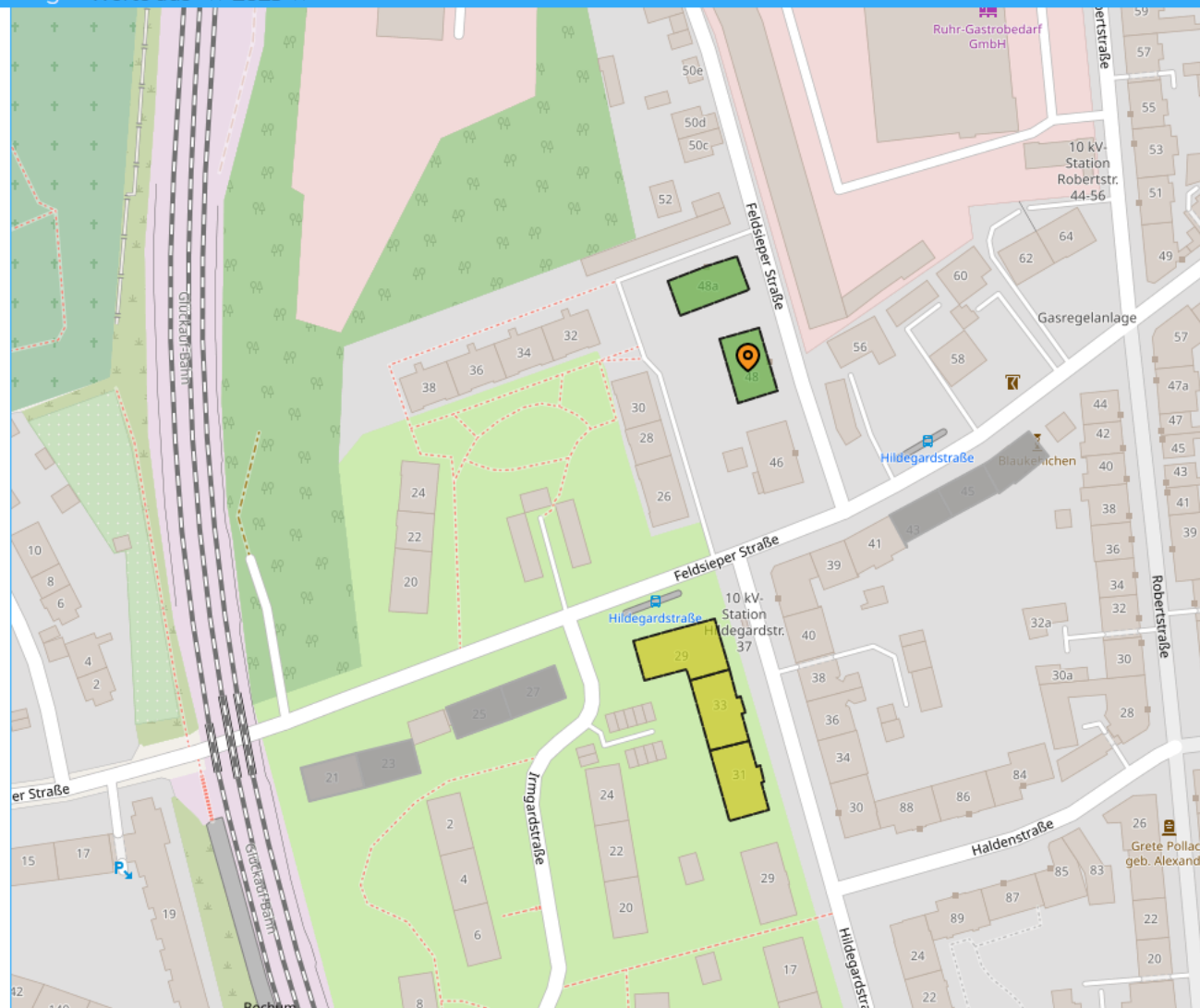
climate-neutral-buildings.org (BETA)

	Diese Anlage
Strom Hz	16,5 kWh/a
Strom TWW	10,6 kWh/a
Gutschrift PV	-19,0 kWh/a
Summe	8,2 kWh/a
CO ₂ -Emissionen	3,3 kgCO ₂ /a

[kg CO₂/(m²a)]

< 5 10 15 20 25 30 35

Datenqualität: A D



Anlagenzuordnung	GMH 2020
Wohneinheiten	14
Wohnfläche [m ²]	873
Kompaktheit [m ⁻¹]	0,39

Dämmqualität HT [W/(m²K)]	KfW 40 (2019)
Heizwärmebedarf [kWh/(m²a)]	26,5
Lüftung	dezentrale Abluft mit WRG
Heizungssystem	2 Luft-WP, Heizstab 18 kW
Heizflächen	Fußbodenheizung
Speichervolumen [Liter]	2000
Warmwasser	zentral, Nacherwärmung
PV-Anlage [kWp]	18,2

↓ Messschema Wärme/Strom

Details

CNB App

← → ↺

https://climate-neutral-buildings.org/cnb-app/efficacy

80%

🏠 👤 ⚙️ ⚠️ 📊

BOCHUMER WOHNSTÄTTEN - climate neutral buildings

real-housing-emissions

Bestandsportal

Monitoring

Messwerte

CO₂-Trend

Öffentliche Karte

Monitoring-Report: Wärmepumpe

Dargestellt sind in der Balkenansicht nach Datenverfügbarkeit Jahres- und Monatswerte (schmale innere Balken). Trendpfeile der Arbeitszahl zeigen den Vergleich mit dem vorletzten Bezugszeitraum. Die zusätzlichen Effizienz-Kennwerte beziehen sich wahlweise auf Vormonat oder Jahr.

Arbeitszahl WP 2024 / 3

Beginnenhof 2

🏠 👤 ⚙️ ⚠️ 📊

4,1

JAZ

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EUR/(m²a)

--

kg CO₂/(m²a)

Waldring 119a, 119b

🏠 👤 ⚙️ ⚠️ 📊

3,2

JAZ

--

EUR/(m²a)

--

kg CO₂/(m²a)

Feldsieper Str. 48a

🏠 👤 ⚙️ ⚠️ 📊

Vormonat:

⚡

43,8

kWh/kWp

📊

45,8

EVA %

%

27,6

AUT %

🔑

0,0

Heizstab %

3,0

JAZ

--

EUR/(m²a)

2,5

tCO₂/a

Feldsieper Str. 48

🏠 👤 ⚙️ ⚠️ 📊

Vormonat:

⚡

50,6

kWh/kWp

📊

56,7

EVA %

%

41,0

AUT %

🔑

0,0

Heizstab %

2,8

JAZ

--

EUR/(m²a)

2,5

tCO₂/a

Feldgartenweg 13, 15

🏠 👤 ⚙️ ⚠️ 📊

2,6

JAZ

--

EUR/(m²a)

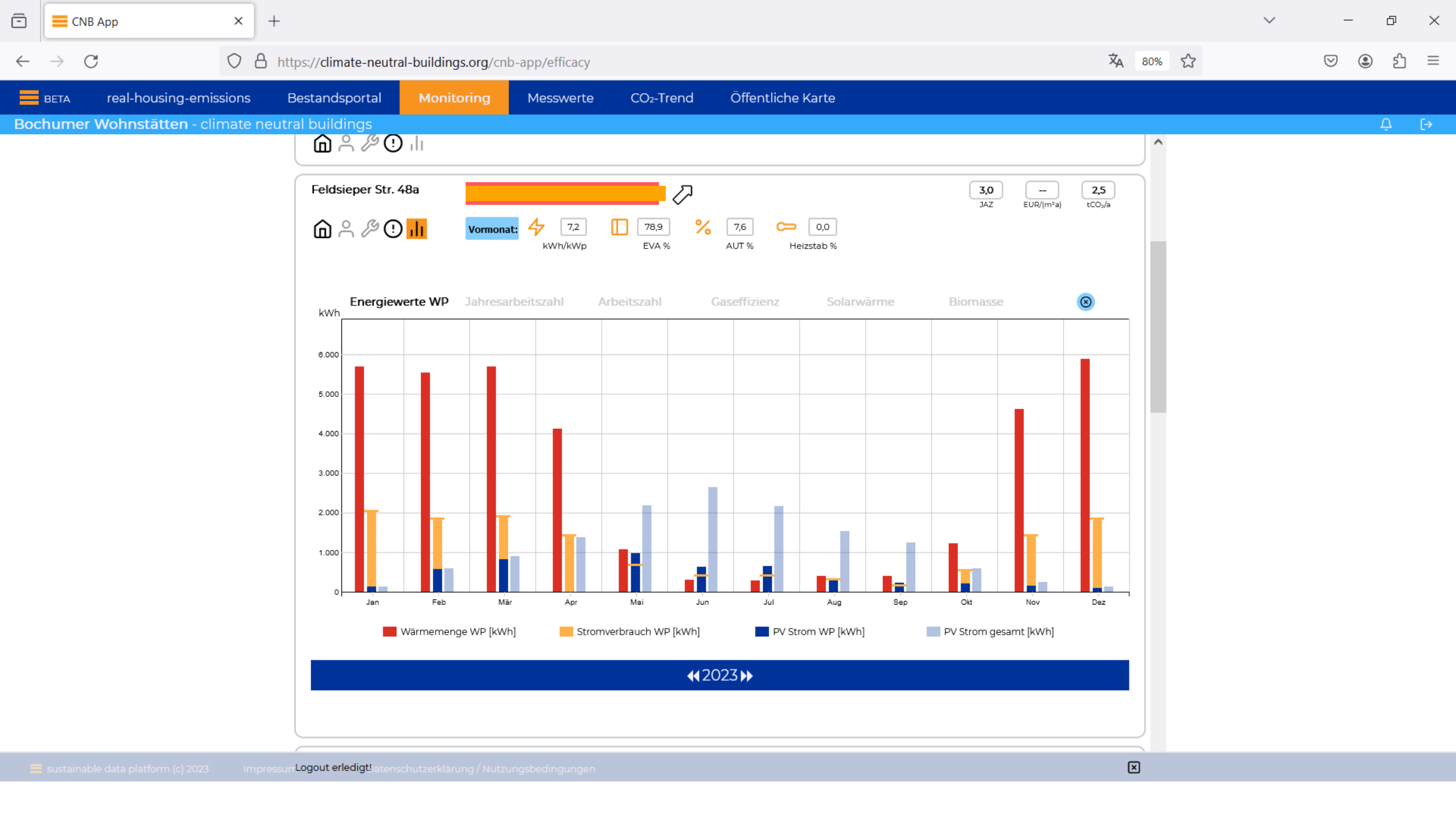
0,4

tCO₂/a

sustainable data platform (c) 2023

Impressum

Datenschutzerklärung / Nutzungsbedingungen



Für klimaneutrale Gebäude und bezahlbare Heizkosten.

CO₂: Ihr persönlicher CO₂-Fußabdruck Mit dem [CO₂-Avatar](#) kann der persönliche Pfad zur Klimaneutralität bestimmt werden. Zur CO₂-Reduktion können rund 30 einfache Alltagsmaßnahmen ausgewählt werden.

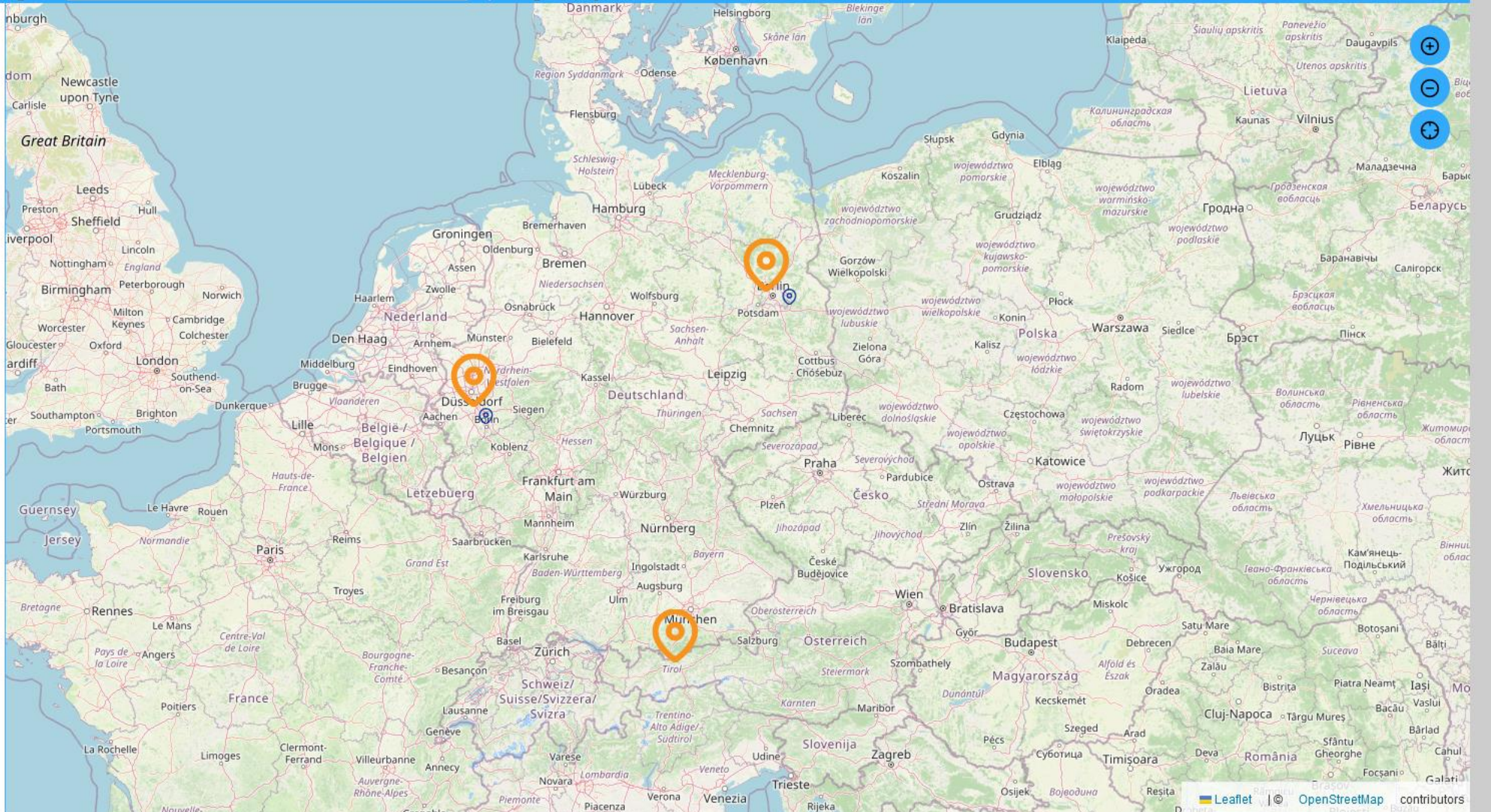
FW: Saubere und bezahlbare Fernwärme Fernwärmekunden erhalten Tipps zur Einsparung von Kosten und CO₂. Die für Fernwärme oft unbekannten CO₂-Emissionen von Gebäuden werden dargestellt. [Mehr...](#)

WP: Effiziente Wärmepumpen Wärmepumpen müssen ihrer wichtigen Rolle im Energiesystem der Zukunft ausreichend gerecht werden. Zunächst werden private Haushalte mit neuen Wärmepumpen unterstützt. [Mehr...](#)

Die [sustainable data platform](#) ermöglicht den Soll-Ist Abgleich für die Klimaschutzziele von Gebäuden. In den prototypischen [sdp info-cornern](#) stehen Ihnen erste persönliche Beratungsangebote zur Verfügung:



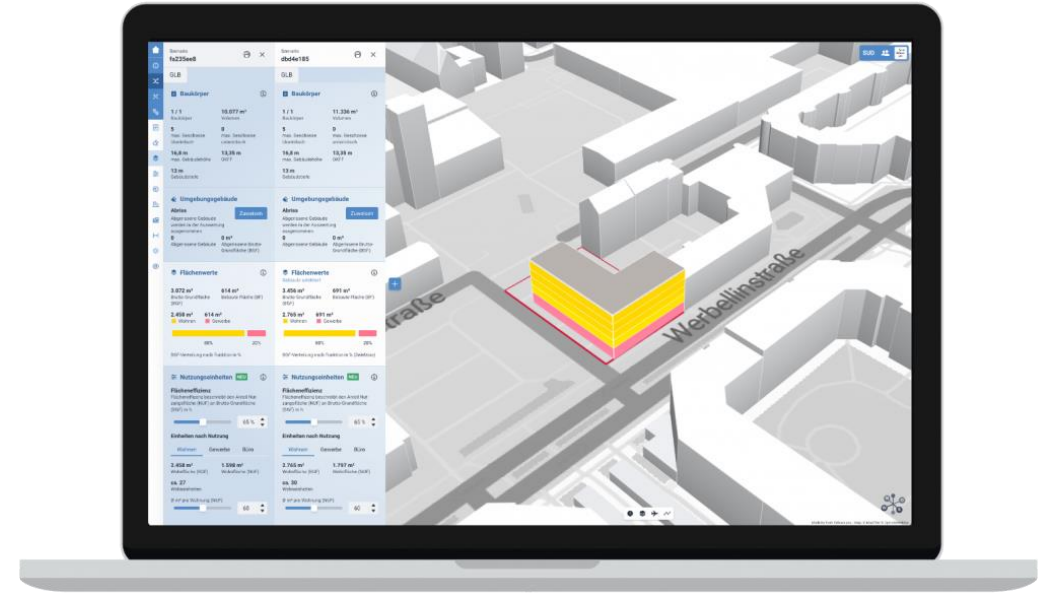
Die codexbasierte sustainable data platform steht Multiplikatoren zur Nutzung ihrer offenen Tools zur Verfügung. Die ehrenamtlich geleitete Plattform freut sich über Spenden.



climate-neutral buildings

What we do

Exchange of platform informations
for decisions at regional planning
and building level



source: formfollowsyoud.com



source: climate-neutral-buildings.org (BETA)



**certified exchange of
valid sustainable data**

climate-neutral buildings

What we plan: Evidence based building modelling

in cooperation

Prof. Dr. Katharina Gapp-Schmeling D-Berlin, Izes

Katharina Gebhardt, Architect, D-Magdeburg

Dr. Burkhard Schulze Darup, Architect, D-Berlin

Prof. Dr. Dieter Wolff, D-Wolffenbüttel, Ostfalia University

Analysis of (residential) building modelling

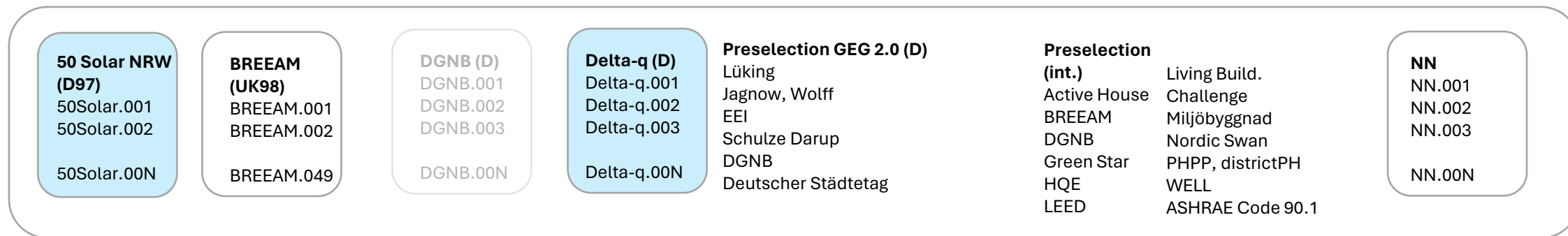


Problems

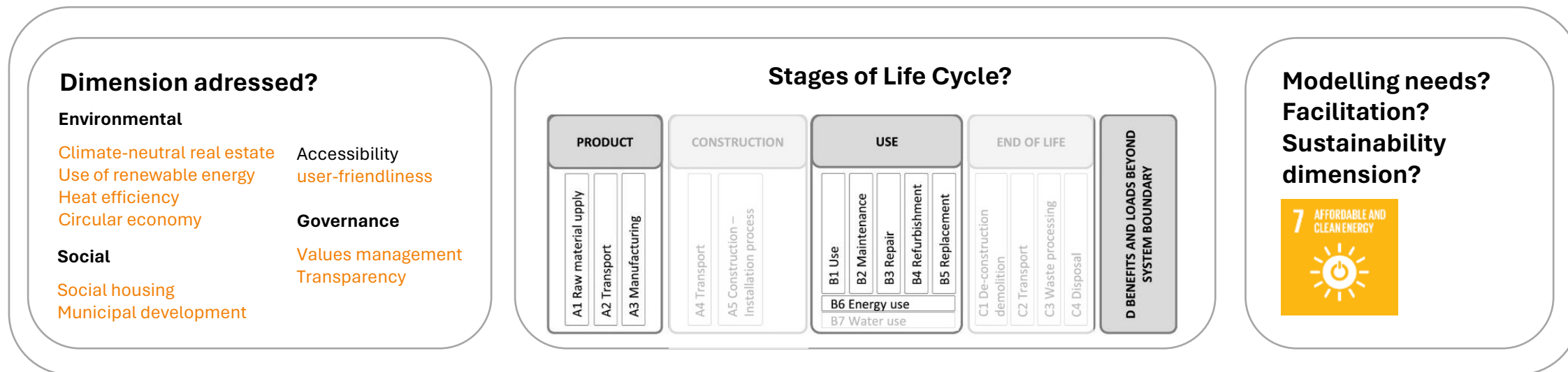
- Theoretical approaches with producer lab. values
- Missing net zero orientation
- Missing inclusion of GWP (emission from construction)
- Overcomplexity
- Missing integration of monitoring and optimization



Review of calculation methods and KPIs

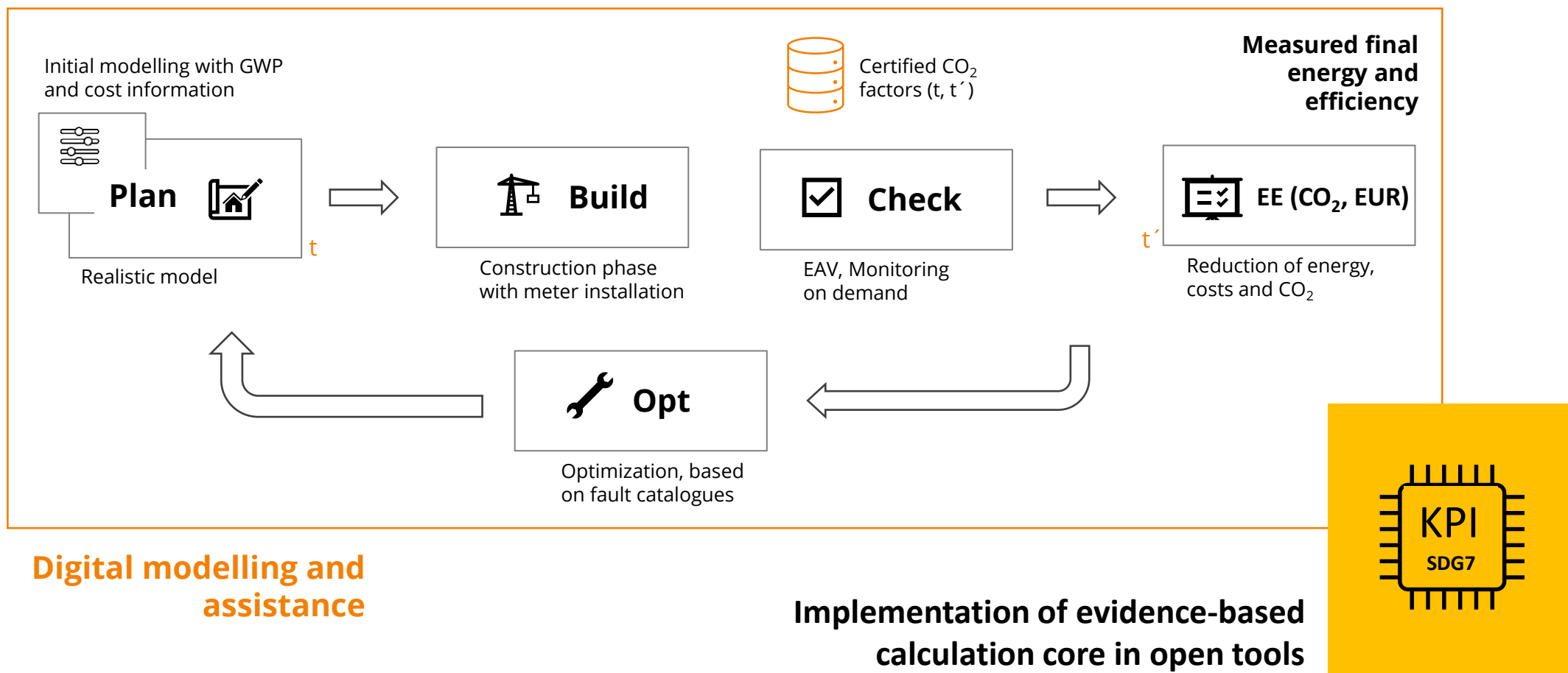


Identification of evidence based elements



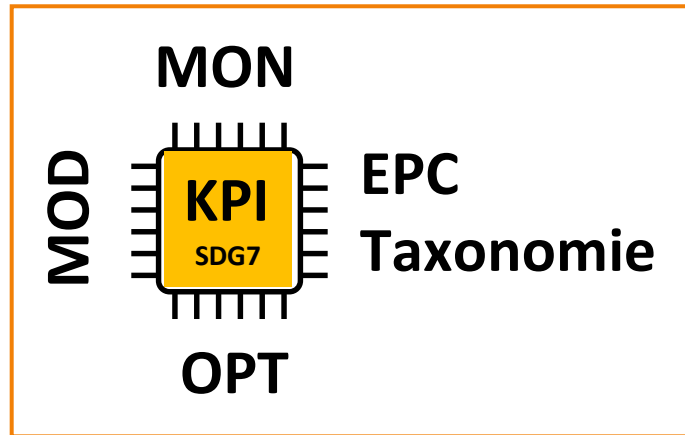
KPI harmonization

What we plan



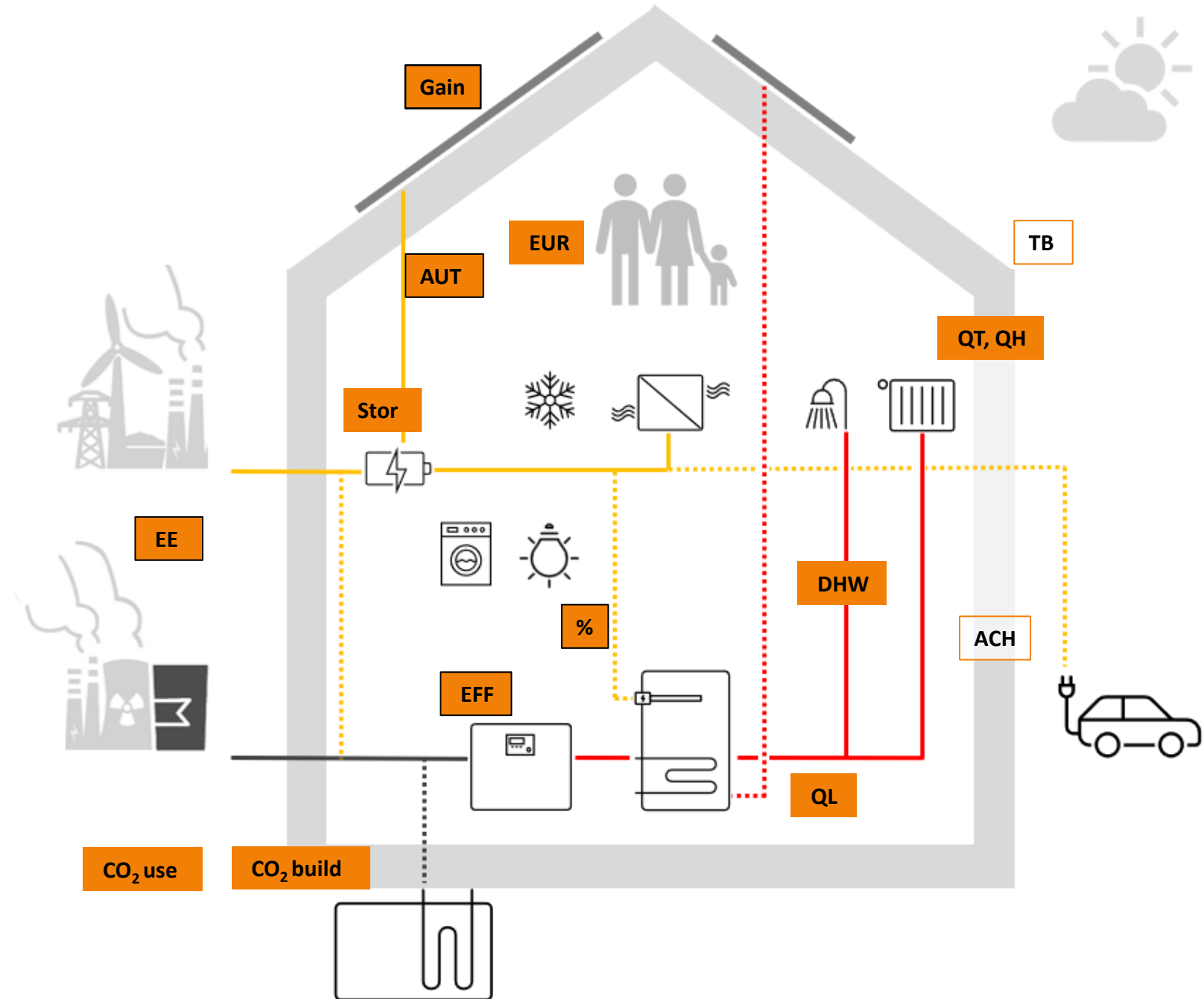
 climate-neutral buildings

Standardization of KPIs



system boundaries and metering systems

ISEC 2024, 3rd International
Sustainable Energy Conference,
10 - 11 April 2024, A-Graz



Data Collection

energy supplier data

open-data-tools

sdp-tools

Public databases

IoT field devices

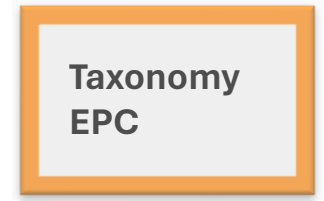
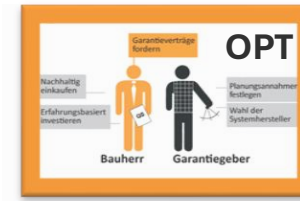
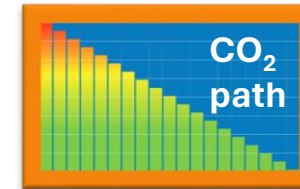
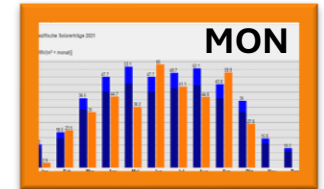
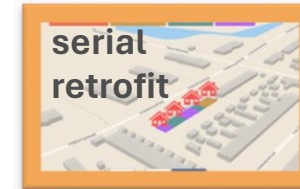


Validation and Processing



High
Resolution
data

Tools for Digital Assistance



Thank You

sdp participants

The prototype platform is being developed mainly on a voluntary basis, financed by donations and funds from participating stakeholders. The design thinking process focuses on people, building owners and local authorities who have started to implement evidence-based climate protection. Companies, energy agencies, institutes and non-profit foundations with many years of experience in climate protection and digitalization work together at the sdp under the sponsorship of the Energy Efficiency Foundation. This "hybrid" collaboration is based on the platform code of conduct.

drivers for data-based climate action




[AGT Akademie für Gestaltung und Technologie GmbH](#), D-Berlin: openBIM – openDATA, circular economy, [comgy GmbH](#), Berlin, Digitalization of measurement and visualization of heat, water and electricity consumption, [Consolar Solare Energiesysteme GmbH](#), D-Lörrach: Concept CO2COMPASS program, [Energieagentur St. Gallen GmbH](#), CH-St. Gallen: Promotion of energy efficiency and use of renewable energy sources, [energy check gGmbH](#), D-Köln: Monitoring of efficient buildings and plants, [Engelmann Sensor GmbH](#), D-Wiesloch: Heat quantity recording and measured value transmission, [FEN Sustain Systems GmbH](#) – Green Energy Center Europe, A-Innsbruck: Regional energy monitoring, [Fraunhofer Institute for Solar Energy Systems](#) ISE, D-Freiburg: Research for the energy transition, [Fritz Husemann GmbH & Co. KG](#), D-Gütersloh: Industrial energy management systems,

[Gradeo Planung und Service GmbH & Co. KG](#), D-Ahaus: Local and district heating, system engineering, [greenventory GmbH](#), D-Freiburg: Digital concepts and scenarios, [HoWoGe Wärme GmbH](#), D-Berlin: Energy management of housing stock, [Peer4 GmbH](#), D-Waghäusel: IoT for Existing Facilities, [SEnerCon GmbH](#), D-Berlin: Products and services for more energy efficiency, [SKOPOS Institute for Market and Communication Research](#) GmbH & Co. KG, D-Hürth: AI-supported data analysis and app development, [Stiftung Energieeffizienz](#) D-Köln: Platform development, Commissarial responsibility, [T-Systems International GmbH](#) D-Frankfurt: Tracking app for the reduction of vehicle emissions, [University of Tuebingen, Dept. of Computer Science](#), D-Tübingen: Research group on Experimental Cognitive Science, [Viadukt GmbH](#), D-Wuppertal, Digital assistants for the building energy transition

Contact



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