Meet Up

Gewobag Innovation Challenge

featuring GBG Mannheim and EFL

Gewobag
Die ganze Vielfalt Berlins.

GBG
Unternehmensgruppe

EFL

2. Who is Gewobag?

Meet Up Innovation Challenge

Company Profile

Key figures as at the reporting date: 31.12.2022

Gewobag is one of the largest real estate companies nationwide.

745
Employees

6,43 €/m²
Flat rent

74.591
Flats
Own portfolio

2.722
Trade
Own portfolio

5.8 bn €
Balance sheet total

€ 30 m
Annual result

Gewobag
Die ganze Vielfalt Berlins.

3. Who is GBG Mannheim?

The GBG Group

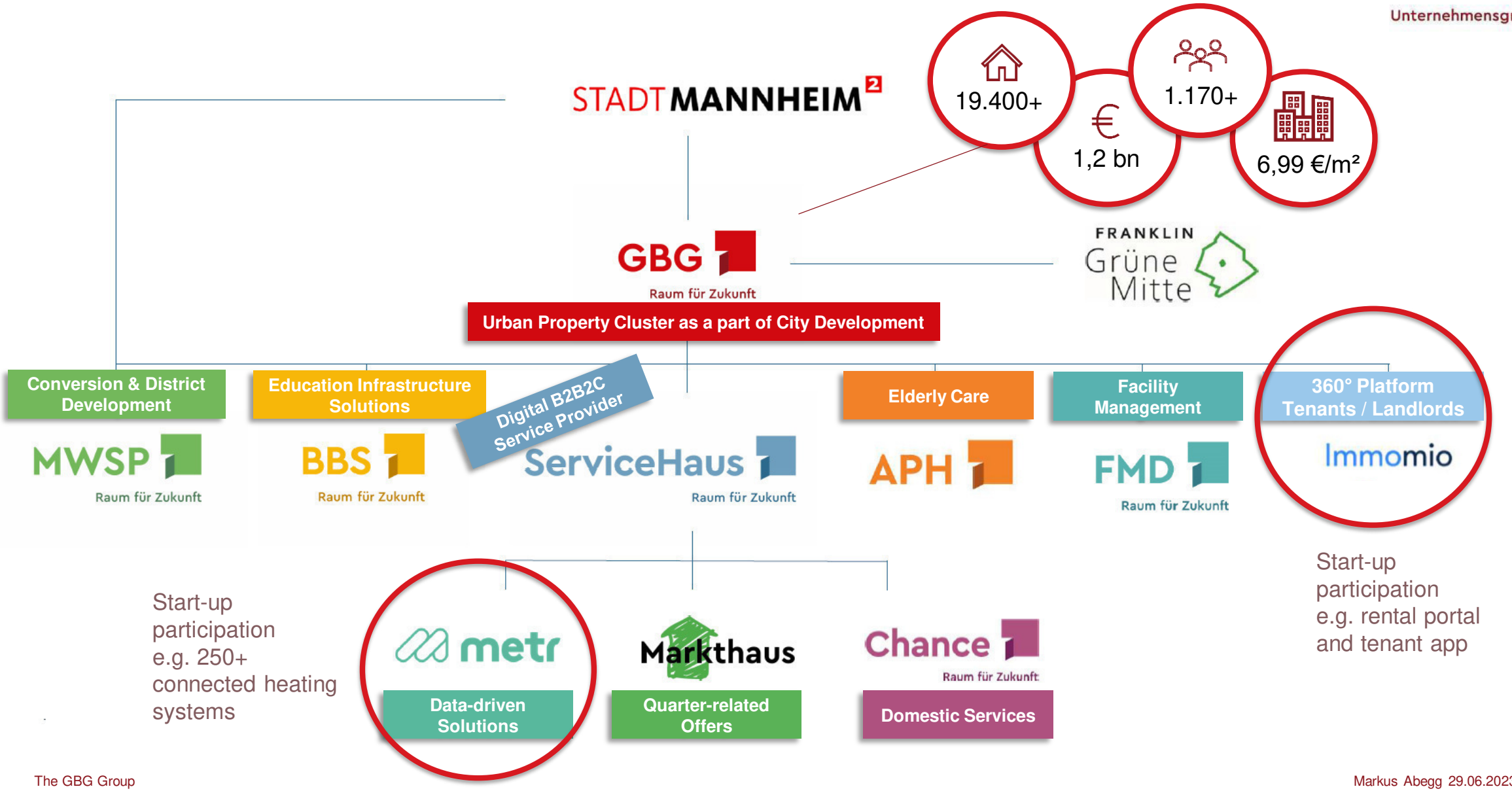
Gewobag Innovation Challenge 2023

Markus Abegg, 29.06.2023

Unternehmen der Stadt MANNHEIM

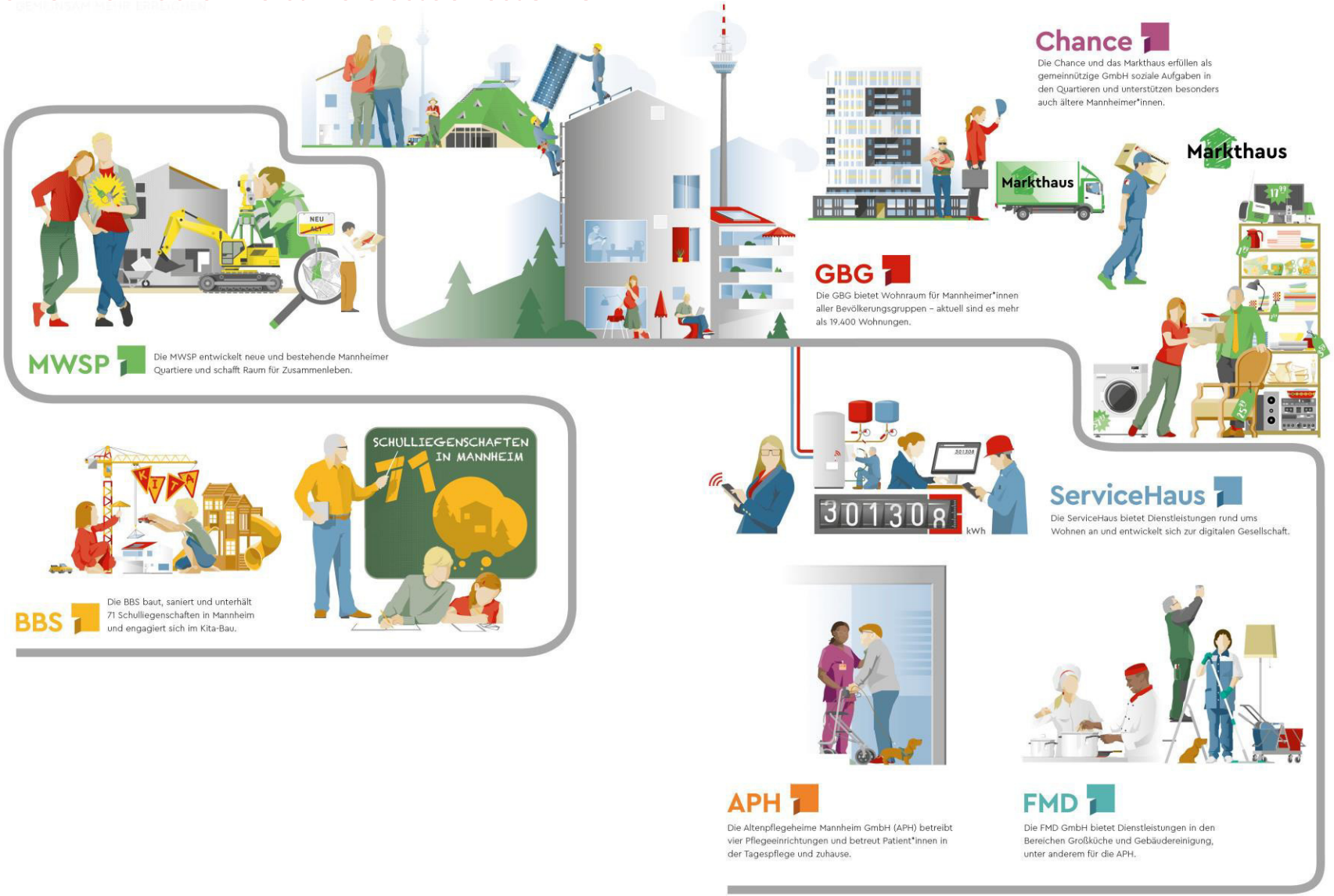
GBG Unternehmensgruppe

„Space for Future“ - The GBG Group



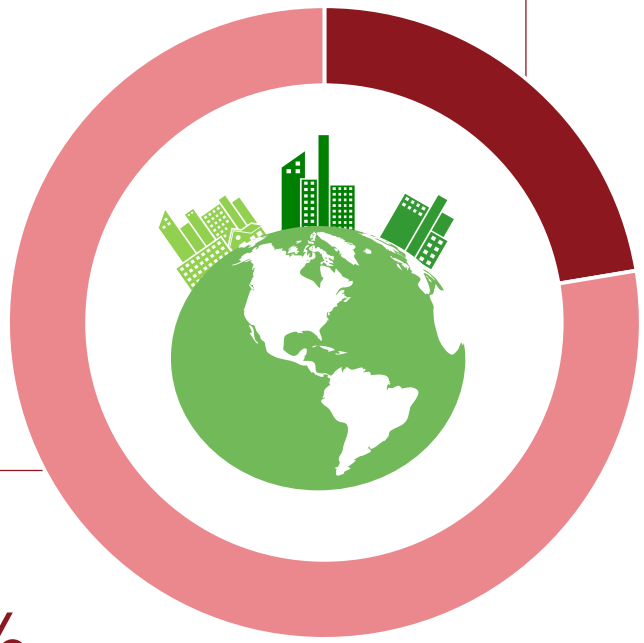
The Life Stage Model

Life-phase-oriented real estate tasks

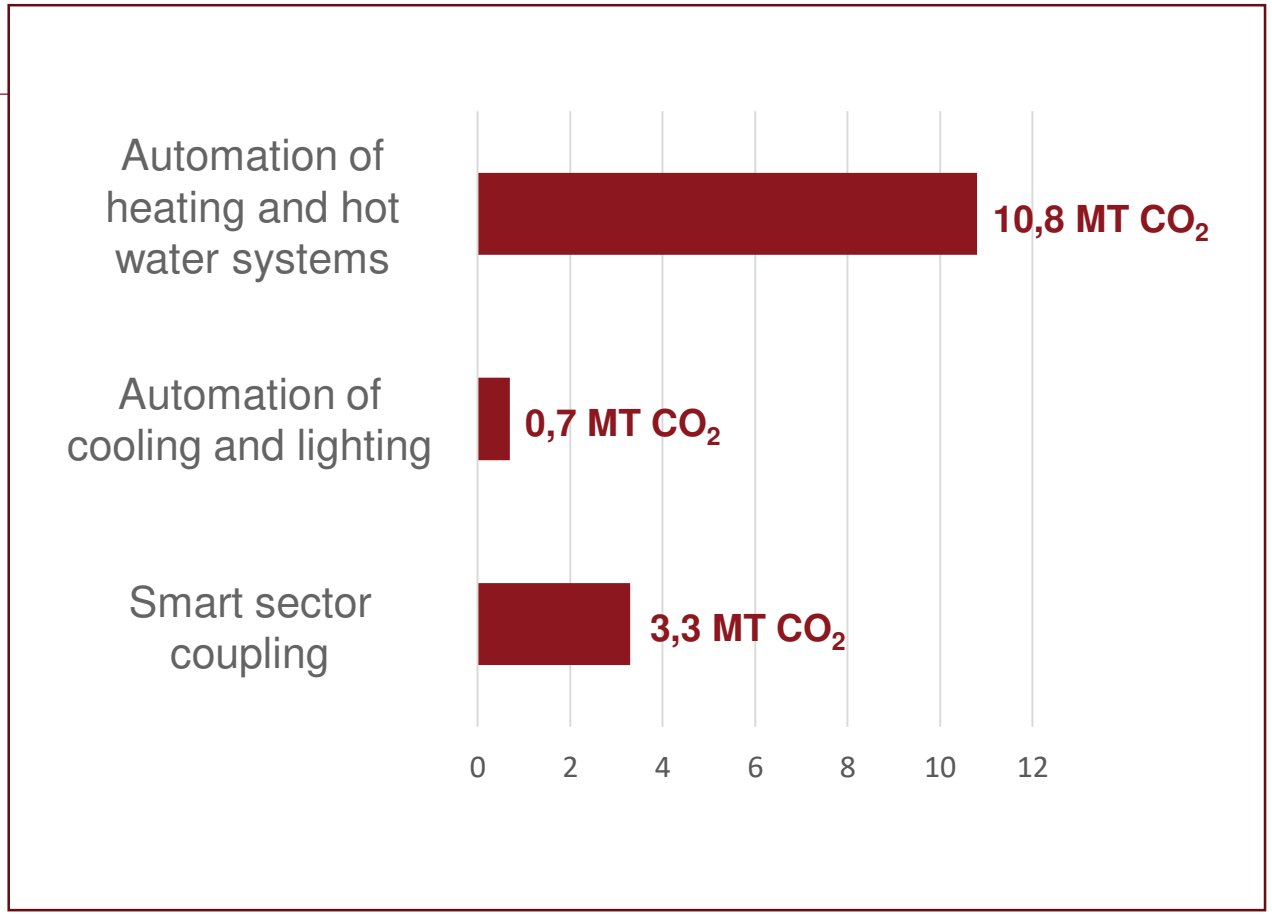


Digital technologies' impact on building sector CO2 emissions

29 %
Reduction by use of digital technologies 14,7 Mio. tons

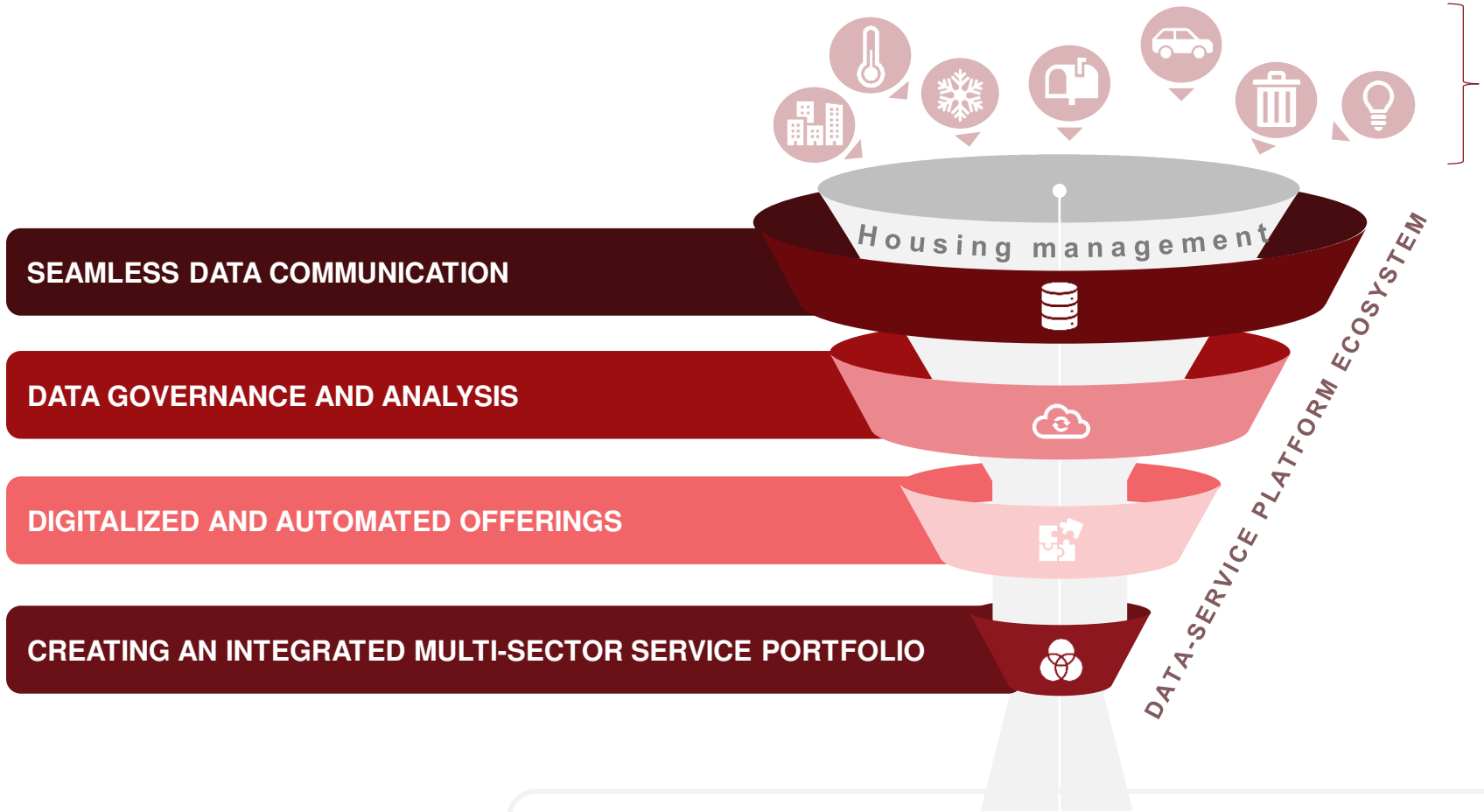


71 %
Total required savings until 2030: 51 Mio. tons (Climate Protection Act target in the buliding sector)



Quelle: Bitkom-Studie “Klimaschutz und Eneergieeffizienz durch digitale Gebäudetechnologien”, durchgeführt vom Borderstep Institut (2021), in Anlehnung an Grafik von: Digitalisierung kann fast ein Drittel zu den Klimazielen im Gebäudesektor beitragen | Bitkom e.V.

Digital ecosystem driving value through information-centric approach – ServiceHaus GmbH



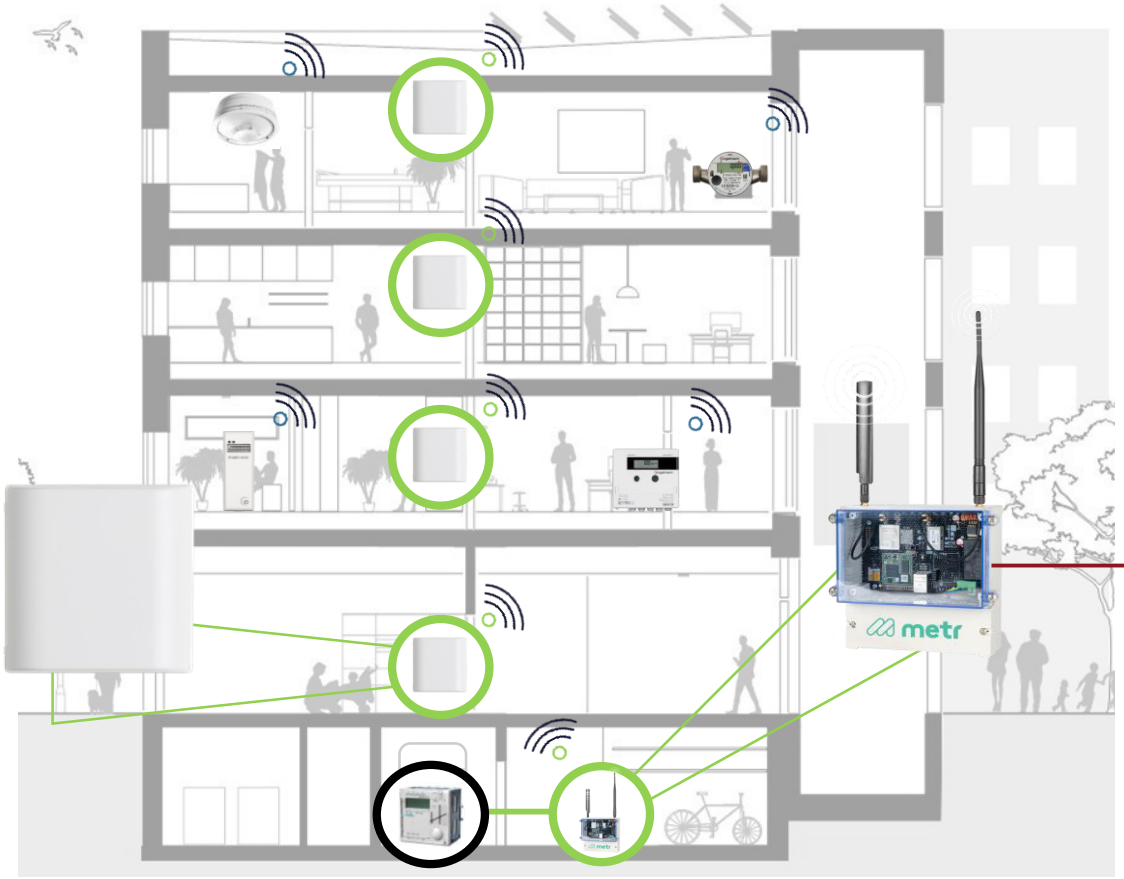
POTENTIAL SCENARIOS AND APPLICATIONS

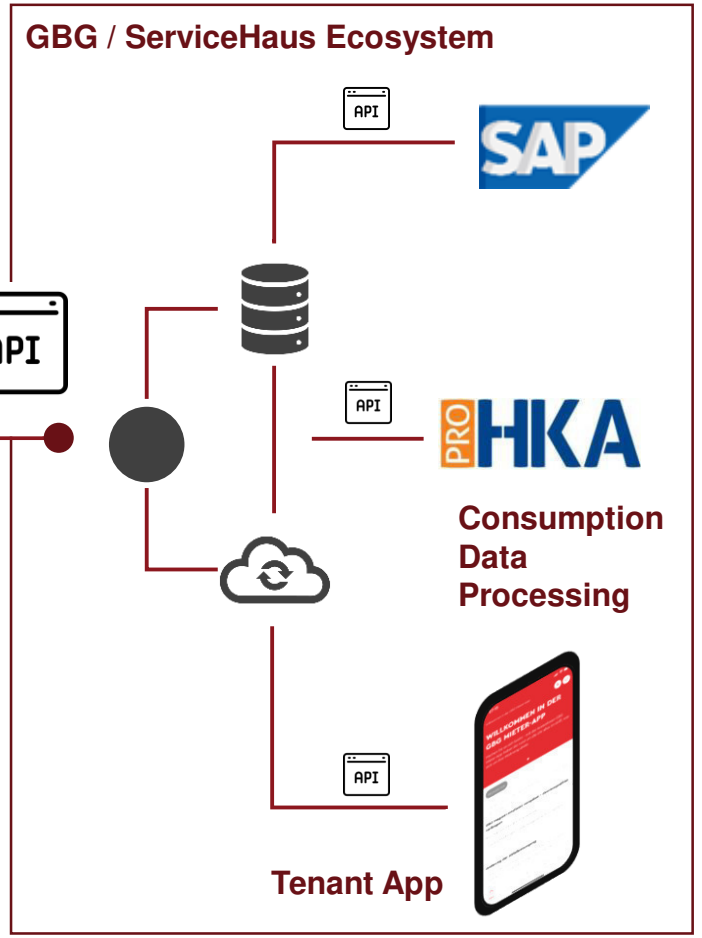
e.g. 650+ IoT Building Gateways, Submetering, Monitoring, Smoke detectors, Heating optimization powered by metr

Data-as-an-Asset

Digitalization for sustainable housing industry goals

The Interaction of the IoT-Infrastructure and Software-Architecture



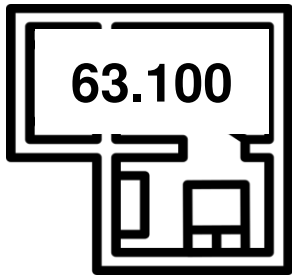


Quelle: Metr Gateway (https://www.metr.systems/de/m-gate/), Engelmann Zähler (https://www.engelmann.de/de/heizkostenverteiler-hca-e2/, https://www.engelmann.de/de/waterstar-m-2/, https://www.engelmann.de/de/sensostar-c_/), Lansen Repeater (https://www.lansensystems.com/assortments/infrastructure/), Wifi created by Lordicon (https://lordicon.com/icons/wired/outline/64-wifi); HZ-Regler Siemens (RVL479 - Heizungsregler für zweiten Heizkreis (siemens.com)

IoT-Infrastructure – ServiceHaus GmbH

23
Employees working in building services and IoT

Total number of units billed for GBG and other customers



75.000
Wireless metering devices in GBG inventory

10.436
UVI's (Legally required monthly consumption information)

90.000
Smoke detectors

+250
Connected heating systems

4. Gewobag ED as sponsor of the Challenge

Gewobag AG is one of the largest real estate companies in Germany, its central energy service provider is Gewobag ED

- Gewobag ED is a wholly owned subsidiary of Gewobag AG and is responsible for the secure heat supply of the centrally heated neighbourhoods and those centrally supplied with hot water, organises the secure operation of the facilities and optimises the operation and energy purchasing with a view to reducing climate-damaging exhaust gases.

With the thematic complex of climate protection and smart city, the ED makes a significant contribution to one of the focal points of the Group's strategy

Creation of new and affordable housing through acquisition and new construction

Innovative concepts for a green and efficient city

- Gewobag ED is founded as a service provider for energy supply, -management and multimedia
- Implementation of the climate strategy by asset management and ED

Sustainable neighbourhood development as a contribution to social stability

Berliner Leben
Eine Stiftung der Gewobag

URBAN NATION

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Contribution of Gewobag ED

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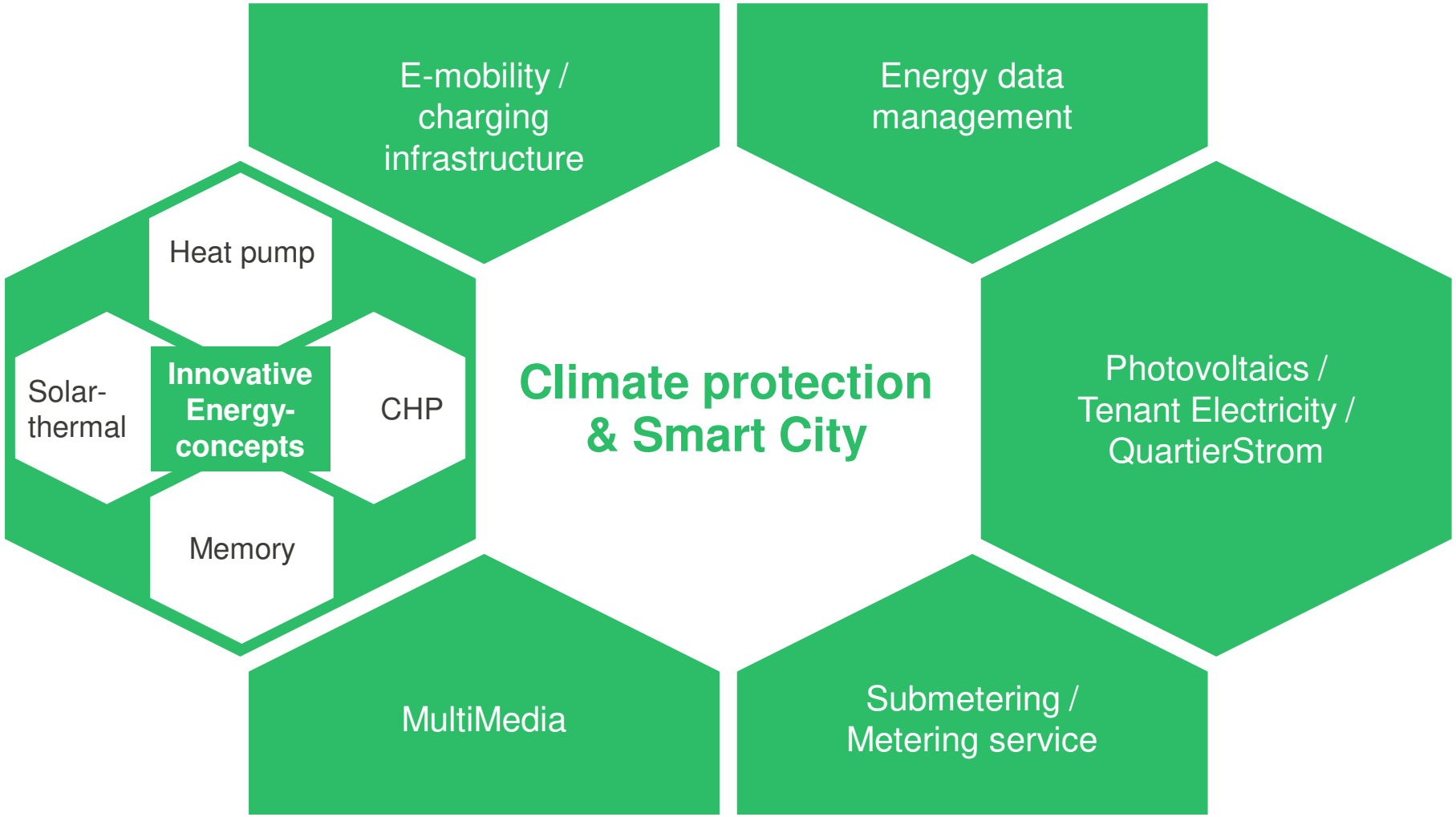
Contribution of Gewobag ED



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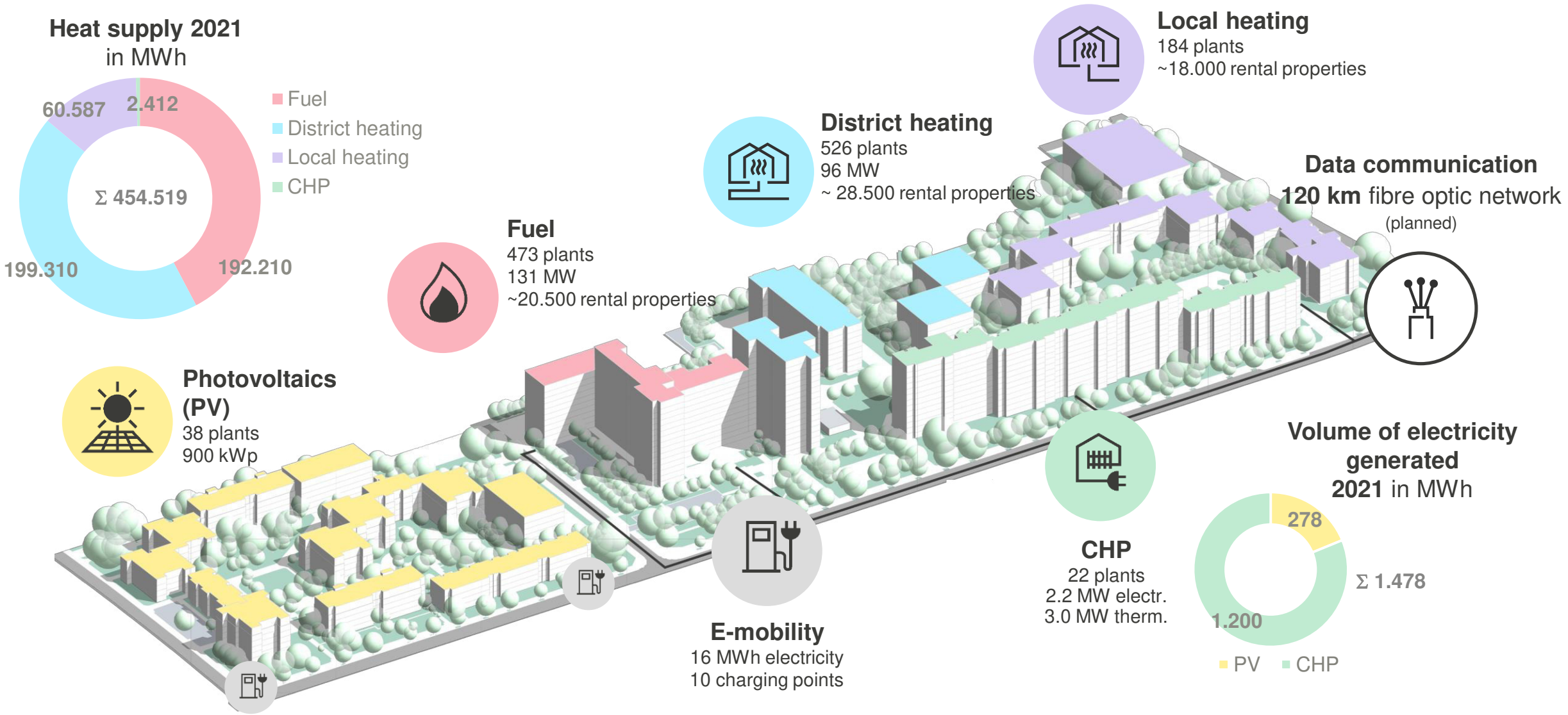
Gewobag ED looks after over 1,000 heating systems as well as PV, e-charging columns and fibre optic networks



5. Explanation of the missions

Meet Up Innovation Challenge

The Missions 2023

The digital solutions of Missions are intended to help us as landlords and heating operators to use financial resources as efficiently as possible. In addition, the solutions should help tenants to reduce their living costs.

The challenge is to combine a use case and a business case where the energy savings are financially attractive and beneficial to Gewobag and the residents.

The aim is, among other things, to use the data of the Energy supply through digital applications.
Different user groups are to be involved, such as managers and engineers when it comes to using energy supply data for their daily needs.
To this end, we have six specific missions for which we are looking for solutions.

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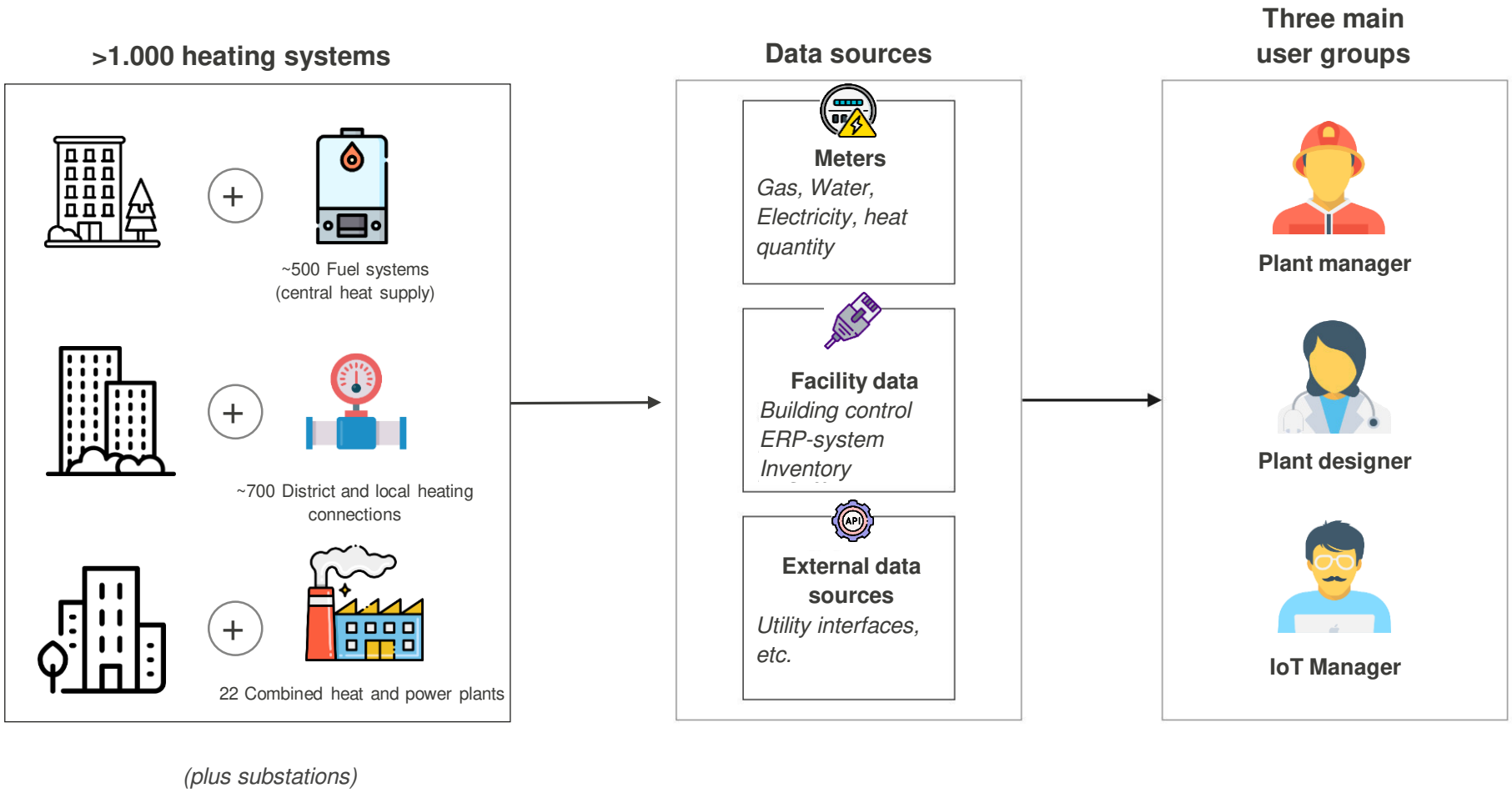
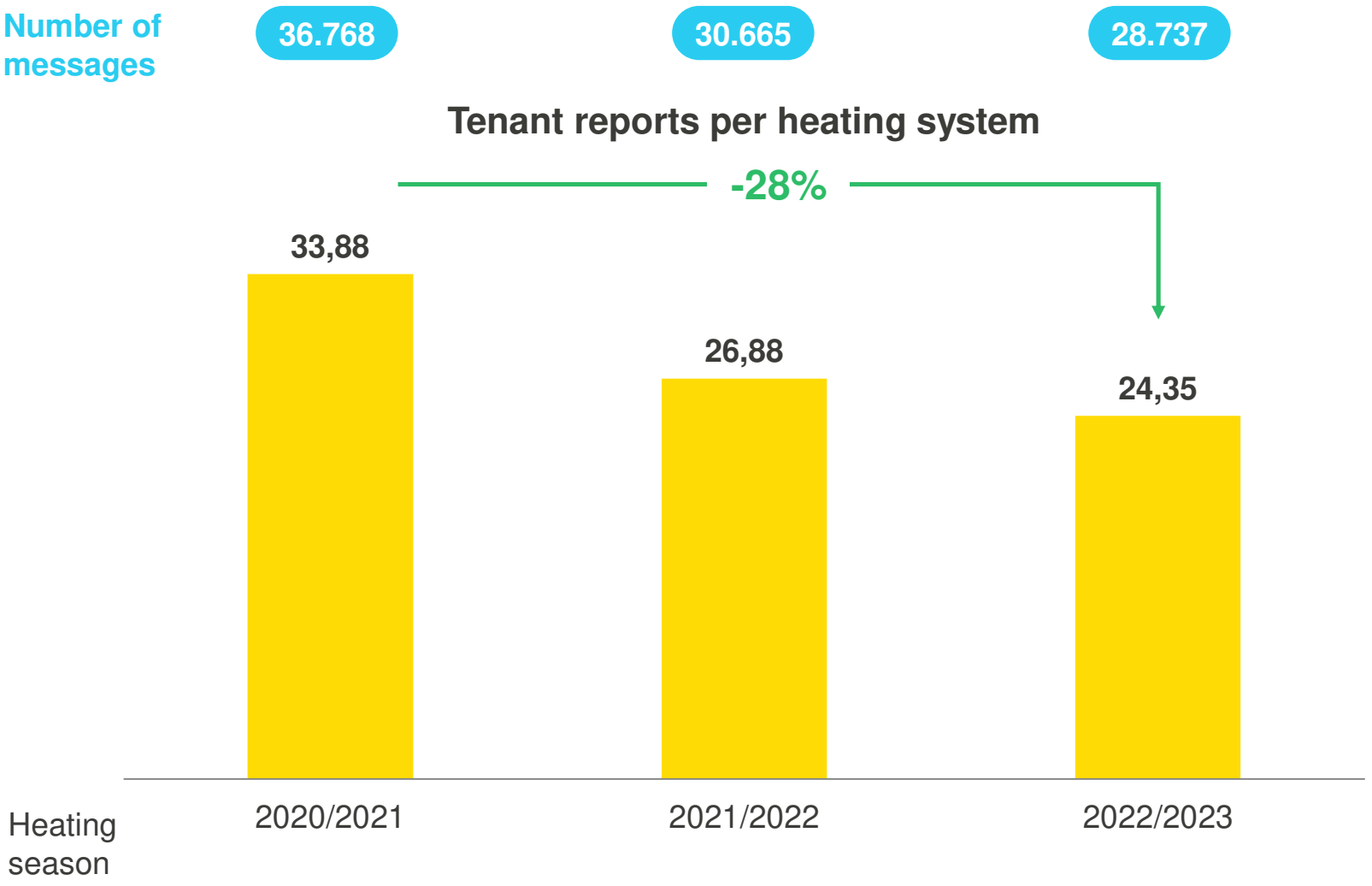
The aim of this tender: to provide meter, plant and externally connected energy data for three user groups



The tenant reports per system could be reduced by 28% within two years through digitisation of the heating systems



Notes

- The **absolute number of tenant notifications** were **reduced** from 36.768 to 28.737 within **two years**
- At the same time, the **number of** managed **facilities has increased slightly**
- This results in a **reduction of 28%** of the tenant reports per heating system
- The main reason for this was the **digitalisation/connection of the heating systems in order** to be able to **identify faults more quickly** and not only through reports from the tenants

Our three user groups have to cope with fundamentally different tasks in their day-to-day work

Needs at a glance

Facility manager

"I want to ensure the operation of our facilities with the least possible **use of resources** and **fix faults** before our tenants notice them."

Plant designer

"I want to be able to track the performance of each of our assets so I can **plan** upgrades and new builds **based on demand.**"

IoT Manager

"I want to ensure 100% **data availability** from heat generation with as little effort as possible."

Detailed information on the activity profiles and challenges of the user groups can be found in Appendix 4.1.

Meet Up Innovation Challenge

The needs of the software to be tendered arise from the activity profiles and challenges of our users

We need software for the following requirements:

1 Help in time

- Recognise and remedy faults
- Respond automatically to critical failures
- Order preventive maintenance

2 Plan & operate according to demand

- Putting historical data into context
- Optimise inefficient systems
- Live monitoring of operating states

3 Reliably provide data

- Monitor systems & ensure data quality
- Manage resources
- Manage access rights

We are looking for solutions in these application areas:

Dashboards

Automatic workflows

Analytics & Intelligence

Challenge

The aim is to provide applications that enable three groups of users to use data from the energy supply for their work tasks.

Mission #1
Inventory of all heat-generating systems

Initial situation:
All heat generators are recorded. Important components of the heat distribution are missing, e.g. pumps, valves, mixers.

Challenge:
Settings for optimal operation are difficult to define and track.
Detailed maintenance and budget planning is difficult.
Detection of component-specific causes of malfunctions is currently not possible. It is always necessary to travel to the preclarification.

Expectation:
Transparent data situation (digital twin) and good manageability of data maintenance (see Mission #4)

The content of Mission #1 is to improve the operational management and maintenance of the plants by taking inventory of all heat-generating plants and their components. So far, only meta-data such as type, year of construction and output of the boilers are available. Through a detailed inventory, additional information such as condition, wear and maintenance requirements will now be collected in order to optimise the maintenance of the plants and avoid failures.

For this purpose, we are looking for innovative solutions and technologies to enable a comprehensive inventory of the plants and thus make an important contribution to increasing efficiency and conserving resources.

Mission #2
Use of information from substations and strings

Initial situation:
Central heat generation failures are often recorded digitally; in heat distribution, these have so far been detected almost exclusively via tenant complaints.
Monitoring efficient distribution operation is often only possible on site.

Challenge:
Connection of the substations and strings to a central building control system for monitoring supply security and efficiency.
Determining component-specific causes of malfunctions remotely saves ways and time (see Mission #1).

Expectation:
Centralised detection of faults, also in the distribution system, at an early stage and as accurately as possible so that action can be taken before the tenant notices.
Monitor efficient driving simply and remotely. Quickly detect deviations between target and actual values.

In this mission, the use of information from substations and strings is to be improved. Up to now, it has been possible to read out data from the main stations of heat generation, for which in some cases extra temperature sensors have been installed or the heat meter is used for data collection. In the substations and heating circuits, however, which are often spatially separated from the main station, this data is not yet digitally recorded.

Within the framework of Mission #2, innovative solutions are now to be found to reliably record the flow and return temperatures as well as the flow rate in the substations and lines and to store them historically. The goal is to be able to evaluate this data in order to improve energy efficiency and reduce energy consumption.

Mission #3

Analysis of data from heat-generating systems

Initial situation:

The heat transition is progressing. The previous gas-based heat generators are gradually being replaced by renewable and mostly electrically powered technologies.

Challenge:

So far, there is little experience in interconnecting the new technologies with each other or even with conventional plants together and using the data from these plants to ensure efficient, resource-saving and economic operation.

Expectation:

Application for analysing data from heat generation, electricity generation, distribution and consumption for automated operation with multiple generators for optimised operation.

We have realised that we can gain valuable insights by analysing data from heat-generating systems. Therefore, we are now looking for solutions that support us in the analysis and take into account heat pumps, solar thermal, PV and their interaction. So far, our analyses have mainly been fed by heat-relevant data from our conventional heating systems, i.e. predominantly gas boilers.

Help us understand the heat transition even better through clever reporting and data analysis.

Mission #4
Further digitalisation of heating service providers

Initial situation:
Service providers and fitters often work with manual documentation. Transmission takes an unnecessarily long time and requires many routes, evaluation is time-consuming.

Challenge:
Saving time and effort through fast and evaluable communication. Helpful documents are usually not available to the installers on site (design settings, floor plans, string diagrams).
Enable digital maintenance of inventory after initial intake (Mission #1).

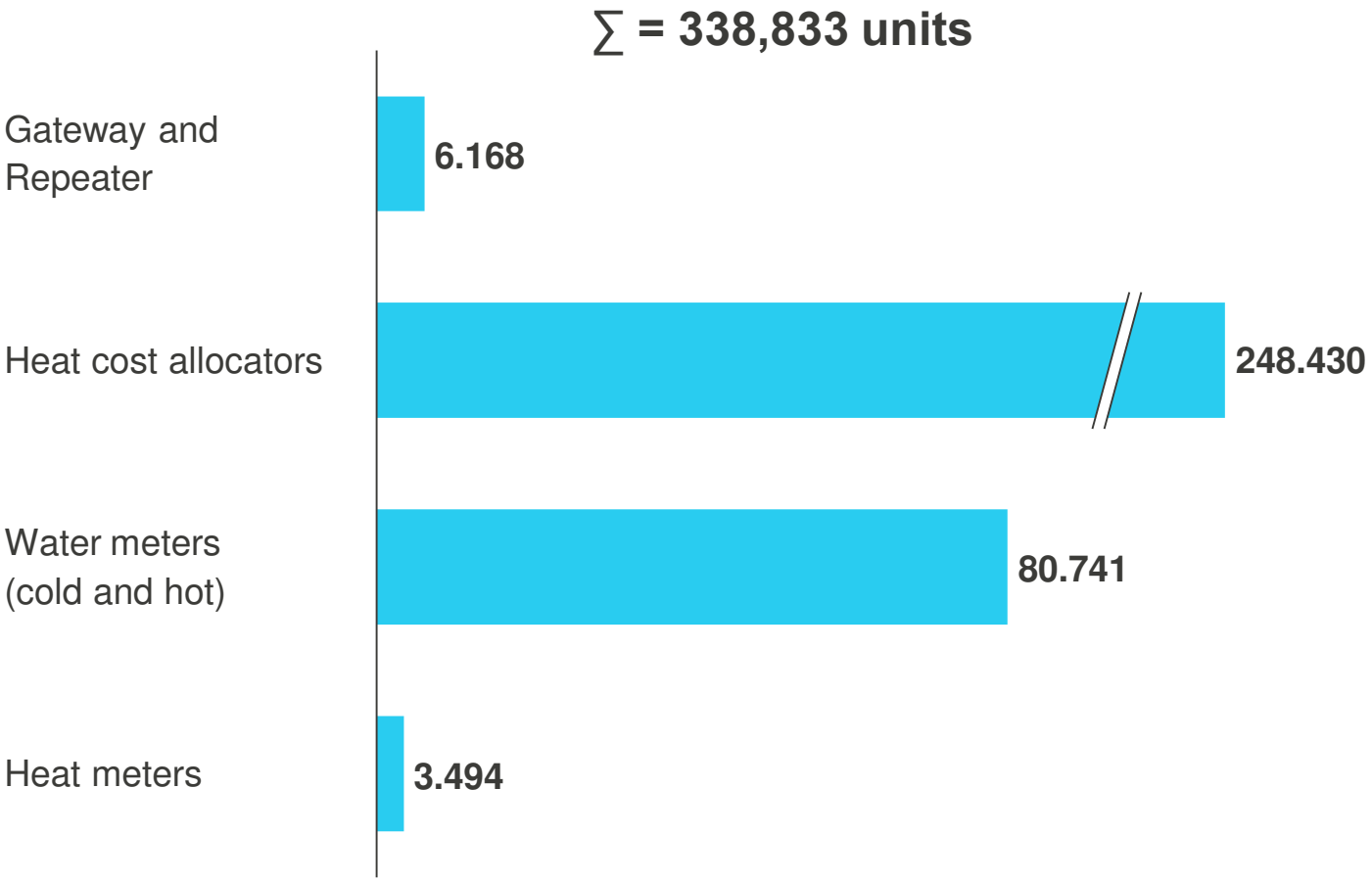
Expectation:
Fast, digital order forwarding and feedback between customer and service providers or their fitters. Digital recording of information from reports and protocols. Central overview of existing orders in nearby facilities.
Create a transparent data situation via digital media for fitters on site. Uncomplicated maintenance of the inventory directly on site.

To increase efficiency and save costs, we want to better integrate our heating service providers into digital processes such as maintenance, servicing and troubleshooting. For example, unnecessary trips to take stock of faults and a faster response time should be achieved - so that our tenants do not have to take cold showers or freeze. The planning of maintenance work can also be optimised through better integration of service providers, who are currently integrated via ticket systems but cannot access system data.

To this end, we are prepared to share relevant data from the systems with our service providers. The existing heating systems may still have to be equipped accordingly so that the necessary data can be transmitted in a targeted manner. Within the scope of the mission, innovative technologies as well as hardware are required to master these challenges.

As part of the ramp-up in the area of metering services, 338,833 devices have already been installed by March 2023, the project progress is at 100%

DEVICE DISTRIBUTION



ASSEMBLY STATUS

The ED has done the fitting out in 100% of the properties, in 12%, however, there is still residual work to be done (due to non-existing installation requirements)

Heat meter (WMZ)

Heat cost allocator (HKV)

Hot water meter (WWZ)

Mission #5
Generating, optimising and providing periodic consumption data

Initial situation:

In Gewobag's buildings, radio-readable meters are installed in the secondary area. The metering data is currently only received, stored and processed by the responsible metering service provider. This data is then used to prepare the consumption information during the year as well as the consumption data for the annual heating and operating cost billing. Tenants' questions about consumption patterns, etc. can currently only be answered by the metering service provider.

Challenge:

The challenge is to store the measurement data, which is stored at 14-day intervals, in the future in the ERP system of Gewobag in a timely manner and make it processable, either by connecting it to the systems of the metering service provider or by reading out the values independently. In this context, it is also important that the unit-coded heat cost allocators take into account both the evaluation factor of the device and the basic sensitivity for conversion into heat.

Expectation:

It is expected that the measured values can be evaluated in different ways in the future. It should be possible to evaluate the data at different levels (property, building, tenant...) and at different times (year, month, rental period...). It should also be possible to make graphical evaluations that can be embedded in documents (tenant letters, presentations, etc.).

The aim of Mission #5 is to create readable and processable databases based on the data from the technology for metering services (heat cost allocators, pre-recording heat meters, etc.), which are currently received by the contractually bound metering service providers via monthly radio protocols, the contents of which can be used both for graphically prepared information vis-à-vis tenants and for analyses and plausibility checks in the context of heat supply.

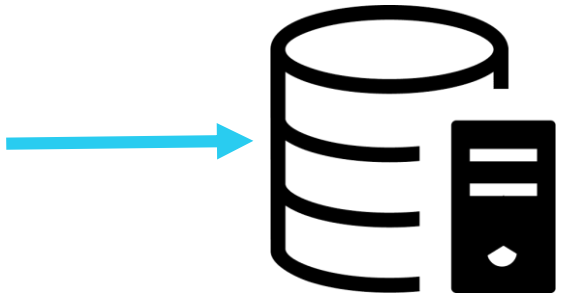
Consumption values and operating data as the key to energy management

Gas meter

Heat meter

Building management system

LTE router



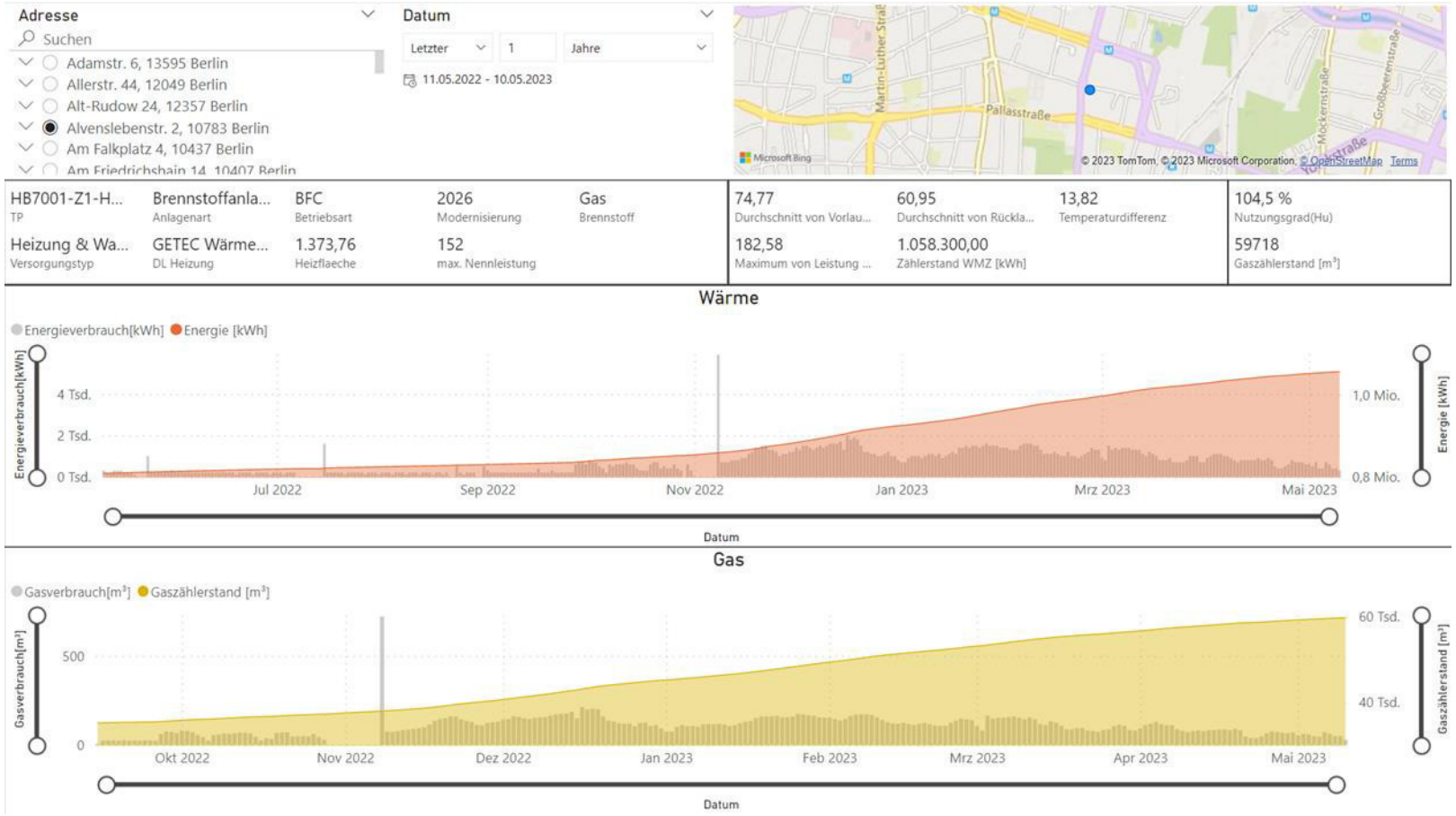
1. automated collection of sensor data from the heating systems

- Primary meter from systems (gas/heat) in 5 min cycle
- Systems with building management system
- Data from interfaces (Vattenfall)
- (Metering service meter)

2. transmission of the data via secure network, which we operate ourselves (Vodafone)

3. storage of data on own Gewobag servers

The ED's data management is based on high-resolution meters in the plants and its own IoT network



Example: Alvenslebenstr. 2 plant; excerpt from an interactive PowerBI report

Expansion of energy data management

- 85% of all heat and gas meters supply data every 5 minutes
- The data is analysed using PowerBI and blended with each other to determine, for example, the utilisation rates of the plants
- In the future, weather data will be included in the calculations and work will be done on the expansion of further digitalised meters and high data quality

Mission #6
Developing and running an IoT network with integrated field devices

Initial situation:

Gewobag ED operates an IoT network on the basis of mobile radio LTE standard for the connection of approx. 500 locations. The network is implemented as a VPN: secure against external attacks through the known measures: Encryption, private IP addresses, complex access data. Various gateways and measuring devices are connected to these locations to record important consumption and operating data.

Challenge:

The challenge consists of the following points: 1. implementation NB-IoT standard with a plug&play solution (simple installation in the outdoor locations); 2. expansion to additional locations (approx. 200); 3. offer of a full service for installation, operation, monitoring, troubleshooting on the basis of NBD SLA; 4. connection of further consumption and operating data in existing/new facilities to be equipped.

Expectation:

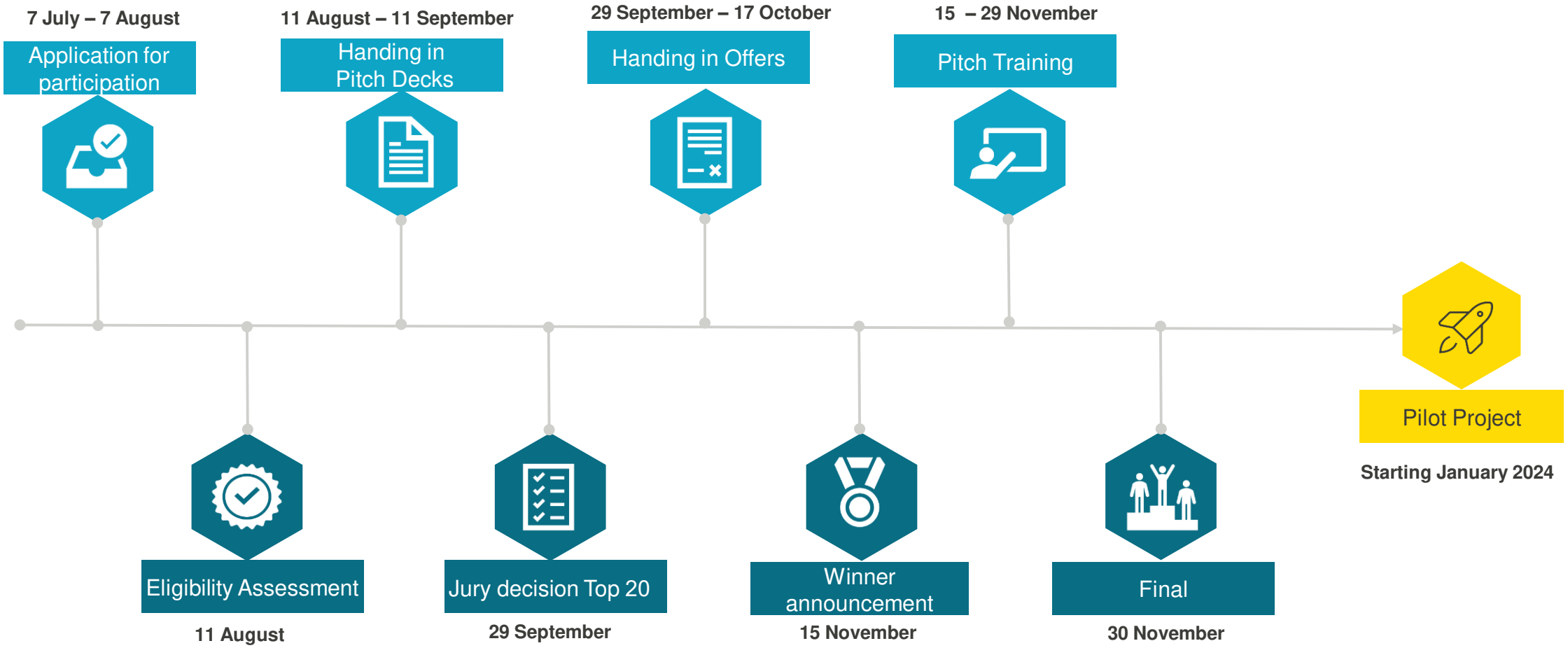
Our expectations are bidders with proven solutions, a lot of experience, who implement our specifications such as mobile phone contract at ED, separation between network endpoints and field equipment as well as high network security.

Gewobag operates an IoT network with currently more than 500 field offices, where various IoT devices (e.g. higher-level heating controls or gateways for meter data collection) communicate with our servers. The content of mission #6 is to build up this network efficiently for current and future requirements, to integrate the field devices and to put them into operation.

6. Process of the Challenge

Meet Up Innovation Challenge

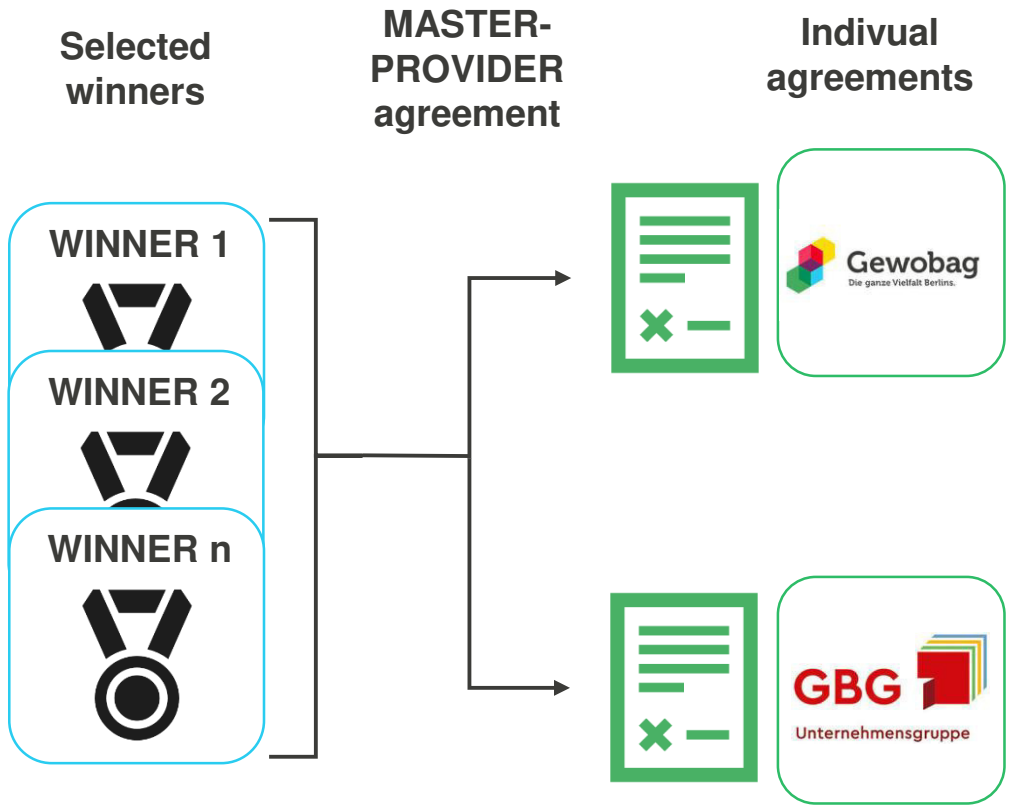
The Process of the Innovation Challenge



The Innovation Challenge fulfils the formal criteria of a European award and tendering procedure

Sponsors can commission independent pilots on base of a master agreement

- **Winners are bound as** contractors in a master agreement
- **The master agreement** contains an annex and entry clause for sponsoring partners
- **Sponsors** can independently commission their **pilots with the winners**
- A contract clause allows sponsors **scaling beyond pilots**



Documents to be submitted

	Pitch Deck for evaluation of your product/ service	Presentation of your plan for the pilot project inluding your offer
Document to submit	Presentation with max. 10 pages	Presentation with max. 10 pages
Dead -line	11th of September	17th of October
Content	• Presentation company and team • Presentation of product/service • Presentation of the business model solution for a mission • Benefits for Gewobag/ other stakeholders • USP - why better than other products	• Problem Solution Fit of the mission(s) • Presentation of product/service and design forms for sizes XS, S, M and L • Project plan for the pilot (risks & opportunities) • Benefits for Gewobag/ other stakeholders • USP - why better than other products

Meet Up Innovation Challenge

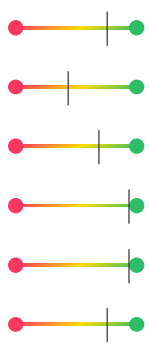
Evaluation Criteria

1 EGIBILITY ASSESSMENT

- Confirmation Code of Conduct of Gewobag
- Number of FTE
- Reference projects
- Mission to be applied for

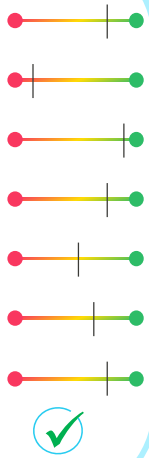
2 PITCH DECK ASSESSMENT

- Theme fit
- Enablement
- Cost reduction
- Innovation
- USP
- Persuasiveness



3 OFFER ASSESSMENT

- Main target Mission
- Other Missions
- Innovation
- Strategic Fit
- Feasibility
- Economic viability
- Presentation
- Commitment Pilot



Meet Up Innovation Challenge

Our Jury

Sven Harke-Kajuth
Head of digitalisation and group services
and CDO of Gewobag

Peter Burgfried
Head of Property Management
Managing director of Gewobag MB

Markus Abegg
Head of IT and Service of GBG Group
Managing Director of Service Haus GmbH

Dominik Unger
Head of technical service
Gewobag ED

Olaf Nestler
Head of strategic IoT managment
Gewobag ED

Beate Albert
Coordinator Smart City Unit
Berlin Partner

Dr. Severin Beucker
Founder and Partner
Bordstep Institute

7. Insights from KUGU - Challenge Winner 2021

Winner of the last Innovation Challenge

8. Q&A