Interreg CENTRAL EUROPE

Co-funded by the European Union

MESTRI-CE

Handbook on Sustainable Management of Buildings

Using the MESTRI-CE Smart Data Hub

Version 1
03 2025

TABLE OF CONTENTS

1. Introduction

1.1. What is the MESTRI-CE Smart Data Hub?

This innovative digital platform is designed to empower you in managing individual buildings and building portfolios sustainably by leveraging data-driven tools and methodologies. Acting as a centralized system, the MESTRI-CE Smart Data Hub (SDH) enables you to:

- ✅ Simulate current energy consumptions.
- ✅ Evaluate the technical and economic feasibility of building renovation measures.
- ✅ Forecast energy savings and assess sustainability impacts.
- ✅ Develop and implement strategic visions for managing your buildings effectively.

The MESTRI-CE SDH is here to help you **optimize resource use**, **align with climate goals**, and **make informed decisions**. It offers advanced features like **performance monitoring, benchmarking**, and **decision-support tools**, all tailored to support your journey toward climate neutrality.

Whether you are part of the public or private sector, the platform fosters collaboration, ensures data transparency, and supports your efforts in achieving sustainable outcomes.

🚀 Dive in and start transforming the way you manage your buildings!

1.2. What is the purpose of this Handbook?

This **handbook** serves as **your guide to mastering the MESTRI-CE SDH**, from understanding its key functionalities to unlocking its full potential. It is your go-to resource for understanding and applying the MESTRI-CE SDH, empowering you to manage buildings more effectively as it:

- 📌 highlights the importance of efficient building management;
- 📌 guides you through the types of data required, advanced assessment methodologies, and the hub's outputs.

💡 By using this handbook, you'll gain the tools and knowledge to optimize building operations, improve decision-making, and enhance overall efficiency.

1.3. Who is the SDH and this Handbook for?

This handbook is designed to support various stakeholders in public and private sectors who manage building stocks and seek to improve sustainability, operational efficiency, and financial planning through the SDH.

➡️ **Are you a BUILDING MANAGER or HOUSING ASSOCIATION?**

If you are an enterprise, such as a housing association or a company managing buildings, you understand that managing large building portfolios requires centralized data management and strategic investment planning. The SDH will help you with:

- Centralized data management: Use SDH to track building performance, energy consumption, and maintenance needs across entire portfolios in one place.

- Renovation and sustainability planning: Plan and compare different retrofit scenarios, optimize costs, and align upgrades with long-term sustainability goals. SDH will help you assess sustainability performance and financial viability of different renovation scenarios.
- Regulatory compliance and reporting: Ensure adherence to energy performance regulations, streamline data collection for sustainability reporting, and facilitate compliance audits.
- Information sharing and access control: Easily share key building data with owners by granting customized access to the platform. Owners can view real-time energy performance, renovation plans, and compliance reports, ensuring transparency, better collaboration, and informed decision-making.
- Financial and operational efficiency: Access tools for financial planning, return-on-investment analysis, and cost reduction strategies to enhance asset value and affordability for tenants.

➡️ **Are you a LOCAL, REGIONAL or LOCAL PUBLIC AUTHORITY?**

By using the SDH, you will have access to an integrated digital tool for better management of individual buildings and entire building stocks. The SDH will help you:

- **Strategic planning and policy development**: With SDH you can integrate and better manage individual buildings and your entire building stock. Use SDH for evidence-based decision-making, leveraging real-time data on building stocks to develop sustainable renovation policies.
- **Investment prioritization**: Identify and prioritize buildings in need of renovations based on energy performance, CO_2 emissions, and financial feasibility.
- **Financial planning**: Utilize built-in tools to assess the economic viability of retrofits and align investments with EU Taxonomy and EU Green Deal objectives.
- **Public engagement and compliance**: Ensure buildings meet climate neutrality goals, track sustainability progress, and facilitate citizen engagement in local renovation strategies.

➡️ **Are you a SECTORAL AGENCY?**

If you are an energy and development agency providing management services of buildings for public and private institutions the toll will help you with:

- **Advisory and technical support**: Offer expert guidance on sustainable building management to public and private sector users.
- **Project development and implementation**: Identify investment opportunities for the (re)construction of buildings, support energy efficiency programs, and optimize funding allocation.
- **Monitoring and reporting**: Use SDH's automated tools for tracking policy impact, energy savings, and compliance with national and EU sustainability targets.

➡️ **Are you a SME company?**

If you are a SME company always looking for ways to improve the building stock in your control / possession the SDH will help you with:

- **Integrated building management:** Have a tool for integrated and better management of individual buildings and your whole building stock.
- **Business growth and market opportunities**: Identify investment opportunities for (re)construction of your buildings and to build a pipeline of projects.
- **Optimized investment and cost savings**: SMEs owning or leasing buildings can use SDH to evaluate and plan cost-effective energy efficiency upgrades.
- **Data-driven decision-making**: Utilize performance tracking and benchmarking tools to enhance competitiveness and sustainability practices.

1.4. How is the Handbook structured?

This handbook is organized to provide you with **a step-by-step guide** helping you understand the fundamentals of sustainable building management to mastering the use of the MESTRI-CE SDH. It covers:

📌 The importance and challenges of building management.
📌 Key functionalities and benefits of the MESTRI-CE SDH.
📌 Practical step-by-step instructions for using the MESTRI-CE SDH.
📌 Guidance on achieving climate-neutral goals through data-driven decision-making.

2. Understanding Building Management

2.1. Why is Effective Building Management important?

Effective Building Management is critical for ensuring operational efficiency, sustainability, and long-term asset value. Poorly managed buildings lead to:
❌ higher operational costs,
❌ energy waste,
❌ regulatory non-compliance,
❌ faster asset depreciation,
..leading to unnecessary financial and environmental burdens.

On the contrary a **well-structured management approach** enhances:
✅ energy efficiency,
✅ reduces maintenance costs,
✅ improves occupant comfort,
..making buildings more attractive for tenants and investors.

For **public sector stakeholders**, effective management ensures compliance with climate targets, optimized use of public funds, and enhanced service delivery. In the **private sector**, it increases property value, reduces liability risks, and improves financial performance by ensuring lower operational expenses and improved occupant comfort.

A key element of modern building management is **digitalization**. Integrated data platforms, such as Building Information Modeling (BIM) or Smart Data Hubs, allow for real-time monitoring, accurate performance assessments, and streamlined reporting—critical for securing funding, meeting ESG standards, and achieving carbon neutrality.

💡 By prioritizing data-driven building management, owners and operators can **future-proof their assets**, **meet evolving environmental and economic demands**, and **drive the transition toward climate-neutral infrastructure.**

2.2. What are the challenges in current practices?

Building management in both public and private sectors is often fragmented, reactive, and inefficient, relying on outdated methodologies that do not support the transition to climate-neutral buildings. Key issues include:

⚠️ **Fragmented data and limited integration:**
- Many buildings still rely on paper-based records or disconnected digital systems, making it difficult to obtain a comprehensive overview of energy performance, maintenance needs, and renovation history.
- Even when digital tools are used, data interoperability is often lacking, with different software platforms unable to communicate with each other.

⚠️ **Reactive rather than proactive management:**
- Maintenance is often performed reactively, addressing breakdowns rather than preventing them through predictive analytics.
- Building managers frequently implement critical measures only when regulatory mandates force them to act, rather than proactively planning maintenance or upgrades to avoid future issues.

⚠️ **Regulatory and compliance gaps:**
- Many building managers struggle to keep up with evolving EU and national regulations regarding energy efficiency, carbon emissions, and sustainability reporting.
- Compliance audits are time-consuming and expensive to compile, especially when data is not centralized and easily accessible.

⚠️ **Limited financial and strategic planning:**
- The economic benefits of energy-efficient renovations are poorly quantified, making it difficult to justify investments to stakeholders.
- Decision-makers lack access to standardized financial assessment tools to evaluate return on investment (ROI) and lifecycle costs of building upgrades.

The MESTRI-CE project and its Hub directly address these gaps.

TECHNICAL CHALLENGES	Technical inefficiencies stem from poor building stock management, limited internal capacities, and outdated digital tools. The SDH tackles these issues by: ✅ **Centralized Data Management**: The Hub consolidates **static and dynamic building data** (e.g., energy usage, water consumption, renovation passports, energy certificates) in one digital platform, overcoming the issue of fragmented building stock management. ✅ **Standardized Sustainability Assessment**: By incorporating EU frameworks such as **Level(s)** and **Life Cycle Assessment (LCA)**, SDH introduces a **common methodology** for sustainability reporting and evaluation.

POLICY CHALLENGES	Policy obstacles arise from ineffective regulations that are not easily translated into actionable projects due to the lack of comprehensive data and digital tools. The SDH assists by: ✅ **Supporting Decision-Makers with Data-Driven Insights**: Policymakers at local, regional, and national levels gain access to **real-time, high-quality baseline data** on building stocks, enabling them to develop targeted, evidence-based renovation policies. ✅ **Integration into Strategic Planning**: The tool facilitates the creation of long-term visions and actionable plans for building stock management, ensuring that regional and EU climate neutrality goals are met. ✅ **Facilitating Stakeholder Engagement**: Through **regional working groups and round-table sessions**, SDH connects building managers, public authorities, and financial institutions, fostering collaboration and shared best practices.
FINANCIAL CHALLENGES	Financial challenges include the under-quantification of energy retrofit benefits and the absence of standardized tools for economic evaluation. The SDH addresses these issues by: ✅ **Providing an Evaluation Toolbox**: This feature quantifies both energy and non-energy-related benefits, offering transparent financial assessments that help justify renovation investments and build investor confidence. ✅ **Enhancing transparency and trust**: By offering standardized reporting and risk assessment frameworks, the SDH makes energy efficiency projects more bankable, aligning them with EU Taxonomy and Green Bond Standards. ✅ **Facilitating Green Financing Models**: The platform supports innovative financial schemes, such as municipal green bonds and crowdinvesting, thereby improving the mobilization of private capital for sustainable building upgrades.

3. Key Components of the MESTRI-CE Smart Data Hub

3.1. Overview of Functionalities

The MESTRI-CE SDH consists of **three subpages**, each offering distinct functionalities. A **detailed description** of their **features** and **how to use them** is provided below.

Planning	Portfolio	Property
Go to section ➔ Planning	Go to section ➔ Portfolio	Go to section ➔ Property

To assist you in navigating the MESTRI-CE SDH platform, here is a **glossary of the symbols used on the platform:**

⚠ - data marked with this symbol is mandatory for input
⚠ - data marked with this symbol is important for your input in order to obtain more exact results but is not mandatory
🔵 – data marked with blue dot indicates that the source of data is the software (i.e., by Scandens)
🟢 – data marked with green dot indicates that the source of data is the user of the software

3.1.1. Portfolio

In the portfolio section, you can create comprehensive portfolios by combining different buildings and viewing key metrics to assess whole portfolio performance. The section includes an:

✅ **Renovation potential**: overview of portfolio performance through a bubble chart, where the size and color of the bubbles indicate building conditions—red bubbles represent older components that need prioritization for updates.
✅ **Building performance insights:** insights into decarbonization pathways and climate alignment, allowing you to track their buildings' sustainability progress. Visualization of the efficiency classes, exposure to fossil fuels, PV power generation, CREEM[1] etc.
✅ **"Before vs After" comparison:** evaluate improvements by comparing the before and after renovation, while other important metrics provide a detailed snapshot of each building's status.
✅ **Export to Excel option**: For more in-depth analysis, you can export all the portfolio data to an Excel file for further review and action.

[1] Carbon Risk Exposure and Economic Model (CREEM) is a tool used to assess the financial risks associated with carbon emissions, particularly in the context of building and construction. It helps estimate the economic impact of carbon-related risks, such as future carbon taxes or the costs of emissions reduction measures.

Figure 1: Overview of your buildings' portfolio.

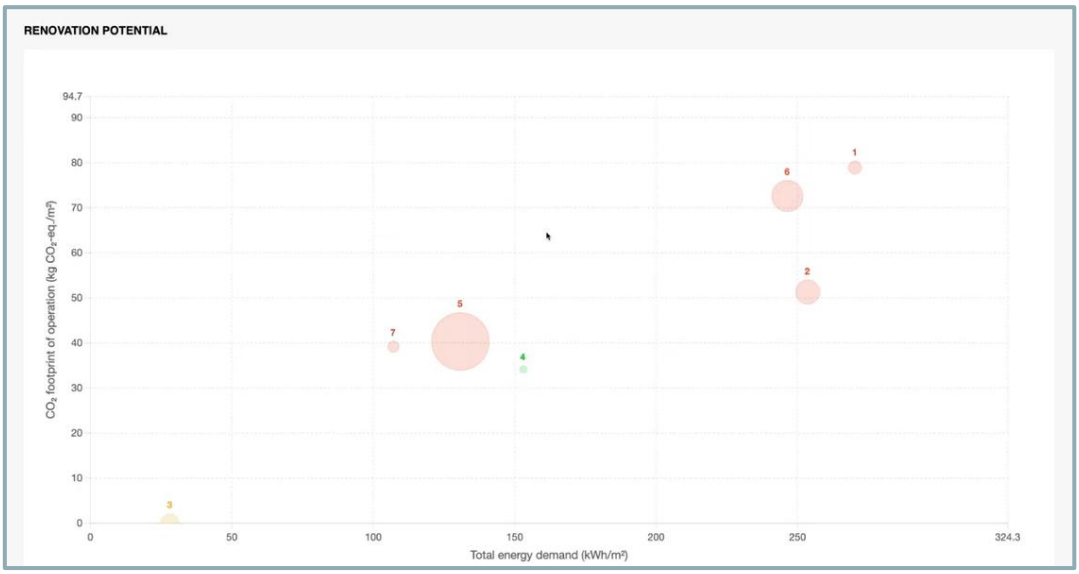


Figure 2: Renovation potential of entire building portfolio.

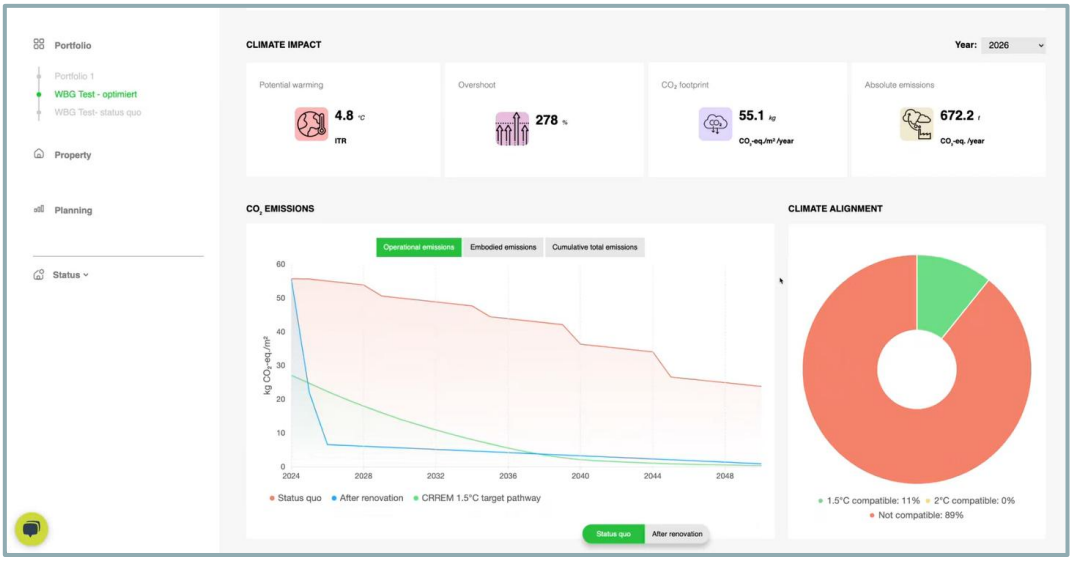


Figure 3: Climate impact of your buildings portfolio.

3.1.2. Property

In the property section, you can either:

- ✅ add individual buildings
- ✅ view a comprehensive list of all the properties that have been added to the system.

Adding New Buildings

Buildings can be added either manually by searching for their official addresses or through a bulk import by completing the provided Excel sheet.

- Instructions - How to add new buildings to the system
- List of data needed for bulk import via Excel

You will be asked to provide the following information on your building:

- **General** information – provide information on building type, year of construction, number of heated floors, nr of residential units, residential / usage area, energy reference area and real estate purpose.
- **Building geometry** – a map with the buildings, in some regions, where available, a 3D model is also calculated and depicted. You can either work on the 3D model in the editor or create a 3D model from scratch and create it in the tool. 👉 Check the default building geometry to make sure the building is positioned on the right parcel or adjust the 3D model.
- **Building envelope** –provide information on the energy renovation / replacement, repair year and expected end of life for four measures (roof, wall, floor / cellar ceiling, windows).
- **Energy systems** – provide information on what heating systems exist within the building (e.g., heating system, DHW system, mechanical ventilation).
- **Emission factors** – provide information on operational emissions (kg CO_2-eq./kWh), primary energy factors for non-renewable energy sources (kWh/kWh), and details on the start and end years of grid decarbonization for electricity and district heating.

- **Usage** - provide information on how the building is being used, such as the availability of a basement, heating in the attic or basement, number of occupants, room temperature, outdoor air flow rate, and infiltration.

Reviewing Data on Existing Buildings

By selecting one of the existing buildings, you will be presented with an overview of building data in the following tabs:

- Building Overview ( )
- Energy performance ( )
- Climate performance ( )
- Consumption ( )
- Building diagnosis ( )
- Data manager ( )
- Access rights ( )

Below you can find a detailed description of each functionality.

3.1.2.1. Building Overview ( )

This section provides detailed information on various aspects of a building, including its general characteristics, energy systems, thermal performance, emissions, and energy usage. It also covers renovation plans, grid decarbonization timelines, and occupancy details.

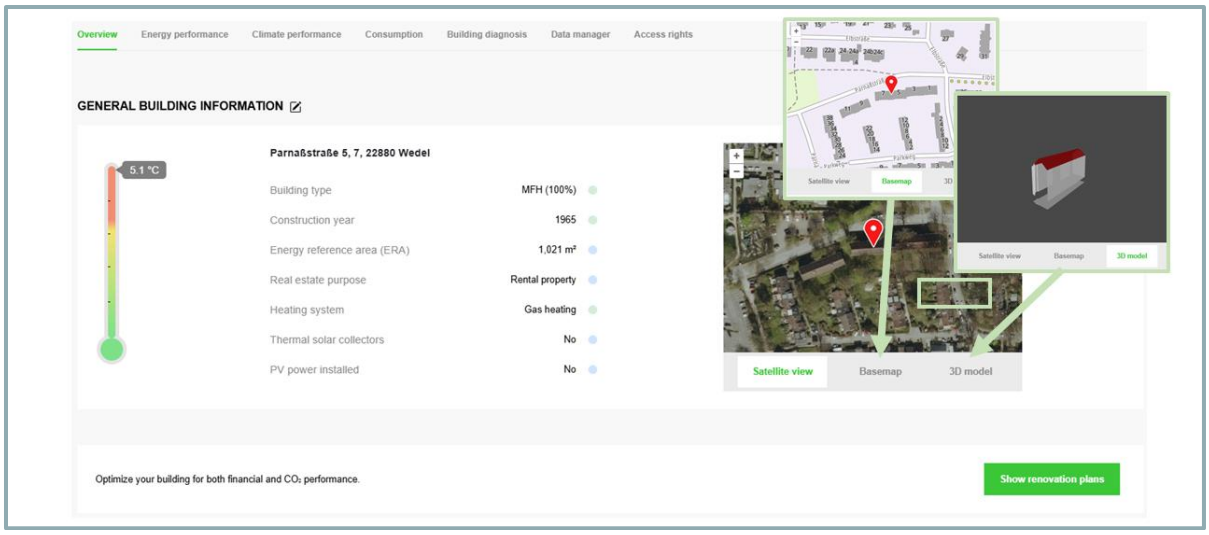


Figure 4: The general building information section with three options to visualize the location and the 3D shape of the building.

- **General building information**: Key details about the building are provided, including its type, construction year, energy reference area, real estate purpose, heating system, and whether thermal solar collectors or photovoltaic (PV) systems are installed.

- **Renovation pressure**: Information on building components, including the year the measure was implemented and the expected end-of-life year for the measure (i.e., when an alternative measure should be implemented).
- **Energy systems**: Information on the heating and domestic hot water (DHW) systems of a building, including:
  - Heating system: Type (e.g., gas heating), location, installation year, and next installation year.
  - DHW system: Type (e.g., gas heating), location, heat dissipation method, design supply temperature, temperature spread, DHW temperature, and storage volume.
  - Additional features: Mechanical ventilation, active cooling, solar thermal and photovoltaic installations, tilt/orientation of solar collectors, and battery storage.
- **Component properties**: change information on the thermal performance of building components, including:
  - Average U-values for the roof, walls, floor, and windows (indicating heat transfer efficiency).
  - The window-to-wall ratio and window-to-roof ratio, reflecting the proportion of windows in the respective building components. This information can also be changed in the Building geometry section.
- **Operational emissions**: find the carbon emissions (in kg CO_2-eq./kWh) for various energy sources used in the building, including: Oil, Gas, District heating, Electricity, Biogas, and different types of wood (pellets, chips, logs), with each energy source's associated emissions value. The values are generated by the software, but you can also update them manually with your own data.
- **Primary energy factors (PEF)**: find the primary energy factors (in kWh/kWh) for various energy sources, indicating the amount of primary energy required to produce one kWh of energy. This includes values for oil, gas, district heating, wood (pellets, chips, logs), electricity, and biogas. The values are generated by the software, but you can also update them manually with your own data.
- **Grid decarbonization**: provide the planned timeline for the decarbonization of district heating and electricity, with the start and end years for each process (2025 to 2050).
- **Usage**: provide information on building characteristics and occupancy, including:
  - Availability of basement and attic, whether they are heated.
  - Number of occupants.
  - Room temperature setting.
  - Outdoor air flow rate (without infiltration) and infiltration rate (both in $m^3/h \cdot m^2$).

3.1.2.2. Energy performance (⚡)

The energy performance section provides an overview of the building's energy demand and greenhouse gas emissions. Key details include:

- Energy ratings: for primary energy demand, final energy demand, and greenhouse gas emissions measured on a scale from A+ to H.
- Final energy demand: how much electricity and gas measured in kWh/year is consumed by a building.
- Key Indicators for:
  - **Heating and Hot Water**: demand for heating and hot water (kWh/m^2) and its efficiency (%)
  - **Electricity**: electricity demand for cooling, ventilation, lighting and electrical appliances (kWh/m^2)

- **Total heating power**: power required for heating load and power demand for hot water generation (kW)

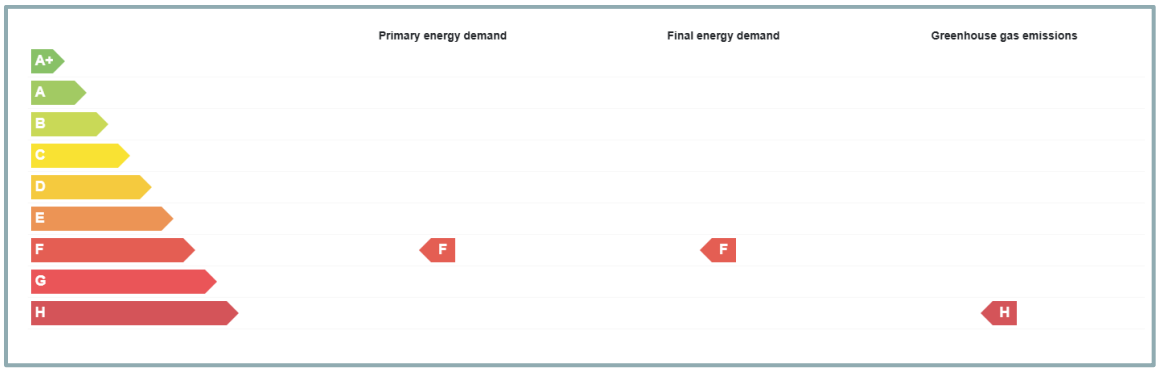


Figure 5: Example of a visual presentation of energy ratings for energy demand, final energy demand, and greenhouse gas emissions.

Figure 6: Example of a visual presentation of yearly final energy demand (kWh/year) and key building indicators.

3.1.2.3. Climate performance ( )

The climate performance section provides the **building's CO_2 footprint** (kg CO_2-eq./m^2) and the **implied temperature rise** (°C). It also includes a comparison of the building's CO_2 budget over- or undershoot for 2020-2050, with information on:

- **Cumulative operational emissions** (kg CO_2-eq./m^2) which refers to the total amount of carbon dioxide equivalent (CO_2-eq.) emissions produced by the building's energy use (such as heating, electricity, and cooling) over time, measured per square meter of the building's area. This metric helps assess the environmental impact of the building's operations.
- CO_2 budget for 1.5°C climate target which refers to the total amount of carbon dioxide (CO_2) emissions that can be emitted by the building while still staying within the global carbon limit required to limit global temperature rise to 1.5°C. This budget helps ensure that the building's emissions align with climate goals to mitigate climate change.

Figure 7: Example of a building and its climate performance.

3.1.2.4. Consumption ( )

In this section, you can provide information on building consumption for two purposes - (1) **Heating and hot water** and (2) **Electricity usage**:

- Measuring period
- Energy carrier (gas, oil, district heating, electricity, pellets, wood chips, wood logs)
- Consumption
- Unit (kWh, litres, m3, Ster, kg)

3.1.2.5. Building diagnosis ( )

Every time you visit a building site, you can add a new inspection report in this section by providing the following information:

- Done by – who conducted the inspection
- Date – when the inspection was conducted
- Description – brief description of inspection (up to 255 characters)
- Building site information:
  - Owner name
  - Street and number
  - Zipcode
  - Contact information (phone/email)
- Images – ability to add images from the site inspection

3.1.2.6. Data manager ( )

In this section, you can view and upload different documents for the building site such as documents related to the building diagnosis, consumption / billing, energy performance certificates (EPCs), manuals / schemas, permits, photos, plans, reports.

3.1.2.7. Access rights ( )

In this section, you can specify who receives access rights to the building. If the system recognizes the user's email address, they will be granted access. If not, an invitation will be sent to that email to complete registration.

The following access options are available for you to assign to your contacts:

- ***"Read-only"*** - is only able to review the data (e.g., your customer, building owner)
- "Write-all" - is able to input, update and delete all data related to the building site.

3.1.3. Planning

In the planning section of MESTRI-CE SDH you can:

✅ **Create and compare renovation plans**: Plan out your building's future by setting specific implementation years for each measure and comparing different renovation scenarios.
✅ **Gather detailed impact insights**: Get a full breakdown of your plans, including:
- **Energy** efficiency: See how your measures improve energy classes.
- Cost estimates: Calculate costs for each measure, including payback periods.
- Emission changes: Understand how your measures impact operational, cumulative, and embodied emissions.

✅ **Analyze PV roof potential**: Evaluate how much solar energy your roof could generate with a PV system.
✅ **Use it for financial planning:**
- **Reduce operational costs**: Estimate how much you can save during operation.
- **Maximize PV yield**: See the potential returns from installing solar panels.

✅ **Customize your building data**: Adjust energy prices, emission factors, financial parameters, and subsidies to fit your unique situation.
✅ **Compare and export plans**: Easily compare renovation plans side-by-side or export a detailed building report (PDF) to keep all your findings in one place.

To access the "planning" section you first have to select a specific building in the "property" section of the SDH tool. Then you can continue to the planning section of the tool, where you will be presented with two subsections:

- Measures overview
- Renovation plans

3.1.3.1. Measures Overview

In this section, you are provided with an overview of possible measures that you can implement on your building. For each measure, you have indication as to whether the measure is feasible.

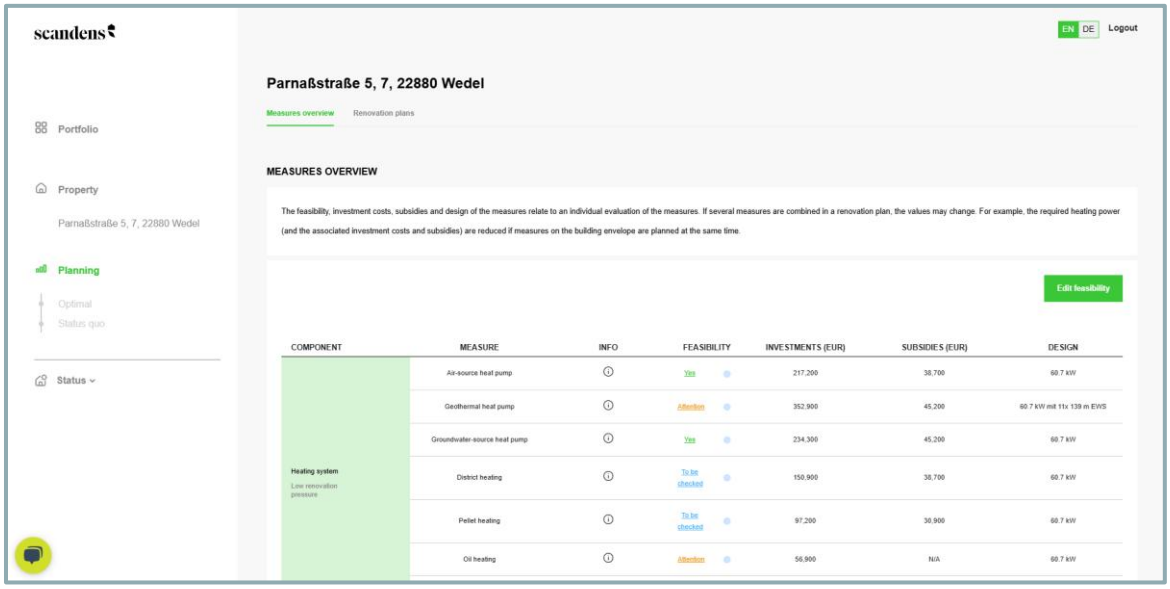


Figure 8: Overview of measures.

For each measure, the “Info” column provides a brief description of the measure, along with its advantages and disadvantages.

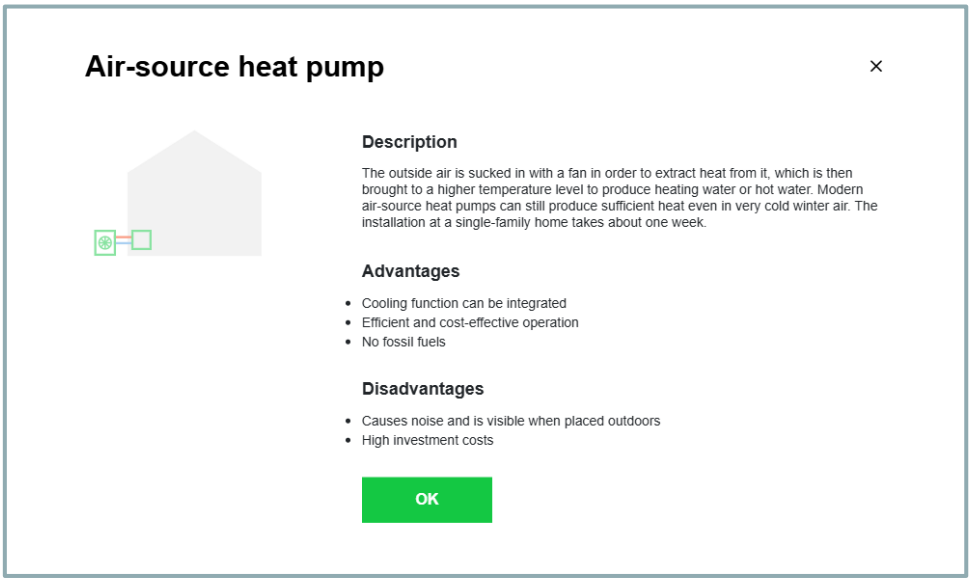


Figure 9: Brief description of selected measure.

By selecting the 'Edit Feasibility' button, you can modify the feasibility of the measure and add your comments and notes.

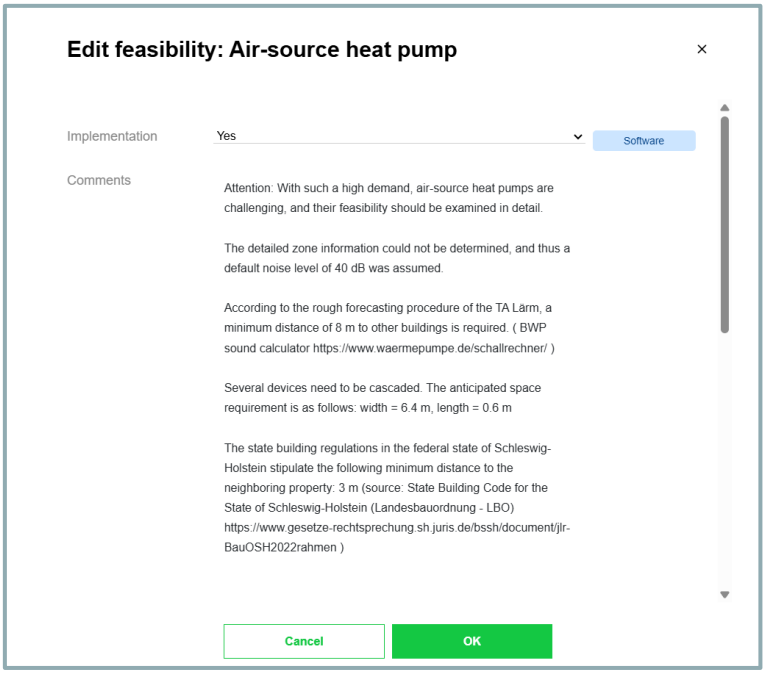


Figure 10: Editing the notes on the feasibility of proposed measures.

3.1.3.2. Renovation Plans

This section enables you to add and compare different renovation plans:

1. Assess each renovation plan
2. Change the parameters
3. Add custom renovation plans
4. Compare renovation plans

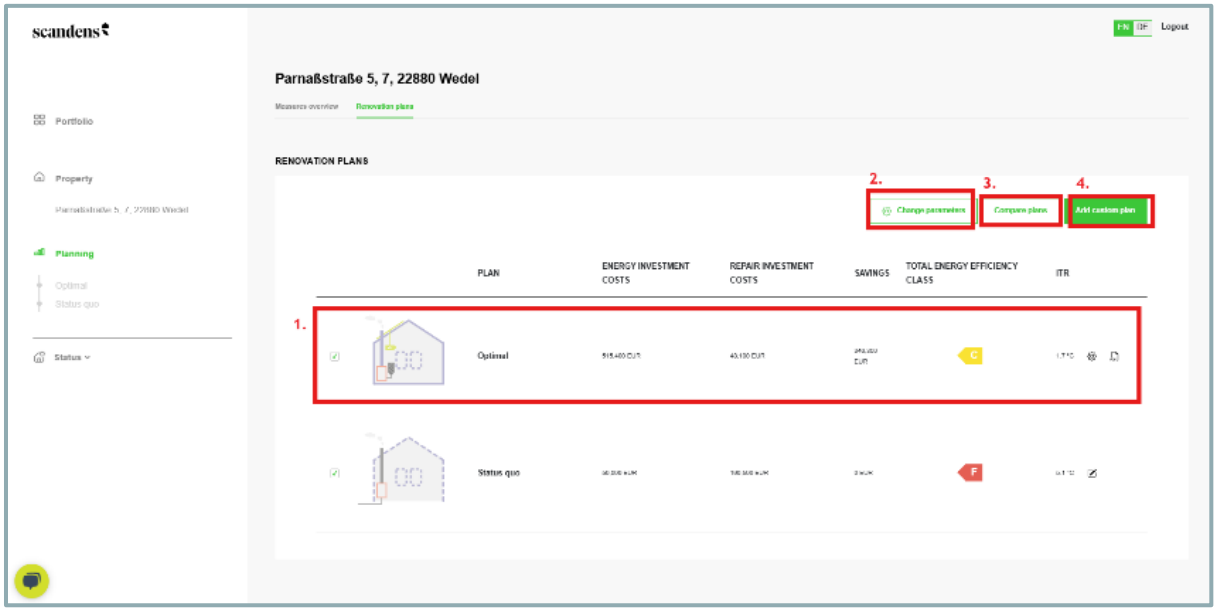


Figure 11: Functionalities in the renovation plans section.

Each functionality is briefly described below.

(1) Assess each renovation plan

By clicking on one of the renovation plans, you will be presented with:

- **Overview**: Provides an overview of the measures to be implemented as part of the selected renovation plan, including the financial and environmental impacts of each measure, a summary of all planned measures, and a visual depiction of the environmental and economic impacts of the plan.

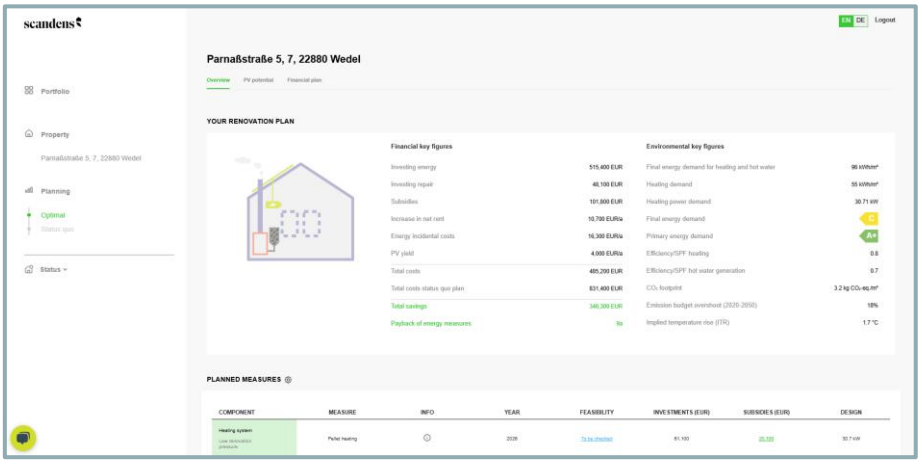


Figure 12: Overview of key financial and environmental figures of your renovation plan.

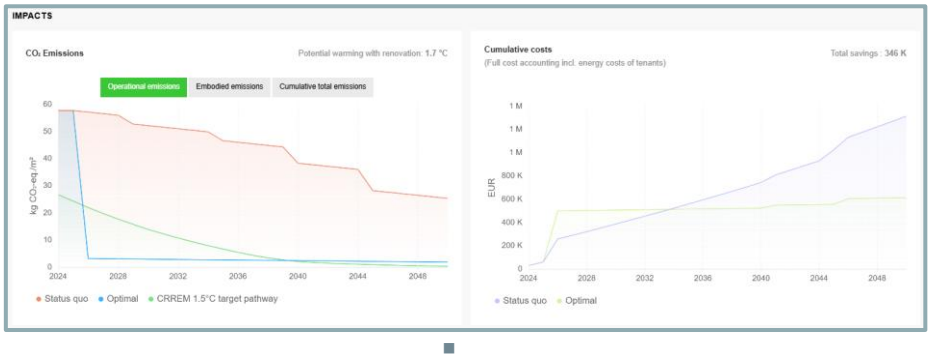


Figure 13: Impacts of your renovation plan (CO2 emissions, cumulative costs).

- **PV potential**: In this section, you can find information on the PV potential of the selected building, including the suitable area for PV, annual PV potential (in kWh and EUR), share of self-consumption, etc.

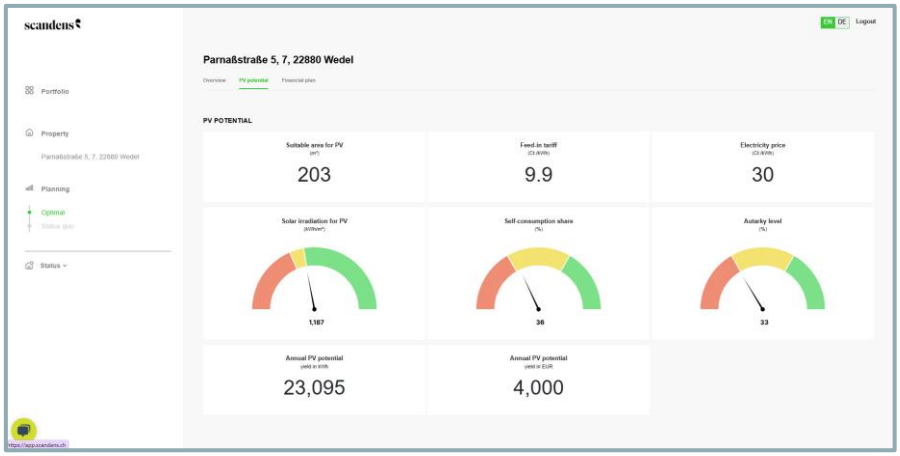


Figure 14: PV potential summary of the planned measure.

- Financial **Plan**: in this section you can review the capital expenditure (CAPEX)[2] and operating expenses (OPEX)[3] of your investment. Here you can:
  - Review the financial plan with the different measures
  - Analyze how much you can reduce the operational costs
  - analyze yearly PV yield that you can achieve

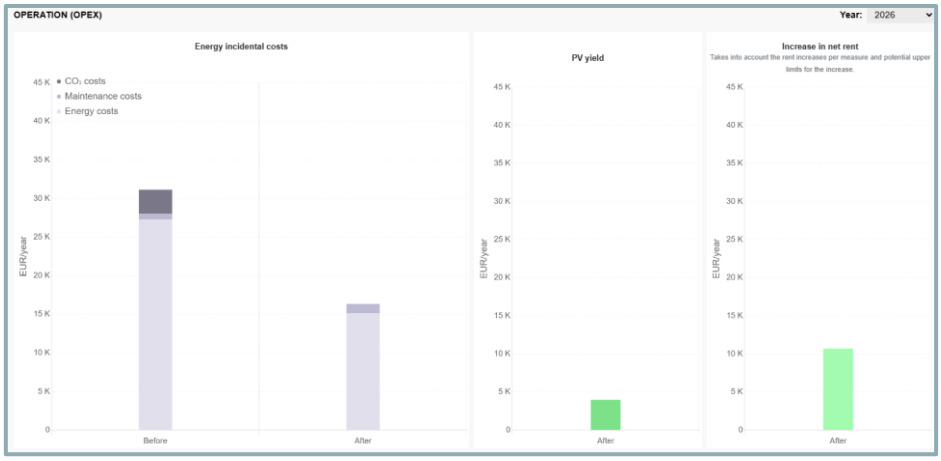


Figure 15: Financial overview of CAPEX and OPEX of the planned renovation plan.

(2) Changing parameters section

In this section, you can change the input parameters:

- Goals
- Approved measures

[2] Capex (Capital Expenditure) refers to the funds a company spends on acquiring, upgrading, or maintaining physical assets like buildings, machinery, or equipment to improve its long-term operational capacity. It represents an investment in the future growth of the business.
[3] Opex (Operating Expenses) refers to the day-to-day costs a company incurs to run its business, such as salaries, rent, utilities, and maintenance. These expenses are necessary for the company's regular operations but are typically short-term in nature.

- Energy prices
- Emissions factors
- Financial paramters
- PV potential
- Costs & subsidies
- Dimensioning

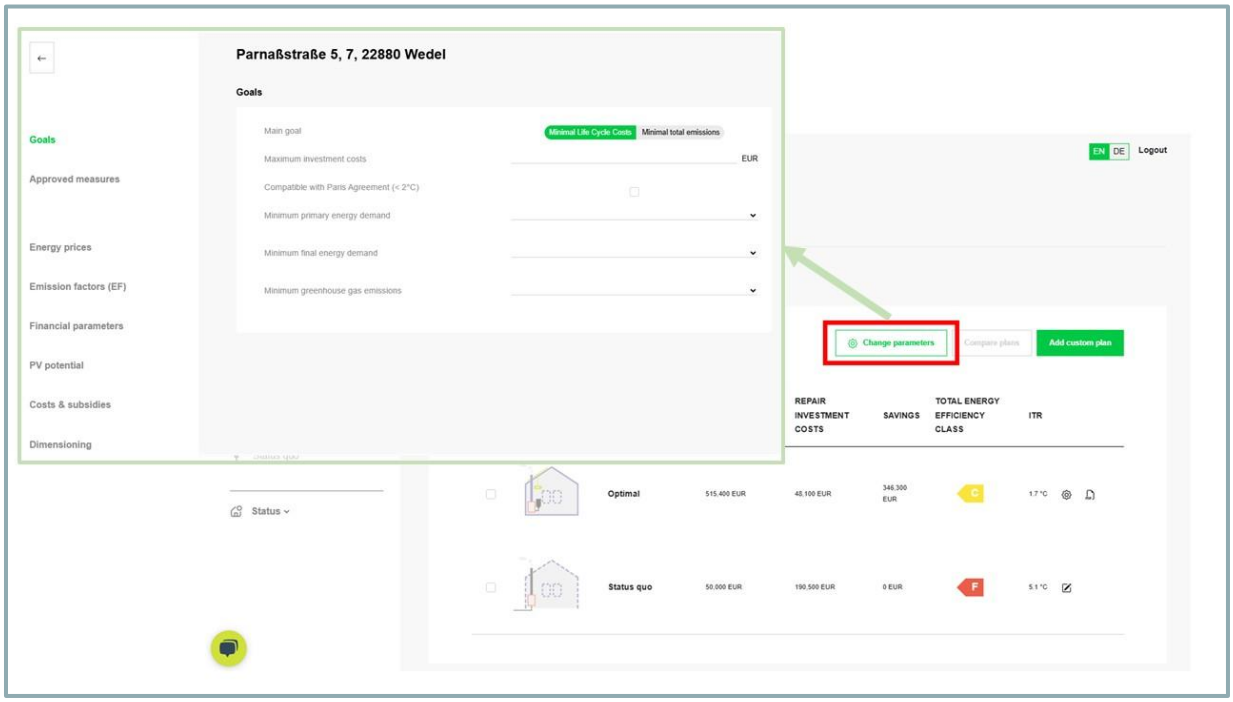


Figure 16: Changing the parameters section with an overview of what parameters can be changed.

(3) Adding custom renovation plans

You can add information on renovation plans such as type of measure (heating system, roof, wall, window, floor/cellar ceiling and solar system), info, year in which the measure will be implemented and feasibility of the measure to be implemented.

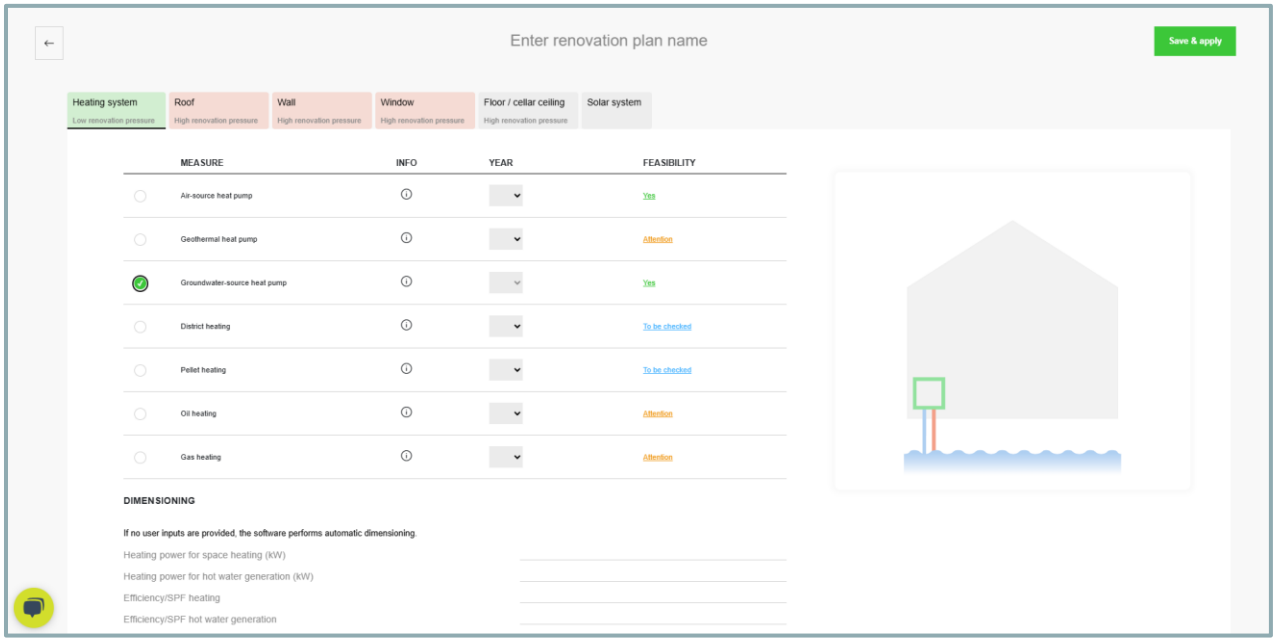


Figure 17: Adding custom renovation plans.

(4) Compare renovation plans

To compare your renovation plans, first select the plans you wish to compare and then proceed with the comparison. For all renovation plans, you can compare energy efficiency classes, climate impact, and costs, which are visually depicted. You also have the option to export the renovation plans as a PDF file.

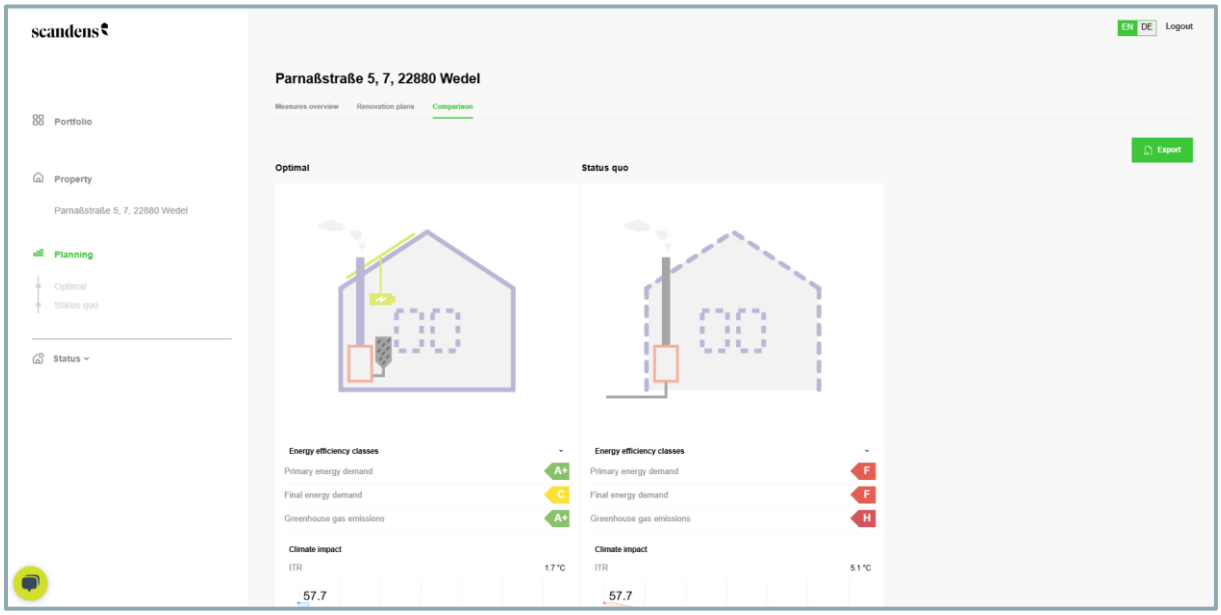


Figure 18: Comparison of two renovation plans.

Figure 19: For all renovation plans you a visual comparison of different metrics is available.

3.2. Data Needed for Practical Assessment

Please find below an overview of the data required in the SDH for practical assessment. The data is categorized into three groups based on its necessity:

- Mandatory information: inputs and information that you must provide on each building
- Important information: this information is not mandatory to provide, but recommended to provide to use different functionalities of the SDH
- Nice-to-have information: information that is recommended to fill out for more accurate results

	German	English
Mandatory information	Objekt-Nr. Strasse Nummer Postleitzahl Gemeinde Baujahr Gebäudetyp 1 Anteil Gebäudetyp 1 (%) Heizung Warmwasser	Object No. Street Number Postal Code Municipality Year of Construction Building Type 1 Share of Building Type 1 (%) Heating Hot Water
Important information	Anzahl Wohneinheiten Anzahl beheizte Geschosse Dachboden beheizt Wohn-/Nutzfläche [m2] Heizung Zentral? Jahr letzter Heizungsersatz Warmwasser Zentral? Wärmeabgabe Photovoltaik [kWp] Therm. Kollektoren [m2] Lüftungsanlage Kältemaschine Fassade Sanierungsjahr Fassade Instandsetzungs-Jahr Dach Sanierungsjahr Dach Instandsetzungs-Jahr Fenster Sanierungsjahr Fenster Instandsetzungs-Jahr Kellerdecke Sanierungsjahr Endenergieverbrauch WE Heizung und Warmwasser? Energieträger Einheit Endenergieverbrauch WW Energieträger Warmwasser Einheit Warmwasser Elektrizitätsverbrauch [kWh/a] Start Verbrauchsperiode Ende Verbrauchsperiode	Number of Residential Units Number of Heated Floors Attic Heated Living/Usable Area [m²] Central Heating? Year of Last Heating Replacement Central Hot Water? Heat Distribution Photovoltaics [kWp] Thermal Collectors [m²] Ventilation System Cooling System Facade Renovation Year Facade Maintenance Year Roof Renovation Year Roof Maintenance Year Window Renovation Year Window Maintenance Year Basement Ceiling Renovation Year Final Energy Consumption per Unit Heating and Hot Water? Energy Carrier Unit Final Energy Consumption for Hot Water Energy Carrier for Hot Water Hot Water Unit Electricity Consumption [kWh/year] Start of Consumption Period End of Consumption Period
Nice-to-have	Liegenschaft Liegenschaft-Nr.	Property Property No.

	Energiebezugsfläche [m2]	Energy Reference Area [m²]
	U-Wert Fassade [W/(m2*K)]	U-Value Facade [W/(m²K)]
	U-Wert Dach [W/(m2*K)]	U-Value Roof [W/(m²K)]
	U-Wert Fenster [W/(m2*K)]	U-Value Windows [W/(m²K)]
	U-Wert Kellerdecke [W/(m2*K)]	U-Value Basement Ceiling [W/(m²K)]
	Nächster Heizungsersatz	Next Heating Replacement
	Nächste Dachsanierung	Next Roof Renovation
	Nächste Fassadensanierung	Next Facade Renovation
	Nächste Fenster-Instandsetzung	Next Window Maintenance
	Fernwärme-Anschlusspflicht	District Heating Connection Obligation
	Denkmalschutz	Heritage Protection

3.3. Assessment Methodologies

Are you interested in learning about the methodologies used in the SMD for:

- Energy simulation
- Solar simulation
- Building parameters
- Reference area
- Cost data
- Energy performance certificate
- Emission factors
- Primary energy factors
- CRREM (Carbon Risk Real Estate Monitor)
- Weather data?

📌 You can find a detailed description of methodologies here.

3.4. Outputs and Benefits

Exporting data on renovation plans

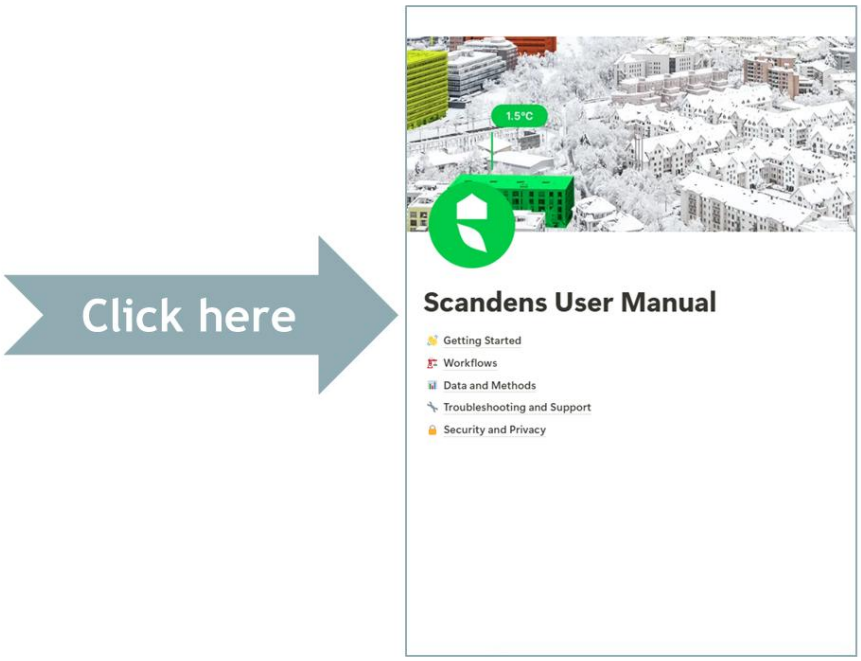
After you add your customer renovation plan in the “renovation plans” section, you can export this data into a PDF report. In the report all the information on renovation plan is compiled:

- General building information
- Current building condition
  - Energy performance
  - Climate performance
  - Renovation/repair needs
- Energy efficient renovation
  - Feasibility of renovation measures
  - Photovoltaic potential
  - Renovation plan
  - Improving energy and climate performance
- Data Sources and Assumptions

Figure 20: Exporting building renovation plans into PDF report.

4. Step-by-Step Guide to Using the Smart Data Hub

📌 You can find the **Manual** on How to Use Scandens platform by clicking **here**.



📌 **Video Tutorials** are available (in German only) for the following topics:

🎞 **Accessing the Platform and Setting Up the Account:**
https://www.loom.com/share/69623487d73640968a155bcb8f795438

🎞 **Adding New Buildings to the Platform**

- 1a) Adding new buildings: https://www.loom.com/share/20df45b34940417683079f6c00df49ab
- 1b) Adjust building geometry:
https://www.loom.com/share/fe9440f949174322baa60cdc01d6b5d4

🎞 **Building Analysis:**

- 2a) Validation of the building analysis results:
https://www.loom.com/share/6f82dca936eb4fa48b82e6f540625587
- 2b) Record energy consumption:
https://www.loom.com/share/c4828dcd046342c2a9a1f8e65b16544d

🎞 **Define optimization criteria for renovations:**
https://www.loom.com/share/772194f53c1345ce9e8627643622fa35

🎞 **Optimize buildings & compare renovation plans:**
https://www.loom.com/share/49ca56d487d44bd6b8242be4e1a2b8ac

🎞 **Create and compare your own restructuring plans:**

- 6a) Export building reports as PDF: https://www.loom.com/share/283e4442a3a6490ea5493570c8425e21
- 6b) Export impulse consultation checklist for gMFH: https://www.loom.com/share/4dcf0b5a7ffd431a83a41b17267d3c7a

🎞 **Portfolio overview:** https://www.loom.com/share/61c5612dc74949f79703f3e2759ea5d6

🎞 **Create and compare your own restructuring plans:** https://www.loom.com/share/38a46e537e9248e0a56c6d9cb3df99e4

🎞 **3D Modelling:**

- 3D Building Model Editor: Adjust Properties: https://www.loom.com/share/f37f3f6f26f141218264ebcef59ac92d
- 3D Building Model Editor: Create a new 3D model: https://www.loom.com/share/b39ede4595ac4b6dbcbe7042e0310c63
- 3D Building Model Editor: Advanced Features: https://www.loom.com/share/7da4366a4fb24762be951453400d502b

5. Practical Tips for Effective Use

5.1. Maining High-Quality Data

Maintaining high-quality data is critical for accurate reporting, effective decision-making, and regulatory compliance. Follow these best practices to ensure data integrity and consistency within the Smart Data Hub:

1. **Establish Clear Data Ownership and Responsibilities**
   ✅ Assign specific roles (e.g., data entry personnel, validators, auditors) and name responsible persons to ensure accountability.
   ✅ Maintain a data governance policy outlining who can enter, modify, and approve data.
   ✅ Require dual approval for critical updates to avoid unintended errors.
   ✅ Designate a responsible individual to conduct regular system checkups and monitor for any faults, recognizing that no system is entirely fault-free.

2. **Capacity Building of SDM Users**
   ✅ Offer comprehensive introductory training for new SDH users to ensure they are equipped with the knowledge and skills to effectively use the system from the start.
   ✅ Consistently organize knowledge transfer sessions on SDH functionalities, such as hosting in-person or online sessions with current users or sending notification emails to keep users informed about new features and updates.

3. **Standardize Data Entry Across Users:**
   ✅ Use consistent naming conventions for buildings, assets, and performance indicators.
   ✅ Define clear measurement units (e.g., kWh, CO_2 emissions in metric tons) and standardized input formats (e.g., DD/MM/YYYY for dates).
   ✅ During on-site visits, use only the SDH system for data collection and entry, avoiding the use of additional formats such as Excel files to ensure consistency.
   ✅ Maintain a clear and comprehensive overview of all data sources.

4. **Schedule Regular Data Updates and Quality Audits**
   ✅ Regularly update building data, ensuring that all interventions and their outcomes are accurately recorded and documented.
   ✅ Perform regular audits (e.g., monthly or quarterly) to identify and address missing, outdated, or inconsistent data.
   ✅ Use the Smart Data Hub's automated reporting tools to track anomalies over time.
   ✅ Compare actual performance data with expected benchmarks to identify discrepancies.

5. **Using Advanced Data Collection Methods**
   ✅ Digitize data management processes and enhance them with AI models.
   ✅ Installing automatic detectors in the building to collect data.
   ✅ Thermovision connected with the AI simulation.

5.2. Maximizing the Hub's Potential

As future users of the SDH you can benefit from early insights shared by project partners who explored its functionalities across various contexts. Below are practical suggestions to help you make the most of the SDH — whether you're just getting started or looking to scale your efforts.

	Tip	Action	Benefit
🏢	Experiment across buildings	Start with a pilot group of buildings — mix sizes, functions, and renovation statuses — to explore the Hub's capabilities in different contexts.	Using the SDH across diverse building types (e.g., schools, offices, housing) and at varying points in the renovation lifecycle helps reveal patterns, test features, and ensure its adaptability to real-world needs.
🔍	Monitor progress & follow a roadmap	Regularly update project milestones and compare them to your initial roadmap. Use these insights to adjust strategies and share progress with stakeholders.	Tracking your renovation journey in the SDH allows you to identify bottlenecks, measure impact, and ensure alignment with sustainability goals.
🗂️	Define portfolios strategically early on	Group buildings by similar characteristics (e.g., usage type, energy performance, location) to create a well-structured portfolio.	Thoughtful portfolio definitions facilitate comparison, reporting and streamline decision-making.
🧩	Start small, grow over time	Utilize SDH even in the absence of complete data, and gradually add data as it becomes available. Lack of data shouldn't stop you as SDH is built to evolve with your needs, allowing for continuous input and refinement over time.	Begin with basic data (e.g., floor area, energy use) and add layers (e.g., cost, renovation plans) as they become available. This incremental approach helps build confidence and momentum.
📣	Disseminate and inspire broader use	Share your results with stakeholders through in-person events or your established channels, such as social media, your website, or annual reports.	Sharing your experience and outcomes helps drive adoption of the SDH, builds partnerships with different stakeholders (e.g., policy makers, financial institutions), and encourages harmonization of data practices.

Case Study 1: Using SDH to Enhance Building Management at [name of the pilot site]

Please provide a brief overview of how the pilot site has utilized the hub. Suggested topics to cover include:

- *Description of the demo site (stakeholders, building details, and implemented measures)*
- *Key lessons learned from using the SDH*
- *How and for what purpose the SDH was used at the pilot site*
- *Specific ways the pilot partner utilized the SDH*

6. Support and Further Resources

6.1. Support Resources for Smart Data Hub Users

📜 **Scandens Platform Usage Manual:** https://intelligent-hubcap-0b3.notion.site/Scandens-User-Manual-1b09d5bdc05280aba686ccd20f28f558

▶️ **Step-by-step video tutorials** (for now only available in German): https://www.loom.com/looms/videos/Tutorial-Videos-Scandens-2aeb6be045dc441ea6264894a65434bc

💬 **Chat with the Energy Expert Function:** At the bottom left corner of the Scandens Web App you will find a green chat icon enables you to chat with the energy experts.

⚠️ **Technical Support:** If the resources mentioned above do not help or if you encounter a technical issue, please report it to the following email address: diego@scandens.ch. Kindly provide as much detail as possible about the issue to assist the technical team in resolving it efficiently.

💡 **Additional Learning Materials**: ***Are you interested in learning more about different aspects of Buildings Management?*** You can find all the projects' materials and outputs here. However, we believe the materials provided in the table below could be specifically interesting for you. The

symbols are used to provide you with an information on what topic the material refers to: (📊) **Smart Data Management of Buildings**, (🌱) **Sustainable Management of Buildings** and ($) **Financing of Sustainable Building Renovations**.

	Title	Short Description	Access
📊	Creation of the MESTRI-CE Smart Data Hub (D.1.2.1)	Learn about the identified needs used for the creation of MESTRI-CE Smart Data Hub.	Click for access
📊	Vision for long-term utilization of individual buildings (D.1.4.2)		Click for access (coming soon)
📊	Joint Strategy for transition towards long-term climate neutrality of buildings (D.1.4.3)		Click for access (coming soon)
📊	Trainings for Stakeholders (D.1.5.1)	Access available training materials developed for workshops covering various topics related to Building Management (e.g., financing, technical aspects, sustainability).	Click for access (coming soon)
🌱	MESTRI-CE Sustainable Building Methodology for (re)construction of buildings (D.2.2.2)	Learn about the development of the sustainable building methodology (SBM) integrated in the Evaluation toolbox.	Click for access (coming soon)
🌱	Step-by-step Guide on Sustainable Building Methodology (D.2.5.1)	Learn about how Sustainable Building Methodology (SBM) integrates EU sustainable buildings framework and builds on existing standards.	Click for access (coming soon)
🌱	Advisory Hub for Project and Policy Developers (D.2.5.2)	Support for project developers using MESTRI-CE technical and financial tools and methodologies.	Click for access (coming soon)
$	Financing the transition to climate-neutral buildings (D.3.1.3)	Learn about the available financing options for sustainable building renovations in Austria, Germany, Italy, Croatia, Poland, and Slovenia.	Click for access
$	Guidelines for financing with innovative models and support schemes (D.3.2.3)	Learn how to use the MESTRI-CE green methodology for financing with different innovative models, and how the financial aspects of project are evaluated, reported, and monitored.	Click for access (coming soon)

$	Becoming investors and prosumers (D.3.2.4)	Free communication materials (guides, online tutorials) are available to inform citizens about actively participating in financing sustainable building renovations.	Click for access (coming soon)

6.2. FAQ

You can find a lot of information about the Smart Data Hub **here**. Below, we address the most frequently asked questions. If you have any additional questions that aren't covered, please feel free to contact us at johanna.jicha@e-sieben.at.

6.2.1. Cost and Access

- *Is the Smart Data Hub (SDH) toll free to use for the duration of the project and after the project ends?*
  - Yes, the tool is free to use for the MESTRI-CE project partners for the duration of the project and 5 years after the completion of the project. Other interested parties have the possibility to test the tool free of charge with a limited scope and a limited number of buildings.

- *What happens to all the uploaded data if a user of the SDH wants to stop using the SDH?*
  - The data is stored on the server. If you no longer wish to edit your portfolio in the smart data hub, all stored data can be exported as pdf and excel files.

6.2.2. Data Storage and Security

- *How is data stored?*
  - Data is stored on Amazon Web Services (AWS) cloud infrastructure, with AWS responsible for securing the underlying infrastructure and Scandens ensuring the security of customer data within the cloud. Both parties comply with industry-leading security standards. You can learn more about cloud infrastructure **here**.

- *How is the data safety ensured? Is the data shared with third parties?*
  - Scandens ensures data safety through comprehensive measures that protect confidentiality, integrity, and availability, while safeguarding against accidental destruction, loss, theft, or unauthorized use. Data is not shared with third parties without consent. You can learn more about data security and privacy **here**.

6.2.3. Data Updates and Compliance

- *If a renovation measure is proposed for a specific year within the tool (e.g., replacing a gas boiler with a heat pump in 2025), will the building's status update automatically to "completed" after that year, or will the user be prompted to confirm whether the measure has been carried out?*

- No, the status of the building will not update automatically. The user has to manually confirm the change in the renovation plan. The planned measure is listed separately as a future action, and you can modify or delete it if it has not been implemented.

- *How often will the Smart Data Hub update data related to national subsidies?*
  - This is a part of Scandens' service offering, that the regulations and subsidies are constantly updated, on a quarterly, biannual and annual frequency.

- *How often are the political indicators updated?*
  - This is a part of Scandens' service offering, that the regulations and subsidies are constantly updated, on a quarterly, biannual and annual frequency.

- *Is there a possibility to create scenarios to be EED III compliant?*
  - It will be possible to specify that all buildings must achieve energy efficiency class E from 2030 and class D from 2033 and the Portfolio Optimiser will then optimise everything.

6.2.4. Using the Smart Data Hub Tool

- *On which devices can I use the SDH tool?*
  - The tool is compatible with both desktop and tablet devices.

- *I'm having trouble logging into the SDH app. What should I do?*
  - Please check the list of most common issues and solutions when accessing the platform with further contact support options here.

- *I can't remember which two-factor authentication app I used when I first logged in. How can I find this information?*
  - Coming soon.