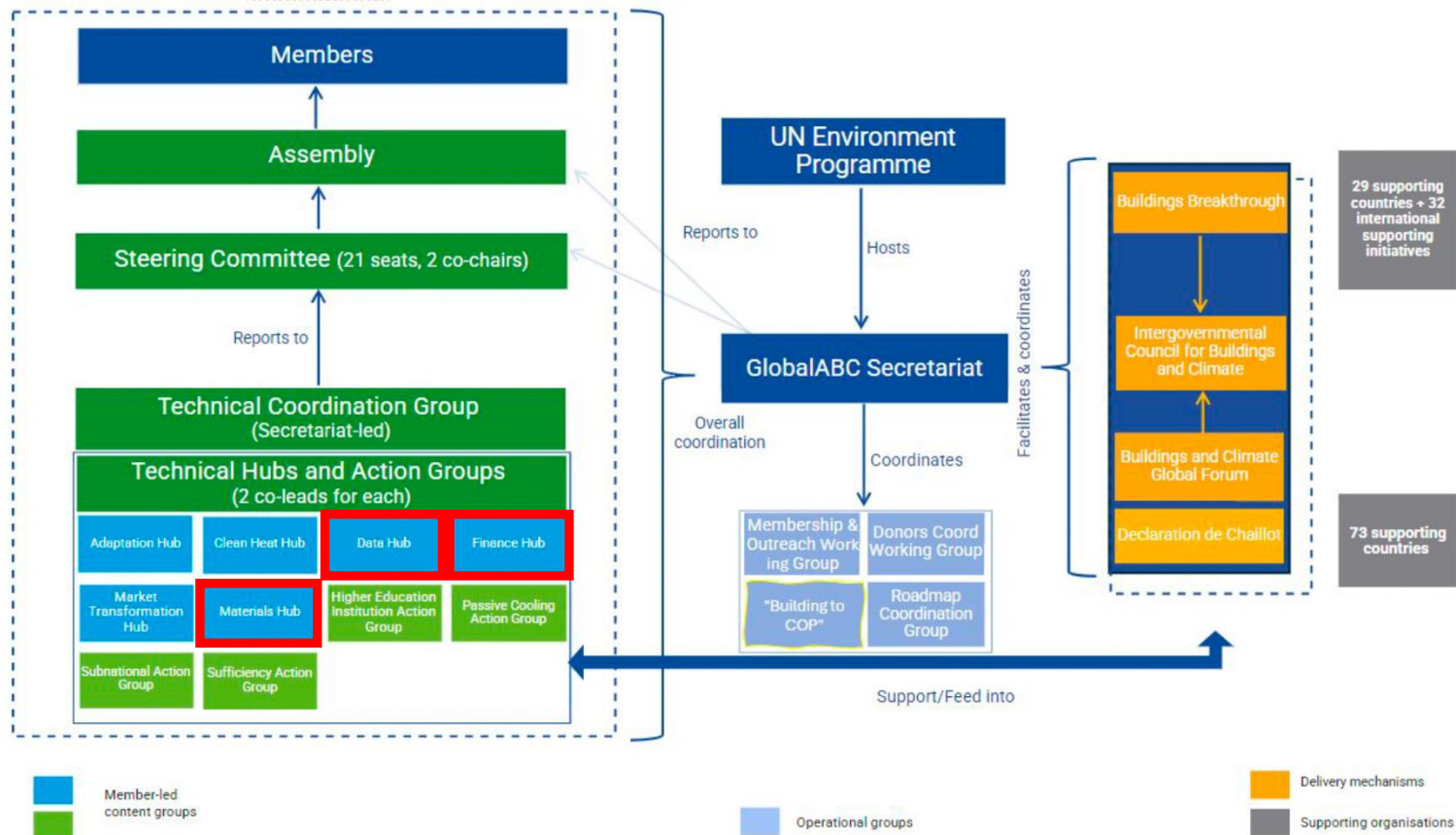


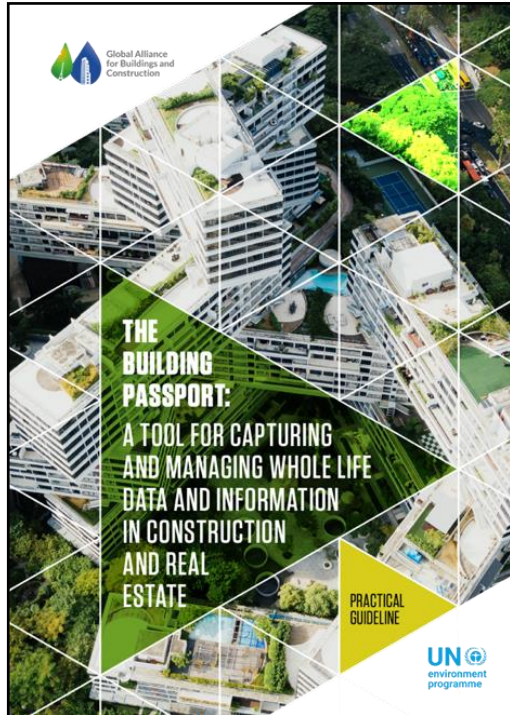
CAPSA as digital support tool for supporting investment into building refurbishment

York Ostermeyer, PhD

Professor for Energy and Building Data









What is a Digital Building Passport?

- a database that holds all building data relevant for a building in digital and processable form
- Includes means of data collection, processing and governance
- makes data available to other service providers via interfaces

What is a Digital Building Passport good for?

- Enables building a national baseline and report on progress towards NCD targets
- lowers costs for energy audits and building certification
- lowers interest rates and insurance costs by building trust
- links buildings to international green finance and article 6

The value of digital building passports

Individual and institutional stakeholders and public authorities in their role as: investor, client, buyer, owner, portfolio manager, vendor, owner-occupier, private landlord, housing company, real estate company, property fund, REIT, public authorities with building stock, companies with building stock



Financial services providers: valuers/appraisers, risk assessors, financial institutions, insurance companies



Conveyancing service providers: lawyers and solicitors



Construction products industry



Waste and recycling industry



Public authorities in their role as building authority, building inspector, funding programme provider



Supplier of utility services: energy supplier, water supplier, waste water management, waste management



Service providers during design: design and construction, i.e. designer, engineer, consultant



Service provider during operation: facility managers, cleaning & maintenance service providers



Construction services providers: constructors, de-constructors, construction companies, craftsmen



Developers



Real estate services providers: estate agents/brokers



Tenants



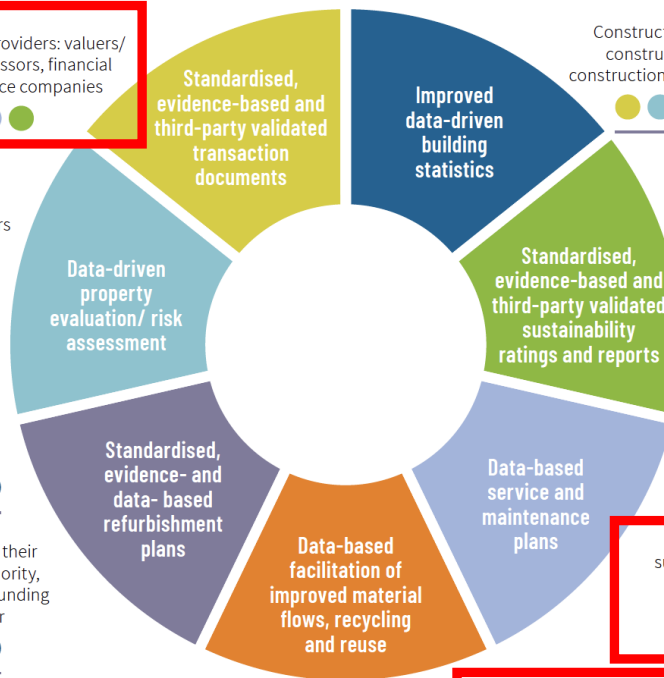
Assessment providers: sustainability assessors, LCA specialists, sustainability certifiers



Public authorities in their role as lawmakers and monitoring bodies: local governments, national governments, statistical offices



Global Alliance
for Buildings and
Construction



The CAPSA digital building passport platform

CAPSA®

The intuitive app designed for
efficient building data collection.





89 Königs Wusterhausen Completed
Kirchsteig 74+74a, 15711
Königs Wusterhausen, Germany



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[Consumption](#)

Scenarios

[Heat pump feasibility](#)

Planning

[Intervention roadmap](#)

Resources

[Error logs](#)

[Photo vault](#)



89 Königs Wusterhausen

Completed

Building details

- [Address](#) Kirchsteig 74+74a, 15711 Königs Wusterhausen
- [Construction year building](#) 1 January 2015
- [Technical systems](#) 1 Heating system, 1 Ventilation system
- [Type of use](#)
- [Energy carrier](#)
- [Latest updated](#) 12.06.2025

Intervention roadmap

There is a roadmap!
Created 24 days ago
2026-2039 | 9 actions

Errors / Warnings

No errors or warnings

Total gross floor area

1202 m²

Conditioned useful floor area

1109 m²

Compactness of conditioned blocks (A/V)

1.2 m⁻¹

Conditioned gross volume

3467 m³

Envelope U-value conditioned

0.33 W/m²K

Weighted average volumetric flow rate

0.35 l/m²/h

Annual carbon intensity

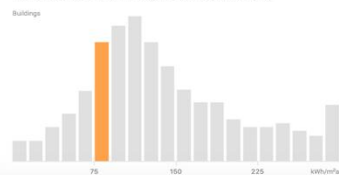
16 kgCO₂/m²a

Annual final energy demand

83 kWh/m²a

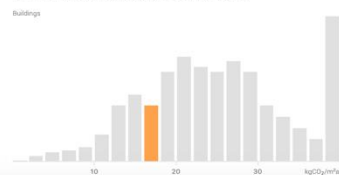
Final energy demand compared to the average

Final energy demand benchmark against synthetic German stock



CO₂ emissions compared to the average

CO₂ emissions benchmark against synthetic German stock



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Kirchsteig 74+74a, 15711
Königs Wusterhausen, Germany



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83 kWh/m²

Total final energy demand per area

68 kWh/m²

Total combined heat demand per area

56 kWh/m²

Space heating demand per area

12 kWh/m²

Domestic hot water heating demand

16 kgCO₂/m²

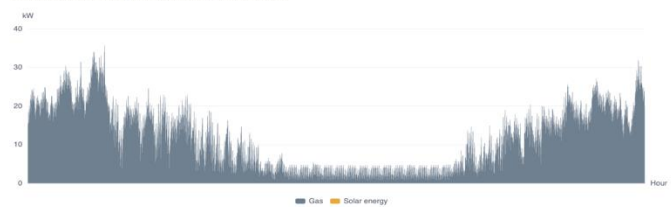
Total carbon emissions per area

THERMAL DEMAND AND FINAL ENERGY DEMAND

[Close](#)

The heat demand represents the energy required to maintain the building's indoor heating conditions. The final energy reflects the energy used by the technical systems to meet these demands. Together, they illustrate the relationship between the building's thermal needs and the energy required to fulfil them.

Hourly final energy demand of the building by energy carrier (kWh/h)



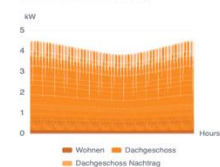
Space heating demand (kWh/h)



Space cooling demand (kWh/h)



Hot water heat demand (kWh/h)

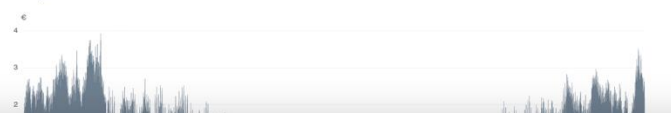


RUNNING COSTS

[Close](#)

The final energy use and heat demand result in running costs required to supply the building with energy, including both economic costs and environmental impacts in terms of carbon emissions (across two scopes).

Running costs



Building summary

Building

Keller Ost

Wohnen Ost

Dachgeschoss Ost

Keller West

Wohnen West

Dachgeschoss Ost

Locations (Coming soon)

Technical systems

Solar Energy (Coming soon)

Site

Intervention playground

Energy graph

Heat pump analytics

Decarbonization roadmap

Photo vault

Error logs

Test Graphs

Big 3D Model

Latest updated

Raw data 02.12.2025
Energy calculations 03.12.2025

Run energy calculations

Wohnen Ost
6005 Heidelberg (KLON)
Ruhlbacher Straße 146, 69126
Heidelberg, Germany

Completed



Edit block

GENERAL INFO

Close

Block name	Wohnen Ost		
Number of floors	2		
Floor height	Internal slab thicknesses		
Floor 1	265cm	Slab 1	30cm
Floor 2	265cm		
Type of use	Block type		
Living	100%	Main	

3D Model



TEMPERATURE

Close

Heating setpoint
Heated living space (20-22 °C)Cooling setpoint
No cooling

WALLS (14)

Close

Wand 1 Assembly added Features: 0	Wand 2 Assembly added x2	Wand 3 Assembly added x4 x1
Wand 4 Assembly added x2	Wand 5 Assembly added Features: 0	Wand 6 Assembly added x4
Wand 7 Assembly added Features: 0	Wand 8 Assembly added x2	Wand 9 Assembly added Features: 0
Wand 10 Assembly added x1	Wand 11 Assembly added Features: 0	Wand 12 Assembly added x4
Wand 13 Assembly added Features: 0	Wand 14 Assembly added Features: 0	

INWARD WALLS (0)

Close

No inward walls

ROOFS (4)

Close

Dach 1 Assembly added Features: 0	Dach 2 Assembly added Features: 0	Dach 3 Assembly added Features: 0
---	---	---

Building summary

Building

Keller Ost

Wohnen Ost

Dachgeschoss Ost

Keller West

Wohnen West

Dachgeschoss Ost

Locations (Coming soon)

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Latest updated

Raw data 02.12.2025
Energy calculations 03.12.2025

Run energy calculations

Wohnen Ost Wand 10 Schmal
6005 Heidelberg (KLON)
Ruhlbacher Straße 146, 69126
Heidelberg, Germany

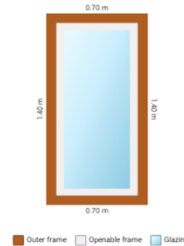
Completed



Edit window

SHAPE AND SIZE

Close



Size
70x140cm

Shape
Rectangle

Compass direction
North (358°)

Amount of windows of this type on the wall
1

GLAZING

Close

Type of glazing in the window N/A	Can any glazing parts be opened? Yes	Does any glazing part have grids? No
Does the glazing have a solar protection coating? No	Does the glazing have lowE coating? Yes	Glazing area U-value 0.6 W/m²K
Glazing Solar Heat Gain Coefficient (SHGC) value 70 %	Gas filling Argon	

OUTER FRAME

Close

Material of the outer frame PVC	Thickness of the outer frame 70 mm	Outer frame material U-value 1.7 W/m²K
------------------------------------	---------------------------------------	---

OPAQUE AREAS AND SHADING

Close

Number of opaque areas 0	Material of the opaque area N/A	Opaque material U-value N/A
Type of shading N/A	Window shading schedule N/A	Window shading coefficient N/A

MULLIONS AND INNER FRAME

Close

Mullion thickness No data	Material of the mullions and inner frame PVC
------------------------------	---

11:46 5G

Overview



Initialization Status: 3/3

Type of use

Type of use Define the usage of the building Unlocked

Status: In progress

Start

Status: 0/1

Walls Status: 0/1

Slabs Status: 0/1

11:46 5G

Building blocks

2D 3D



Google

Attic 1 Floor Edit

Main 4 Floors Edit

Basement 1 Floor Edit

11:47 5G

Info

WINDOW INFORMATION

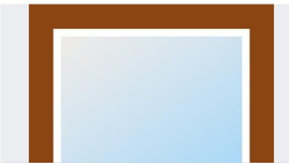
Display name 130x180

Window image

Camera Library

How many windows of this type exist on this wall? - 5 +

WINDOW DATA



Save

11:48 5G

Library

Search

Assemblies: 157

cavity, brick, with insulation, d=175, 1969-1978 Preview

Masonry wall with cavity, brick, with insulation, d=175, 1979-1983 Preview

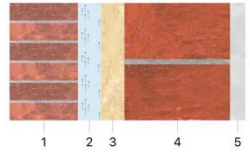
Masonry wall with cavity, brick, with insulation, d=175, 1984-1994 Preview

Masonry wall with cavity, brick, with insulation, d=175, 1995-2001 Preview

Masonry wall with cavity, brick, with insulation, d=175, 2001-2004 Preview

11:49 5G

Assembly



1 2 3 4 5

ASSEMBLY LAYERS

Add +

1 Clinker, 1900kg/m3 Thickness: 115 mm Edit

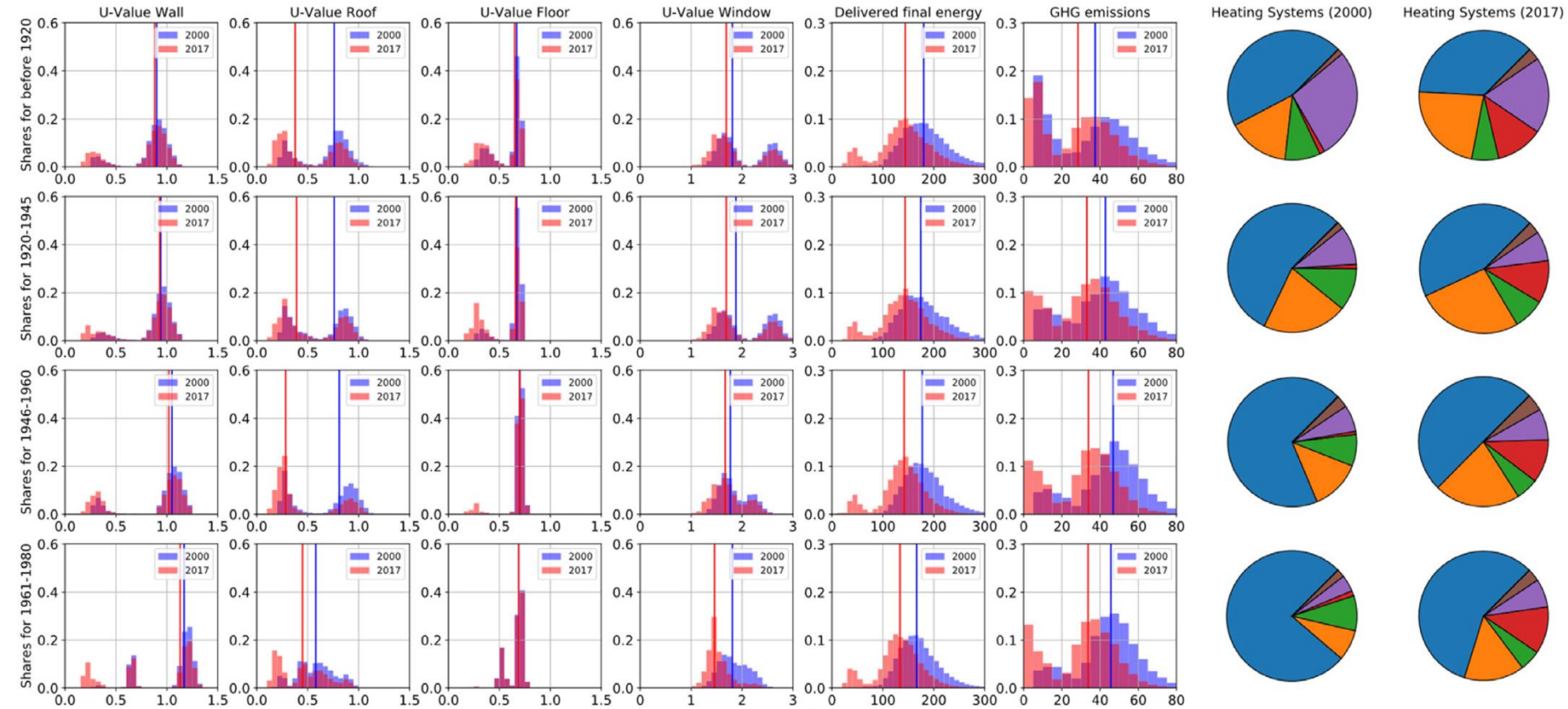
2 Air cavity, lightly v... Thickness: 40 mm Edit

3 Glaswool, lambda... Thickness: 40 mm Edit

4 Perforated brick,... Thickness: 175 mm Edit

Confirm

The policy and monitoring argument



Building		Opaque Components		Transparent Components	
Building type	Multi-Dwelling Building	Component Type	Roof	Component type	Window
Climate zone	Switzerland	Year	1979	Year	1987
Construction year	1926	Surface Area	152 m ²	Surface area	20.7 m ²
Scaling factor	109	U-Value	0.53 W/m ² K	U-value	1.7 W/m ² K
Representative floor area	27721 m ²	Insulation thickness	75 mm	g-value	0.69
Number of floors	2	Orientation	139°/319°	Shading factor	0.71
Number of basement floors	1	Angle	20°	Frame ratio	0.12
Roof type	Pitched			Orientation	144°
Number of dwellings	2			Angle	90°
Residential floor area	211 m ²				
Heated floor area	253 m ²				
Footprint area	126 m ²				
Height floor	2.9 m				
Perimeter	19.0 m				
Volume	761 m ³				
Ventilation rate infiltration	86 m ³ /h				
Electricity auxiliary	1066 kWh/a				
Heat capacity	234 kJ/K m ²				

Ventilation		Heating System		Hot Water System	
Ventilation type	Natural	System type	Oil Boiler	System type	Electric water heater
Year	-	Year	1991	Year	1991
Central	False	Central	True	Central	False
Ventilation rate	296 m ³ /h	Power	20 kW	Volume	200 l / day
Efficiency heat recovery	0%	Efficiency	80 %	Efficiency	66 %
Specific fan power	0 W/m ³ h	Energy carrier	Oil	Energy carrier	Electricity
Maintenance costs	0 CHF/a	Maintenance costs	680 CHF/a	Maintenance costs	386 CHF/a

Building		Opaque Components		Transparent Components	
Building type	Multi-Dwelling Building	Component Type	Roof	Component type	Window
Climate zone	Switzerland	Year	1979	Year	1987
Construction year	1926	Surface Area	152 m ²	Surface area	
Scaling factor		U-Value		U-value	
Representative floor area		Insulation thickness		g-value	
Number of floors	2	Orientation		Shading factor	
Number of basement floors	1	Angle		Frame ratio	
Roof type	Pitched			Orientation	
Number of dwellings	2			Angle	
Residential floor area	211 m ²				
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Footprint area	126 m ²				
Height floor	2.9 m				
Perimeter	19.0 m				
Volume	761 m ³				
Ventilation rate infiltration					
Electricity auxiliary					
Heat capacity					

Ventilation		Heating System		Hot Water System	
Ventilation type	Natural	System type		System type	
Year		Year		Year	
Central		Central		Central	
Ventilation rate		Power		Volume	
Efficiency heat recovery		Efficiency		Efficiency	
Specific fan power		Energy carrier		Energy carrier	
Maintenance costs	0 CHF/a	Maintenance costs	680 CHF/a	Maintenance costs	386 CHF/a

This is what service providers need as input...

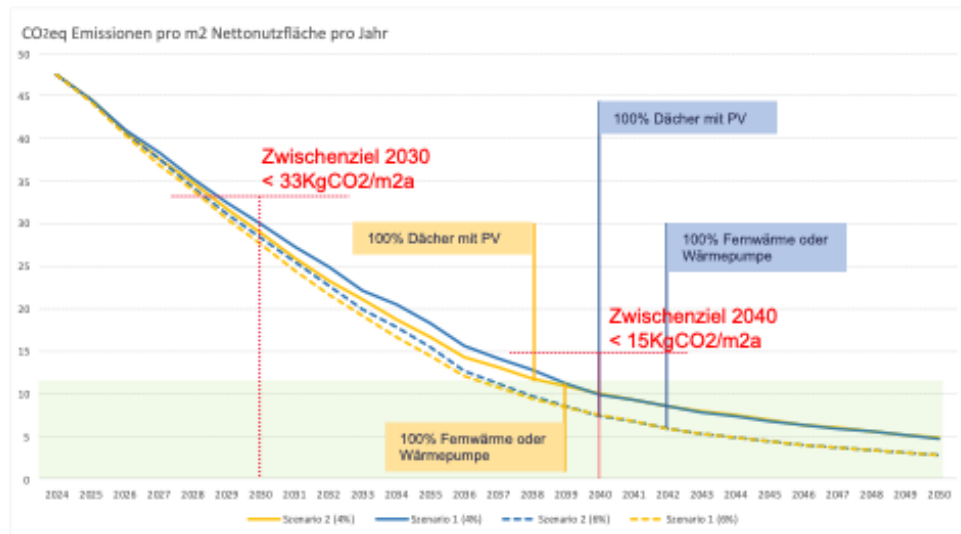
This is what they typically get (on a good day)...



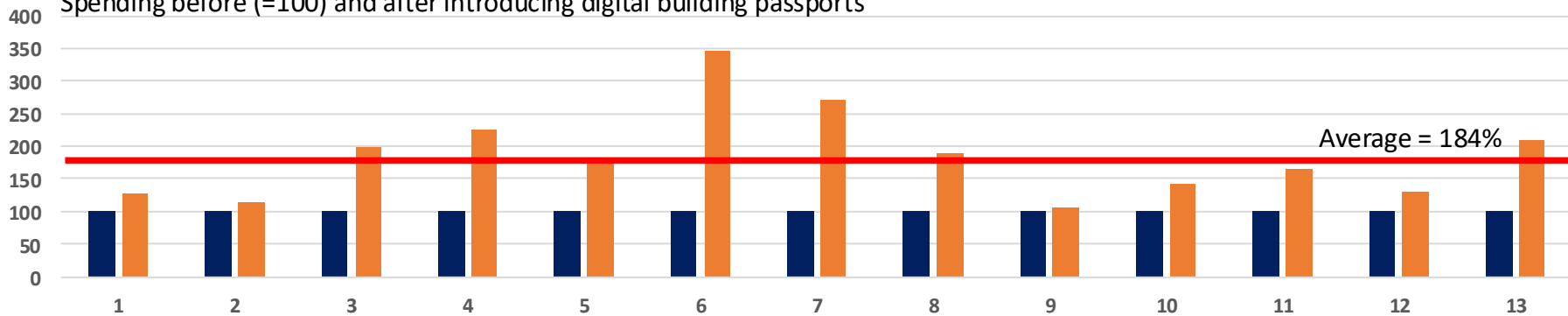
GREAT-01

received financing from the ELENA Facility
under the Horizon 2020 Programme





Spending before (=100) and after introducing digital building passports



THANK YOU!
QUESTIONS?

