

This project has received funding from the European Union's Horizon 2020 research and innovation programme under grant agreement N°754045

## **Webinar**

A Tour of the iBRoad Software Tools:  
Roadmap and Logbook

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Umweltforschung**

**June 4<sup>th</sup> 2020**

# A Tour of the iBRoad Software Tools: Roadmap and Logbook

- Welcome and Introduction
- iBRoad Renovation Roadmap and Roadmap Assistant
  - Intention / Introduction
  - Online presentation
  - Questions & Answers
- iBRoad Logbook
  - Intention / Introduction
  - Online presentation
  - Questions & Answers





### iBRoad Plan

#### Step by Step Plan

ENERGY CLASS	ENERGY CLASS	ENERGY CLASS
F	D	A
TODAY	WHEN BOILER NEEDS TO BE EXCHANGED	WHEN WINDOWS NEED TO BE EXCHANGED
YOUR BUILDING	RENOVATION STEP 1	RENOVATION STEP 2
	WHAT TO DO? • Improve the air permeability of the envelope • Optimization control system	WHAT TO DO? • Installation of a thermal insulating layer on top of concrete ground floor in contact with the ground
	INVESTMENT COSTS 456555 €	INVESTMENT COSTS 44 €
	COSTS FOR MAINTENANCE 2467 €	COSTS FOR MAINTENANCE 44 €
ENERGY BILL 159 €/a	ENERGY BILL 144 €/a	ENERGY BILL 143 €/a



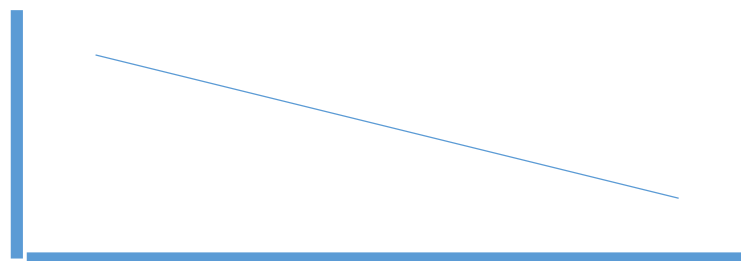
### iBRoad Logbook

Start page	Envelope Performance				
My buildings		2019-02-11	2021-02-13	2027-02-13	2050
Data Store Repository My documents & plans	Walls	●	●	●	●
Building diagnosis	Roof	●	●	●	●
Overall Performance	Windows	●	●	●	●
Envelope Performance	Floor	●	●	●	●
Equipment Performance					
Comfort Performance					
Recommendations					



1

Climate targets are ambitious. Yet building components have long life spans.



2

Today most renovations are stepwise. Still they need to lead to a carbon neutral building stock.

Step by Step Plan

ENERGY CLASS	ENERGY CLASS	ENERGY CLASS
F	D	A
TODAY	WHEN ROLLER NEEDS TO BE EXCHANGED	WHEN WINDOWS NEED TO BE EXCHANGED
YOUR BUILDING	RENOVATION STEP 1	RENOVATION STEP 2
	WHAT TO DO? • Improve the air permeability of the envelope • Optimization control system	WHAT TO DO? • Installation of a thermal insulating layer on top of concrete ground floor in contact with the ground
	INVESTMENT COSTS 25000 €	INVESTMENT COSTS 20 €
	COSTS FOR MAINTENANCE 200 €	COSTS FOR MAINTENANCE 10 €
ENERGY BILL 110 €/a	ENERGY BILL 104 €/a	ENERGY BILL 102 €/a



3

it takes an overarching plan to combine single renovation steps to a deep renovation



4

a long-term plan can consider the occasions („trigger points“) in the homeowners' lives



## What is the Renovation Roadmap?

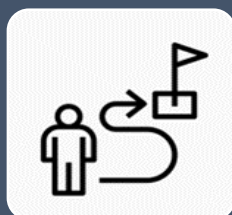
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Step by Step Plan

ENERGY CLASS <b>F</b>	ENERGY CLASS <b>D</b>	ENERGY CLASS <b>A</b>
TODAY	WHEN BOILER NEEDS TO BE EXCHANGED	WHEN WINDOWS NEED TO BE EXCHANGED
YOUR BUILDING	RENOVATION STEP 1	RENOVATION STEP 2
	WHAT TO DO? • Improve the air permeability of the envelope • Optimization control system	WHAT TO DO? • Installation of a thermal insulating layer on top of concrete ground floor in contact with the ground
	INVESTMENT COSTS 45055 €	INVESTMENT COSTS 44 €
	COSTS FOR MAINTENANCE 2007 €	COSTS FOR MAINTENANCE 44 €
ENERGY BILL 159 €/a	ENERGY BILL 144 €/a	ENERGY BILL 143 €/a



**iBRoad Roadmap:**  
diagnosis tool on buildings performance  
and individual stepwise renovation plan  
for building owners



### Features:

- long-term renovation strategy
- developed individually together with the owner
- targeted measures from the beginning finally lead to deep renovation



## Pages of the Renovation Roadmap

Current building state

Roadmap overview

Detailed Roadmap

Detailed renovation step

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**iBRoad Plan** Home Roadmap Detailed Roadmap Your Building Renovation Steps Log out

### Current State

Your Building Today

ENERGY CLASS	Building Data	User Influence on Energy	Technical Data
<b>G</b>	Year of Construction of the Building: 1994 Building Type: Single Family House Number of Floors: 3 Number of Residential Units: 1 Living Space Area: 250 m <sup>2</sup> Previous Renovations: 0	Use Influence on Energy: Attendance Time Hot Water Use Habits: several persons take a shower daily and take a bath at least once a week Ventilation Use Habits: during heating period the windows open for several hours per day	Year of Construction of the Heating System: 1994 Energy Bill: 4500 €/a

### User Influence

Even your behaviour influences energy use. Here are some pointers to lower your total energy use.

- Reduce room temperature: Every degree less room temperature saves around 6 % of heating energy. Usually 20 to 22 °C is sufficient in living rooms, 18 to 20 °C in the kitchen, 23 °C in the bathroom and 16 to 18 °C in the bedroom.
- Short and intensive ventilation: That windows hardly provide fresh air, but they cool walls and rooms down. Correct intensive ventilation should be provided 2 to 3 times a day for about 4 to 5 minutes, with open windows and doors in all rooms. This ensures the necessary air exchange.
- Vent radiators: If radiators charge and do not warm up properly even though the thermostat is fully turned on, there is air in the radiator which wastes unnecessary energy. By regular venting you save heating costs and consume less CO<sub>2</sub>.

### Step by Step Plan

ENERGY CLASS	ENERGY CLASS	ENERGY CLASS
<b>F</b>	<b>D</b>	<b>A</b>
<b>TODAY</b>	<b>WHEN BOILER NEEDS TO BE EXCHANGED</b>	<b>WHEN WINDOWS NEED TO BE EXCHANGED</b>
<b>YOUR BUILDING</b>	<b>RENOVATION STEP 1</b>	<b>RENOVATION STEP 2</b>
<b>WHAT TO DO?</b> • Improve the air permeability of the envelope • Optimization control system	<b>WHAT TO DO?</b> • Installation of a thermal insulating layer on top of concrete ground floor in contact with the ground	<b>WHAT TO DO?</b> • Installation of a thermal insulating layer on top of concrete ground floor in contact with the ground
<b>INVESTMENT COSTS</b> 45000 €	<b>INVESTMENT COSTS</b> 45000 €	<b>INVESTMENT COSTS</b> 45000 €
<b>ENERGY BILL</b> 139 €/a	<b>ENERGY BILL</b> 144 €/a	<b>ENERGY BILL</b> 142 €/a

### Detailed Renovation Roadmap

Step by Step Plan

ENERGY CLASS	ENERGY CLASS	ENERGY CLASS	ENERGY CLASS	ENERGY CLASS
<b>G</b>	<b>E</b>	<b>D</b>	<b>B</b>	<b>A</b>
<b>Your Building</b>	<b>Renovation Step 1</b>	<b>Renovation Step 2</b>	<b>Renovation Step 3</b>	<b>Renovation Step 4</b>
<b>Measure</b> • Add a thermal solar system	<b>Measure</b> • External Wall Insulation	<b>Measure</b> • Substitution of the old windows	<b>Measure</b> • Substitution of the heating system by a heating pump	<b>Measure</b> • Installation of a heat recovery unit
<b>Primary Energy Demand</b> 250 kWh/m <sup>2</sup> a	<b>Primary Energy Demand</b> 210 kWh/m <sup>2</sup> a	<b>Primary Energy Demand</b> 180 kWh/m <sup>2</sup> a	<b>Primary Energy Demand</b> 100 kWh/m <sup>2</sup> a	<b>Primary Energy Demand</b> 100 kWh/m <sup>2</sup> a
<b>Main Energy Source</b> Natural Gas	<b>Main Energy Source</b> Natural Gas	<b>Main Energy Source</b> Natural Gas	<b>Main Energy Source</b> Natural Gas	<b>Main Energy Source</b> Electricity
<b>Final Energy Demand</b> 250 kWh/m <sup>2</sup> a	<b>Final Energy Demand</b> 200 kWh/m <sup>2</sup> a	<b>Final Energy Demand</b> 150 kWh/m <sup>2</sup> a	<b>Final Energy Demand</b> 80 kWh/m <sup>2</sup> a	<b>Final Energy Demand</b> 30 kWh/m <sup>2</sup> a
<b>Carbon Emissions</b> 40 kgCO <sub>2</sub> /a	<b>Carbon Emissions</b> 30 kgCO <sub>2</sub> /a	<b>Carbon Emissions</b> 20 kgCO <sub>2</sub> /a	<b>Carbon Emissions</b> 10 kgCO <sub>2</sub> /a	<b>Carbon Emissions</b> 10 kgCO <sub>2</sub> /a
<b>Investment Costs for Renovation Step</b> 10000 €	<b>Investment Costs for Renovation Step</b> 2500 €	<b>Investment Costs for Renovation Step</b> 2500 €	<b>Investment Costs for Renovation Step</b> 2000 €	<b>Investment Costs for Renovation Step</b> 2000 €
<b>Included Costs for Maintenance</b> 1000 €	<b>Included Costs for Maintenance</b> 2000 €	<b>Included Costs for Maintenance</b> 2000 €	<b>Included Costs for Maintenance</b> 4000 €	<b>Included Costs for Maintenance</b> 2000 €
<b>Name of Incentives</b> KfW	<b>Name of Incentives</b> KfW	<b>Name of Incentives</b> KfW	<b>Name of Incentives</b> KfW	<b>Name of Incentives</b> KfW
<b>Changed Comforts</b> Improved	<b>Changed Comforts</b> Improved	<b>Changed Comforts</b> Improved	<b>Changed Comforts</b> Improved	<b>Changed Comforts</b> Improved

### Details of the renovation Roadmap

#### Renovation Step 4

ENERGY CLASS	Measure
<b>A</b>	<b>Installation of a heat recovery unit</b>
<b>Renovation Step 4</b> 2020 - 2040	<b>Technical Details</b> • Substitution of the heating system by a heating pump
<b>Primary Energy Demand</b> 100 kWh/m <sup>2</sup> a	<b>Renovation Costs</b> 2000 €
<b>Main Energy Source</b> Electricity	<b>Included Costs for Maintenance</b> 2000 €
<b>Final Energy Demand Main Source</b> 10 kWh/m <sup>2</sup> a	<b>Measure</b> • Substitution of the heating system by a heating pump
<b>Final Energy Demand second Source</b> 10 kWh/m <sup>2</sup> a	<b>Technical Details</b> • Substitution of the heating system by a heating pump
<b>Auxiliary Energy Source</b> Electricity	<b>Renovation Costs</b> 2000 €
<b>Energy Bill</b> 300 €/a	<b>Included Costs for Maintenance</b> 2000 €
<b>Carbon Emissions</b> 10 kgCO <sub>2</sub> /a	<b>Name of Incentives</b> KfW

#### Previous Steps Benefits

- Aesthetics**  
• Refurbishment of the facade, thus optimal improvement of the building.
- Improved Architectural Quality and Heritage of the Building**
- Health**  
• The renovation measures reduce the amount of moisture entering your room.
- Reduction of Indoor Humidity, Mold and Damp**
- Noise Protection**  
• There will be new windows with better sound insulation.
- Reduction of Noise**
- Thermal Comfort**  
• The temperature at the walls increases, so that they obtain a higher comfort.
- Reduction of Draught, Drafting and Cold**
- Indoor Air Quality**  
• Regular ventilation improves the quality of your indoor space.
- High Indoor Air Quality**

#### Additional Benefits

## ■ Renovation Measure

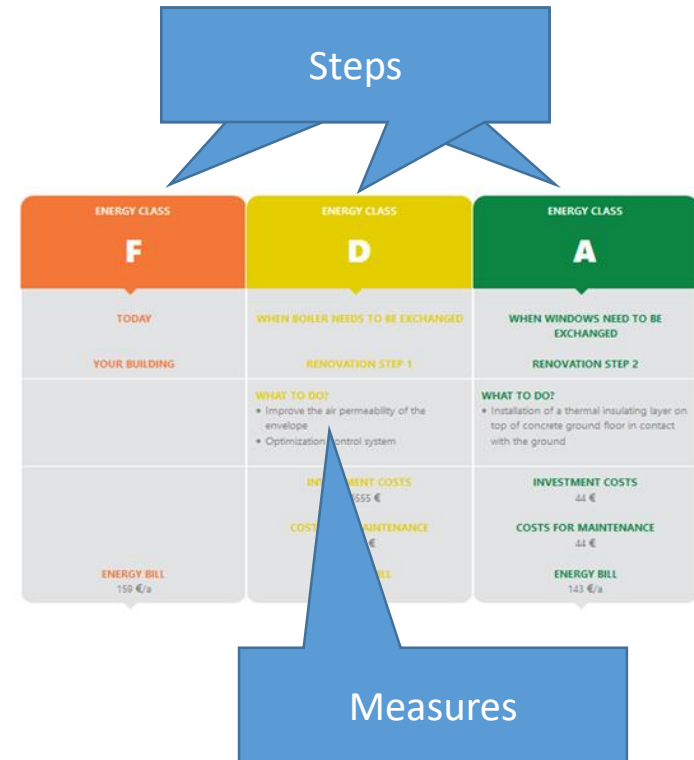
- Renovation measures refer to only one component (e.g. facade, roof, boiler)

## ■ Renovation Step

- Renovation steps are construction periods
- One renovation step can comprise several measures

e.g. in step 1 you may combine the measures

- insulation of the walls,
  - exchanging windows
  - and a new heating boiler
- The number of renovation steps is determined individually





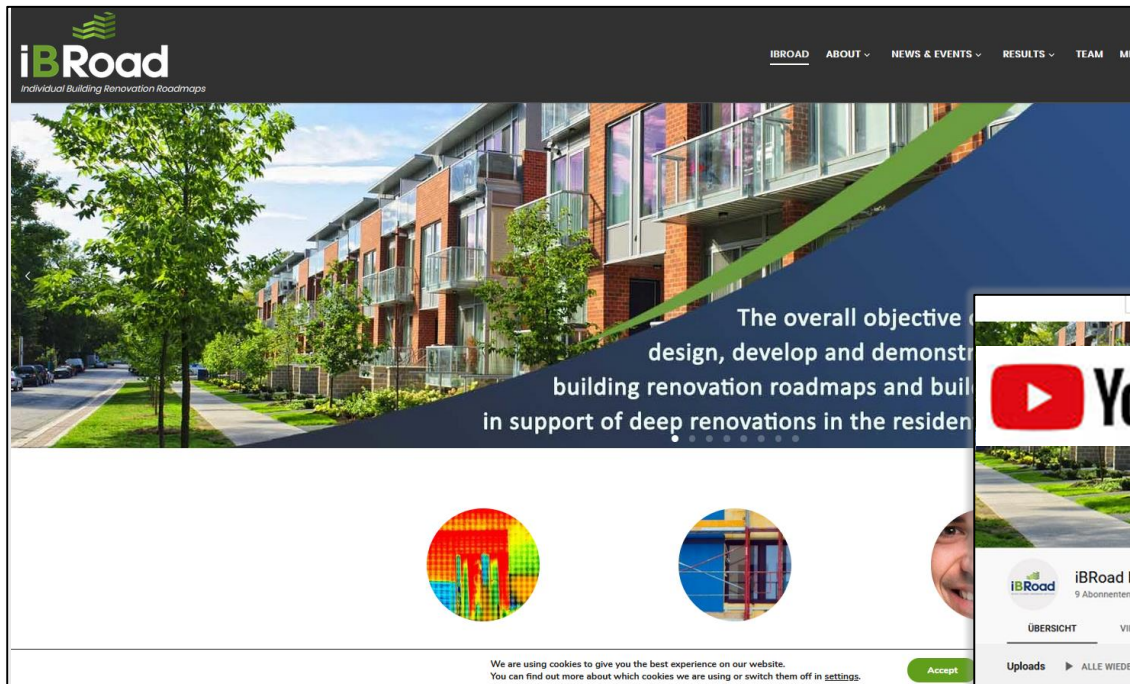
# iBROAD

Individual Building Renovation Roadmaps

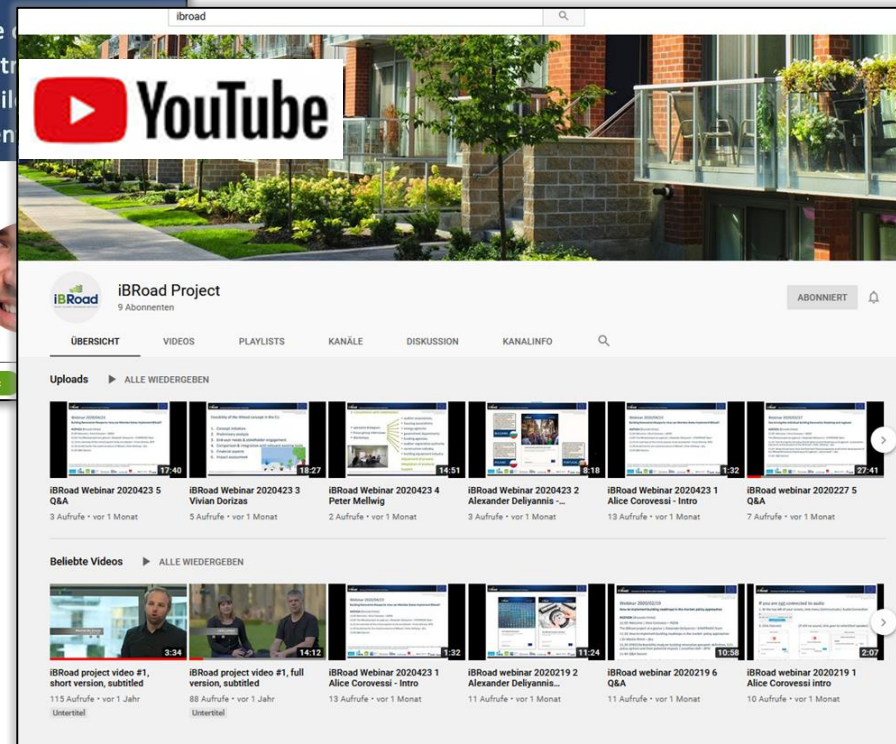
## Find more iBRoad Information



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<https://ibroad-project.eu/>



## Roadmap Assistant in general

### Building Address

Street  Number  Postal Box

Municipality  Zip Code  Country

### Building Facts

Subtitle

Subtitle

Subtitle

Subtitle

Number of Residential Units  Building Type

Living Space Area

Year of Construction of the Heating System  Year of Construction

Number of Floors

Here the energy auditor can edit the data ...

### Current State

#### Your Building Today



ENERGY CLASS	Building Data	User Influence on Energy	Technical Data
G	<b>Year of Construction of the Building</b> 1994	<b>Attendance Time</b>  	<b>Renewable Energies</b>  
	<b>Building Type</b> Single Family House	<b>Hot Water Use Habits</b> several persons take a shower daily and take a bath at least once a week	<b>Year of Construction of the Heating System</b> 1994
	<b>Number of Floors</b> 3	<b>Ventilation Use Habits</b> during heating period one window open for several hours per day	<b>Energy Bill</b> 4600 €/a
	<b>Number of Residential Units</b>  		
	<b>Living Space Area</b> 250 m <sup>2</sup>		
	<b>Previous Renovations</b>		

### User Influence



Even your behaviour influences energy use

Reduce room temperature: Every degree less 20 to 22 °C\* is sufficient in living rooms, 18 to 20 °C\* in the bedroom.

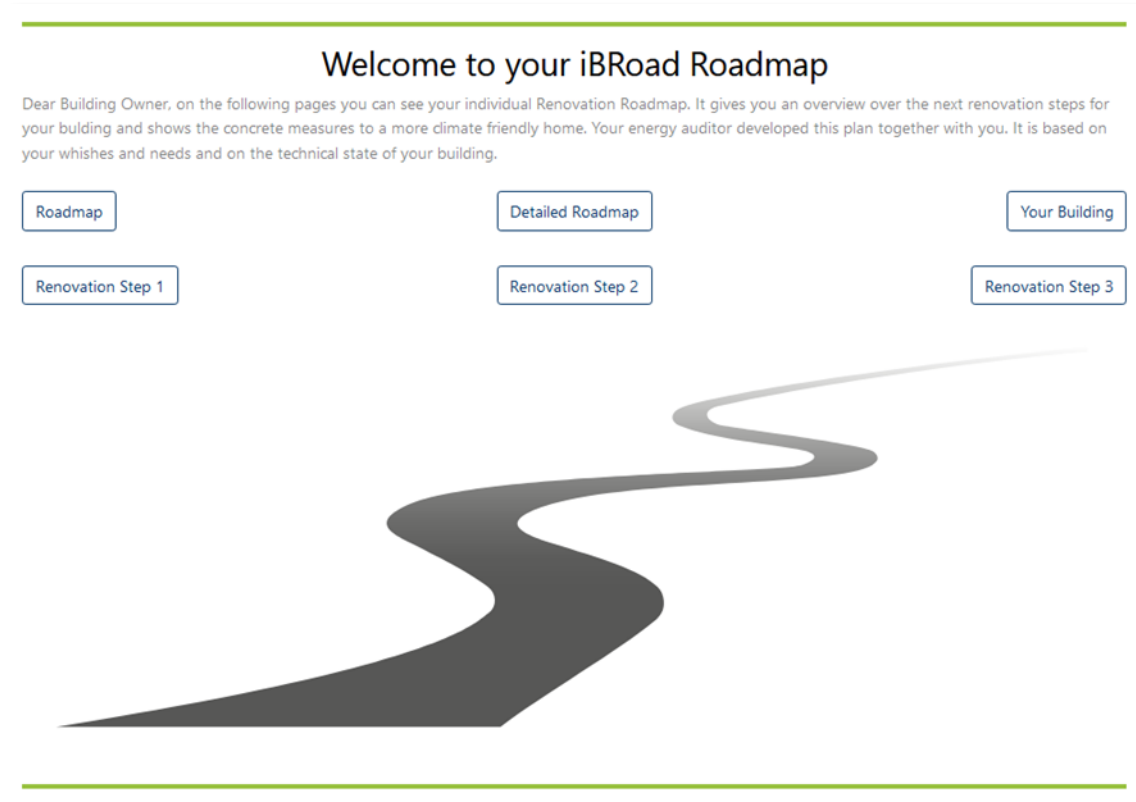
Short and intensive ventilation: Tilted window sills open for 5 minutes. Correct intensive ventilation should be provided by windows and doors in all rooms. This ensures a high level of indoor air quality.

Vent radiators: If radiators chortle and do not warm up properly even though the thermostat is fully turned on, there is air in the radiator which wastes unnecessary energy. By regular venting you save heating costs and consume less CO<sub>2</sub>.

... that is shown in the Renovation Roadmap

The iBRoad Roadmap Assistant is not publicly available because

- it is a tool for energy auditors
- it needs to be adapted to specific Member State requirements.





# iBROAD

Individual Building Renovation Roadmaps

## Questions

# Do you have any Questions?





## iBRoad Plan

### Step by Step Plan

ENERGY CLASS <b>F</b>	ENERGY CLASS <b>D</b>	ENERGY CLASS <b>A</b>
TODAY	WHEN BOILER NEEDS TO BE EXCHANGED	WHEN WINDOWS NEED TO BE EXCHANGED
YOUR BUILDING	RENOVATION STEP 1	RENOVATION STEP 2
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	COSTS FOR MAINTENANCE 2407 €	COSTS FOR MAINTENANCE 44 €
ENERGY BILL 150 €/y	ENERGY BILL 144 €/y	ENERGY BILL 143 €/y



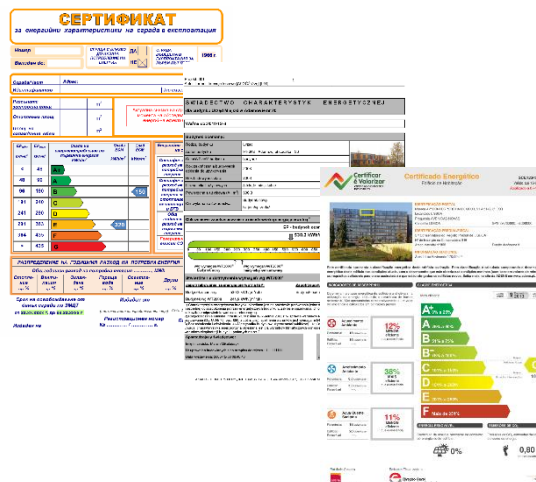
## iBRoad Logbook

Envelope Performance		2019-02-11	2021-02-13	2027-02-13	2050
Walls		●	●	●	●
Roof		●	●	●	●
Windows		●	●	●	●
Floor		●	●	●	●



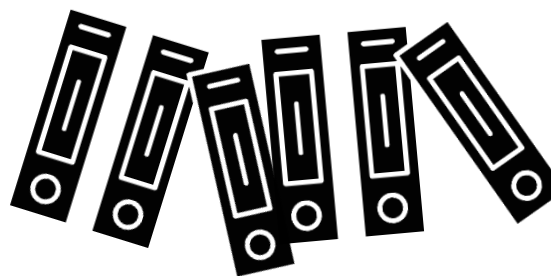
1

A lot of information about the buildings already exist (EPC data, energy audit) – but where?



2

Most renovations are stepwise and refer to a long period of time. How can they be remembered?

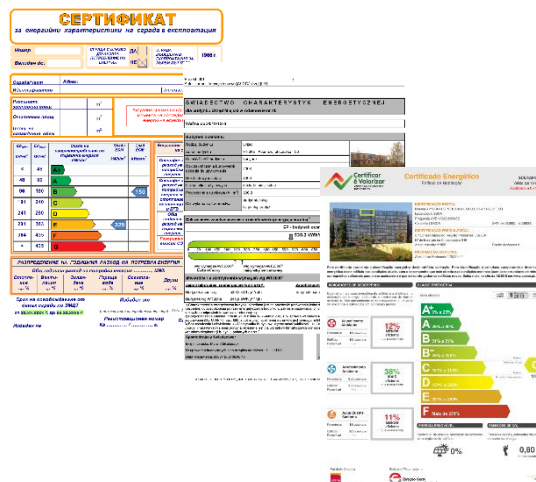




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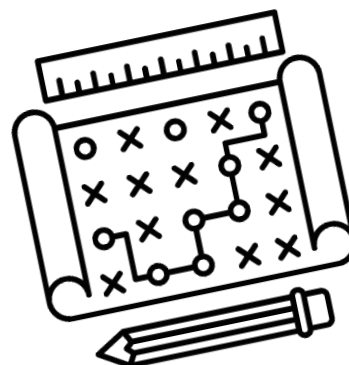
3

Simple presentation of the efficiency of the individual building and its components



4

Simple forward planning for homeowners



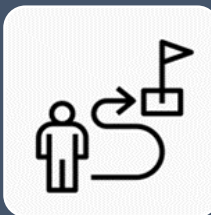
## What is the iBRoad Logbook?

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iBRoad Logbook:  
digital repository for all building related information

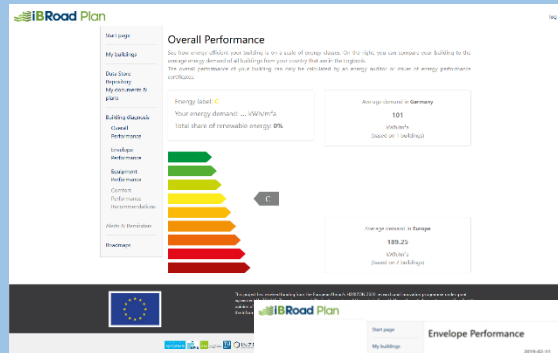
Start page	Envelope Performance					
My buildings						
Data Store Repository My documents & plans		2019-02-11	2021-02-13	2027-02-13	—	2050
Building diagnosis		Walls	●	●	●	—
Overall Performance		Roof	●	●	●	—
Envelope Performance		Windows	●	●	●	—
Equipment Performance		Floor	●	●	●	—
Comfort Performance Recommendations						



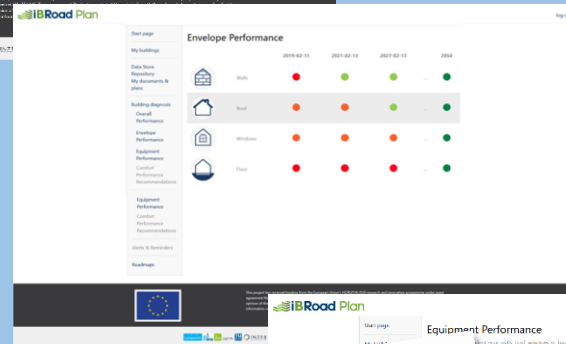
### Features:

- Save complete data set of each building state
- Track all changes to the building
- Connection to the iBRoad Roadmap

## Data storage



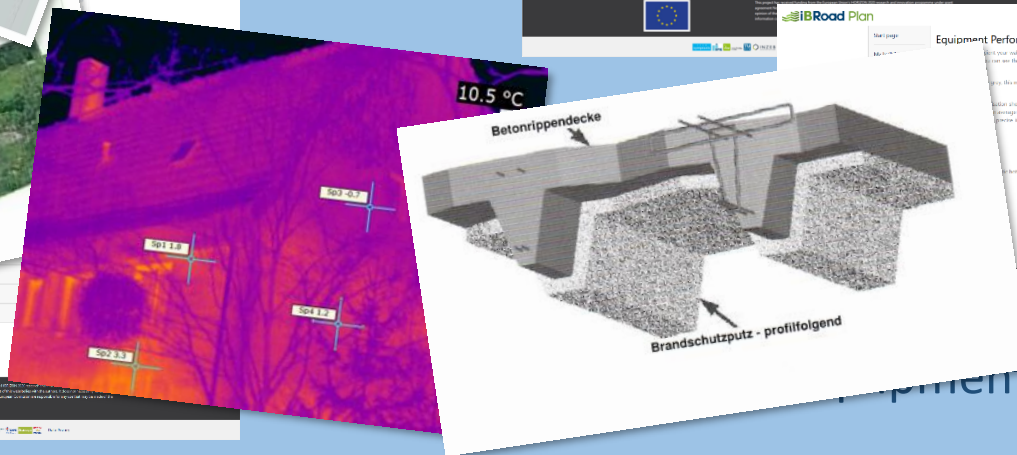
## Building performance



## Envelop performance





## Equipment performance







## Repository

Building state – 2039-02-13  Building state 2039-02-13 [+ New building state](#)[Manage building states](#)[Start page](#)[My buildings](#)[Data Store](#)[Repository](#)[My documents &  
plans](#)[Building states](#)[Building diagnosis](#)[Alerts & Reminders](#)[Roadmaps](#)[Glossary](#)

General and Administrative Information



Building Construction Information



Building Equipment



Building Energy Performance



Building Operation and Use



Smart Information

# Do you have any Questions?



# Thank you very much



Peter Mellwig