

iBRoad2EPC Issuer Training



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Agenda

- What is iBRoad2EPC?
- Five Steps to issue the iBRoad2EPC
- iBRoad2EPC Assistant
- Additional Functionalities of iBRoad2EPC



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Recast #EPBD

→ What does it mean for the buildings sector?

Building renovation passports (Article 15)

- To what target should the iBRoad(2EPC) lead? Significant improvement? “Deep renovation” to ZEB?
- Implementation date (end 2024/2025) –
- Issued after “virtual on-site visit”?
- Financial support and integration into DBL?

Updates for EPCs (Article 16)

- Bandwidth EPCs (A+, Ao) and date EPC reform
- EPC issuance
- Validity (5-10 years)

Deep Renovation definition

- Deep renovation = ZEB in 2027 or 2030
- Definition WPB – national or EU level
- Inclusion WLC

Minimum energy performance standards (Article 9)

- NR - Scope regulation (EPC classes or % WPB)
- NR - Exemptions
- R - Compliance deadlines and ambition of performance standard
- R - Exemptions

Whole Life Carbon (on EPC)

- WLC to be disclosed on EPCs
- WLC gradually applied to renovations (methodology to be established in 2025) based on national targets
- WLC disclosure of building parts during major renovations

Recast #EPBD

→ What does it mean for the buildings sector?

Figure 5. Share of registered EPC ratings across the EU

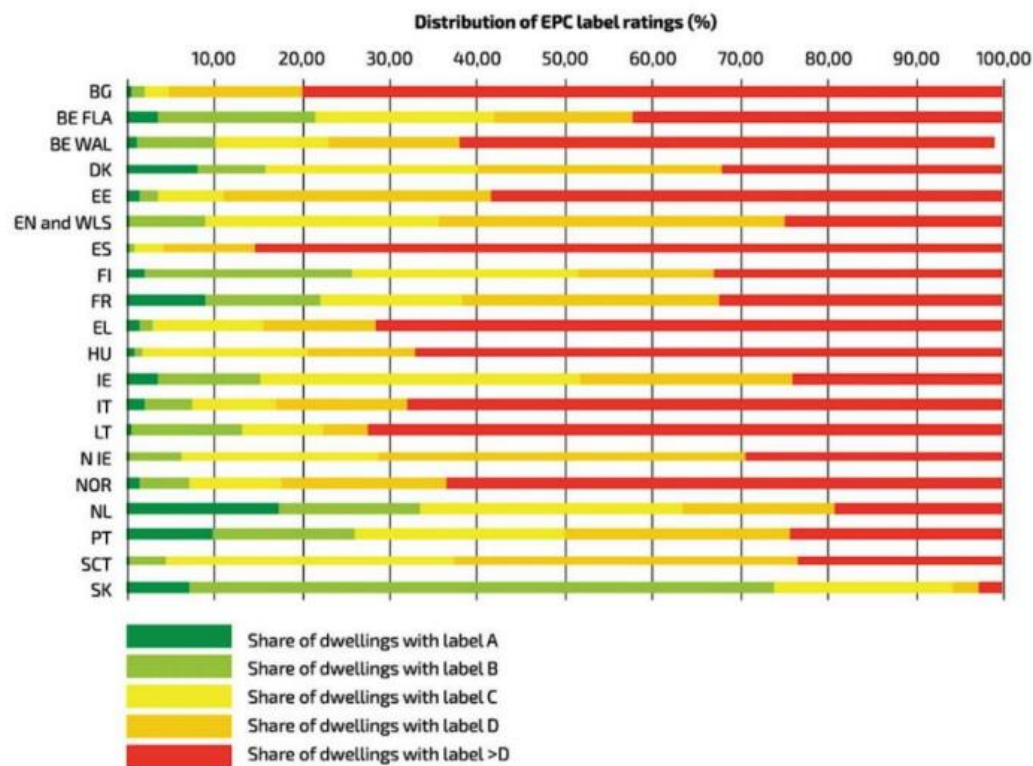


Figure 6. Comparison of EPC scales for residential buildings in selected Member States



Source: European DataWarehouse. (June 2020). The Babel Tower of Energy Performance Certificate ratings and databases in Europe

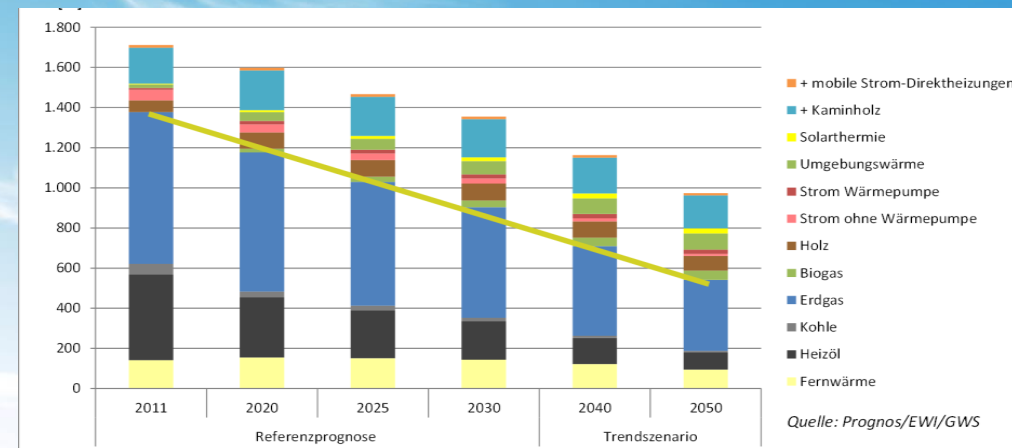


Home renovation
can be a
challenge,
especially
when done
step by step



Why a Building Renovation Passport (BRP)?

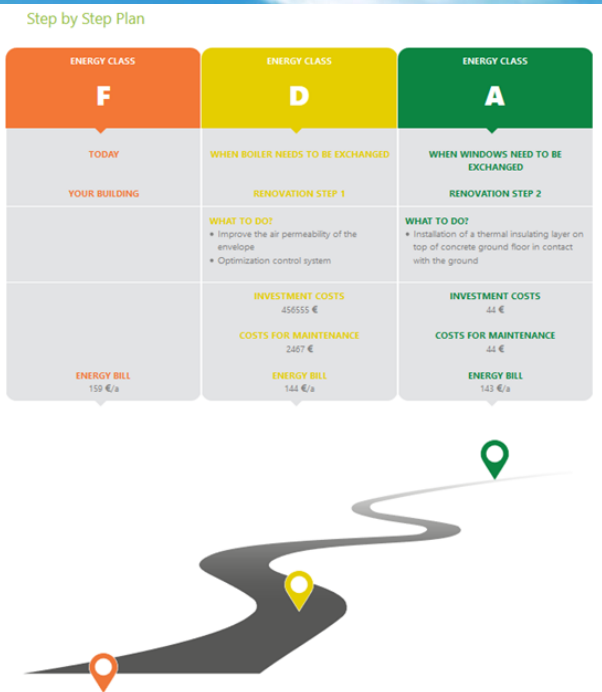
- With a BRP, ambitious climate targets are implemented. Accordingly, each renovation must contribute to reaching the climate target.
- Most building owners carry out partial renovations over a certain timespan. When carefully planned from the start so as to build on one another and to avoid lock-in effects, renovation steps can enable deep renovation achieved over a long-term horizon.



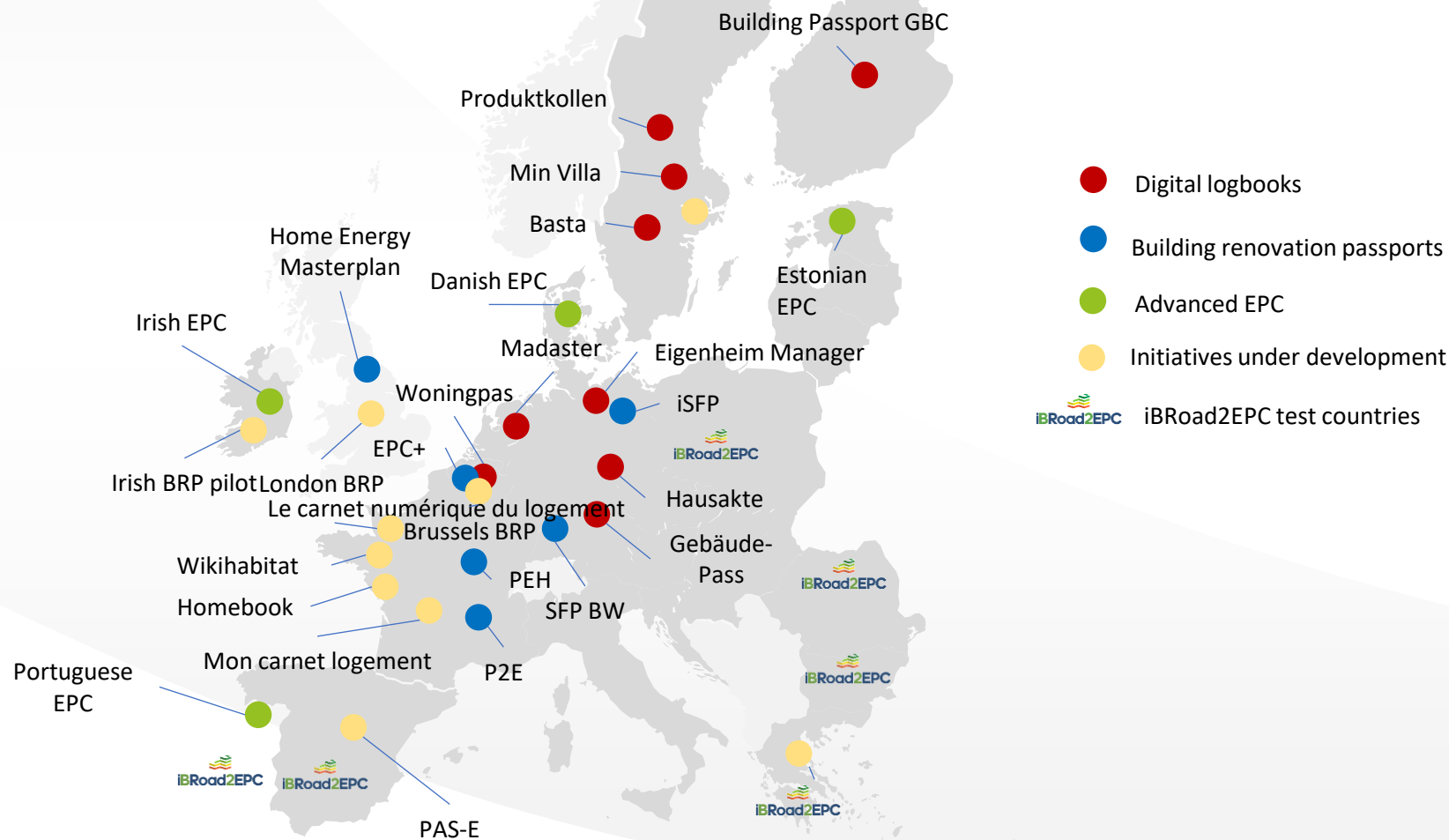
Source: ifeu

Why a Building Renovation Passport (BRP)?

- An overarching plan provides guidance about which components to renovate when and how, at which cost and savings
- A long-term plan can take foreseeable occasions (“trigger points”) in the homeowners’ lives into account (finance, age, children).



In recent years, a revolution of initiatives!



A plan can help

DEEP AND QUALITATIVE RENOVATION

HOLISTIC RENOVATION PROCESS

BUILDING RENOVATION PASSPORT / ROADMAP



Source: Energiesprong

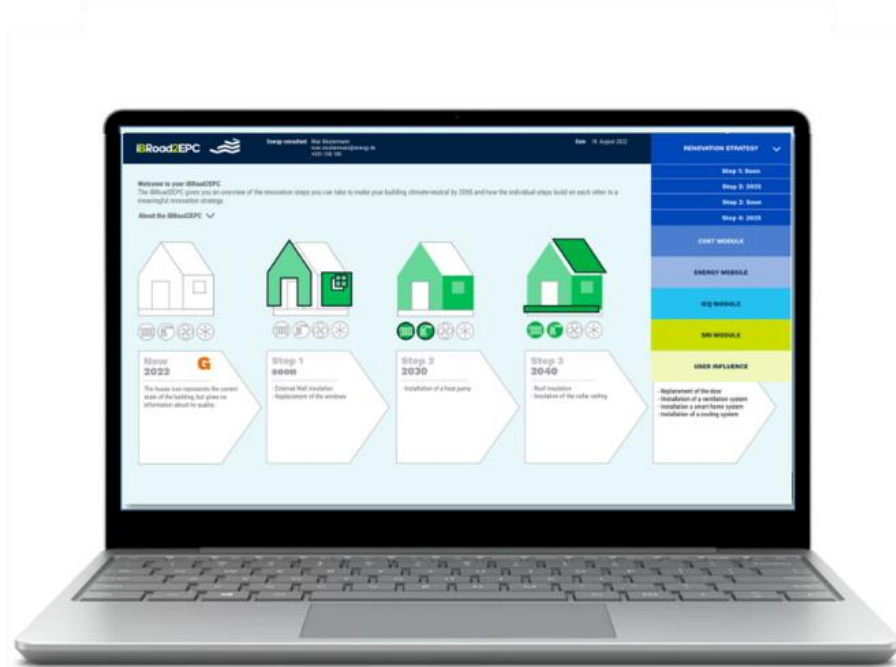
Detailed Renovation Roadmap

Step by Step Plan

	ENERGY CLASS G	ENERGY CLASS E	ENERGY CLASS D	ENERGY CLASS B	ENERGY CLASS A
	Your building Moment of delivery	Renovation Step 1 When boiler needs to be replaced	Renovation Step 2 2021 - 2025	Renovation Step 3 2026 - 2030	Renovation Step 4 2031 - 2040
Measures		Measures • Add a thermal solar system	Measures • External Wall Insulation	Measures • Substitution of the old windows • Roof insulation	Measures • Installation of a heat recovery unit • Substitution of the heating system by a heating pump
Primary Energy Demand	250 kWh/m ² a	Primary Energy Demand 210 kWh/m ² a	Primary Energy Demand 160 kWh/m ² a	Primary Energy Demand 100 kWh/m ² a	Primary Energy Demand 50 kWh/m ² a
Main Energy Source	Natural Gas	Main Energy Source Natural Gas	Main Energy Source Natural Gas	Main Energy Source Natural Gas	Main Energy Source Electricity
Final Energy Demand	200 kWh/m ² a	Final Energy Demand Main Source 200 kWh/m ² a	Final Energy Demand Main Source 150 kWh/m ² a	Final Energy Demand Main Source 80 kWh/m ² a	Final Energy Demand Main Source 30 kWh/m ² a
Final Energy Demand second Source	0 kWh/m ² a	Final Energy Demand second Source 15 kWh/m ² a	Final Energy Demand second Source 15 kWh/m ² a	Final Energy Demand second Source 15 kWh/m ² a	Final Energy Demand second Source 15 kWh/m ² a
Auxiliary Energy Source	Electricity	Auxiliary Energy Source Electricity	Auxiliary Energy Source Electricity	Auxiliary Energy Source Electricity	Auxiliary Energy Source Electricity
Final auxiliary Energy Demand	50 kWh/m ² a	Final auxiliary Energy Demand 15 kWh/m ² a	Final auxiliary Energy Demand 15 kWh/m ² a	Final auxiliary Energy Demand 15 kWh/m ² a	Final auxiliary Energy Demand 15 kWh/m ² a
Energy Bill	40000 €/a	Energy Bill 23000 €/a	Energy Bill 18000 €/a	Energy Bill 11000 €/a	Energy Bill 3000 €/a
CO ₂	Carbon Dioxide 40 kg/m ² a	Carbon Dioxide 20 kg/m ² a	Carbon Dioxide 10 kg/m ² a	Carbon Dioxide 5 kg/m ² a	Carbon Dioxide 2 kg/m ² a
Costs		Investment Costs For Renovation Step 100000 € Included Costs For Maintenance 150000 € 150000 €	Investment Costs For Renovation Step 25000 € Included Costs For Maintenance 200000 € 200000 €	Investment Costs For Renovation Step 25000 € Included Costs For Maintenance 40000 € 40000 €	Investment Costs For Renovation Step 20000 € Included Costs For Maintenance 20000 € 20000 €
Subsidies		Name of Incentives KIA Incentives 50000 €	Name of Incentives KIA Incentives 100000 €	Name of Incentives KIA Incentives 100000 €	Name of Incentives KIA Incentives 100000 €
Comfort Changes		Changed Comforts 1	Changed Comforts 2	Changed Comforts 3	Changed Comforts 4

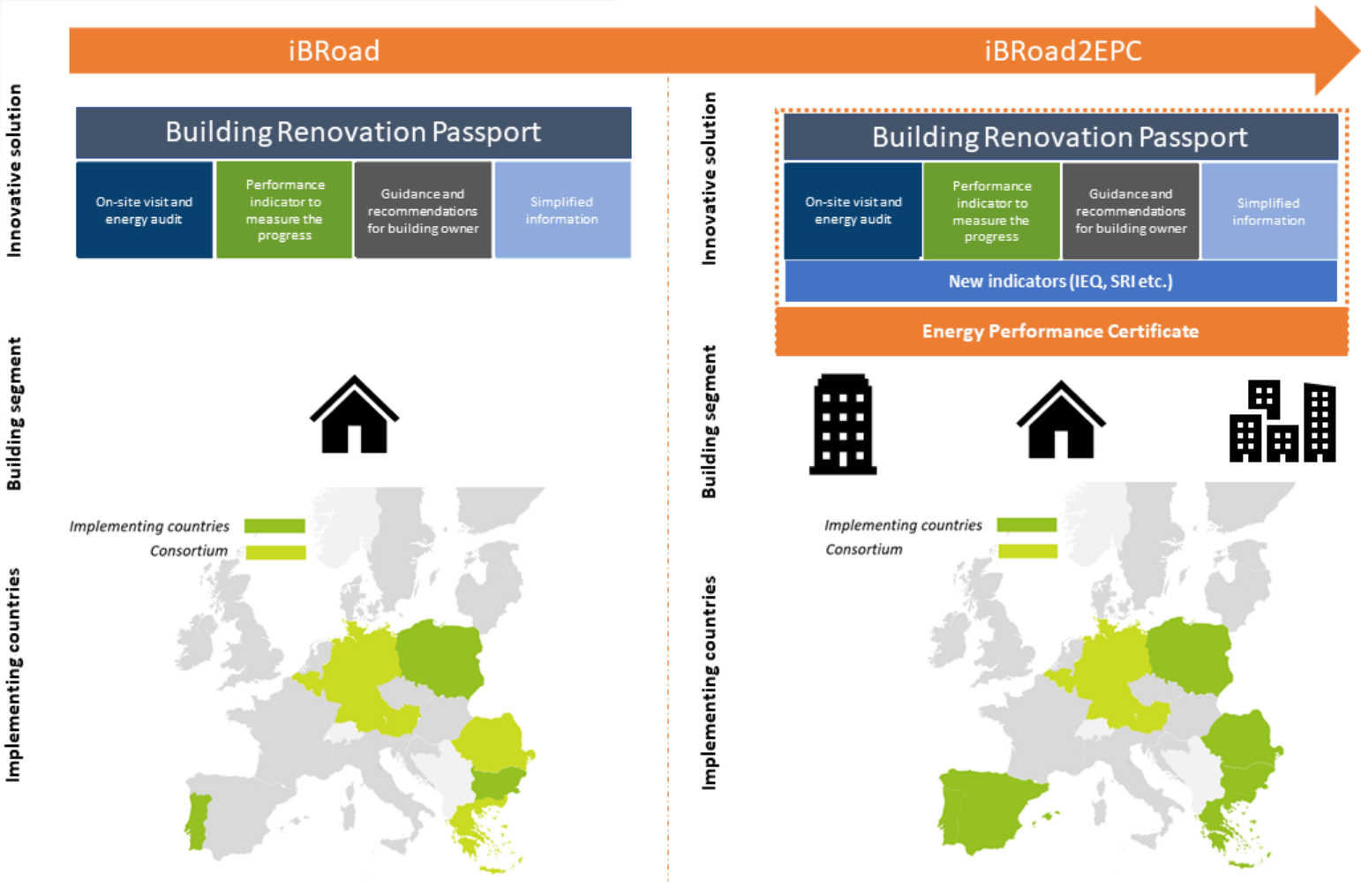
Source: iBRoad

What is iBRoad2EPC

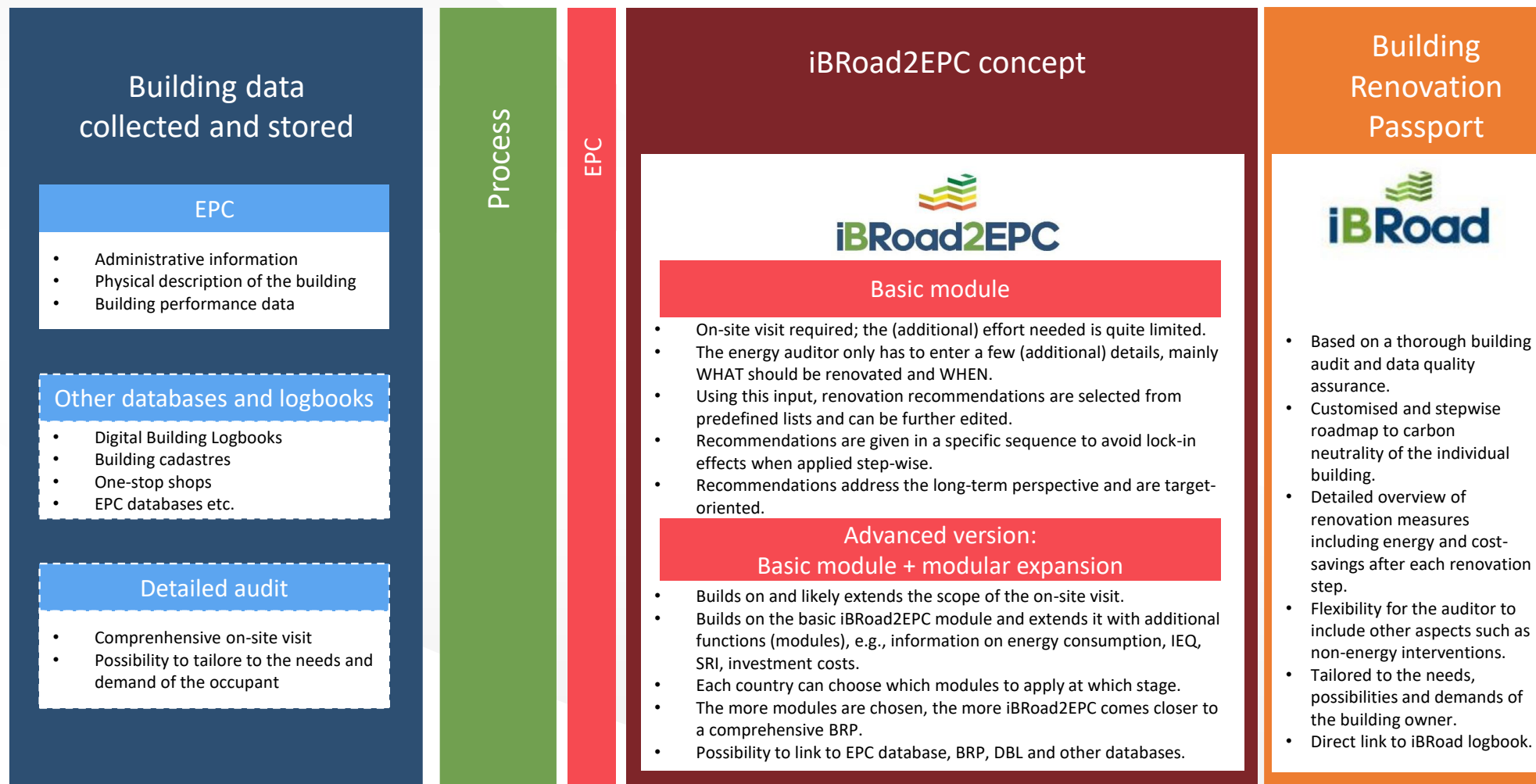


- iBRoad2EPC is an **energy consultation** for building owners, issued by building professionals.
- iBRoad2EPC outlines an initial **renovation strategy** on how a building can become climate neutral in the long term.
- The strategy can include a full renovation in **one step**, but also a renovation in **several steps**.
- The long-term perspective means that the individual renovation steps build on each other, building component connections can be prepared in good time and even future renovation obligations can be taken into account today.

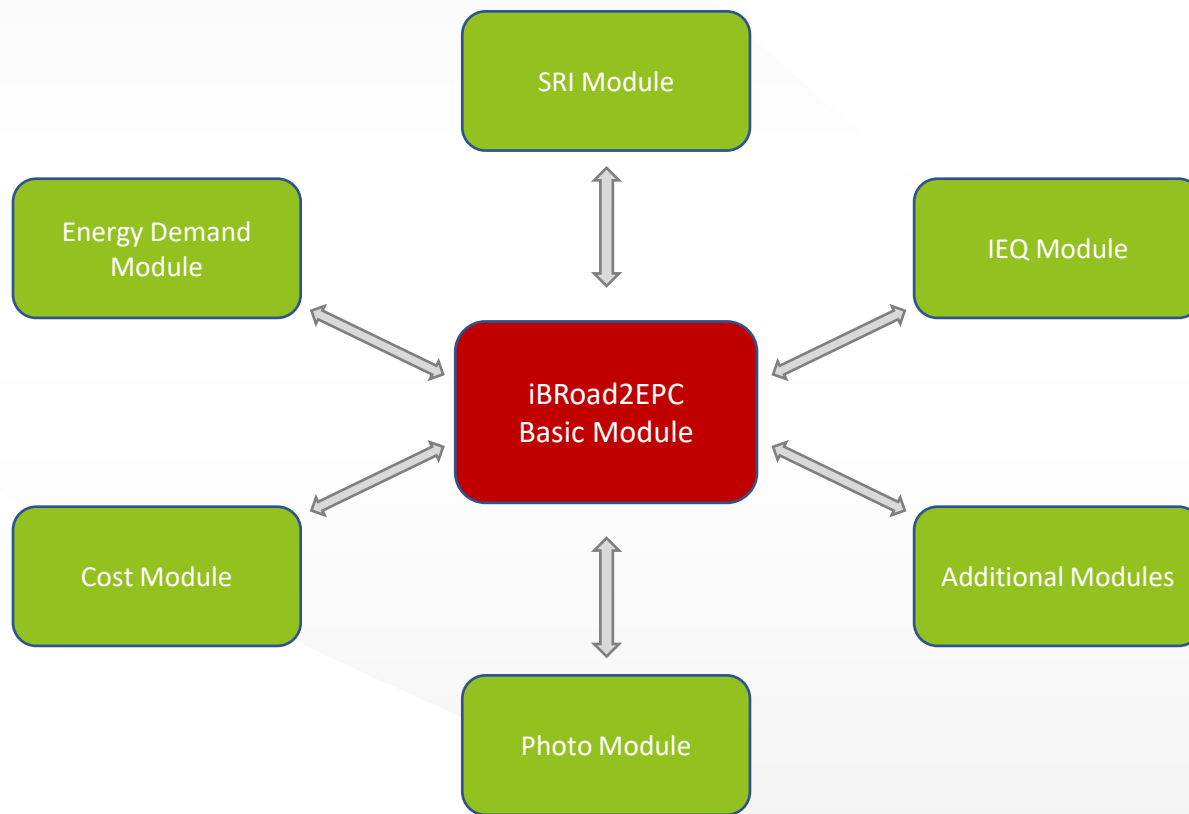
From iBRoad to iBRoad2EPC



Overview of tools



Overview of tools



Example Modules:

- Water efficiency
- Electro mobility
- Renewable energy resources
- Summer heat protection
- Municipal heat planning

Overview of tools

Basic module:

- iBRoad2EPC aims to align renovation recommendations with specific national targets for the building sector. To this end, default recommendations will be suggested to the issuers, that are derived from scenarios for the country specific building stock (NECP, LTRS, NBRP). They include required insulation thicknesses as well as preferred building equipment.
- iBRoad2EPC points out typical issues to be considered in step-by-step renovations. It comes with a set of prefabricated text blocks that can be adapted and expanded to better reflect specific technical solutions in a country.
- iBRoad2EPC informs building owners about foreseeable future legislation concerning their individual buildings (e.g. ban of fossil fuels, minimum energy performance standards).
The respective legal requirements for each country are stored in a database.
- The number of renovation steps that are displayed in iBRoad2EPC can be fixed for each country. Thus, it can ensure a sensible renovation strategy that maps the specific interim goals and requirement steps in the country.

Overview of tools

Advanced version:

- Builds on and likely extends the scope of the EPC on-site visit
- Requires more extensive expert training
- Builds on the basic iBRoad2EPC module and extends it with additional functions (modules)
- Each country can choose which modules to apply at which stage
- The more modules are chosen, the more iBRoad2EPC comes closer to a comprehensive BRP
- Possibility to link to EPC database, BRP, DBL and other instruments or databases
- Can be further tailored according to national renovation strategies as well as local energy infrastructure.



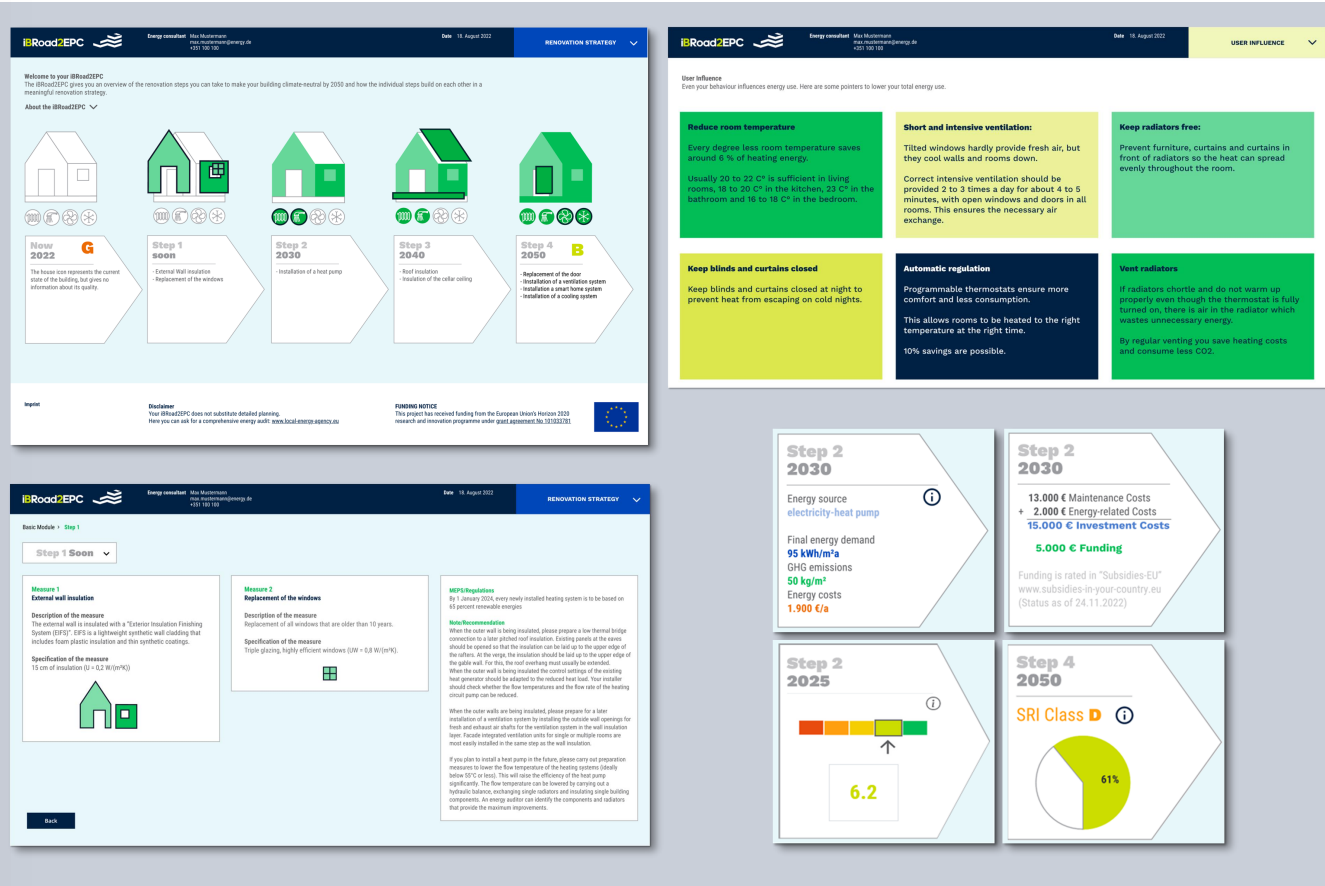
What is iBRoad2EPC

iBRoad2EPC is an online document that consists of the following pages:

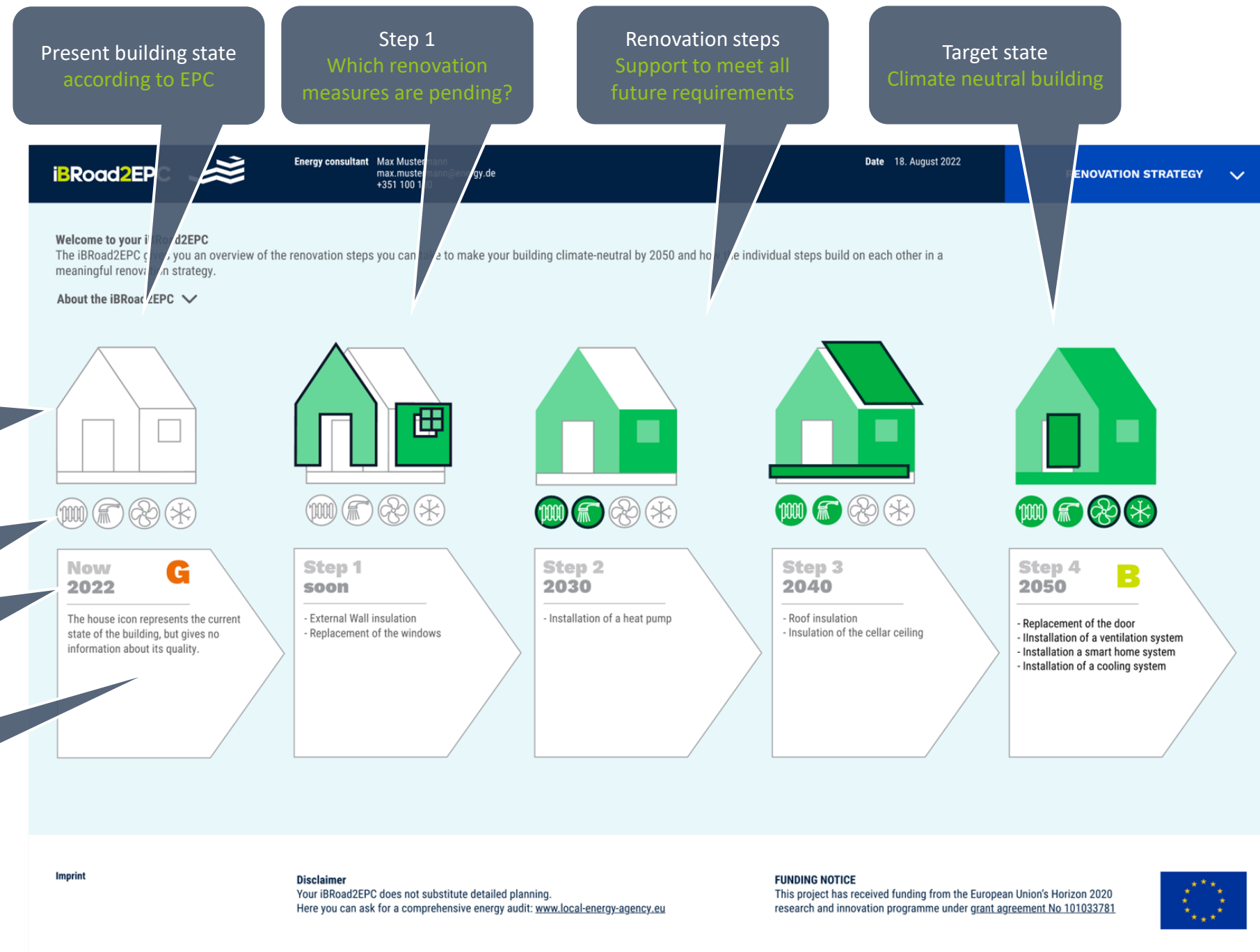
- Overview of the renovation strategy
- Details of renovation steps
- Advice for energy-saving user behaviour

It can be extended with

- Energy demand, cost and GHG emissions
- Investment cost
- Indoor environment quality (IEQ)
- Smart readiness indicator (SRI)



Overview Page



Detail Page

Name of the measure
same as in the
overview for easy
orientation

Description of the
measures
What should be
renovated?

Specification of the
measures
How should it be
renovated?

Icon
same as in the
overview for easy
orientation

Step
that is described in this
page

One box per measure
A renovation step can
comprise several
measures

Future Requirements
Information about
content and timing

Preparation for later
renovation steps
reach deep renovation
and avoid lock-in




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Date 18. August 2022

RENOVATION STRATEGY

Basic Module > Step 1

Step 1 Soon

Measure 1
External wall insulation

Description of the measure
 The external wall is insulated with a "Exterior Insulation Finishing System (EIFS)". EIFS is a lightweight synthetic wall cladding that includes foam plastic insulation and thin synthetic coatings.

Specification of the measure
 15 cm of insulation (U = 0,2 W/(m²K))



Measure 2
Replacement of the windows

Description of the measure
 Replacement of all windows that are older than 10 years.

Specification of the measure
 Triple glazing, highly efficient windows (UW = 0,8 W/(m²K)).



MEPS/Regulations
 By 1 January 2024, every new / installed heating system is to be based on 65 percent renewable energy.

Note/Recommendation
 When the outer wall is being insulated, please prepare a low thermal bridge connection to a later pitched roof insulation. Existing panels at the eaves should be opened so that the insulation can be laid up to the upper edge of the rafters. At the verge, the insulation should be laid up to the upper edge of the gable wall. For this, the roof overhang must usually be extended.
 When the outer wall is being insulated the control settings of the existing heat generator should be adapted to the reduced heat load. Your installer should check whether the flow temperatures and the flow rate of the heating circuit pump can be reduced.

 When the outer walls are being insulated, please prepare for a later installation of a ventilation system by installing the outside wall openings for fresh and exhaust air shafts for the ventilation system in the wall insulation layer. Facade integrated ventilation units for single or multiple rooms are most easily installed in the same step as the wall insulation.

 If you plan to install a heat pump in the future, please carry out preparation measures to lower the flow temperature of the heating systems (ideally below 55°C or less). This will raise the efficiency of the heat pump significantly. The flow temperature can be lowered by carrying out a hydraulic balance, exchanging single radiators and insulating single building components. An energy auditor can identify the components and radiators that provide the maximum improvements.

Back

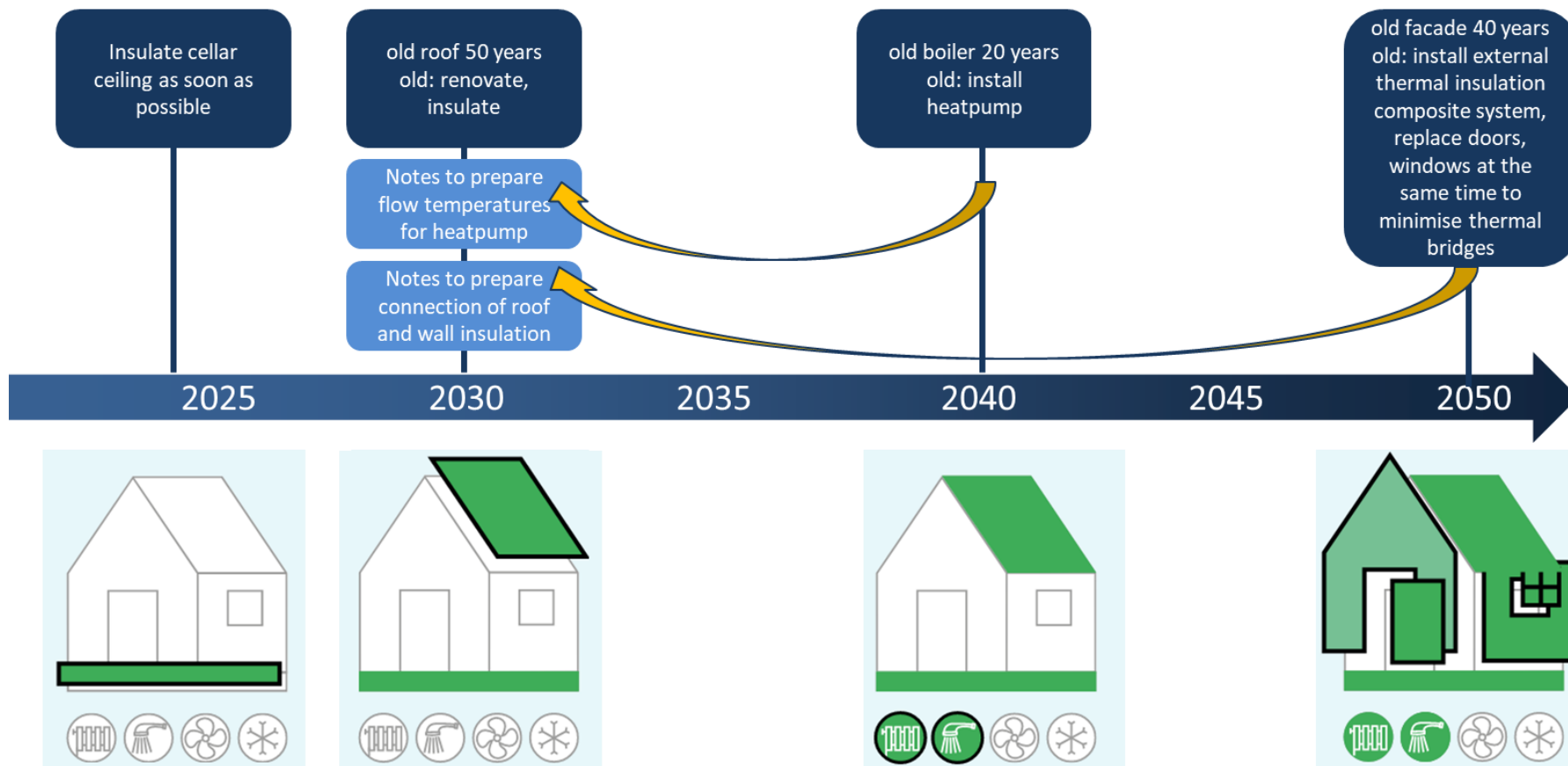
What is iBRoad2EPC

Added value of iBRoad2EPC for building owners

- Better renovation recommendations in EPCs through BRP elements
- Outline of an individual long-term renovation strategy considering
 - step-by-step renovations that gradually lead to a meaningful whole,
 - avoidance of mistakes through early preparation of later renovation measures,
 - alignment with overarching national building targets, future requirements and obligations (e.g. ban of fossil fuels, minimum energy performance standards) in order to prepare the building and fulfil all legal requirements



What is iBRoad2EPC



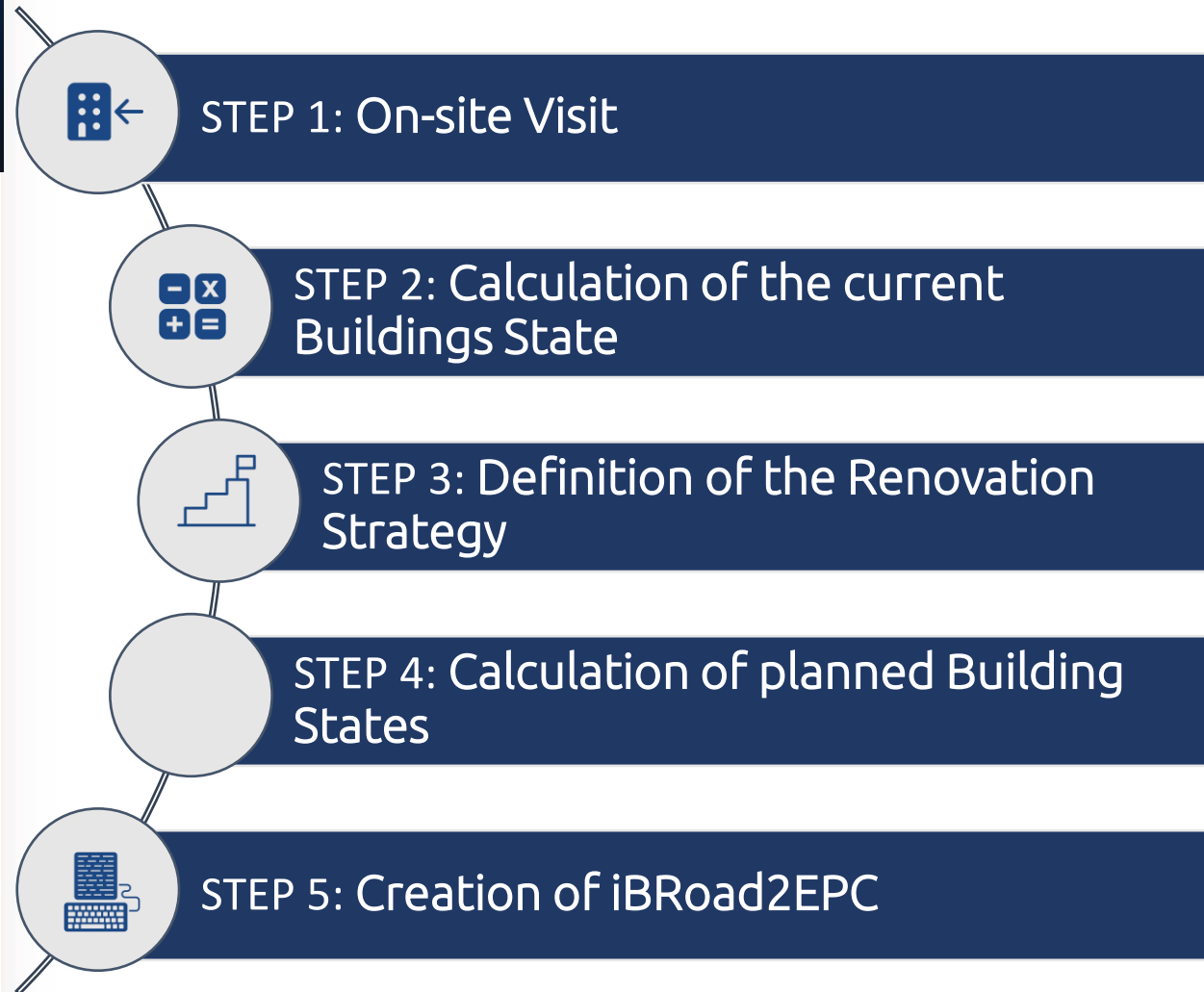
iBRoad2EPC creates a renovation strategy that allows planning ahead and thus preparing for later renovations



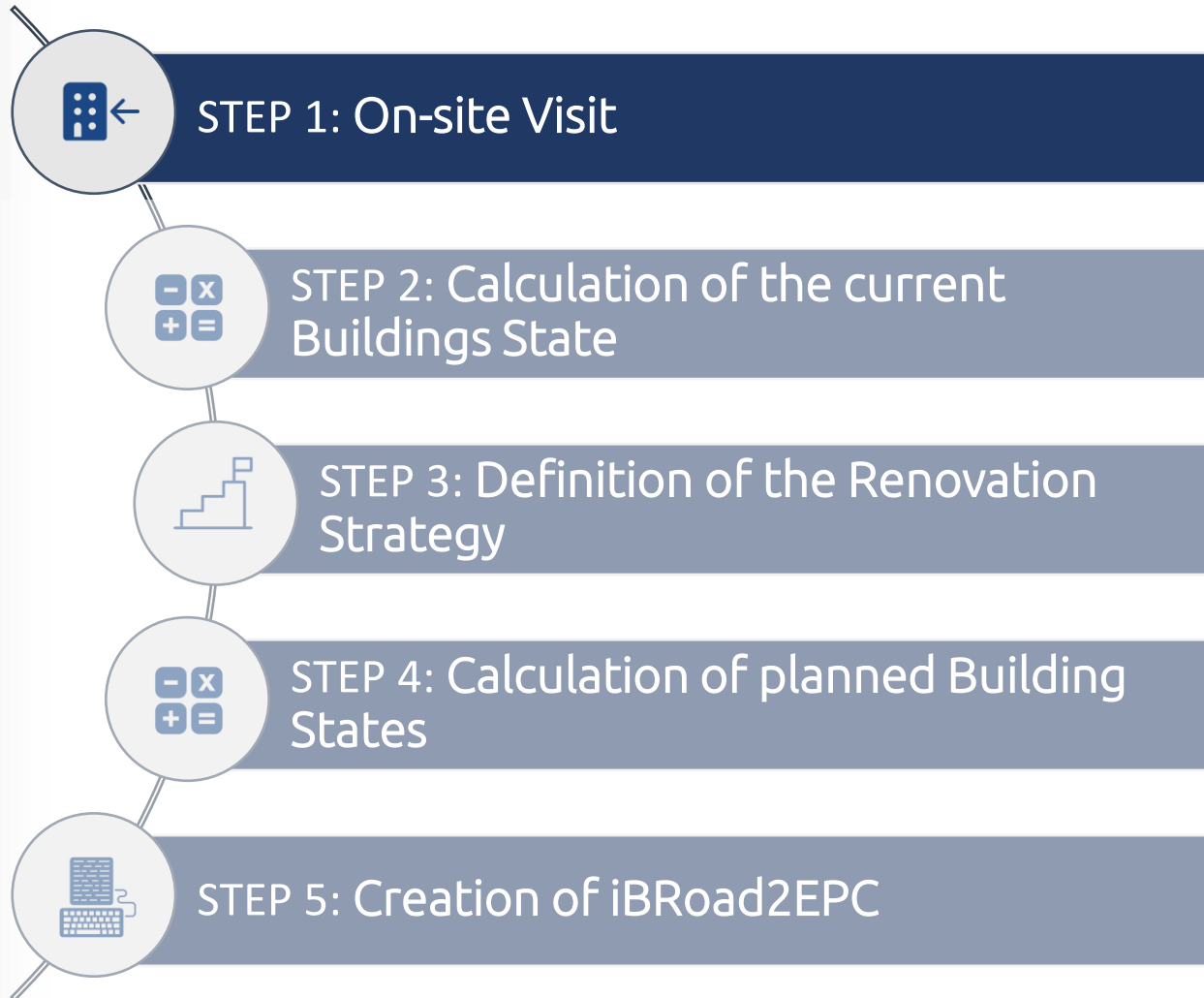
Agenda

- What is iBRoad2EPC?
- **Five Steps to issue the iBRoad2EPC**
- iBRoad2EPC Assistant
- Additional Functionalities of iBRoad2EPC

FIVE STEPS TO ISSUE THE IBROAD2EPC



STEP 1: On-site Visit



- The on-site visit is crucial to the quality of the consultation in iBRoad2EPC.
- It ensures that the long-term renovation strategy is individually tailored to the building.
- Issuers gather the ideas and wishes of the building owners during the visit and answer initial questions

STEP 1: On-site Visit

Checklist for the on-site visit

- ✓ What kind of renovation measures does the homeowner plan to undertake anyway?
- ✓ Is the homeowner interested in a full renovation in one step or rather in a staged renovation?
- ✓ What renovation measures is the homeowner interested in?
- ✓ Is a certain system technology preferred by the homeowner (for heating, cooling,)?
- ✓ Which renewable energy source is the homeowner interested in?
- ✓ Does the building already fulfil the next obligations in the future? If not, which measures would help to meet them?
- ✓ Are there foreseeable occasions, when future renovation steps can be carried out preferably concerning the living situation of the owner or user or periods in which renovation is inappropriate?
- ✓ Are there weak points in the building that require immediate action?
- ✓ Are there any measures that lead to major improvements with little effort?
- ✓ Are there any measures that can be carried out at any time without preconditions?
- ✓ Which components and systems of the building will soon reach the end of their life span?
- ✓ Which components and systems can probably be used longer?
- ✓ Which components and systems should be renovated simultaneously for physical or technical reasons, even if their life span has not reached the end yet?
- ✓ In which technically useful sequence should the components and systems be renovated?



STEP 1: On-site Visit

Blank template

iBRoad2EPC	Year of construction	Energy improvements / renovations in the past	Step 1 ASAP no legal requirements	Step 2 2030 at least class E	Step 3 2040 at least class D ban on new fossil fuel boilers	Step 4 2050 climate neutral building
Building 						
inhabitants 						
roof 						
outer walls 						
windows / doors 						
floor / cellar 						
heating sytem 						
domestic hot water 						
ventilation 						
cooling 						





STEP 1: On-site Visit

Blank template

iBRoad2EPC		Year of construction	Energy improvements / renovations in the past	Step 1 ASAP no legal requirements	Step 2 2030 at least class E	Step 3 2040 at least class D ban on new fossil fuel boilers	Step 4 2050 climate neutral building
Building		1967				Life insurance payout	
inhabitants					Roof insulation, New tiles		
roof		1967					External insulation
outer walls		1996	only painted				passive house windows
windows / doors		1996	double-glazed insulated windows				
floor / cellar		1967		Insulate from below			
heating sytem		2007				Air/water Heat pump	
domestic hot water		2007	condensing boiler				
ventilation		none					Ventilation with heat recovery and cooling
cooling		none					

STEP 2: Calculation of the current Buildings State



STEP 1: On-site Visit



STEP 2: Calculation of the current Buildings State



STEP 3: Definition of the Renovation Strategy

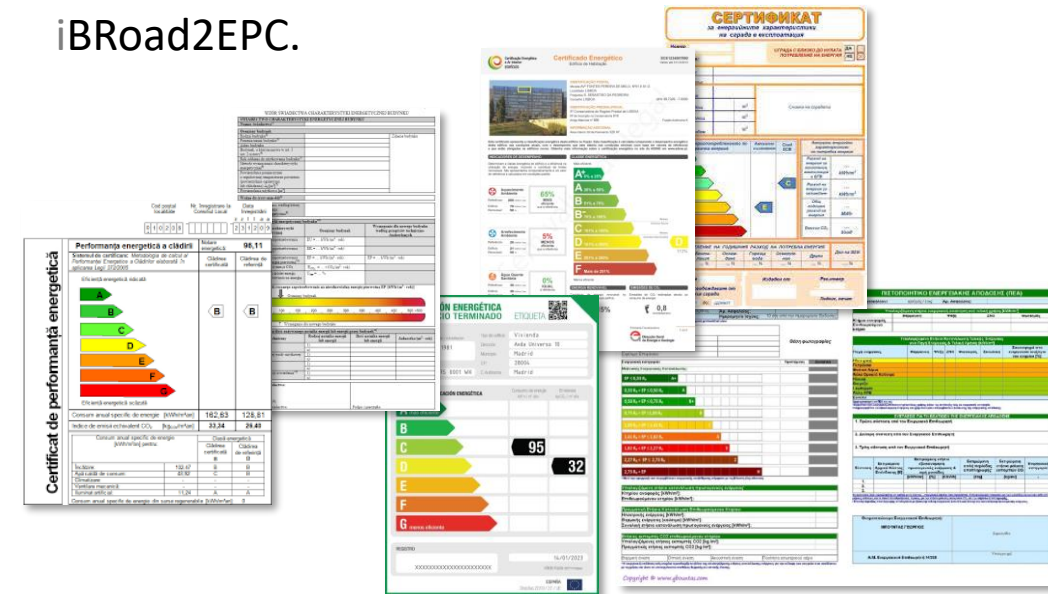


STEP 4: Calculation of planned Building States

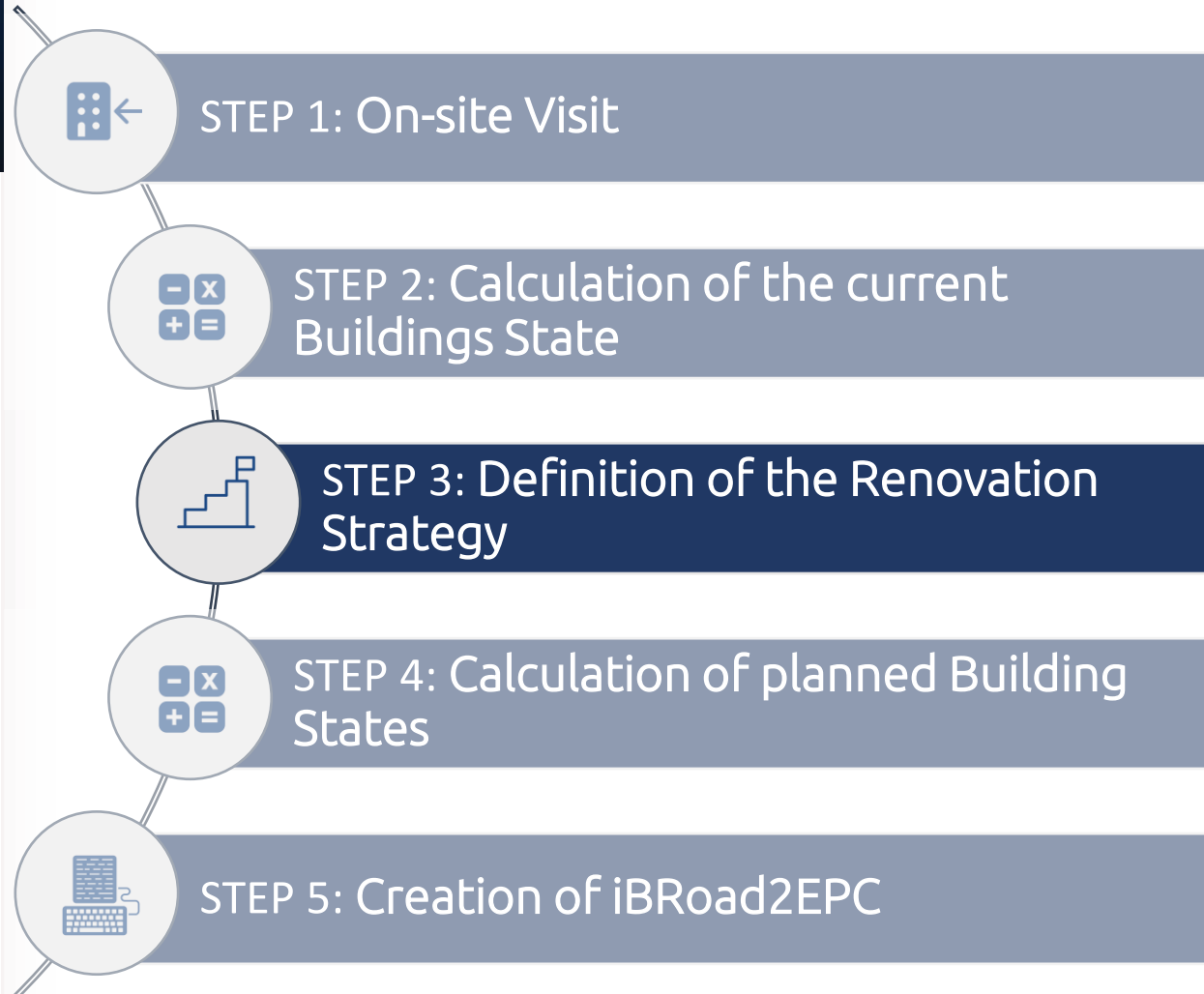


STEP 5: Creation of iBRoad2EPC

- The current state of the building is calculated with the EPC software.
- The calculation is exactly the same as the calculation to issue an EPC based on energy demand.
- This means, an EPC is always issued with each iBRoad2EPC.



STEP 3: Definition of the Renovation Strategy



- This is the central step in the iBRoad2EPC and the main task of the issuer.
- Issuers create the individual renovation strategy for this building based on
 - the on-site visit,
 - the wishes of the building owners,
 - the technical correlations,
 - and their experience.

STEP 3: Definition of the Renovation Strategy

Guiding Principles to define the Strategy

- **Full renovation or gradual renovation**
- **Age of the Components**
- **Sequence of Measures**
- **Components that should be combined**
- **Obligations that must be met**

STEP 3: Definition of the Renovation Strategy

Guiding Principles to define the Strategy

Full renovation or gradual renovation

- A full renovation has many advantages over a step-by-step approach. Issuers should recommend a full renovation in one step if it is technically feasible and can be afforded by the owners.
 - The GHG emissions of the building fall immediately to the target value, i.e. the cumulative emissions over the entire period are significantly lower.
 - Building component connections can be made in such a way that all thermal bridge and airtightness requirements are met.
- However, since full renovations are time-consuming and expensive, many building owners opt for stepwise renovations.

STEP 3: Definition of the Renovation Strategy

Guiding Principles to define the Strategy

Age of the Components

- In the case of stepwise renovation, the building components can be prioritised according to their age.
 - Components that have already reached or will soon reach the end of their normal technical life span must be renovated earlier than those that will still be usable for many years.
 - The usual technical life span is individually different for all components.

STEP 3: Definition of the Renovation Strategy

Guiding Principles to define the Strategy

Sequence of Measures

- The renovation measures must build on each other.
- For example, it often makes sense to improve the building envelope first. This means that later a heat generator with a lower heat capacity can be installed, which is more cost-effective.
- Many renewable heat generators, such as heat pumps, only work efficiently if a building is at least partially insulated.

STEP 3: Definition of the Renovation Strategy

Guiding Principles to define the Strategy

Components that should be combined

- In addition to the age of the components, issuers must also consider which components should preferably be renovated together.
- For example, many problems with connecting windows to the façade can be avoided if both components are renovated in one step.

STEP 3: Definition of the Renovation Strategy

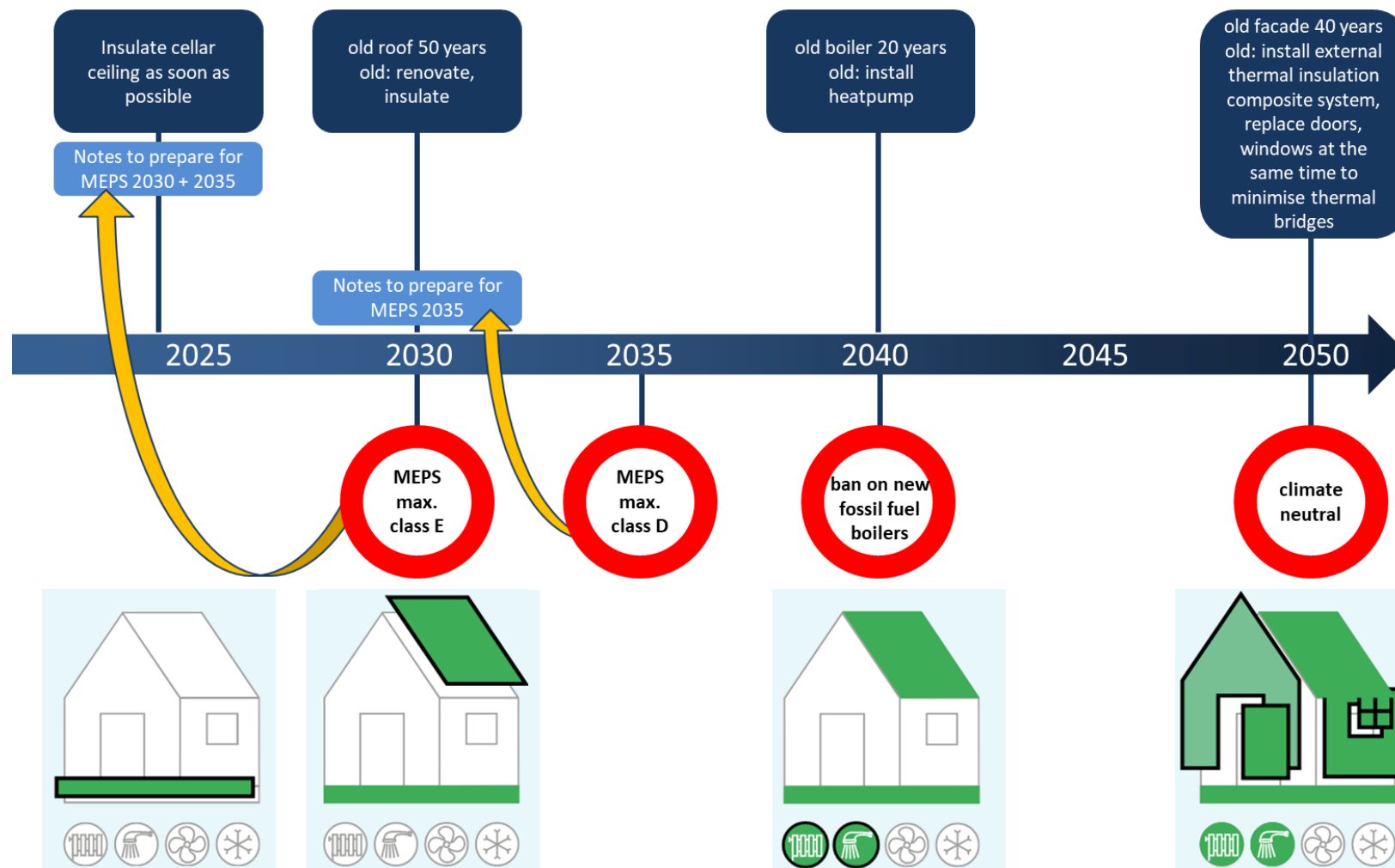
Guiding Principles to define the Strategy

Obligations that must be met

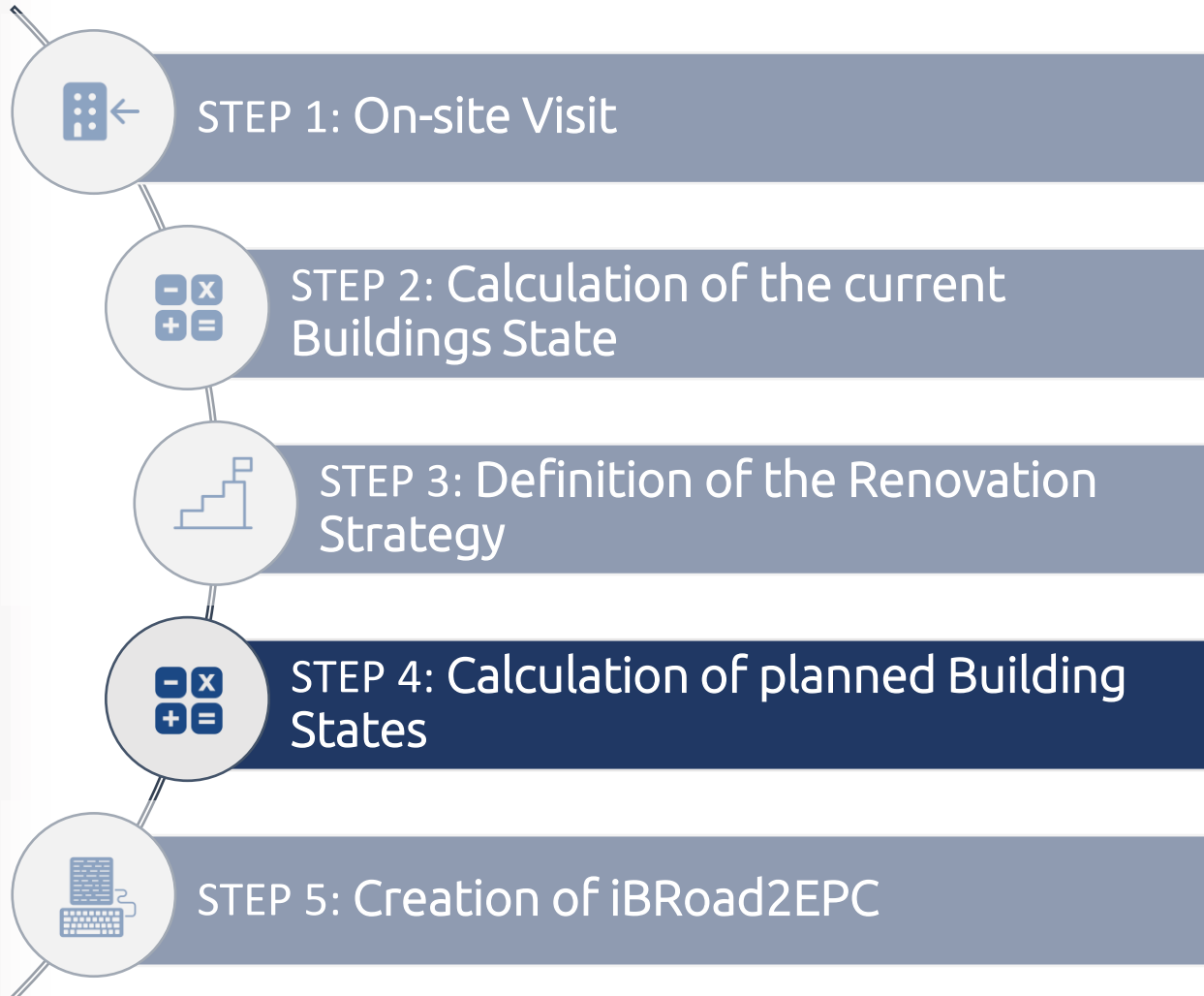
- The renovation measures must be put together in such a way that obligations with which the building must comply, and which are already foreseeable are fulfilled.
- For example, according to the draft of the EPBD recast (15.12.2021), it should be noted that buildings with efficiency classes G must be renovated by 2030 and buildings with efficiency class F by 2033.

STEP 3: Definition of the Renovation Strategy

Guiding Principles to define the Strategy

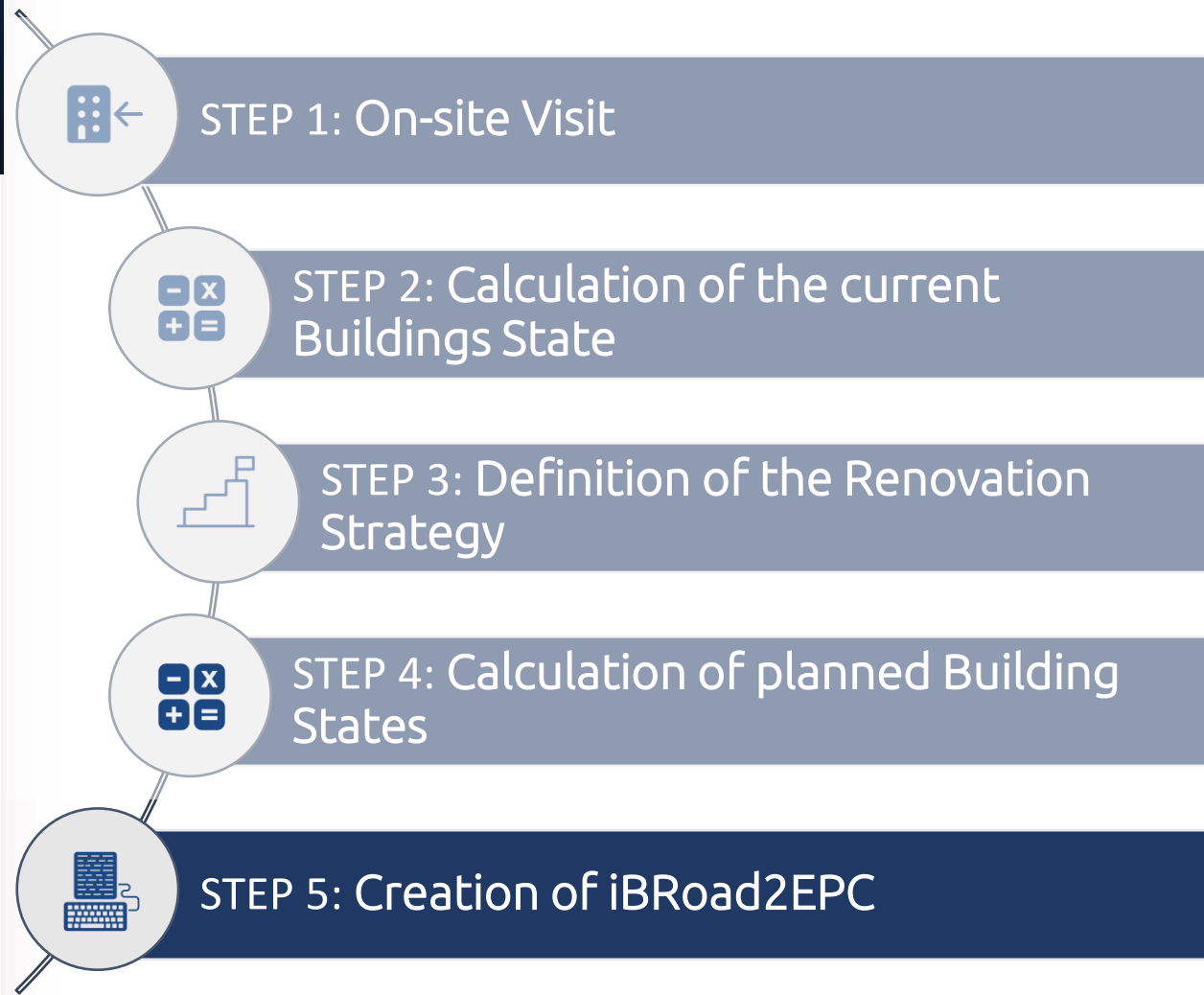


STEP 4: Calculation of planned Building States



- This step is not needed for the basic functionalities of iBRoad2EPC
- It is required for the Energy Demand Module (which is part of the field test)
- The calculation is carried out with the regular EPC software.
- The energy demand is calculated for each renovation step. Usually, the calculation for the actual state can be copied and renovation measures for the respective step can be entered.
- More details will follow in the description of the Energy Demand Module.

STEP 5: Creation of iBRoad2EPC



The iBRoad2EPC is created with an online tool called the iBRoad2EPC Assistant.

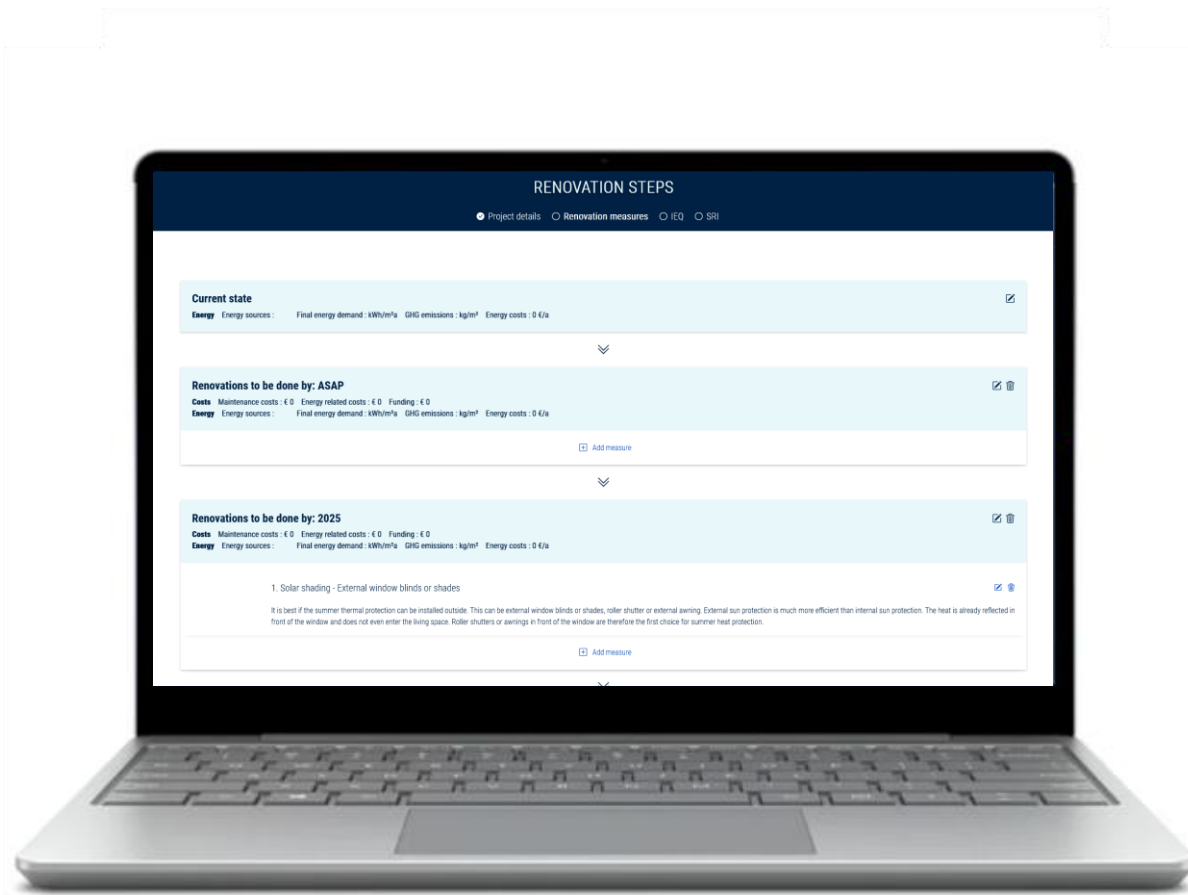
This will be explained in the following section.



Agenda

- What is iBRoad2EPC?
- Five Steps to issue the iBRoad2EPC
- **iBRoad2EPC Assistant**
- Additional Functionalities of iBRoad2EPC

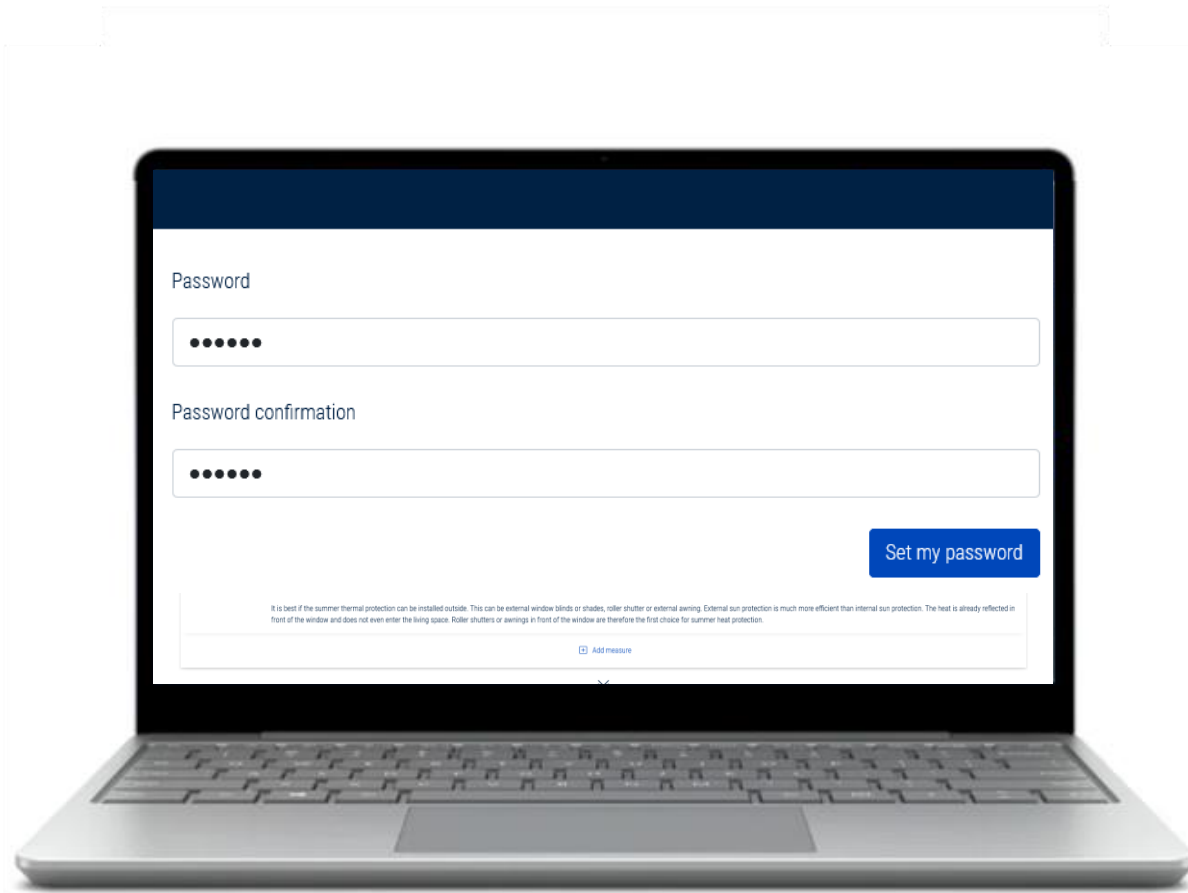
iBRoad2EPC Assistant



The iBRoad2EPC is created with an online tool called the iBRoad2EPC Assistant. The main objectives of this tool are:

- create the iBRoad2EPC in a uniform design,
- output the iBRoad2EPC in an online format,
- facilitate issuers in assigning renovation measures at specific points in time,
- support issuers with prefabricated content,
- allow easy overwriting of all default texts by the issuer.

iBRoad2EPC Assistant



All participants in the field test will receive a personalised invitation link to the iBRoad2EPC Assistant.

This will allow them to sign in and create a password.

iBRoad2EPC Assistant

All texts for the iBRoad2EPC were translated and transferred to the iBRoad2EPC assistant



iBRoad2EPC Assistant Sign In

 Projects Test User : Log out

MY PROFILE

[Edit](#)

Name	Client number	Status	Created at	Actions
p test		Created	April 11, 2023 08:37	Complete details 

Clicking your name in the upper right corner opens the page “my profile”

You can edit your profile by clicking “edit”.

This will open a new window with your data

 Test User : Log out

EDIT MY PROFILE

First name *

Last name *

Phone number *

[Update User](#)

iBRoad2EPC Assistant for Issuers

Add a Project

 Projects

Test User : Log out

PROJECTS

Add a project

Name	Client number	Status	User	Country	Created at	Actions
------	---------------	--------	------	---------	------------	---------

New project

Name *

Create Project

iBRoad2EPC Assistant for Issuers

Add a Project

PROJECTS

[Add a project](#)

Name	Client number	Status	User	Country	Created at	Actions
p_test_04	123	Submitted	Test User	Portugal	April 26, 2023 14:12	Show 
small test		Validated	Test User	Portugal	April 20, 2023 09:36	Complete details 
p_test_03		Submitted	Test User	Portugal	April 17, 2023 15:14	Show 
test		Created	Test User	Portugal	April 17, 2023 11:51	Complete details 
p test_02		Submitted	Test User	Greece	April 13, 2023 09:39	Show 
p test		Submitted	Test User	Portugal	April 11, 2023 08:37	Show 

iBRoad2EPC Assistant for Issuers

Add a Project

 Projects Test User [Log out](#)

COMPLETE PROJECT DETAILS

☐ Project details ☐ Renovation measures

Name *	Client number	
Test_	111	
Building constructed in	Country *	
1990	Portugal	
Climate zone *	Current energy class *	
IT V1	F	
Building type *	Building sub type *	
Residential building	Multi-family building	
Environment *	Tenure status *	
Urban	Rented	
Heating system constructed in	Cooling system constructed in	
1990	1990	
Project trigger *	Project receiver *	Recommendations target *
Extension	Owner	Building owner
Image *		
Durchsuchen... Keine Datei ausgewählt.		
Previous epc *		
Durchsuchen... Keine Datei ausgewählt.		

[Confirm details](#)

After creating a project please fill in the project details

iBRoad2EPC Assistant for Issuers

Add a Project

 Projects Test User Log out

COMPLETE PROJECT DETAILS
☐ Project details ☐ Renovation measures

Name *

Test_

✓

Client number

111

✓

Building constructed in

1990

✓

Country *

Portugal

✓

Climate zone *

IT V1

✓

Current energy class *

F

✓

Building type *

Residential building

✓

Building sub type *

Multi-family building

✓

Image

Browse

no file selected

EPC certificate *

Browse

no file selected

Confirm details

You can upload an image of the building. It will show up in the summary.

Please upload an EPC for the current building state in pdf format. The link to the iBRoad2EPC will be attached to the EPC in an extra page to the pdf. You can forward this enhanced pdf-file to the building owner or print it out.

Clicking “confirm details” takes you to the renovation steps.

Projects

Test User : Log out

RENOVATION STEPS

● Project details

○ Renovation measures

○ IEQ

Current state

Energy Energy sources : Final energy demand : kWh/m²a GHG emissions : kg/m³ Energy costs : 0 €/a

⇅

Renovations to be done by: ASAP

Costs Maintenance costs : € 1,000 Energy related costs : € 1,000 Funding : € 5,000

Energy Energy sources : 1. Solar 2. Biomass Final energy demand : 32 kWh/m²a GHG emissions : 32 kg/m³ Energy costs : 0.0 €/a

✎

🗑

1. Floor - Insulation on the basement ceiling

Insulation of the cellar ceiling from below.

✎

🗑

2. Heating - Substitution of the heating system by a gas boiler

Remove your old heating system and install a new gas boiler.

⚠ Preparation for later renovation steps

✎

🗑

➕ Add measure

⇅

Renovations to be done by: 2025

Costs Maintenance costs : € 2,500 Energy related costs : € 2,500 Funding : € 0

Energy Energy sources : Final energy demand : kWh/m²a GHG emissions : kg/m³ Energy costs : 0 €/a

✎

🗑

1. Window - Window glazing substitution

Windows glazing substitution, keeping the actual frames.

⚠ Preparation for later renovation steps

✎

🗑

2. External wall - External insulation (EIFS System)

The external wall is insulated with an "Exterior Insulation Finishing System (EIFS)". EIFS is a lightweight synthetic wall cladding that includes foam plastic insulation and thin synthetic coatings.

⚠ Preparation for later renovation steps

✎

🗑

➕ Add measure

This page shows the current building state and all future renovation steps in an overview.

The dates of the renovation steps are already filled in as a template. They reflect future climate targets or legal obligations.

Issuers are free to add more steps if required.

You can edit every step by clicking the pencil icon on the right.



Project: test_04: edit step for 2031

Target year

2031

☐ Asap

Submit

You can edit every step by clicking the pencil icon on the right.



This will open a menu where you can change the date (target year) of the respective renovation step.

If a renovation step should not refer to a certain year but be carried out as soon as possible you can click the checkbox “Asap”.

Clicking “Submit” will save the changes.

Renovations to be done by: 2030



Costs Maintenance costs : € 0 Energy related costs : € 0 Funding : € 0

Energy Energy sources : Final energy demand : kWh/m²a GHG emissions : kg/m² Energy costs : 0 €/a

[+ Add measure](#)

Regulation targets

By 1 January 2030, buildings constructed prior to 1990 will need to have at least category III comfort levels via the introduction of passive measures on the envelope (insulation, efficient windows, etc). 

By 1 January 2030, 65% of residential buildings will need to have replaced all the lighting by LED and have upgraded electric equipment 

By 1 January 2030, 23% of residential buildings that don't achieve category III comfort levels after the introduction of passive measures will need to have efficient heating and cooling systems such as electrical heat pumps in place. LPG systems replaced with priority for families living in energy poverty. 

Até 1 de Janeiro de 2030, 50% das necessidades de aquecimento de água para edifícios residenciais terão de ser asseguradas por sistemas solares térmicos (cerca de 23% do parque habitacional deverá estar equipado com estes sistemas) 



Foreseeable future legal obligations are automatically marked and explained in the overview page. The texts will be displayed in the detailed output pages of each renovation step. You can edit the texts by clicking





Projects

Test User : Log out

RENOVATION STEPS

Project details

Renovation measures

IEQ

Current state

Energy

Energy sources :

Final energy demand : kWh/m²a

GHG emissions : kg/m²

Energy costs : 0 €/a

Renovations to be done by: ASAP

Costs

Maintenance costs : € 1,000

Energy related costs : € 1,000

Funding : € 5,000

Energy

Energy sources :

1. Solar

2. Biomass

Final energy demand : 32 kWh/m²a

GHG emissions : 32 kg/m²

Energy costs : 0.0 €/a

1. Floor - Insulation on the basement ceiling

Insulation of the cellar ceiling from below.

2. Heating - Substitution of the heating system by a gas boiler

Remove your old heating system and install a new gas boiler.

Preparation for later renovation steps

Add measure

Renovations to be done by: 2025

Costs

Maintenance costs : € 2,500

Energy related costs : € 2,500

Funding : € 0

Energy

Energy sources :

Final energy demand : kWh/m²a

GHG emissions : kg/m²

Energy costs : 0 €/a

1. Window - Window glazing substitution

Windows glazing substitution, keeping the actual frames.

2. External wall - External insulation (EIFS System)

The external wall is insulated with an "Exterior Insulation Finishing System (EIFS)". EIFS is a lightweight synthetic wall cladding that includes foam plastic insulation and thin synthetic coatings.

Preparation for later renovation steps

Add measure

Every renovation step can comprise several renovation measures.

Step: a point in time when renovations are carried out

Measure: energetic improvement of one building component

You can assign measures to the steps by clicking  Add measure

New measure

Measure type *

Substitution of the heating system by a heat pump

Description

Install a heat pump. There are two common types of heat pumps: With ground-source heat pumps, a liquid is pumped through pipes laid in the ground and is heated by the temperature of the soil. Air source heat pumps use outside air as a heat source. What all heat pumps have in common is that the heat they absorb is then raised to a higher temperature level for heating and hot water with the help of electricity. As a rule, heat pumps should produce three to four parts of heat from one part of electricity.

Specification

The heat pump should feature a coefficient of performance (COP) of at least 4.0.

Submit



New measure

Measure type *

Solar shading

Improve solar solar radiation heat gains

Window or door

Change glazing with energy saving glazing

Substitution of the old windows

Substitution of the old doors

Cooling

Installation of a chiller

Installation of an absorption chiller connected to thermal solar collectors (solar cooling)

Substitution of the heating/cooling system by a heat pump (Air to Air technology)

Domestic hot water (DHW)

Installation of a condensing gas boiler for domestic hot water

Installation of a thermal solar system for domestic hot water

Installation of a biomass boiler for domestic hot water

Installation of a heat pump for domestic hot water

translation missing: en.non_db_models.record_translations.measure_types.district_heating_network_water

Installation of local electric hot water boiler

Connection to a existing heating system

Heating

Clicking into the field “measure type” will open a dropdown menu. Here you can choose the desired measure from a list.

Clicking a measure will automatically fill in the name, description and specification.

The description can be edited if required.

The technical specification is aligned with the long-term climate targets in your country. You can overwrite it if applicable.

Clicking “Submit” will save the measure and return to the steps overview page.



English

Test User

Log out

RENOVATION STEPS

Project details

Renovation measures

ISO

SP

Current state

Energy

Energy sources

Final energy demand: 60 kWh/m²

GHG emissions: 1 kg/m²

Energy costs: 0 €/m²

Renovations to be done by: ABAP

Costs

Maintenance costs: -40

Energy related costs: -40

Retrofitting: -40

Energy

Energy sources

Final energy demand: 60 kWh/m²

GHG emissions: 1 kg/m²

Energy costs: 0 €/m²

+

ADD MEASURE

Renovations to be done by: 2025

Costs

Maintenance costs: -40

Energy related costs: -40

Retrofitting: -40

Energy

Energy sources

Final energy demand: 60 kWh/m²

GHG emissions: 1 kg/m²

Energy costs: 0 €/m²

+

ADD MEASURE

Renovations to be done by: 2030

Costs

Maintenance costs: -40

Energy related costs: -40

Retrofitting: -40

Energy

Energy sources

Final energy demand: 60 kWh/m²

GHG emissions: 1 kg/m²

Energy costs: 0 €/m²

+

ADD MEASURE

Regulation targets

By 1 January 2030, buildings constructed prior to 1990 will need to have at least category II comfort levels via the introduction of passive measures on the envelope (insulation, efficient windows, etc.)

By 1 January 2030, 65% of residential buildings will need to have replaced all the lighting by LED and have upgraded electric equipment

By 1 January 2030, 50% of residential buildings that don't achieve category II comfort levels after the introduction of passive measures will need to have efficient heating and cooling systems such as electrical heat pumps in place. LFG systems replaced with priority for families living in energy poverty

Until 1 de Janeiro de 2030, 65% das necessidades de aquecimento de água para edifícios residenciais terão de ser asseguradas por sistemas solares térmicos (parce de 55% do parque residencial deverá estar equipado com estes sistemas)

Renovations to be done by: 2040

Costs

Maintenance costs: -40

Energy related costs: -40

Retrofitting: -40

Energy

Energy sources

Final energy demand: 11.5 kWh/m²

GHG emissions: 0.1 kg/m²

Energy costs: 0.0002 €/m²

+

ADD MEASURE

Regulation targets

By 1 January 2040, residential buildings constructed prior to 2014 will need to have at least category II comfort levels via the introduction of passive measures on the envelope (insulation, efficient windows, etc.)

By 1 January 2040, 100% of residential buildings will need to have replaced all the lighting by LED and have upgraded electric equipment

Until 1 de Janeiro de 2040, 77% dos edifícios residenciais que não atingem a categoria II de conforto terão de introduzir medidas passivas tanto de isolamento térmico como de sistemas de aquecimento e arrefecimento, tais como bombas de calor elétricas. Todos os sistemas de gás a gás deverão ser substituídos por sistemas elétricos.

By 1 January 2040, 100% of residential buildings that don't achieve category II comfort levels after the introduction of passive measures will need to have efficient heating and cooling systems such as electrical heat pumps in place

Until 1 de Janeiro de 2040, 77% do stock de edifícios residenciais terá primário solar térmico e/ou produção fotovoltaica e/ou armazenamento elétrico.

By 1 January 2040, 100% of the residential building stock will have either heat pumps and/or PV electrical production and/or electrical storage

+

ADD MEAS

Test step

The renovation for the individual building is created by assigning renovation measures to the steps the way described before.

The definition of the renovation strategy is the main task of the issuer. Guiding questions in this task are (as described above):

- Full renovation or gradual renovation
- Age of the Components
- Sequence of Measures
- Components that should be combined
- Obligations that must be met

Issuers aim to achieve a complete renovation of all relevant building components until the target year thus reaching a climate-neutral building state.

When the strategy is ready you click “create overview document” to proceed.

Renovations to be done by: ASAP

Costs	Maintenance costs : € 0	Energy related costs : € 0	Funding : € 0
Energy	Energy sources : 1. Gas	Final energy demand : 167 kWh/m²a	GHG emissions : 40 kg/m²
			Energy costs : 2800.0 €/a

1. Roof - Insulation of the top storey ceiling  

Isolamento da cobertura do piso superior em sótão (desvão ventilado - espaço não útil). As placas de isolamento são colocadas sobre a esteira horizontal. No caso de tectos permeáveis ao vapor, pode ser necessário colocar uma barreira de vapor sob o isolamento para evitar a acumulação de humidade no material de isolamento. Pergunte ao seu projectista sobre isto. Se o sótão tiver de ser pisado, o material de isolamento deve ser coberto com tábuas estáveis.

 Preparations for later renovations steps 

 Add measure

While assigning more renovation measures to the steps you will notice that “preparations for later renovation steps” appear automatically beneath some measures. They open up when clicked.

These prefabricated text blocks provide advice on how to prepare for later steps while implementing the actual measure. They depend on the sequence of measures.

You can edit them when you click the pencil icon.

2. External wall - External insulation (EIFS System)  

The external wall is insulated with an “Exterior Insulation Finishing System (EIFS)”. EIFS is a lightweight synthetic wall cladding that includes foam plastic insulation and thin synthetic coatings.

 Preparation for later renovation steps 

Preparation for a later insulation of a flat roof 

When the outer walls are being insulated, please prepare for a later flat roof insulation. The upper edge of the parapet should be insulated. The sheeting should be wide enough so that the later flat roof insulation can be connected.

English

Test User

Log out

PROJECT: TEST_04

Download enhanced EPC pdf

Overview page

Edit

RENOVATION PLAN

Current state

Renovations to be done by: ASAP

Renovations to be done by: 2025

Renovations to be done by: 2030

Regulation targets

Renovations to be done by: 2040

Regulation targets

PROJECT DETAILS

User: Test User

Environment: Urban

Building type: Residential building

Current energy class: F

Year of Construction of the Heating System: 2010

Thermal status: Owner occupied

Receiver of iBRoad2EPC: Owner

Have the building's components already been renovated to the target state?

Country: Portugal

Climate zone: IT n°1

Building subtype: Multifamily building

Year of Construction of the Building: 1990

Year of Construction of the Cooling System: No legal trigger

Trigger point for iBRoad2EPC: Building owner

Recommendations addressed to: Submitted

Status: Submitted

Currently attached image

Currently attached EPC document

energ_bouwer's.pdf

After all entries are ready and confirmed you are shown an overview page.

A new menu appears in the upper right corner.

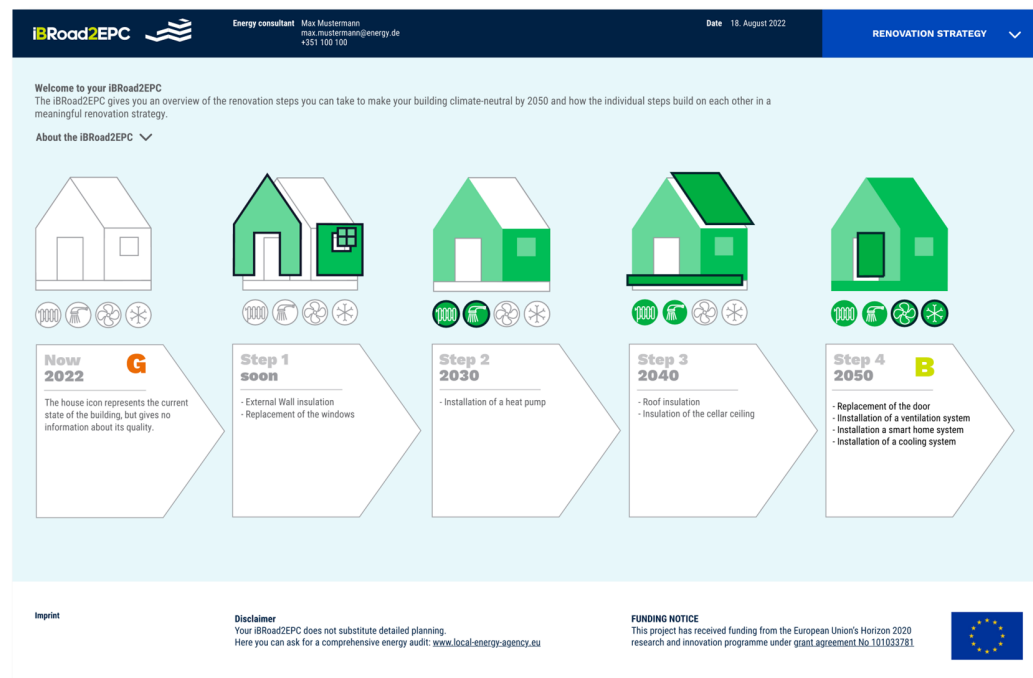
Download enhanced EPC pdf

Overview page

Edit

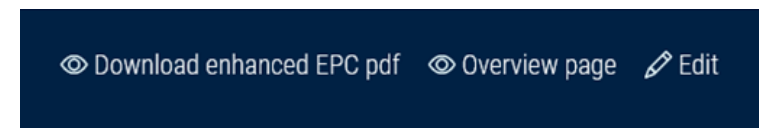
It allows you to

- edit the entered data
this leads you back to the previous page
- See the iBRoad2EPC output document (overview page)
- Download the EPC enhanced with an additional page with links to the iBRoad2EPC in pdf format



After all entries are ready and confirmed you are shown an overview page.

A new menu appears in the upper right corner.



It allows you to

- edit the entered data
this leads you back to the previous page
- **See the iBRoad2EPC output document (overview page)**
- Download the EPC enhanced with an additional page with links to the iBRoad2EPC in pdf format

[illegible]

After all entries are ready and confirmed you are shown an overview page.

A new menu appears in the upper right corner.

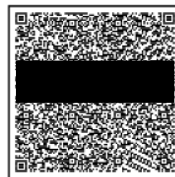


It allows you to

- edit the entered data
this leads you back to the previous page
- See the iBRoad2EPC output document (overview page)
- **Download the EPC enhanced with an additional page with links to the iBRoad2EPC in pdf format**



Find your enhanced iBRoad2EPC document via the qr code below:





Agenda

- What is iBRoad2EPC?
- Five Steps to issue the iBRoad2EPC
- iBRoad2EPC Assistant
- Additional Functionalities of iBRoad2EPC

iBRoad2EPC Assistant for Issuers

ADDITIONAL FUNCTIONALITIES OF IBROAD2EPC

Step 2 2030

Energy source
electricity-heat pump



Final energy demand

95 kWh/m²a

GHG emissions

50 kg/m²

Energy costs

1.900 €/a

Step 2 2030

13.000 € Maintenance Costs
+ 2.000 € Energy-related Costs
15.000 € Investment Costs

5.000 € Funding

Funding is rated in "Subsidies-EU"
www.subsidies-in-your-country.eu
(Status as of 24.11.2022)

Step 2 2025



6.2

Step 4 2050

SRI Class D

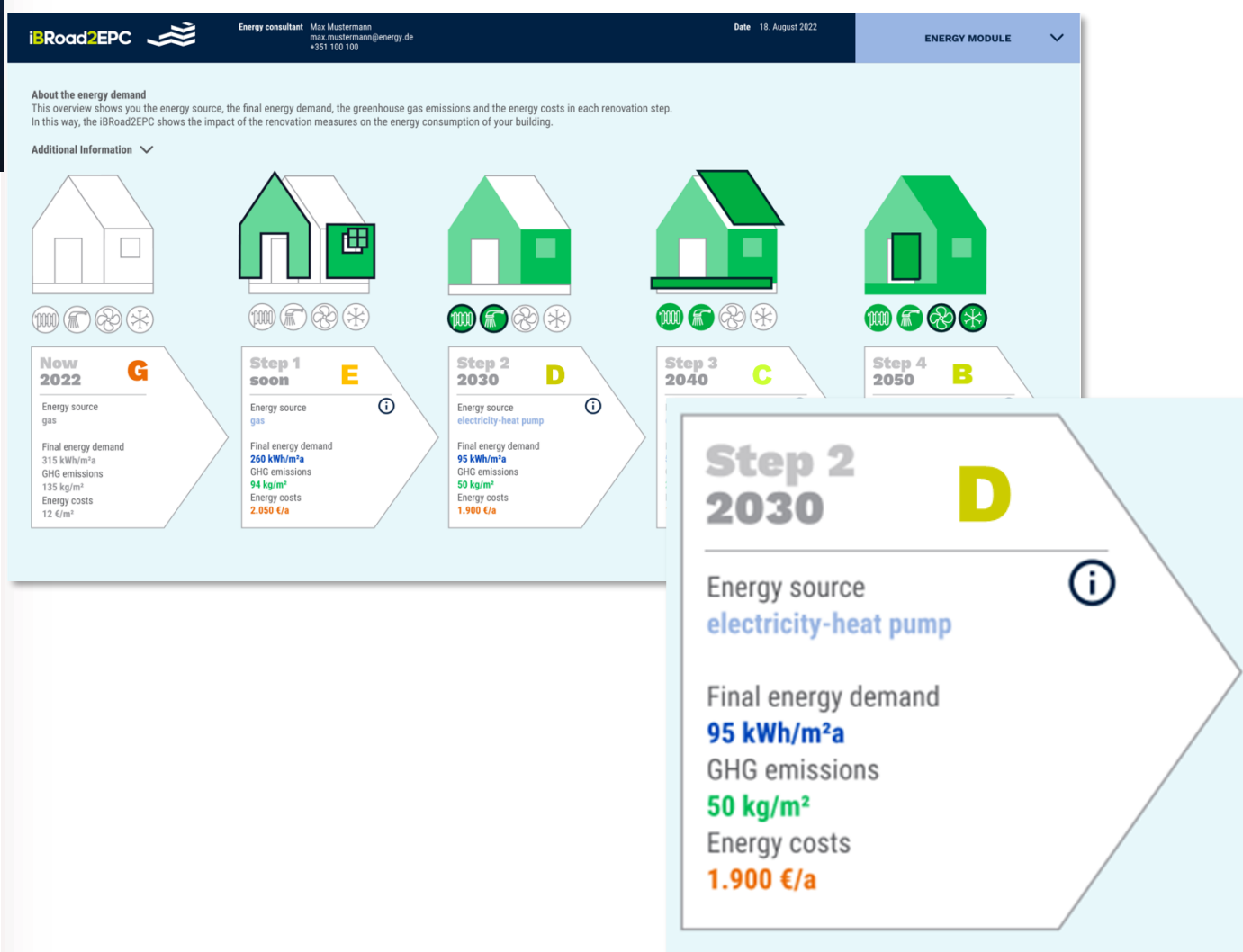


The following Modules are available

- Energy Demand Module
- Investment Cost Module
- Indoor Environment Quality (IEQ) Module
- Smart Readiness Indicator (SRI) Module



iBRoad2EPC Assistant for Issuers Energy Demand Module



The Energy Demand Module adds the following information for each renovation step to the iBRoad2EPC:

- Final energy demand
- efficiency class
- greenhouse gas emissions
- energy costs

iBRoad2EPC Assistant for Issuers Energy Demand Module

Project: p test: edit step for ASAP

Target year

✓ **Asap**

Energy

Energy sources

1. Gas

+ -

Final energy demand

153 kWh/m²a

GHG emissions

39 kg/m²

Current energy class

E

A+

A

B

B-

C

D

Energy costs

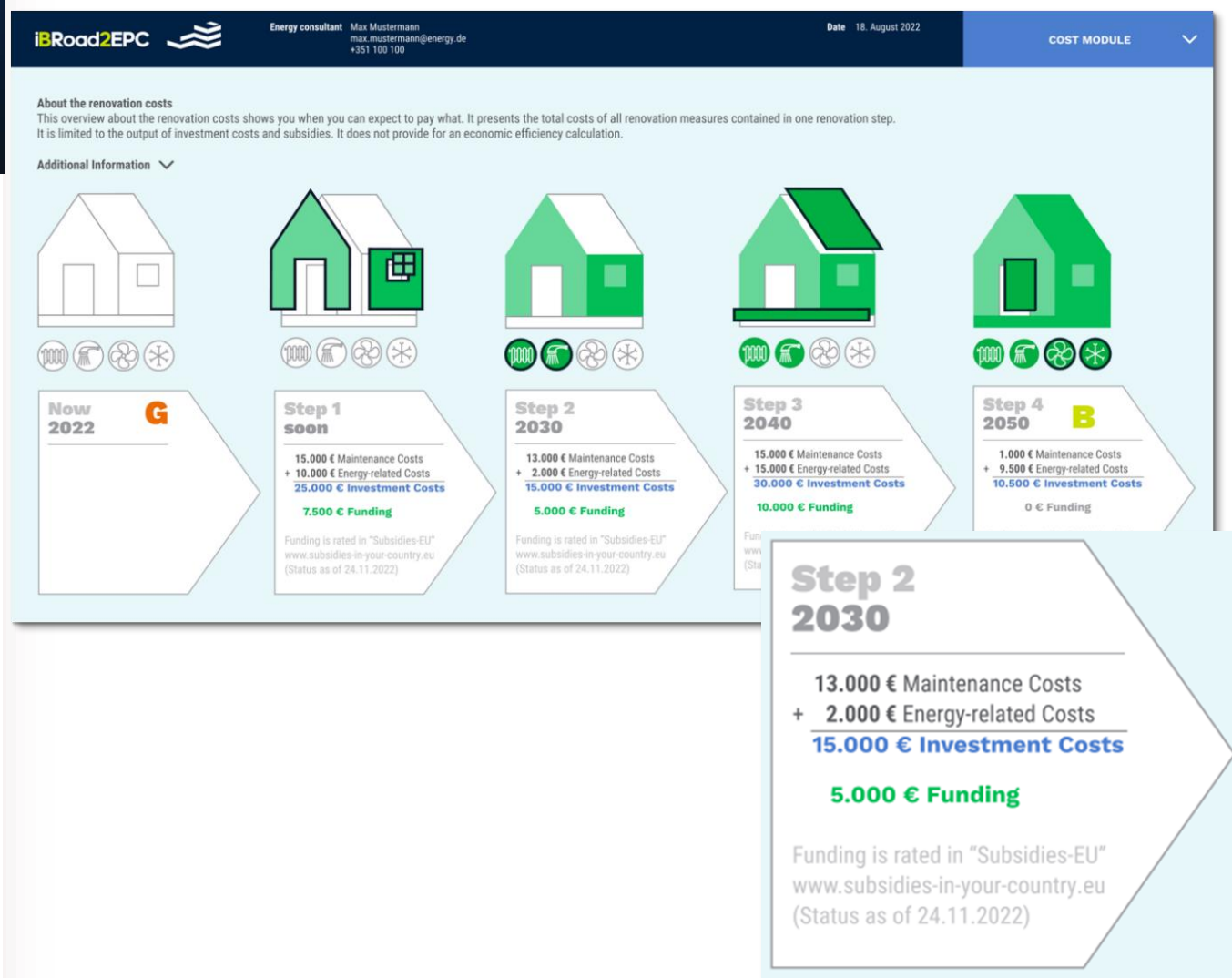
3000 €

Submit

When the Energy Demand Module is active it adds an input field to the iBRoad2EPC Assistant.

It allows you to enter energy features for every renovation step.

iBRoad2EPC Assistant for Issuers Investment Cost Module



The Investment Cost Module allows for the display of renovation costs in iBRoad2EPC. The following cost types can be presented:

- Total investment costs
- Maintenance costs
- Energy-related additional costs
- Funding

iBRoad2EPC Assistant for Issuers Investment Cost Module

Project: p test: edit step for ASAP

Target year

☒ Asap

Renovation step costs

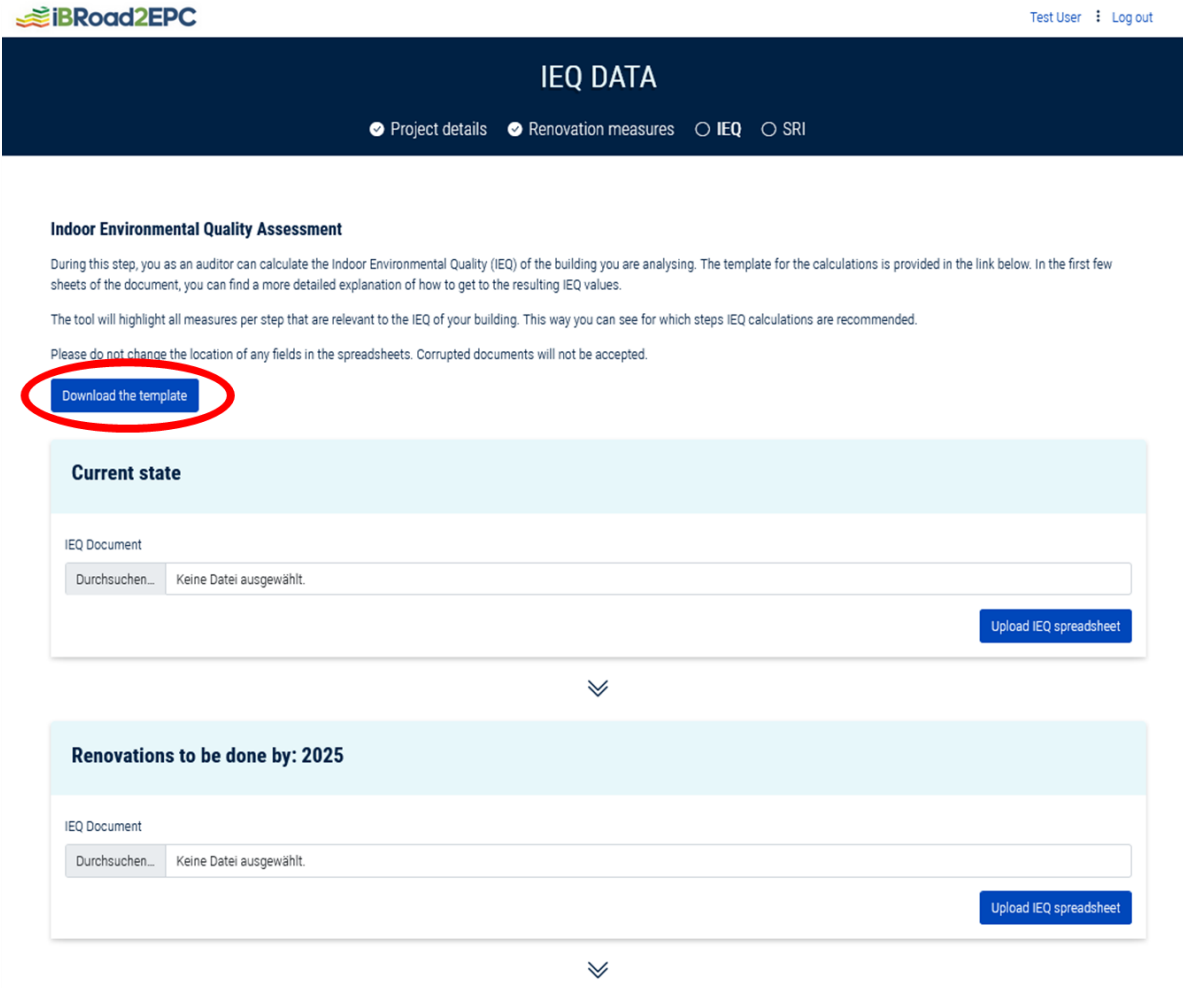
Maintenance costs	Energy related costs	Funding
10000 €	5000 €	2000 €

When the Investment Cost Module is active it adds an input field to the iBRoad2EPC Assistant. It allows you to enter cost data for every renovation step.

- **Total investment costs**
The total cost of all renovation measures included in a renovation step.
- **Maintenance costs**
Part of the total costs that has to be spent anyway for the maintenance of the building.
- **Energy-related additional costs**
Part of the total cost that arises only from the energy improvement.
- **Funding**
The presentation of the funding mainly refers to grant subsidies not subsidised loans.

iBRoad2EPC Assistant for Issuers

Indoor Environmental Quality (IEQ) Module



The screenshot shows the 'IEQ DATA' section of the iBRoad2EPC interface. At the top, there are tabs for 'Project details', 'Renovation measures', 'IEQ' (selected), and 'SRI'. Below the tabs, the 'Indoor Environmental Quality Assessment' section contains instructions for auditors. A blue button labeled 'Download the template' is circled in red. Below this, there are two sections: 'Current state' and 'Renovations to be done by: 2025'. Each section has an 'IEQ Document' input field with a search button and an 'Upload IEQ spreadsheet' button.

IEQ DATA

Test User : Log out

● Project details ● Renovation measures ○ **IEQ** ○ SRI

Indoor Environmental Quality Assessment

During this step, you as an auditor can calculate the Indoor Environmental Quality (IEQ) of the building you are analysing. The template for the calculations is provided in the link below. In the first few sheets of the document, you can find a more detailed explanation of how to get to the resulting IEQ values.

The tool will highlight all measures per step that are relevant to the IEQ of your building. This way you can see for which steps IEQ calculations are recommended.

Please do not change the location of any fields in the spreadsheets. Corrupted documents will not be accepted.

[Download the template](#)

Current state

IEQ Document

Durchsuchen... Keine Datei ausgewählt.

[Upload IEQ spreadsheet](#)

Renovations to be done by: 2025

IEQ Document

Durchsuchen... Keine Datei ausgewählt.

[Upload IEQ spreadsheet](#)

The IEQ Module allows issuers to evaluate the indoor environmental quality of a building. The main determinants of IEQ are

- indoor air quality
- thermal comfort
- lighting
- Acoustics

If the IEQ Module is implemented in a country, the corresponding input mask opens automatically after the definition of the renovation measures is completed. At the top left of the page is a link to download the excel tool (button "download the template").

iBRoad2EPC Assistant for Issuers Indoor Environmental Quality (IEQ) Module

Guideline IEQ by x-tendo



eXTENDING the energy performance assessment and
certification schemes via a mOdular approach

Comfort Asset Rating Procedure (CARP)

User-guide

Version 1.0

2022

This document describes Comfort Asset Rating Procedure (CARP)

Dated 21.04.2022.

This version is applicable to new and existing residential buildings, schools and offices that are
unoccupied.



This project has received funding from the European Union's Horizon 2020 research
and innovation programme under grant agreement No 847056.

Use the x-tendo Guideline to
create IEQ

	A	B	C	D	F	G	H	I	K	L	M
1											
2		Factors responsible for under-heating					Factors that reduce under-heating				
3											
4		Geography					Location				
5		Country		Poland							
6		Climatic zone	Climate zone	Climate zone V							
7											
8		Site characteristics					Site characteristics				
9		Mutual shading of glazed areas from trees/buildings in winter	Shading from neighbouring trees and buildings reduce solar gains from solar exposed E/W/S surfaces.	No							
10											
11		Building characteristics					Barriers to wind (e.g. ever green trees, buildings etc.)				
12											
13		Insulation (wall/roof/floor)	Existing buildings before and after renovation would have significant difference in indoor comfort levels due to insulation against thermal discomfort and are primary components of heat loss in the fabric of buildings.	Walls+Roof+Floor							
14		Windows		Single							
15											
16		Heat loss					Exposed thermal mass category				
17											
18		Age of the building	Age of the building is a determinant of the degradation of the envelope and its capacity to provide air-tightness.	Post 2010							
19											
20											
21											
22		Under-heating probability									
		Medium									

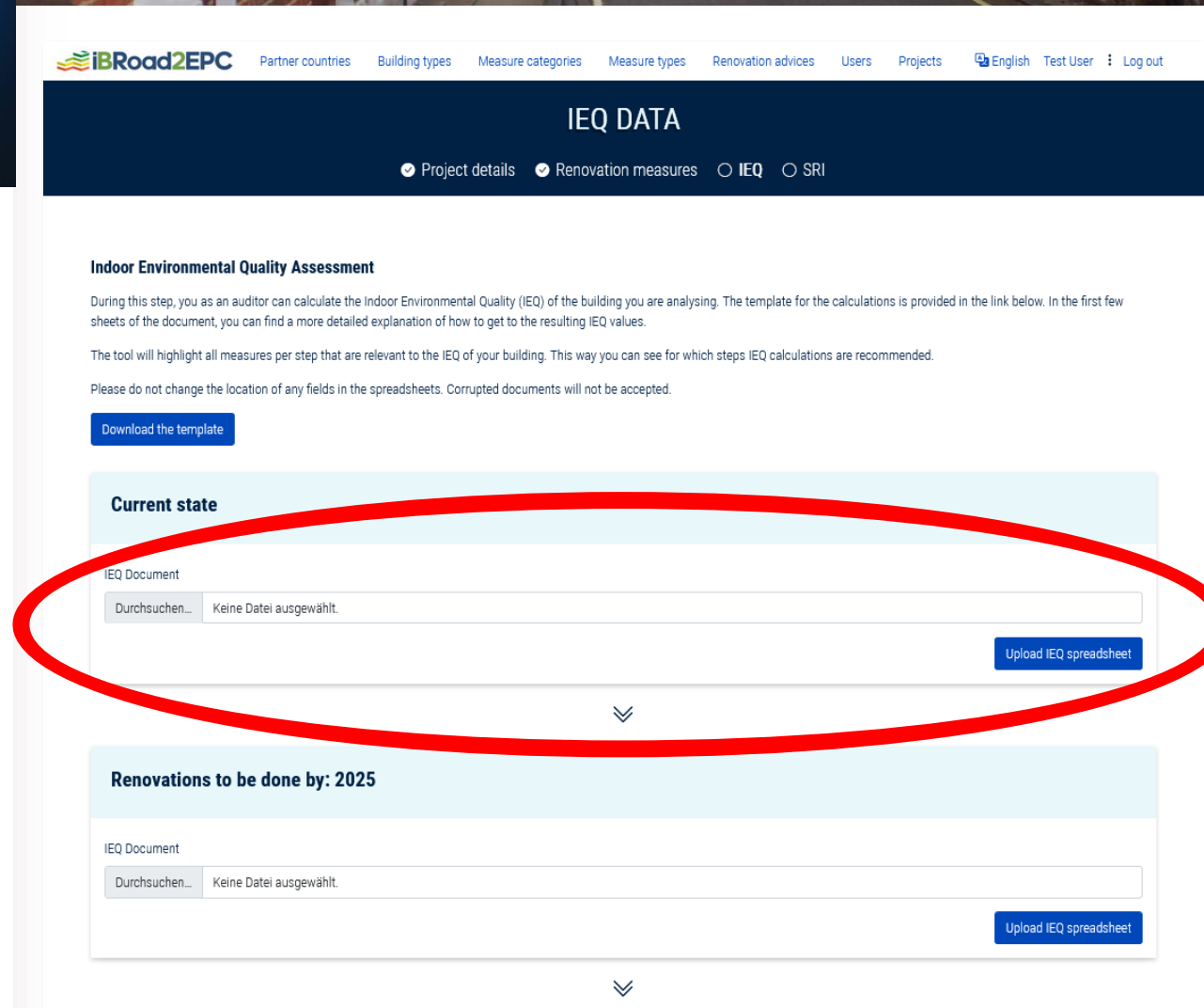
Dropdown

Dropdown

All other tabs work according to the same structure. After all sheets have been filled in, IEQ is calculated.

iBRoad2EPC Assistant for Issuers

Indoor Environmental Quality (IEQ) Module



IEQ DATA

Project details Renovation measures **IEQ** SRI

Indoor Environmental Quality Assessment

During this step, you as an auditor can calculate the Indoor Environmental Quality (IEQ) of the building you are analysing. The template for the calculations is provided in the link below. In the first few sheets of the document, you can find a more detailed explanation of how to get to the resulting IEQ values.

The tool will highlight all measures per step that are relevant to the IEQ of your building. This way you can see for which steps IEQ calculations are recommended.

Please do not change the location of any fields in the spreadsheets. Corrupted documents will not be accepted.

[Download the template](#)

Current state

IEQ Document

Durchsuchen... Keine Datei ausgewählt.

[Upload IEQ spreadsheet](#)

Renovations to be done by: 2025

IEQ Document

Durchsuchen... Keine Datei ausgewählt.

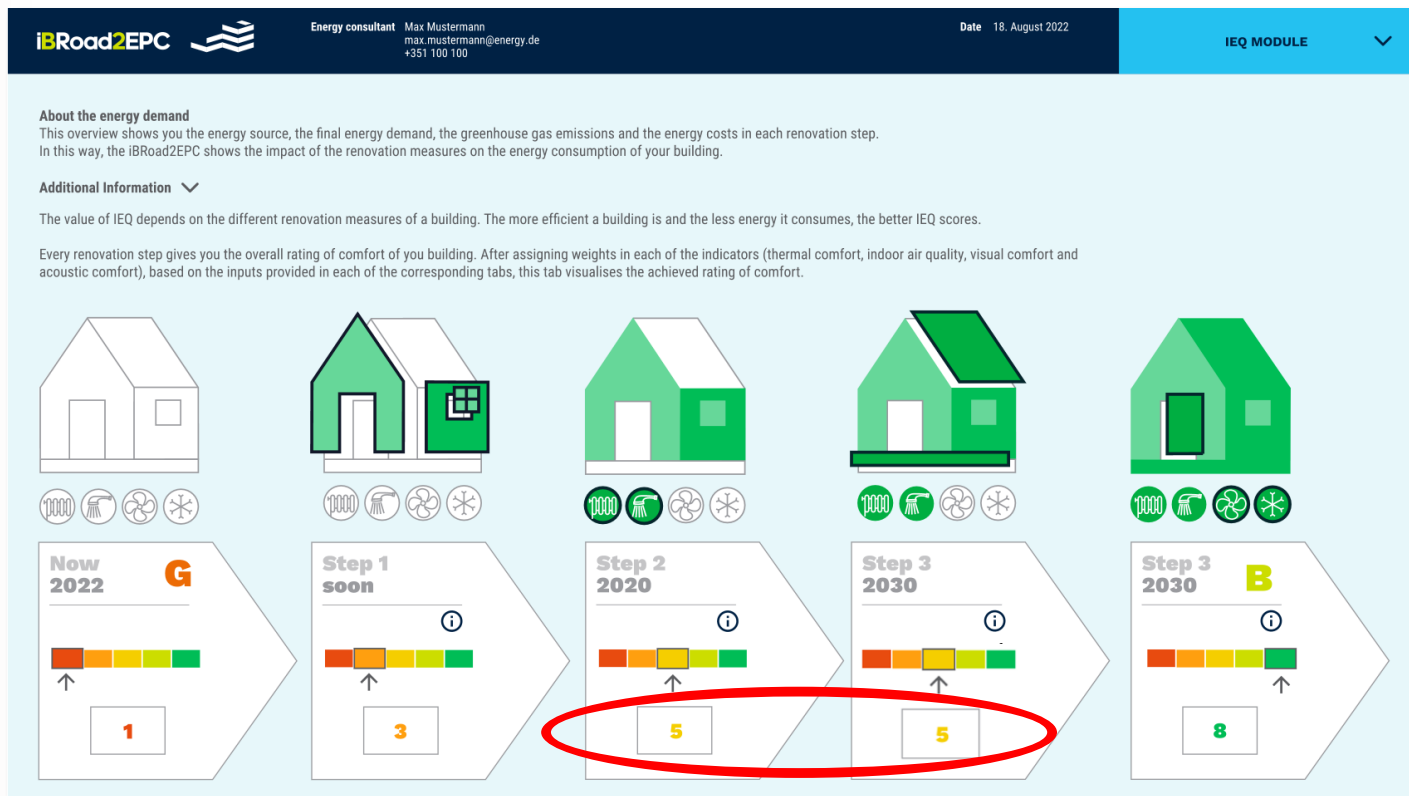
[Upload IEQ spreadsheet](#)

The IEQ is first calculated for the current state of the building. The completed excel-file can then be uploaded in the "current state" field. Issuers can browse their computer and select the appropriate excel file. Clicking the button "upload IQE spreadsheet" will submit the file.

The Assistant checks the plausibility and completeness of the spreadsheet and imports the IEQ result. Based on the provided inputs, the IEQ output page visualises the achieved rating of comfort after assigning weights to each of the indicators.

iBRoad2EPC Assistant for Issuers

Indoor Environmental Quality (IEQ) Module

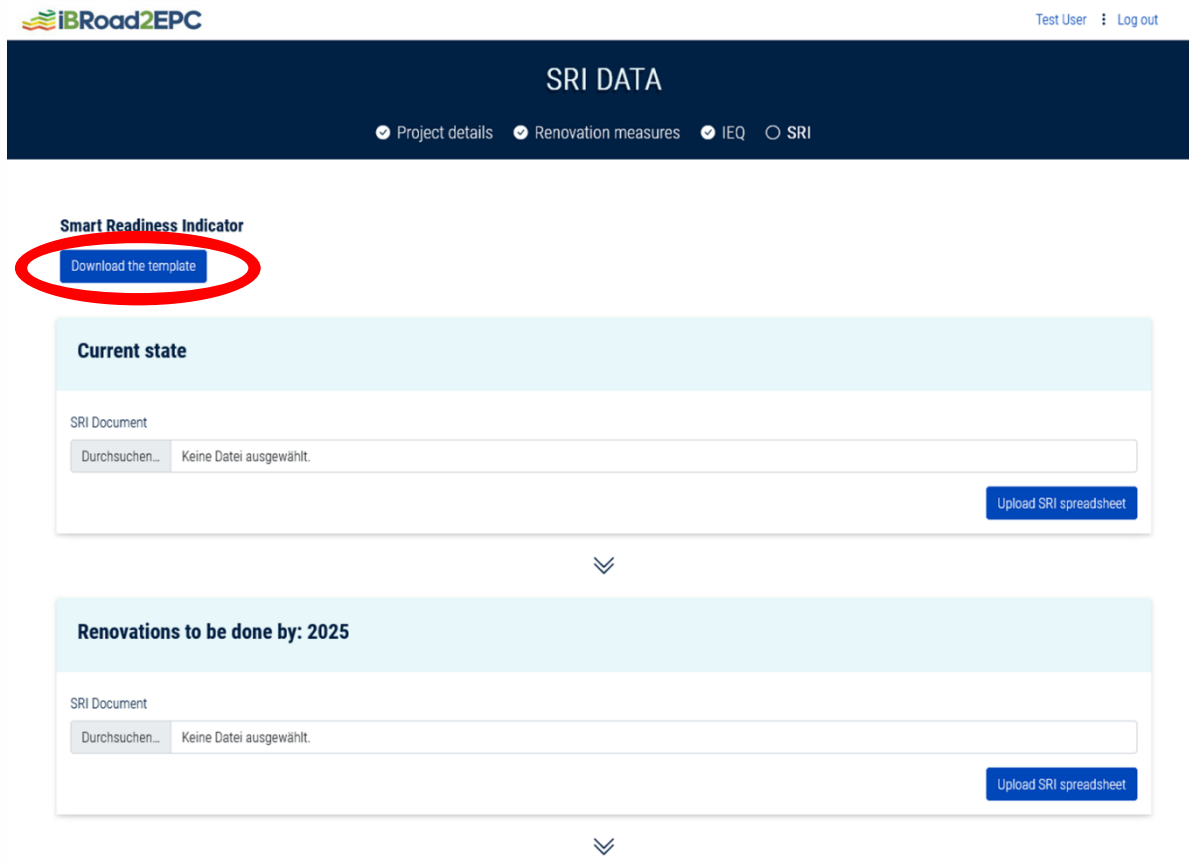


If measures are planned in the following renovation steps that affect the IEQ, the calculation has to be repeated for these steps and a new excel-file is uploaded in the corresponding step.

If no measures that affect the IEQ are planned in a renovation step (e.g. new heat generator), no new IEQ calculation needs to be performed for this step.

In such steps, the IEQ value from the previous step is automatically adopted.

iBRoad2EPC Assistant for Issuers Smart Readiness Indicator (SRI) Module



iBRoad2EPC Test User : Log out

SRI DATA

Project details Renovation measures **IEQ** SRI

Smart Readiness Indicator

[Download the template](#)

Current state

SRI Document

Durchsuchen... Keine Datei ausgewählt.

Upload SRI spreadsheet

Renovations to be done by: 2025

SRI Document

Durchsuchen... Keine Datei ausgewählt.

Upload SRI spreadsheet

The SRI rates the readiness of buildings in performing three key functionalities:

- to optimise energy efficiency and overall in-use performance
- to adapt their operation to the needs of the occupant
- to adapt to signals from the grid (for example, energy flexibility)

If the SRI Module is implemented in a country, the corresponding input mask opens automatically after the definition of the renovation measures is completed. At the top left of the page is a link to download the excel tool (button "download the template").

Smart Readiness Indicator (SRI) Module Calculation sheet

Guideline SRI by the EU commission



Smart Readiness Indicator (SRI)

**ASSESSMENT PACKAGE:
PRACTICAL GUIDE SRI
CALCULATION FRAMEWORK v 4.5**

Authors: Yixiao Ma, Stijn Verbeke, Christina Protopapadaki (VITO)
Sophie Dourlens-Quaranta (R2M Solution)

Date: April 2023

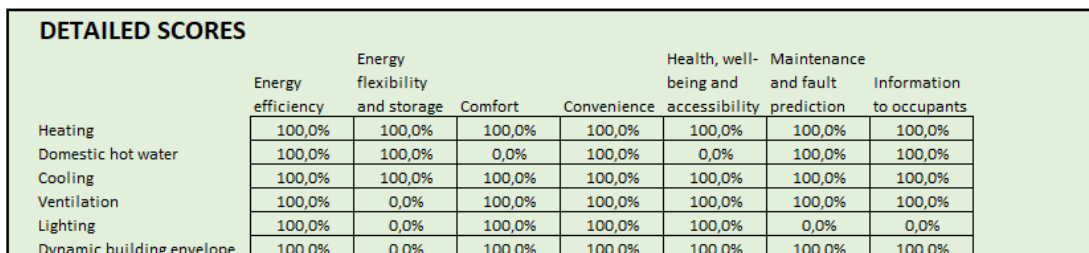
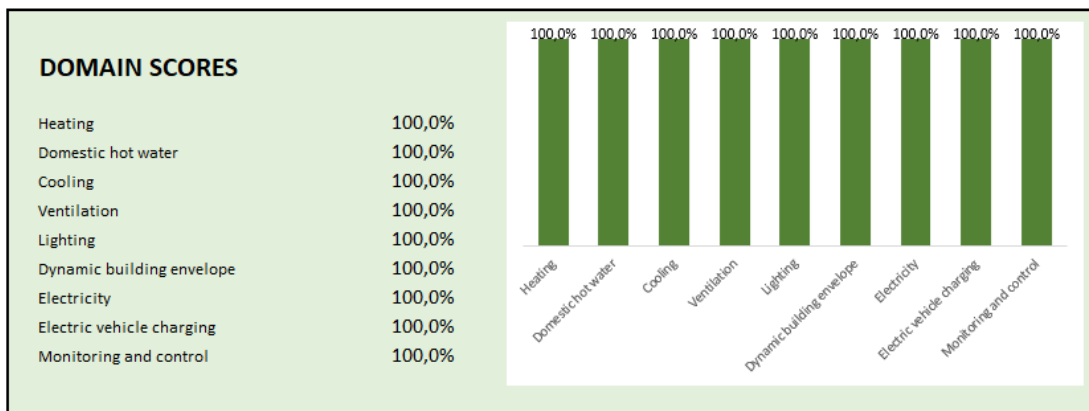
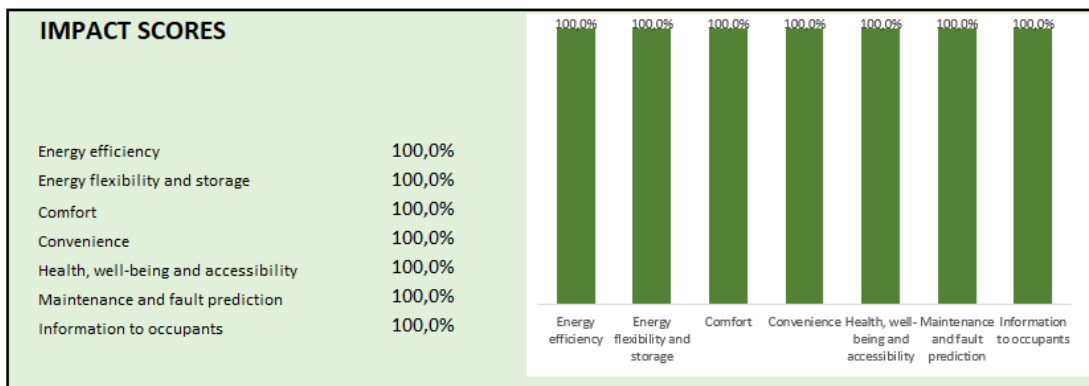


Background information is in the
SRI Guideline

Smart Readiness Indicator for Buildings

The SRI calculations have been performed with an experimental tool. Please note that the scores and the visual presentation of results are solely provided for testing purposes. Using this experimental tool can by no means lead to any claims on an actual score or certificate for a building.

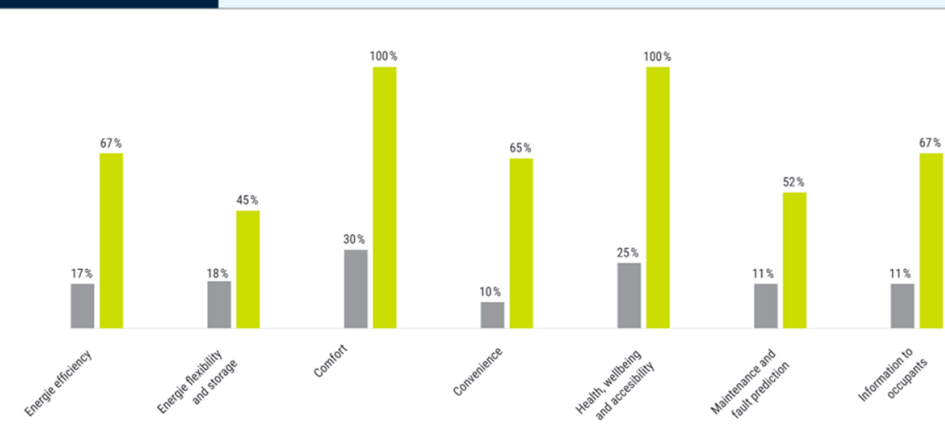
SRI spreadsheet tool Version 4.5



If you wish, you can change the weighting here



iBRoad2EPC visualisation Smart Readiness Indicator (SRI) Module

Total SRI score **Now
2022****SRI Class E** **Step 4
2050****SRI Class D** **Impact scores** **Additional information**

The basic structure of the methodology is a flexible and modular multi-criteria assessment method which builds on assessing the smart ready services present in a building. Services are enabled by (a combination of) smart ready technologies, but are defined in a technology neutral way. The proposed calculation methodology is structured amongst 9 technical domains (heating, domestic hot water, cooling, ventilation, lighting, dynamic building envelope, electricity, electric vehicle charging, monitoring and control) and 7 impact criteria (energy efficiency, energy flexibility and storage, comfort, convenience, health, well-being and accessibility, maintenance and fault prediction, information to occupants).

For each of the services several functionality levels are defined. A higher functionality level reflects a "smarter" implementation of the service, which generally provides more beneficial impacts to building users or to the grid compared to services implemented at a lower functionality level.

The smart readiness score of a building or building unit is expressed as a percentage which represents the ratio between the smart readiness of the building compared to the maximum smart readiness that it could reach. By calculating and weighting the intermediate scores at domain and impact level the final single score will be assessed.

Various types of results are displayed in the tables

Total SRI score:

the total SRI score, taking into account domain weightings and impact weightings.

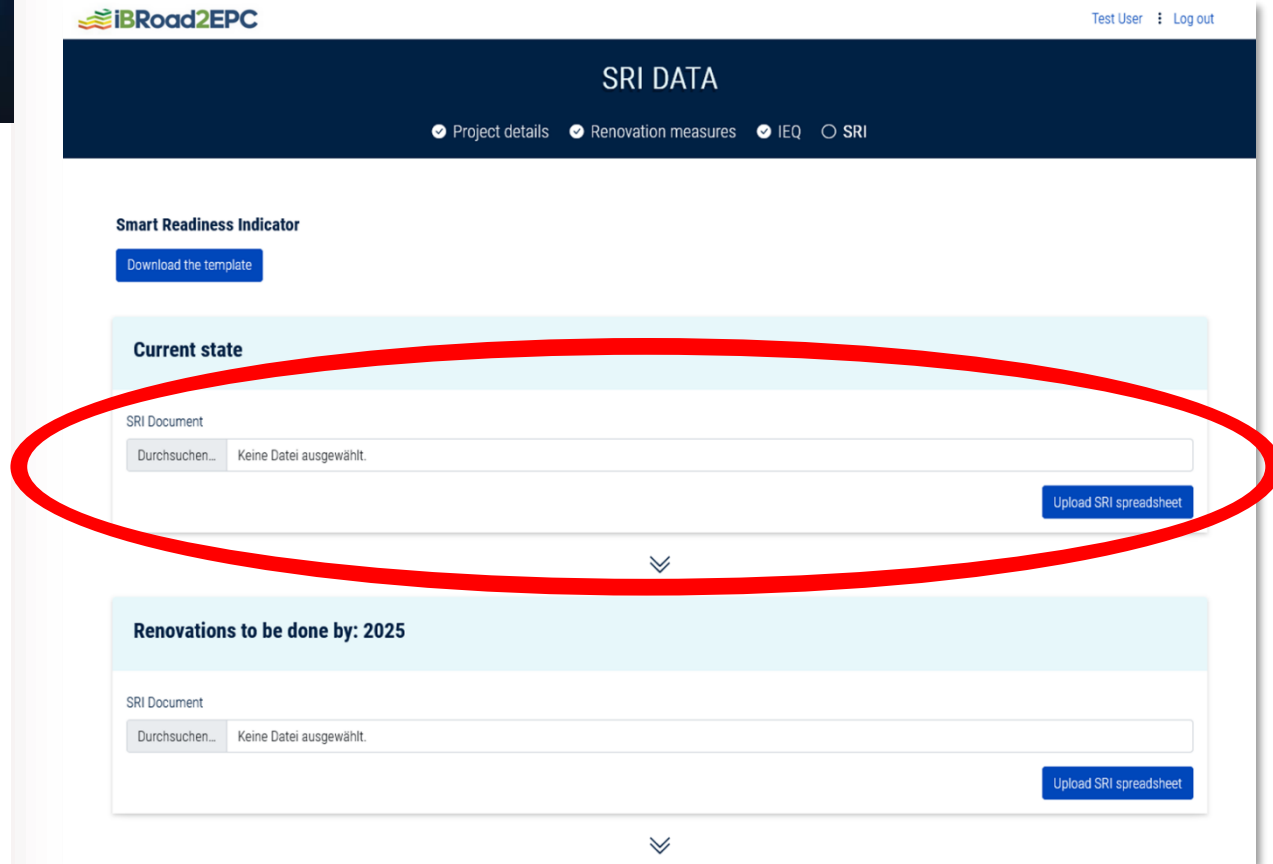
Impact scores:

the impact scores for each impact criterion, taking into account domain weightings.

Domain scores:

the domain scores for each domain, taking into account impact weightings.

iBRoad2EPC Assistant for Issuers Smart Readiness Indicator (SRI) Module



iBRoad2EPC Test User : Log out

SRI DATA

Project details Renovation measures **IEQ** SRI

Smart Readiness Indicator

Download the template

Current state

SRI Document

Durchsuchen... Keine Datei ausgewählt.

Upload SRI spreadsheet

Renovations to be done by: 2025

SRI Document

Durchsuchen... Keine Datei ausgewählt.

Upload SRI spreadsheet

The excel file with the completed calculations can be uploaded to the iBRoad2EPC Assistant. Here the results for the SRI are automatically extracted, checked, and inserted into the output format of the iBRoad2EPC SRI Module.

This should be done first for the current state of the building. Second, the issuer should check for every renovation step whether the package of measures is expected to result in a change in any of the input variables for the SRI calculation. Third, the issuer should carry out the SRI calculation for those renovation steps with a possible change of the SRI input variables and upload the spreadsheets.



iBRoad2EPC visualisation

User Influence



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:

Tilted 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.

Keep radiators free:

Prevent furniture, curtains and curtains in front of radiators so the heat can spread evenly throughout the room.

Keep blinds and curtains closed

Keep blinds and curtains closed at night to prevent heat from escaping on cold nights.

Automatic regulation

Programmable thermostats ensure more comfort and less consumption.

This allows rooms to be heated to the right temperature at the right time.

10% savings are possible.

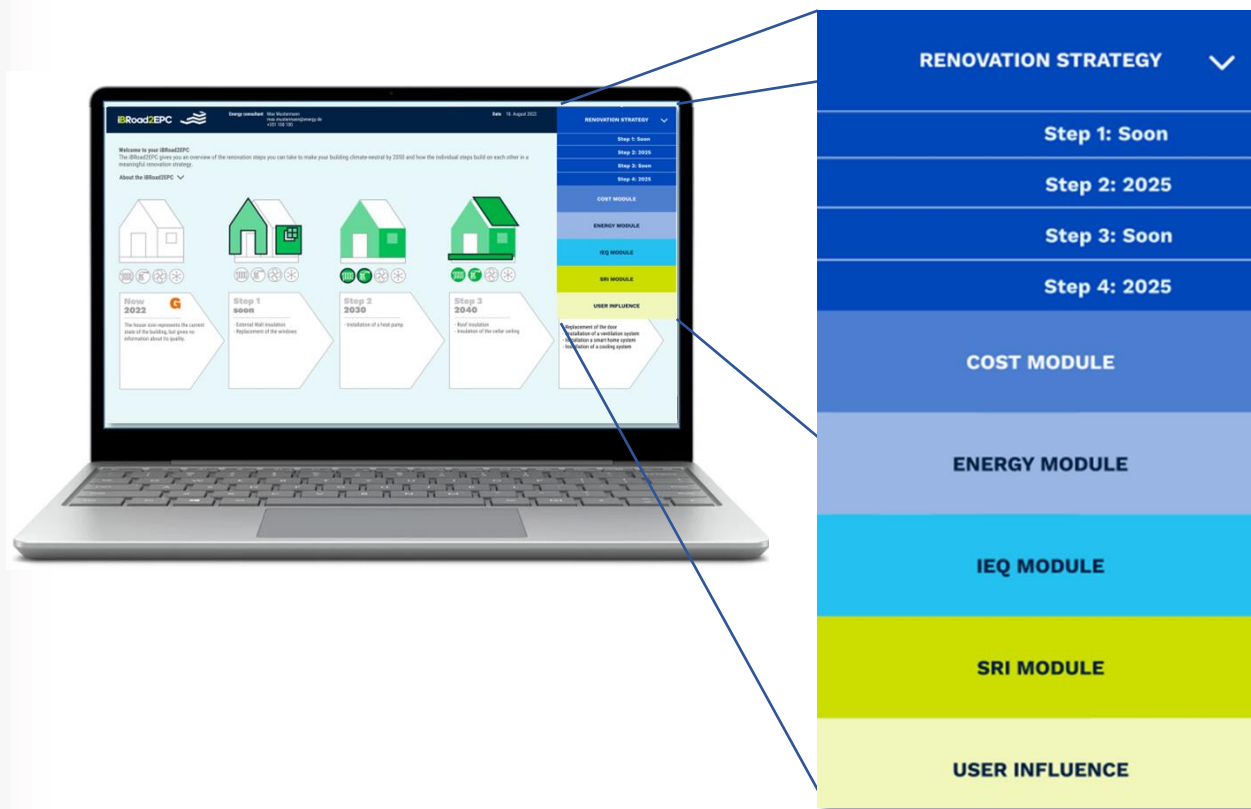
Vent radiators

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 CO₂.

In iBRoad2EPC, residents receive advice for energy-saving behaviour on a separate page. The advice can be compiled individually for each country. Issuers can select the advices they want to give to building owners from a drop-down menu. Up to six advice messages can be displayed.

iBRoad2EPC Assistant for Issuers Navigation



The iBRoad2EPC output document has a tab in the upper right corner that can be used to navigate through all pages. It automatically adapts to the number of renovation steps and modules activated in a country. One can navigate to the details for the individual renovation steps by clicking on the desired step or by clicking on the respective icon. The top menu item "RENOVATION STRATEGY" takes you back to the overview page.

Stay in touch with iBRoad2EPC at www.ibroad2epc.eu

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