



iBRoad2EPC

As ferramentas e metodologia iBRoad2EPC para emissão de Passaportes de Renovação dos edifícios e módulos adicionais



This project has received funding from the European Union's HORIZON 2020 research and innovation programme under grant agreement No 101033781



Gestão da sessão



A sessão será gravada para fins de registo. Não será partilhada publicamente. Poderemos utilizar um *screenshot* da sessão para divulgação, limitando a informação pessoal.



Sempre que desejem intervir, intervenham.

- Levantando a mão digital
- Utilizando o microfone
- (no chat caso não seja possível falar)



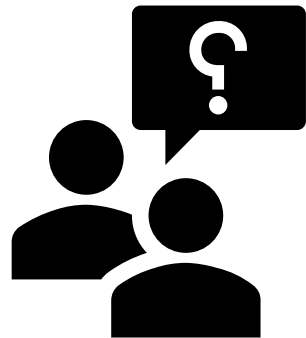
Por favor, mantenham o microfone desligado sempre que não estejam a falar.



Algo parece estranho?

Não aparecem slides, não ouço bem, não percebo, envie uma mensagem e não respondem.

Avisem.



Gestão da sessão



As ferramentas e metodologia iRoad2EPC para emissão de Passaportes de Renovação dos edifícios e módulos adicionais

Enquadramento Geral



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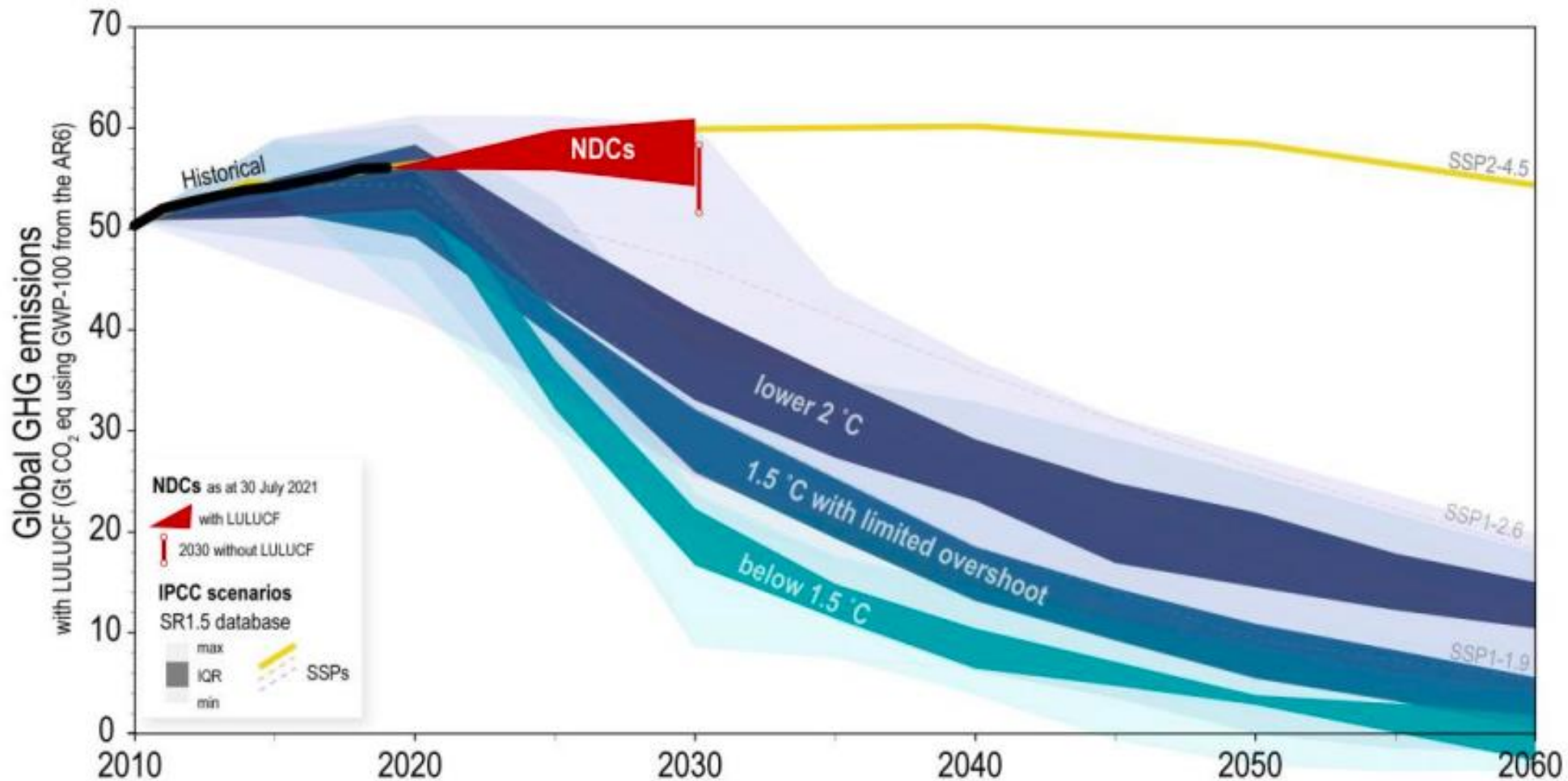
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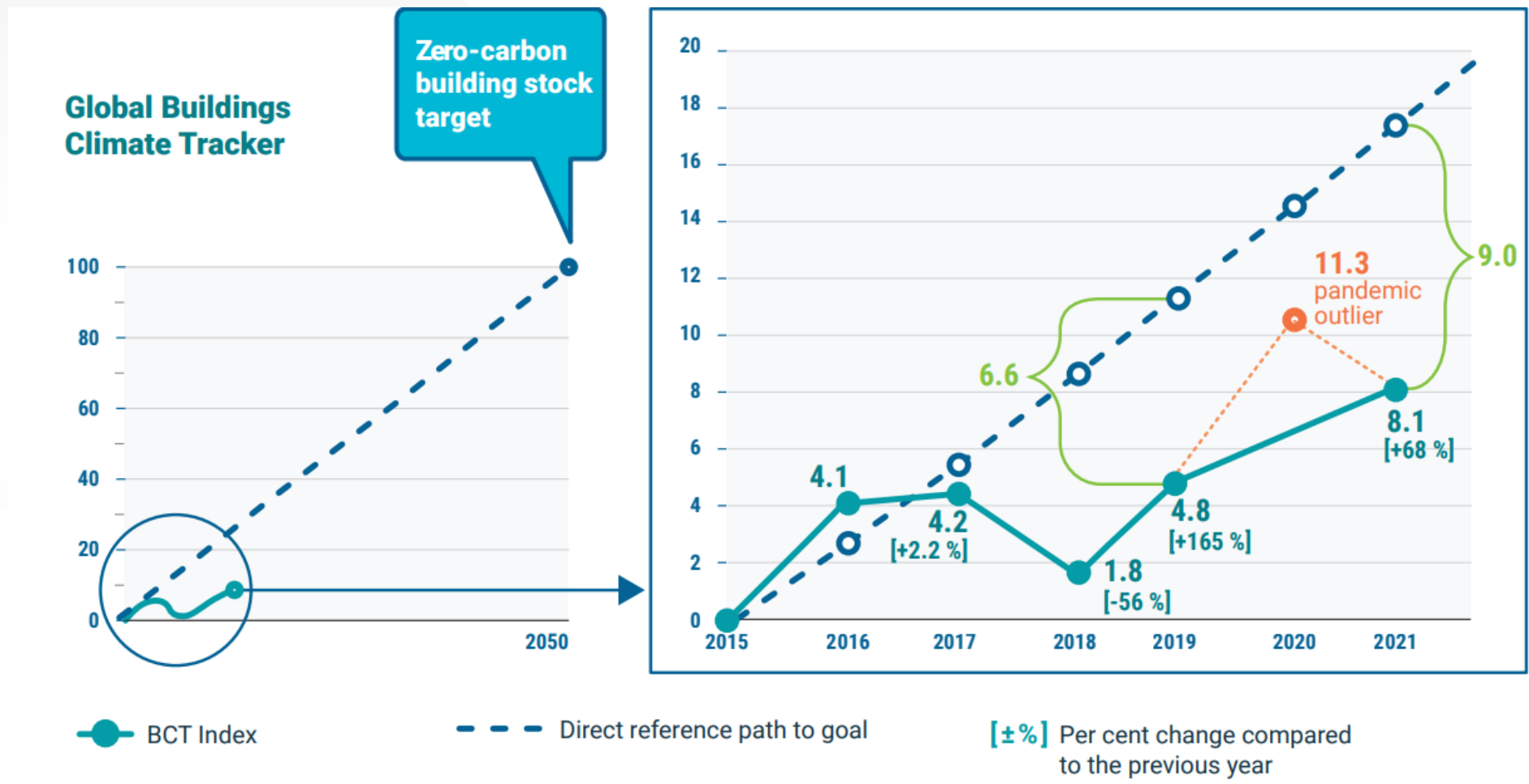
Part I. Background

The Climate Challenge – we need to act now



The Climate Challenge – we need to act now

→ What does it mean for the buildings sector?

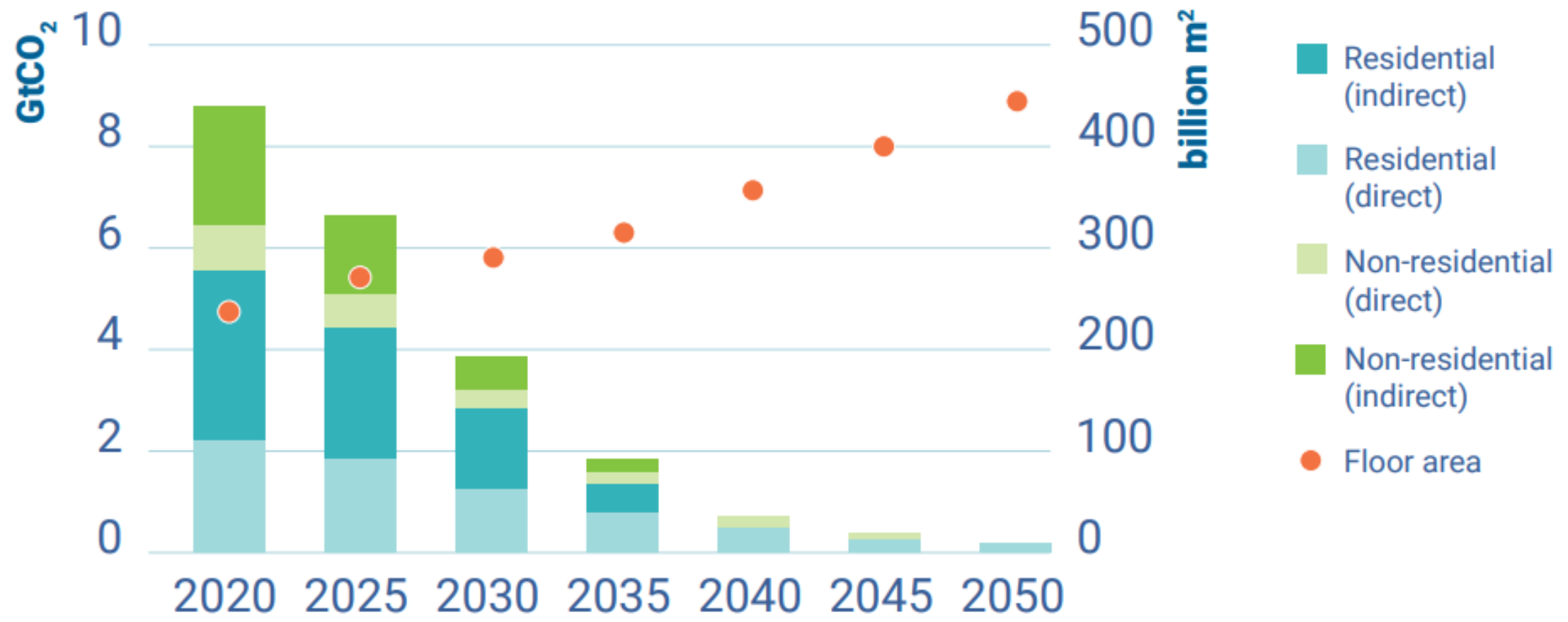


Source: Adapted by the Buildings Performance Institute Europe 2022.

United Nations Environment Programme (2022). 2022 Global Status Report for Buildings and Construction: Towards a Zero-emission, Efficient and Resilient Buildings and Construction Sector. Nairobi. The electronic copy of this report can be downloaded at www.globalabc.org.

The Climate Challenge – we need to act now

→ What does it mean for the buildings sector?



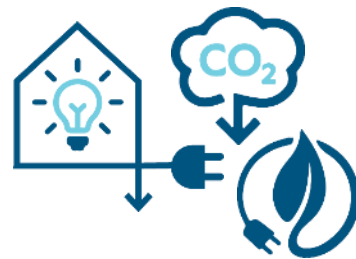
Source: IEA 2021. All rights reserved. Adapted from "Tracking Clean Energy Progress" (IEA 2021c).

2030 climate target: at least -55% GHG emissions

→ What does it mean for the buildings sector?



Moving asap from
annual deep
renovation rate of
0.2% to 3%



Reducing GHG
emissions until
2030 by 60%
compared to 2015



<https://bit.ly/3M0Dwef>

Following the Renovation Wave strategy:

Several key directives are being revised, EPBD included

The EU launched the Green Deal (2019) and the fit for 55 package (2020) to increase climate targets and actions.

It increased the goal to reduce EU GHG emissions with 55% by 2030.

This was followed by the **Renovation Wave with proposals for specific targets and actions for the building stock**. This included a **revision of the EPBD** - the main building-related directive.

The EPBD sets out requirements for several key policy instruments, incl. Energy Performance Certificates, Nearly-Zero Energy Building standard, Long-Term Renovation Strategies.



Following the Renovation Wave strategy:

Several key directives are being revised, EPBD included

The EPBD proposal (currently being negotiated in the trilogue between the Commission, the Council and the Parliament)

- Aims to:
 - improve the energy performance of buildings,
 - reduce emissions in the building sector towards 2030, and,
 - setting long term vision towards climate neutrality in 2050 (zero emission building stock).
- It sets tougher requirements for existing provisions such as EPCs and renovation strategies
- It introduces a building renovation passport, a deep renovation standard, Zero-emission building standard and Minimum Energy Performance Standard for existing buildings



Stronger EPBD provisions – “council/commission/parliament” positions

Building Renovation Passport

- **MS must introduce BRP schemes by 2025⁴ (for use on voluntary basis)**
- BRP is “a document that provides a tailored roadmap for the **deep** renovation of a specific building in a **maximum number** of steps that will **significantly improve its energy performance transform the building into a ZEB by 2050 latest**”
- based on on-site visit (**virtual means possible**)
- objective to transform the building into zero emission by 2050
- **MS may integrate BRP in EPC - major renovations or to receive financial support**
- **when integrated, BRP replaces EPC recommendation**
- **must include info on benefits + financial & technical support**

Energy Performance Certificate

- MS must ensure that as of 2026⁵, EPCs
 - comply with a common EU template
 - include additional indicators (CO₂, RES, GHG emissions) use a **harmonized scale of classes** (A = ZEB and G = 15% WPB at national level)
 - **inclusion of energy label A° AND A+ (zero-emission buildings / positive energy)**
 - have a 5 - 10 year validity
 - are digital
 - follow after an on-site visit (**virtual means possible**)
- EPCs can also include **additional indicators** (GWP, life cycle GWP, **SRI, BRP, DBL**, etc.)

Deep Renovation Standard

- introduction of definition = renovation into NZEB (by 2030²⁷) and into Zero-Emission Building (as of 2030²⁷).
- **staged-deep renovation: carried out in several steps, following a BRP**
- Zero-Emission Building is by definition an EPC label A° following the new harmonized scale
- public financing to be tailored towards deep renovations, staged deep renovation but also >30% reduction of primary energy renovations (not deep)

Stronger EPBD provisions – “council/commission/parliament” positions

Mandatory Minimum Energy Performance Standard (MEPS)

- EU-wide “MEPS”:

- all **non-residential**

buildings ... 45%
threshold ...
2030 and ...
threshold ...
related to ...
performing

At least class E
by 01/01/2027
and D by
01/01/2030

- **residential buildings,**

MEPS based on a national
trajectory
emission b ...
by 2050 - b ...
at least D ...
performan ...
(exceptions for single-
family houses)

At least class E
by 01/01/2030
and D by
01/01/2033

Building renovation plans

- Replacing the existing LTRS by June 2025
- Updated every 5 year
- More ambitious vision for 2050
- Clearer link with other planning tools (NECP)
- More robust governance system
- Common mandatory template for MS with indicators

...Digital Building Logbook

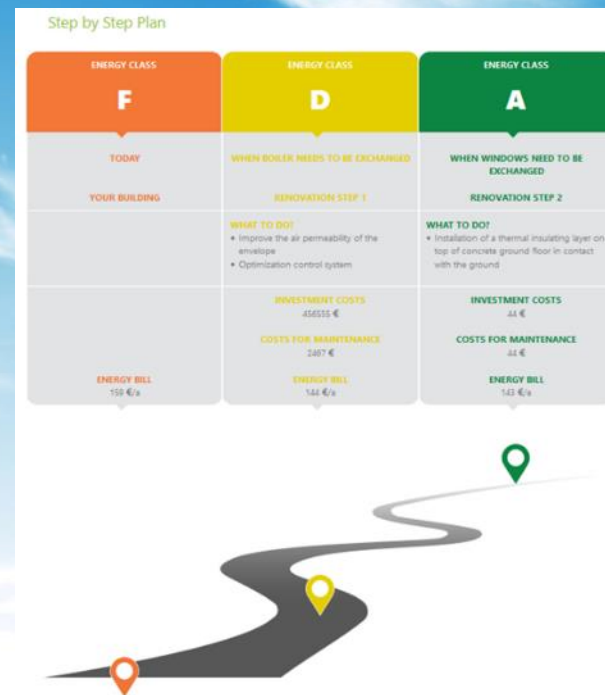
- Not foreseen directly in the EPBD proposal
- European Commission aims to introduce DBL that “will serve as repositories for data on individual buildings and facilitate information sharing within the construction sector, and between building owners and tenants, financial institutions and public authorities.”
- Links to EPC and BRP (and SRI and Levels) + national database on EPC’s + EU building Observatory

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



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) + Legal and strategic national targets for renovation (e.g. MEPS)



Guiding principles for establishing the Roadmap



Best-Possible-Principle

Propose the measures with the highest possible energy efficiency



Individual Renovation Context

Consider the wishes, needs, financial situation of the homeowner and the inhabitants, and the circumstances of the building



Long-Term Perspective

Help the homeowner to understand the importance of having a long-term renovation strategy



Timing and Sequencing

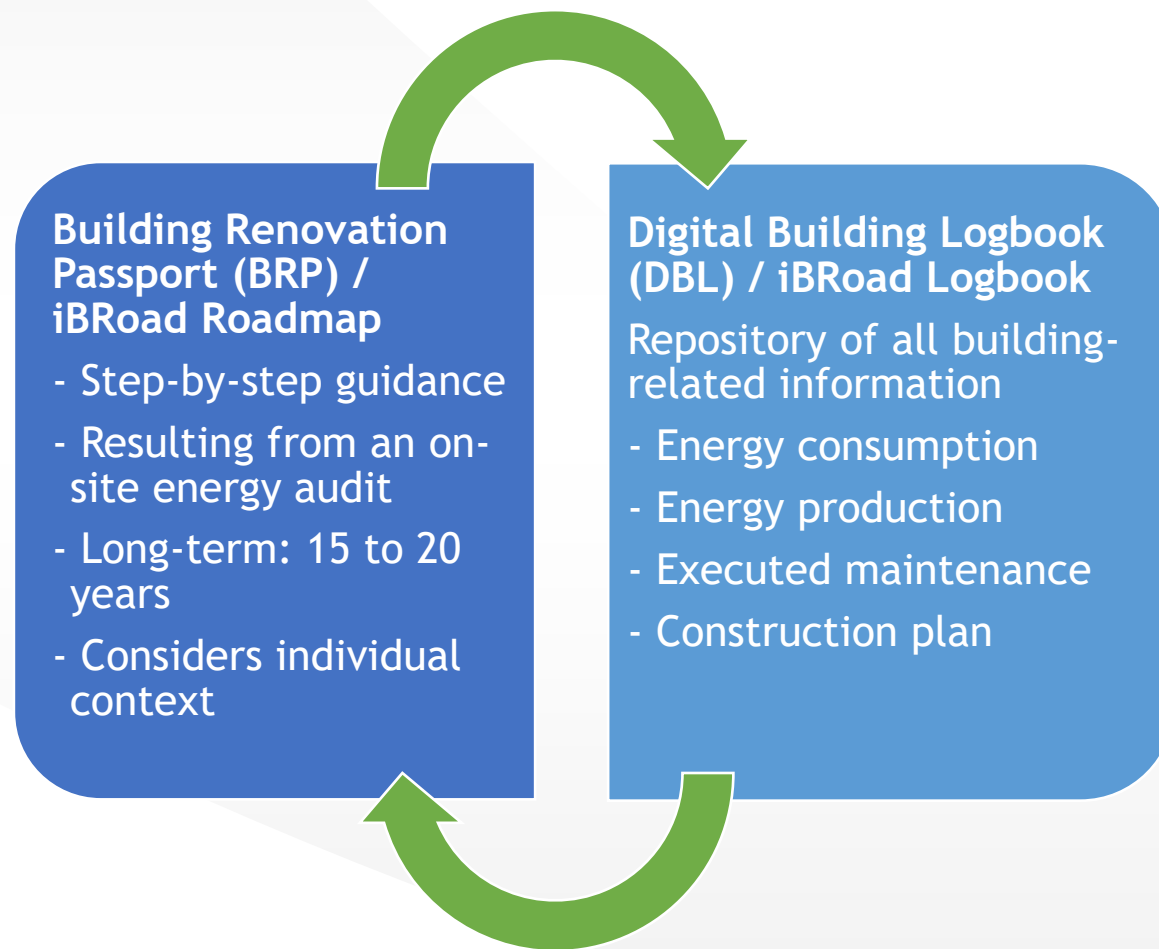
Demonstrate the homeowner that a step-by-step renovation does have several advantages



Attractive and Motivating

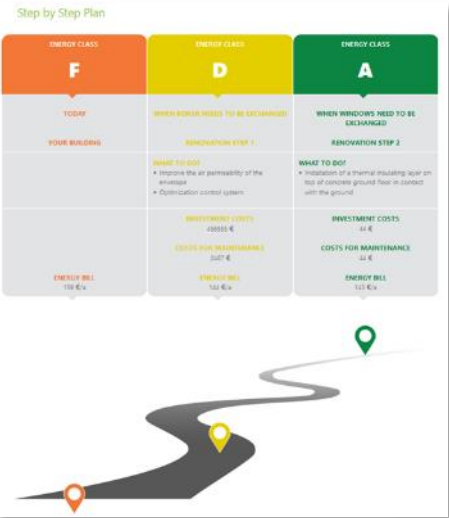
The Roadmap should be attractive and easily understandable for homeowners so that they can be motivated to take action

Looking back at the iBRoad outputs



Pages of the Renovation Roadmap in iBRoad

Roadmap Overview



Detailed Roadmap

Detailed Renovation Roadmap

Step by Step Plan

	ENERGY CLASS	ENERGY CLASS	ENERGY CLASS	ENERGY CLASS	ENERGY CLASS
	G	E	D	B	A
	Your Building	Renovation Step 1	Renovation Step 2	Renovation Step 3	Renovation Step 4
	Measure of delivery	Measure	Measure	Measure	Measure
Substrate		• Add thermal insulation system	• External Wall insulation	• Insulation of the roof and attic	• Insulation of the roof and attic
Energy class	Primary Energy Demand 240 kWh/m²/a Heat Energy Demand 100 kWh/m²/a Heat Energy Demand 100 kWh/m²/a Auxiliary Energy Demand 100 kWh/m²/a Energy Bill 1000 €/a Carbon Emissions 10 kg/m²/a	Primary Energy Demand 210 kWh/m²/a Heat Energy Demand 90 kWh/m²/a Heat Energy Demand 90 kWh/m²/a Auxiliary Energy Demand 100 kWh/m²/a Energy Bill 1000 €/a Carbon Emissions 10 kg/m²/a	Primary Energy Demand 180 kWh/m²/a Heat Energy Demand 80 kWh/m²/a Heat Energy Demand 80 kWh/m²/a Auxiliary Energy Demand 100 kWh/m²/a Energy Bill 1000 €/a Carbon Emissions 10 kg/m²/a	Primary Energy Demand 150 kWh/m²/a Heat Energy Demand 70 kWh/m²/a Heat Energy Demand 70 kWh/m²/a Auxiliary Energy Demand 100 kWh/m²/a Energy Bill 1000 €/a Carbon Emissions 10 kg/m²/a	Primary Energy Demand 120 kWh/m²/a Heat Energy Demand 60 kWh/m²/a Heat Energy Demand 60 kWh/m²/a Auxiliary Energy Demand 100 kWh/m²/a Energy Bill 1000 €/a Carbon Emissions 10 kg/m²/a
Cost		Investment Costs for Renovation Step 1 10000 € Included Costs for Maintenance 10000 €	Investment Costs for Renovation Step 2 10000 € Included Costs for Maintenance 10000 €	Investment Costs for Renovation Step 3 10000 € Included Costs for Maintenance 10000 €	Investment Costs for Renovation Step 4 10000 € Included Costs for Maintenance 10000 €
Benefit		None at this stage	None at this stage	None at this stage	None at this stage
Contribution		Changed Contribution	Changed Contribution	Changed Contribution	Changed Contribution

Current building state



Detailed renovation step



iBRoad pilot testing results

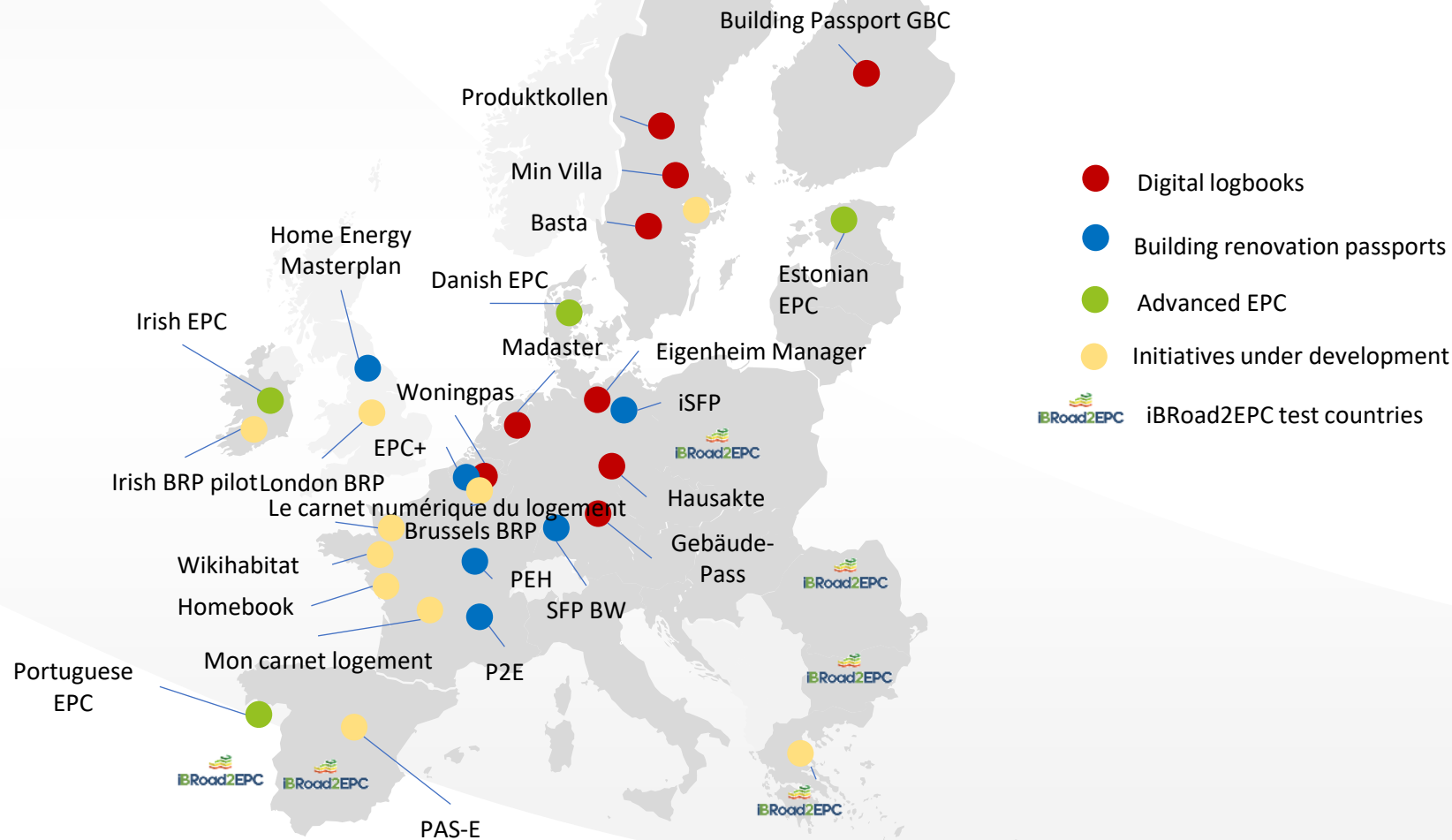
Pilot country	No.	Year of construction	Number of renovation steps	Current energy level	Final / future energy level	Current primary energy demand [kWh/m²]	Future primary energy demand [kWh/m²]	Estimated date for final renovation step	Completeness
BULGARIA	1	1970	3	G	B	600	362	When plaster needs renovation	complete
	2	-	4	D	B	269	36	2035-2040	complete
	3	1950	3	G	B	600	119	New heating system	complete
	4	1994	3	G	B	504	176	2019	parts missing
	5	1970	4	G	B	479	126	When boiler is exchanged	complete
	6	1980	4	F	A	390	73	2030-2035	complete
	7	1950	3	F	B	600	112	New heating system	-
	8	1968	5	E	A+	411	27	2035-2040	complete
	9	1982	4	G	B	500	111	2030-2035	complete
	10	1947	4	G	A	600	95	2025-2030	complete
	11	1911	2	D	B	362	142	2025-2030	parts missing
	12	2008	2	C	B	203	158	2025-2030	complete
	13	1929	5	G	A	505	109	2035 - 2040	complete
	14	1962	4	D	B	262	108	2035-2040	complete
	15	-	3	D	B	280	136	When windows are exchanged	parts missing

Pilot country	No.	Year of construction	Number of renovation steps	Current energy level	Final / future energy level	Current primary energy demand [kWh/m²]	Future primary energy demand [kWh/m²]	Estimated date for final renovation step	Completeness
PORTUGAL	1	1986	5	C	A+	183	74	2035-2040	complete
	2	1500	5	D	A+	155	48	2035-2040	complete
	3	1971	4	E	A+	183	0	When plaster needs renovation	complete
	4	1937	3	F	A+	600	27	2030-2035	complete
	5	2001	3	A	A+	30	0	When boiler is exchanged	complete
	6	1937	4	F	A+	600	19	2030-2035	complete
	7	1919	5	D	A+	356	120	2025-2030	complete
	8	1998	4	C	A+	116	0	When plaster needs renovation	complete
	9	1994	2	A+	A	145	112	2025-2030	parts missing
	10	2002	3	C	A	278	104	2030-2035	complete
	11	1575	4	D	A	319	42	2025-2030	complete
	12	1988	4	F	A+	423	117	When windows are exchanged	complete
	13	1998	5	E	B-	203	0	2025-2030	complete
	14	1972	4	D	B-	387	250	2025-2030	complete
	15	1995	3	C	A	176	19	2030-2035	parts missing
	16	1966	2	E	A	326	27	2025-2030	complete
	17	1946	4	F	A	350	92	2030-2035	-
	18	1989	5	D	A+	116	20	When plaster needs renovation	complete
	19	2001	5	E	A	192	19	When plaster needs renovation	complete
	20	1981	4	C	A	211	34	2025-2030	complete

Pilot country	No.	Year of construction	Number of renovation steps	Current energy level	Final / future energy level	Current primary energy demand [kWh/m²]	Future primary energy demand [kWh/m²]	Estimated date for final renovation step	Completeness
POLAND	1	1975	3	medium orange	light green	474	134	Substitution of the old windows	complete
	2	1978	3	dark orange	light green	382	123	2030-2035	complete
	3	1987	4	dark orange	yellow	400	172	2019	complete
	4	1950	3	dark orange	light orange	570	326	2020	complete
	5	1978	1	red	yellow	600	159	As soon as possible	complete
	6	1975	3	medium orange	yellow	321	160	When windows are exchanged	complete
	7	1981	3	dark orange	light green	435	185	2025-2030	complete
	8	2000	3	dark orange	light green	233	185	2035-2040	complete
	9	1978	3	light green	dark green	138	31	2025-2030	complete
	10	1990	3	light orange	light green	335	193	2025-2030	complete
	11	1991	4	medium green	dark green	70	78	2025-2030	complete
	12	1936	5	red	light green	422	134	When plaster needs renovation	parts missing
	13	1978	3	medium orange	light green	276	133	2025-2030	complete
	14	1980	3	dark red	yellow	600	189	2025-2030	parts missing
	15	1999	5	medium green	light green	165	197	2035-2040	complete
	16	2000	5	dark orange	yellow	374	152	During the attic renovation...	complete
	17	2006	5	medium orange	light green	143	86	2030-2035	complete
	18	1981	5	red	medium green	181	46	2025-2030	complete
	19	1980	4	light orange	yellow	600	316	2025-2030	complete
	20	1982	2	yellow	medium green	198	161	When plaster needs renovation	complete

60%
average improvement

In recent years, a revolution of initiatives!



iBRoad2EPC Consortium

Coordinator
 SYMPRAXIS TEAM (GR)

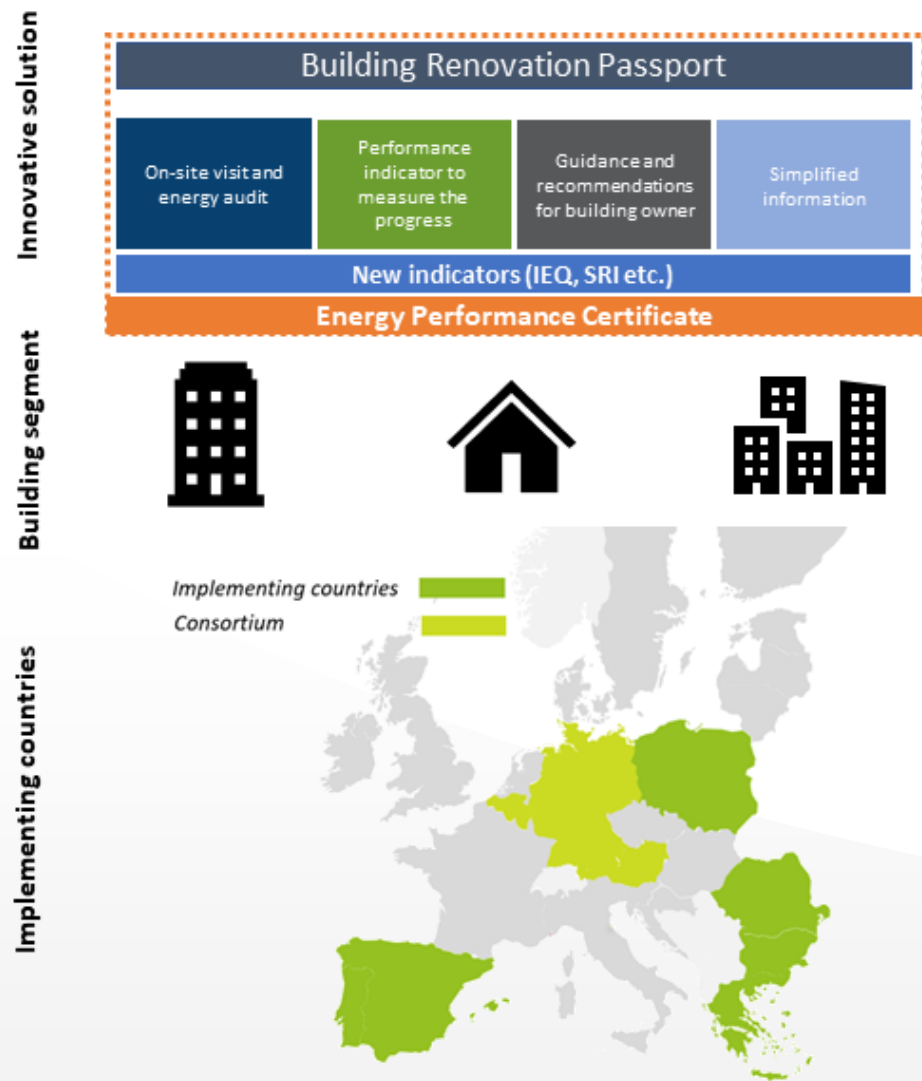
Partners

- BPIE - Buildings Performance Institute Europe a.s.b.l (BE)
- IFEU - Institut für Energie- und Umweltforschung Heidelberg GmbH (DE)
- TU Wien - Technische Universität Wien (AT)
- INZEB - Institute of Zero Energy Buildings (GR)
- BPAC - Blue Planet Academy & Consulting (BE)
- ENEFFECT - Energy Efficiency Center - Eneffectfoundation (BG)
- ADENE - Agência para a Energia (PT)
- KAPE - Polish National Energy Agency (PL)
- INCD URBAN-INCERC - Institutul National de Cercetare-Dezvoltare in Constructii, Urbanism si Dezvoltare Teritoriala Durabila (RO)
- GBCe - Green Building Council - Consejo Para la Edificacion Sostenible (ES)
- CICLICA - Ciclica Arquitectura SCCL (ES)

Websites
<https://ibroad2epc.eu/>
<https://www.adene.pt/projetos/>


 Start (09/2021)


 Ends (08/2024)



IBRoad2EPC – General objectives



iBRoad2EPC represents the next step in energy performance assessment schemes and certification practices



iBRoad2EPC integrates Building Renovation Passport elements into EPC schemes and establishes the next generation of EPCs

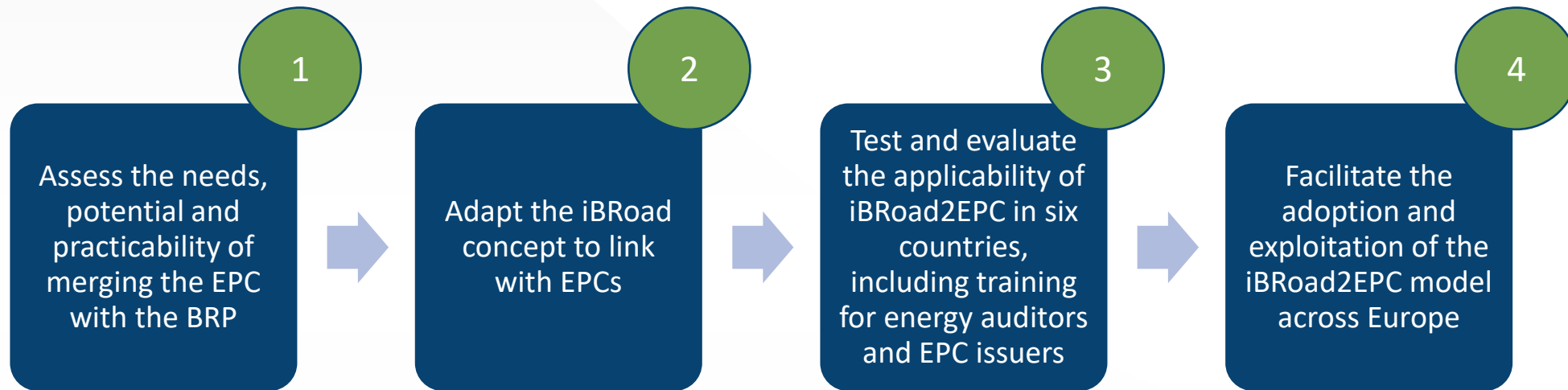


iBRoad2EPC supports building-owners with personalised advice to facilitate stepwise deep renovation



iBRoad2EPC works for residential buildings but also for multi-family and public buildings

The iBRoad2EPC project's key activities



Sep 21

We are here!

Aug 24



Part I. iBRoad2EPC – Concept, methodology and technical approach

The iBRoad2EPC concept

EPC



BRP



Added value of iBRoad2EPC

- Improvement of the EPC renovation recommendations
- Integration of BRP elements into EPC schemes

- ✓ Individual building renovation plan
- ✓ Step-by-step implementation
- ✓ Avoiding lock-ins
- ✓ Long-term perspective
- ✓ Target-oriented
- ✓ Alignment with overarching national building targets & future legal requirements and obligations

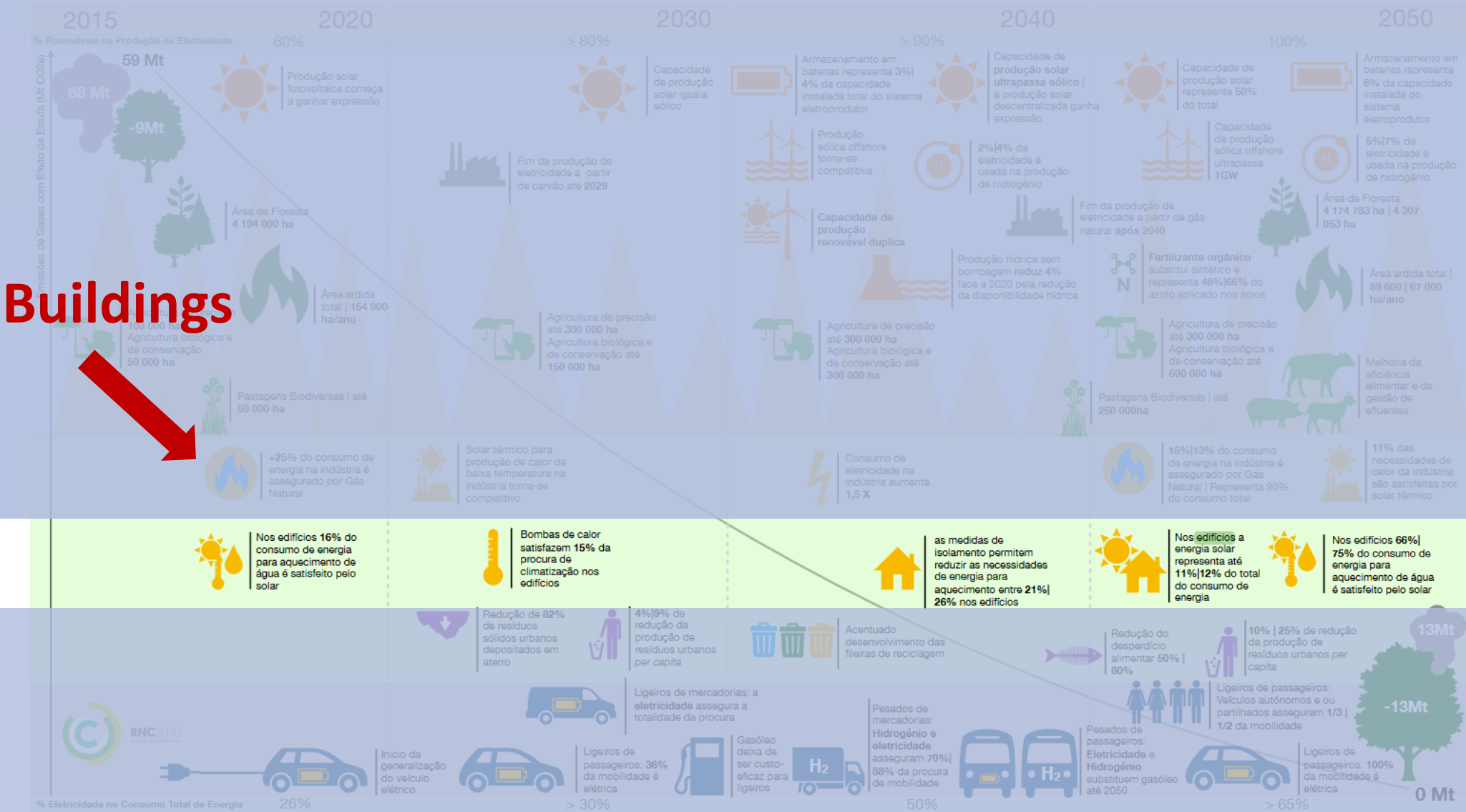
iBRoad2EPC contents

	Explanation	Example
what?	description of measures	insulate the roof replace the heat generator install a ventilation system
when?	likely time span to implement measures	before 2030 before 2040 before 2050
how?	technical specifications coherent with national legislation and LTRS, NBRP, NECP...	roof: 24 cm polystyrene heating: heat pump ventilation: 85 per cent recovery rate
what to beware of?	foreseeable obligations	MEPS: your building has to fulfil at least efficiency class D in 2030
what to pay attention to?	notes to prevent lock-in situations	if you insulate the roof make sure that the overhang is sufficient for the wall insulation in a later stage

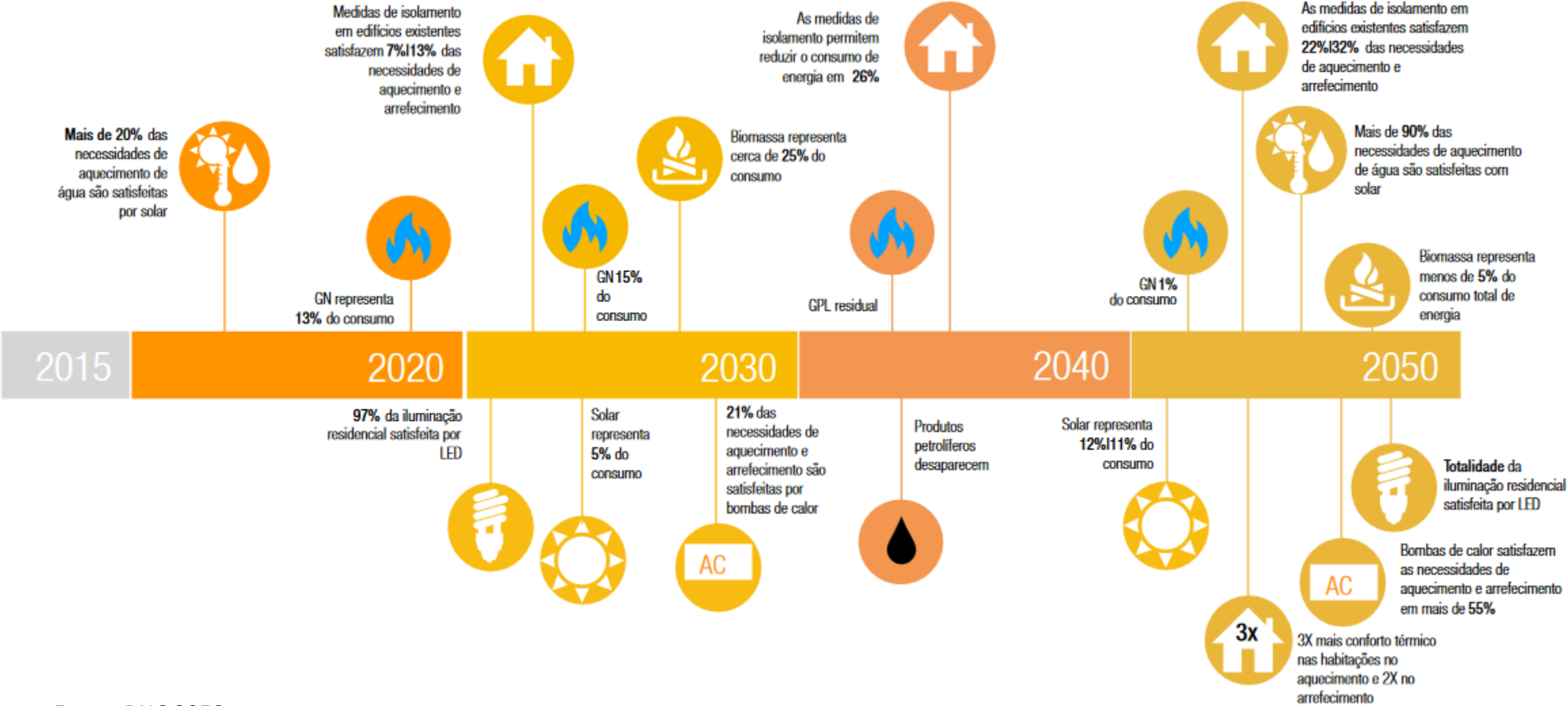


Number of renovation steps and Future Policies

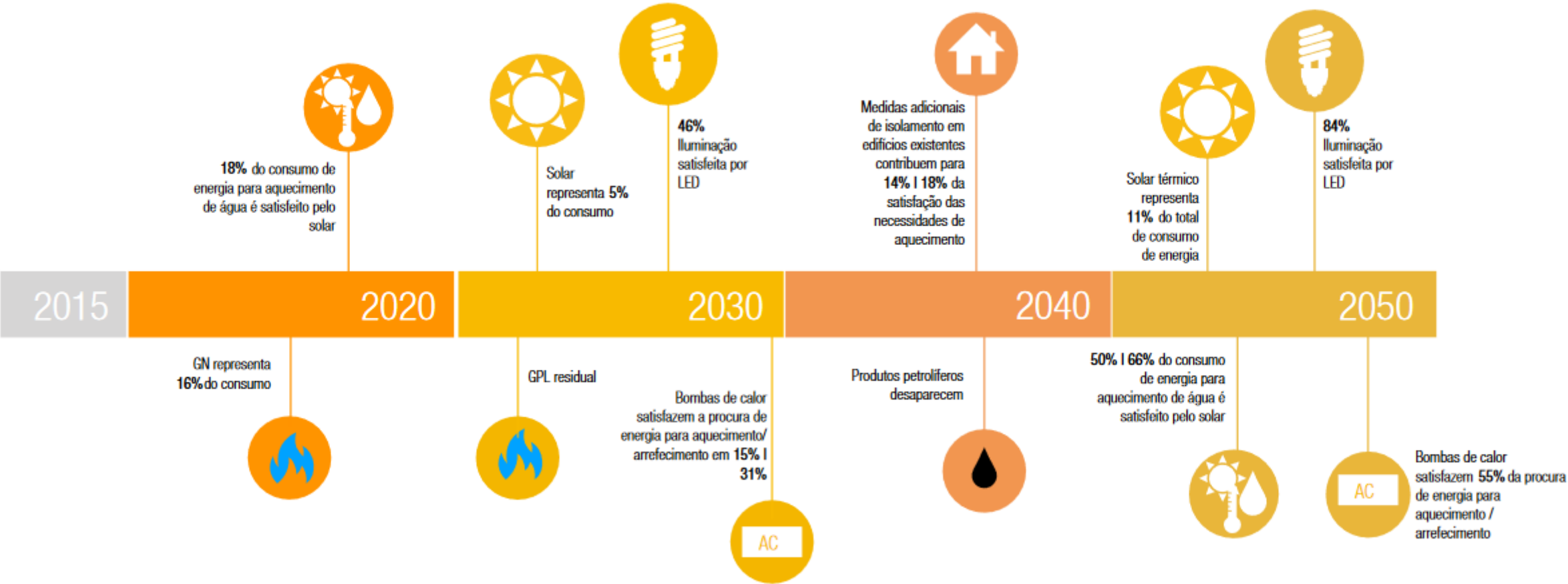
RNC 2050 – National Roadmap for Carbon Neutrality



Residential – RNC 2050



Services – RNC 2050





Portugal: Long Term Renovation Strategy

Objective:

- Upgrade the buildings stock by 2050 through:
 - ✓ improved energy efficiency
 - ✓ transformation into nearly zero energy buildings
 - ✓ decarbonisation of energy supply

Strategic guidelines:

- Policies and actions to encourage deep renovations
- Focus on less efficient buildings and reducing energy poverty

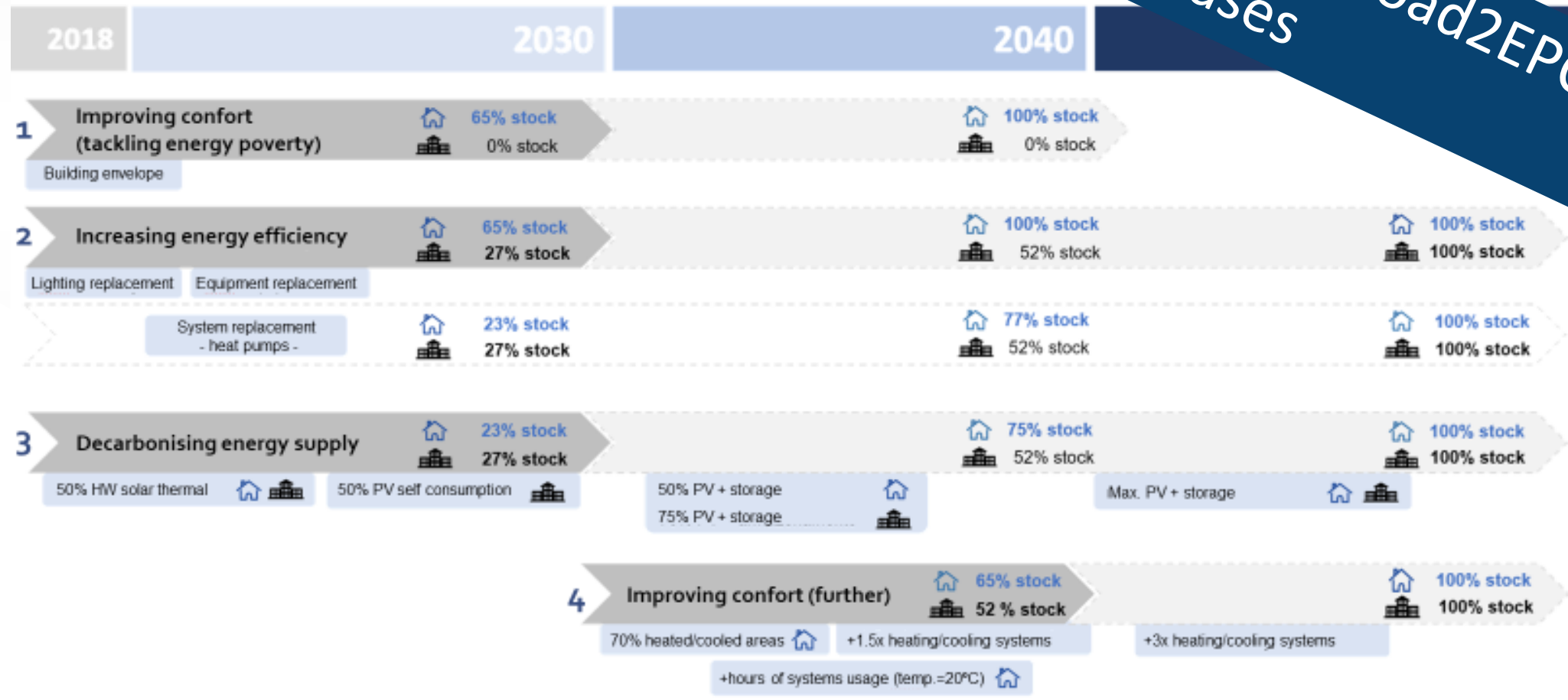


- Criação do passaporte de renovação de edifícios⁴⁴, enquanto instrumento facultativo, que complemente o certificado energético (em linha com o desenvolvido no âmbito do projeto Europeu iBRoad⁴⁵);

LTRS

Four packages across the decarbonisation pathway

Already included in iBRoad2EPC databases



PORTUGAL

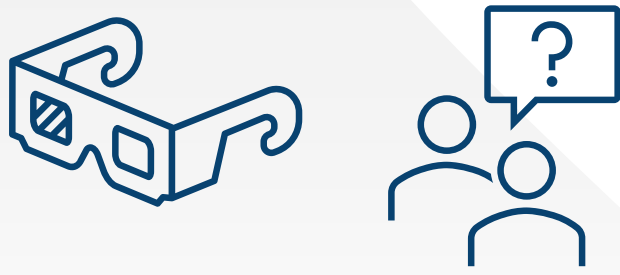
[✎ Editar](#)

Código do país PT

Localidade pt

[Projecto modelo](#)[Objectivos do regulamento](#)[Tipos de medidas](#)[Tipos de conflitos](#)[Recomendações gerais](#)[Objectivo do novo regulamento](#)

Ano-alvo	Tipo de edifício	Subtipo de edifício	Regulamento	Acções
2030	Edifício de habitação		Até 1 de Janeiro de 2030, 65% dos edifícios residenciais deverão ter substituído toda a iluminação por LED e terá painéis solares térmicos e/ou produção fotovoltaica e/ou armazenamento elétrico.	✎ 🗑
2030	Edifício de habitação		Até 1 de Janeiro de 2030, 23% dos edifícios residenciais que não atinjam níveis da categoria III de conforto após a introdução de medidas passivas deverão dispor de sistemas eficientes de aquecimento e arrefecimento, tais como bombas de calor elétricas. Os sistemas de GPL deverão ter sido substituídos com prioridade para as famílias que vivem em situação de pobreza energética.	✎ 🗑
2040	Edifício de habitação		Até 1 de Janeiro de 2040, 77% dos edifícios residenciais que não atinjam a categoria III de conforto após a introdução de medidas passivas terão de dispor de sistemas eficientes de aquecimento e arrefecimento, tais como bombas de calor elétricas. Todos os sistemas de gás e gasóleo deverão ter sido substituídos por sistemas elétricos.	✎ 🗑
2050	Edifício de habitação		Até 1 de Janeiro de 2050, 100% dos edifícios residenciais que não atinjam a categoria III de conforto após a introdução de medidas passivas deverão ter instalados sistemas eficientes de aquecimento e arrefecimento, tais como bombas de calor elétricas.	✎ 🗑
2040	Edifício de habitação		Até 1 de Janeiro de 2040, 75% do stock do edifícios residenciais terá painéis solares térmicos e/ou produção fotovoltaica e/ou armazenamento elétrico.	✎ 🗑
2050	Edifício de habitação		Até 1 de Janeiro de 2050, 100% do stock de edifícios residenciais terá painéis solares térmicos e/ou produção fotovoltaica e/ou armazenamento elétrico.	✎ 🗑
2030	Edifícios públicos		Até 1 de Janeiro de 2030, 27% dos edifícios não residenciais deverão ter substituído toda a iluminação por LED e ter renovado os eletrodomésticos para equipamentos altamente eficientes.	✎ 🗑
2030	Edifícios públicos		Até 1 de Janeiro de 2030, 25% dos edifícios não residenciais terão de dispor de sistemas eficientes de aquecimento e arrefecimento, tais como bombas de calor elétricas.	✎ 🗑
2050	Edifícios públicos		Até 1 de Janeiro de 2050, 100% dos edifícios não residenciais terão de dispor de sistemas eficientes de aquecimento e arrefecimento, tais como bombas de calor elétricas.	✎ 🗑



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 - are digital
 - follow after an on-site visit (**virtual-means possible**)
- EPCs can also include additional indicators (GWP, life cycle GWP, SRI, BRP, DBL, etc.)

Deep Renovation Standards

- introduction of definitive renovation into NZEB (by 2030²⁷) and into Zero-Emission Building (as of 2030²⁷).
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- Zero-Emission Building is by definition an EPC label A⁺ following the new harmonized scale
- public financing to be tailored towards deep renovations, staged deep renovation but also >30% reduction of primary energy renovations (not deep)

Dealing with uncertainty but stronger provisions are certain and needed!

Building Renovation Passports – Context PT

BRP's included in the long term renovation strategy

ELPRE: RCM nº 8-A/2021

- Criação do passaporte de renovação de edifícios⁴⁴, enquanto instrumento facultativo, que complemente o certificado energético (em linha com o desenvolvido no âmbito do projeto Europeu iBRoad⁴⁵);

Knowledge sharing networks enabled

Technical support work developed



Agência para a Energia



Soon on www.ibroad2epc.eu

 Integrating Building Renovation Passports into Energy Performance Certification schemes for a decarbonised building stock



EPCs & LTRS

Summary analysis of Energy Performance Certificates' alignment with national Long-Term Renovation Strategies

TU Wien – Technische Universität Wien
May 2022

www.ibroad2epc.eu


This project has received funding from the European Union's Horizon 2020 research and innovation programme under grant agreement N° 101033781

 Integrating Building Renovation Passports into Energy Performance Certification schemes for a decarbonised building stock



Conceptualising iBRoad2EPC

How Energy Performance Certificates (EPCs) can be upgraded with Building Renovation Passport (BRP) elements

BPIE – Buildings Performance Institute Europe
November 2022

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Extending the iBRoad Building Renovation Passport I

Report on the adaptation to multi-family and public buildings

ifeu – Institute for Energy and Environmental Research
April 2022

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Experience from other projects

Report on linking Energy Performance Certificates (EPCs) with the Building Renovation Passport (BRP)

TU Wien – Technische Universität Wien
October 2022



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iBRoad2EPC in depth

Technical report on the definition of the proposed concept, content and methodology

Institute for Energy and Environmental Research
November 2022



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Extending the iBRoad Building Renovation Passport II

Report on potential indicators to expand the scope of iBRoad

TU Wien – Technische Universität Wien
August 2022



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Stay in touch with iBRoad2EPC at
www.ibroad2epc.eu

Thank you
for your time and collaboration

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