

iBRoad2EPC
Setting Building Renovation Passports (BRPs) up for success
*Frameworks, measures and elements in support of stepwise
deep renovation of the EU building stock*

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Session 1



These projects have received funding from the European Union's
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Setting Building Renovation Passports (BRPs) up for success

Frameworks, measures and elements in support of stepwise deep renovation of the EU building stock

- The context and logic of Building Renovation Passports (BRPs)
- How BRPs can help in financing deep renovation
- Results of iBRoad and ambitions of the iBRoad2EPC project
- Guiding principles for financing deep renovation in connection with BRPs

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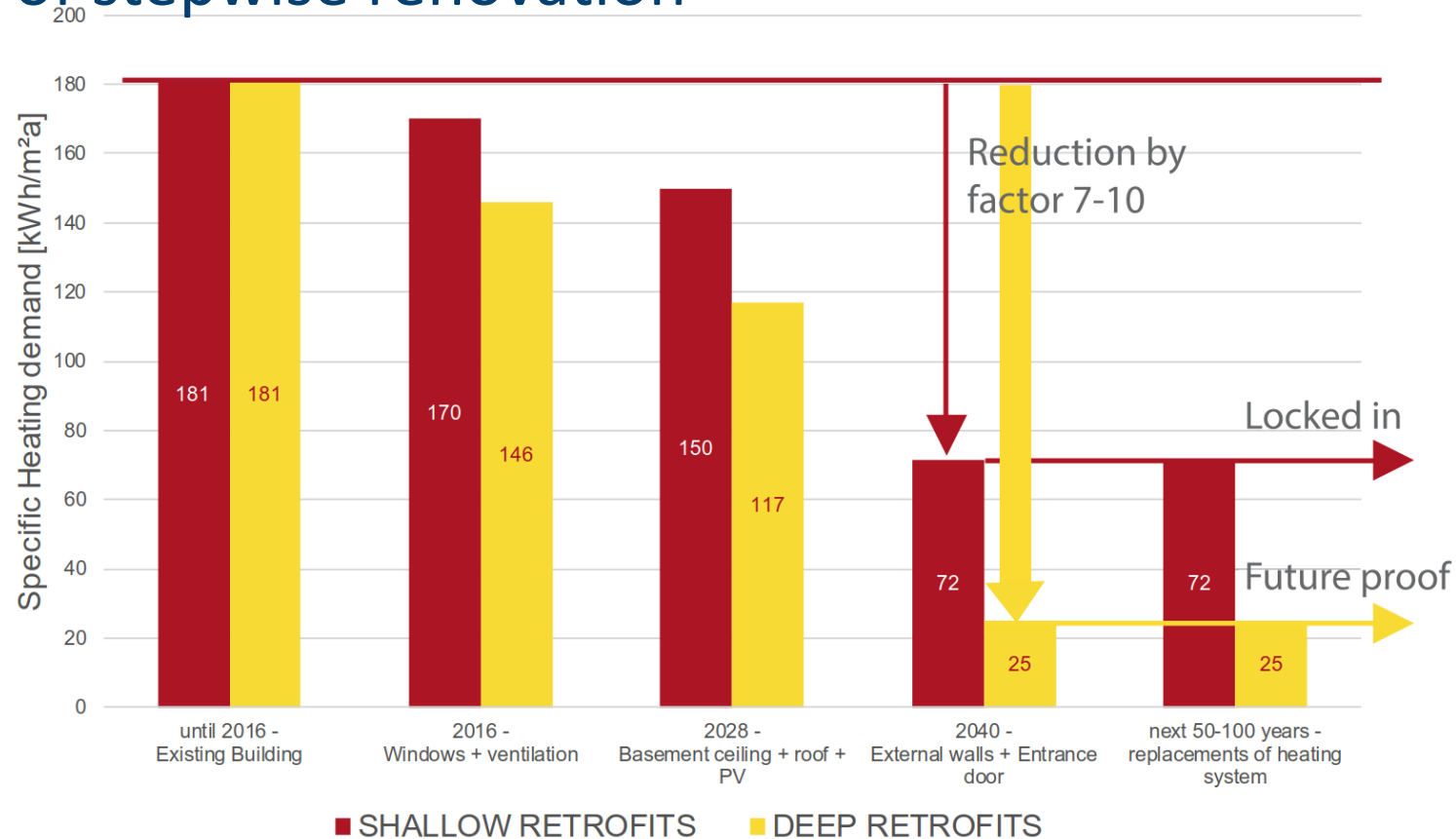
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Renovation can be a challenge



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Two scenarios of stepwise renovation



Source: EuroPHit project / Passive House Institute

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A plan can help

We wouldn't build a house without a plan, why would we renovate it without one?

HOLISTIC RENOVATION PROCESS



Source: Energiesprong

DEEP AND QUALITATIVE RENOVATION

BUILDING RENOVATION PASSPORT / ROADMAP

Detailed Renovation Roadmap

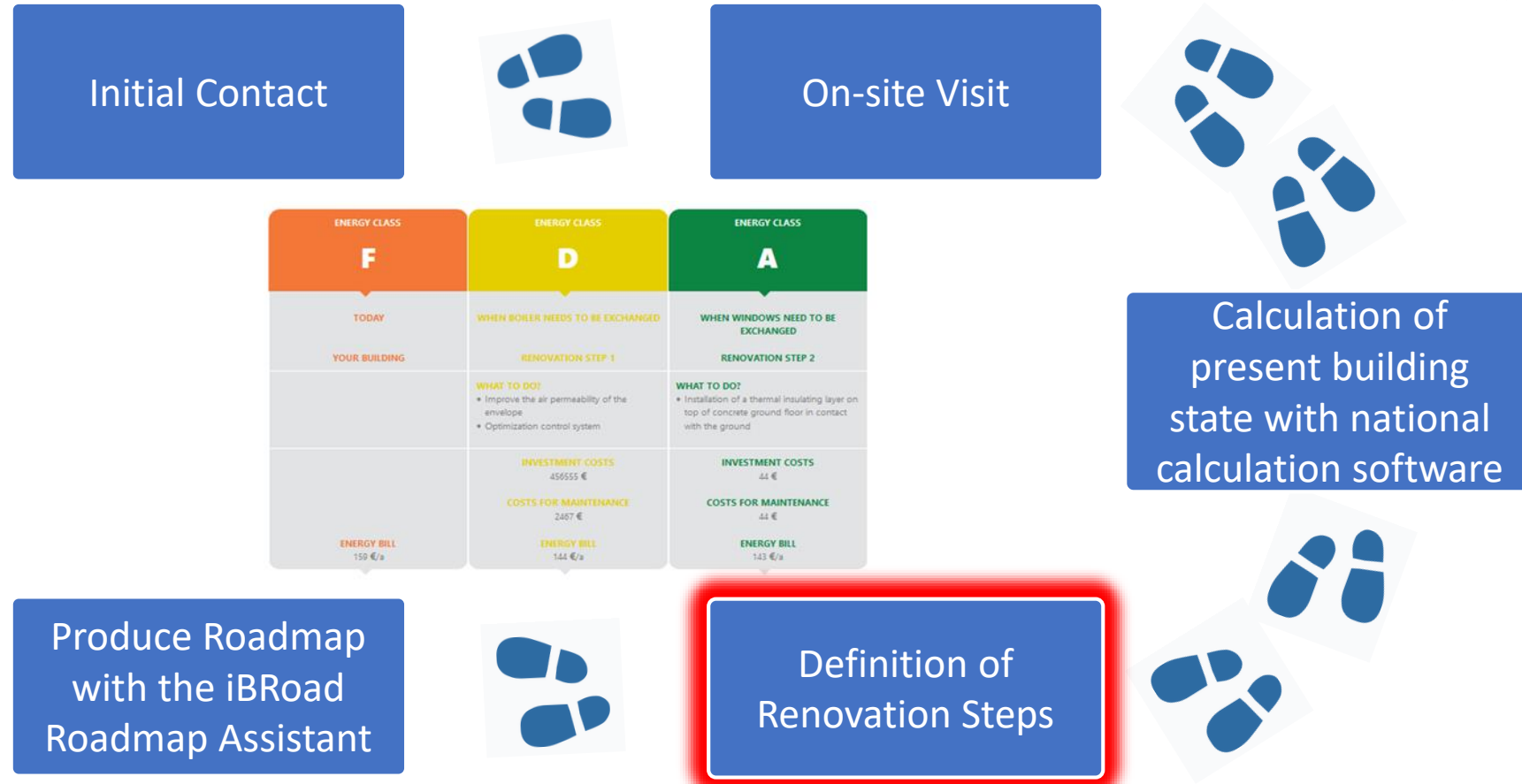
Step by Step Plan

	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 - 2023	Renovation Step 3 2023 - 2025	Renovation Step 4 2025 - 2040
Measures		<ul style="list-style-type: none"> Add a thermal solar system 	<ul style="list-style-type: none"> General Wall insulation 	<ul style="list-style-type: none"> Substitution of the old window Substitution of the heating system by a heat pump 	<ul style="list-style-type: none"> Installation of a heat recovery unit Substitution of the heating system by a heat pump
Primary Energy Demand	250 kWh/m²/a	210 kWh/m²/a	180 kWh/m²/a	140 kWh/m²/a	100 kWh/m²/a
Main Energy Source	Natural Gas	Natural Gas	Natural Gas	Natural Gas	Electricity
Final Energy Demand	200 kWh/m²/a	180 kWh/m²/a	160 kWh/m²/a	130 kWh/m²/a	100 kWh/m²/a
Main Source	Natural Gas	Natural Gas	Natural Gas	Natural Gas	Electricity
Final Energy Demand second Source	0 kWh/m²/a	10 kWh/m²/a	15 kWh/m²/a	15 kWh/m²/a	15 kWh/m²/a
Auxiliary Energy Source	Electricity	Auxiliary Energy Source	Auxiliary Energy Source	Auxiliary Energy Source	Auxiliary Energy Source
Final auxiliary Energy Demand	30 kWh/m²/a	15 kWh/m²/a	15 kWh/m²/a	15 kWh/m²/a	15 kWh/m²/a
Energy Bill	4000 €/a	2000 €/a	1500 €/a	1000 €/a	500 €/a
Carbon Dioxide	40 kg/m²/a	20 kg/m²/a	15 kg/m²/a	10 kg/m²/a	5 kg/m²/a
Costs		Investment Costs for Renovation Step 1: 10000 € Included Costs for Maintenance: 10000 €	Investment Costs for Renovation Step 2: 20000 € Included Costs for Maintenance: 20000 €	Investment Costs for Renovation Step 3: 30000 € Included Costs for Maintenance: 30000 €	Investment Costs for Renovation Step 4: 40000 € Included Costs for Maintenance: 40000 €
Benefits		None of incentives	None of incentives	None of incentives	None of incentives
Comfort		Improved	Improved	Improved	Improved
Climate Change		Changed Comforts	Changed Comforts	Changed Comforts	Changed Comforts

Source: iBRoad

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The process



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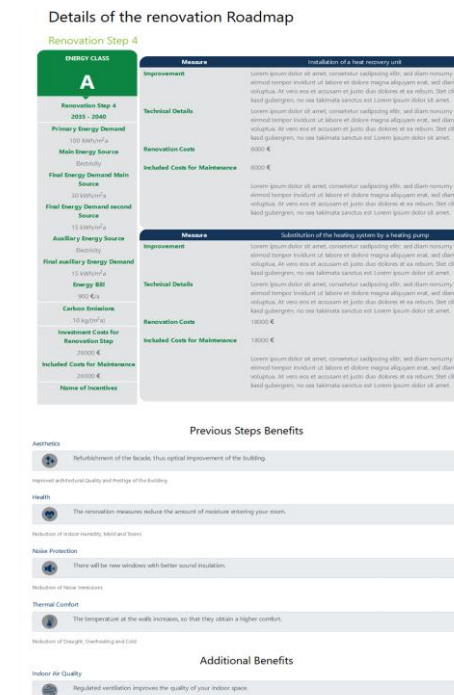
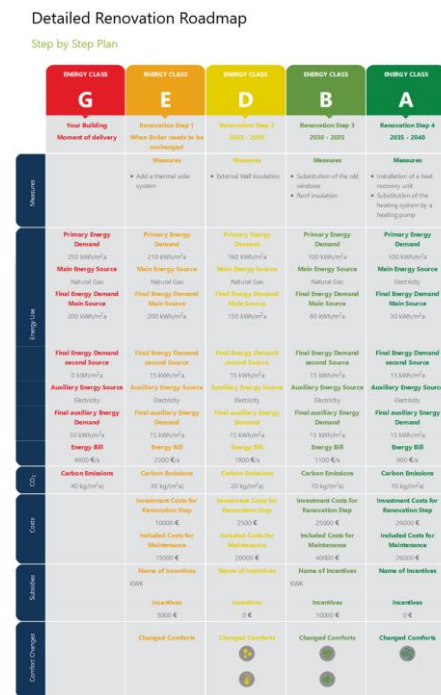
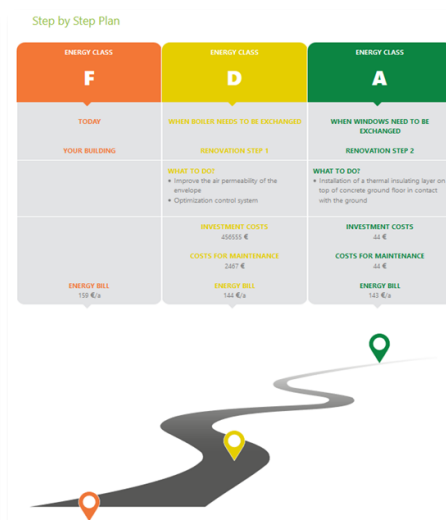
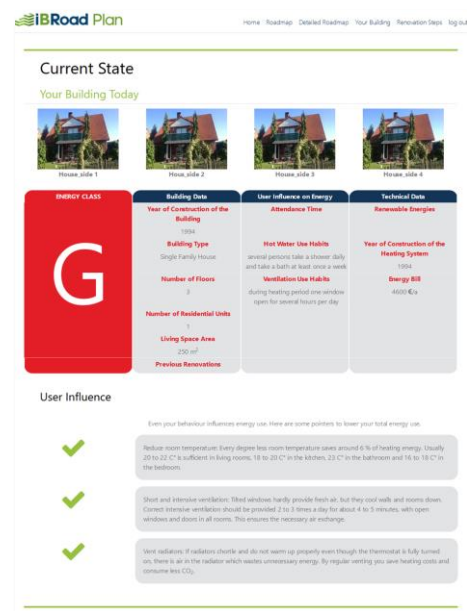
The results

Current building state

Roadmap overview

Detailed Roadmap

Detailed renovation step



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How BRPs can help in financing deep renovation

- **Ensuring that the most efficient measures can be scheduled first**, hereby allowing the building owners to save on energy costs and have more money available for future renovation steps.
- **Including financial information and links to relevant funding schemes.**
- **Minimising the risk for investment or funding** by third parties; a building renovation roadmap can be used as a business plan to negotiate better terms.
- **As a means for verification** that the measures have been implemented as foreseen and achieve the expected impact.
- **Help to best distribute the funding**
- **Support the implementation of bundles of suitable energy efficiency measures**

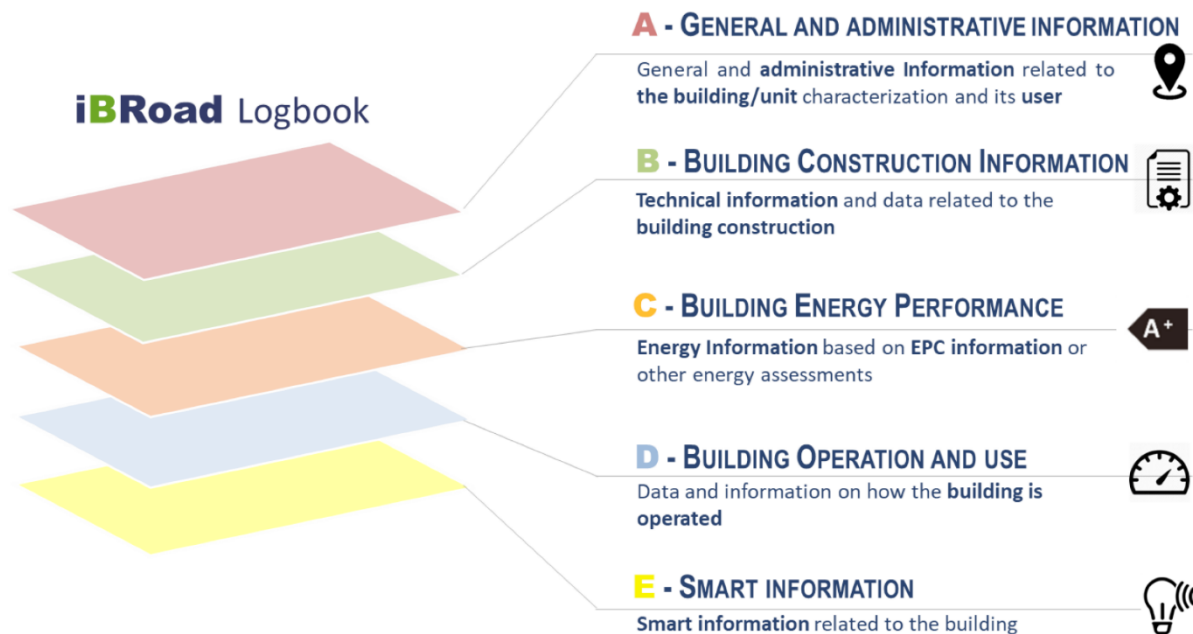
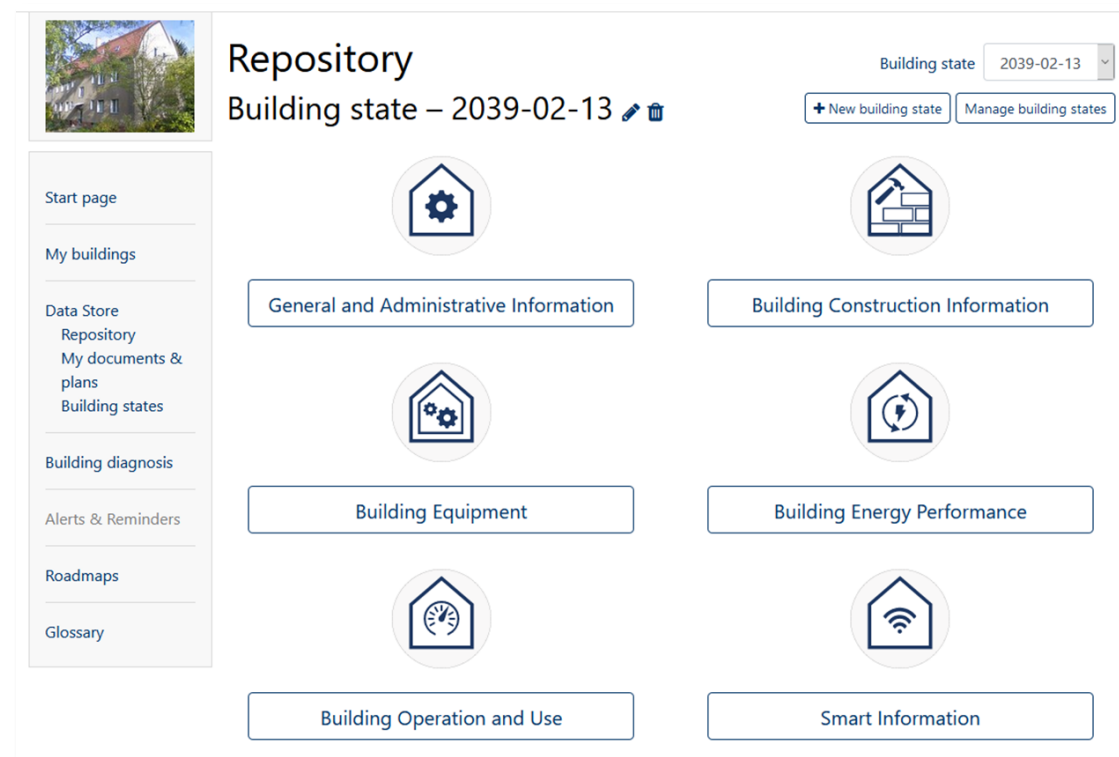
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How BRPs can help in financing deep renovation (continued)

- Public money should be spent on reaching the highest impact. **Advisory services, among which the BRP, can help decrease free-riding prevalence while still catering for low-income households.**
- Based on a BRP, home owners can decide with which technical measures they want to achieve regulatory requirements for their building, e.g., setting minimum energy performance standards.
- A BRP can help consumers make the best of a P4P scheme.
- Increase the number of individual deep renovations, local employment and the quality of the works. This will also **increase the real estate value and property prices.**

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The iBRoad Logbook

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

Source: iBRoad project report "The logbook data quest" <https://ibroad-project.eu/news/the-logbook-data-quest/>

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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

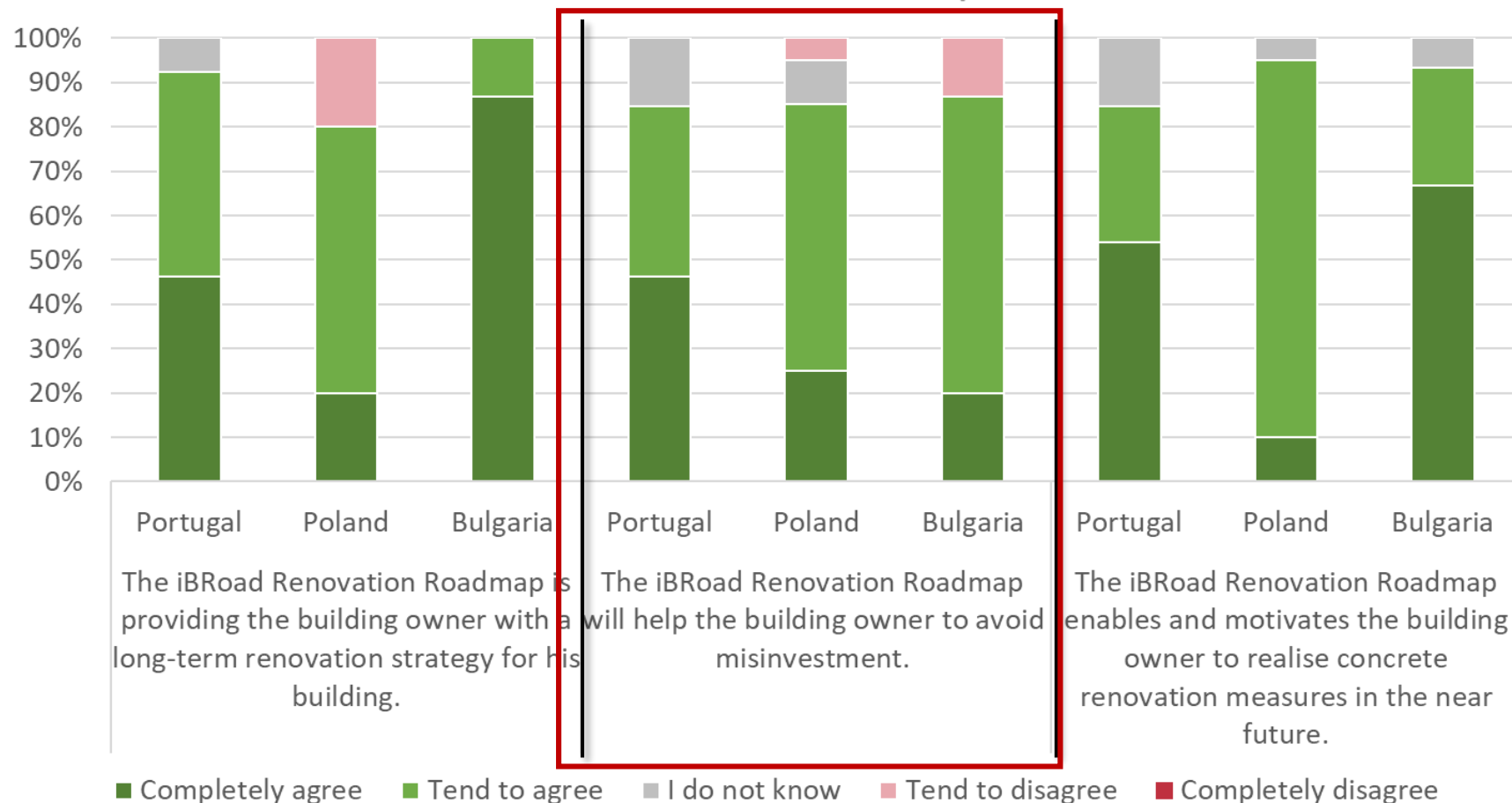
Pilot country	No.	Year of construction	Number of renovation steps	Current energy level	Final / future energy level	Current primary energy demand [kWh/m²]	Future primary energy demand [kWh/m²]	Estimated date for final renovation step	Completeness
POLAND	1	1975	3	medium orange	light green	474	134	Substitution 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

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Auditors' feedback

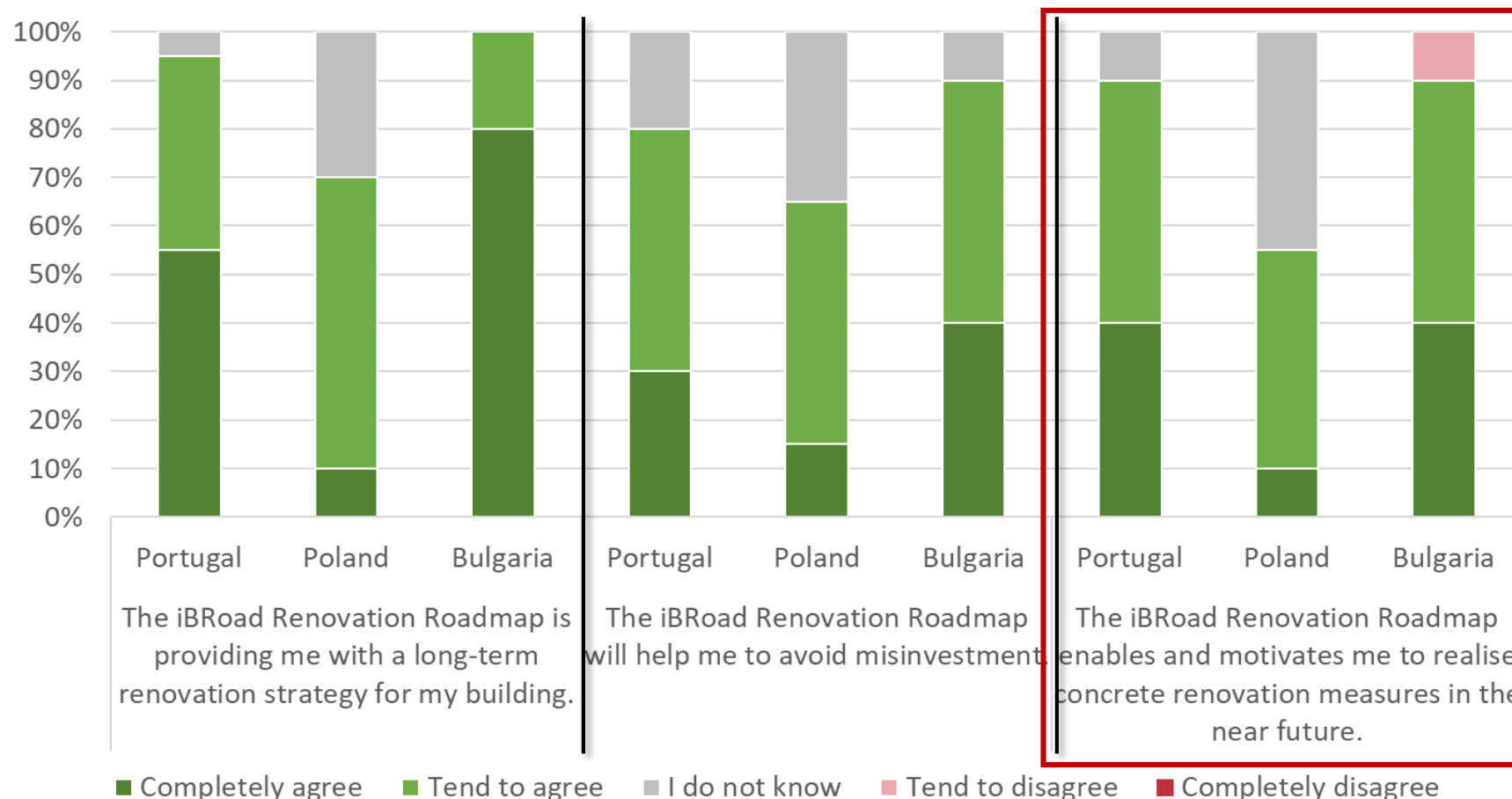
To what extent do you agree with the following statement to the iBRoad Renovation Roadmap?



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Owners' feedback

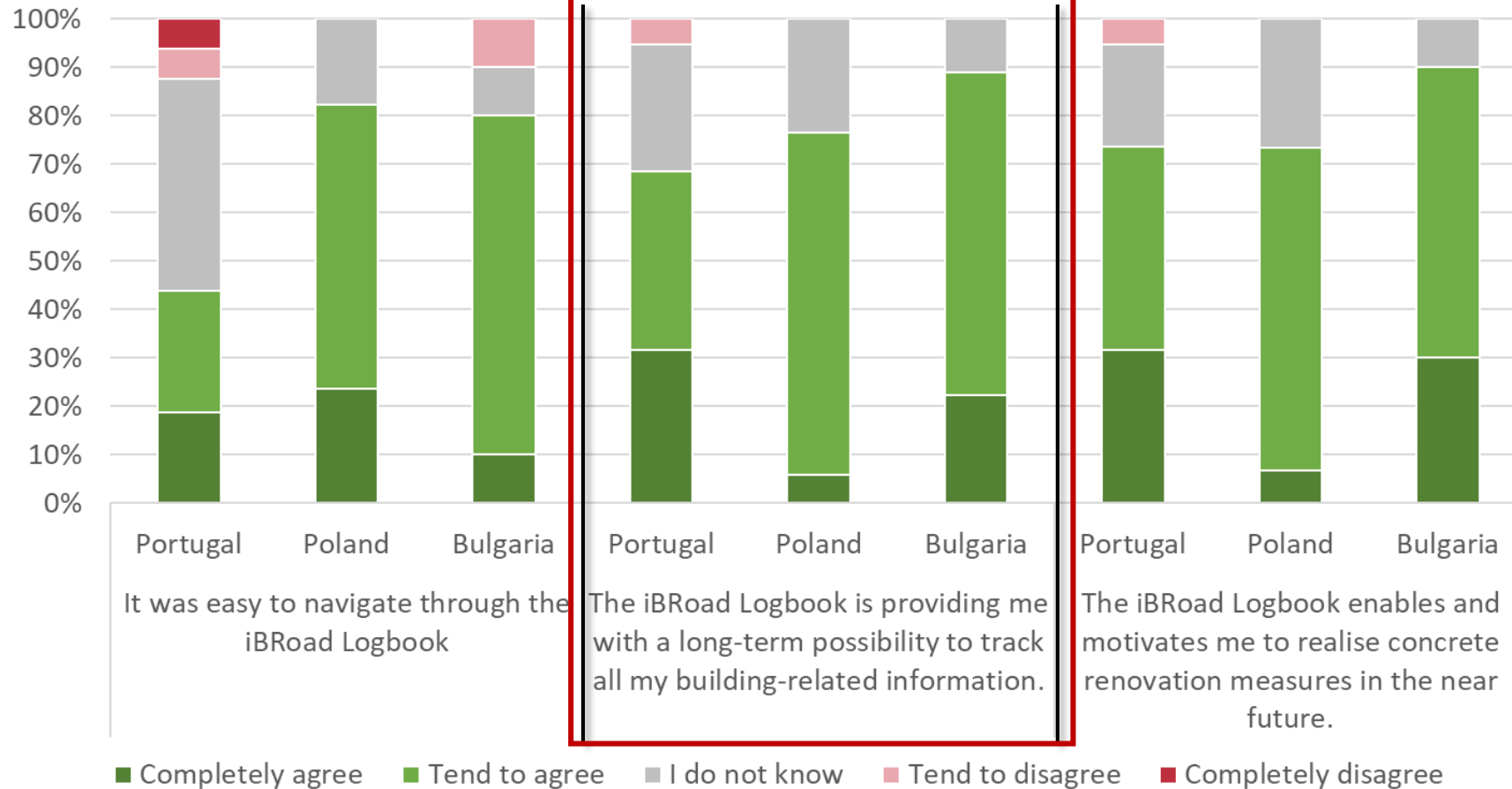
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Owners' feedback

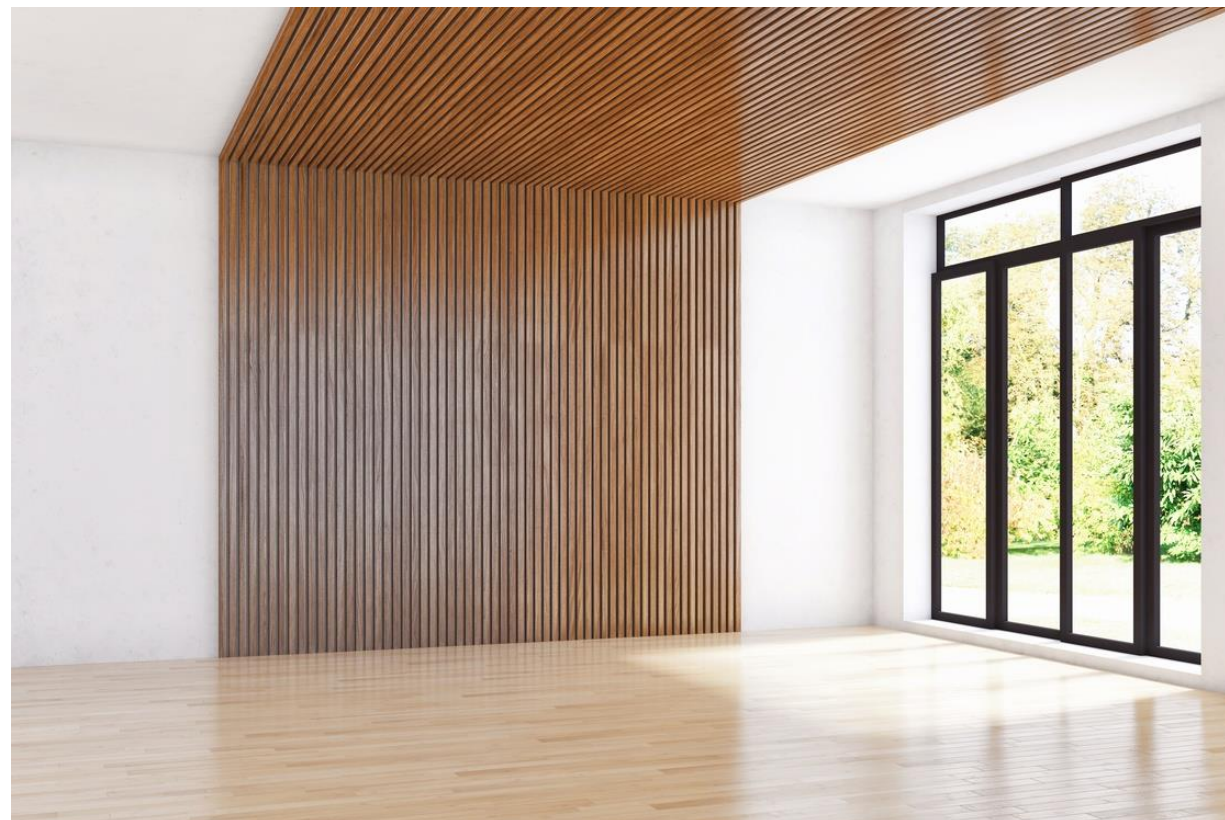
To what extent do you agree with the following statements related to the iBRoad Logbook?



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More than energy efficiency

-  improved comfort
-  indoor air quality
-  acoustics
-  safety & security
-  aesthetics
-  lighting conditions
-  improved market value

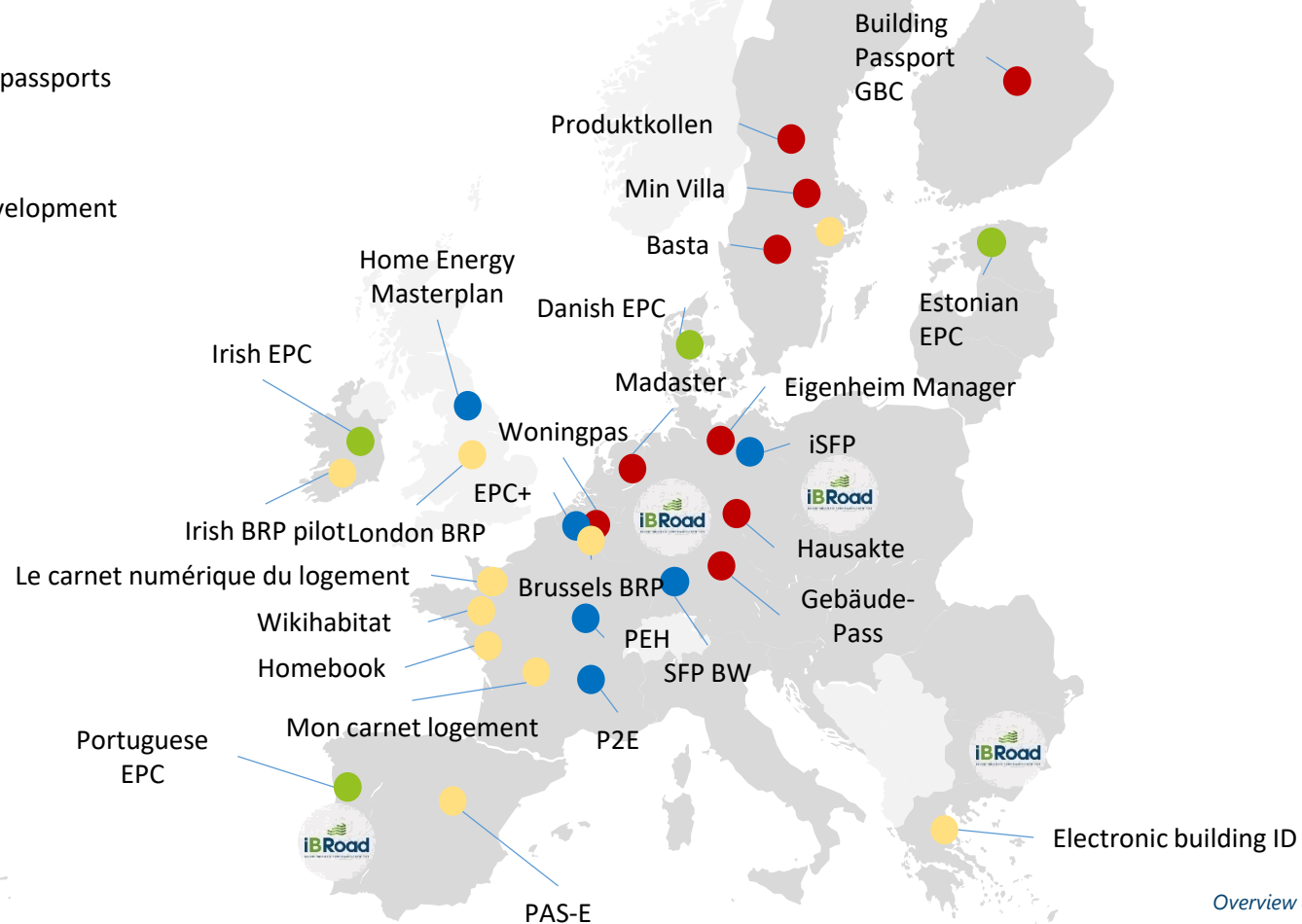


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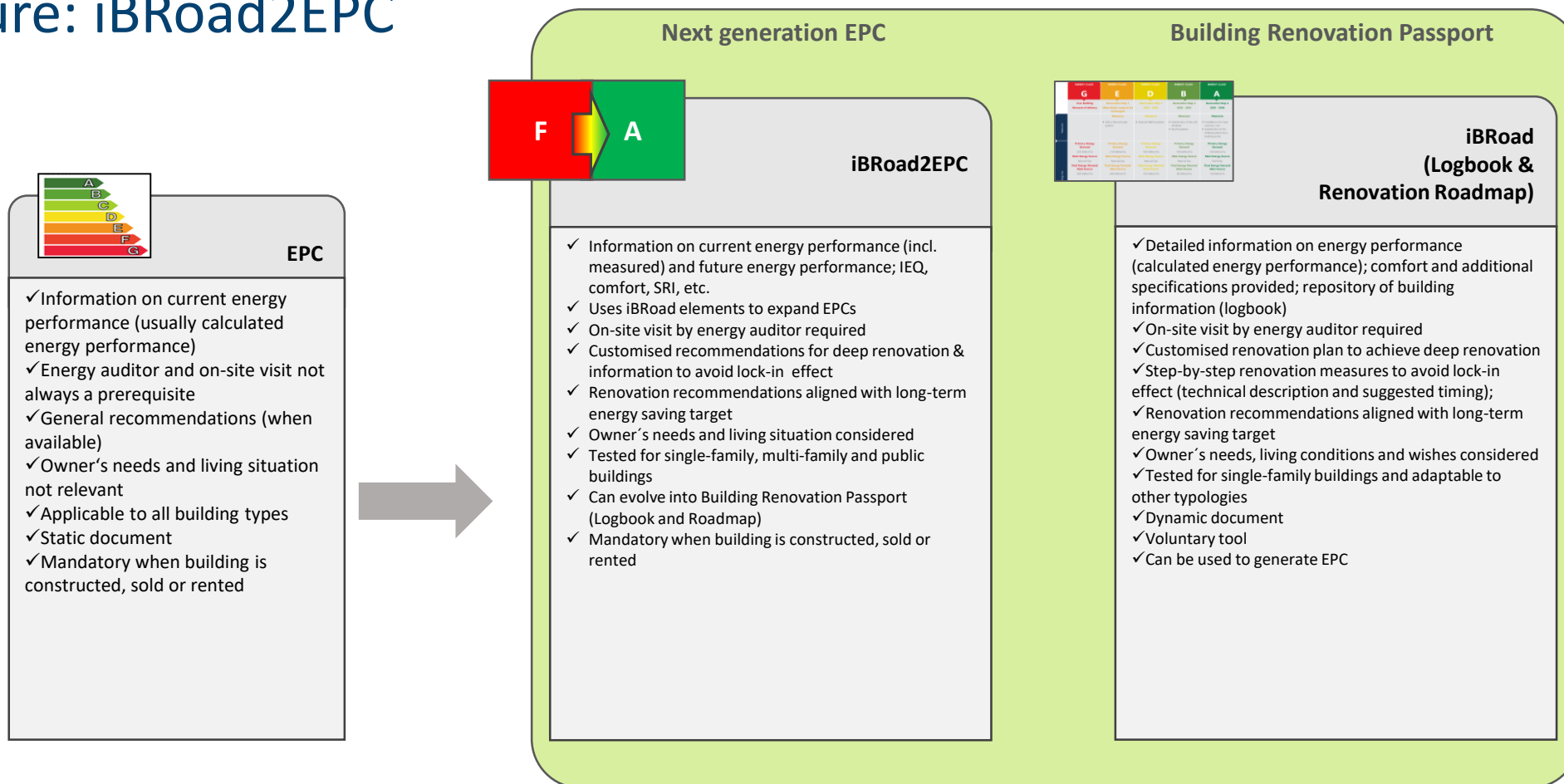
Relevant initiatives

- Digital logbooks
- Building renovation passports
- Advanced EPCs
- Initiatives under development



Overview of initiative prepared by Jonathan Volt, BPIE | Source of map graphic: Showeet.com

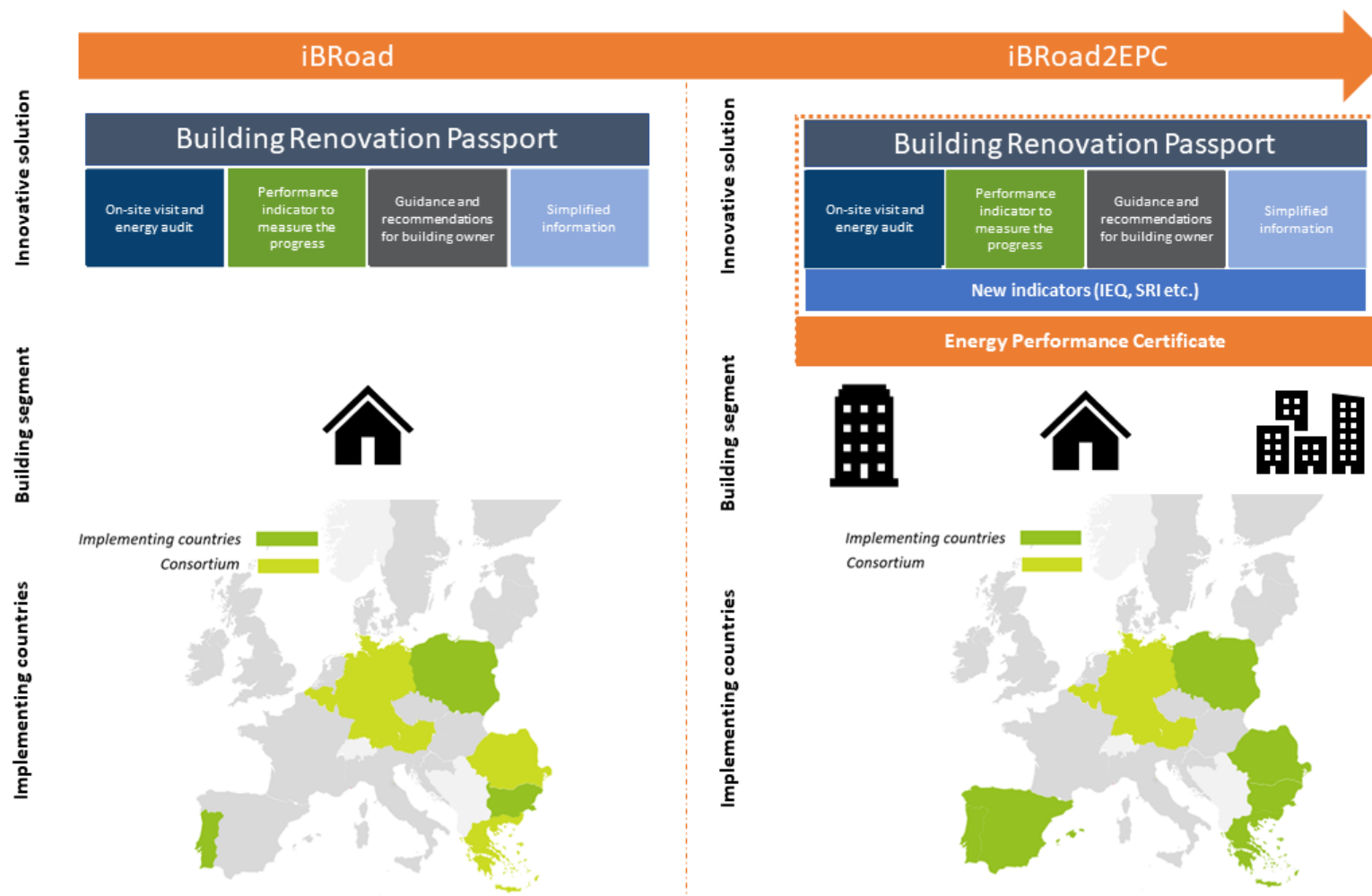
The future: iBRoad2EPC



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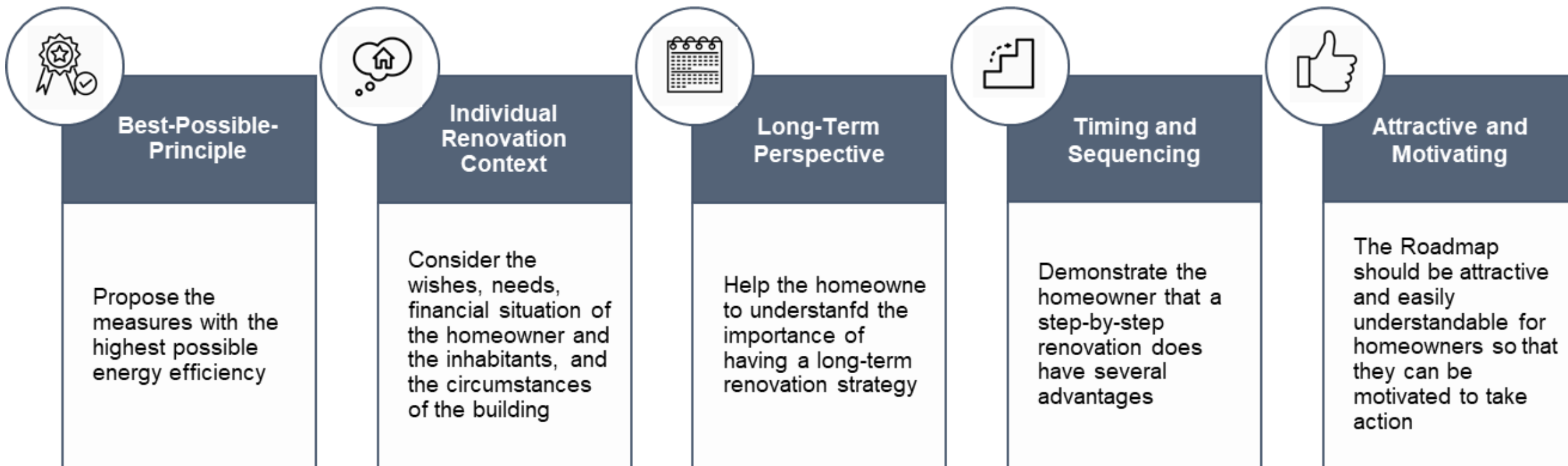
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Guiding Principles for establishing the Roadmap



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Guiding principles for deep renovation in connection with BRPs – information

Guiding Principle	Best Possible	Individual Renovation Context	Long-term Perspective	Timing and Sequencing	Attractive and Motivating
Information Approach	<i>Demonstrate energy saving potential of best commercially available solutions</i>	<i>Provide information relevant to different categories of building owners</i>	<i>Promote long-term vision for buildings, neighbourhoods, districts, etc.</i>	<i>Train energy auditors in identifying and eliminating lock-ins</i>	<i>Embed information on staged renovation in energy efficiency campaigns</i>

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Guiding principles for deep renovation in connection to BRPs – regulation

Guiding Principle	Best Possible	Individual Renovation Context	Long-term Perspective	Timing and Sequencing	Attractive and Motivating
Regulation Approach	Define “deep renovation”	Define renovation obligations based on current energy rating of buildings	Set long-term targets for minimum efficiency in building codes	Make renovation roadmaps mandatory under specific contexts	Combine renovation roadmaps with efficiency or renewable heating obligations

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Guiding principles for financing deep renovation in connection with BRPs

Guiding Principle	Best Possible	Individual Renovation Context	Long-term Perspective	Timing and Sequencing	Attractive and Motivating
Financing Approach	<i>Finance and promote measures with highest possible energy efficiency</i>	<i>Adapt financial support as per the needs of individual owners – link to income</i>	<i>Allow renovation to take place stepwise, not just in one go – link to tax (incentives)</i>	<i>Encourage long-term and integrated planning of renovation measures</i>	<i>Simplify procedures for applicants; encourage ambitious plans, discourage free-riding</i>

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Guiding principles for financing deep renovation in connection with BRPs – examples

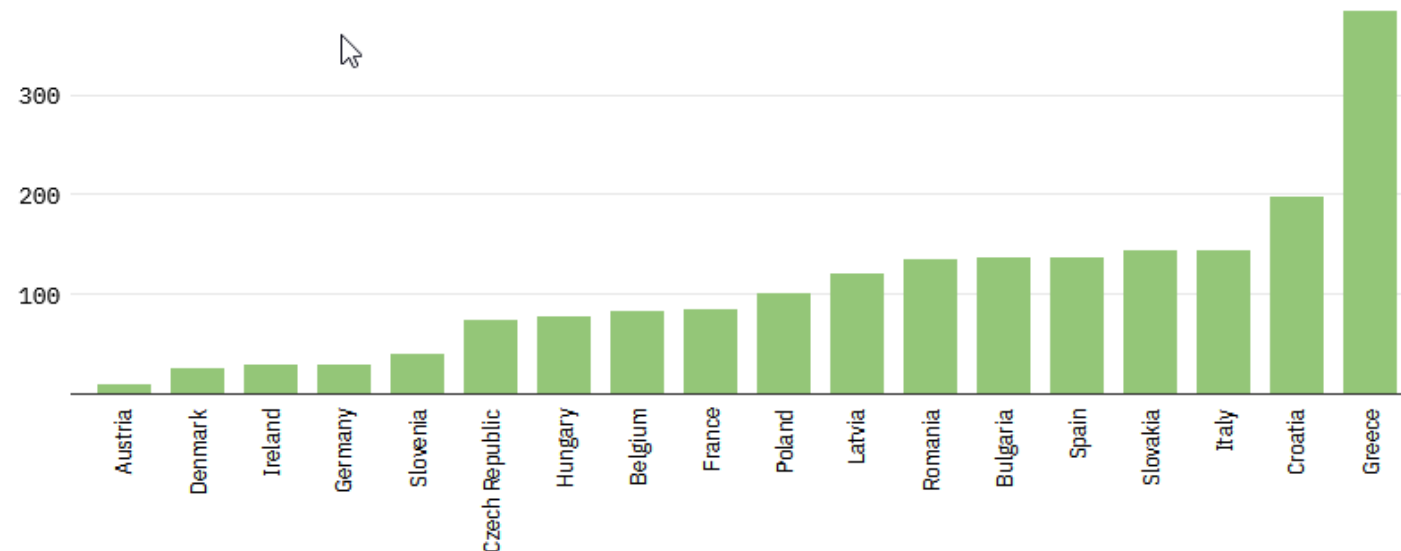
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Good practice	KfW “Efficiency House Standard” includes minimum quality criteria (e.g., U-values, efficiencies or seasonal performance factors)	Current call of Greek “Exikonomo” focuses on very low efficiency homes to prevent energy poverty	EuroPACE project offers 100 % up-front financing for energy efficiency renovation that can be repaid over a long term of up to 25 years	<ul style="list-style-type: none"> German BEG scheme rewarding building owners who have an individual refurbishment timetable City of Tübingen supports homeowners with bonus of 500 EUR to implement a measure referred to in the roadmap 	EED obligated schemes for power utilities enable consumers to save energy through regular interaction
Can be improved	Minimum improvement defined by number of classes, irrespective of starting point	Certain financing schemes seem to indirectly favour high-income households	Financing schemes providing limited implementation time, while not encouraging choosing best possible individual measures	Financing schemes favouring quick-fix solutions over sequenced long-term interventions	Schemes requiring substantial specific investment to apply for financing

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Recovery package: major opportunity for deep renovation

Southern Europe leads the financing of energy efficiency in national economic recovery plans

Funding for energy renovation of buildings per capita, €/person



Source: Renovate Europe

ENERGYMONITOR

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Thank you for your attention

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For more information, please visit
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(currently under construction)



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