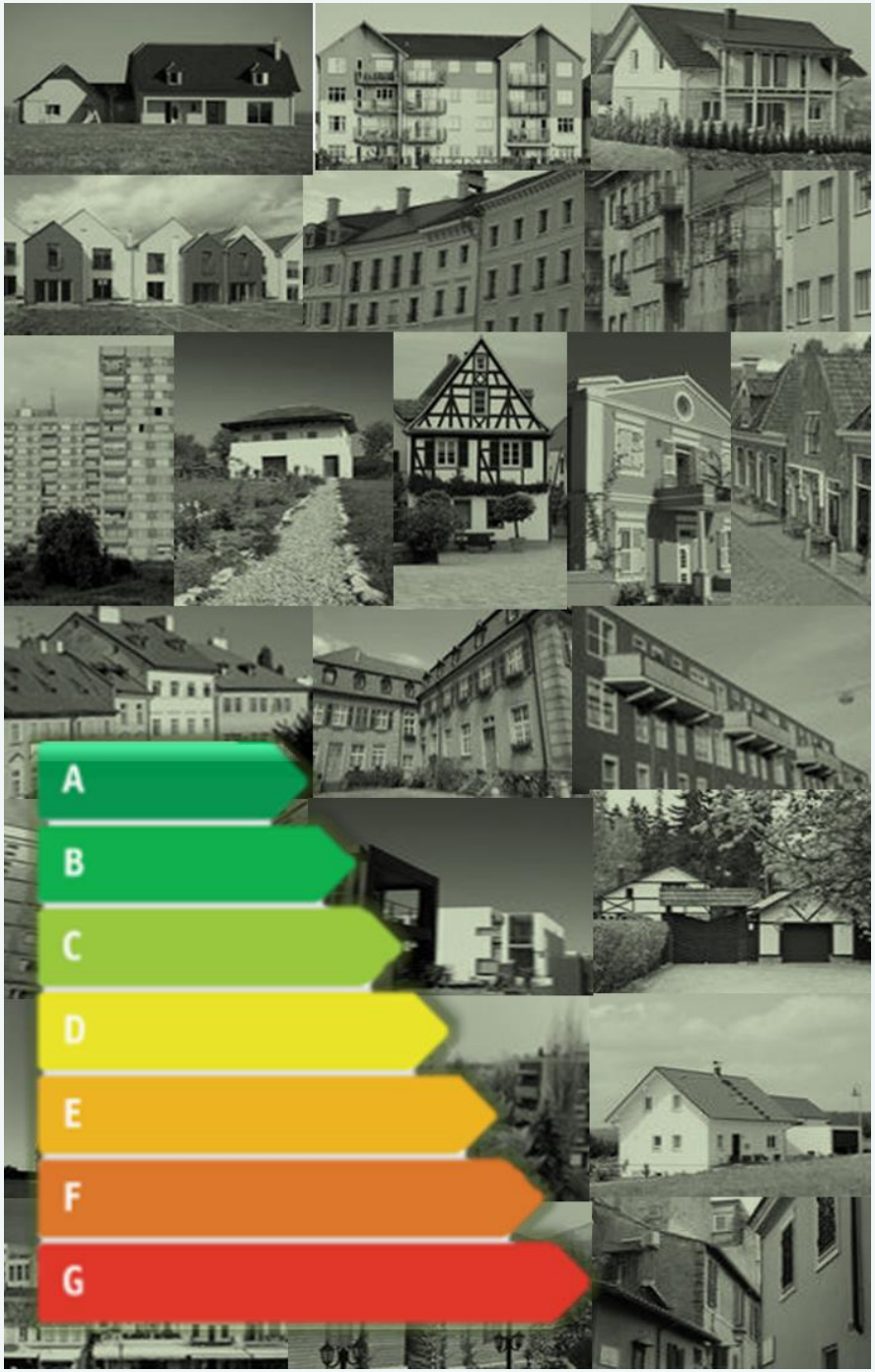


European Federation of Building Societies
XVIII European Congress
Budapest, 20 October 2016

Challenges and Opportunities for the transition to a future-proof European building stock

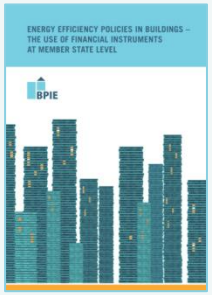
Oliver Rapf
Executive Director
Buildings Performance Institute Europe

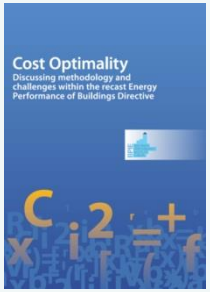
BPIE

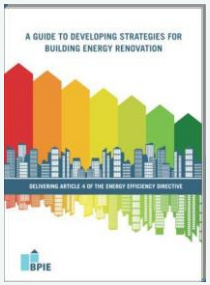
Content of this presentation

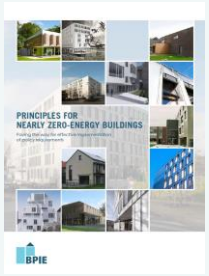
- BPIE and the policy context
- Better new buildings?
- The European Challenge
- Instruments and strategies to tackle the challenge
- Cost-effective potentials to renovate in Europe
- Geopolitics and drivers

About the Buildings Performance Institute Europe







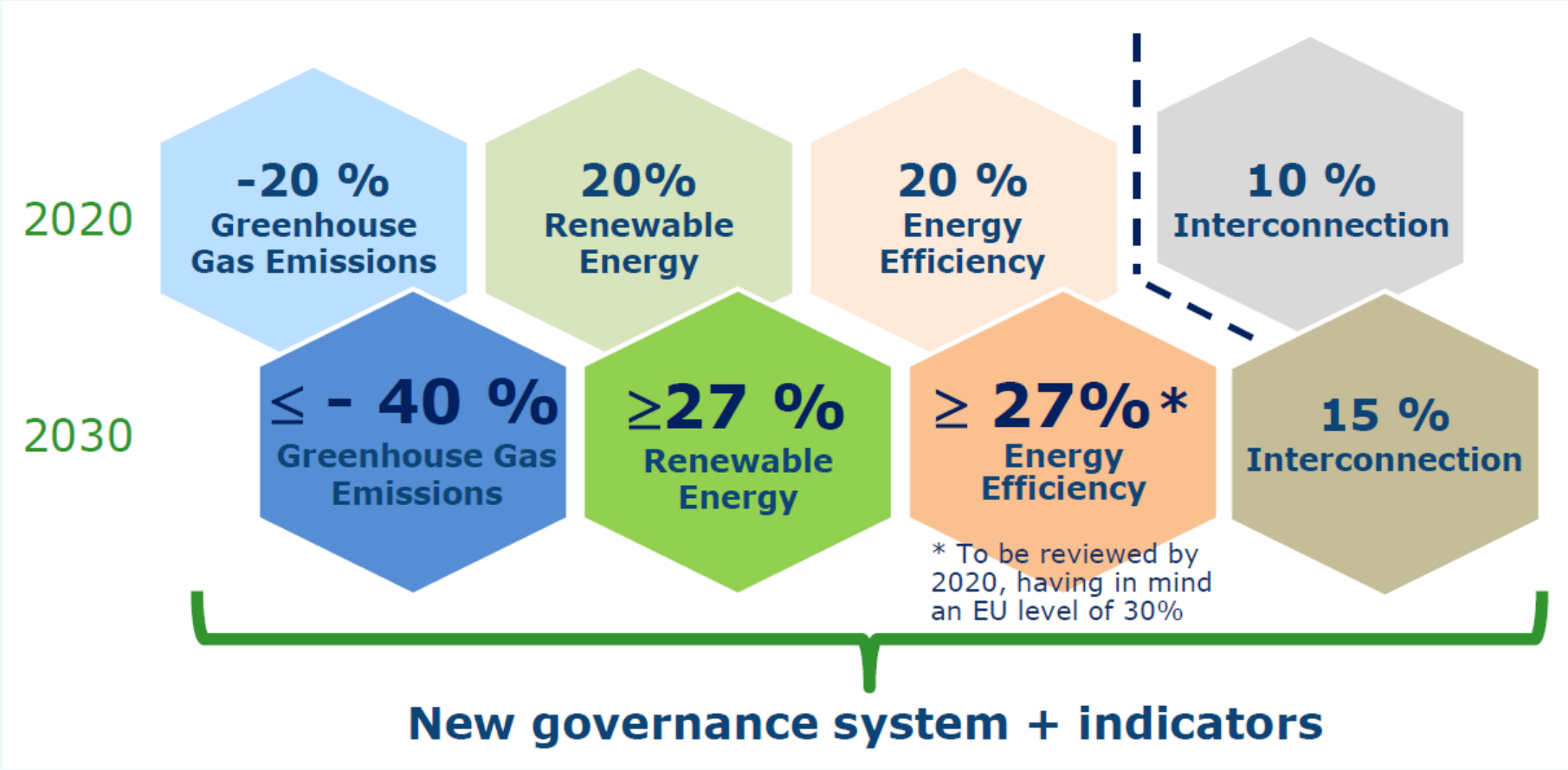


www.bpie.eu

www.buildingsdata.eu

BPIE

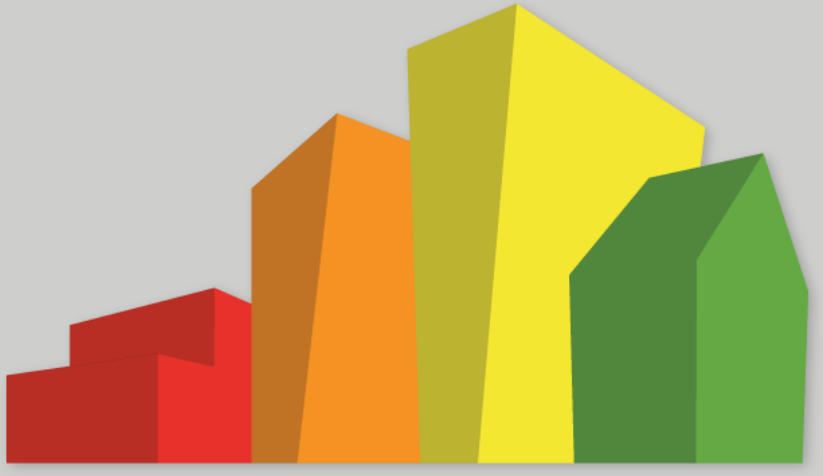
2030 framework for climate and energy policies



Source: DG Energy

New buildings in Europe – progress in energy performance?

BPIE



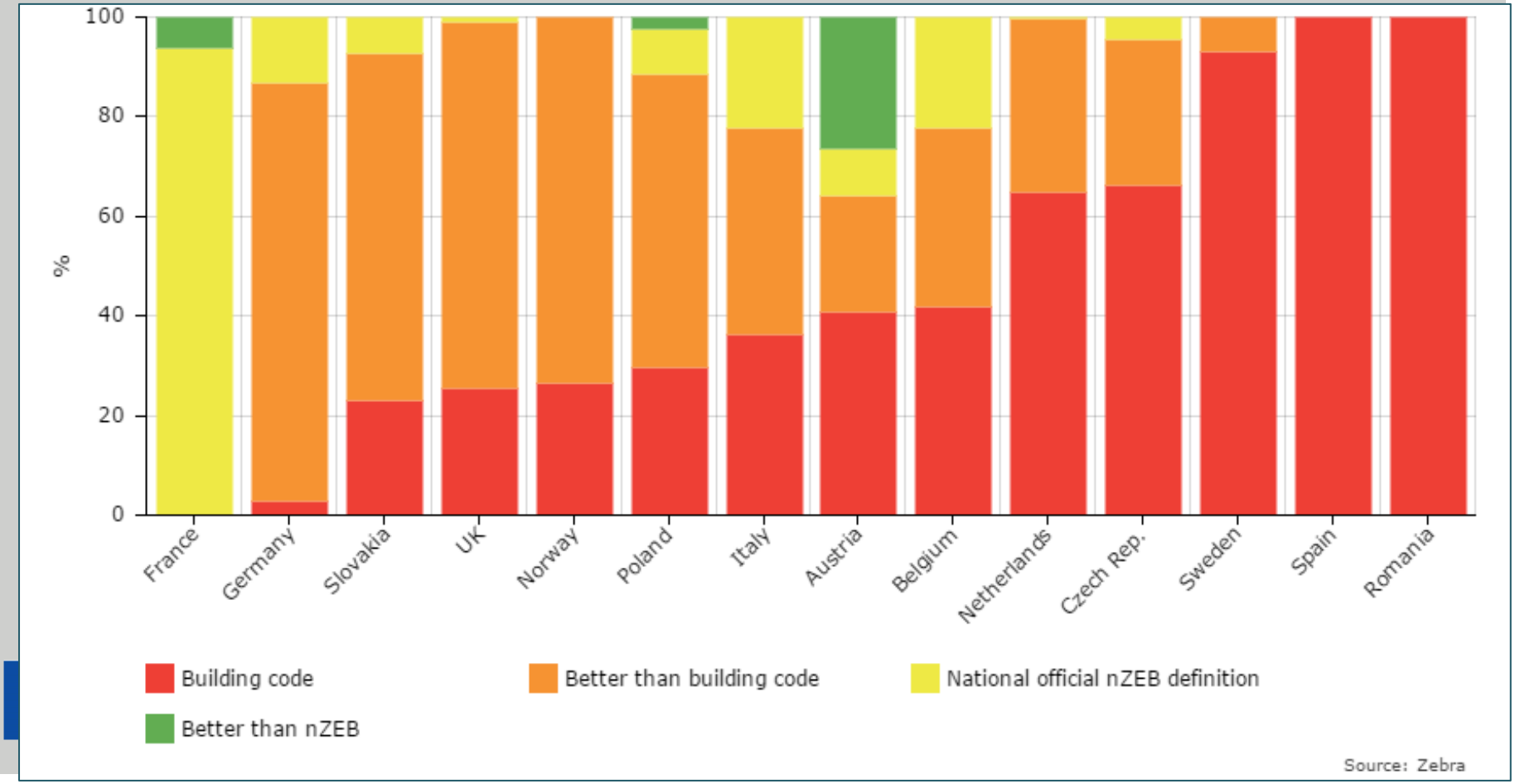
ZEBRA2020

Co-funded by the Intelligent Energy Europe
Programme of the European Union

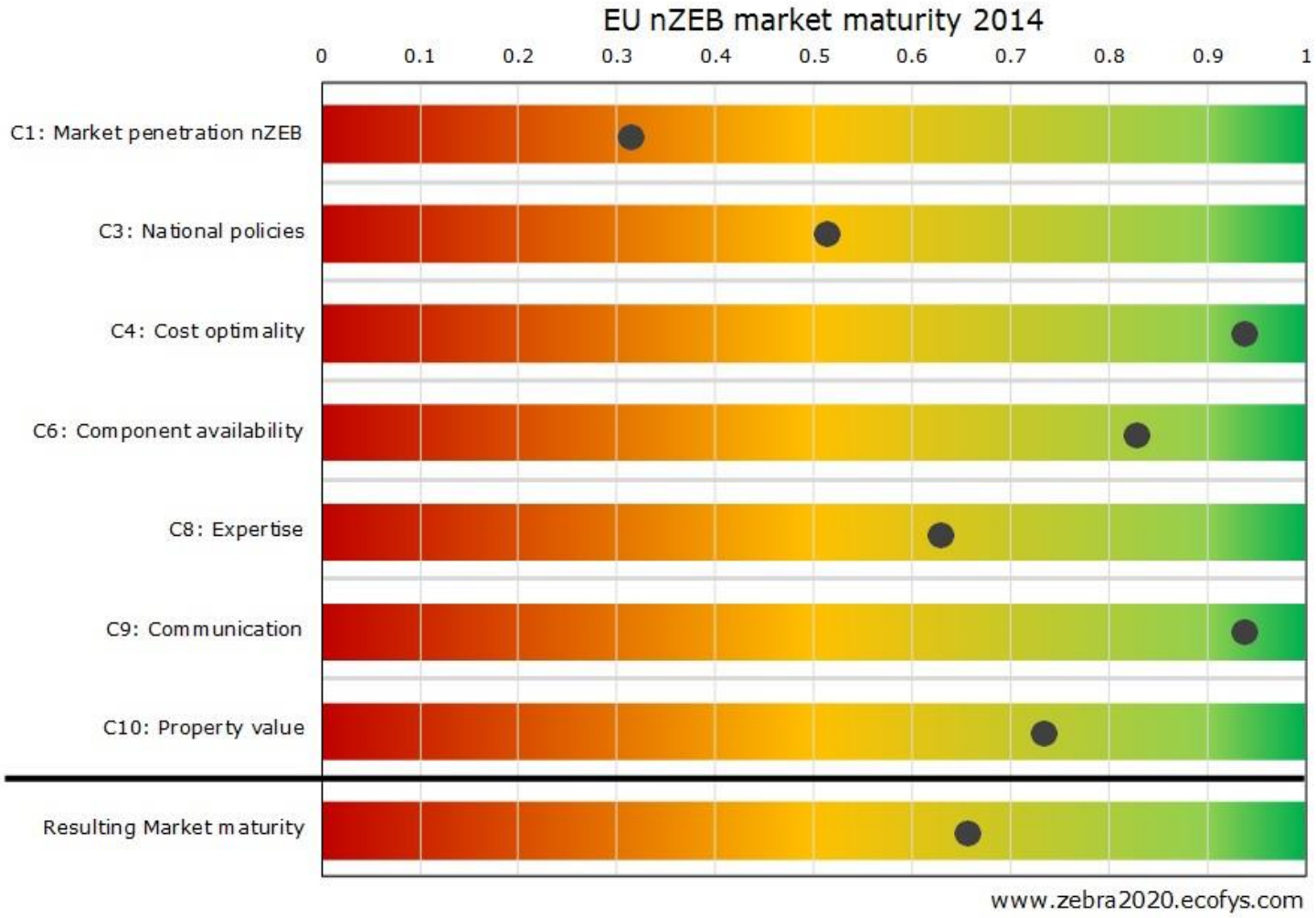
www.zebra2020.eu

ZEBRA 2020 project

- Distribution of new constructed dwellings in the year 2014 according to different building standards



Maturity of the EU nZEB market for

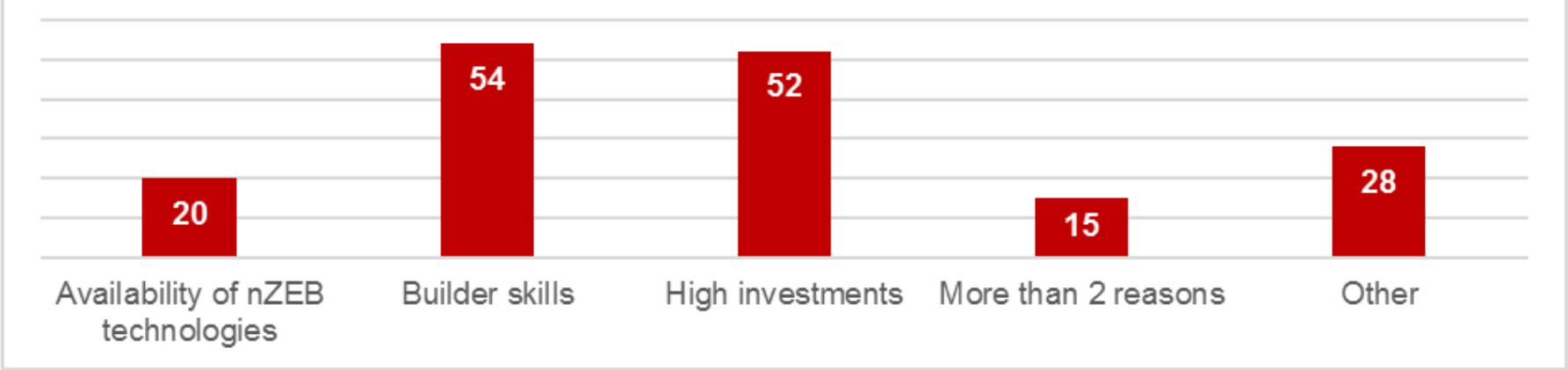


Co-funded by the Intelligent Energy Europe Programme of the European Union

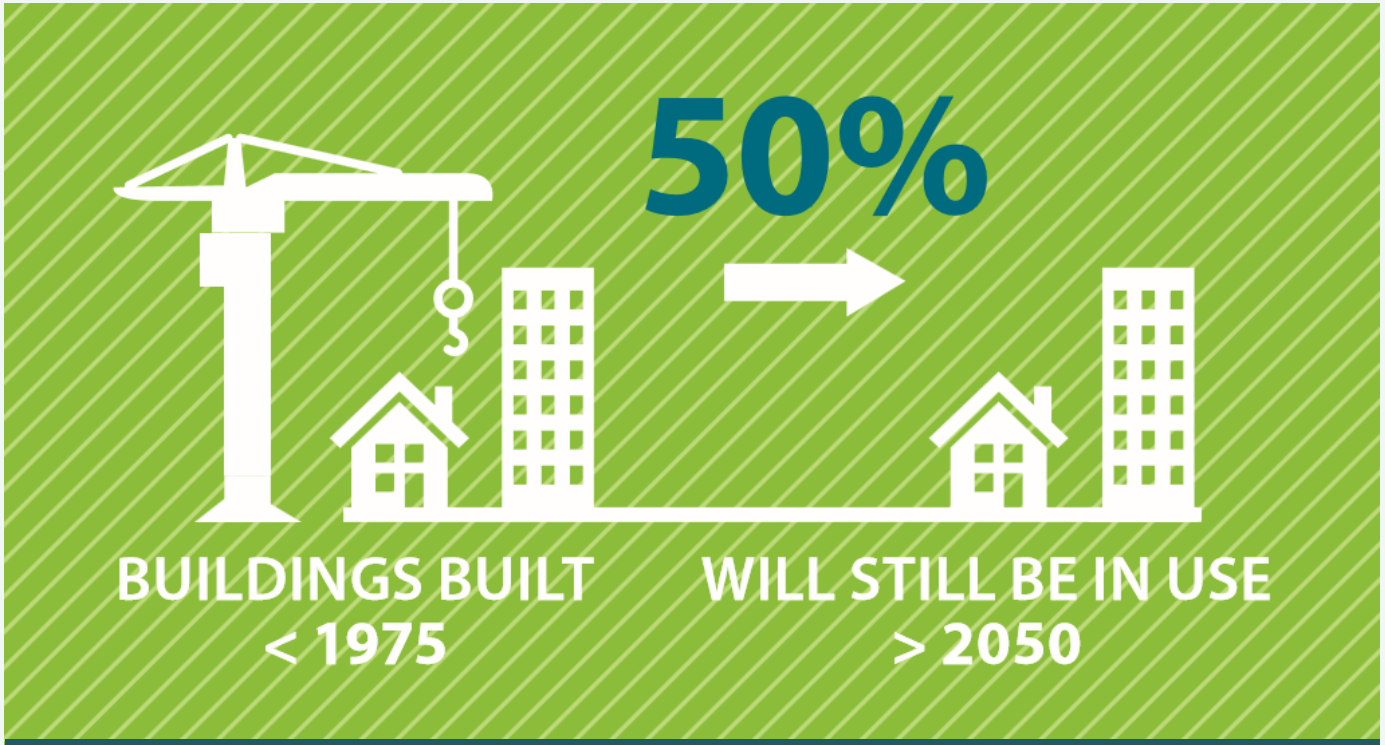
Source: www.zebra2020.eu

Survey

BARRIER TO SPEED UP NZEB TRANSITION (Building Professionals opinion)



Main challenge: the existing building stock



75-90% of the current building stock will remain in use in 2050

Great heterogeneity of EU's building stock

CZ 

DE 

FR 

SW 

NL 

UK 

GR 

ES 

IT 

RO 

LIT 

PT 

BUL 

BE 

AU 

BPIE

@BPIE_eu

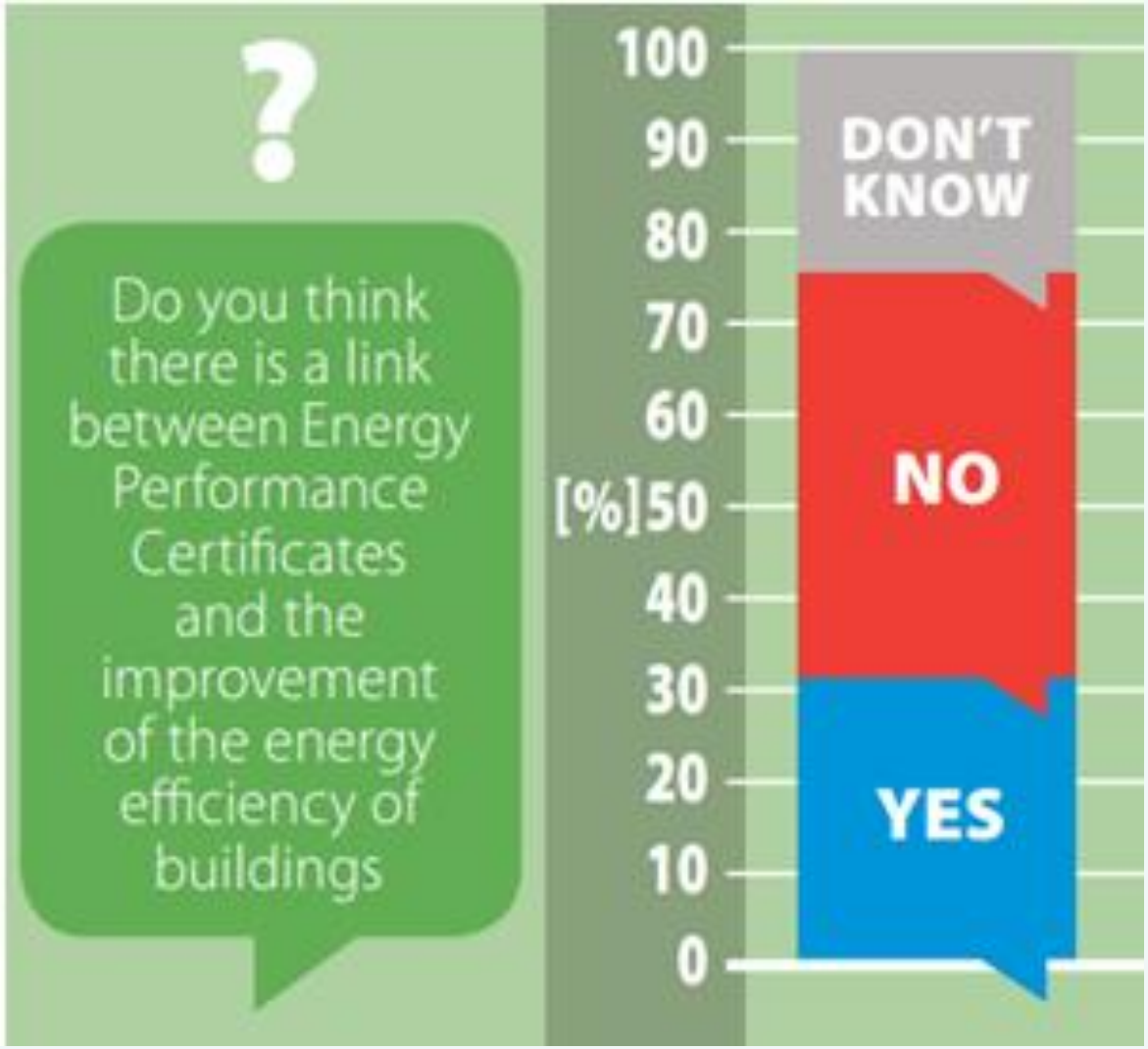
Challenges for renovating residential buildings

- Building owner lacks information
- Building sector lacks skills
- Financial resources - upfront costing
- Complex legislation and ‘stop and go’ support measures
- Burden for owner
- Fragmented renovation & lock-in effect




Link between EPC's and EE improvement

ZEBRA2020



Fragmented renovation is risk to lock-in

- What about external insulation and connection with the eaves and the window frames?

Fragmented renovation is risk to lock-in (2)

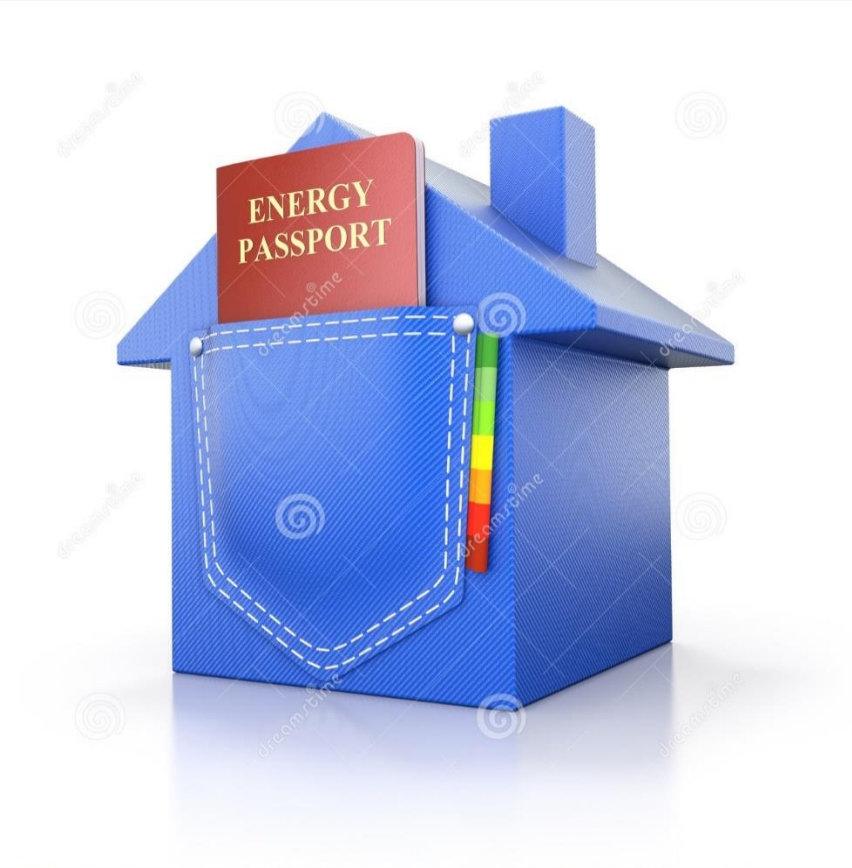
- What if insulation appears to be inadequate?
- What about solar panels afterwards?

Common barriers

- Building owner lacks information (what to do, where to start, and which measures to implement in which order?)
- Renovation perceived as a burden (time, money and *dust*)
- Insufficient training for auditors beyond technical aspects (how to convince to start renovation after the audit?)
- Limited financial resources - upfront costing
- Complex legislation and ‘stop and go’ support measures




What is a Building Renovation Passport?



a. Renovation Roadmap:

A document outlining a long-term (up to 15 or 20 years) step-by-step renovation roadmap for a specific building, resulting from an on-site energy audit fulfilling specific quality criteria established in dialogue with building owners.

b. Logbook:

A repository of all building-related information (e.g. energy consumption and production, executed maintenance and building plans).

BPIE

BUILDING RENOVATION PASSPORT

1. DATA GATHERING ON INDIVIDUAL BUILDING LEVEL

On-site Energy Audit

External experts: energy auditors, installers (dialogue with owners)

On-site Data Gathering

- **By building owners or tenants** (e.g. executed works, characteristics of installed equipment)
- **Automated data:** e.g. smart meters, monitoring systems (e.g. RES, heating, CO2 meters, etc.)

2. PROCESSING THE DATA

3a. RENOVATION ROADMAP (Deep "Staged" Renovation)

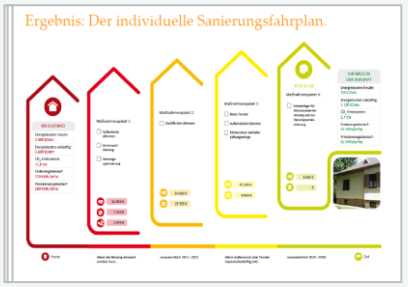
- Comprehensive audit
- Long-term perspective
- Considering individual context
- Systematic renovation in a sensible order and packages

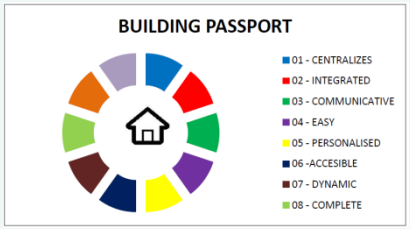
3b. BUILDING LOGBOOK

1. **Inventory of non-dynamic information**
2. **Interactive tool**
3. **Linking building owners (users) and third parties**

Understanding Building Renovation Passports

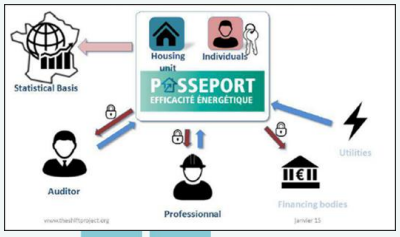
Individueller Sanierungsfahrplan
(Individual Renovation Roadmap)
Germany





Woningpas (Dwelling ID)
Belgium Flanders (VEA)

Passeport Efficacité Énergétique, P2E
(Energy Efficiency Passport) France



BPIE

Different building passports, but same features

- Focus on consumers
- Long-term perspective
- Consideration of the individual renovation context
- Attractive and user-friendly
- Aimed at achieving staged-deep renovations, avoiding the lock-in effect

BPIE

So what's happening on the ground?

RENOVATION STRATEGIES OF SELECTED EU COUNTRIES

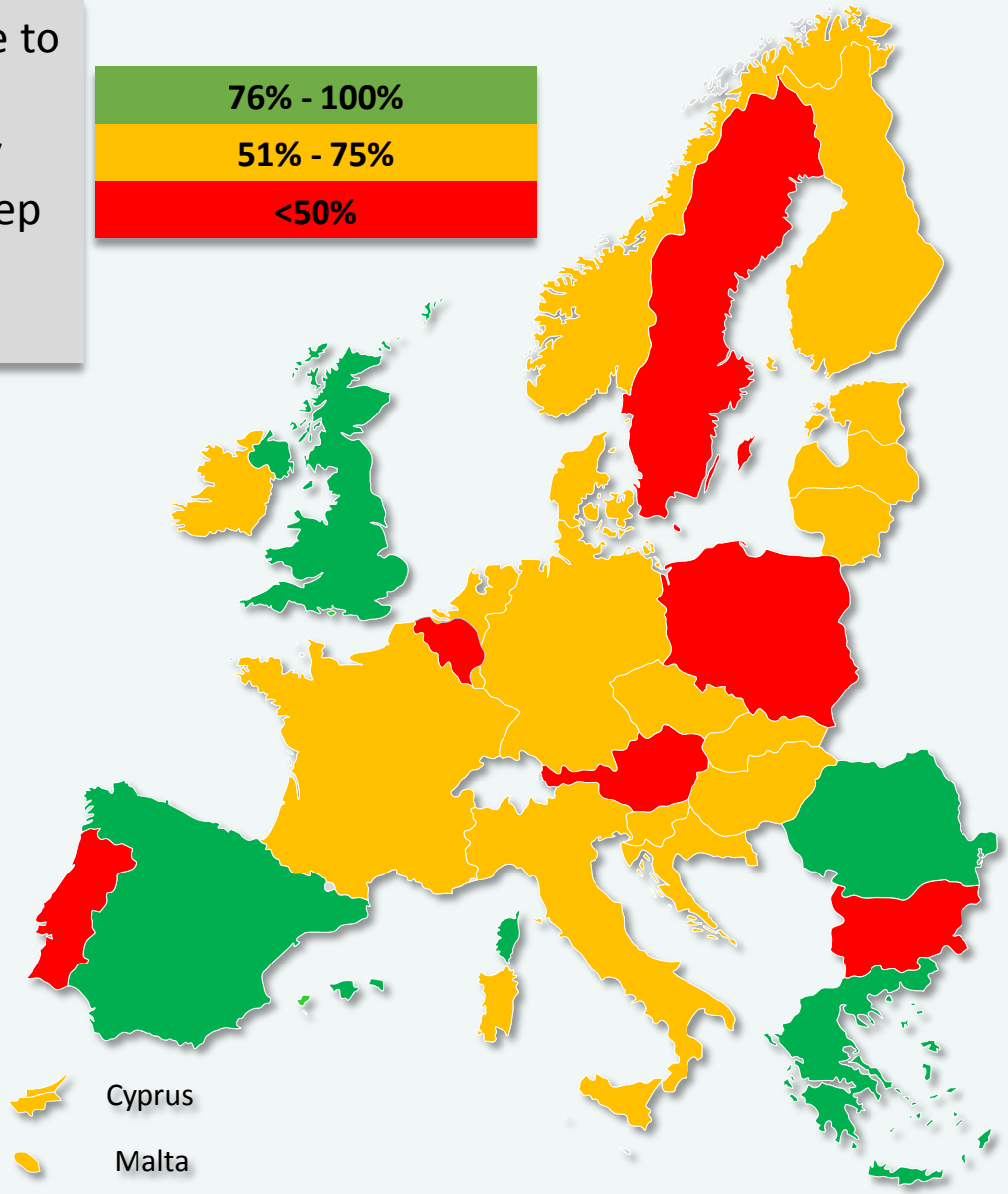
A STATUS REPORT ON COMPLIANCE WITH ARTICLE 4 OF THE ENERGY EFFICIENCY DIRECTIVE

BPIE

BPIE

EU Member States efforts on renovation

Level of compliance to issue a national renovation strategy which triggers a deep renovation of the building stock



Sources:
BPIE 2014
JRC 2016

BPIE

Cost-effective potentials to renovate in Europe – The example of Poland

BPIE's Poland activities

Buildings modernisation strategy: Roadmap 2050

Summary

KAPE BPIE pwc

FINANCING BUILDING ENERGY PERFORMANCE IMPROVEMENT IN POLAND

STATUS REPORT

BPIE

BPIE

The Polish building stock

Figure 1 – Distribution of residential floor area by building type (Source: Implementing Nearly Zero-Energy Buildings (NZEB) In Poland -Towards a Definition and Roadmap, BPIE, 2012)

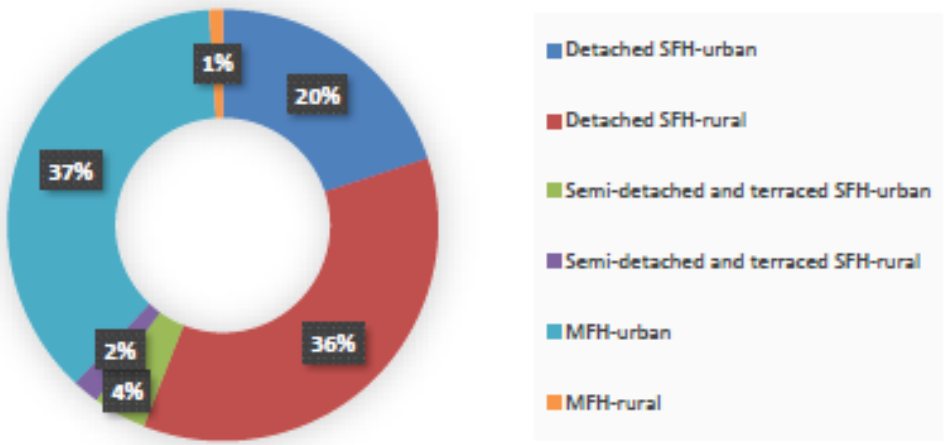
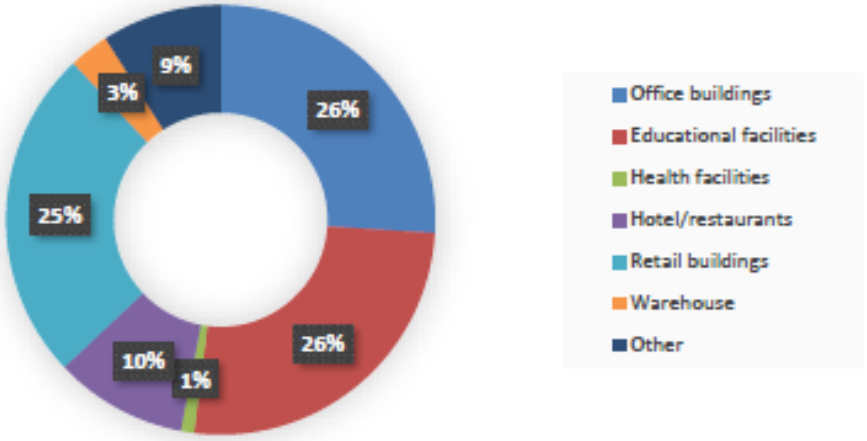


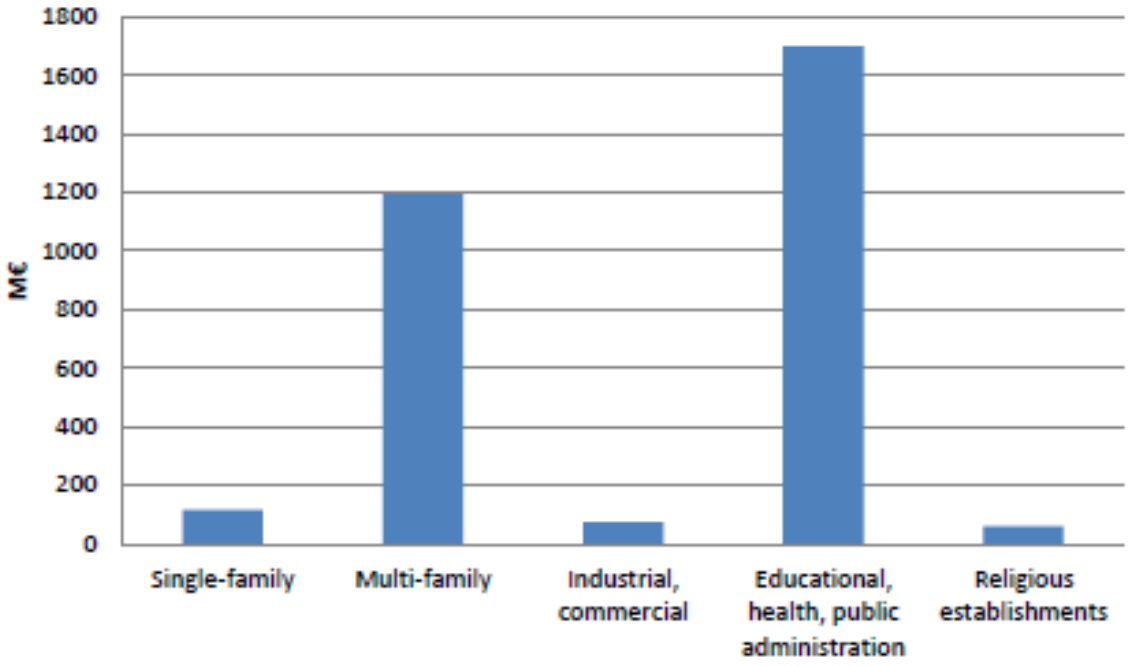
Figure 2 – Distribution of non-residential floor area by building type (Source: Implementing Nearly Zero-Energy Buildings (NZEB) In Poland -Towards a Definition and Roadmap, BPIE, 2012)



BPIE

The funding situation in Poland to improve the energy performance of buildings

Figure 11 – Mapping of existing funding until 2020 to the building typologies



BPIE

Renovation levels in Poland

Table 11 – Stages of building renovation (Source: Dz.U. 2008 no 223 poz. 1459 USTAWA z dnia 21 listopada 2008 r. o wspieraniu termomodernisacji i remontów oraz opracowanie własne)

Stages of building thermo-modernisation	Activities to achieve the desired degree of renovation
Light renovation	• Modernisation or replacement of heat source;
Medium renovation	• Modernisation or replacement of heat source together with: • Replacement of window and door joinery; or • Thermal insulation of a façade.
Complex renovation	• Total or partial replacement energy sources, the use of renewables or the use of high-efficiency cogeneration; • Replacement of the central heating and DHW with insulation (in accordance with current technical and construction regulations); • Replacement of external window and door joinery; • Insulation of the whole external envelope (façades, flat roof and the ceiling/ floor); • Repair of balconies.

BPIE

Renovation levels in Poland

Figure 7 – Grades of modernisation in residential buildings (Source: Bank Gospodarstwa Krajowego and NAPE own elaboration)

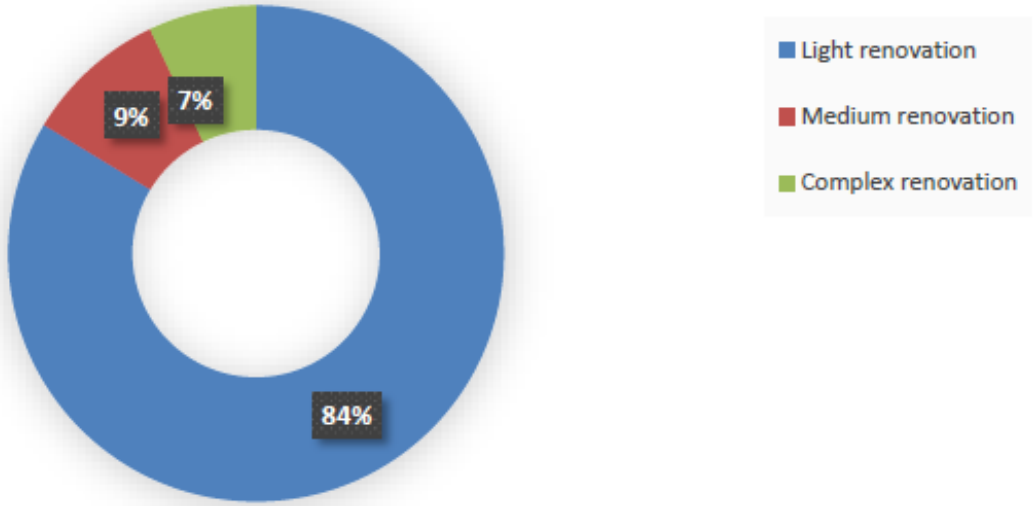
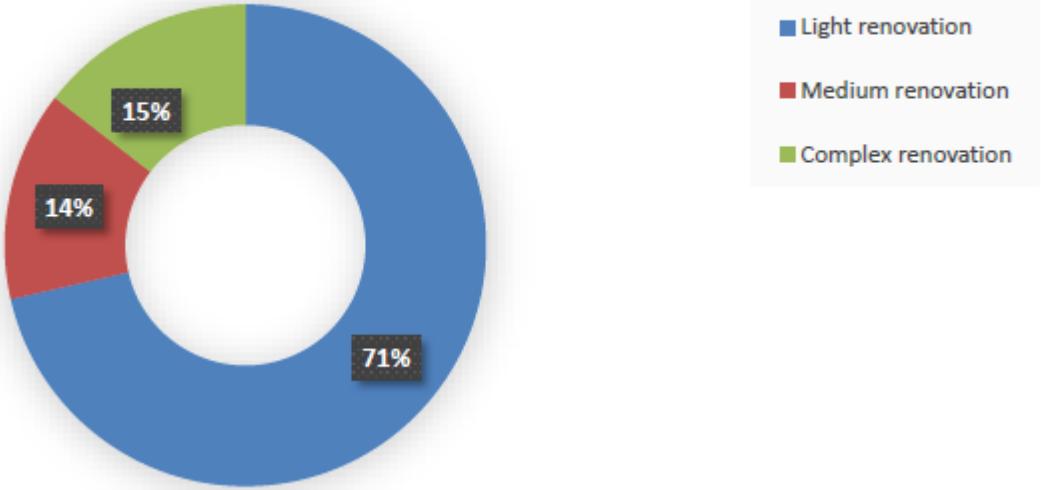
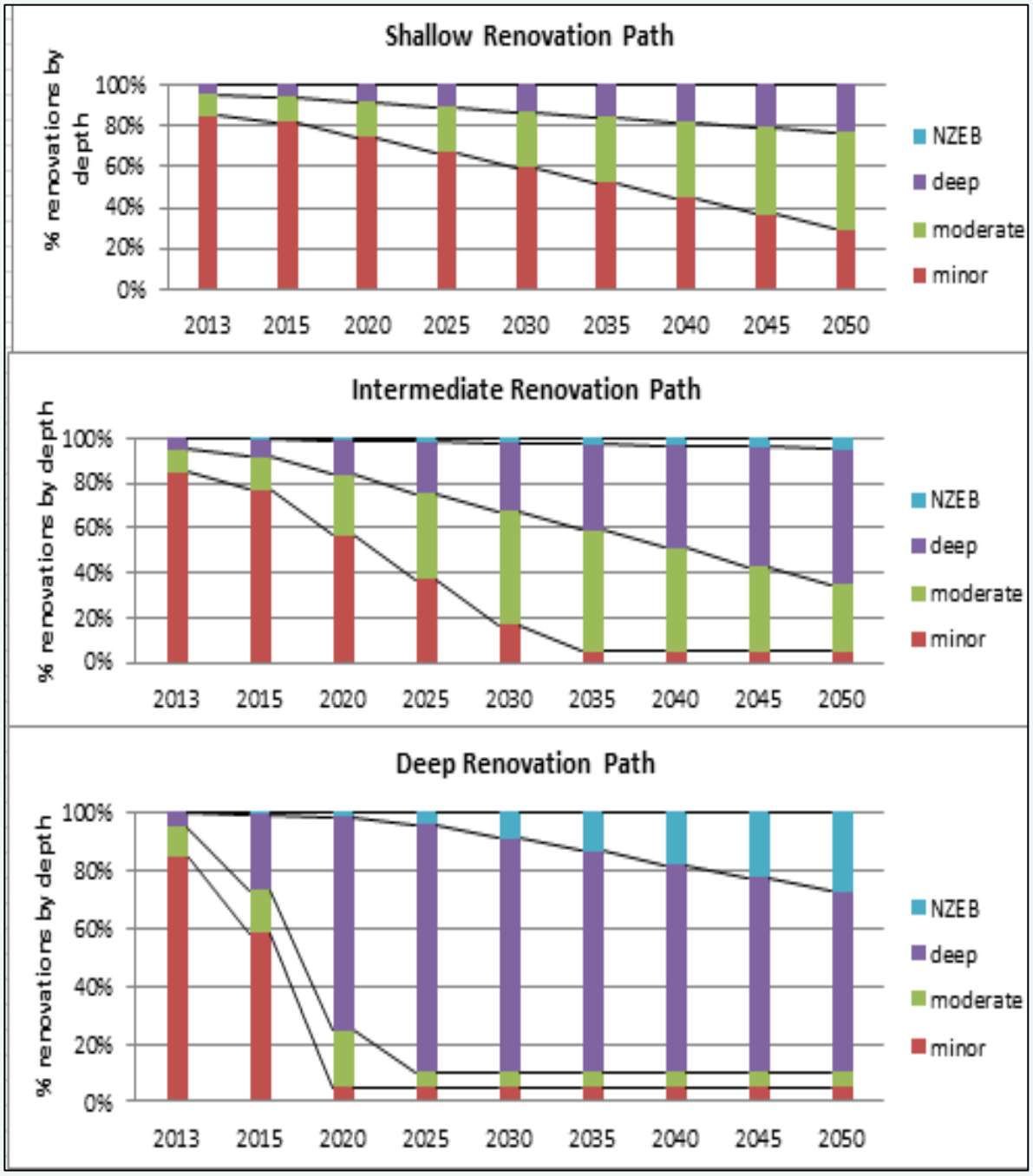


Figure 8 – Grades of modernisation in non-residential buildings (2006 to 2013) (Source: Bank Gospodarstwa Krajowego and NAPE own elaboration)



BPIE

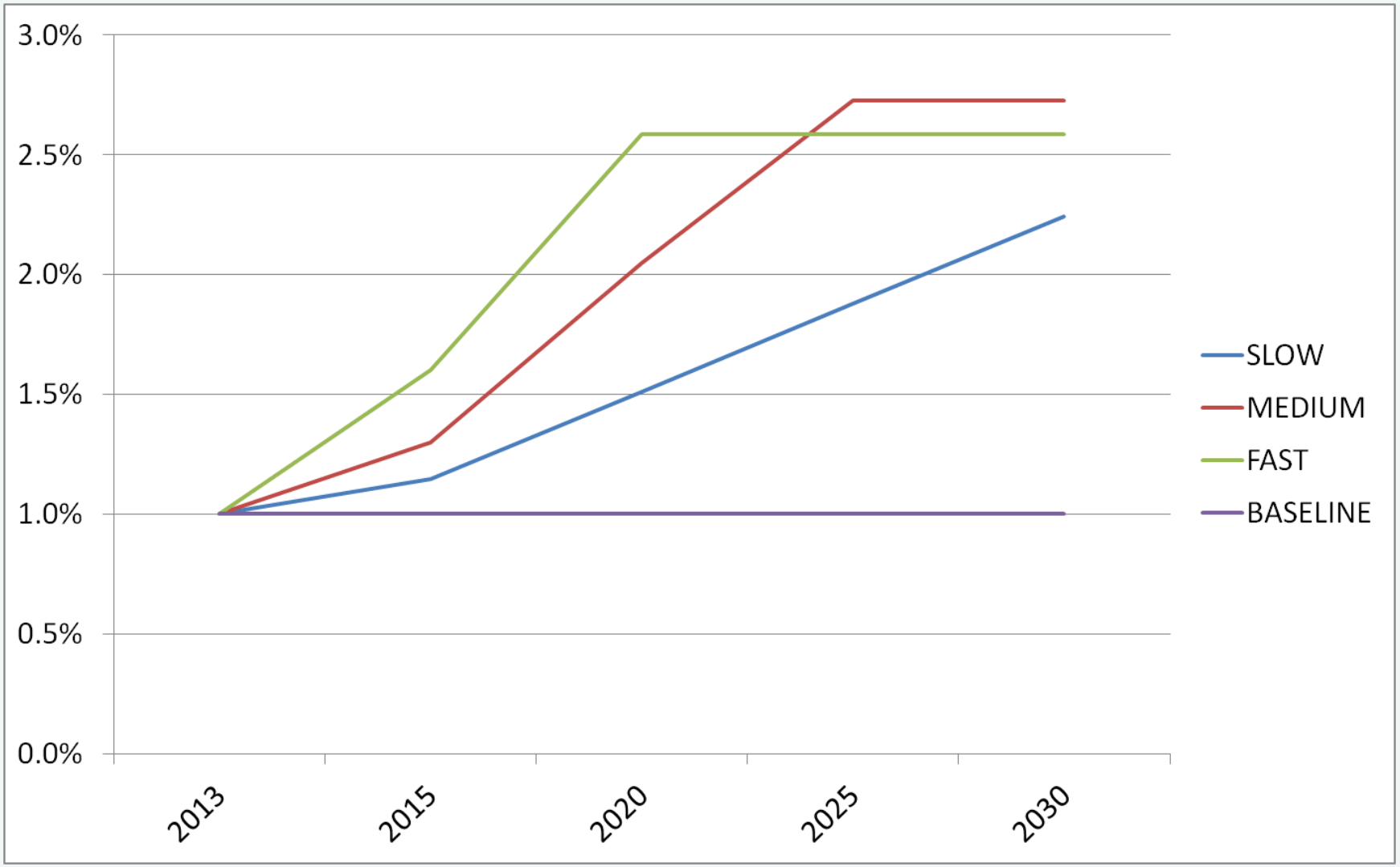


Renovation Depth

Type of Renovation	Energy saving	Renovation Cost zł/m2
minor	15%	170
moderate	45%	420
deep	75%	960
NZEB	95%	1670

BPIE

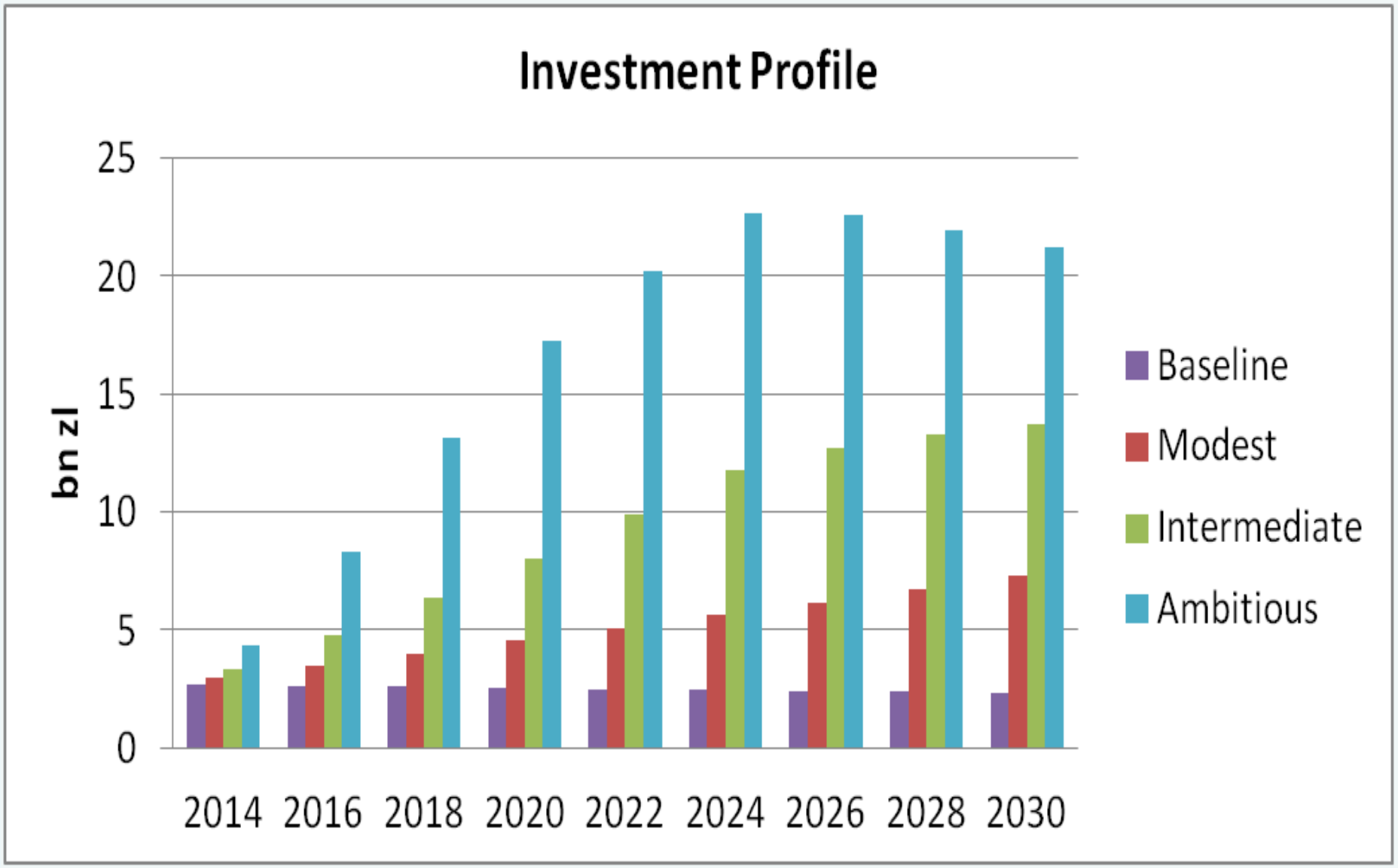
Renovation Rate - % floor area p.a.



RESULTS TO 2030

		Scenario			
Description	**Units**	**Baseline**	**Modest**	**Intermediate**	**Ambitious**
Annual Energy Saving in 2030	TWh/a	14	24	44	75
2030 saving as % of today	%	5%	8%	15%	26%
Investment Costs (present value)	bn zl	21	38	66	122
Savings (present value)	bn zl	38	59	107	185
Net saving to consumers	bn zl	17	21	41	63
Net saving to society - without externality	bn zl	159	262	496	828
Net saving to society - including externality	bn zl	177	291	550	920
Internal Rate of Return	IRR	15.1%	13.4%	13.9%	13.2%
DECARBONISATION					
Annual CO2 saving in 2030	MtCO2/a	9	54	59	65
2030 CO2 saved (% of 2010)	%	8%	49%	53%	59%
CO2 abatement cost	zl/tCO2	-272	-44	-81	-131
Average Annual Net Jobs Generated	thousand	18	36	65	119

BPIE


Investment Profile
bn zl
25
20
15
10
5
0
2014
2016
2018
2020
2022
2024
2026
2028
2030
Baseline
Modest
Intermediate
Ambitious

BPIE

What drivers for the renovation of Europe's building stock?

@BPIE_eu

SAFEGUARDING ENERGY SECURITY IN SOUTH-EAST EUROPE WITH INVESTMENT IN DEMAND-SIDE INFRASTRUCTURE

THE CASE FOR ENERGY EFFICIENCY IN BUILDINGS

BPIE

BPIE

Building Stock Vulnerability

	BVI	Vulnerability level
Albania	0	Not applicable
Bosnia & Herzegovina	5	Moderate
Bulgaria	12	Substantial
Croatia	4	Low
FYROM	5	Moderate
Greece	3	Low
Hungary	34	Severe
Kosovo	0	Not applicable
Montenegro	0	Not applicable
Romania	1	Low
Serbia	7	Moderate
Slovakia	39	Severe
Slovenia	6	Moderate

Scale:	N/A BVI = 0	Low 0 < BVI < 5	Moderate 5 < BVI < 10	Substantial 10 < BVI < 20	Severe 20 < BVI < 40	Critical BVI > 40

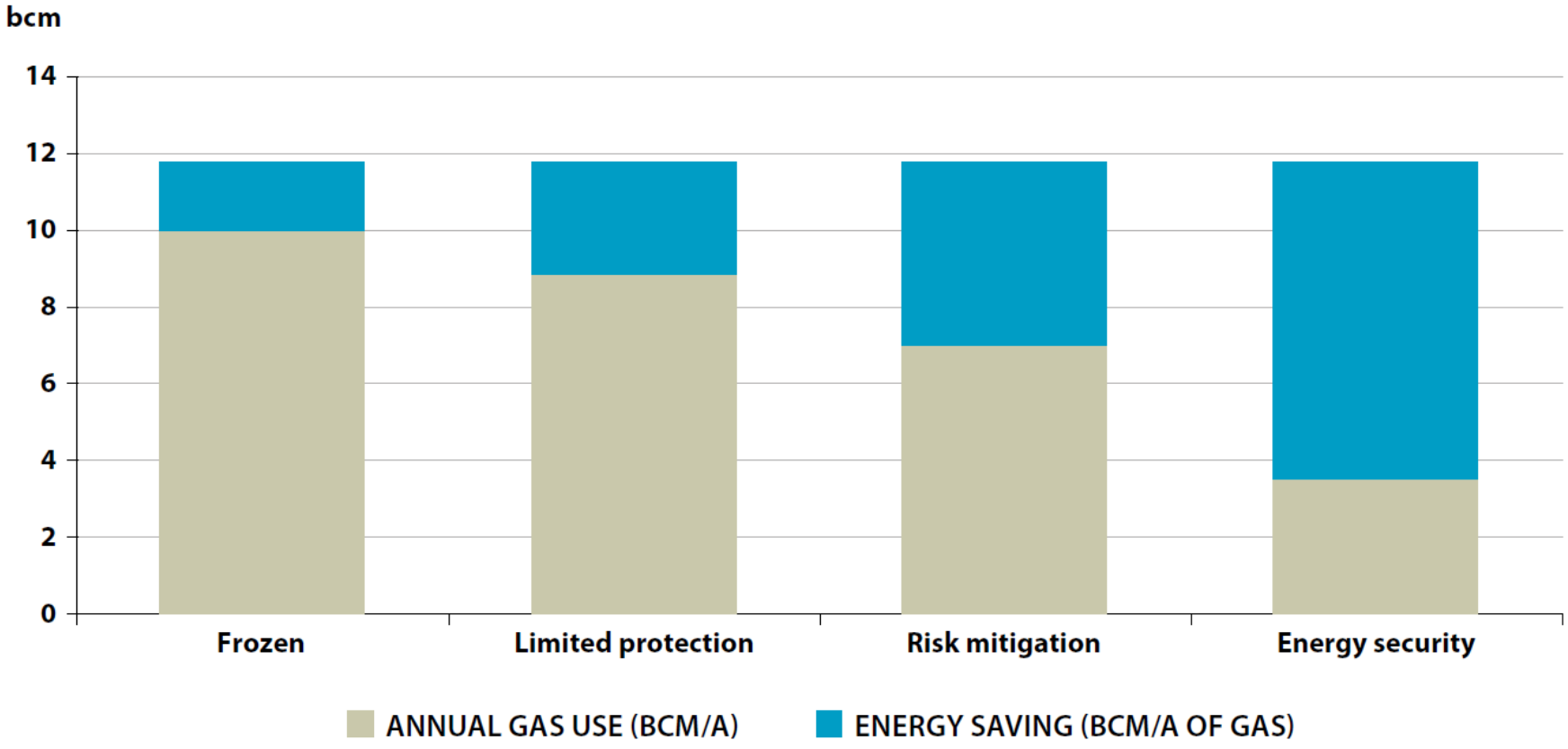
BPIE

@BPIE_eu

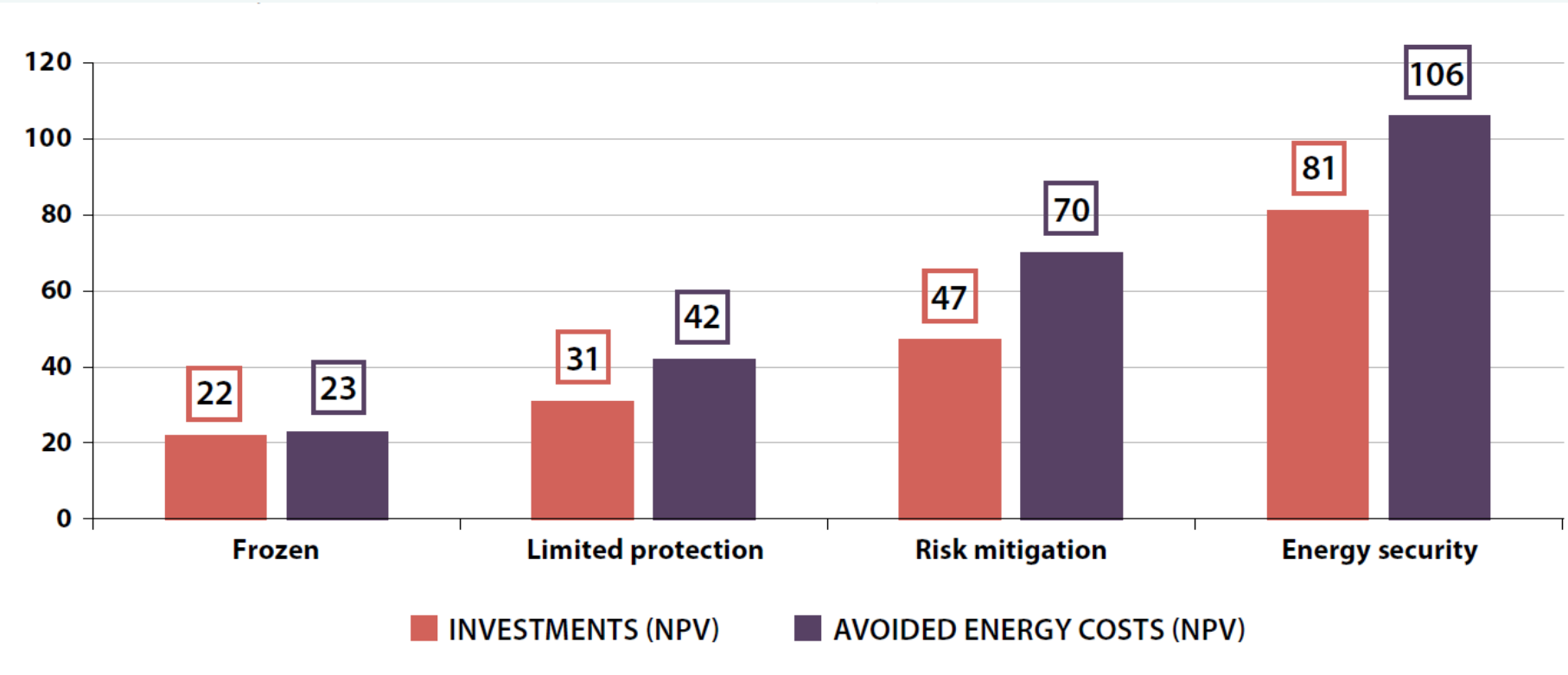
How to mitigate the risk?

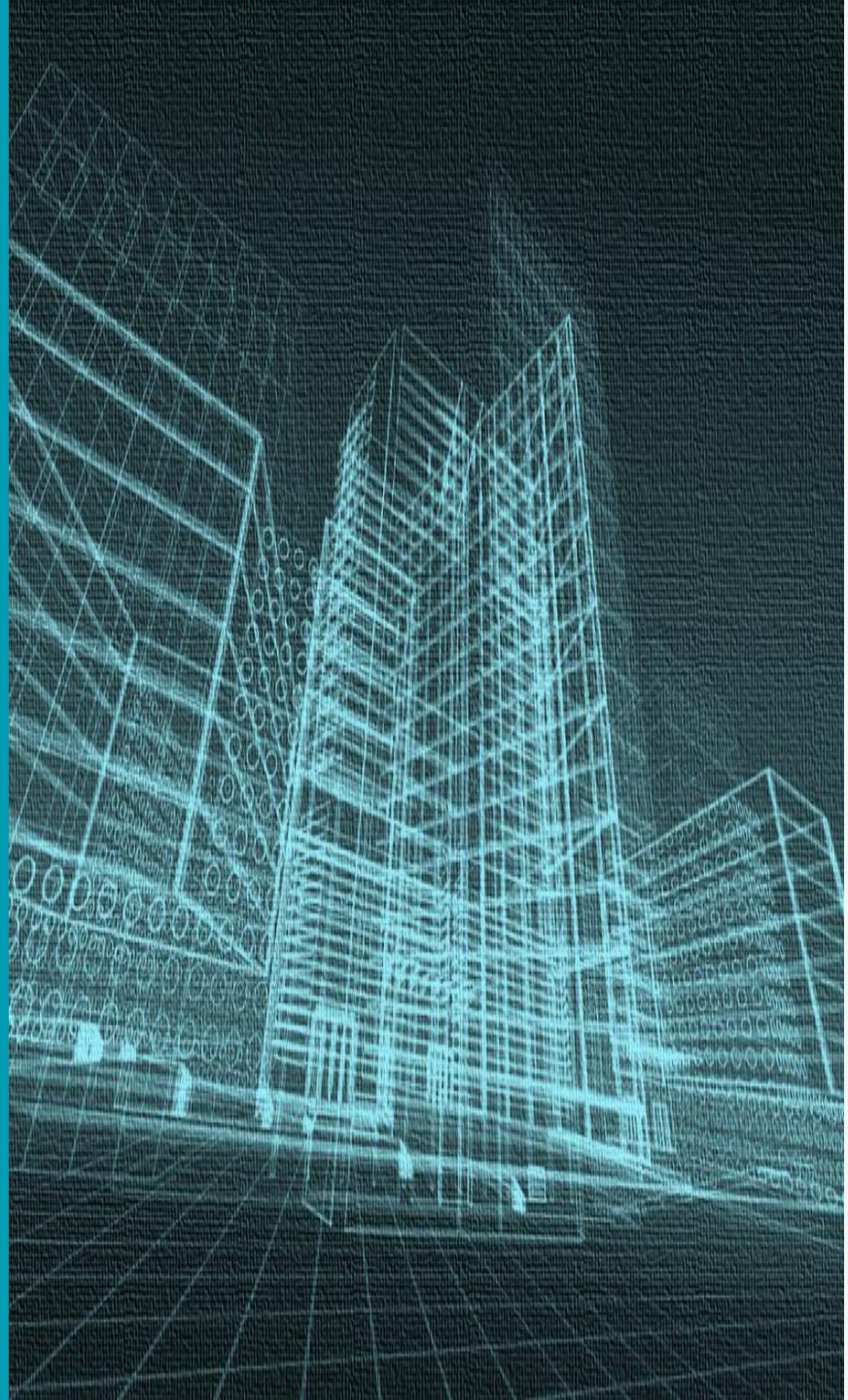
Four scenarios to reduce the vulnerability of the building stock

Gas demand in buildings reduced through energy efficiency measures



Estimated investment costs for deployment of energy efficiency and the corresponding avoided energy costs in €Billion





@BPIE_eu

Thank you for your attention!

Oliver Rapf
Executive Director

oliver.rapf@bpie.eu
www.bpie.eu

BPIE