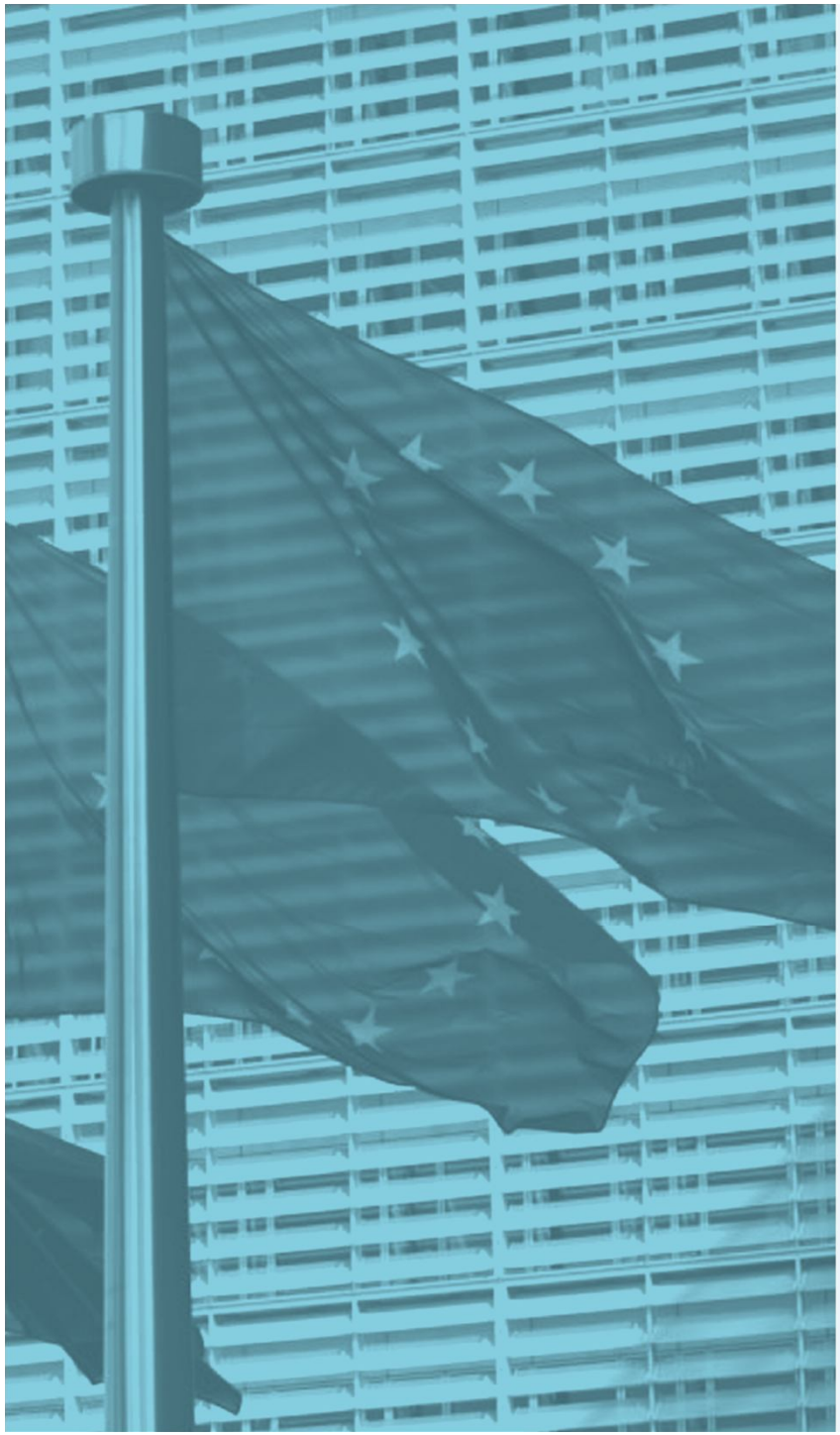


Europe's buildings under the microscope

Oliver Rapf
Executive Director

"Innovate to Renovate"

EU Sustainable Energy Week
Brussels 19 June 2012

BPIE

Buildings Performance Institute Europe

www.bpie.eu

- Non-profit association based in Brussels, created 2010
- Founders: ECF, ClimateWorks, eceee
- BPIE's mission is to improve the energy performance of buildings by:
  - Supporting the development of ambitious - yet pragmatic - buildings-related policies and programs at EU and member state level
  - Driving timely and efficient implementation by teaming-up with relevant stakeholders
  - Providing fact based analysis and knowledge, and sharing best practice globally through our network
- European center of Global Buildings Performance Network

BPIE

Our mission is to significantly reduce greenhouse gas emissions associated with building energy use by

Transforming
Policies and markets

Global Buildings Performance Network

Global Center

Conducting cross-cutting research and analysis

Connecting regional institutions, and share the best thinking building energy and GHG policy.

Communicating progress toward achieving the GHG abatement potential of the building sector

Harvesting best practices policies in building energy efficiency and performance.

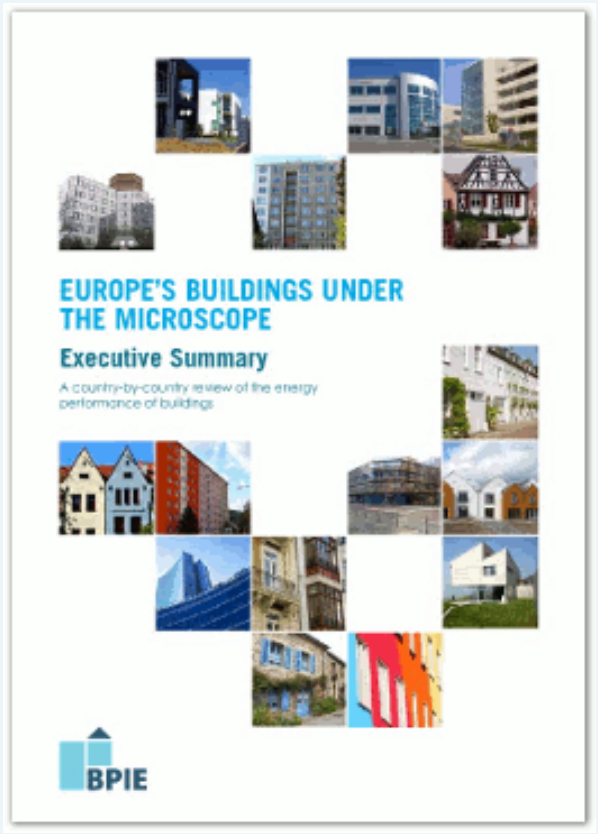
Advancing policies and programs that promote low carbon, energy & efficient buildings.

IMT

BPIE

Offering world class energy efficiency expertise to policy makers and business leaders

BPIE



EUROPE'S BUILDINGS UNDER THE MICROSCOPE

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The microscope study?

- Survey template covering legal, financial and technical information on the energy performance of buildings sent out to countries
- Countries covered: EU27, Norway and Switzerland
- Buildings covered: single and multi-family houses, offices, educational buildings, hospitals, hotels and restaurants, sports facilites and wholesale and retail trade buildings
- Picture of European building stock, Policies and Financial programmes, Renovation Scenarios
- 3 regions considered for data analysis and scenario modelling

North & West	AT, BE, CH, DE, DK, FI, FR, IE, LU, NL, NO, SE, UK	Population: 281 mil
Central & East	BG, CZ, EE, HU, LT, LV, PL, RO, SI, SK	Population: 102 mil
South	CY, EL, ES, IT, MT, PT	Population: 129 mil

Countries and regions considered and equivalent population

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EU Roadmap for moving towards a competitive low-carbon economy in 2050

GHG Reduction vs. 1990	2005	2030	2050
Total	-7%	-40 to -44%	-79 to -82%
Power	-7%	-54 to -68%	-93 to -99%
Industry	-20%	-34 to -40%	-83 to -87%
Transport	30%	+20 to -9%	-54 to -67%
Residential and Services	-12%	-37 to -53%	-88 to-91%
Agriculture	-20%	-36 to -37%	-42 to -49%
Other non-GHG emissions	-30%	-72 to -73%	-70 to -78%

High sectorial targets for the buildings sector!

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Model basic assumptions

Practical limit by 2050:

- Demolition rate considered (0,2% / yr.)
- Recent renovations excluded (only few, up to 1%)
- New buildings between 2011-2020 considered (0,5% / yr.)
- Additional adjustment

Building stock energy performance:

- By age bands
- By building types
- Residential; old buildings to be renovated first
- Non-residential

Cost assumptions:

- Discount rates: societal (3%), private (10%), public sector (5%)
- Learning curves
- Energy prices: Eurostat, PRIMES forecasts

Decarbonisation of the power sector- 2 pathways:

- BaU (approx. 0,5% / yr.)
- As requested by the Low-carbon economy Roadmap 2050 (approx. 5% p.a. for electricity and 2% for other fuels)

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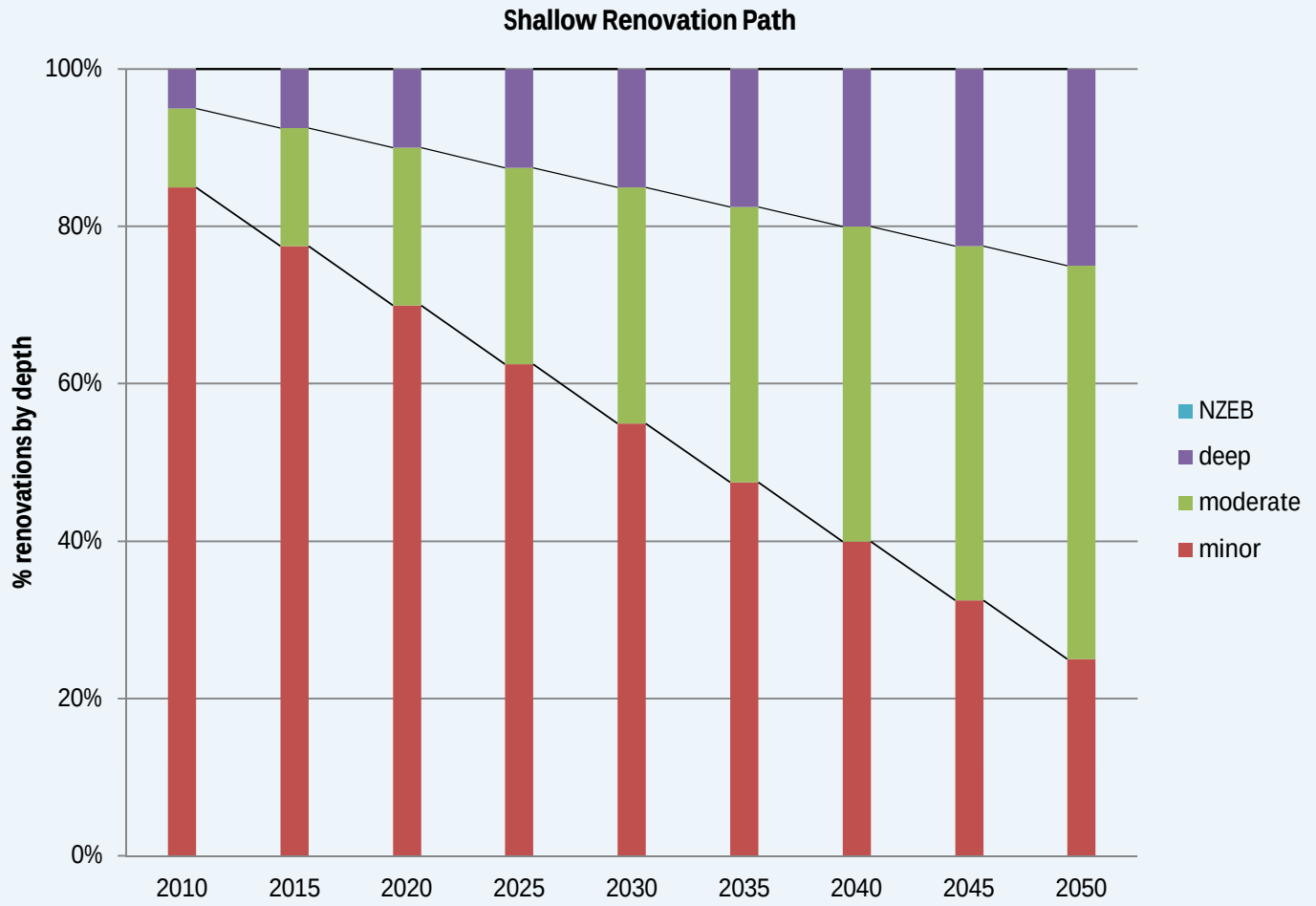
Renovation depths



-18% CO_2 by 2050

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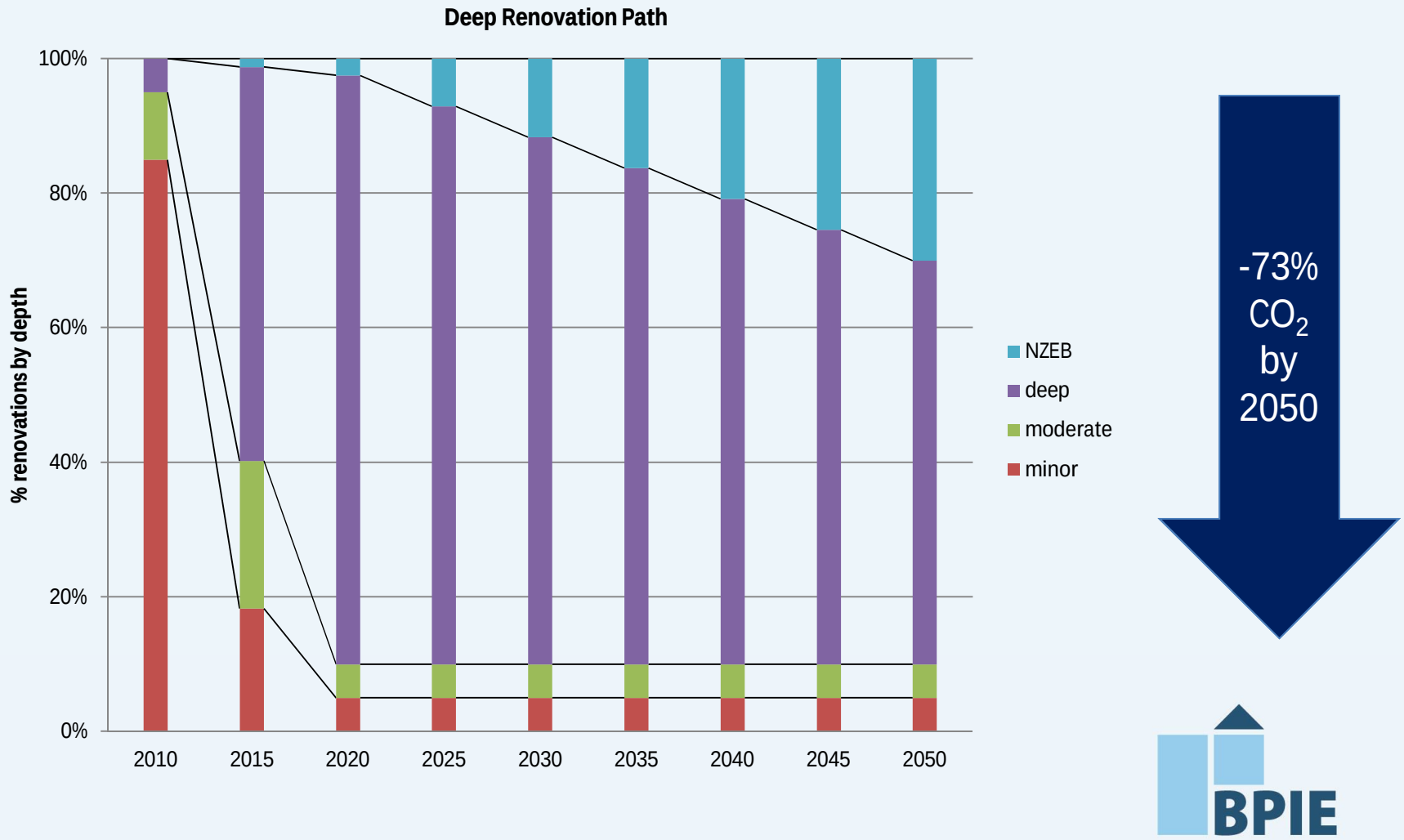
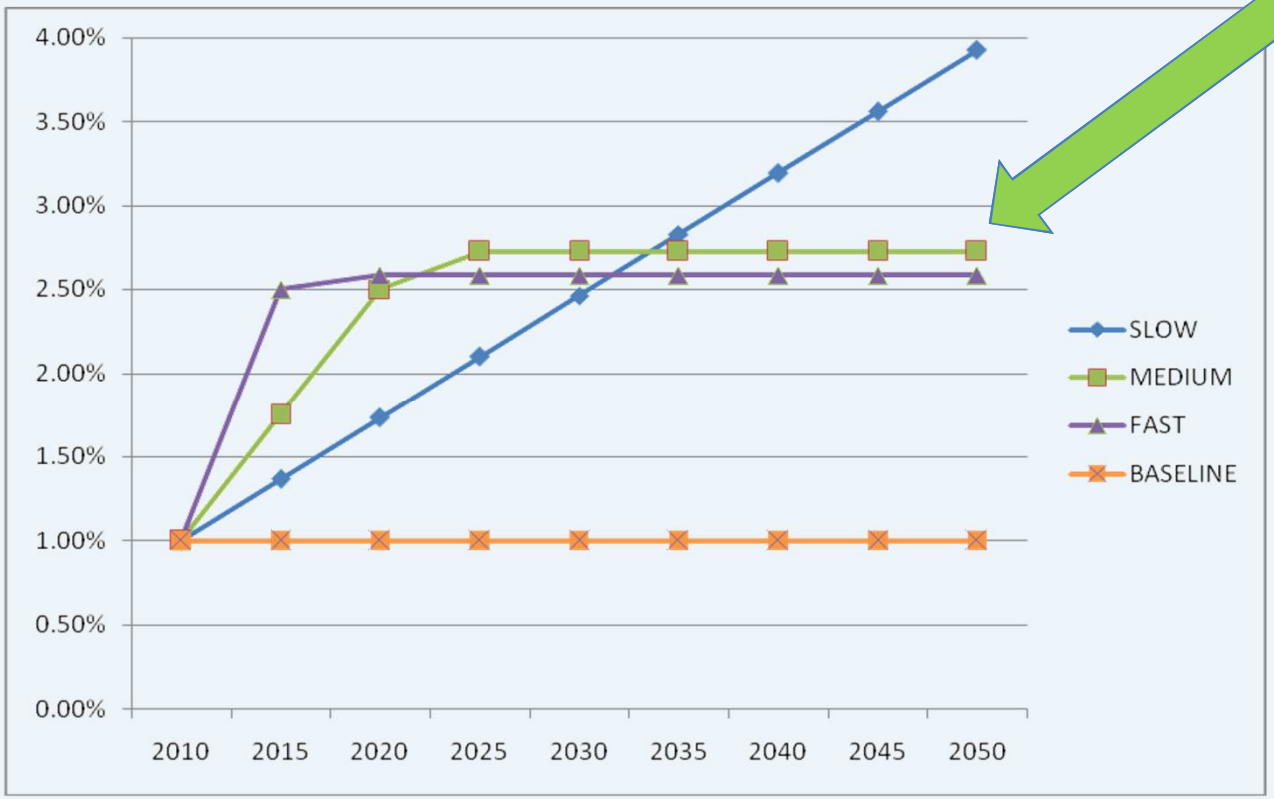
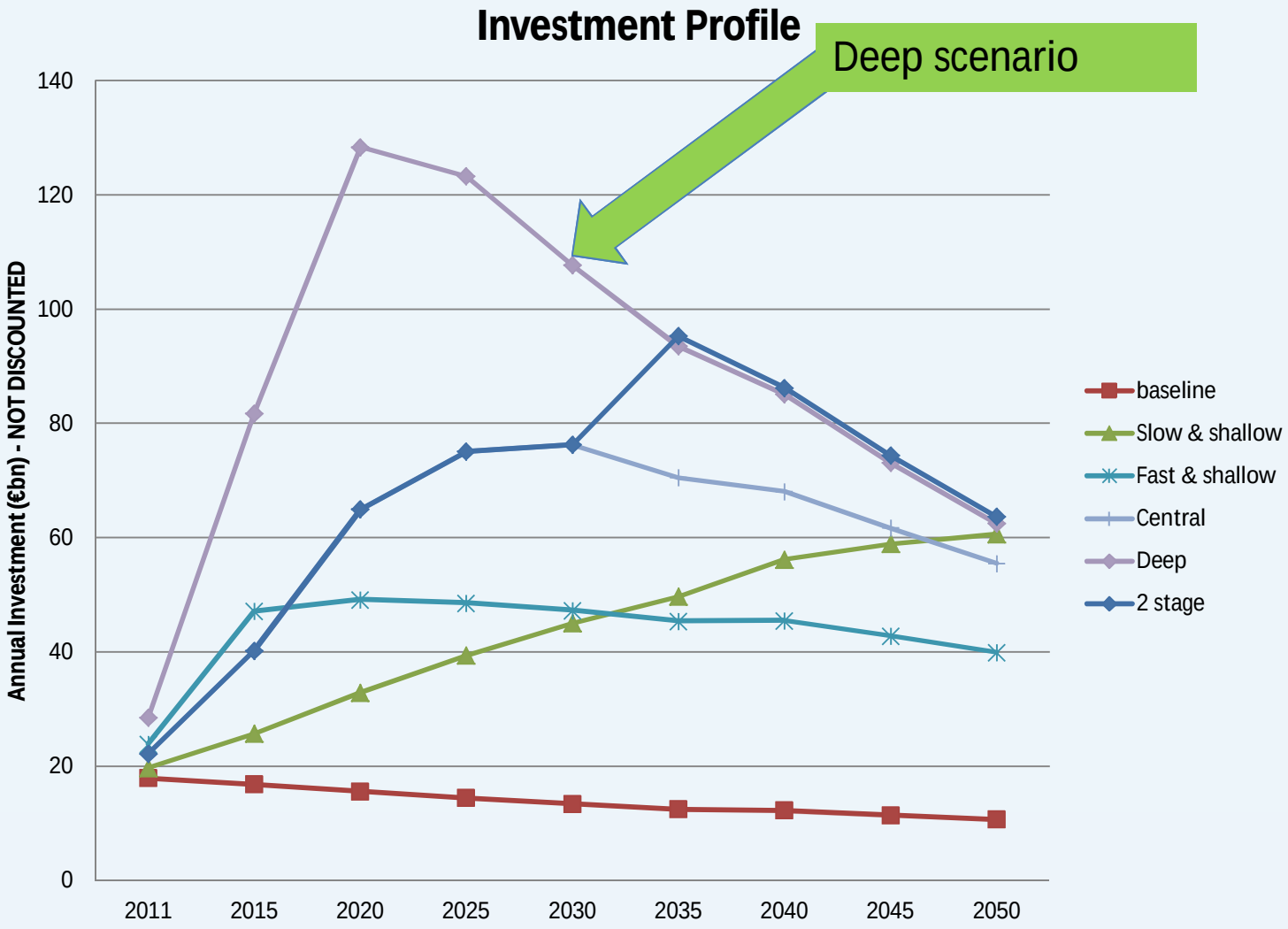
Renovation depths



Renovation speeds

Renovation rates profiles considered over time




Investment Profile
Deep scenario
Annual Investment (€bn) - NOT DISCOUNTED
140
120
100
80
60
40
20
0
2011
2015
2020
2025
2030
2035
2040
2045
2050
baseline
Slow & shallow
Fast & shallow
Central
Deep
2 stage

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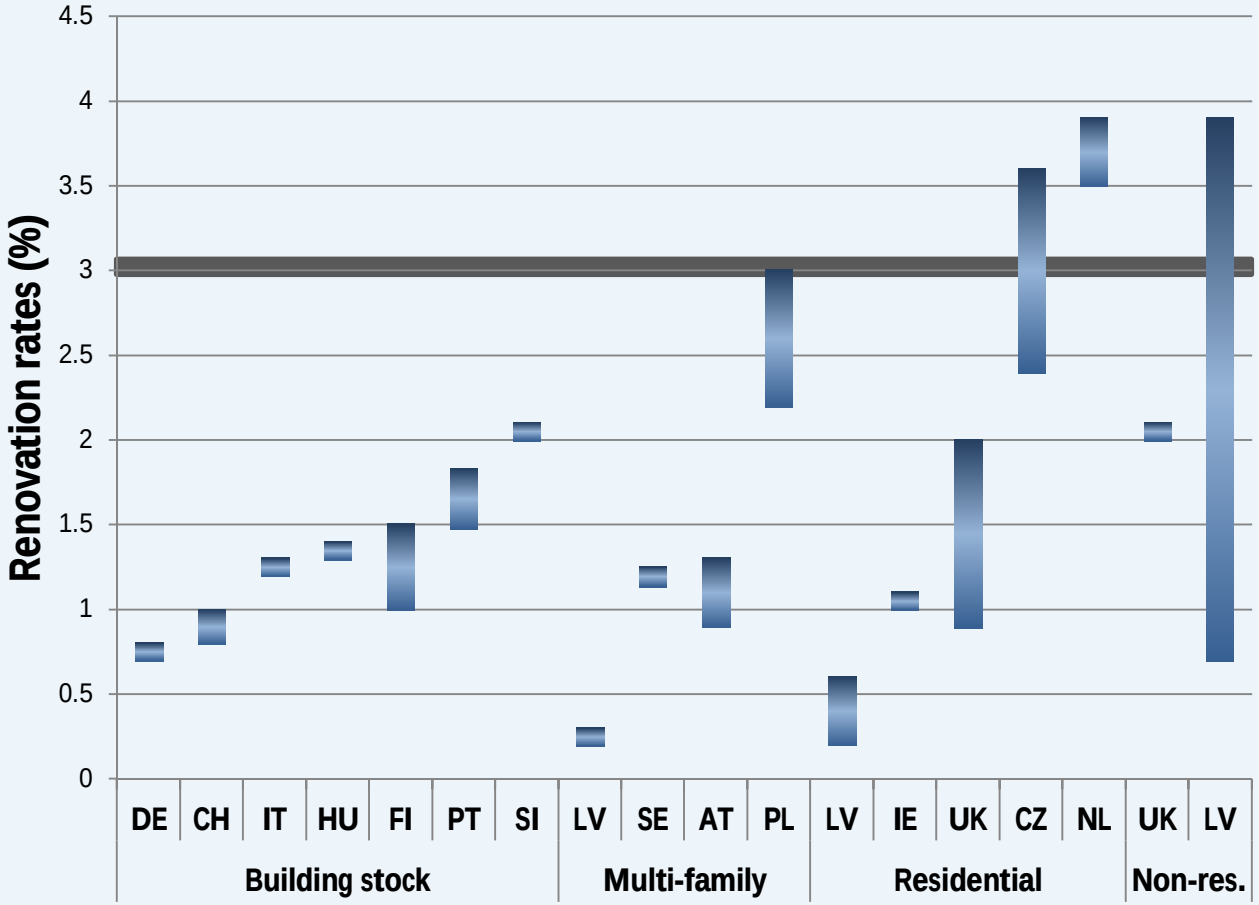
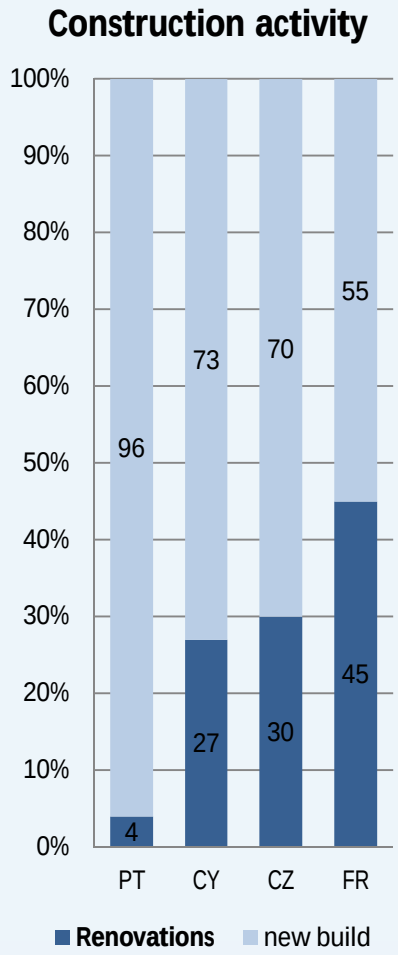
REALITY CHECK!

Annual renovation rates





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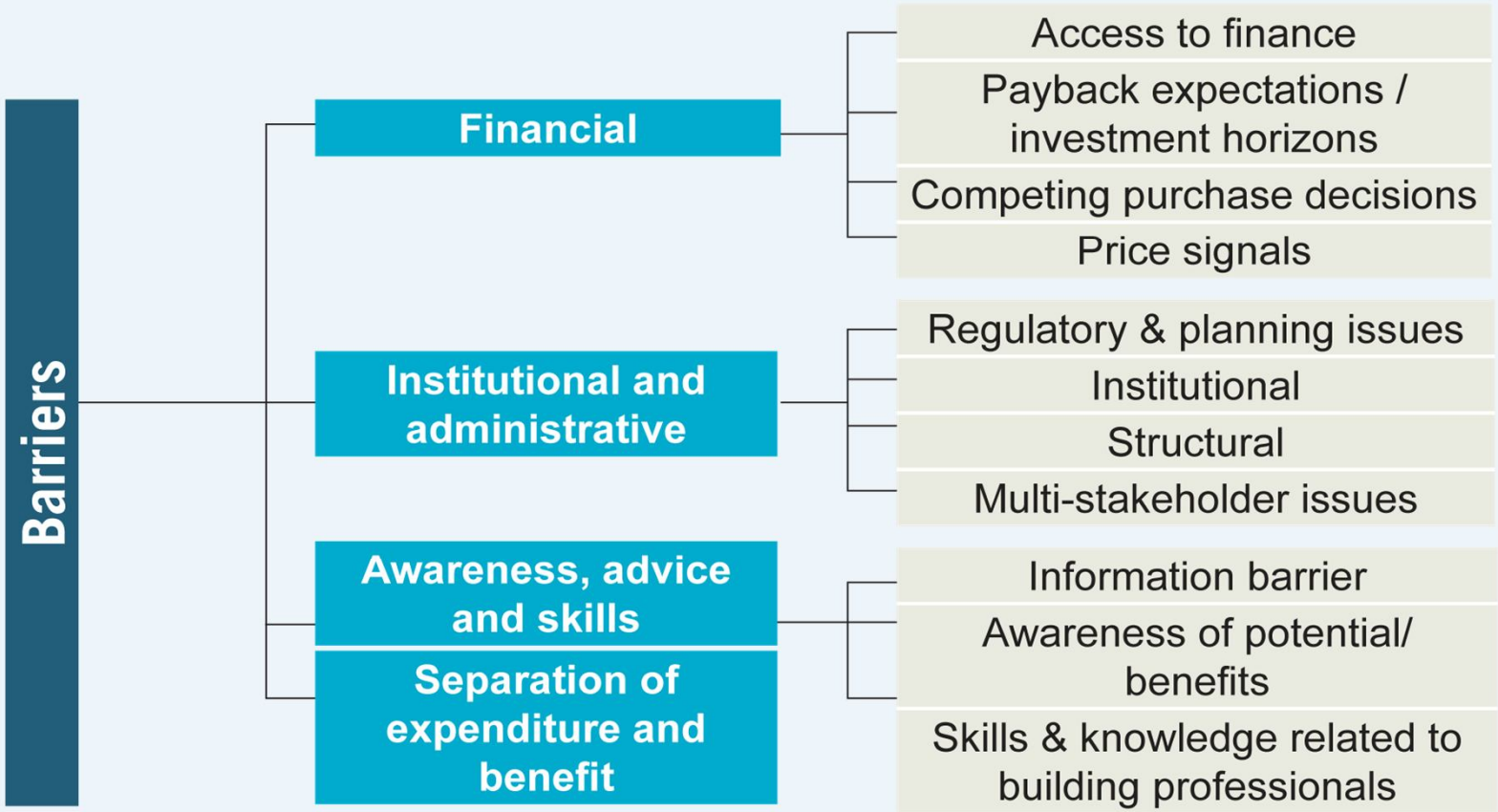
Identified barriers



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Energy performance requirements

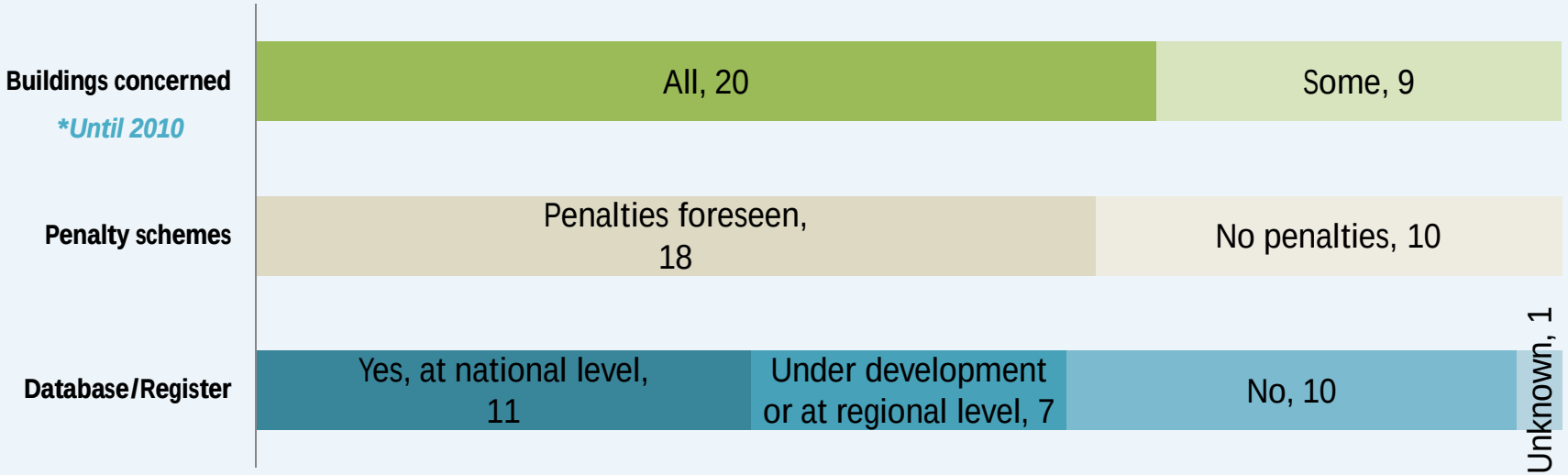
	Performance based requirements[1]				
	New build	Renov.		New build	Renov.
AT	✓	✓	HU	✓	✓
BE-Wl	✓	X	IE	✓	X
BE-Br	✓	X	IT	✓	✓
BE-Fl	✓	X	LT	✓	✓
BG	✓	✓	LV	X	X
CH	✓	✓	MT	X	X
CY	✓	✓	NL	✓	X
CZ	✓	✓	NO	✓	✓
DE	✓	X	PL	✓	✓
DK	✓	X	PT	✓	✓
EE	✓	✓	RO	X	X
EL	✓	✓	SE	✓	✓
ES	✓	✓	SI	✓	✓[3]
FI	✓	P[2]	SK	✓	✓
FR	✓	✓	UK	✓	✓

- The approach shifted from one typically expressed as a maximum permitted U-value to one based on overall building performance, including requirements for technical systems such as HVAC plant and lighting;
- Nearly all countries have adopted a national methodology setting performance/based requirements for new buildings
- In some cases, two approaches exist in parallel (e.g. NO, ES, PL, CH): 1st on holistic approach and 2nd on performance of single elements
- Many different approaches have been applied and no direct comparison can be made (see next slide)

All footnotes are listed under the table 2B6 in BPIE study Europe's buildings Under the Microscope

EPC schemes

Implementation status



Countries concerned: EU27, CH, NO

Existing EPC registers/databases have proven to be extremely useful in monitoring and analysing the opportunities for energy performance improvement.

In the longer term, they will also prove invaluable in assessing trends in energy performance.

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Financial instruments for EE in buildings

	Grants, Subsidies, Funds	Loans	Tax Incentives, Levies Etc	Obligations, white certificates	Audits	3rd Party finace, ESCOs	Other
AT	All		Households			Existing bldgs	
BE	All		Households & Business	Flanders region			
BG	Existing bldgs	Residential and Public bldgs	Class A or B new build				
CR	All	Public bldgs				Existing residential bldgs	
CY	All						
DK	Existing bldgs						
ES	Residential	Residential					
FI	All		Households		Existing non-residential		
FR	All	All	Households & Business	Existing buildings	Private sector		Feed-in tariff; training scheme
DE	All	Residential				Public buildings	Feed-in tariff
GR	Existing bldgs		Private sector				
HU	Existing bldgs		Planned				
IE	Residential		Business	Imminent			
Ita-ly	Existing bldgs	Existing bldgs	Households & Business	All		Yes	Feed-in tariff
LT	Existing bldgs						household renewable grants
LI	All						
LU	All	New homes					
MT	All						
NL	Residential	New private non-residential	Private sector				All
NO	All					All	
PL	Public sector	Existing bldgs		Planned			
PT	All		All				
RO	Residential bldgs						
SK	Existing bldgs	Existing bldgs					
SL	Private residential and Public non-residential	Private homes				Public residential	
ES	All	All	Households			Public sector	
SE	All		Households & Business				Technology procurement
CH	All		Households & Business				
UK	Existing bldgs	Residential	Households & Business	Residential		Public sector	Feed-in tariff

Summary of the current financial programmes in Europe

- About 333 financial schemes have been screened through the BPIE survey using several databases (among them MURE, IEA and input from each MS)
- Wide range of identified financial instruments, from grants to VAT reduction applied to all building typologies.
- Financial support varies considerably from around €1M/a to in excess of €1b/a. Larger programmes tend to be support for improvements of social housing.
- Many schemes targeting specific technologies, such as insulation, boiler scrapage, renewables, and also new passive buildings.
- Various forms of loans and taxes are usually available both for individuals as well as businesses
- Less popular schemes: audits, third party financing and energy supplier obligations/white certificate schemes (this could become mandatory across all EU MSs if the current proposal in the draft Energy Efficiency Directive is approved)

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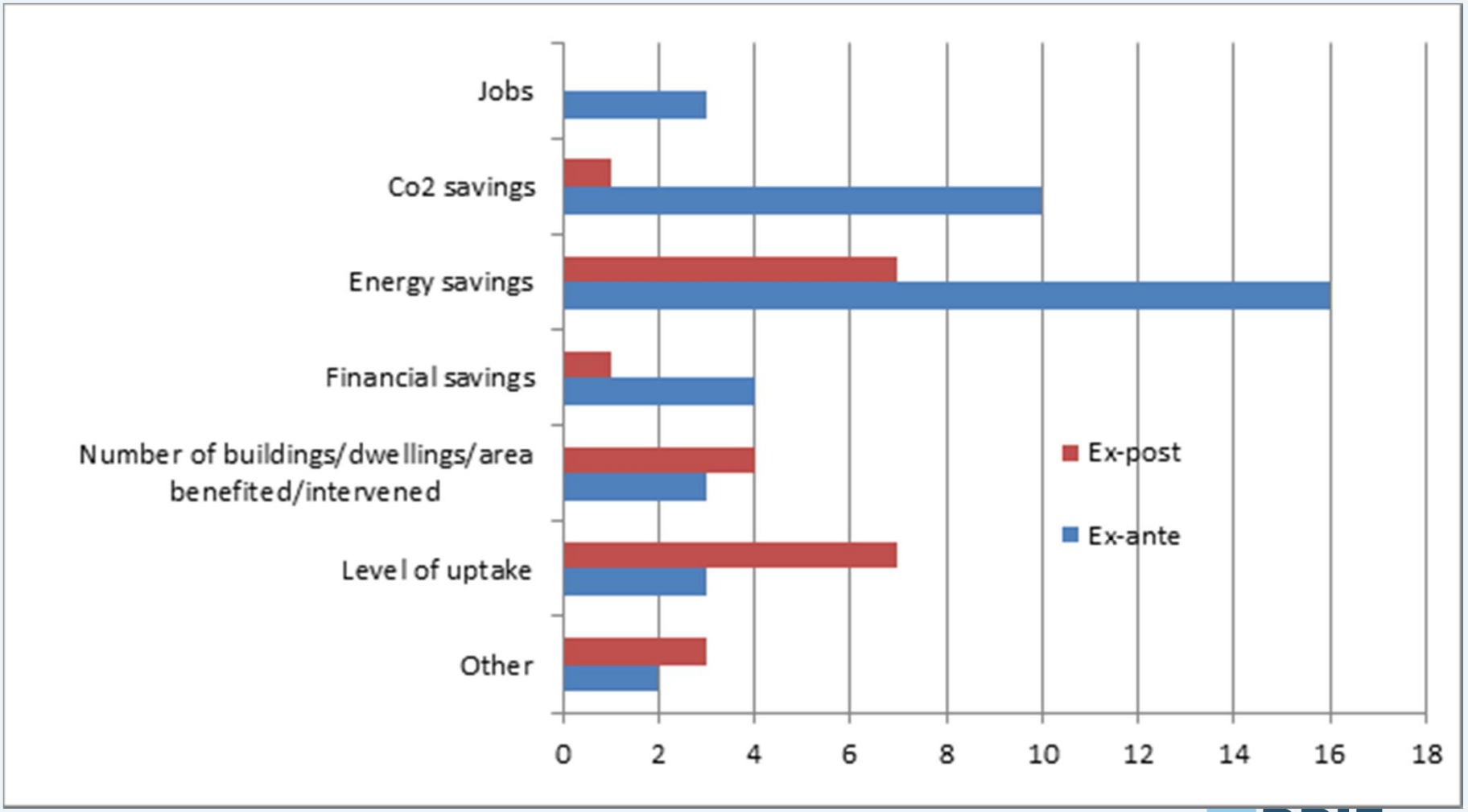
Impact Evaluation for financial programmes



Number of evaluations of financial programmes
Source: BPIE survey

Policy recommendations

- Need for a **reliable and continuous data collection**
- **Renovation roadmaps need to be ambitious and comprehensive in delivering a supporting framework for deep renovation**
- Financing tools that unlock private capital and institutional investors capital
- Better **Monitoring/compliance/enforcement and more ambitious Building Codes requirements** for renovation activities
- Strengthen the implementation of the **buildings energy certification and audit schemes**
- **Training & education** to improve the skills in the construction industry and in other related sectors
- R**emove market barriers and administrative bottlenecks, to further support the ESCOs and to develop a well-functioning energy services market**

Thank you for your attention!

Please check

www.bpie.eu

and

www.buildup.eu

for news and reports.

BUILD UP
energy solutions
for better buildings

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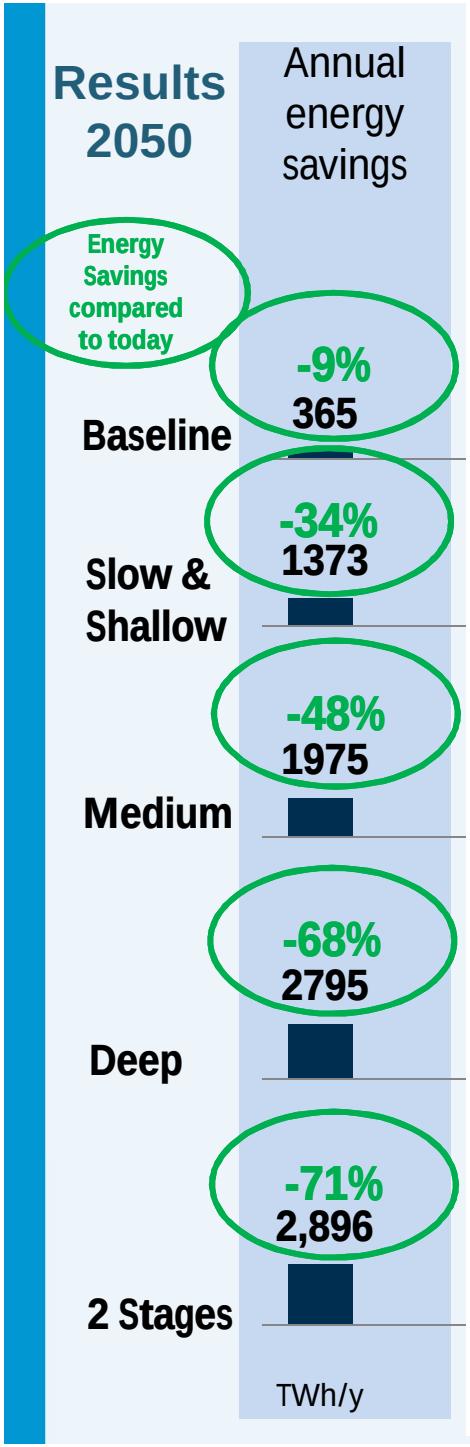
BACK UP Slide


Results 2050
Annual energy savings
Energy Savings compared to today
-9%
365
Baseline
-34%
1373
Slow & Shallow
-48%
1975
Medium
-68%
2795
Deep
-71%
2,896
2 Stages
TWh/y