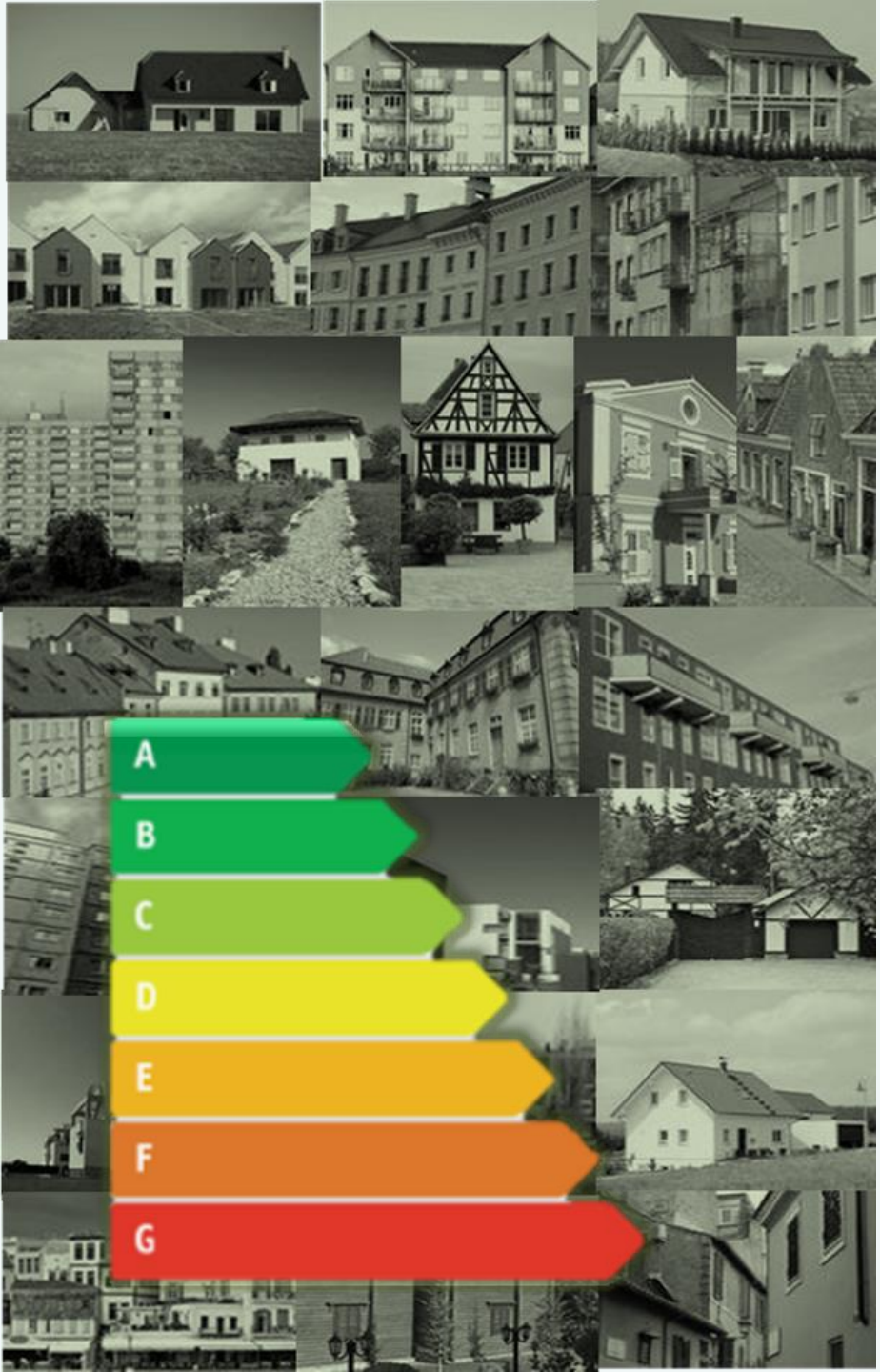


Modelling for what?

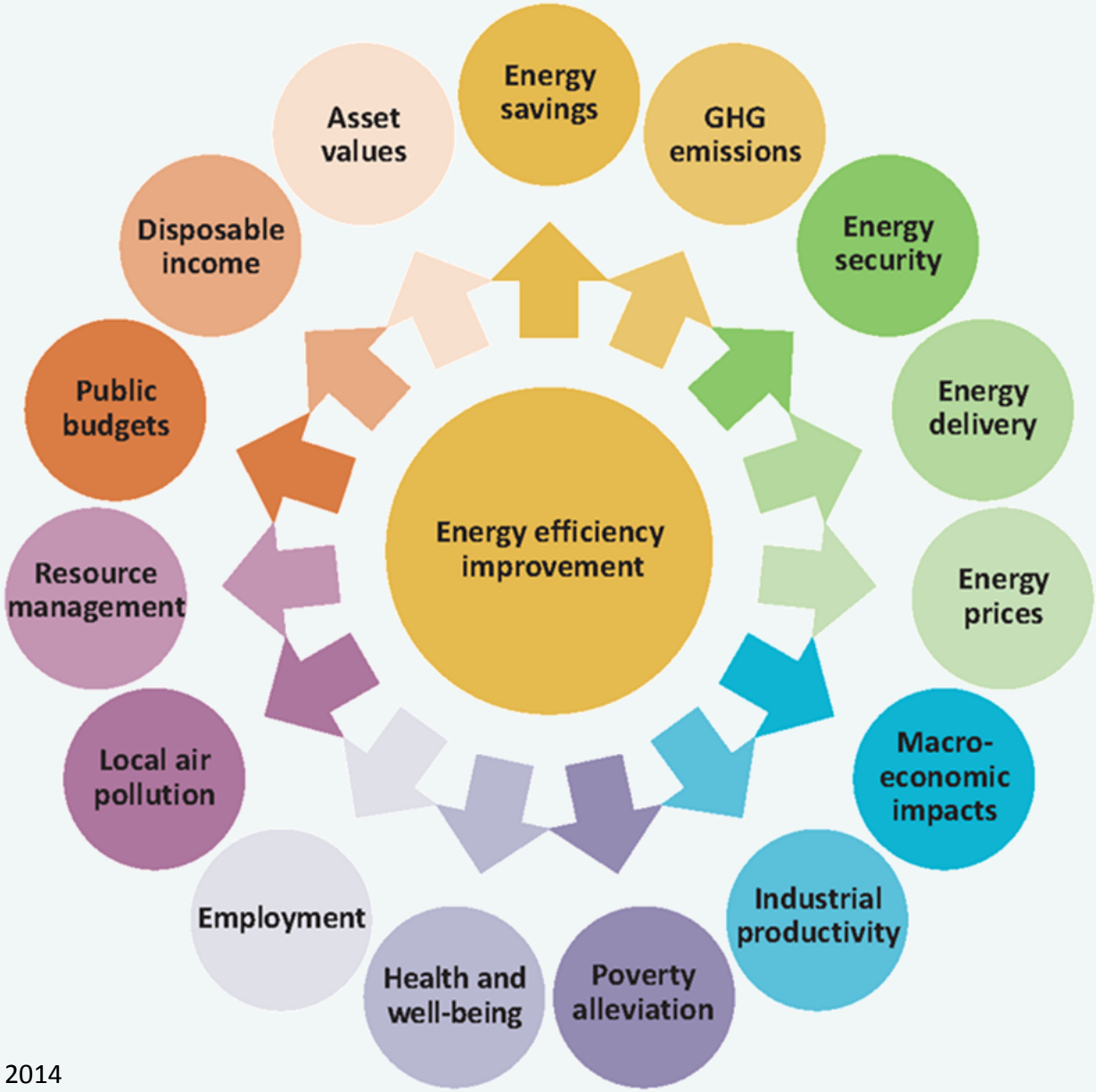
What do we need to convince skeptics that energy efficiency in buildings is…..

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A
B
C
D
E
F
G
PRESENTING . . . AGAIN MRS BAIRD TAKES THE LEAD!
THE NEWEST THING IN SLICED BREAD!
Now!
SLICED BREAD
"Stays Fresh Longer"
SLICED BREAD
MRS. BAIRD'S
WRAPPER NUMBER 1
INSIDE WRAPPER NUMBER 2
MRS. BAIRD'S New "DOUBL-WRAPPED" SLICED BREAD ... brings you the convenience of Sliced Bread and prevents "Drying-Out"

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All those benefits….



Source: IEA 2014

BPIE

…and so little integration!

Table 2.2 Overview of several macroeconomic models of energy efficiency impacts

Model name	Model type	Scope	Impacts
World Energy Model[A]	Partial equilibrium	Global	Energy prices and expenditures, investment
GINFORS[B]	Econometric	Global	GDP, employment, trade, CPI, distribution
E3ME[C]	Econometric	EU member states	GDP, employment, trade, CPI, distribution
ENV-Linkages[D]	CGE	Global	GDP, employment, trade and value-added by sector
ThreeME[E]	CGE	France	GDP, employment, trade, distribution, public budget
HMRC CGE model[F]	CGE and BCA	United Kingdom	GDP, employment, public budget
REMI[G]	CGE and I-O	Canadian provinces	GDP, employment, public budget
UKENVI[H]	CGE and I-O	United Kingdom	GDP, employment, trade, public budget, aggregate distribution effects, investment behaviour and sectoral activity levels
IKARIS[I]	Bottom-up buildings systems model with I-O	Germany	Public budgets, employment
3CSEP model[J]	Bottom-up buildings sector with I-O	Hungary	GDP, employment
Copenhagen Economics model[K]	PCGE/macroeconomic multipliers	Regional (EU)	GDP, employment, trade, CPI
PANTA RHEI[L]	I-O	Germany	Employment, trade, value-added, production
SEAI model[M]	BCA	Ireland	GDP, employment, public budget

Source: IEA 2014

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Individual barriers need to be taken into account: SFH

Table 13.2. Owner-occupied single-family homes: The most critical barriers in target countries

		AT	BG	CZ	DE	FI	FR	IT	RO	ES
Genuine uncertaint	Conflicting information, mistrust of information	■		■		■	■		■		■	
	Heterogeneous outcomes					■				■		
	Uncertainty in measurement & verification					■			■			
Financial barriers	High initial costs	■	■	■		■	■	■	■	■	■	■
	Long payback time	■		■		■	■	■	■	■	■	■
	Access to/cost of capital		■	■		■	■	■	■	■	■	■
	Unwillingness to incur debt	■		■	■	■	■		■	■	■	■
	Low/uncertain resale value of property					■	■					
Lack of information & skills	Lack of customer attention and interest	■		■		■						
	Lack of customer knowledge	■	■	■			■		■			
	Lack of reliable advice						■		■	■		
Transaction costs	Lack of skilled service providers	■						■	■	■		
	High information search costs	■				■	■	■	■			
	Switching costs, concerns over disruption	■										
	Risks of failures in renovation	■										

Source: Own compilation, see previous chapters

Source: www.entranze.eu

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Individual barriers…. Public Buildings

Table 13.5. Public buildings: The most critical barriers in target countries

		AT	BG	CZ	DE	FI	FR	IT	RO	ES
Genuine uncertaint	Conflicting information, mistrust of information			■					■	
	Heterogeneous outcomes					■		■	■	
	Uncertainty in measurement & verification						■	■		
Financial barriers	High initial costs	■	■	■	■	*	■	■	■	■
	Long payback time	■				■		■	■	■
	Access to/cost of capital		■	■	■	*	■	■	■	■
	Unwillingness to incur debt							■	■	
	Occupant take-back									
	Low/uncertain resale value of property					*				
Organi-zational problems	Landlord-tenant dilemma									
	Collective decision problems	■		■			■		■	
	Short timeframe of decisions			■		*				
	Public budgeting practices	■	■	■	■	■	■	■	■	■
Lack of information & skills	Lack of customer attention and interest		■			*			■	■
	Lack of customer knowledge			■		*	■			
	Lack of reliable advice					*			■	■
Transaction costs	Lack of skilled service providers	■				*			■	■
	High information search costs	■				*				
	Switching costs, concerns over disruption	■								
	Risks of failures in renovation	■								

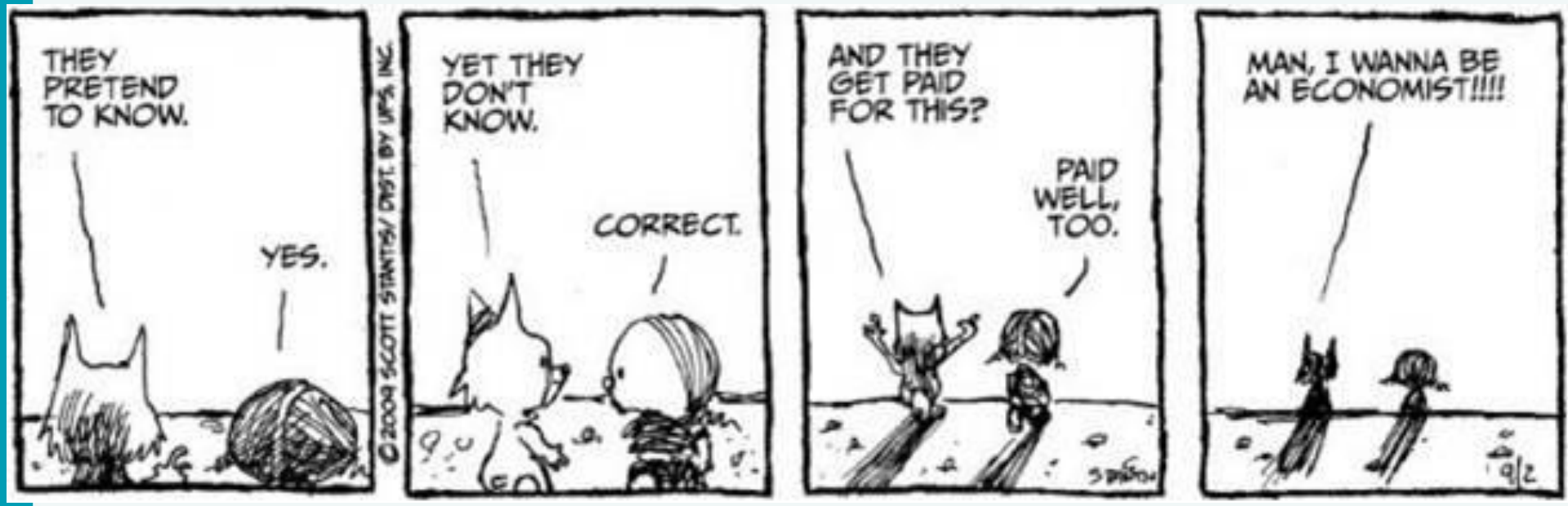
Source: Own compilation, see previous chapters

*= small municipalities

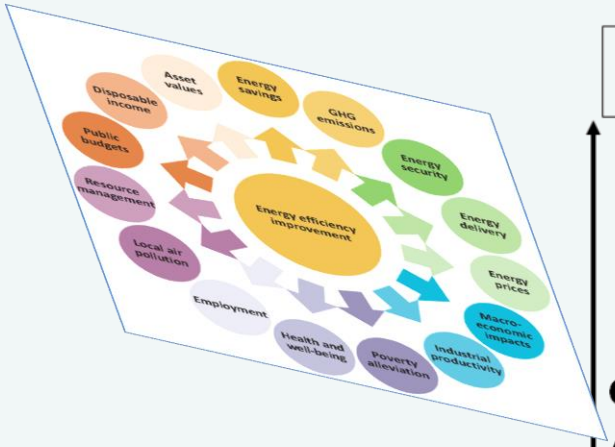
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Source: www.entranze.eu


MIND THE GAP


THEY PRETEND TO KNOW.
YES.
©2009 SCOTT STANTIS/ DIST. BY UFS, INC.
YET THEY DON'T KNOW.
CORRECT.
AND THEY GET PAID FOR THIS?
PAID WELL, TOO.
MAN, I WANNA BE AN ECONOMIST!!!!

Understanding the Decision Process: The Policy Funnel

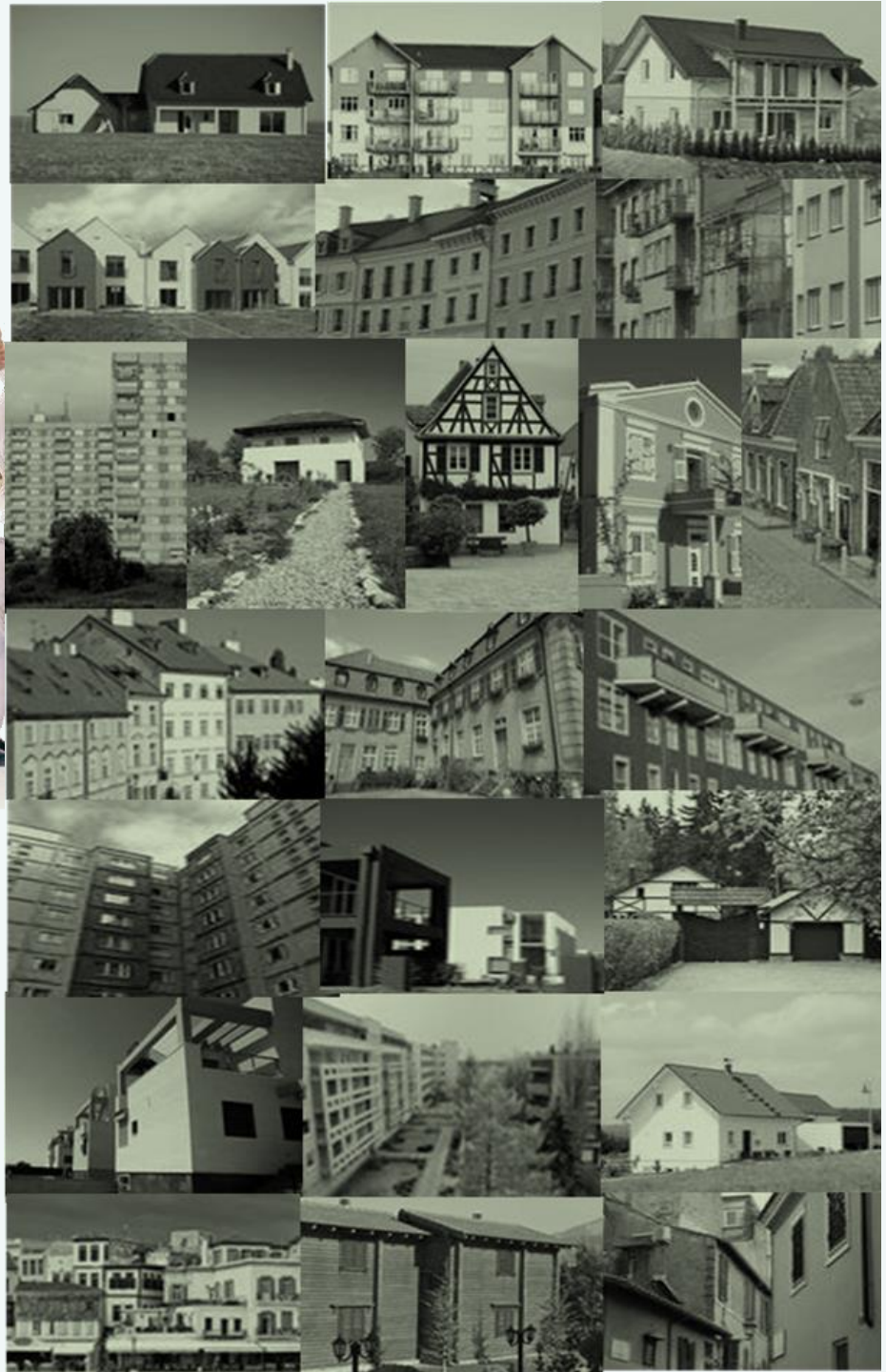


General Opinion	Public Debate	Policy Process	Final Decision
Concepts /agenda setting	Questions /Framing /instruments	Solutions/ Problems	$/ text
	Media and narrative, bearing witness	What Coalition? Power Analysis and lobby	Insider v Outsider

Room for manoeuvre falls, relative importance of internal players increases

Source: Oxfam, based on e3g





ENTRANZE Consortium



Energy Economics Group

TU WIEN TECHNISCHE UNIVERSITÄT WIEN Vienna University of Technology

BPIE

Öko-Institut e.V.
Institut für angewandte Ökologie
Institute for Applied Ecology

SOFENA

Enerdata

ADEME
Agence de l'Environnement et de la Maîtrise de l'Energie

Fraunhofer ISI

NATIONAL CONSUMER RESEARCH CENTRE

CENER NATIONAL RENEWABLE ENERGY CENTRE

eERG end-use Efficiency Research Group
Gruppo di ricerca sull'efficienza negli usi finali dell'energia

POLITECNICO MILANO

SEVEn

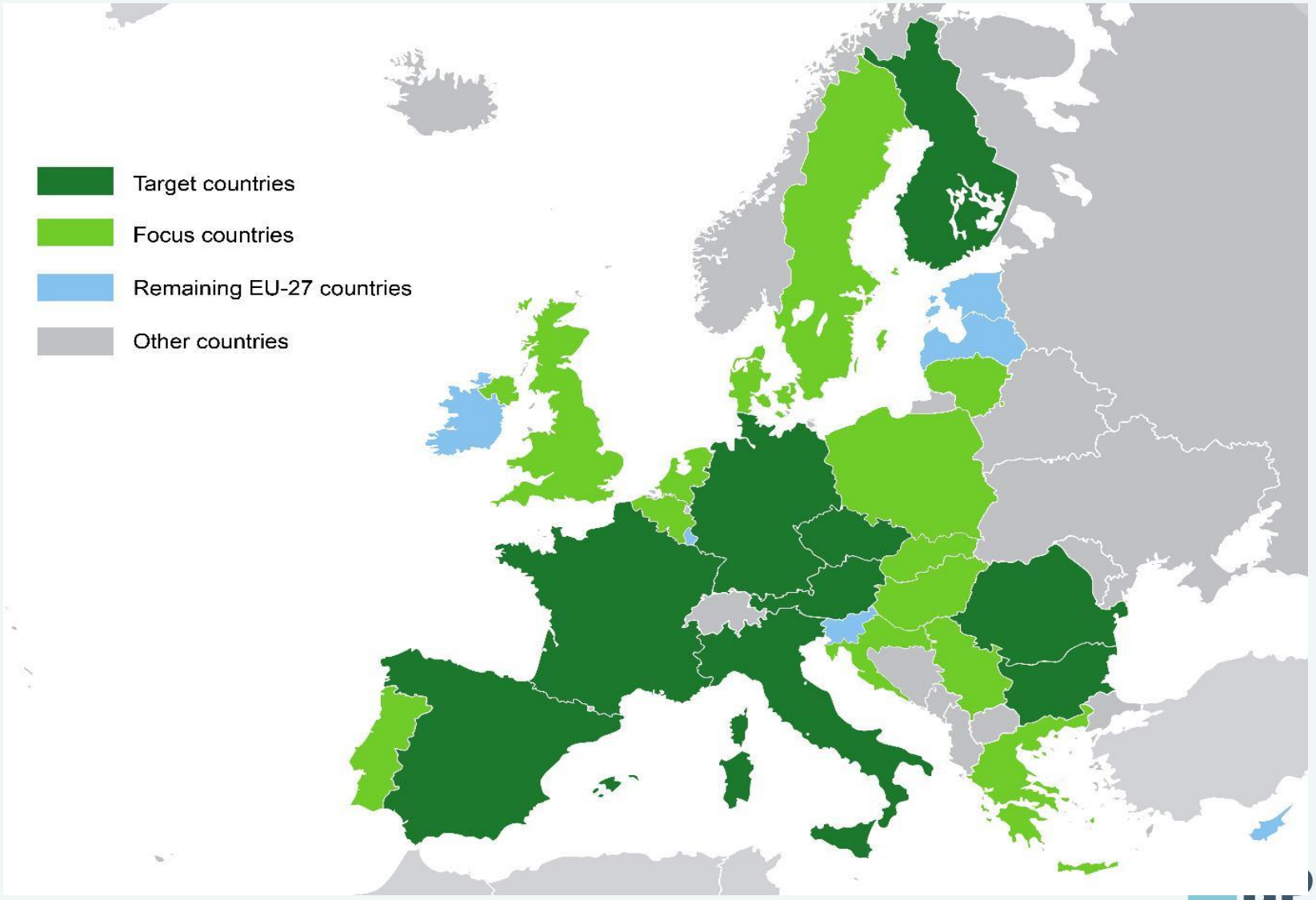
Co-funded by the Intelligent Energy Europe Programme of the European Union

ENTRANZE duration: April 2012-September 2014

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ENTRANZE Regional Coverage



„Entranze as a laboratory for buildings policy “: Methodology

April 2012

- ✓ **Assessment of current policy status:** existing policies and regulations, implementation of cost-optimality and nZEB, support economic programs, cross-countries analysis
- ✓ **Assessment of behavioral aspects:** decision criteria for renovation, acceptance of nZEB technology
- ✓ **Assessment of the existing building stock:** no. of dwellings by type and, energy consumption by dwelling type and by energy carriers, occupancy etc.
- ✓ **Assessment of market costs** for technology, materials, workforce, taxes and fees
- ✓ **Cost-optimal calculation and identification of renovation packages**
- ✓ **Definition of policy sets and scenarios by 2030 tailored on each focus country –** in close cooperation to national policy makers and stakeholders
- ✓ **Modelling of policy sets scenarios for moving towards nZEB** based on INVERT/EE-Lab model of TU Wien
- ✓ **Analysis of modeling results and findings. Policy recommendations for moving to nZEB**

Sept. 2014

Available at www.entranze.eu: targeted reports, buildings data-tool, cost-optimal tool, **policy scenario tool**

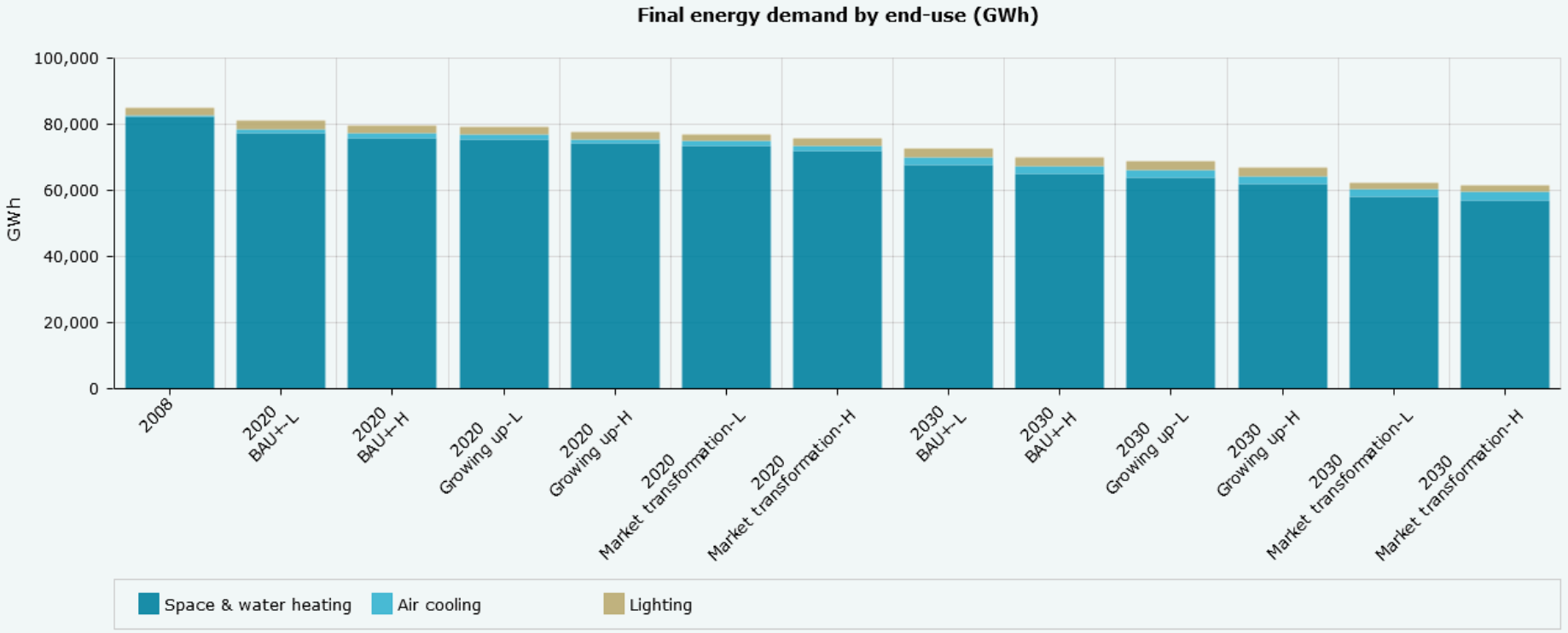
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Ex: policy sets for Romania

Policy Sets (PS)	PS1 Bau	PS2 Growing-up	PS3 Market transformation
Regulations	Slight but constant increase of EP regulations	Moderate and constant increase of EP regulations	Ambitious and constant increase of EP regulations
Economic support programs	Same programs as today will continue on same rules; however multi-annual budgets	Programs shifting gradually to more loans; multi-annual increased budgets	Programs shifting to mainly loans; credit line for owners co-financing, multi-annual budgets
Information, awareness advice, capacity building	Same level of info and advice (i.e. only on implementing programs)	Increased level of info and awareness, advice (through municipalities) but mainly in cities	Significant awareness, advice (through municipalities, agencies, guidelines) in the whole country
Capacity building, skills	Low qualification, low compliance (approx. 50%)	Slow improvement of compliance (60%) and quality of work	Strong improvement of qualification, compliance at around 80%-90%

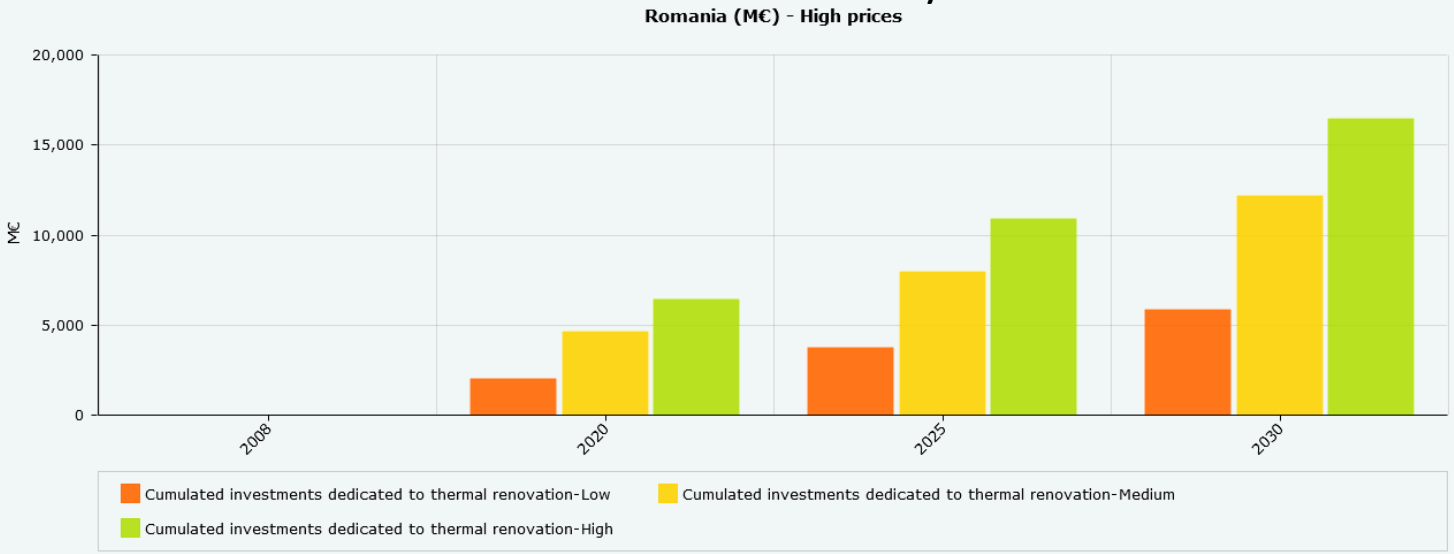
Few results, ex ROMANIA

Final energy consumption: The predefined policy scenarios may deliver more than 30% energy savings by 2030 (in the most ambitious scenario)



Few results, ex ROMANIA

Cumulative investments for thermal renovation by 2030: around 15 bn EURO



Cumulative investments for RES H/C by 2030: around 22 bn



Leverage effect of public financing: 5-6

BPIE model on buildings

- Developed in 2011

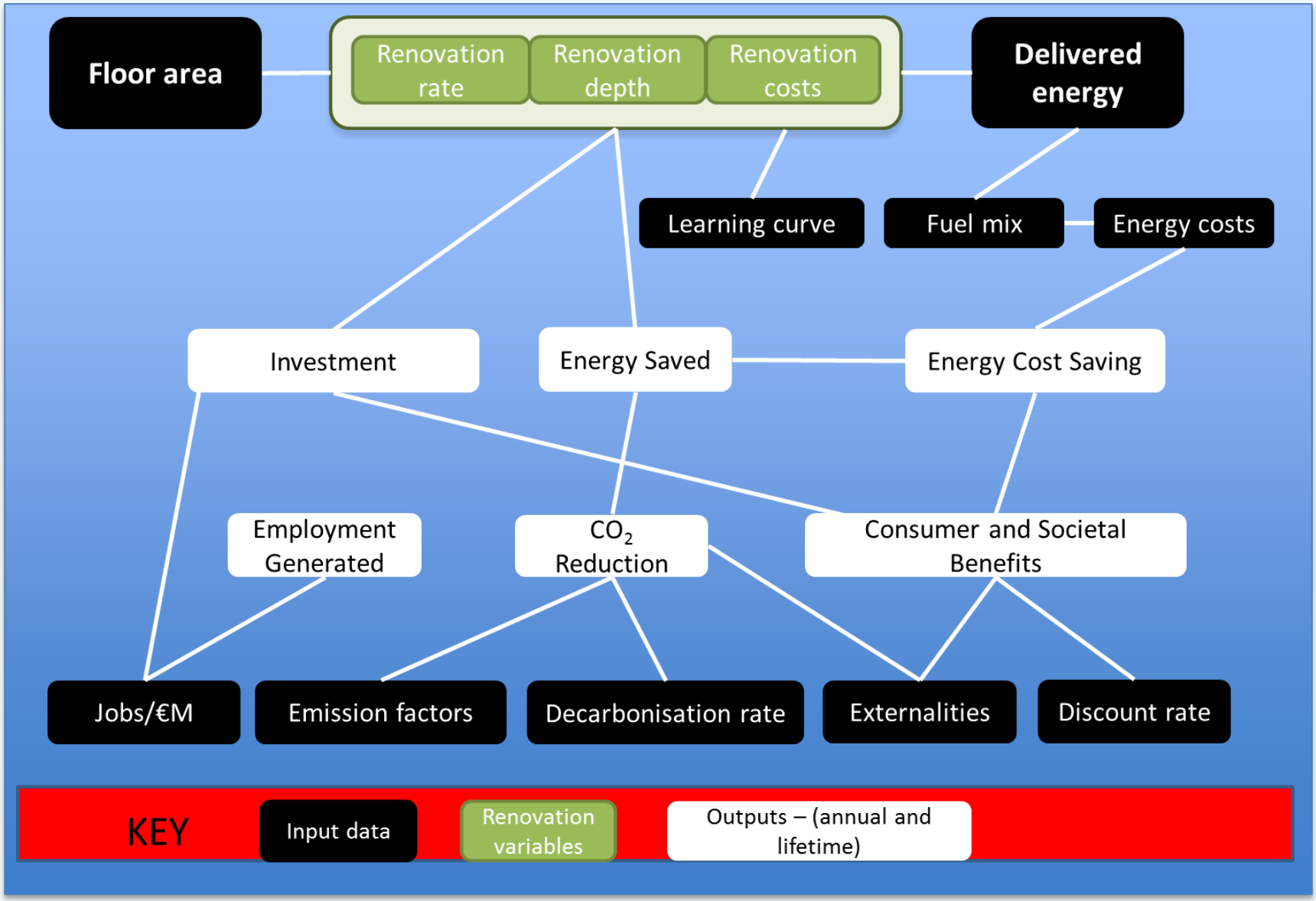
- Numerous scenarios can be modelled to illustrate the financial, economic, environmental, employment and energy use impacts of building renovation

The BPIE model aims in particular **to assist Governments in fulfilling their commitments under the Energy Efficiency Directive**:

- **Article 4**: all Member States are required to report their national renovation strategies no later than 30th April 2014

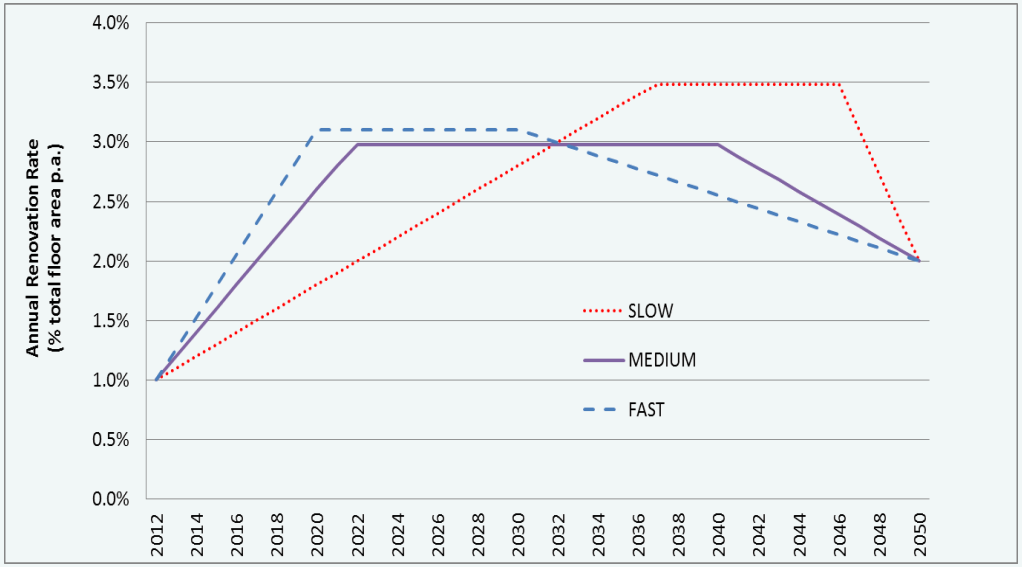
Already used for BPIE's 'Microscope' and Renovating Romania studies (the latter together with ENTRANZE), for supporting Czech and Spanish shadow renovation roadmaps etc.

BPIE model (1)

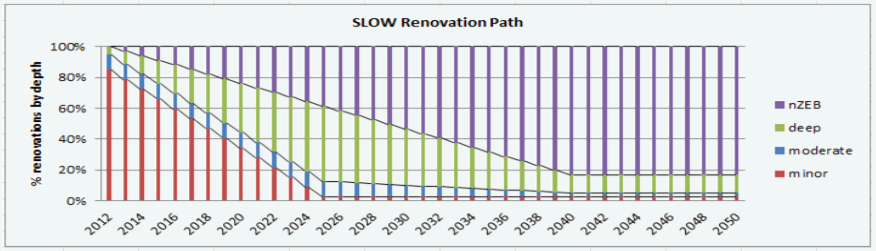

Floor area
Renovation rate
Renovation depth
Renovation costs
Delivered energy
Learning curve
Fuel mix
Energy costs
Investment
Energy Saved
Energy Cost Saving
Employment Generated
CO_2 Reduction
Consumer and Societal Benefits
Jobs/€M
Emission factors
Decarbonisation rate
Externalities
Discount rate
KEY
Input data
Renovation variables
Outputs – (annual and lifetime)

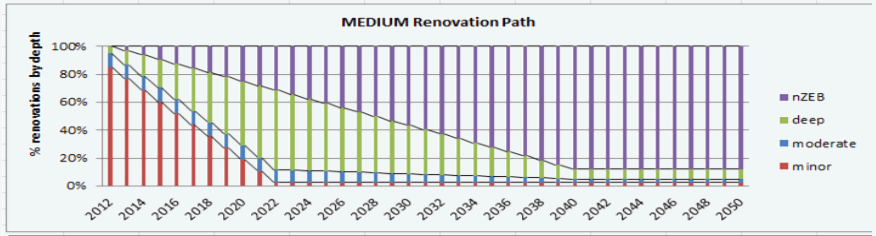
BPIE model (3)

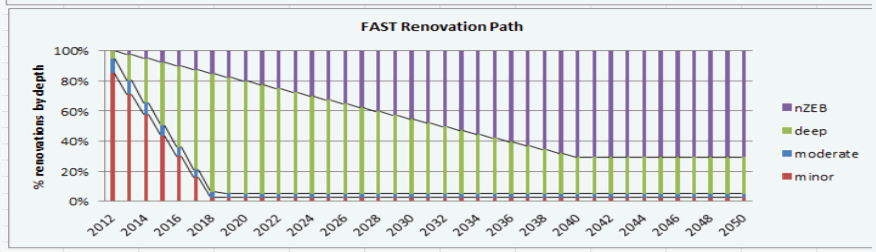
Renovation rate (example)



Renovation depth (example)





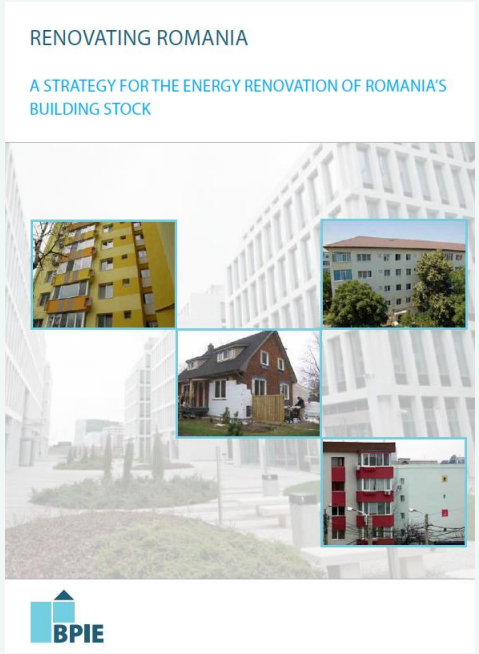


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…and again Romania

- The BPIE model has been used in parallel to ENTRANZE work for supporting the Romanian authorities to elaborate the long-term renovation plan (art 4, EED) – RENOVATING ROMANIA

SCENARIO		Baseline	Modest	Intermedi-ate	Ambitious
Energy Savings					
Energy saving in 2050	TWh/a	8.5	31.1	44.8	63.2
Energy saving in 2050 compared to 2010	%	8.3	30.4	43.8	61.8
Lifetime Costs and Benefits					
Investment costs up to 2050	€ million (NPV)	2,084	5,486	9,224	16,540
Cumulative energy cost savings	€ million (NPV)	5,414	16,726	25,164	37,011
Net saving to consumers (@ 8% discount rate)	€ million (NPV)	3,333	11,248	15,954	20,496
Net saving to society (@ 4% discount rate)	€ million (NPV)	17,143	67,586	93,862	126,408
Internal Rate of Return	IRR	14.6	14.4	13.6	11.4
Carbon Emissions*					
Annual CO_2 saving in 2050	$MtCO_2/a$	3	22	24	25
2050 CO_2 saved (% of 2010)	%	12	79	83	89
CO_2 abatement cost	€/tCO_2	-138	-40	-54	-70
Societal Benefits					
Employment generated	Average Jobs/year	4,403	15,854	24,888	39,736

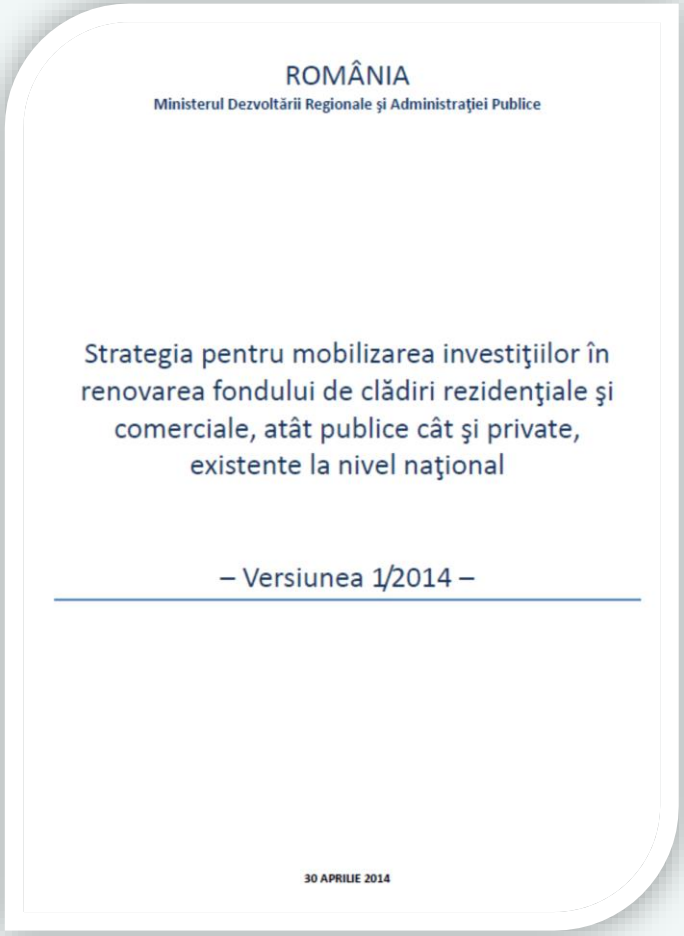


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…AND THE RESULT OF BPIE & ENTRANZE ACTIVITIES IN ROMANIA

Romanian long-term renovation plan under Art 4, EED is strongly based on the BPIE & ENTRANZE modelling results!

(Reported to the EU Commission and available at: http://ec.europa.eu/energy/efficiency/eed/doc/article4/2014_article4_ro_romania.pdf)



ROMÂNIA

Ministerul Dezvoltării Regionale şi Administraţiei Publice

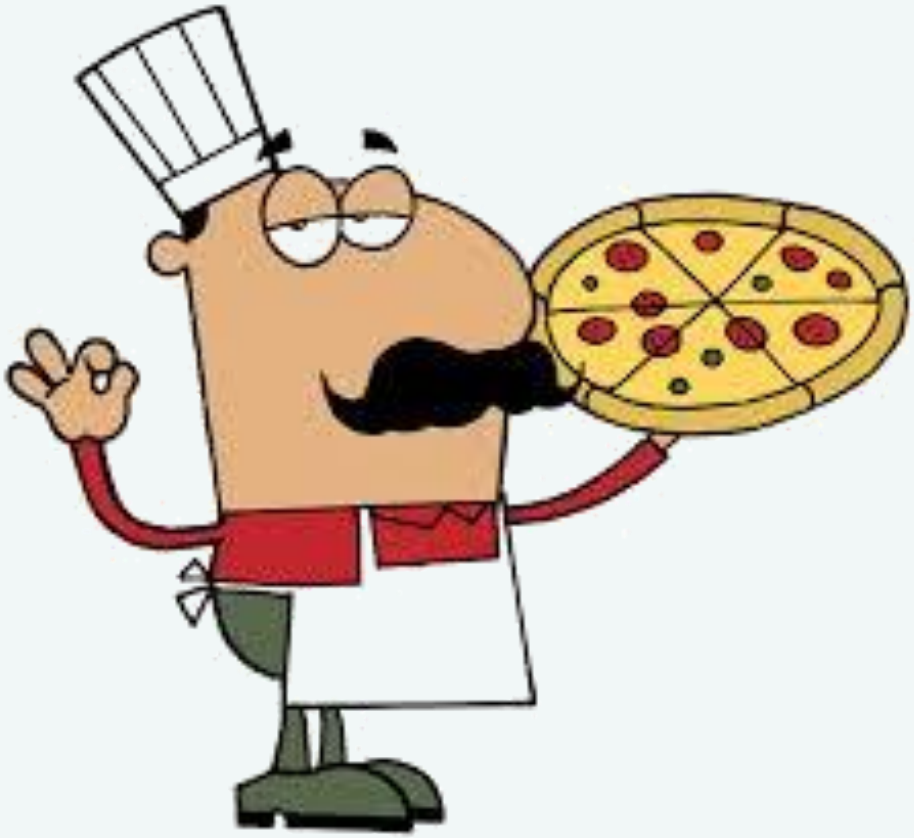
Strategia pentru mobilizarea investiţiilor în renovarea fondului de clădiri rezidenţiale şi comerciale, atât publice cât şi private, existente la nivel naţional

– Versiunea 1/2014 –

30 APRILIE 2014

PRELIMINARY CONCLUSION:

- Ingredients for a well-implemented policy process for buildings:



- 100 g of data collection
- 100 g of modelling
- 500 g of knowledge
- 700 g of stakeholders dialogue
- 1 tonne of enthusiasm

And continuous monitoring and adjustment.

BPIE





Thank you
for your attention!

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