Renovating Romania

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Bucharest
4th April 2014

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"Energy Efficiency is the highest impact measure governments can take to save energy.

"Buildings represent the greatest potential sector for energy savings in the EU"

"Energy efficiency in buildings is not a cost, but an investment with a great rate of return"

EU President Van Rompuy;

9th October 2013 @ Renovate Europe Day

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Buildings Energy Efficiency ranks 1st in Resource Efficiency Potential

McKinsey&Company

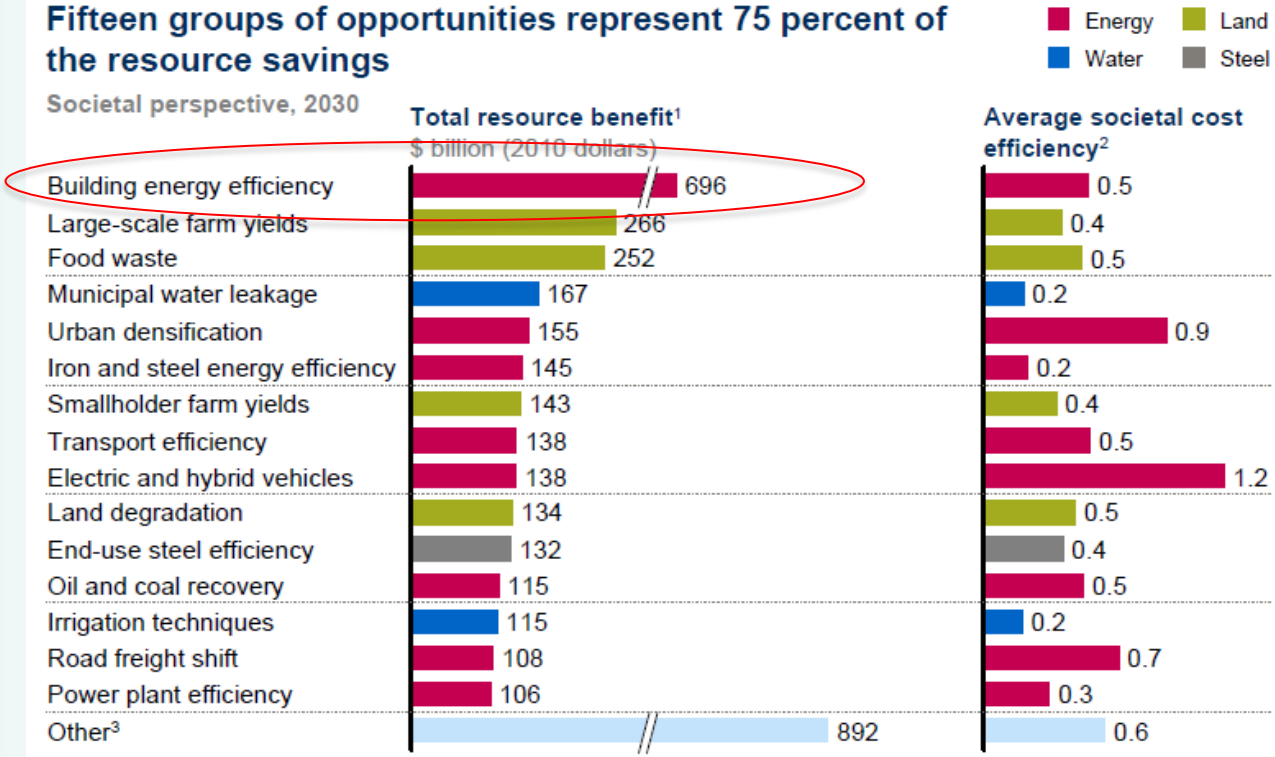
McKinsey Global Institute
McKinsey Sustainability & Resource Productivity Practice

November 2011

Resource Revolution: Meeting the world's energy, materials, food, and water needs

Fifteen groups of opportunities represent 75 percent of the resource savings

Societal perspective, 2030



1 Based on current prices for energy, steel, and food plus unsubsidized water prices and a shadow cost for carbon.
2 Annualized cost of implementation divided by annual total resource benefit.
3 Includes other opportunities such as feed efficiency, industrial water efficiency, air transport, municipal water, steel recycling, wastewater reuse, and other industrial energy efficiency.

SOURCE: McKinsey analysis

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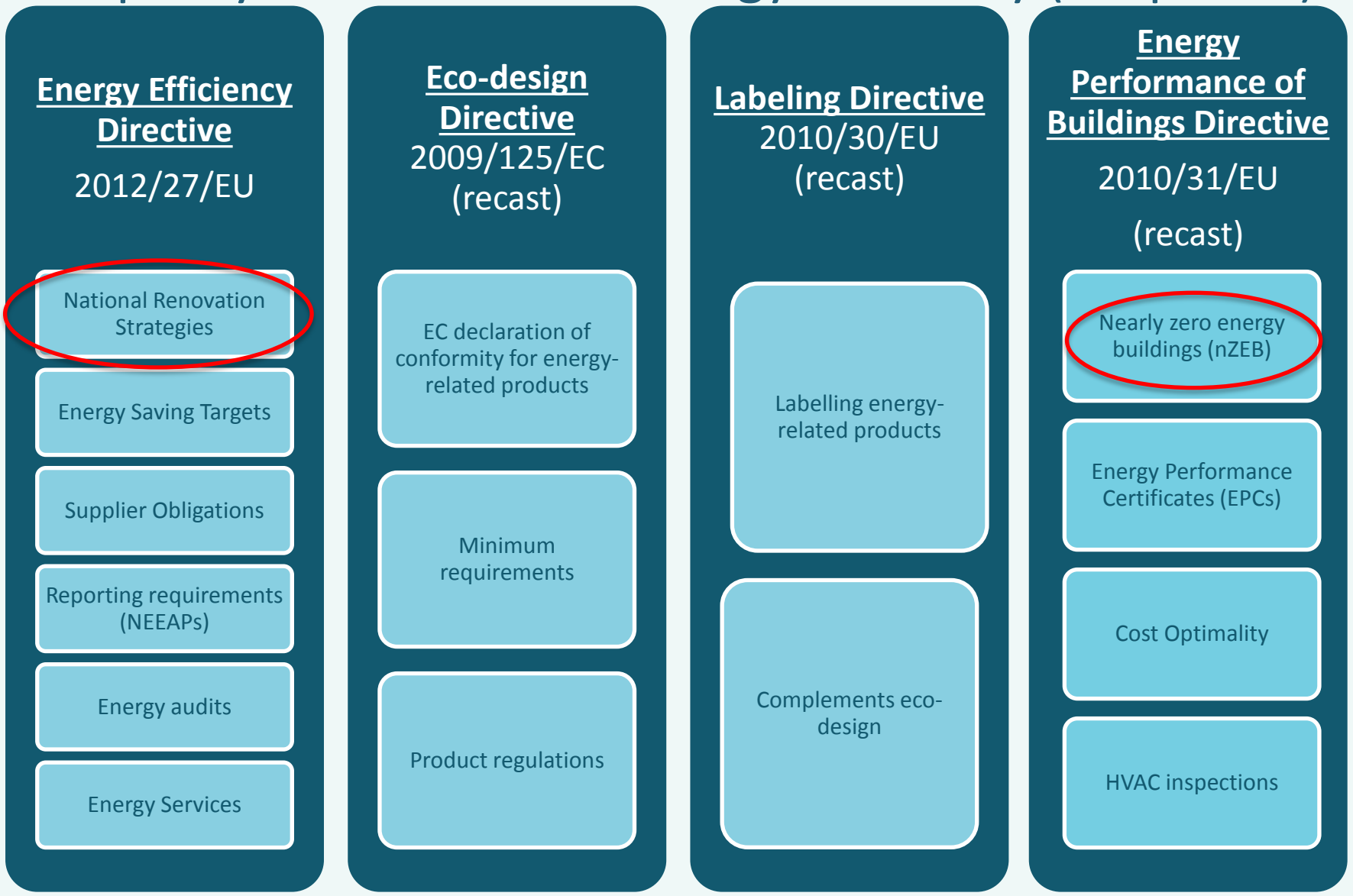
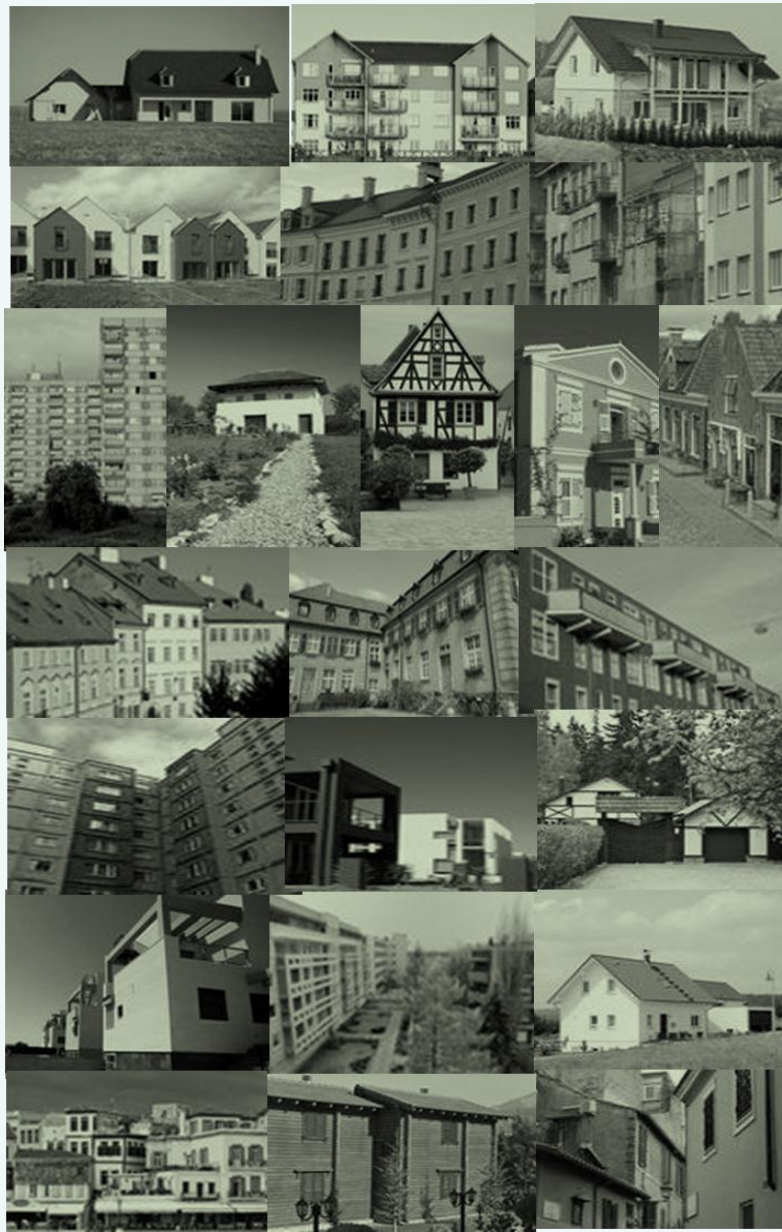
EU policy framework for energy efficiency (simplified)



Energy Efficiency Directive (Art. 4)

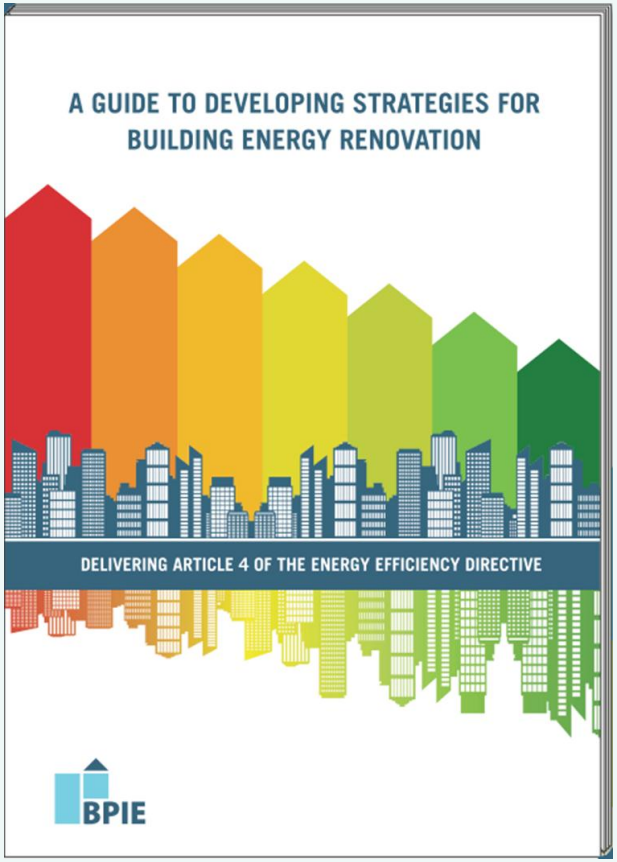
- *"Member States shall establish a **long-term strategy** for **mobilising investment** in **renovation of the national stock** of residential and commercial buildings, both public and private."*

- Publish by 30 April 2014 and update every 3 years thereafter



BPIE's *Guide to Developing Strategies for Building Energy Renovation*

- Published February 2013
- Sets out 5-stage methodology to assist Member States in strategy development
- The basis for ongoing « shadow » strategy development in Poland, Romania and other Member States



http://www.bpie.eu/renovation_strategy.html

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BPIE Renovation Guide

- Identify Key Stakeholders
- Identify Information Sources

- Building Stock Characterisation
- Economic Appraisal of Renovation Potential
- Quantification of Investment Requirements

- Comprehensive Appraisal of Barriers
- Development of Holistic Policy Package

- Draft Renovation Strategy
- Consultation on Draft Strategy

- Publish Final Strategy
- Commence Policy Implementation Process
- Establish Monitoring and Evaluation Process
- Review and Update Strategy every 3 years

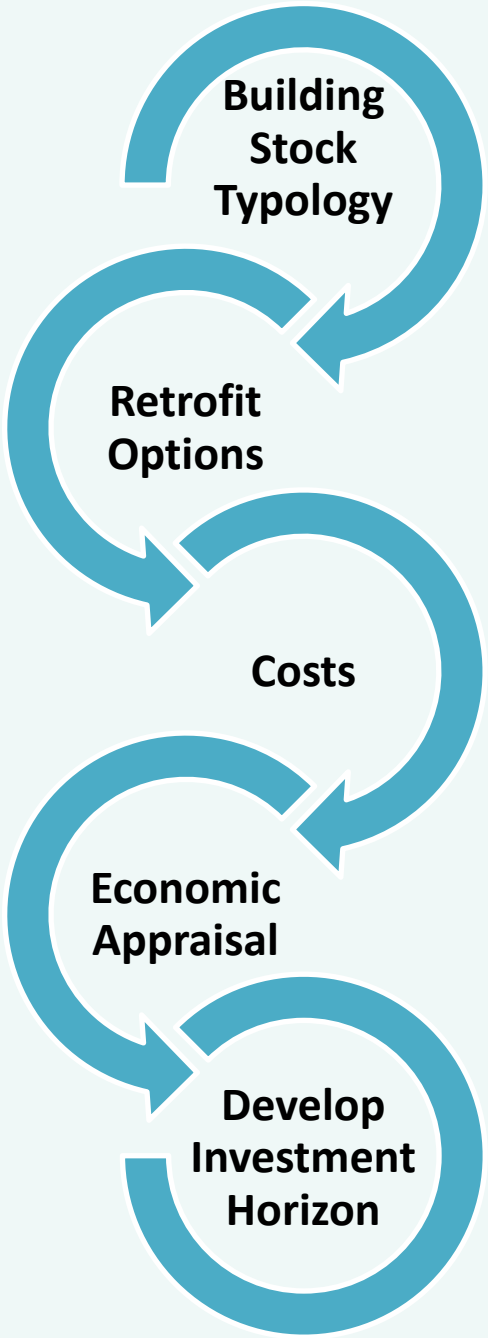
Phase 1 – Identify Key Stakeholders…

…and data sources

- National statistics
- Eurostat
- Surveys
- BPIE data hub

www.buildingsdata.eu

BPIE | DATA HUB FOR THE ENERGY PERFORMANCE OF BUILDINGS



Phase 2 – Technical & Economic Appraisal

BPIE European Building Renovation Model — Developed by Dan Staniaszek, Sustainability Consulting - dan@sustainabilityconsulting.org.uk; +44 77 22 22 44 79

NOTE - orange cells are taken from the "factors" sheet

SECTION	Source	ITEM	NOTES	TOTAL	UNITS	2010	2011	2015	2020	2025	2030	2035	2040	2045	2050
A		**Building Typology**													
A.1		**Building Stock**	notes!A3			**BASELINE**									
	F&E	N&W (N & W Europe) old			km2	4245	4245	4245	4245	4245	4245	4245	4245	4245	4245
	F&E	N&W modern			km2	3603	3603	3603	3603	3603	3603	3603	3603	3603	3603
	F&E	N&W recent			km2	1616	1616	1616	1616	1616	1616	1616	1616	1616	1616
	F&E	N&W new			km2								520	520	520
	F&E	S (*S Europe*) old			km2	1964	1964	1964	1964	1964	1964	1964	1964	1964	1964
	F&E	S modern			km2	2601	2601	2601	2601	2601	2601	2601	2601	2601	2601
	F&E	S recent			km2	773	773	773	773	773	773	773	773	773	773
	F&E	S new			km2								293	293	293
	F&E	C&E (C&E Europe) old			km2	810	810	810	810	810	810	810	810	810	810
	F&E	C&E modern			km2	1087	1087	1087	1087	1087	1087	1087	1087	1087	1087
	F&E	C&E recent			km2	386	386	386	386	386	386	386	386	386	386
	F&E	C&E new			km2								125	125	125
	F&E	Residential Total			km2	17085	17085	17085	17085	17085	17085	17085	18024	18024	18024
	F&E	Non-Residential Total			km2	5306	5306	5306	5306	5306	5306	5306	5585	5585	5585
	F&E	**TOTAL BUILDING STOCK**			**km2**	**22391**	**22391**	**22391**	**22391**	**22391**	**22391**	**22391**	**23609**	**23609**	**23609**
	F&E	No. of residential properties			M	197	197	197	197	197	197	197	227	227	227
	calc	Ave residential property size			m2	87	87	87	87	87	87	87	87	87	87
A.2		**Floor area by age band**	notes!A4	**% of total (post-2040)**											
	calc	old		38.9%	km2	7019	7019	7019	7019	7019	7019	7019	7019	7019	7019
	calc	modern		40.5%	km2	7291	7291	7291	7291	7291	7291	7291	7291	7291	7291
	calc	recent		15.4%	km2	2775	2775	2775	2775	2775	2775	2775	2775	2775	2775
	calc	new		5.2%	km2	0	0	0	0	0	0	0	939	939	939
	calc	**TOTAL**				**17085**	**17085**	**17085**	**17085**	**17085**	**17085**	**17085**	**18024**	**18024**	**18024**

Index | MODEL | 2050 RESULTS | MODEL2020 | 2020 RESULTS | methodology | G. inv profile | G. employmt | G. annual jobs | G. net savings

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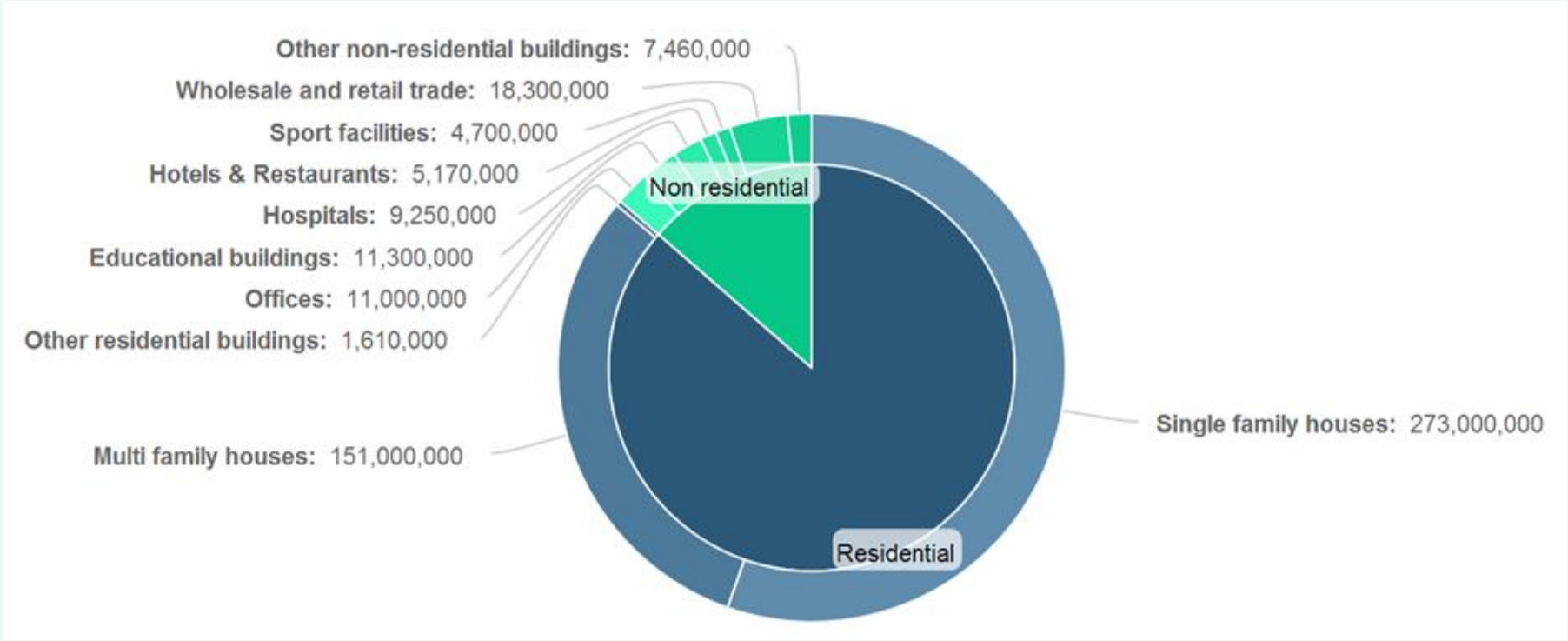
Breakdown of building stock by building category (m^2)



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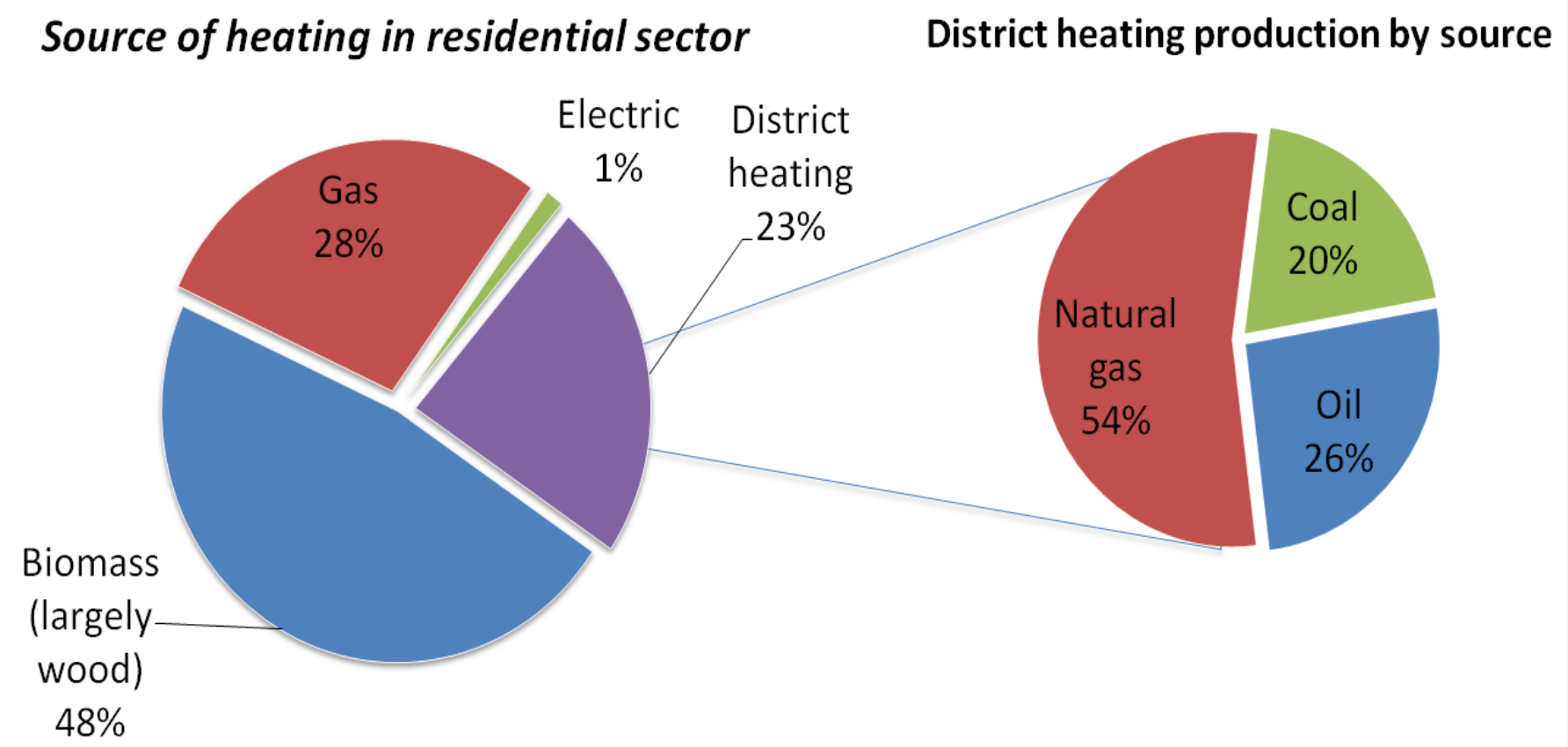
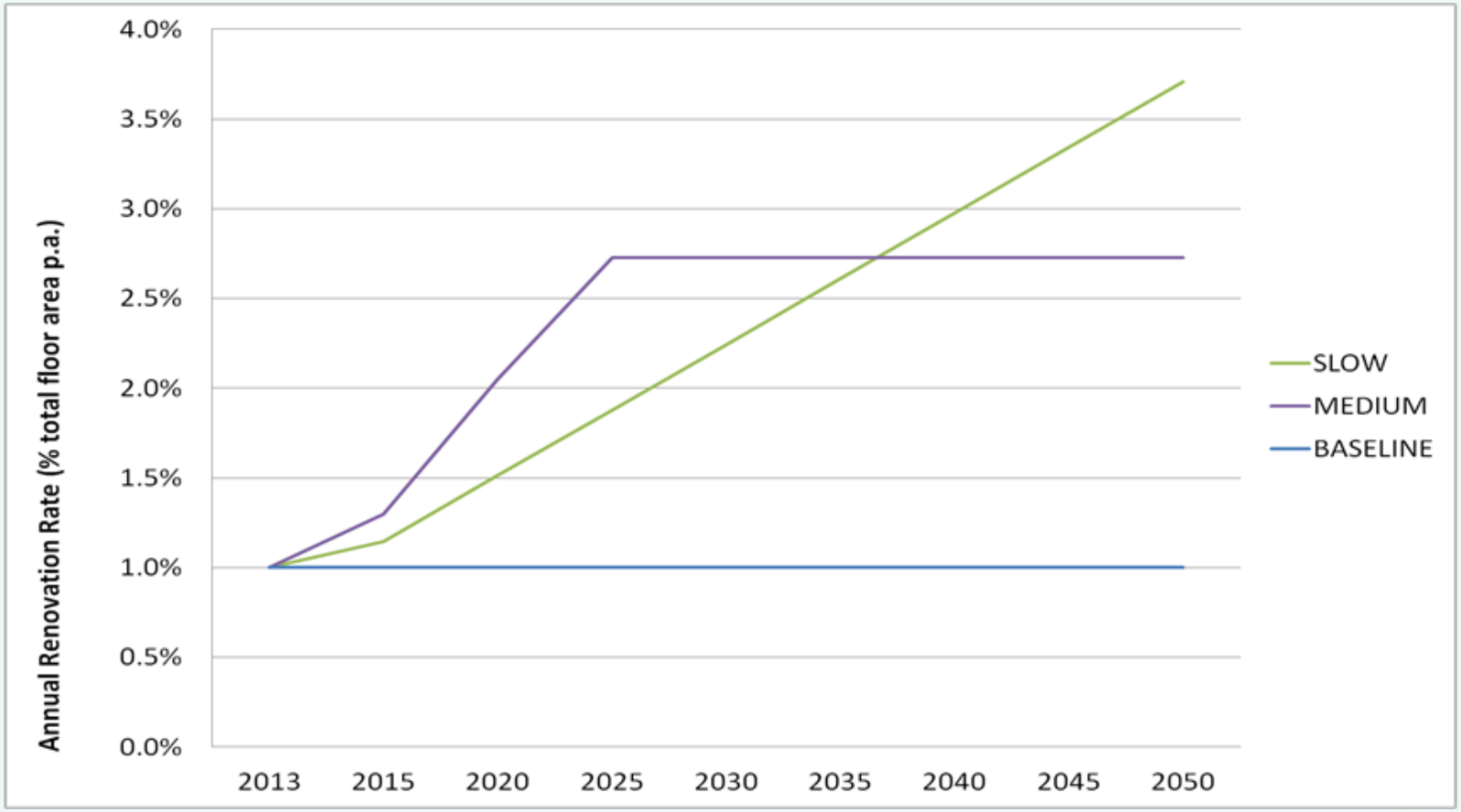
Source of heating in residential sector



Modelled Pathways for Renovation Rates



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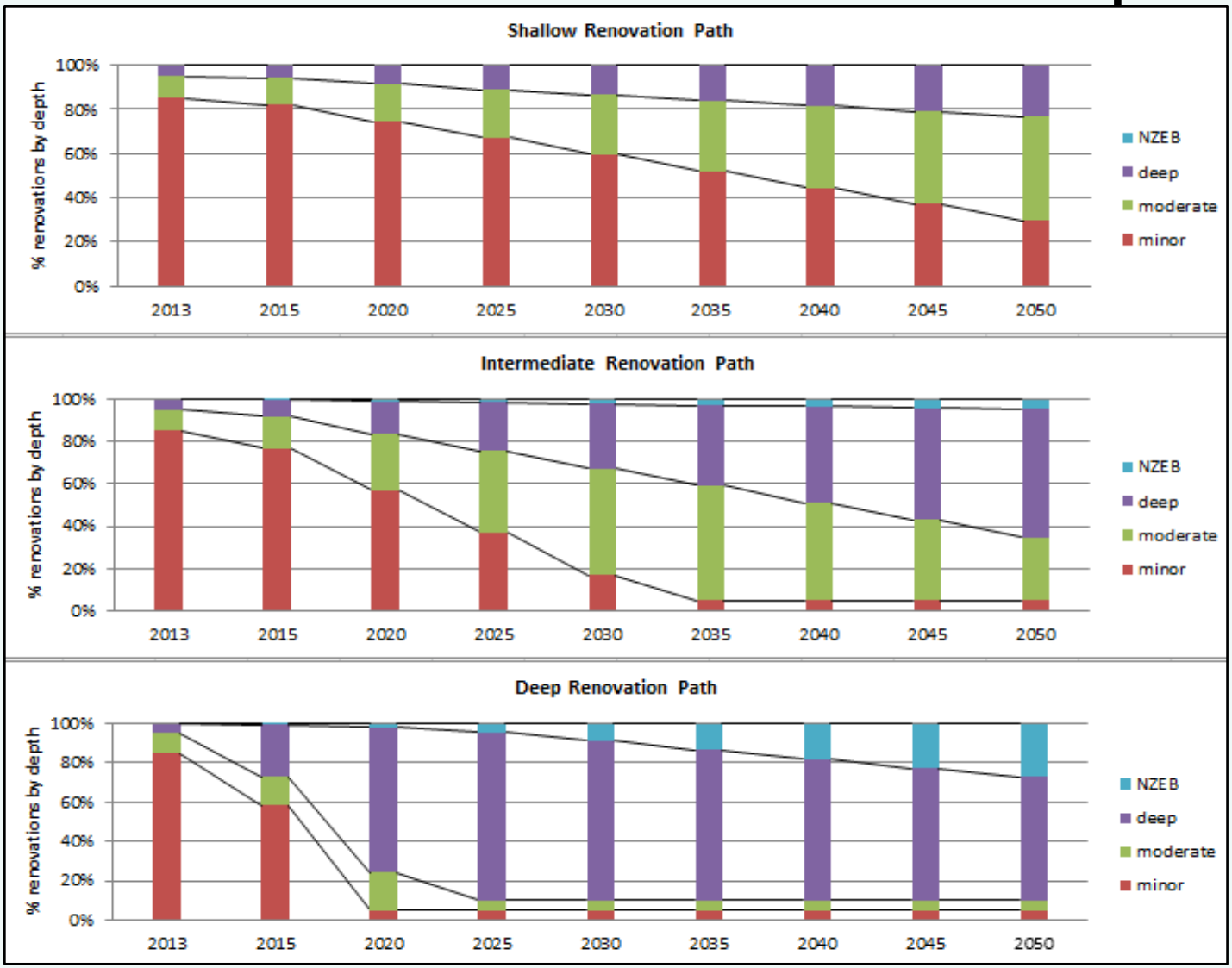
Split of renovation type (depth) across three indicative renovation paths



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Results of scenario analysis

SCENARIO		baseline	modest	intermediate	ambitious
Energy Saving					
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 CO2 saving in 2050	MtCO2/a	3	22	24	25
2050 CO2 saved (% of 2010)	%	12%	79%	83%	89%
CO2 abatement cost	€/tCO2	-138	-40	-54	-70
Societal Benefits					
Employment generated	Average Jobs/year	4,403	15,854	24,888	39,736

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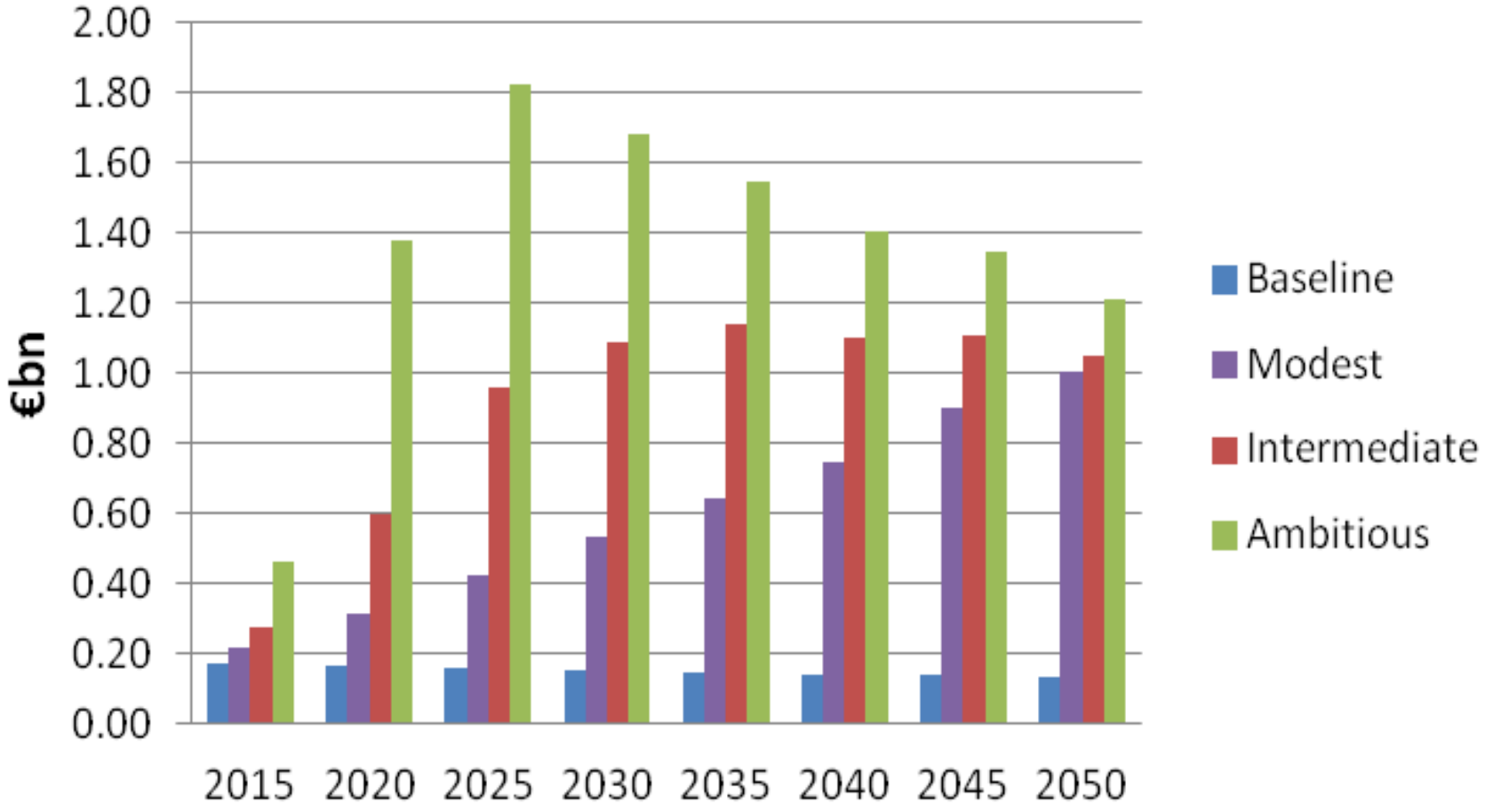
Investment Profile



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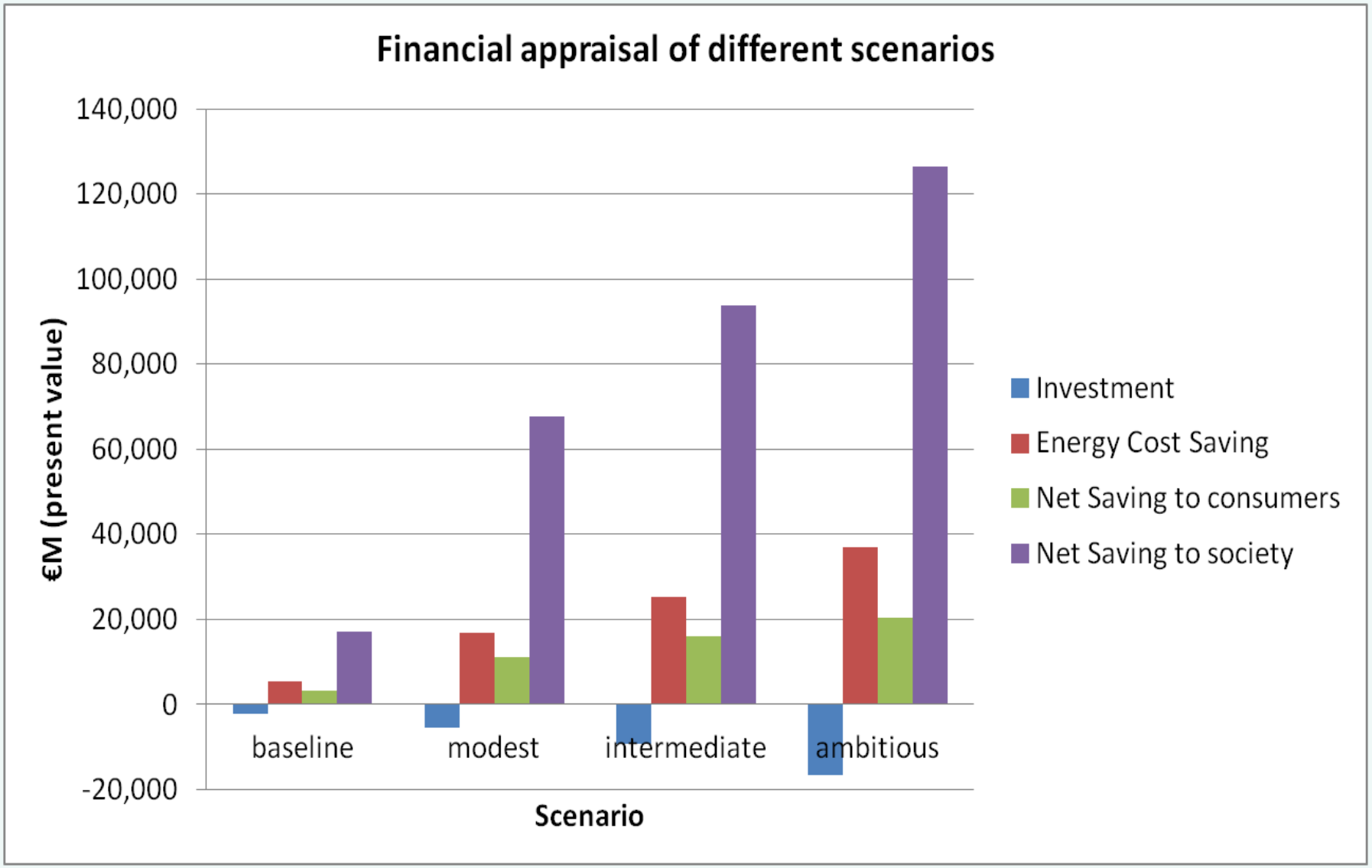
Financial appraisal of different scenarios
140,000
120,000
100,000
80,000
60,000
40,000
20,000
0
-20,000
€M (present value)
baseline
modest
intermediate
ambitious
Scenario
Investment
Energy Cost Saving
Net Saving to consumers
Net Saving to society

Valuing the Multiple Benefits

ITEM	MULTIPLIER
Energy Cost Saving	1.0
Economic Stimulus	1.5
Societal (health) Benefits	1.0
Environmental Benefits	0.1
Energy System Benefits	1.0
TOTAL	4.6

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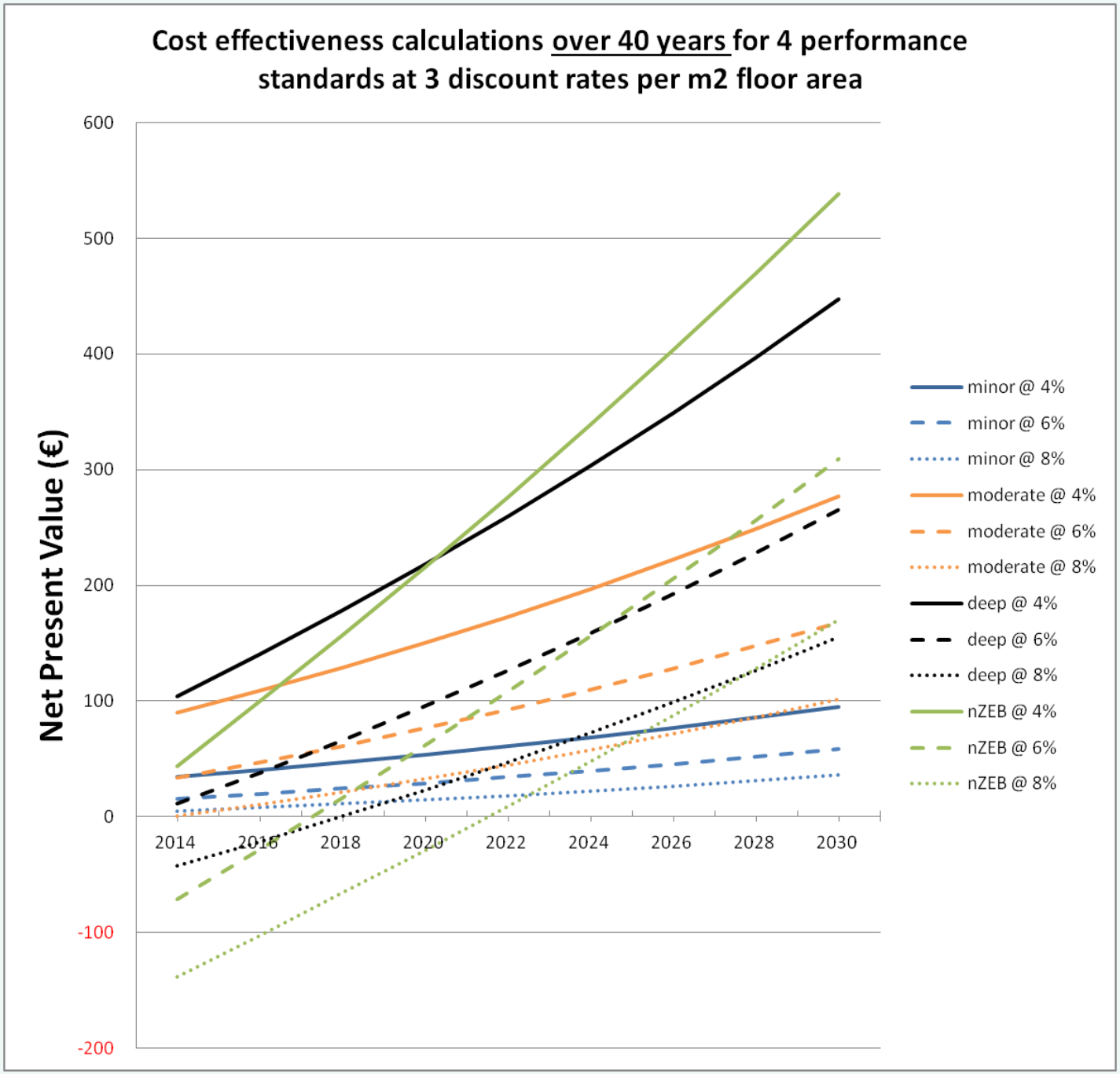
Cost effectiveness calculations over 40 years for 4 performance standards at 3 discount rates per m2 floor area



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Cost effectiveness calculation for DEEP RENOVATION in three building types

ITEM	UNITS	SINGLE FAMILY HOUSE	MULTI-FAMILY HOUSE	NON-RESIDENTIAL
Area	m2	73	48	1000
Energy use/m2	kWh/m2/a	201	201	255
Energy use	kWh/a	14673	9648	255000
Annual energy spend	€/a	604	397	10505
Investment cost - deep renovation	€	14308	9408	196000
Annual saving in 2014	€	453	298	7879
Annual saving in 2020	€	605	398	10522
Annual saving in 2030	€	980	644	17030
NPV @ 4%	€	6649	4372	166186
NPV @ 8%	€	-3560	-2341	-13114
Year in which deep renovation becomes cost effective @ 8%		2023	2023	2019

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Phase 3 - Develop Ambitious Policy Landscape

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Policy Options/Recommendations (1)

- Aim for cross party and cross-society support for this strategy;
- Establish cross-ministerial group to appraise the co-benefits from energy performance improvement;
- Address the poor energy performance of housing of the many disadvantaged Romanian citizens;
- Implement a 3% renovation rate for the entire public sector, commencing in 2015;
- Establish high performance requirements for replacement building elements and technical components such as HVAC plant;
- Provide support for buildings integrated renewables;
- Continue improvement in the efficiency and public acceptability of existing district heating systems;

Policy Options/Recommendations (2)

- Develop an Energy Efficiency Obligation (EEO) scheme to support deep renovation (from 2017);
- Maximise investment of EU Funds to deep renovation of buildings;
- Design the Energy Efficiency Investment Fund as one-stop funding vehicle for renovation;
- Develop regulatory framework for ESCOs and energy performance contracting;
- Remove restrictive tenancy laws which inhibit energy performance improvement;
- Implement findings from BuildUp Skills Romania;
- Encourage development of a home-grown local supply chain industry for the supply and installation of retrofit measures;
- Develop promotional and dissemination activities;
- Establish a renovation stakeholder forum.

Phases 4 and 5

- **Draft Strategy** – combining technical and policy appraisal
- **Consult** on draft strategy (c.f. consultation event in November 2013)
- **Publish** final strategy by 30 April 2014
- **DELIVER**!
- **Monitor** progress and review every 3 years

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