

# Deep Renovations: Essential to Achieving a 40% Target and Make Sense Economically

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The 40% Seminar

European Parliament  
Brussels, 27 April 2010



# Content

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1. Deep Renovations to meet 2020 & 2050 goals
2. Where Legislation Has Failed
3. Recommendations

# Stabilisation at 2° & emissions reduction needed



Category	Radiative forcing (W/m <sup>2</sup> )	CO <sub>2</sub> concentration <sup>c)</sup> (ppm)	CO <sub>2</sub> -eq concentration <sup>c)</sup> (ppm)	Global mean temperature increase above pre-industrial at equilibrium, using "best estimate" climate sensitivity <sup>b), c)</sup> (°C)	Peaking year for CO <sub>2</sub> emissions <sup>d)</sup>	Change in global CO <sub>2</sub> emissions in 2050 (% of 2000 emissions) <sup>d)</sup>
I	2.5-3.0	350-400	445-490	2.0-2.4	2000-2015	-85 to -50
II	3.0-3.5	400-440	490-535	2.4-2.8	2000-2020	-60 to -30
III	3.5-4.0	440-485	535-590	2.8-3.2	2010-2030	-30 to +5
IV	4.0-5.0	485-570	590-710	3.2-4.0	2020-2060	+10 to +60
V	5.0-6.0	570-660	710-855	4.0-4.9	2050-2080	+25 to +85
VI	6.0-7.5	660-790	855-1130	4.9-6.1	2060-2090	+90 to +140
						Total

# Reducing CO2 50% - 85% by 2050<sup>1</sup>? Not without Large-scale Deep Renovations



- Largest potential: 40% of energy consumption is in buildings
- Action needed in existing buildings: New buildings only 1% - 1.3% of stock annually
- Poor renovation rate: Current rate 1.2% - 1.4% annually - can increase 3X !!
- Poor renovations: Current energy performance improvement 15% - 20% per renovation; cost optimal (LCC) is 60% - 90% (“deep renovation”)
- Missed chances: Sub-optimal renovations “lock in” large savings potential
- Yes, we can pay it: Financing is available if public funds leverage private funds
- Legislative coverage needed: Recast EPBD doesn't address deep renovations

<sup>1</sup>Or 40% 2020

# Energy savings and other benefits



Retrofit rate sensitivity- A small step with huge consequences

Retrofit rate	Global energy savings
1.4%	40%
2%	74%

(in 2050, compared to 2005 levels - CEU Model)

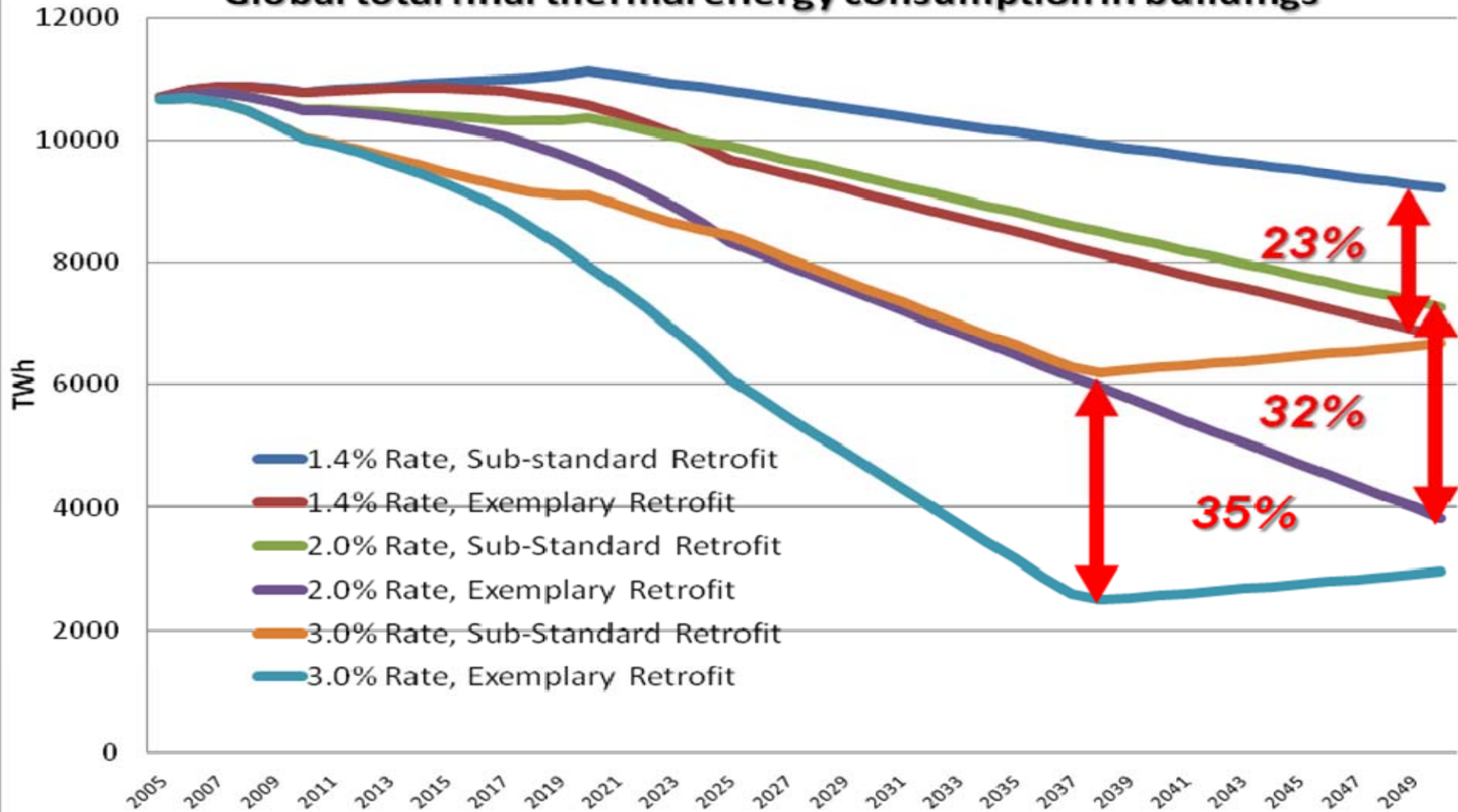
Other societal benefits:

- Approx. 500.000 green-collar jobs could be created
- Annual cost saving of approximately 270 billion Euros

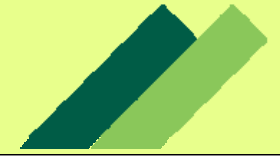
# Lock-in Effect

The lock-in effect through substandard retrofit,  
different retrofit rates

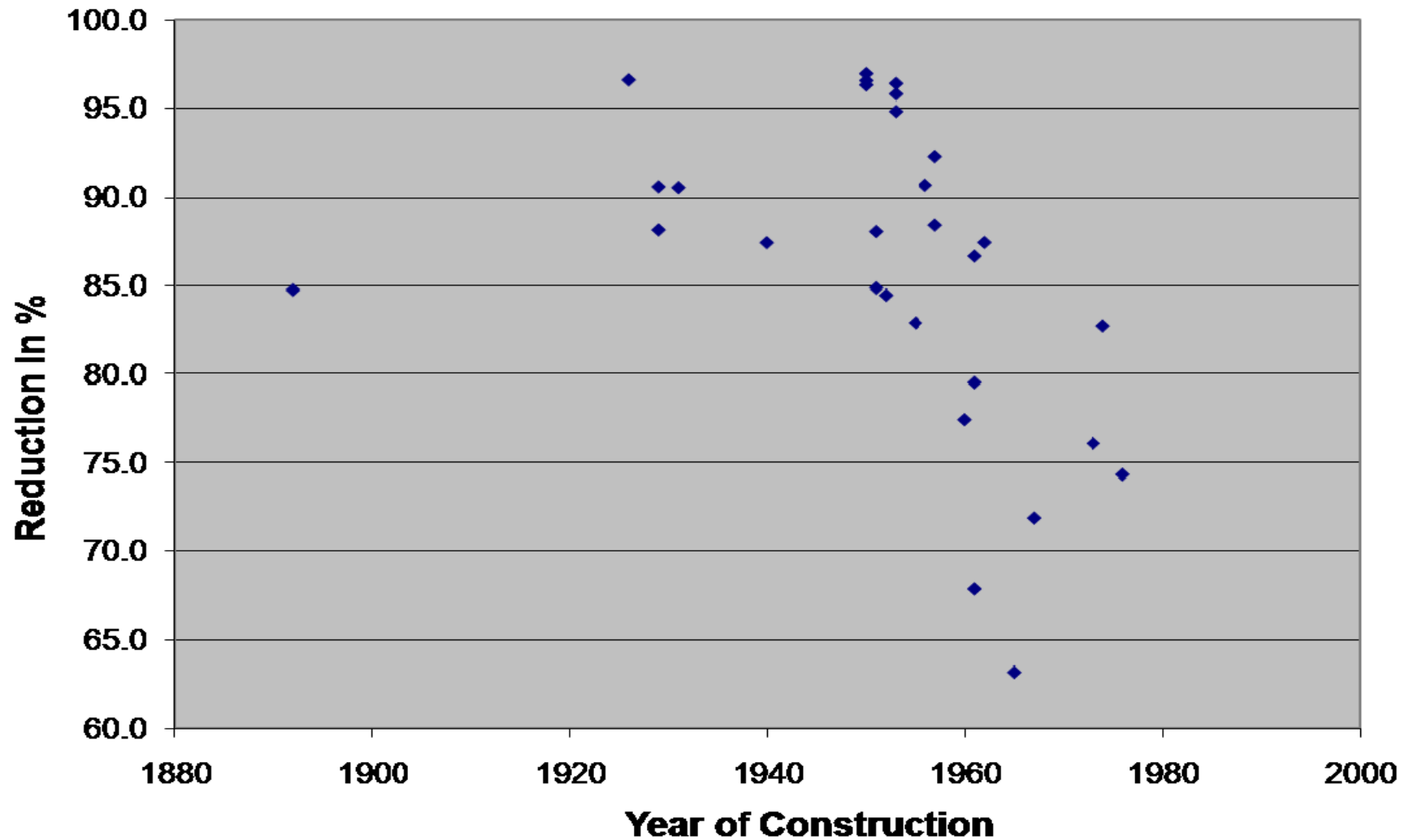
Global total final thermal energy consumption in buildings



# Older Buildings Need Deeper Renovations

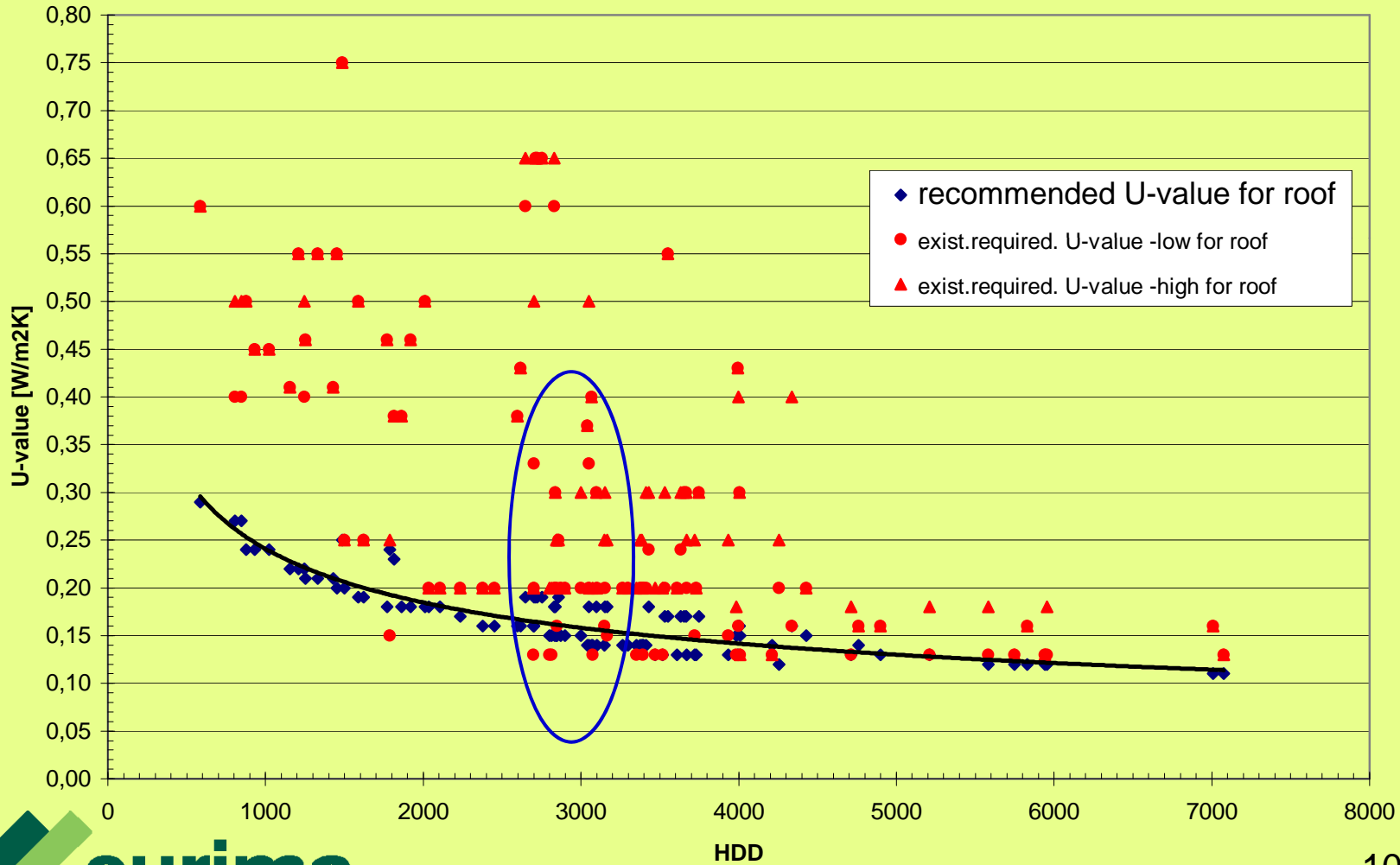


Reduction - Year of Construction

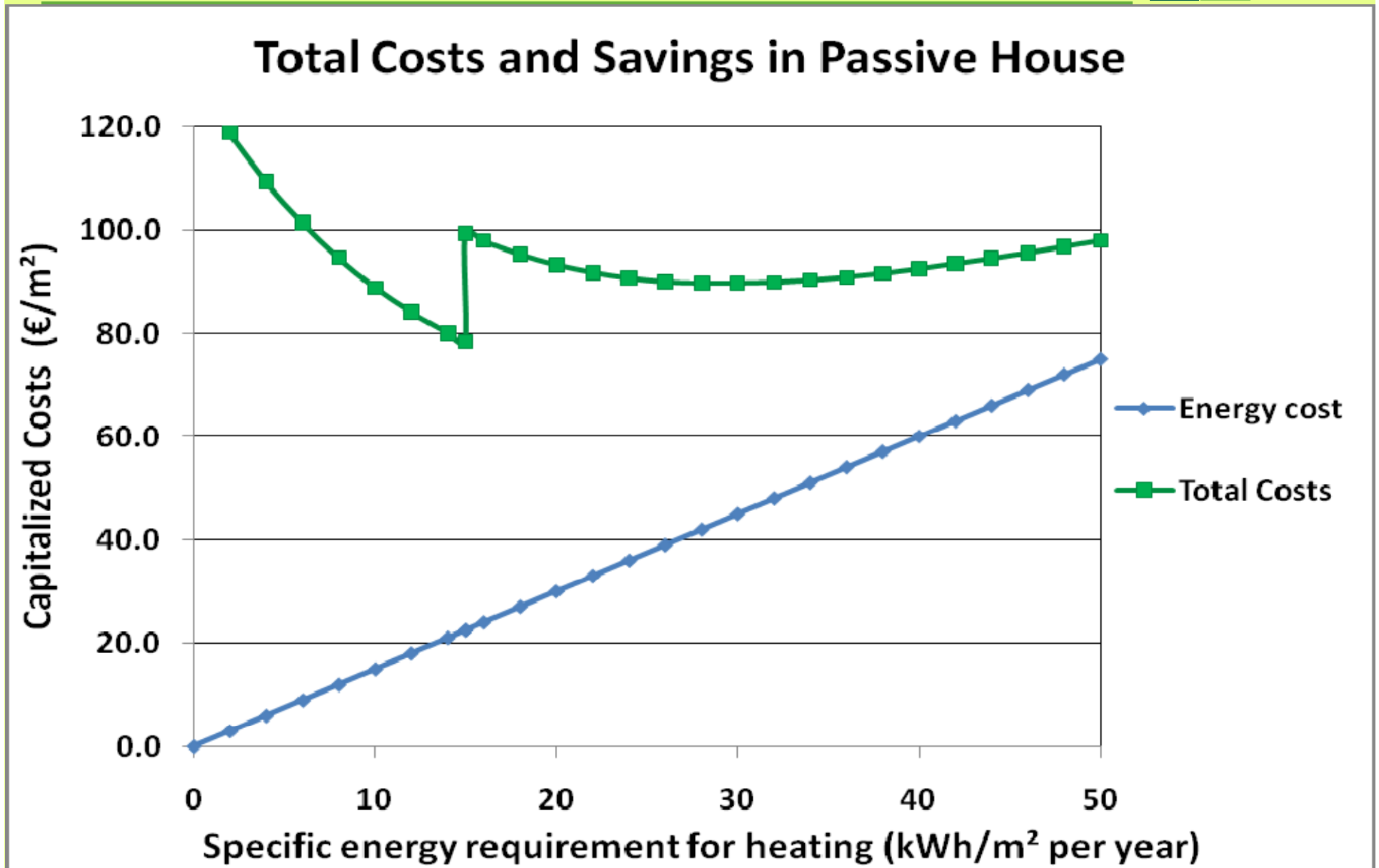


# Recommended U-Values - Roof

Peak price - roof



# Passive Houses are Not More Expensive



# Fuel poverty: An increasing problem



‘Tackling Fuel Poverty in Europe’, EPEE Consortium - IEE Study, 2009:

- *“Between 50 million and 125 million people in Europe are estimated to be fuel poor. This number will inevitably increase in the future in line with rising energy prices and increased fuel bills”*
- *“Nearly 1 in 7 households in Europe are at risk of poverty”*

Deep renovations can address this problem  
by decreasing future energy bills

# Where Legislation Has Failed

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1. EPBD1: 1000m<sup>2</sup> threshold; EPC weak; low compliance
2. ESD: No binding savings target
3. EPBD 2: Few drivers for renovation of existing buildings

# Recommendations (i)

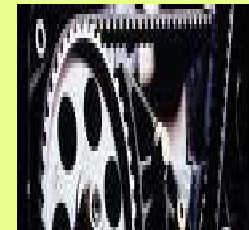
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From current missed opportunities  
to great energy & CO2 savings

A combination of:

Regulatory measures - Financial measures - Technical measures



## Recommendations (ii)

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1. Set renovation targets 2.5% -3.5% above BAU(1,4%); C>R
2. Set building codes right (cost optimal)
3. Better certification (EPC) and compliance control
4. Better training & education in all parts of building chain
5. Go to Factor 10 when possible; factor 6 or 4 otherwise
6. Financing & funding (TA, Asset-based) IG Audits
7. Develop step-wise (progressive) financing & incentives

## Recommendations (iii)

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8. Strict MERs for components; incentives for BAT
9. Internal load reduction reduces cooling requirements
10. Intelligent refurbishment with integrated design
11. Intelligent system boundaries (districts)
12. Better data collection, incl metering & information; standards
13. Better Best Practices and technology procurement

THANK YOU!

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