

# Session IX: **Energy Efficiency** Global Dimension and **Regional Prospects**

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# SE Europe Data: Area - Population - GDP

A/A	COUNTRY	AREA km2	POPULATION	GDP	per capita
				Billion \$USD	\$USD
1	Albania	28.748	2.846.000	15,1	5.305,69
2	Bosnia & Herzegovina	51.197	3.324.000	20,16	6.064,98
3	Bulgaria	110.994	7.100.000	65,13	9.173,24
4	Croatia	56.594	4.058.000	60,97	15.024,64
5	Cyprus	9.251	1.189.000	24,96	20.992,43
6	Hellas	131.957	10.720.000	209,85	19.575,56
7	Hungary	93.030	9.770.000	157,9	16.161,72
8	Israel	22.145	8.884.000	370,6	41.715,44
9	Kosovo	10.887	1.845.000	7,94	4.303,52
10	Montenegro	13.812	623.200	5,504	8.831,84
11	N. Macedonia	25.713	2.077.000	12,67	6.100,14
12	Romania	238.397	19.410.000	239,6	12.344,15
13	Serbia	88.361	6.982.000	50,6	7.247,21
14	Slovenia	20.271	2.081.000	54,01	25.953,87
15	Turkey	783.562	83.000.000	771,4	9.293,98
	<b>TOTAL</b>	<b>1.684.919</b>	<b>163.909.200</b>	<b>2066,394</b>	<b>13.872,56</b>

- 40% of the area of EU-27
- 38% of the pop. Of EU-27
- 14,9% of the GDP of EU-27

# European Union Policy for Energy Efficiency

The **European Energy Efficiency Directive, EED**, is the framework within which the national indicative and mandatory energy efficiency targets, for 2020 and 2030, were set, emphasizing the importance of linking European Energy Policy with its economic development.

The energy strategy for 2030 was built, based on the experience from the implementation of the strategy "20-20-20", but instituting even more ambitious goals for the year 2030, which are the following:

- **Reduction of greenhouse gases by 40%, compared to 1990 levels,**
- **At least 32% of the energy consumed comes from RES,**
- **Energy savings of 32.5%, in relation to the "no measures" scenario,**
- **Interconnection of EU electricity systems of at least 15%.**

# National Plan for Energy and Climate - NPEC

The national energy saving targets for 2030, as well as the measures and policies that the Member-State will take to achieve them, have been set through the "**National Plan for Energy and Climate for 2030**", which is submitted by each Member State and accepted by the European Commission.

Each NPEC is different but, in general terms, it is concerning on:

- taxes on fuels and RES taxation,
- possible setting of new vehicle registration fees based on emissions,
- financial incentives for Energy Efficiency Measures, EEMs, in housing and businesses,
- the obligation to save energy by large energy distributors,
- actions to inform the public and better inform consumers and businesses,
- replacement of street lamps with more energy efficient as LED lamps,
- the voluntary commitment of companies to take EEMs, etc.

# Thermal Comfort for Buildings - Targets & Goals

The main target and goal of all EE interventions in all type of buildings is to provide “Thermal Comfort” to people at any time of their life, with minimum use of Energy.

Some typical data for different types of buildings are given below (based on Greek Building EE Code-KENAK)

	$T_w$	$T_s$	$RH_w$ %	$RH_s$	Fresh air ( $m^3/h/person$ )	Lighting level (lx)
Residential Buildings	20	26	40	45	15	200
Hospitals	22	26	35	50	35-150 (surgery)	300
Schools all levels	20	26	35	45	22	300 - 500
Nursery/Elderly houses	22	26	40	45	25	300
Shopping malls	19	25	35	45	22	300
Museums, theatres	20	26	35	50	20 - 30	100 - 200
Offices	20	26	35	45	30	500

# Energy Efficiency in Buildings

A/A	COUNTRY	Building Stock	
		Residential %	Non-Residential %
1	Albania	83.70	16.30
3	Bulgaria	72.10	27.90
4	Croatia	77.68	22.32
5	Cyprus	86.21	13.79
6	Hellas	84.21	15.79
7	Hungary	73.07	26.93
12	Romania	82.96	17.04
14	Slovenia	81.71	18.29

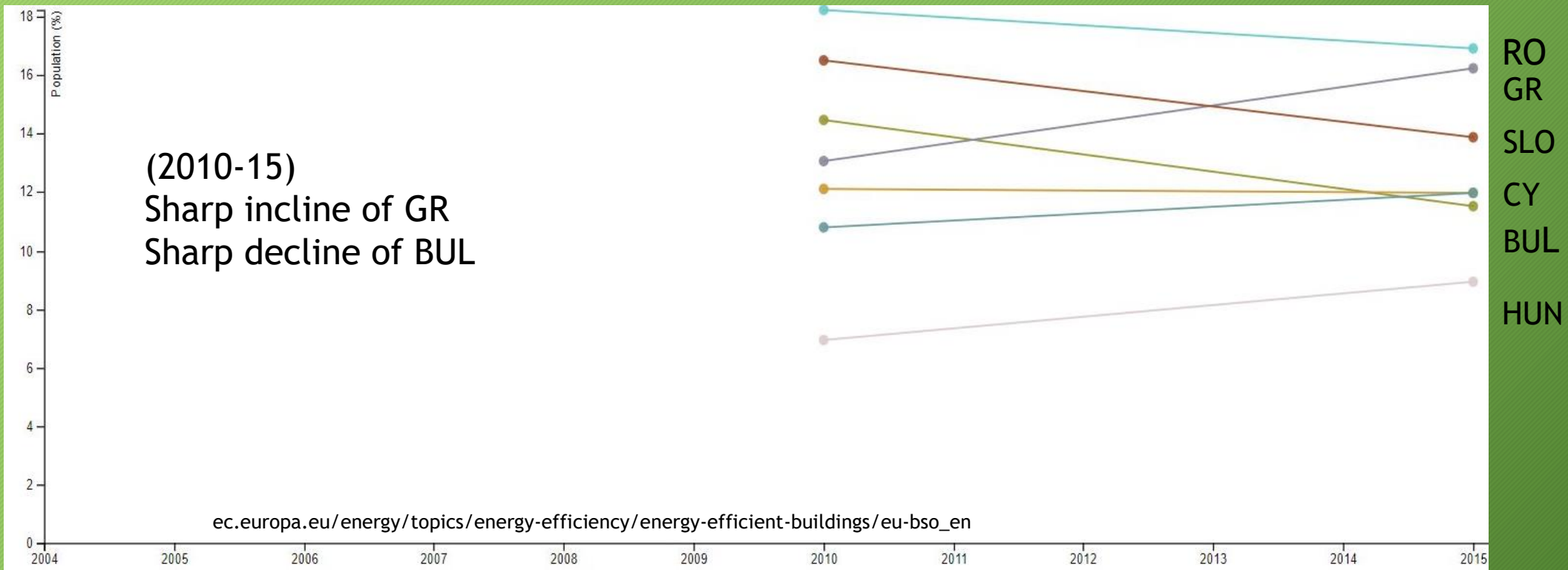
The data for the other countries was unavailable. Research for revealing it is under way by IENE/

# The Building Stock in EU M-S of the Region

A/A	EU M-S/ BUILDING CONSTRUCTION (%)	<1945	1945-69	1970-79	1980-89	1990-99	2000-10	>2010
3	Bulgaria	19.32	32.20	14.98	11.59	5.95	2.33	13.62
4	Croatia	12.59	27.06	20.21	16.63	9.23	9.42	4.86
5	Cyprus	3.00	10.09	13.32	19.44	16.77	28.96	8.43
6	Hellas	7.28	24.00	20.96	16.79	12.82	14.50	3.65
7	Hungary	24.91	30.46	12.46	11.58	8.03	9.30	3.26
12	Romania	11.13	37.00	19.20	14.5	7.11	7.82	2.79
14	Slovenia	30.46	21.33	17.87	11.05	10.18	7.44	1.72

- Thermal Insulation in walls, roofs, openings started in late 70s - early 80s
- 58,5% of existing buildings are without (or with poor) insulation (<1945 - 1979)
- 41,5% are designed and constructed with thermal insulation

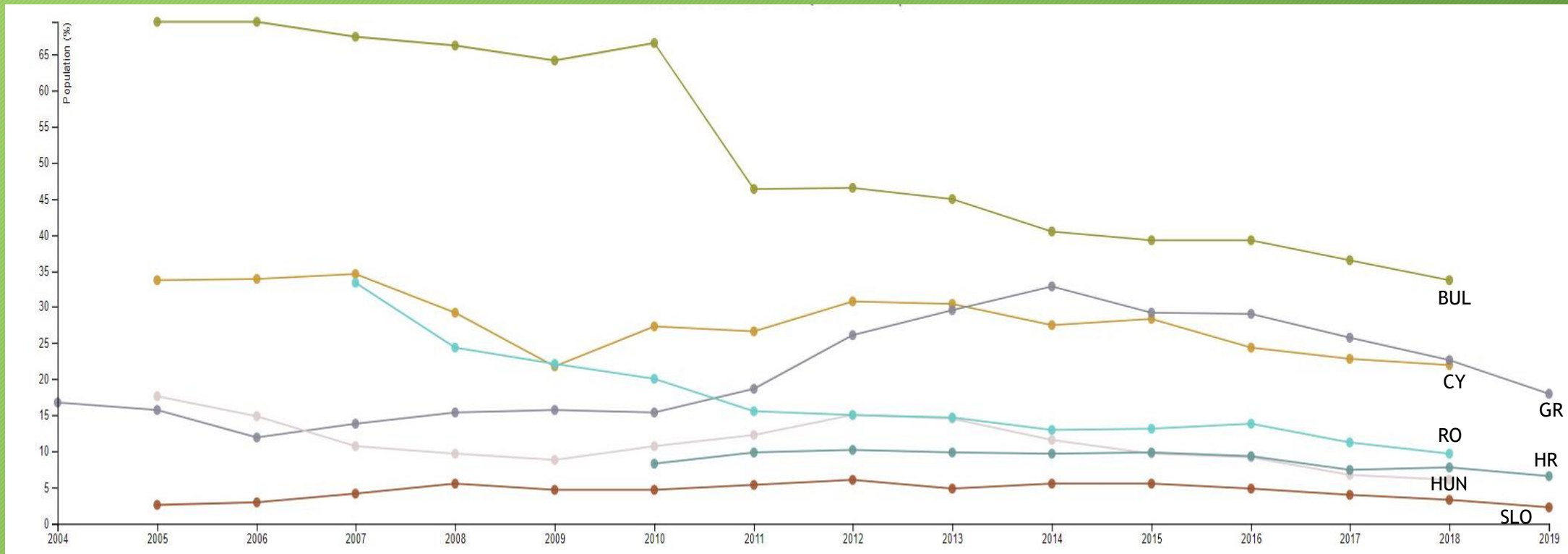
# Energy Expenditure in Income





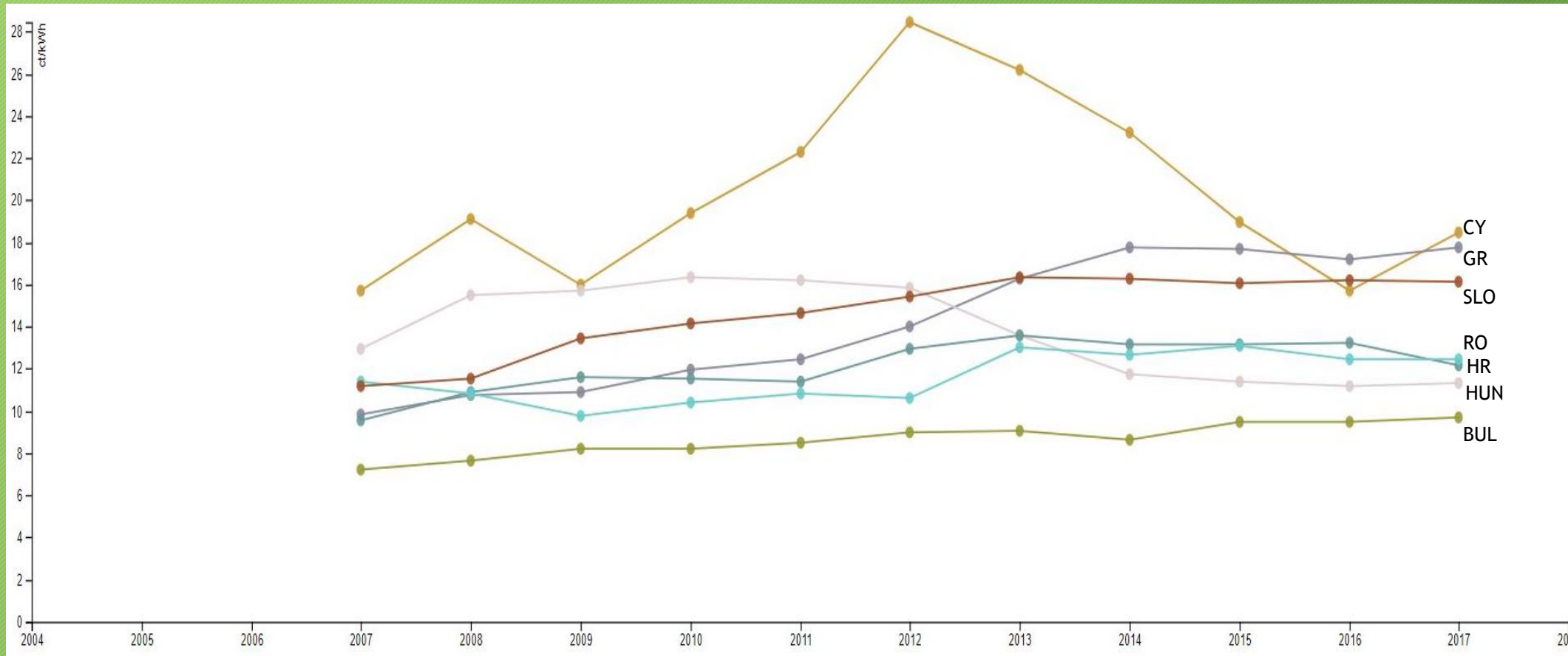
# Energy Poverty

## INABILITY TO KEEP ADEQUATELY WARM (LACK OF THERMAL COMFORT)



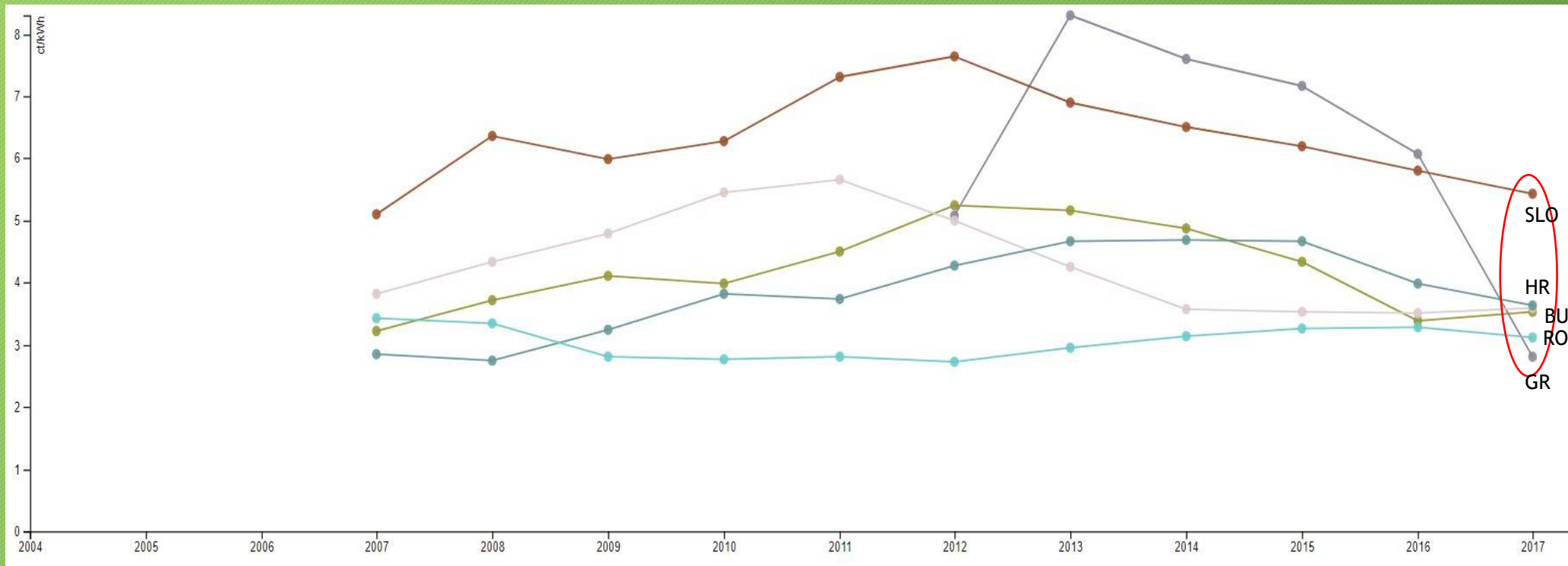
Max: 37% BUL  
Min 4% SLO

# Energy prices - Electricity for household (c/kWh)



Max: 18 c/kWh CY  
Min 9 c/kWh BUL

# Energy Prices - Gas for Household (c/kWh)



Max: 5,5 c/kWh SLO  
Min: 2,5 c/kWh GR

# EE Programs for Buildings

A/A	COUNTRY	Transpose EED	Energy law	No of Programs on EED	Budget in mil €
1	Albania	√	L.124/2015	5 - mainly by German Co. (KfW, GIZ, etc) - No ESCOs	N/A
2	Bosnia & Herzegovina	not yet	no-state Law on EE	-	-
3	Bulgaria	√	NPEC 2021-30 & L. on Local Energy Levies & taxes	3 - EE in PB/Regions in Growth/KIDSF	1000
4	Croatia	√	EE Act 116/18 Building Act 39/19 Protection against Light Pollution Act 14/19	3 - Energy Renovation of Family Houses/EE in PS/loans	211 & 190 mil HRK for loans
5	Cyprus	√	EED & amendments	1 - EE in SMEs	53 in loans
6	Hellas	√	EED & amendments	1 in action - EXOIKONOMO	900
7	Hungary	√	EED & amendments	Multiple - Households/PB	Grants/Subsidies/ Loans
8	Israel	√	Guidance for EE Actions Plans	Multiple	Grants/Subsidies/ Loans/ <b>awareness</b>
9	Kosovo	√	L.06/L-079 & L.05/L-101	EEF (WB/EU)	11,5
10	Montenegro	√	EEAP 2019-21	5 - for PB/households/biomass/PV	N/A
11	N. Macedonia	√	L.32/2020	5 - PB/Household/Power Plants/DHS	Grants/Subsidies/Loans
12	Romania	√	EED & amendments	PB/Power Plants/CHP/DHS	N/A
13	Serbia	√	L. 145/2014 & I.25/2013	4 - mainly by German Co. (KfW, EIB)	220 - Grants/Subsidies/Loans
14	Slovenia	√	EED & amendments	Multiple - Households/PB/new CHP	Grants/Subsidies/Loans
15	Turkey	√	TS825/08 & L.5627	EEIP-Vas-Incentives (EBRD/WB/etc)	Grants/Subsidies/Loans

# Energy efficiency in Transportation

A/A	COUNTRY	Transportation
		Reg. Vehicles (2016)
1	Albania	563.106
2	Bosnia & Herzegovina	978.229
3	Bulgaria	4.031.748
4	Croatia	1.996.056
5	Cyprus	650.805
6	Hellas	9.489.299
7	Hungary	4.022.798
8	Israel	3.239.305
9	Kosovo	334.400
10	Montenegro	211.219
11	N. Macedonia	442.962
12	Romania	7.014.661
13	Serbia	2.282.401
14	Slovenia	1.468.439
15	Turkey	21.090.424
	<b>TOTAL</b>	<b>57.815.852</b>

According to data by WHO in  
 GER: 56.622.000  
 FRA: 42.363.000 registered  
 vehicles

# Conclusions

- Almost all countries in the Region have transposed the EED (2012/27/EU) and its amendment (2018/32/EU) to their energy legal systems.
- Almost all countries prepared a NPEC with notable targets for 2030.
- Attention is given to Public Sector and to the renovation of the Public Buildings, as EED requires, with extensive Energy Audits, Energy Studies, deep Energy Renovation, with high-energy performance materials.
- IFIs are playing crucial role for the non-EU member states for the promotion of EE, followed by EU-funded Projects
- «Operational Program for Implementation of EU Cohesion Policy» is the main financial instrument for EEMs in EU M-S of the Region.

# Conclusions

- Missing detailed data and analysis for many countries of the Region, regarding their building stock.
- Energy Poverty is knocking strongly “the door”.... Actions needed.
- At least 25% of the EU M-S population is leaving in Energy Poverty, as they can not keep warm their home (lack of thermal comfort), at the time when energy prices are dropping the last years.
- This percentage is higher in the non-EU M-S, especially in those with low GDP.

# Conclusions - Remarks

- Another important sector for EE measures is Transportation, where more than 57 mil vehicles are registered, with an average of 680 mil km annually, emitting more than 170 mil tn CO<sub>2</sub>.
- In many countries of the Region the vehicle fleet is old (>15 yrs), with minimal maintenance, using old-type roads/highways.
- Minimum penetration of low-emission (as Euro 5 or 6) or electric vehicles in Region's roads
- IENE, as a prestigious think-tank for Energy issues of SE Europe, has focused and worked on these issues, by publishing sectorial studies i.e. for electric vehicles and their prospects, on the role of EE incentives in residential buildings in Greece, etc. and by organizing Seminars and Conferences/Congresses on these issues.



**Thank you for your attention!**

**Q & A**