Workshop on energy efficient housing for sustainable development, Tirana, Albania, *7–8 July, 2014*

EE Housing Savings Potential – Challenges of the Feasibility Analysis and Results of a Pilot Study in Tirana

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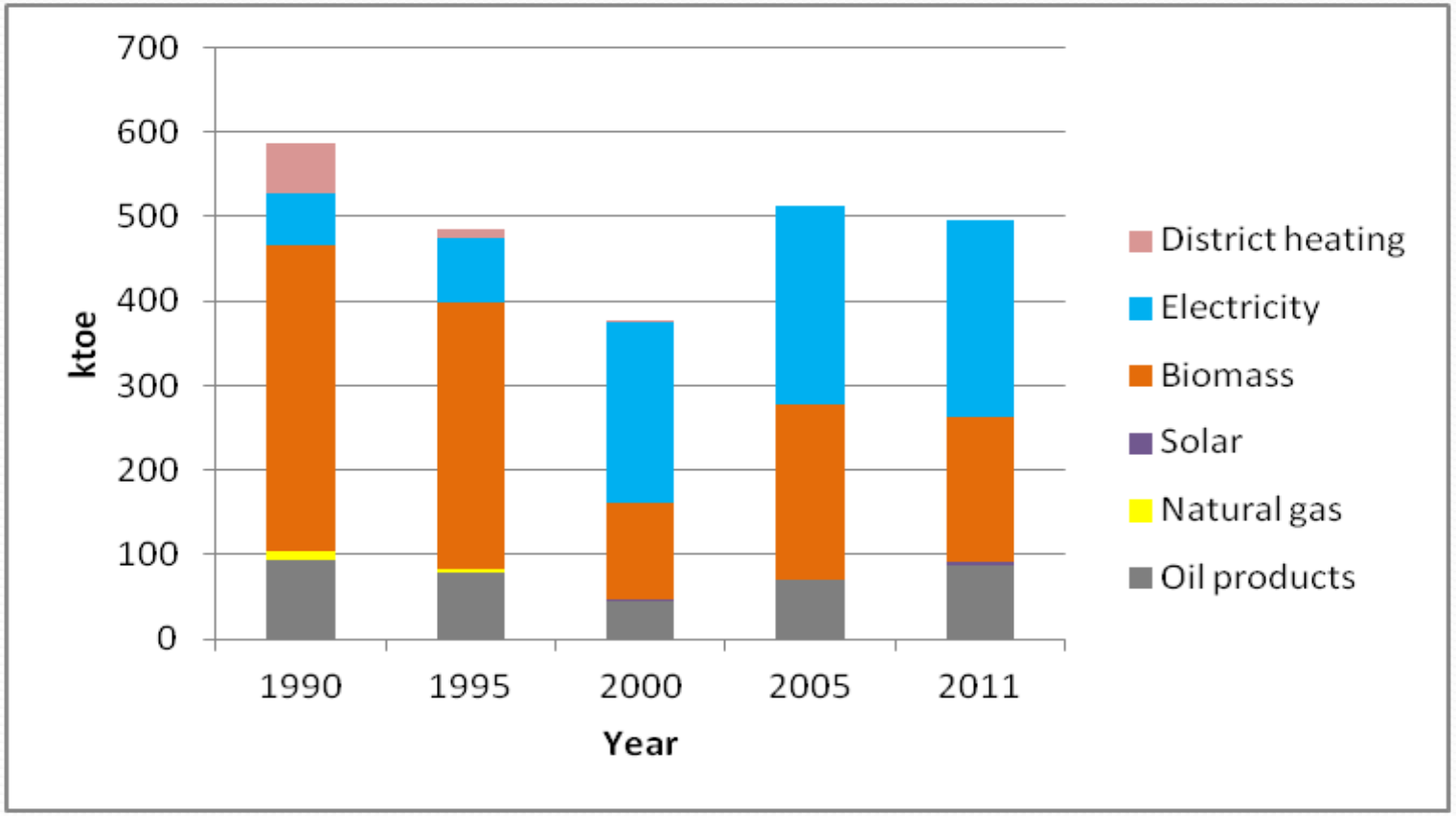
UNDP-UNEP Poverty-Environment Initiative (PEI) in Albania

- Economic assessment comparing the long-term energy and cost savings opportunities of energy efficient vs. current inefficient housing construction
- Desk analysis with the technical problems and other policy barriers of the existing energy building code
- Policy recommendations for the design of a new Energy Building Code
- Capacity development of professionals addressing the cycle from design to construction, maintenance and monitoring
- A package of pilot projects developed for further implementation as per the requirements of the EU Directive of Energy Performance of Buildings.

Main data sources

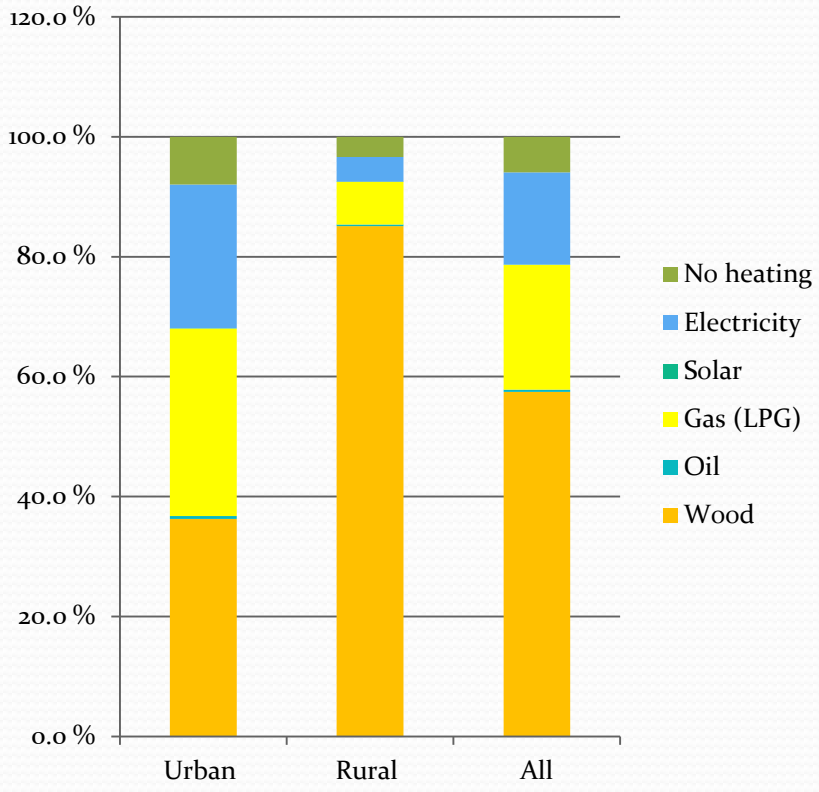
- IEA Energy statistics
- INSTAT CENSUS 2011
- ERE Annual Reports
- Tirana pilot study (thermal simulation program “EnergyPlus”, questionnaire and actual meter readings)
- EU ODYSSEE MURE project: “Energy Efficiency Trends in Buildings in the EU”

Albania residential sector energy consumption in 1990-2011

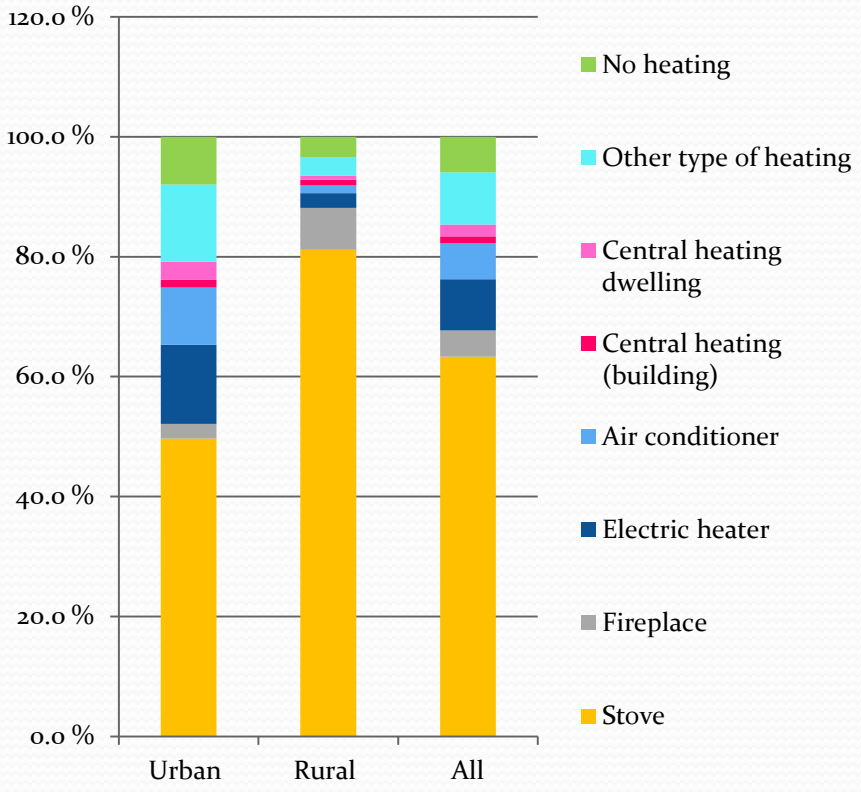


A variety of different energy sources and appliances

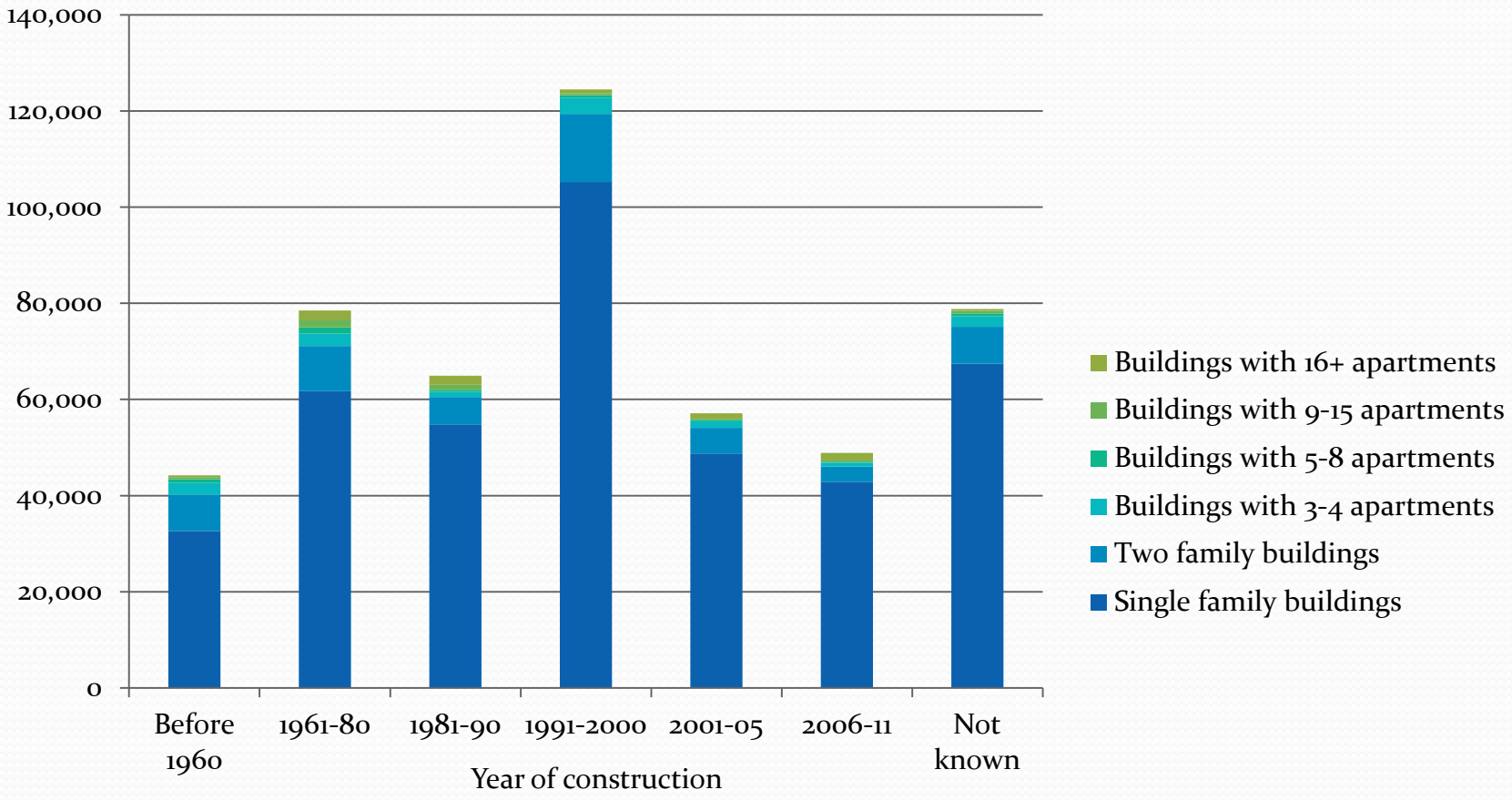
Main source of energy used for heating (INSTAT Census 2011)



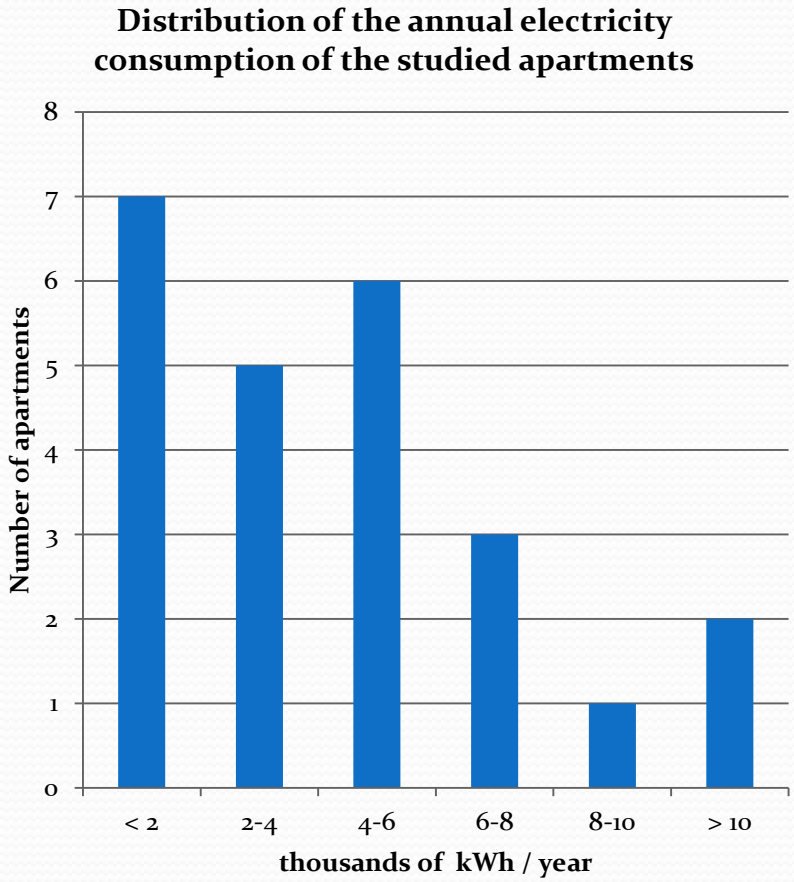
Type of heating system (INSTAT Census 2011)

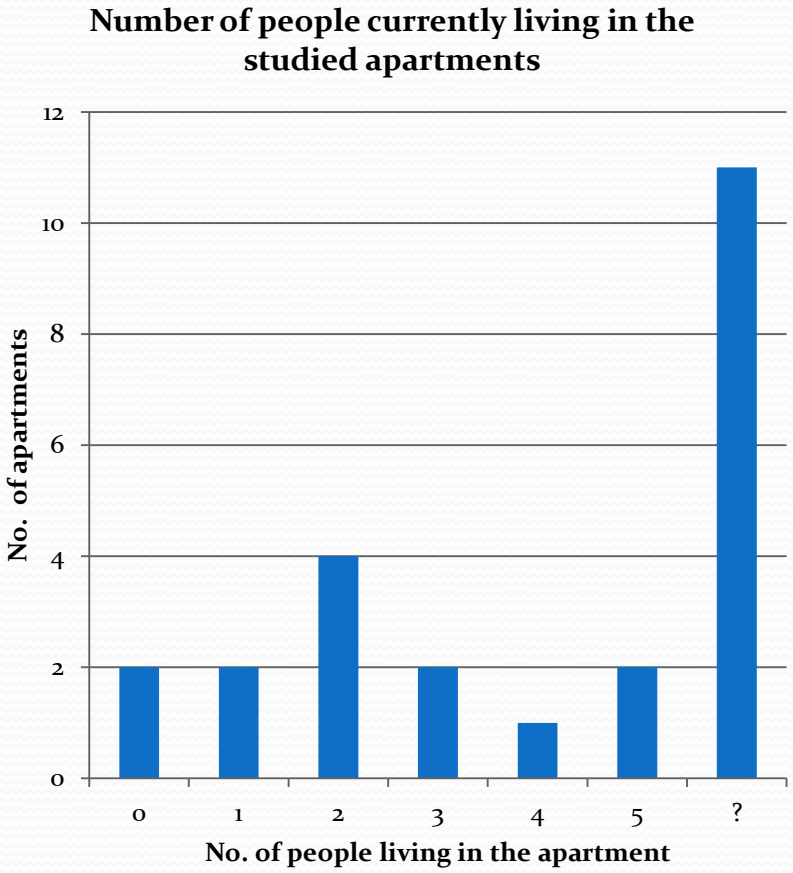


A variety of different type and age of buildings



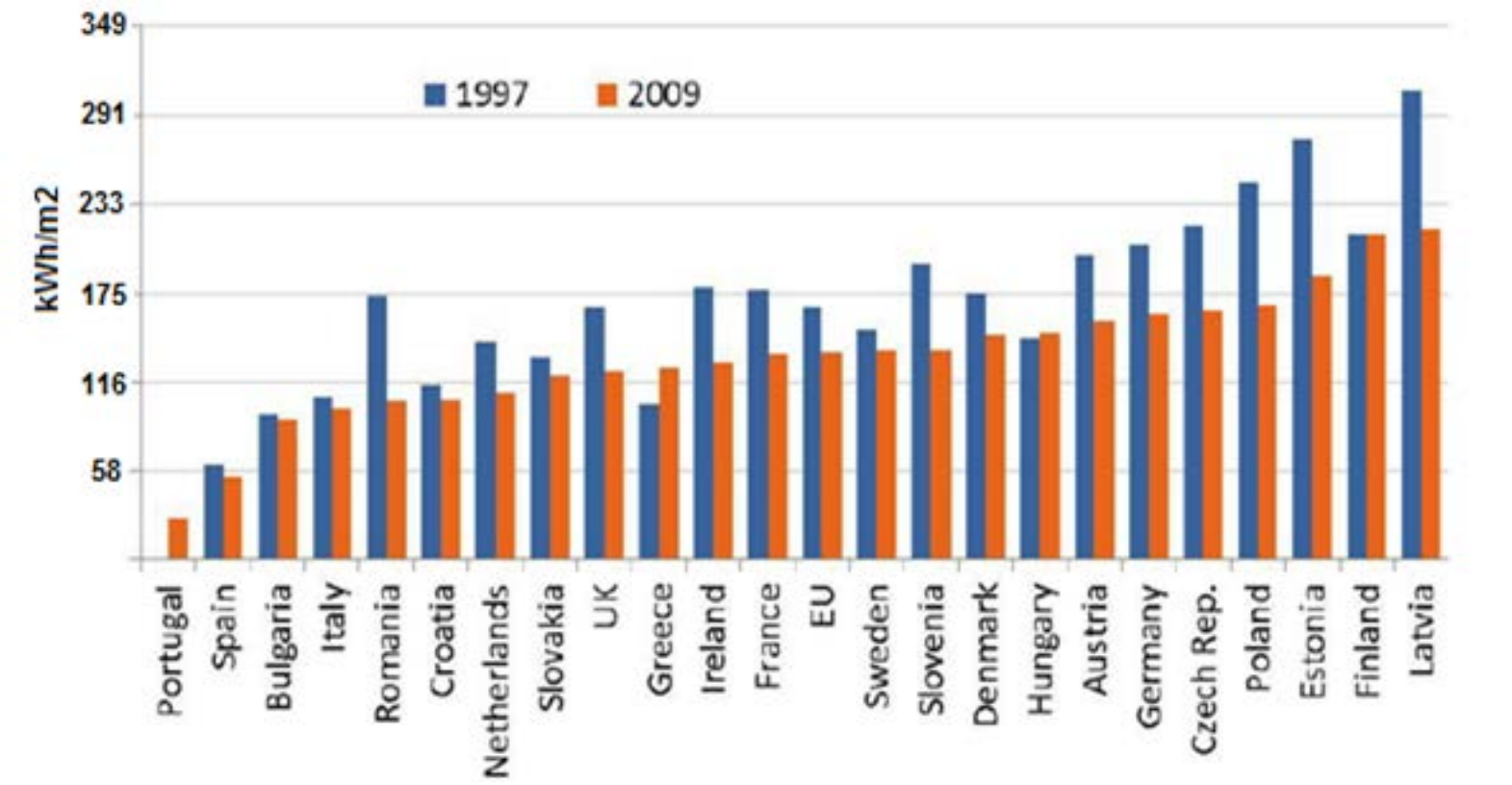
A variety of different consumption patterns (Example of one multi-storey building in Tirana)



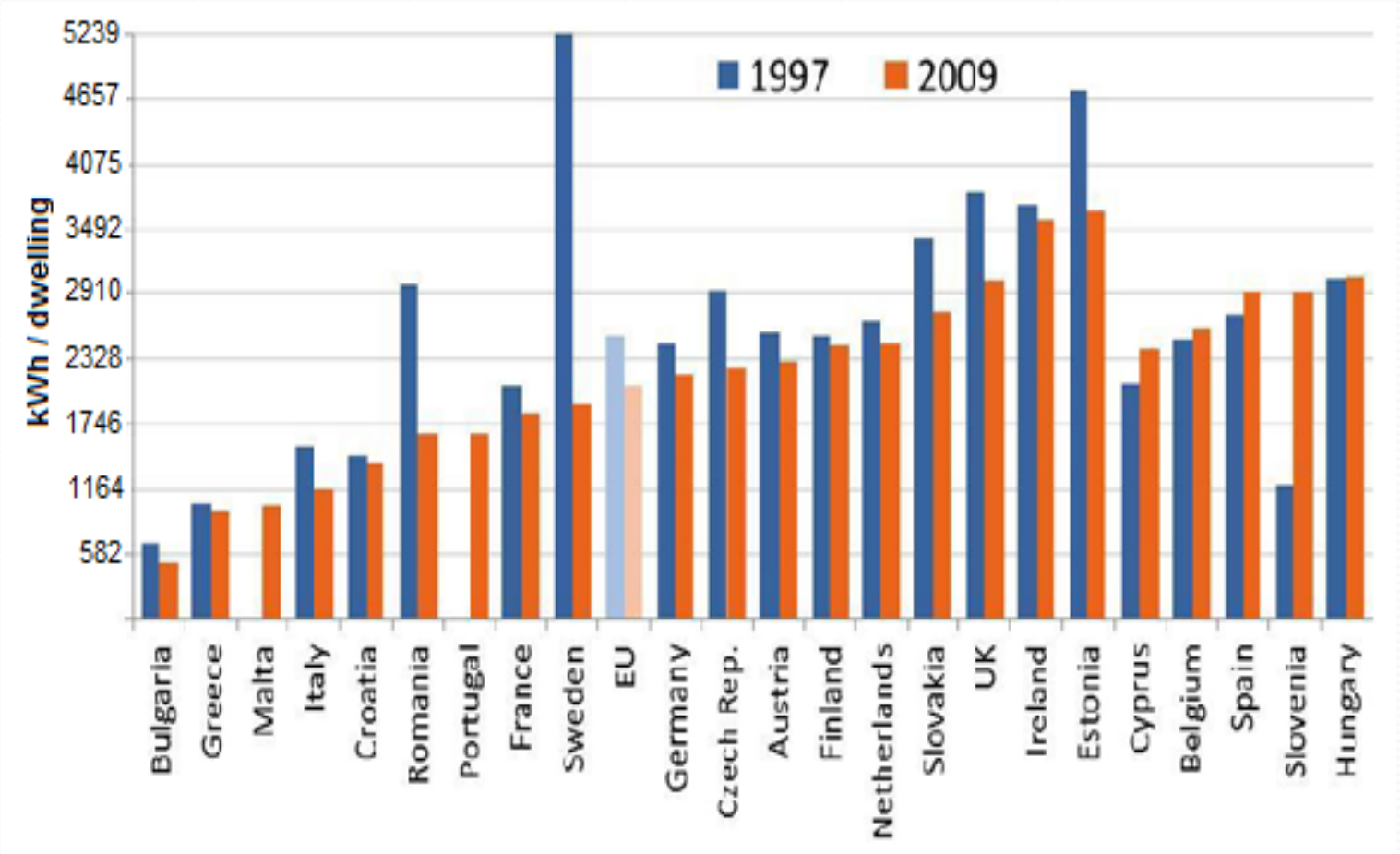


Also internationally ….

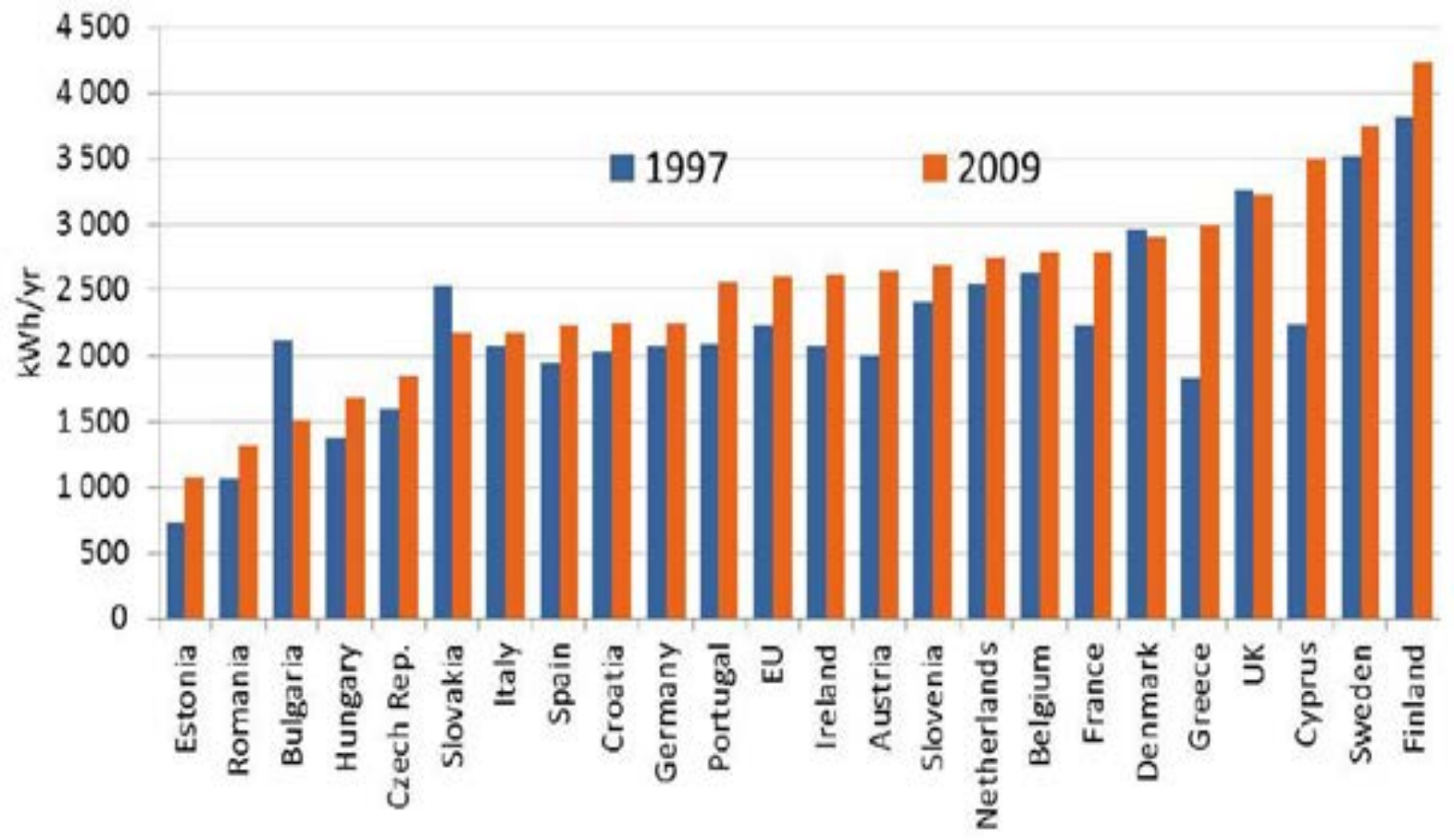
(source: www.odyssee-mure.eu)



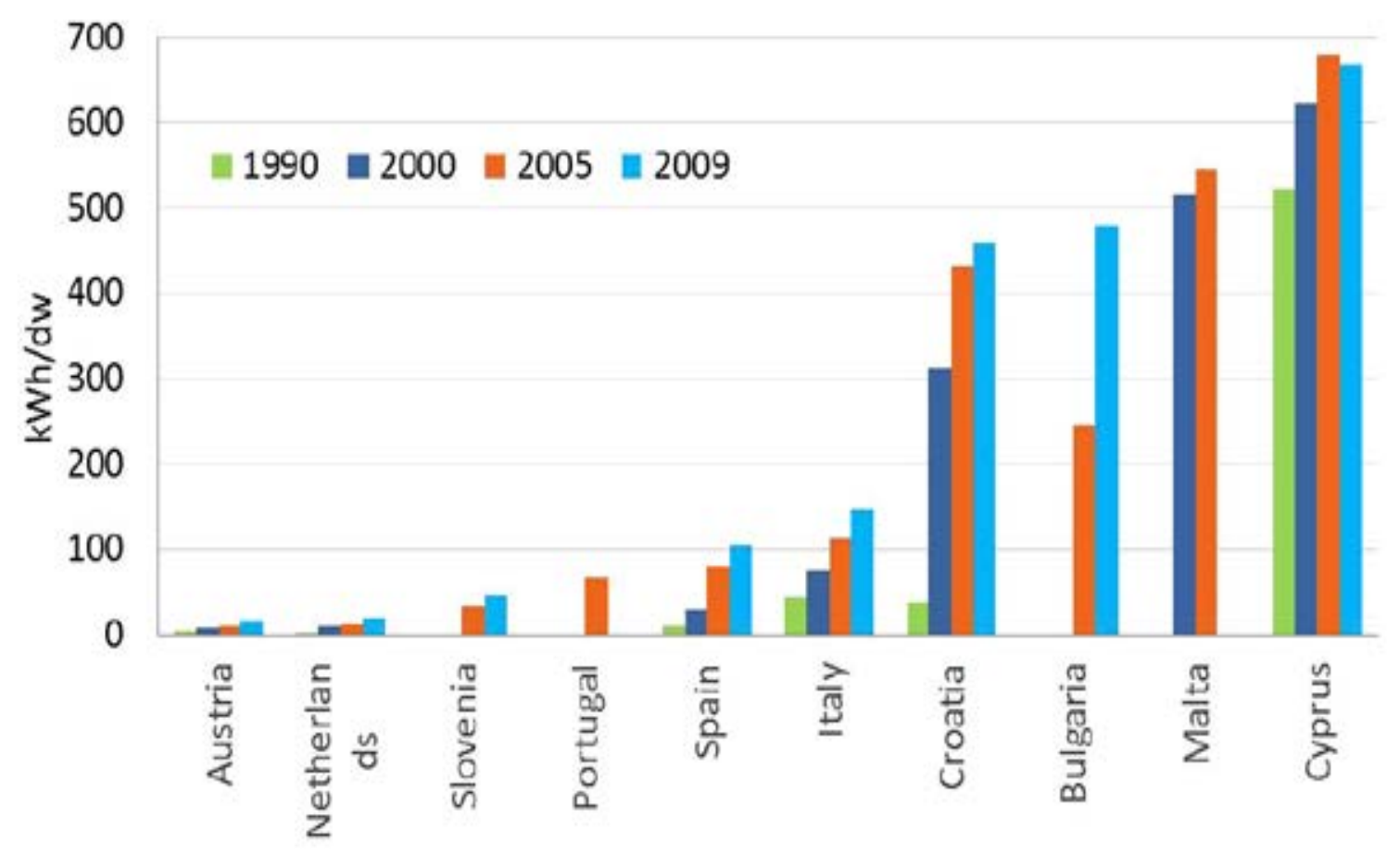
Annual energy use for space heating per m^2 of floor area



Annual energy use for water heating per dwelling

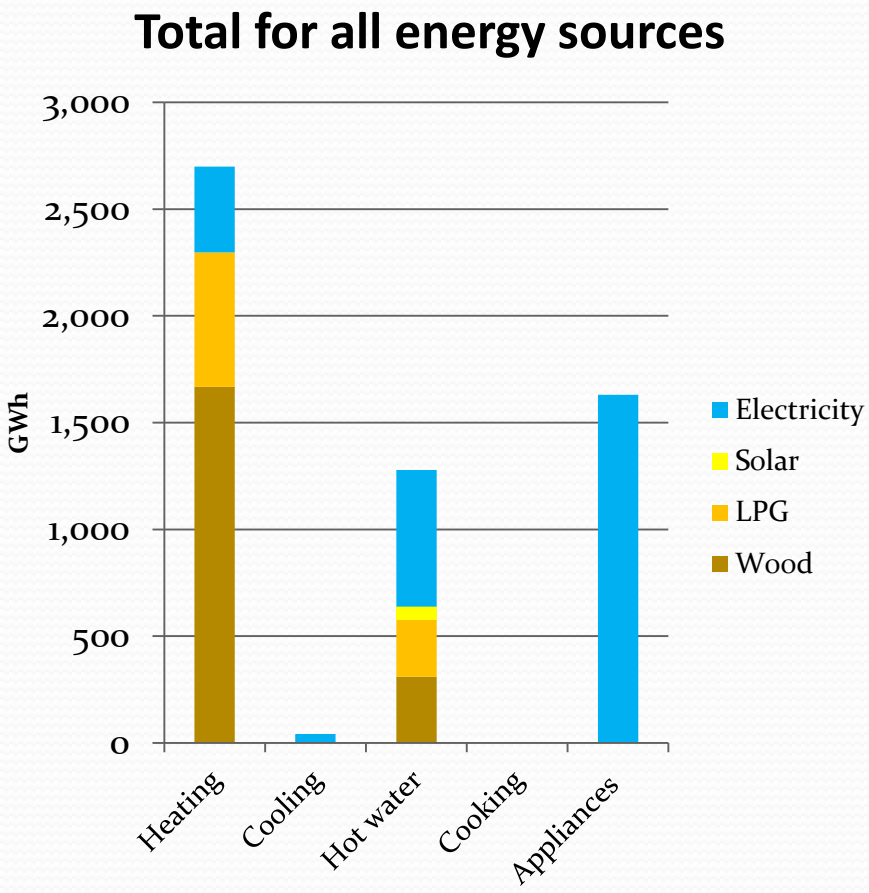


Annual electricity consumption for appliances and lighting per dwelling



Annual electricity consumption for air-conditioning

Estimated (highly inaccurate) residential energy balance of Albania



Assumptions on the average specific energy consumption over the entire building stock:

Heating: 67 kWh/m2

Cooling: 1 kWh/m2

Hot water: 1 769 kWh/dwelling

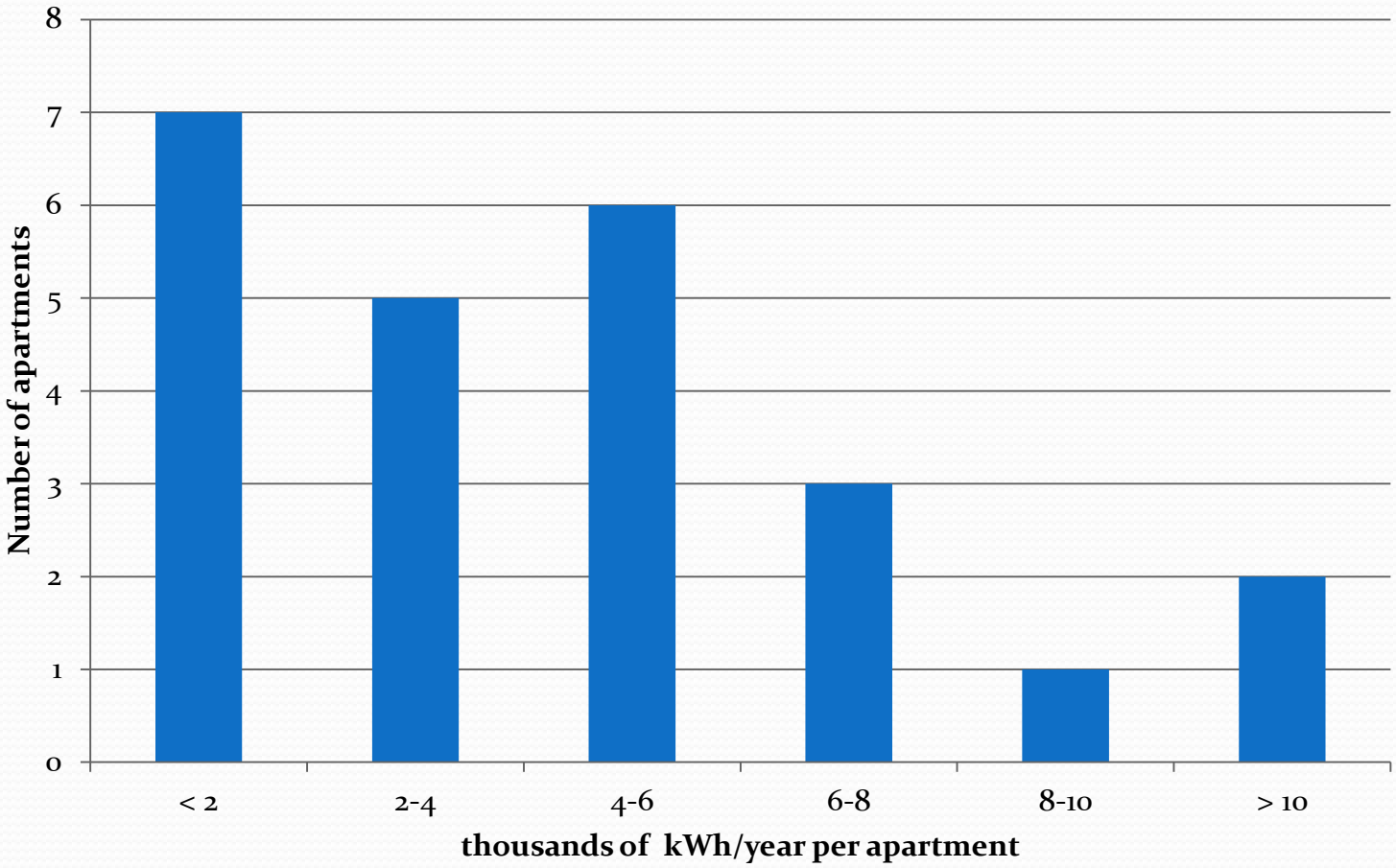
Appliances: 2 258 kWh/dwelling

Total estimated average residential end use of energy in Albania, incl. all energy sources (IEA 2011):

495 ktoe = 5 764 GWh (or 7 821 kWh per inhabited dwelling)

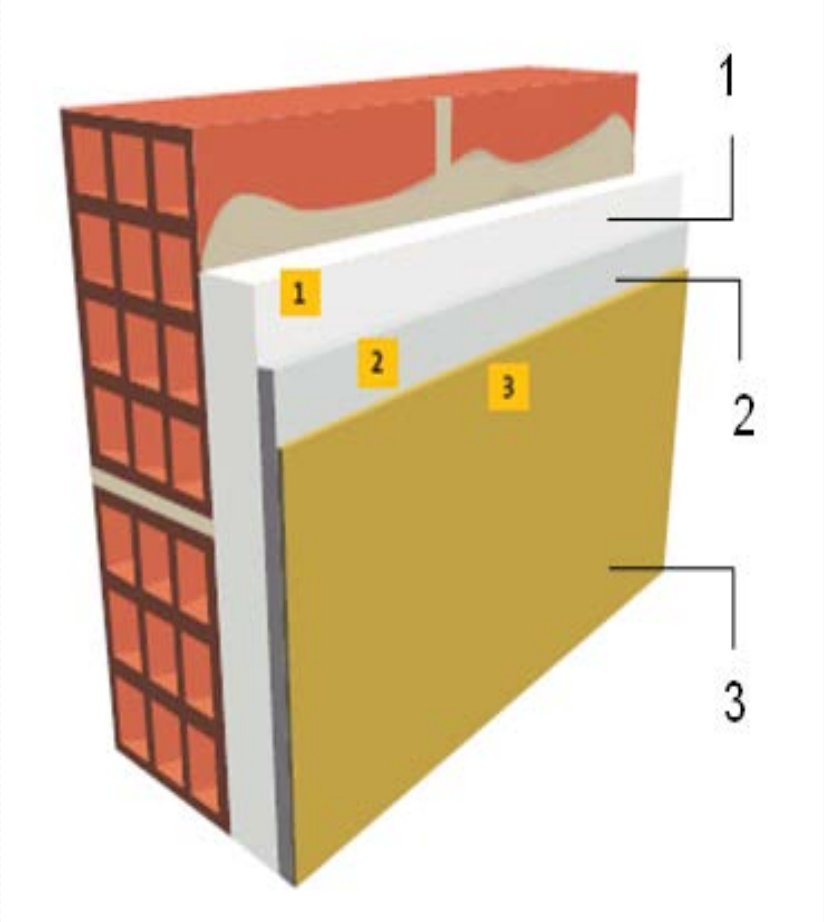
Residential electricity consumption (IEA 2011): 2 712 GWh

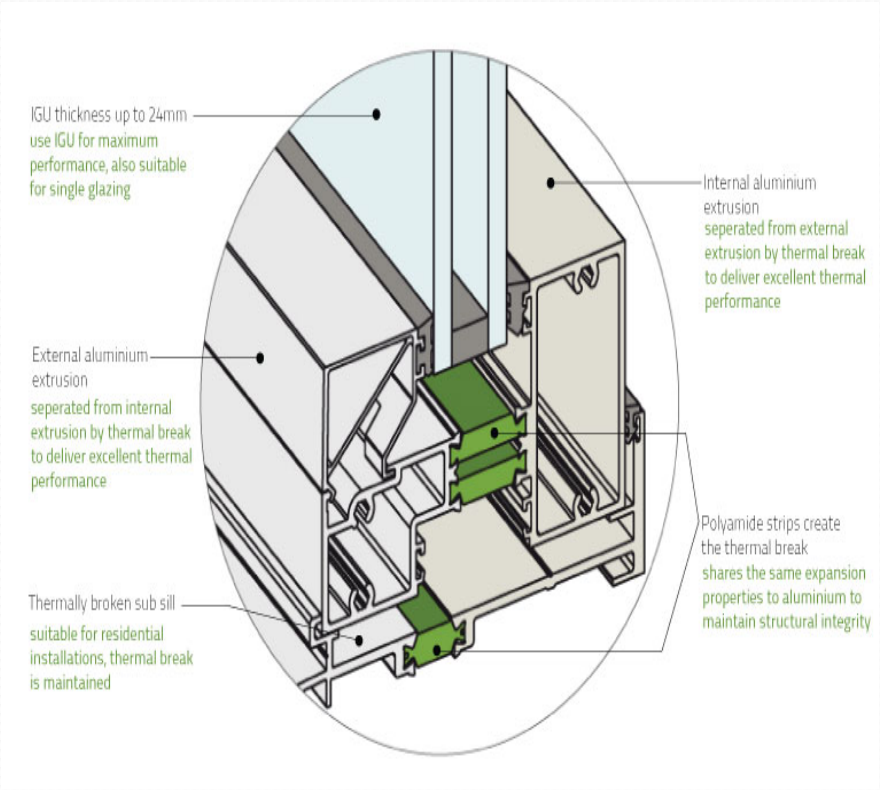
Measured apartment level electricity consumption of one multi-storey building in Tirana



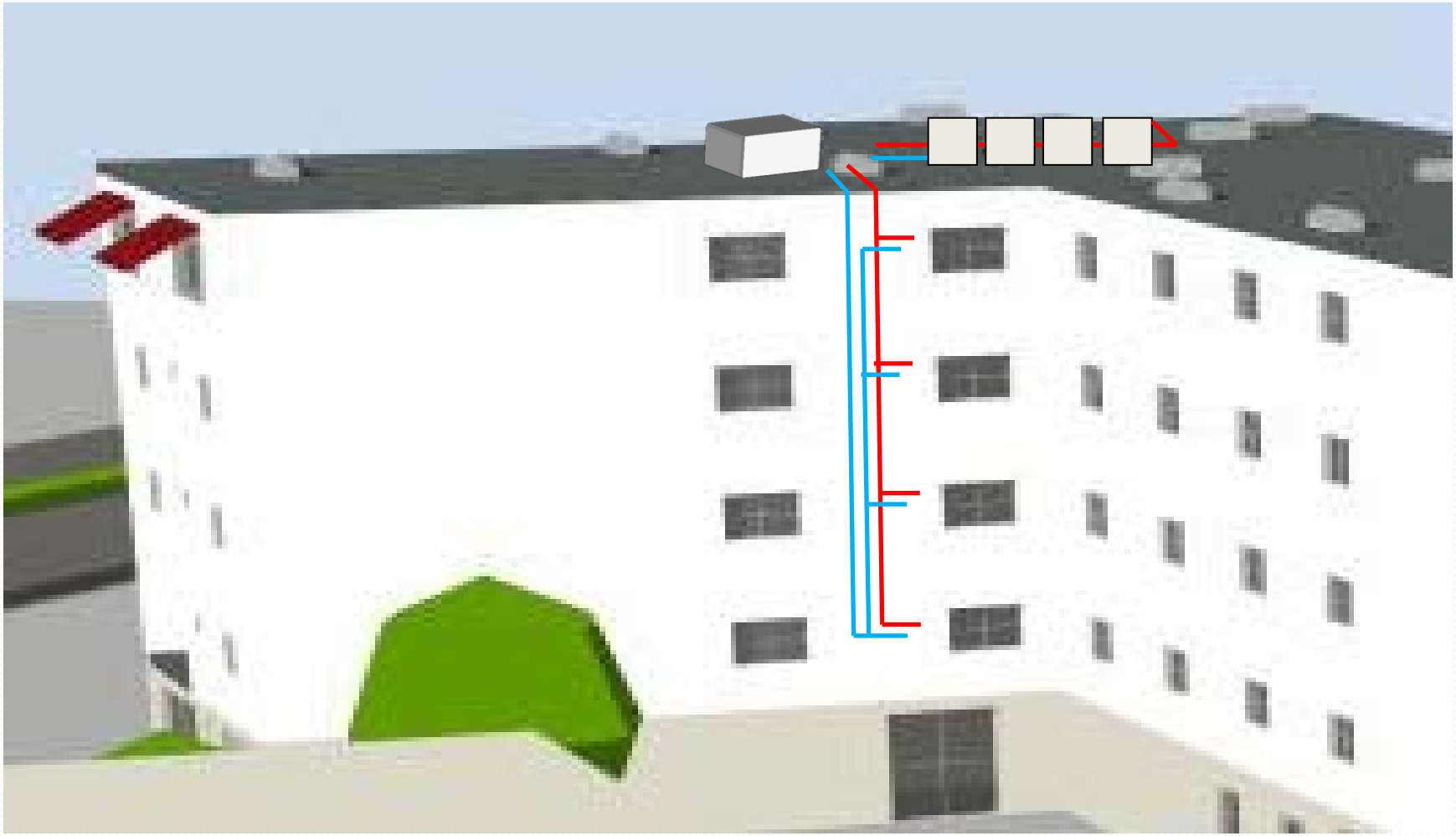
UNDP pilot study in Tirana

Options studied – building envelope





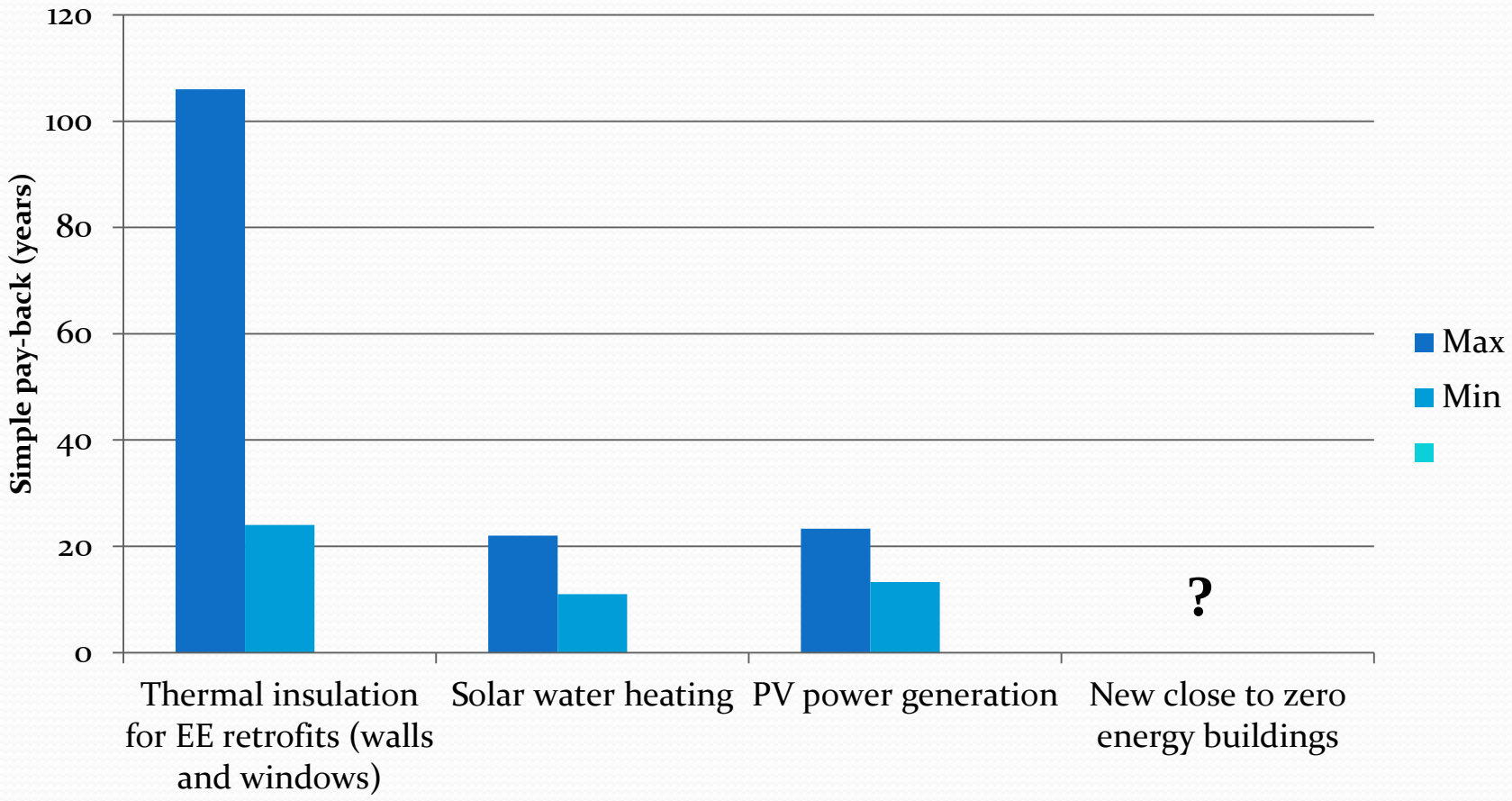
Solar water heating



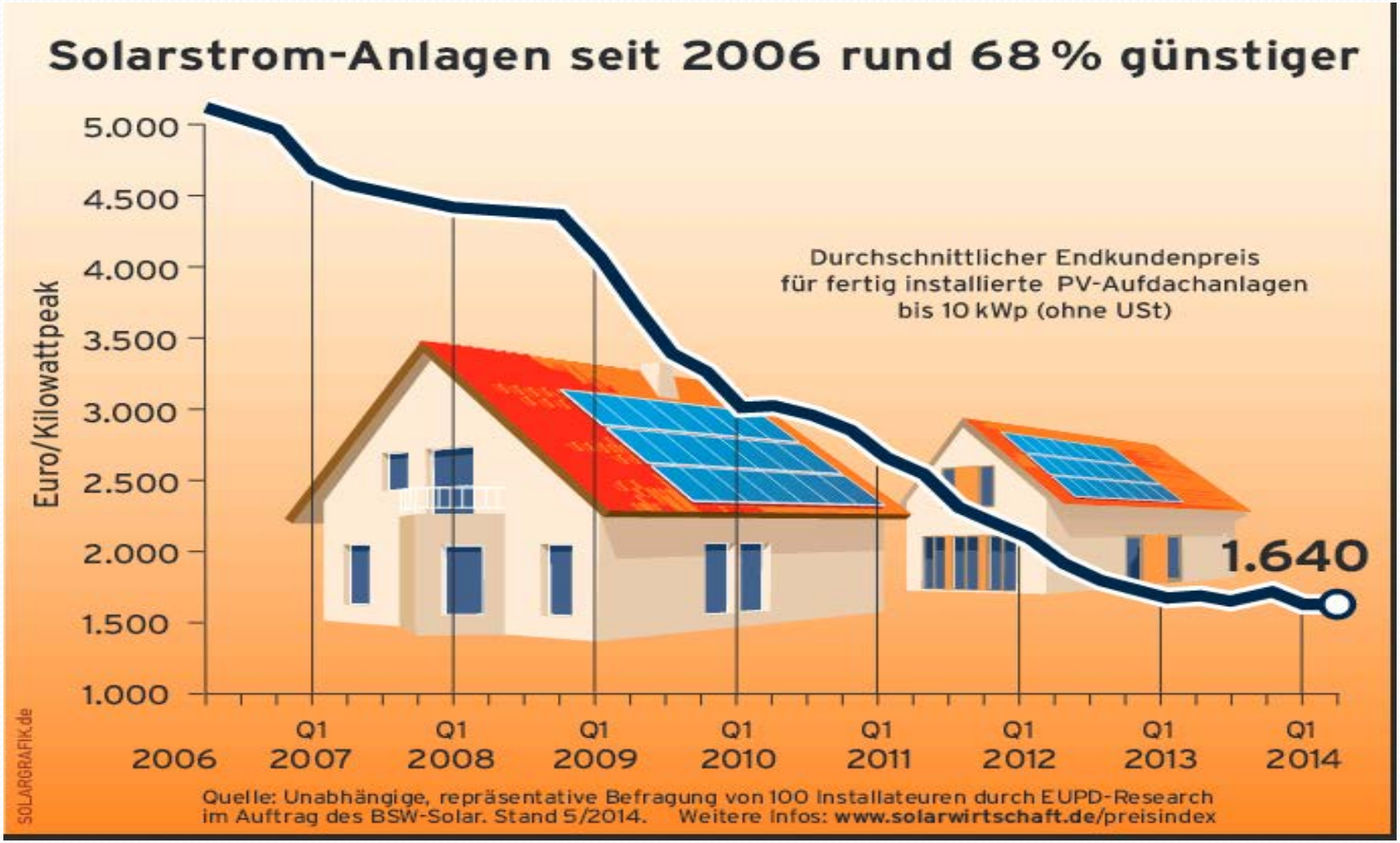
Sample Results

EE retrofit options considered	Annual savings for low consumption			Simple payback	Annual savings for high consumption			Simple payback
	kWh	Euros	Leks	**Years**	kWh	Euros	Leks	**Years**
Baseline consumption	3 000	NA	NA	**NA**	7 500	NA	NA	**NA**
Savings from option 1	272	18	2 517	**128**	681	79	11 031	**29**
Savings from option 2	308	20	2 845	**123**	770	89	12 468	**28**
Savings from Option 3	420	28	3 883	**106**	1 051	122	17 019	**24**
Savings from Option 4	448	30	4 140	**108**	1 120	130	18 148	**25**
Savings from SWH:	683	45	6 309	**25**	868	101	14 064	**11**
Savings from Option 3 + SWH	1 103	73	10 192	**55**	1 919	223	31 083	**18**

Estimated simple pay-back of different EE and RE measures in Albania



Development of PV prices in Germany



Possible support options

- Regulations (Example : EE building norms, solar obligations in the new Albania RE law)
- Fiscal incentives (Example: VAT and custom duty exemptions for SWH in the new Albania RE law)
- Non-refundable grants (Examples from several countries presented in the UNDP Tirana pilot study report - for EE retrofits typically 20-40% of the total costs)
- Specific EE credit lines and soft loans: (Examples: EE credit lines of some commercial banks in Albania, soft loan schemes of several EU countries)
- Available EU support (such as EU Cohesion Funds) often used as a critical building block for financial support schemes in new EU member states

Topics for further discussion

- Reliance on desk studies only in assessing the energy and cost saving opportunities and feasibility of different measures for EE housing may easily mislead the decisions
- Starting the construction of a database by verified energy data on the consumption of different type of buildings by on-site energy audits and by monitoring the results of the EE retrofits already done critical to improve the accuracy of the studies
- With limited financial resources priority setting essential: Focus on new buildings, EE retrofits, thermal insulation, appliance energy efficiency, increasing the RE production or something else ?
- EE retrofits obviously most cost-effective when linked to the general retrofitting needs of the existing building stock – a specific Government program needed to meet the general retrofitting needs, but linked also to energy efficiency ?