



Energy poverty and vulnerable consumers in the energy sector across the EU: analysis of policies and measures: Appendices to main report

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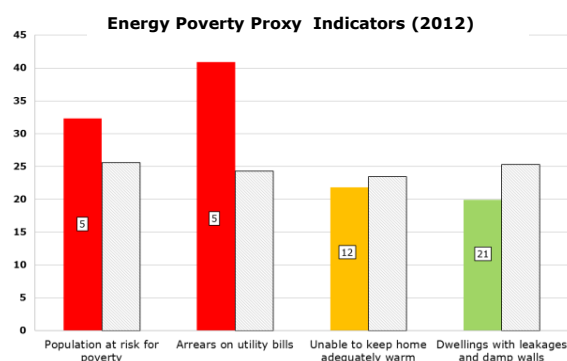


University College
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APPENDIX I. VULNERABLE CONSUMERS AND ENERGY POVERTY IN MEMBER STATES: COUNTRY SUMMARIES



How to interpret the indicator graph.

The Energy Poverty Proxy Indicators Graph compares 4 key indicators of Energy Poverty from specified Members States to the EU average. The EU average is shown in grey for each key indicator while the Member States values are depicted in colours ranging from Red, Orange and Green. The colours capture how the Member States rank in relation to all 28 Member States. The colours range from Red (ranking 1-9), Orange (10-18) and Green (19-28). A value of 1 represents the lowest ranking of that indicator in the EU while a rank of 28 represents the highest ranking. The absolute value of rank is also shown in each pillar. The y-axis is (%) of Population with specific definitions of each indicator below

People at risk of poverty (%) [or social exclusion]: At risk-of-poverty are persons with an equivalised disposable income below the risk-of-poverty threshold, which is set at 60 % of the national median equivalised disposable income (after social transfers). Material deprivation covers indicators relating to economic strain and durables. Severely materially deprived persons have living conditions severely constrained by a lack of resources, they experience at least 4 out of 9 following deprivations items: cannot afford i) to pay rent or utility bills, ii) keep home adequately warm, iii) face unexpected expenses, iv) eat meat, fish or a protein equivalent every second day, v) a week holiday away from home, vi) a car, vii) a washing machine, viii) a colour TV, or ix) a telephone. People living in households with very low work intensity are those aged 0-59 living in households where the adults (aged 18-59) work less than 20% of their total work potential during the past year

Arrears on Utility bills (%): Share of at risk for poverty population with arrears on utility bills sourced from EU-SILC EUROSTAT 2012, Ireland data from 2011

Unable to keep home adequately warm (%): Share of at risk for poverty population unable to keep home adequately warm: Sourced from EU-SILC EUROSTAT 2012, Ireland data from 2012

Dwellings with leakages and damp walls (%): Share of at risk for poverty population dwellings with leakages and damp walls: Sourced from EU-SILC EUROSTAT 2012, Ireland data from 2013.



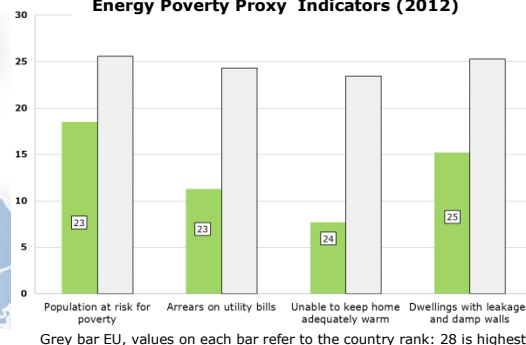
Austria

- Area: 83 870 km²
- Capital city: Vienna
- Population: 8 451 860 (2013)
- GDP per capita in Purchasing Power Standards (PPS): 130 (2012)
- Unemployment rate: 4.8 (11/2013)
- Inflation rate: 2.1 (2013)

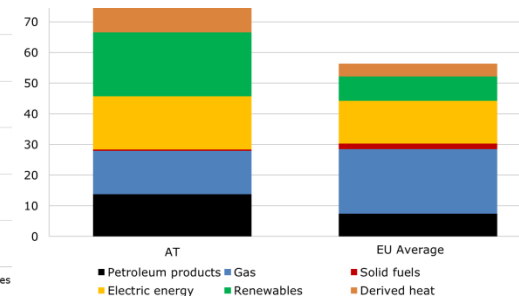
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Energy Poverty Proxy Indicators (2012)



Energy consumption per household by fuel (GJ/HH)

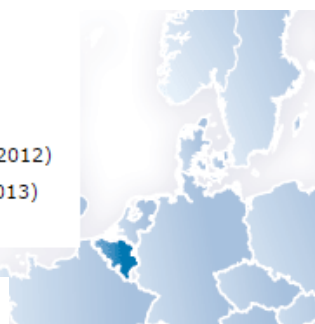


Market situation	Liberalised?	Yes
	Concentrated supply in retail market?	Yes (Gas: 72% for 3 companies; ELC: 57% for largest company)
	Ability of consumers to switch tariffs?	Yes
Definition	Vulnerable consumers (defined?)	Yes
	Vulnerable consumer definition type (GAS / ELC)	Range of socio-economic groups
	Energy or fuel poverty recognised in policy?	Yes - Energy Poverty
Measures	Energy policy (EP) or social policy (SP) led?	Both
	Primary measures	Info/awareness
	Number of assessed measures targeted on VC / EP	2 / 8 (20%)
	Key actors (mainly regulator or others?)	Government, Regulator, Consumer Advice Centres, Civic Society
	Measure effectiveness & challenges	The definition for energy poverty was conceived through an open dialogue between various stakeholders from government to energy utilities to researchers to civil society. Since the 1st of January, 2015, energy suppliers are required to provide customer advice regarding energy poverty. Various short-term measures are in place to provide financial relief to low income households.

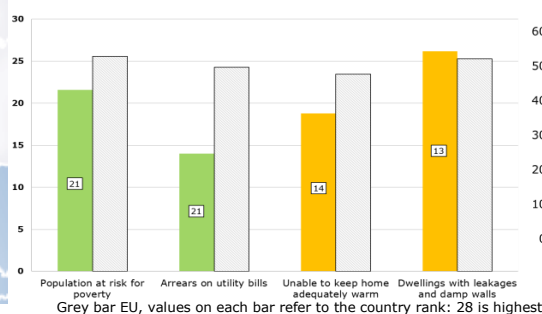


- Area: 30 528 km²
- Capital city: Brussels
- Population: 11 161 642 (2013)
- GDP per capita in Purchasing Power Standards (PPS): 120 (2012)
- Unemployment rate: 8.4 (11/2013)
- Inflation rate: 1.2 (2013)

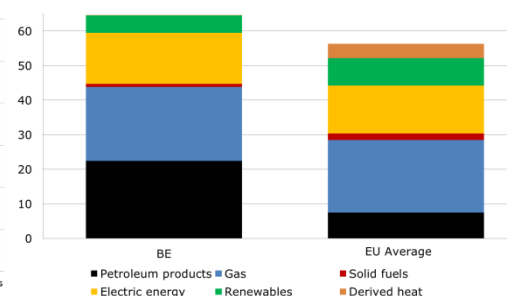
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Energy Poverty Proxy Indicators (2012)



Energy consumption per household by fuel (GJ/HH)



Market situation	Liberalised?	Yes
	Concentrated supply in retail market?	Yes
	Ability of consumers to switch tariffs?	Yes
Definition	Vulnerable consumers (defined?)	Yes
	Vulnerable consumer definition type (GAS / ELC)	Definition of "protected consumers" mostly based on health, income and eligibility to social benefits, broadened to indebted people in Wallonia and Brussels Capital
	Energy or fuel poverty recognised in policy?	No
Measures	Energy policy (EP) or social policy (SP) led?	Both
	Primary measures	Energy efficiency
	Number of assessed measures targeted on VC / EP	11 / 43 (26%)
	Key actors (mainly regulator or others?)	Federal government, Regional Governments, Local social services
	Measure effectiveness & challenges	The overall level of protection is high but does not yield entirely satisfactory results. Pre-payment meters intend to provide a safety net against disconnection, but they are only curative and do not constitute a structural solution. Energy efficiency measures are numerous, but they insufficiently target tenants and low-income households.

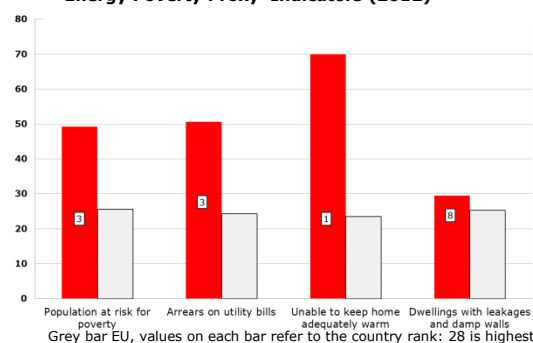


Bulgaria

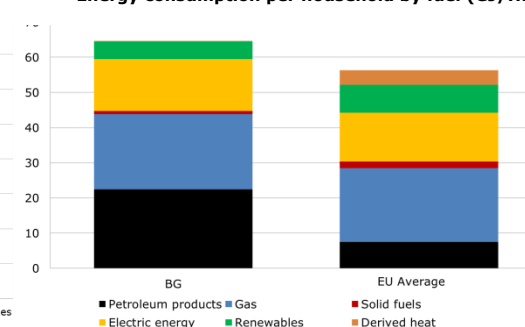
- Area: 111 910 km²
- Capital city: Sofia
- Population: 7 284 552 (2013)
- GDP per capita in Purchasing Power Standards (PPS): 47 (2012)
- Unemployment rate: 12.9 (11/2013)
- Inflation rate: 0.4 (2013)

Source: <http://europa.eu/youreurope>

Energy Poverty Proxy Indicators (2012)



Energy consumption per household by fuel (GJ/HH)

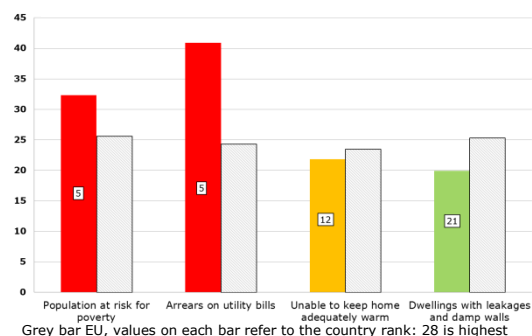


Market situation	Liberalised?	Incomplete
	Concentrated supply in retail market?	Yes, high concentration
	Ability of consumers to switch tariffs?	Practically, no household has ever switched to freely negotiated prices (electricity) or has ever changed supplier (gas)
Definition	Vulnerable consumers (defined?)	Implicitly recognized by the energy law and/or social security system
	Vulnerable consumer definition type (GAS / ELC)	Socio-economic groups
	Energy or fuel poverty recognised in policy?	No
Measures	Energy policy (EP) or social policy (SP) led?	SP
	Primary measures	Income-support orientated
	Number of assessed measures targeted on VC / EP	1 / 3 (33%)
	Key actors (mainly regulator or others?)	National Government / Regulator
	Measure effectiveness & challenges	Energy poverty issues are part of broader social policies. No long term perspective.

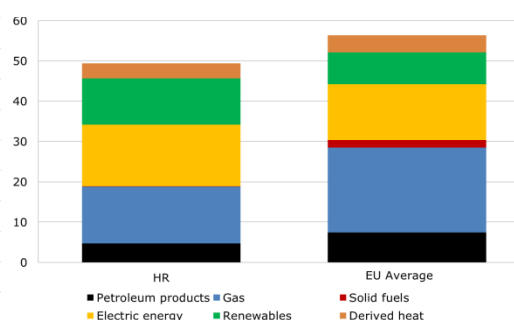


Croatia

Energy Poverty Proxy Indicators (2012)



Energy consumption per household by fuel (GJ/HH)



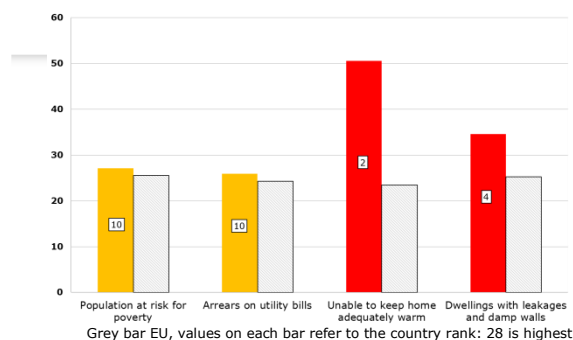
Market situation	Liberalised?	Yes
	Concentrated supply in retail market?	Yes
	Ability of consumers to switch tariffs?	GAS: No; ELC: Yes
Definition	Vulnerable consumers (defined?)	No, but the term is mentioned in Energy Act
	Vulnerable consumer definition type (GAS / ELC)	Social benefit recipients
	Energy or fuel poverty recognised in policy?	No
Measures	Energy policy (EP) or social policy (SP) led?	SP
	Primary measures	Social security payments, EE programme; Concept for protection of vulnerable customers under development
	No. of assessed measures targeted on VC / EP	4 / 7 (57%)
	Key actors (mainly regulator or others?)	National government (Ministry of Social Policy and Youth and Ministry of Economy)
	Measure effectiveness & challenges	Problems in current system for protection of vulnerable customers are lack of definition of vulnerable consumers, lack of coordination between local and central government in providing support to vulnerable customers, poor targeting of social measures, lack of statistics on vulnerable customers that would minimize the chance of system abuse, lack of information exchange between Ministry of Finance (income information) and Ministry of Social policy administering the aid for vulnerable customers, lack of a model to determine the appropriate amount of support each household should receive.



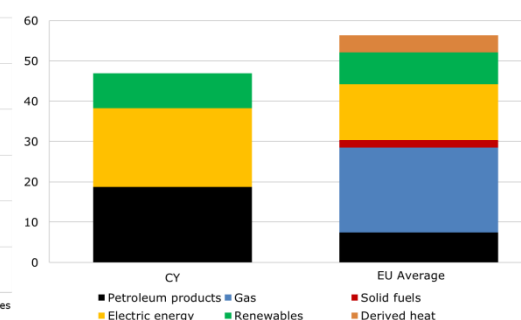
Cyprus



Energy Poverty Proxy Indicators (2012)



Energy consumption per household by fuel (GJ/HH)



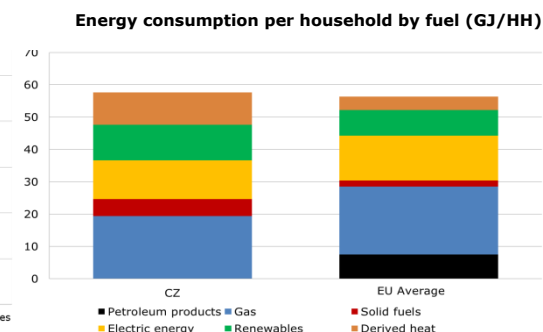
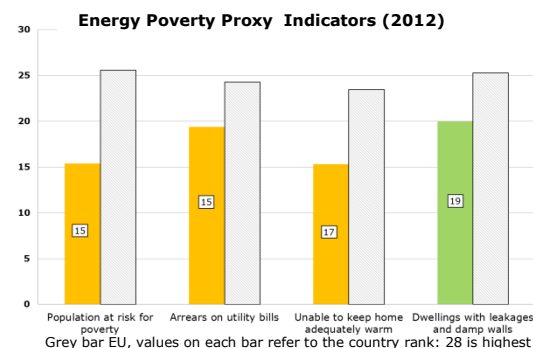
Market situation	Liberalised?	Gas: N/A; ELC: Yes, but only in name
	Concentrated supply in retail market?	Gas: N/A; ELC: Yes
	Ability of consumers to switch tariffs?	Gas: N/A; ELC: No
Definition	Vulnerable consumers (defined?)	Yes
	Vulnerable consumer definition type (GAS / ELC)	N/A ; Income / socio-economic groups
	Energy or fuel poverty recognised in policy?	Yes
Measures	Energy policy (EP) or social policy (SP) led?	Both
	Primary measures	Financial support
	Number of assessed measures targeted on VC / EP	4 / 5 (80%)
	Key actors (mainly regulator or others?)	National government, Regulator
	Measure effectiveness & challenges	The ELIH-MED project (2014) found that there were several barriers to implementation of energy efficiency measures in low-income households and these included financial, management, occupant behaviour and technical barriers.

Czech Republic

- Area: 78 866 km²
- Capital city: Prague
- Population: 10 516 125 (2013)
- GDP per capita in Purchasing Power Standards (PPS): 81 (2012)
- Unemployment rate: 6.9 (11/2013)
- Inflation rate: 0.4 (2013)



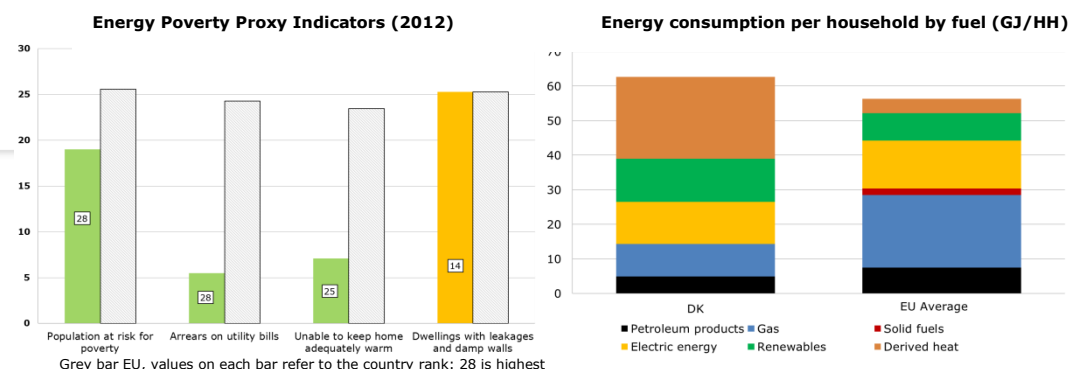
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Market situation	Liberalised?	Yes
	Concentrated supply in retail market?	Yes (GAS: 82.3% for largest company; ELC: 70% for 3 companies)
	Ability of consumers to switch tariffs?	Yes
Definition	Vulnerable consumers (defined?)	Yes
	Vulnerable consumer definition type (GAS / ELC)	Other: people on life support
	Energy or fuel poverty recognised in policy?	No
Measures	Energy policy (EP) or social policy (SP) led?	SP
	Primary measures	Information
	Number of assessed measures targeted on VC / EP	1 / 1 (100%)
	Key actors (mainly regulator or others?)	No Information
	Measure effectiveness & challenges	No Information



Denmark



Market situation	Liberalised?	Yes
	Concentrated supply in retail market?	Elec: No (HHI 1651); Gas: Yes (HHI 3648)
	Ability of consumers to switch tariffs?	Yes
Definition	Vulnerable consumers (defined?)	No - It is mentioned that they are handled by the social security system
	Vulnerable consumer definition type (GAS / ELC)	Social benefit recipients
	Energy or fuel poverty recognised in policy?	No
Measures	Energy policy (EP) or social policy (SP) led?	SP
	Primary measures	Social security payments and consumer protection measures
	Number of assessed measures targeted on VC / EP	2 / 24 (8%)
	Key actors (mainly regulator or others?)	National government, Regulator, Energy Trade Association
	Measure effectiveness & challenges	Energy poverty is absent in the public and political debate in Denmark, and almost absent in the academic literature. The existing measures focus on consumer protection through the supply of last resort or default products and suppliers. The good partnership between the regulator and suppliers ensures try to limit prices (despite a rocketing level of taxes). Energy efficiency measures do not target vulnerable consumers. Energy poverty is not distinguished; and poverty is addressed through the social security system.



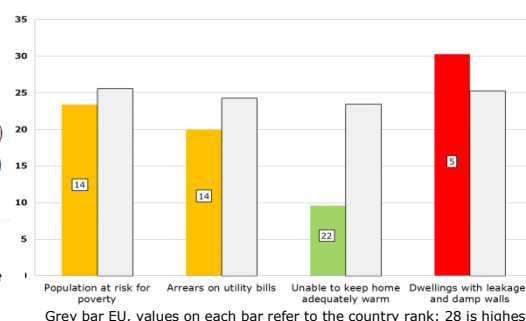
Estonia



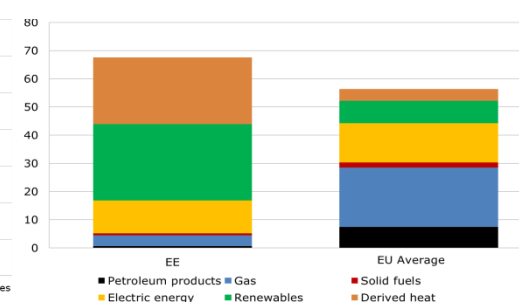
- Area: 45 000 km²
- Capital city: Tallinn
- Population: 1 324 814 (2013)
- GDP per capita in Purchasing Power Standards (PPS): 71 (2012)
- Unemployment rate: 9.0 (10/2013)
- Inflation rate: 3.2 (2013)

Source: <http://europa.eu/youreurope>

Energy Poverty Proxy Indicators (2012)



Energy consumption per household by fuel (GJ/HH)



Market situation	Liberalised?	Gas: Yes; ELC: No
	Concentrated supply in retail market?	Yes
	Ability of consumers to switch tariffs?	Gas: Yes; ELC: No
Definition	Vulnerable consumers (defined?)	Yes
	Vulnerable consumer definition type (GAS / ELC)	Social benefit recipients
	Energy or fuel poverty recognised in policy?	No
Measures	Energy policy (EP) or social policy (SP) led?	No Information
	Primary measures	No Information
	Number of assessed measures targeted on VC / EP	No Information
	Key actors (mainly regulator or others?)	No Information
	Measure effectiveness & challenges	No Information

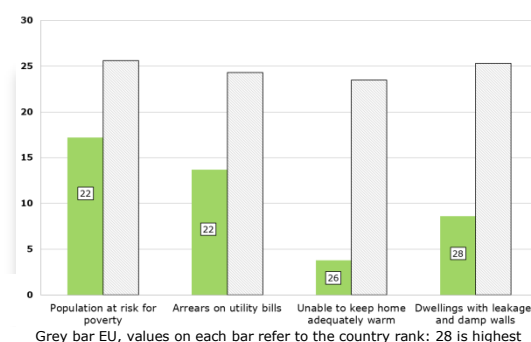


- Area: 338 000 km²
- Capital city: Helsinki
- Population: 5 426 674 (2013)
- GDP per capita in Purchasing Power Standards (PPS): 115 (2012)
- Unemployment rate: 8.4 (12/2013)
- Inflation rate: 2.2 (2013)

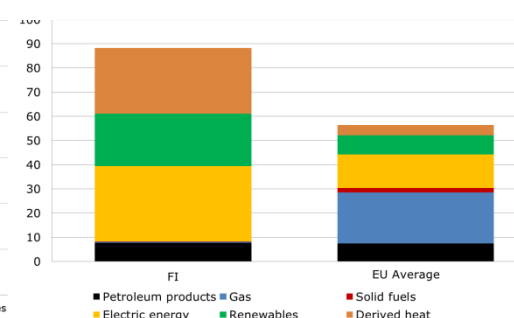


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Energy Poverty Proxy Indicators (2012)



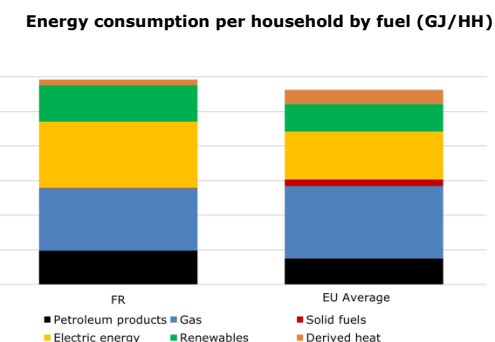
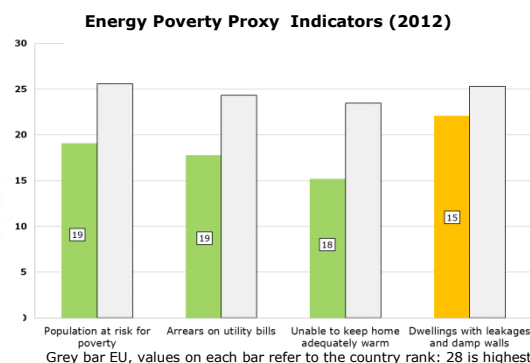
Energy consumption per household by fuel (GJ/HH)



Market situation	Liberalised?	Yes
	Concentrated supply in retail market?	No (ELC); Yes (GAS; 3 largest companies market share for small and medium sized customers ~35-40 %)
	Ability of consumers to switch tariffs?	ELC: Yes; Gas: No
Definition	Vulnerable consumers (defined?)	No
	Vulnerable consumer definition type (GAS / ELC)	Social welfare beneficiaries
	Energy or fuel poverty recognised in policy?	No
Measures	Energy policy (EP) or social policy (SP) led?	SP
	Primary measures	Two types of measures - disconnection is not permitted and financial intervention (housing allowance and social assistance that are inter alia intended to cover heat and electricity costs).
	Number of assessed measures targeted on VC / EP	4 / 4 (100%)
	Key actors (mainly regulator or others?)	Central Government (Ministry of Social Affairs and Health)
	Measure effectiveness & challenges	The system for protection vulnerable consumer is considered sufficient, but possibility for improvement exists. Recently, the Ministry responsible for energy market legislation declared in the Parliament that they were considering amendment to the law on electricity markets: electricity providers should offer their customers (all of them) alternative ways to pay their bills. They could pay either in annuities (equal sums monthly or quarterly) or in some other way. They should inform present and new customers of the advantages/ disadvantages of the methods as seen by the customer.



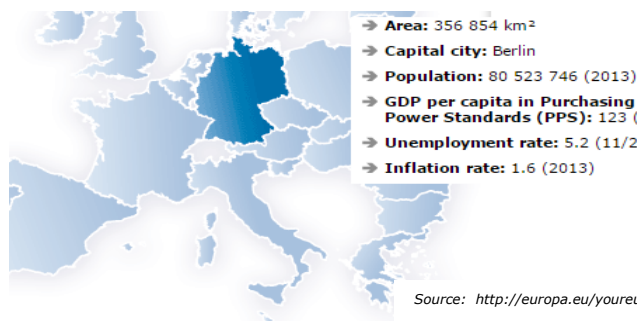
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Market situation	Liberalised?	Yes
	Concentrated supply in retail market?	Yes, high concentration
	Ability of consumers to switch tariffs?	Yes
Definition	Vulnerable consumers (defined?)	Yes (based on eligibility to social tariffs)
	Vulnerable consumer definition type (GAS / ELC)	Based on eligibility to health social insurance
	Energy or fuel poverty recognised in policy?	Yes, since 2010
Measures	Energy policy (EP) or social policy (SP) led?	Both
	Primary measures	Energy efficiency
	Number of assessed measures targeted on VC / EP	18 / 39 (46%)
	Key actors (mainly regulator or others?)	Central government and local authorities, social services
	Measure effectiveness & challenges	France has quite a comprehensive array of measures to fight energy poverty. However, they fail to target people who need them the most, such as tenants and lowest-income people. Energy poverty is approached through the lens of households' resources rather than housing. The lack of data on the housing stock is a general obstacle to the design of an efficient set of preventive measures.

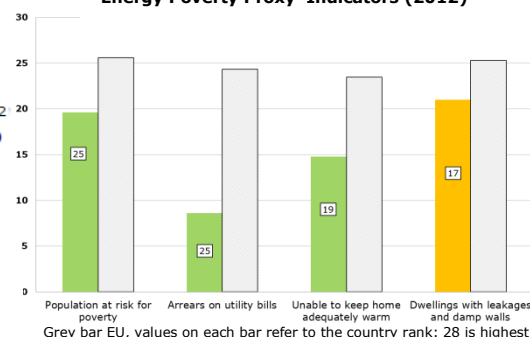


Germany

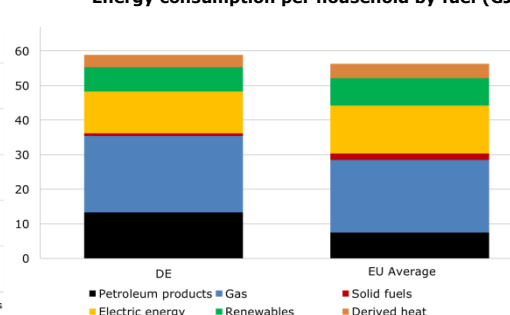


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Energy Poverty Proxy Indicators (2012)

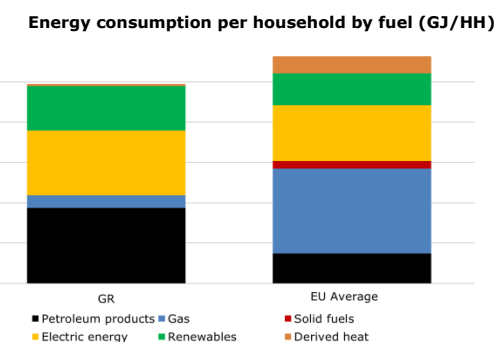
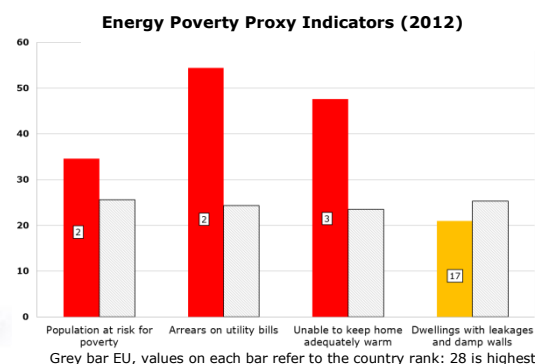
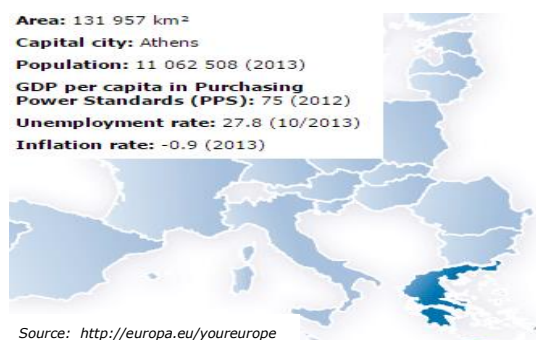


Energy consumption per household by fuel (GJ/HH)



Market situation	Liberalised?	Yes
	Concentrated supply in retail market?	No
	Ability of consumers to switch tariffs?	Yes
Definition	Vulnerable consumers (defined?)	Yes (Social welfare beneficiaries)
	Vulnerable consumer definition type (GAS / ELC)	Various: income, socio-economic groups, social benefit recipients
	Energy or fuel poverty recognised in policy?	No
Measures	Energy policy (EP) or social policy (SP) led?	SP
	Primary measures	Energy efficiency
	Number of assessed measures targeted on VC / EP	11 / 12 (91%)
	Key actors (mainly regulator or others?)	Civic Society, Consumer Advice Centres
	Measure effectiveness & challenges	Generally, Germany's approach to address energy poverty alleviation and prevention strategies through their social policies is considered as substantial. However, this approach has been criticised since the allocations provided for electricity and space and water heating costs are insufficient to cover basic needs and have been shown to be 20% too low. The lack of an official definition for energy poverty is criticised as the missing starting point to take real action by assessing the impact and taking action against a growing problem

Greece



Market situation	Liberalised?	Gas: No; ELC: Yes
	Concentrated supply in retail market?	Gas: Yes (88.6% for largest company); ELC: Yes (63.5% for largest company)
	Ability of consumers to switch tariffs?	Gas: No; ELC: Yes
Definition	Vulnerable consumers (defined?)	Yes
	Vulnerable consumer definition type (GAS / ELC)	Expenditure-based
	Energy or fuel poverty recognised in policy?	Yes
Measures	Energy policy (EP) or social policy (SP) led?	EP
	Primary measures	Financial support
	Number of assessed measures targeted on VC / EP	6 / 7 (80%)
	Key actors (mainly regulator or others?)	Government, Regulator
	Measure effectiveness & challenges	Since the economic crisis, the issue of energy poverty has come to the fore particularly in relation to access to modern energy services especially electricity creating conditions to protect vulnerable consumers.

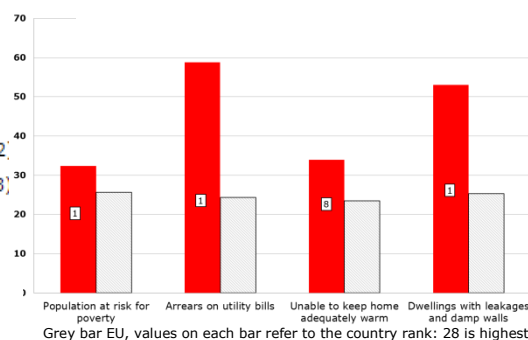
Hungary



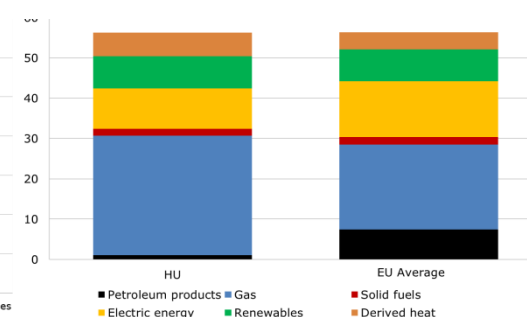
→ Area: 93 000 km²
→ Capital city: Budapest
→ Population: 9 908 798 (2013)
→ GDP per capita in Purchasing Power Standards (PPS): 67 (2012)
→ Unemployment rate: 9.5 (10/2013)
→ Inflation rate: 1.7 (2013)

Source: <http://europa.eu/youreurope>

Energy Poverty Proxy Indicators (2012)

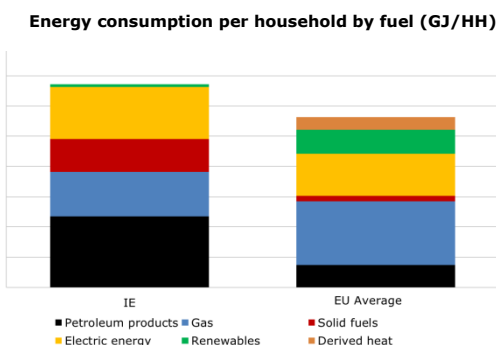
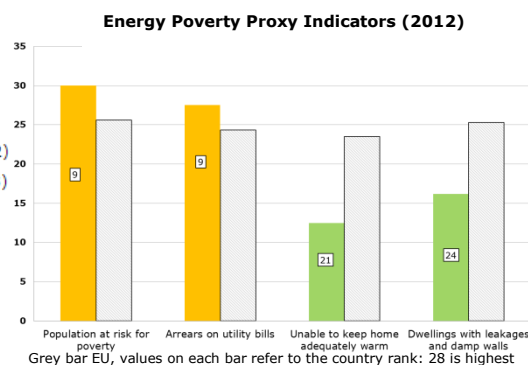


Energy consumption per household by fuel (GJ/HH)

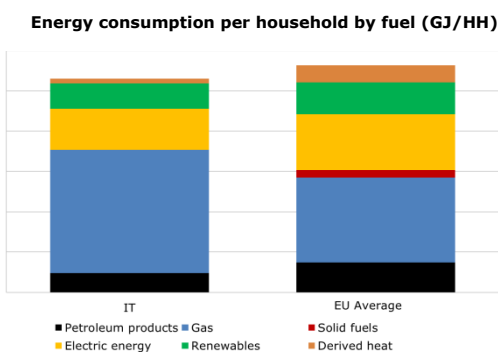
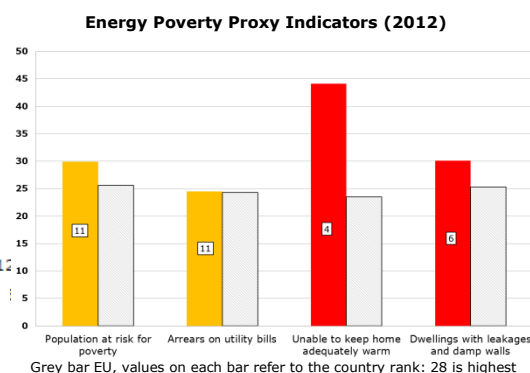


Market situation	Liberalised?	Yes
	Concentrated supply in retail market?	Yes
	Ability of consumers to switch tariffs?	Yes
Definition	Vulnerable consumers (defined?)	Yes
	Vulnerable consumer definition type (GAS / ELC)	Social benefit recipients, disabled consumers
	Energy or fuel poverty recognised in policy?	No
Measures	Energy policy (EP) or social policy (SP) led?	EP, but social criteria necessary for obtain the VC status are determined by SP
	Primary measures	Register of vulnerable customers, Prepayment metering devices, extension of payment deadlines, payment in installements, helping disabled consumers
	Number of assessed measures targeted on VC / EP	5 / 5 (100%)
	Key actors (mainly regulator or others?)	Distribution System Operator, National government
	Measure effectiveness & challenges	Hungary not only made efforts to implement legislation related to protection of vulnerable consumer, but it also made efforts to implement energy efficiency measures in order to reduce household expenditures for energy.

Ireland



Market situation	Liberalised?	Yes
	Concentrated supply in retail market?	Yes
	Ability of consumers to switch tariffs?	Yes
Definition	Vulnerable consumers (defined?)	Yes
	Vulnerable consumer definition type (GAS / ELC)	Socio-economic groups
	Energy or fuel poverty recognised in policy?	Yes
Measures	Energy policy (EP) or social policy (SP) led?	Both
	Primary measures	Energy efficiency
	Number of assessed measures targeted on VC / EP	2 / 15 (15%)
	Key actors (mainly regulator or others?)	National government
	Measure effectiveness & challenges	As acknowledged in the Irish Strategy, existing measures and schemes suggests that much of what is required is being delivered already. The changes that need to be made are those that will improve targeting and delivery. This will have a considerable impact on the effect of resources directed in this area.



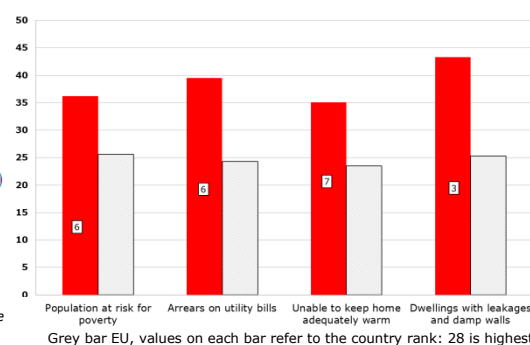
Market situation	Liberalised?	Yes
	Concentrated supply in retail market?	Gas: Yes (46.9% for largest company); ELC: No
	Ability of consumers to switch tariffs?	Yes
Definition	Vulnerable consumers (defined?)	Yes
	Vulnerable consumer definition type (GAS / ELC)	Socio-economic groups
	Energy or fuel poverty recognised in policy?	No
Measures	Energy policy (EP) or social policy (SP) led?	Both
	Primary measures	Energy efficiency
	Number of assessed measures targeted on VC / EP	3 / 10 (30%)
	Key actors (mainly regulator or others?)	Government (central and local)
	Measure effectiveness & challenges	Eligibility criteria need to be improved. Geographic coverage for gas customers requires attention. The mandatory installation of smart meters would enable the administration of a minimum level of consumption defined through the dwelling type and size.



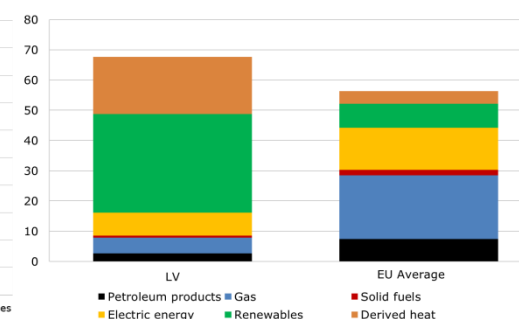
→ Area: 65 000 km²
→ Capital city: Riga
→ Population: 2 023 825 (2013)
→ GDP per capita in Purchasing Power Standards (PPS): 64 (2012)
→ Unemployment rate: 15.4 (2010)
→ Inflation rate: 0.0 (2013)

Source: <http://europa.eu/youreurope>

Energy Poverty Proxy Indicators (2012)



Energy consumption per household by fuel (GJ/HH)



Market situation	Liberalised?	ELC: Yes; GAS: In progress
	Concentrated supply in retail market?	Yes
	Ability of consumers to switch tariffs?	No
Definition	Vulnerable consumers (defined?)	No
	Vulnerable consumer definition type (GAS / ELC)	
	Energy or fuel poverty recognised in policy?	No
Measures	Energy policy (EP) or social policy (SP) led?	No Information
	Primary measures	No Information
	Number of assessed measures targeted on VC / EP	No Information
	Key actors (mainly regulator or others?)	No Information
	Measure effectiveness & challenges	No Information

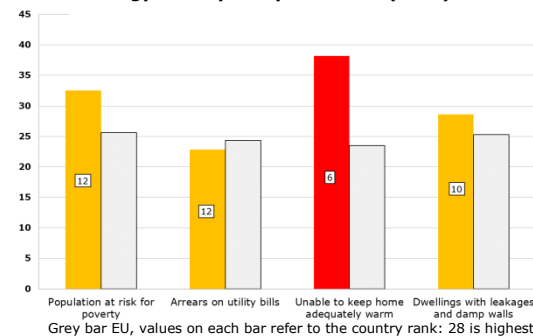


Lithuania

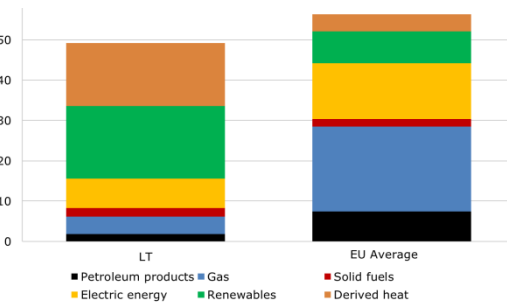


→ Area: 65 000 km²
→ Capital city: Vilnius
→ Population: 2 971 905 (2013)
→ GDP per capita in Purchasing Power Standards (PPS): 72 (2012)
→ Unemployment rate: 11.4 (12/2013)
→ Source: <http://europa.eu/youreurope>

Energy Poverty Proxy Indicators (2012)

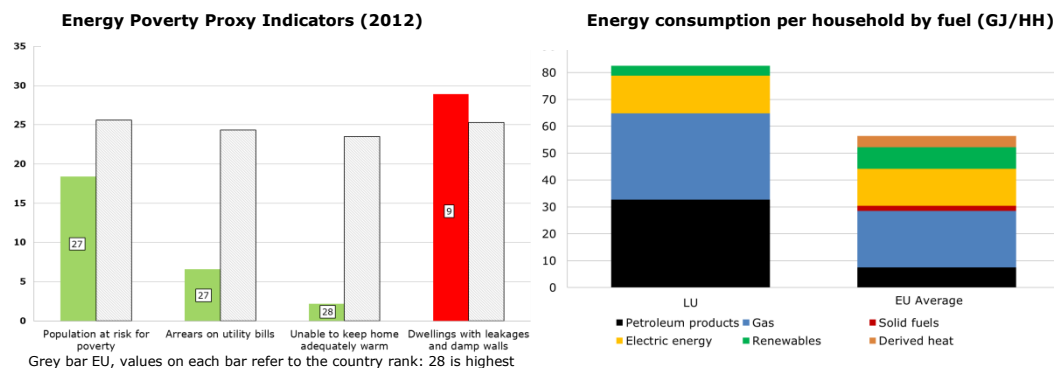
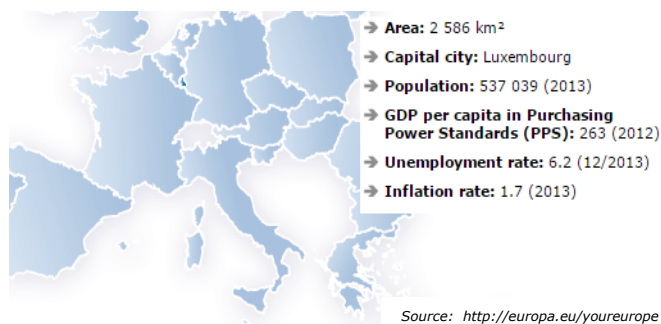


Energy consumption per household by fuel (GJ/HH)



Market situation	Liberalised?	ELC: In progress
	Concentrated supply in retail market?	Yes; Gas: 98% market share by 2 suppliers
	Ability of consumers to switch tariffs?	Gas: No; ELC: Limited
Definition	Vulnerable consumers (defined?)	Yes (under Law of Electricity)
	Vulnerable consumer definition type (GAS / ELC)	All users ; Social benefit recipients
	Energy or fuel poverty recognised in policy?	No
Measures	Energy policy (EP) or social policy (SP) led?	SP
	Primary measures	Social welfare & disconnection protection
	Number of assessed measures targeted on VC / EP	2 / 3 (67%)
	Key actors (mainly regulator or others?)	National government (Ministry of Social Security and Labour), Regulator
	Measure effectiveness & challenges	No Information

Luxembourg



Market situation	Liberalised?	Yes
	Concentrated supply in retail market?	Yes
	Ability of consumers to switch tariffs?	Yes
Definition	Vulnerable consumers (defined?)	No
	Vulnerable consumer definition type (GAS / ELC)	Dealt w/ in social legislation
	Energy or fuel poverty recognised in policy?	No
Measures	Energy policy (EP) or social policy (SP) led?	SP
	Primary measures	Energy efficiency
	Number of assessed measures targeted on VC / EP	0 / 16 (0%)
	Key actors (mainly regulator or others?)	National government, regulator
	Measure effectiveness & challenges	Consumer protection measures, which are quite developed, are the main policy instrument used to fight energy poverty. Energy efficiency measures are developed, but they do not target vulnerable consumers, who are only dealt with through general social support.



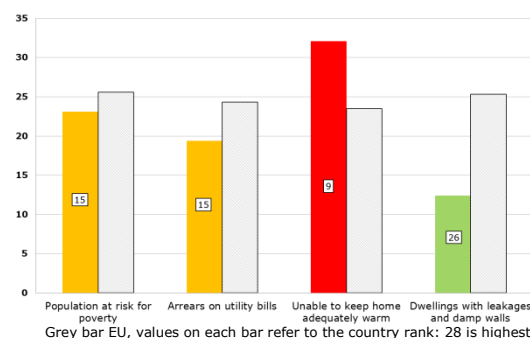
Malta



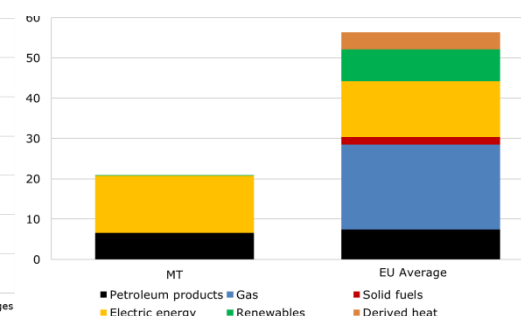
- Area: 316 km²
- Capital city: Valletta
- Population: 421 364 (2013)
- GDP per capita in Purchasing Power Standards (PPS): 86 (2012)
- Unemployment rate: 6.7 (12/2013)
- Inflation rate: 1.0 (2013)

Source: <http://europa.eu/youreurope>

Energy Poverty Proxy Indicators (2012)

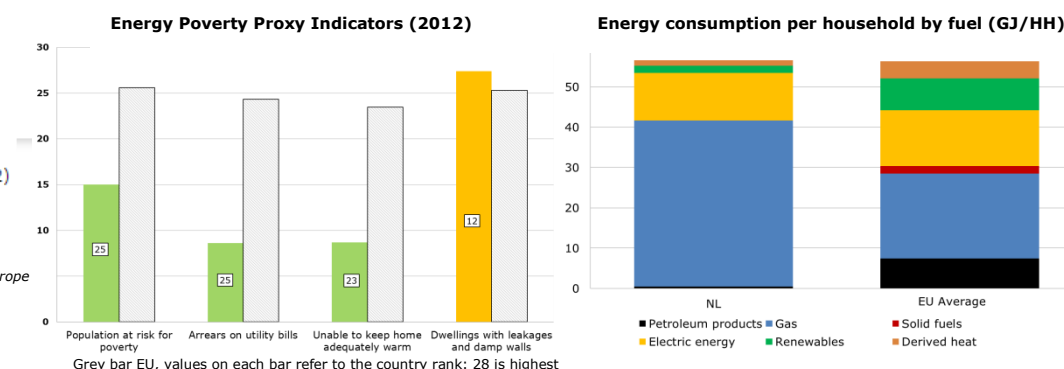
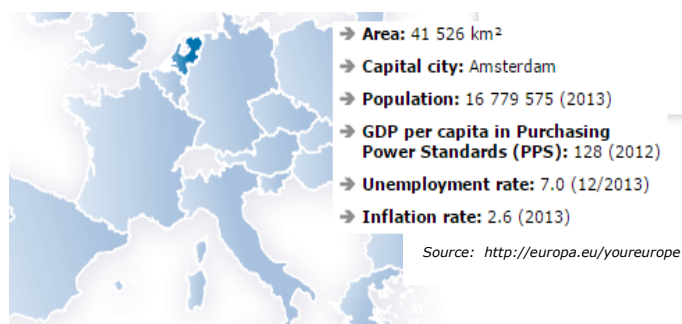


Energy consumption per household by fuel (GJ/HH)

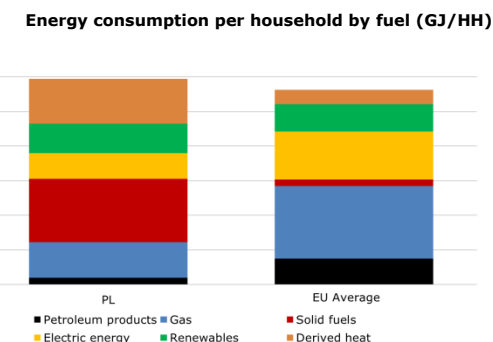
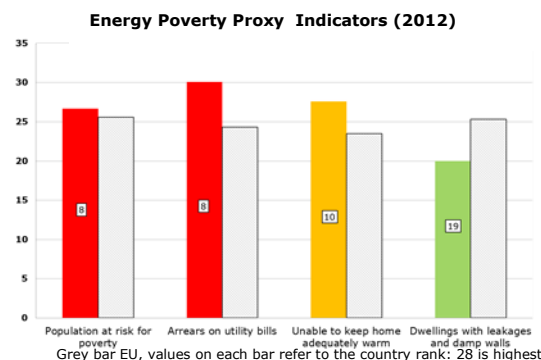
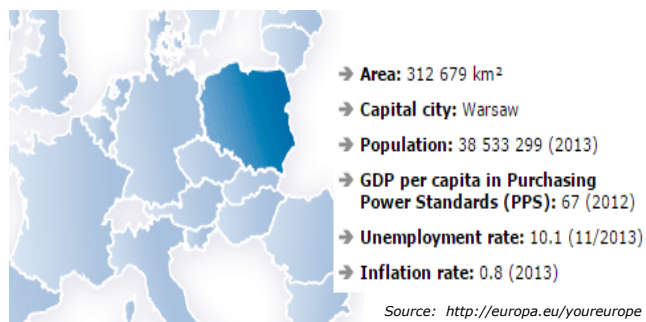
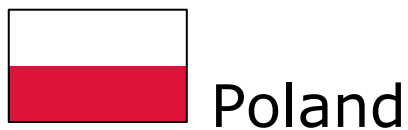


Market situation	Liberalised?	Gas: N/A; ELC: No
	Concentrated supply in retail market?	Gas: N/A; ELC: Yes
	Ability of consumers to switch tariffs?	Gas: N/A; ELC: No
Definition	Vulnerable consumers (defined?)	Yes
	Vulnerable consumer definition type (GAS / ELC)	Income
	Energy or fuel poverty recognised in policy?	No
Measures	Energy policy (EP) or social policy (SP) led?	SP
	Primary measures	Financial support
	Number of assessed measures targeted on VC / EP	3 / 3 (100%)
	Key actors (mainly regulator or others?)	National Government, Utilities
	Measure effectiveness & challenges	No Information

Netherlands



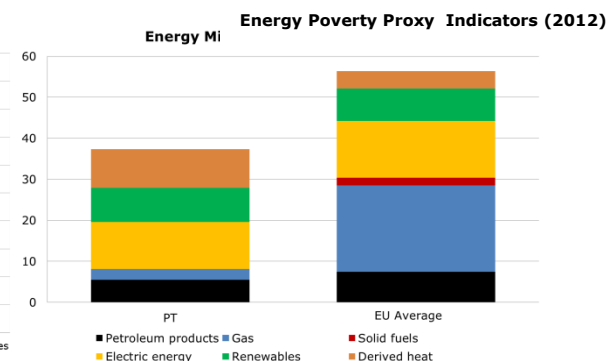
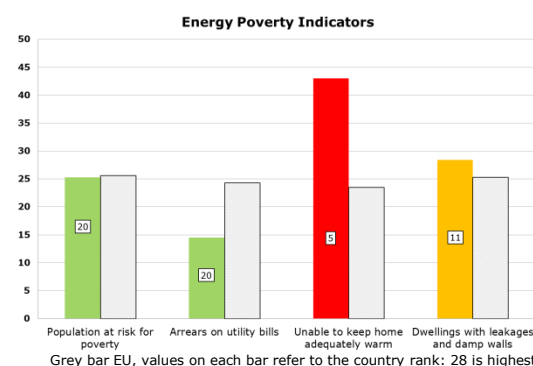
Market situation	Liberalised?	Yes
	Concentrated supply in retail market?	Yes
	Ability of consumers to switch tariffs?	Yes
Definition	Vulnerable consumers (defined?)	Yes
	Vulnerable consumer definition type (GAS / ELC)	Health-based
	Energy or fuel poverty recognised in policy?	No
Measures	Energy policy (EP) or social policy (SP) led?	SP
	Primary measures	Disconnection protection
	Number of assessed measures targeted on VC / EP	2 / 9 (25%)
	Key actors (mainly regulator or others?)	Government, Regulator, Housing Associations
	Measure effectiveness & challenges	Good example of the energy saving covenant to introduce energy efficiency measures in the social / private rental sector



Market situation	Liberalised?	Yes
	Concentrated supply in retail market?	Yes/No (Gas: 96.9% for largest company; ELC: 39.3% for largest company)
	Ability of consumers to switch tariffs?	Yes
Definition	Vulnerable consumers (defined?)	Yes
	Vulnerable consumer definition type (GAS / ELC)	Socio-economic groups
	Energy or fuel poverty recognised in policy?	No
Measures	Energy policy (EP) or social policy (SP) led?	SP
	Primary measures	Additional social support
	Number of assessed measures targeted on VC / EP	No Information
	Key actors (mainly regulator or others?)	No Information
	Measure effectiveness & challenges	No Information



Portugal



Market situation	Liberalised?	Gas: Yes; ELC: partially
	Concentrated supply in retail market?	Yes (Gas: 85.3% for largest company; ELC: 44.9 for largest company)
	Ability of consumers to switch tariffs?	Yes
Definition	Vulnerable consumers (defined?)	Yes
	Vulnerable consumer definition type (GAS / ELC)	Income, social benefits recipient
	Energy or fuel poverty recognised in policy?	No
Measures	Energy policy (EP) or social policy (SP) led?	EP
	Primary measures	Financial support
	Number of assessed measures targeted on VC / EP	1 / 4 (25%)
	Key actors (mainly regulator or others?)	Central Government and Regulator
	Measure effectiveness & challenges	Electricity from renewables is expected to increase from the current 53%; energy efficiency on the demand side will continue, but the targets are considered high-level since buildings is only one aspect of energy consumption. Energy poverty needs to be incorporated into the policy framework.



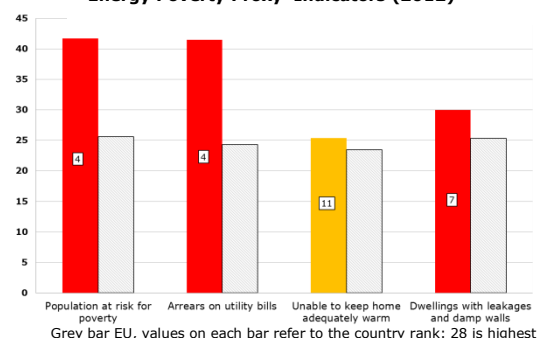
Romania



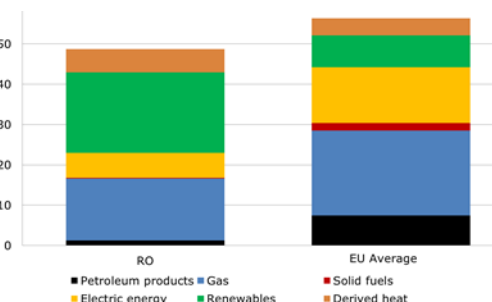
- Area: 237 500 km²
- Capital city: Bucharest
- Population: 20 020 074 (2013)
- GDP per capita in Purchasing Power Standards (PPS): 50 (2012)
- Unemployment rate: 7.1 (12/2013)
- Inflation rate: 3.2 (2013)

Source: <http://europa.eu/youreurope>

Energy Poverty Proxy Indicators (2012)



Energy consumption per household by fuel (GJ/HH)



Market situation	Liberalised?	In progress (expected in 2017)
	Concentrated supply in retail market?	Yes
	Ability of consumers to switch tariffs?	Yes
Definition	Vulnerable consumers (defined?)	Yes
	Vulnerable consumer definition type (GAS / ELC)	Reasons of age, health or low income, is at a risk of social marginalization
	Energy or fuel poverty recognised in policy?	No
Measures	Energy policy (EP) or social policy (SP) led?	Both
	Primary measures	Financial aid and disconnection protection
	Number of assessed measures targeted on VC / EP	1 / 4 (33%)
	Key actors (mainly regulator or others?)	Central government, National regulator, local public authorities
	Measure effectiveness & challenges	Although not officially recognised, all people have a right to access to services irrespective of their income. Policy is shifting away from subsidizing consumption and towards incentives for energy efficiency. However, there is a lack of funding to support building renovation, a low demand for low-energy building options leading to higher prices which depend on a widespread lack of awareness of the energy efficiency issues.



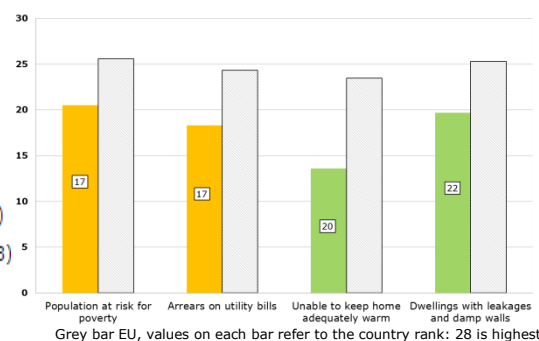
Slovakia



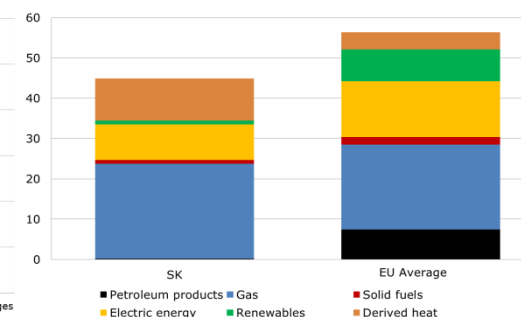
- Area: 48 845 km²
- Capital city: Bratislava
- Population: 5 410 836 (2013)
- GDP per capita in Purchasing Power Standards (PPS): 76 (2012)
- Unemployment rate: 13.8 (12/2013)
- Inflation rate: 1.5 (2013)

Source: <http://europa.eu/youreurope>

Energy Poverty Proxy Indicators (2012)



Energy consumption per household by fuel (GJ/HH)



Market situation	Liberalised?	Yes
	Concentrated supply in retail market?	Yes
	Ability of consumers to switch tariffs?	Yes
Definition	Vulnerable consumers (defined?)	Yes
	Vulnerable consumer definition type (GAS / ELC)	Social benefit recipients
	Energy or fuel poverty recognised in policy?	Yes, Energy Poverty
Measures	Energy policy (EP) or social policy (SP) led?	EP, but problem of energy poverty also incorporated in social policy
	Primary measures	Register of vulnerable customers, but no additional specific mechanism to protect vulnerable customers; Concept for protection of vulnerable customers under development
	Number of assessed measures targeted on VC / EP	4/4 (100%)
	Key actors (mainly regulator or others?)	Regulatory Office for Network Industries, National government (Ministry of Finance, Ministry of Labor, Social Affairs and Family)
	Measure effectiveness & challenges	Policies and measures to protect vulnerable consumer are under construction.



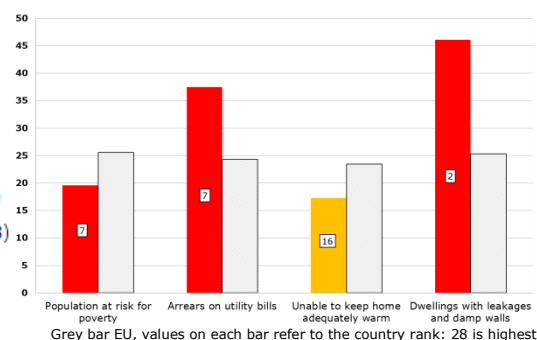
Slovenia



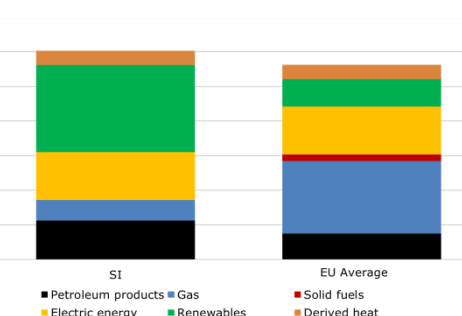
- Area: 20 273 km²
- Capital city: Ljubljana
- Population: 2 058 821 (2013)
- GDP per capita in Purchasing Power Standards (PPS): 84 (2012)
- Unemployment rate: 10.1 (12/2013)
- Inflation rate: 1.9 (2013)

Source: <http://europa.eu/youreurope>

Energy Poverty Proxy Indicators (2012)



Energy consumption per household by fuel (GJ/HH)



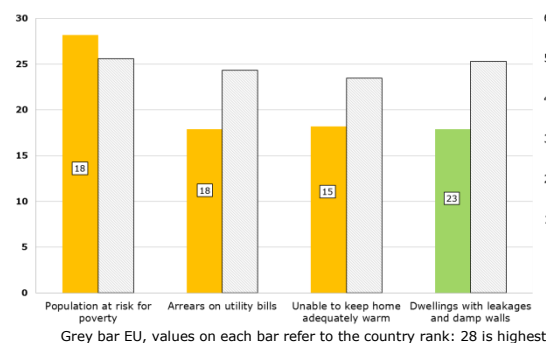
Market situation	Liberalised?	Yes
	Concentrated supply in retail market?	Yes
	Ability of consumers to switch tariffs?	Yes
Definition	Vulnerable consumers (defined?)	Yes
	Vulnerable consumer definition type (GAS / ELC)	Social benefit recipients
	Energy or fuel poverty recognised in policy?	No
Measures	Energy policy (EP) or social policy (SP) led?	EP, but social criteria necessary for obtain the VC status are determined by SP
	Primary measures	Register of vulnerable customers, EE programme, payments methods, financial social assistance
	Number of assessed measures targeted on VC / EP	6 / 8 (75%)
	Key actors (mainly regulator or others?)	National government (Ministry of Labor, Family, Social Affairs and Equal Opportunities and Ministry of Infrastructure) , Network Operators, Regulatory Agency
	Measure effectiveness & challenges	System for protection of vulnerable consumer is well established and it includes the cooperation of all relevant stakeholders. The only criteria for obtaining the status of vulnerable consumer is to be the social assistance beneficiary, is not sufficient. For example, there are a lot of households that are not beneficiaries of financial social assistance because they do not fulfill all criteria to receive it, but they cannot afford to pay their electricity/natural gas bills. In that case, they cannot obtain the rights that are given to the vulnerable consumer.



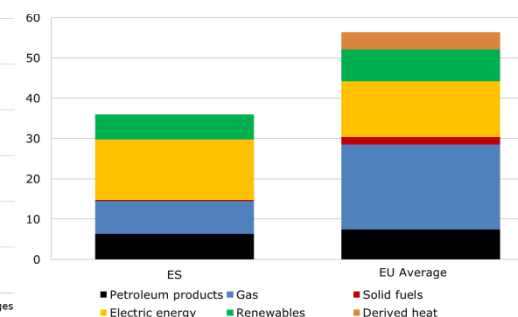
Spain



Energy Poverty Proxy Indicators (2012)



Energy consumption per household by fuel (GJ/HH)



Market situation	Liberalised?	Yes (ongoing liberalisation); a significant share of total volumes and customers are under regulated prices (still more than 70% in 2010).
	Concentrated supply in retail market?	Yes (4 big retailers for electricity, 6 for gas)
	Ability of consumers to switch tariffs?	Yes, although switching rates are quite low.
Definition	Vulnerable consumers (defined?)	Yes
	Vulnerable consumer definition type (GAS / ELC)	Socio-economic groups
	Energy or fuel poverty recognised in policy?	No
Measures	Energy policy (EP) or social policy (SP) led?	SP
	Primary measures	Energy efficiency
	Number of assessed measures targeted on VC / EP	4 / 12 (33%)
	Key actors (mainly regulator or others?)	Central Government, Autonomous Communities
	Measure effectiveness & challenges	There is recognition that a long-term programme is required to tackle fuel poverty and that the current social bonuses are temporary measures. Current measures address energy efficiency in buildings and assisting vulnerable consumers although these are not directly targeted towards addressing fuel poverty. Identification of eligible households needs drastic improvement. There is no special consideration for tenants despite ~10 million households being tenants.



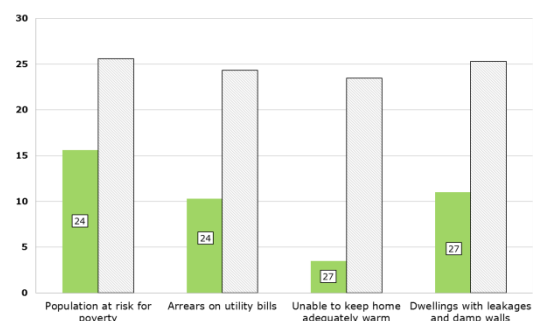
Sweden



- Area: 449 964 km²
- Capital city: Stockholm
- Population: 9 555 893 (2013)
- GDP per capita in Purchasing Power Standards (PPS): 126 (2012)
- Unemployment rate: 8.0 (12/2013)
- Inflation rate: 0.4 (2013)

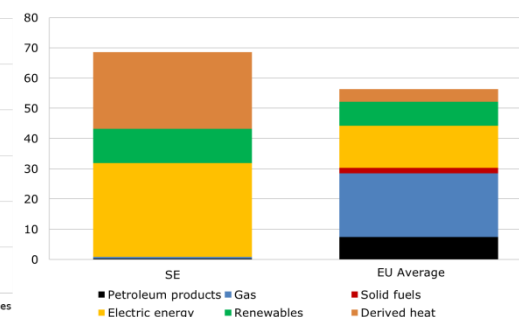
Source: <http://europa.eu/youreurope>

Energy Poverty Proxy Indicators (2012)



Grey bar EU, values on each bar refer to the country rank: 28 is highest

Energy consumption per household by fuel (GJ/HH)



Market situation	Liberalised?	Yes
	Concentrated supply in retail market?	Yes (C3: 78% for electricity)
	Ability of consumers to switch tariffs?	Yes
Definition	Vulnerable consumers (defined?)	Yes
	Vulnerable consumer definition type (GAS / ELC)	Income (definition talks about 'ability to pay')
	Energy or fuel poverty recognised in policy?	No
Measures	Energy policy (EP) or social policy (SP) led?	SP
	Primary measures	Social security payments and consumer information/protection
	Number of assessed measures targeted on VC / EP	4 / 21 (19%)
	Key actors (mainly regulator or others?)	Central government, LA, Regulator
	Measure effectiveness & challenges	Energy poverty is considered as a non-existing issue. Energy expenses of the most deprived households are covered by the social support measures delivered by municipal social services and the housing support provided by the Central government. Consumers are protected through transparency measures, agreements with utilities to impose revenue caps, and disconnection safeguards.



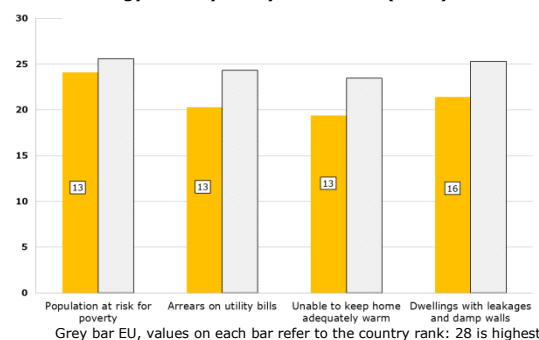
United Kingdom



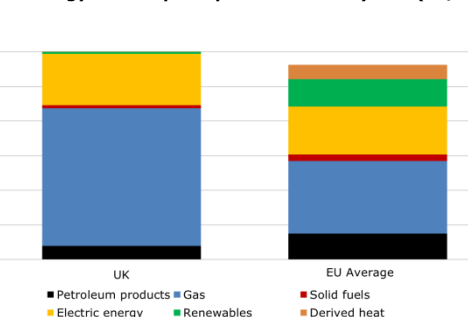
→ Area: 244 820 km²
→ Capital city: London
→ Population: 63 896 071 (2013)
→ GDP per capita in Purchasing Power Standards (PPS): 106 (2012)
→ Unemployment rate: 7.2 (10/2013)
→ Inflation rate: 2.6 (2013)

Source: <http://europa.eu/youreurope>

Energy Poverty Proxy Indicators (2012)



Energy consumption per household by fuel (GJ/HH)



Market situation	Liberalised?	Yes
	Concentrated supply in retail market?	Yes (6 big players)
	Ability of consumers to switch tariffs?	Yes
Definition	Vulnerable consumers (defined?)	Yes
	Vulnerable consumer definition type (GAS / ELC)	Multi criteria ('detriment')
	Energy or fuel poverty recognised in policy?	Yes - Fuel Poverty
Measures	Energy policy (EP) or social policy (SP) led?	EP
	Primary measures	EE programme, fuel payments
	Number of assessed measures targeted on VC / EP	12 / 20 (60%)
	Key actors (mainly regulator or others?)	All actors (incl. utilities)
	Measure effectiveness & challenges	<ul style="list-style-type: none"> • Clear overarching strategies – DECC / Ofgem; actual targets • However, critical to get implementation right of energy efficiency initiatives e.g. ECO / Green Deal • Inclusion of approaches for understanding distributional impacts of policy in UK • Linked policy objectives – climate change and fuel poverty • Definition important – but loss of simplicity

APPENDIX II. VULNERABLE CONSUMERS AND ENERGY POVERTY IN MEMBER STATES: COUNTRY REPORTS

The following Member State reports are available from the INSIGHT_E Observatory website (http://www.insightenergy.org/static_pages/find_resources). Not all Member States have an individual report, which was a means of information gathering. Importantly, all Member States have been reviewed under this project. In summary, these short reports should be viewed as working documents facilitating our review.

MS code	MS Name
AT	Austria
BE	Belgium
BG	Bulgaria
CY	Cyprus
DE	Germany
DK	Denmark
ES	Spain
FI	Finland
FR	France
GR	Greece
HR	Croatia
HU	Hungary
IE	Ireland
IT	Italy
LT	Lithuania
LU	Luxembourg
MT	Malta
NL	Netherlands
PO	Poland
PT	Portugal
RO	Romania
SE	Sweden
SK	Slovakia
SI	Slovenia
UK	United Kingdom

APPENDIX III. EUROPEAN STAKEHOLDERS IN ENERGY POVERTY

Table A.IV. European stakeholders for energy poverty and vulnerable consumers in the energy sector

Organisation	Designation	Brief description	Key energy poverty interest
ACER (Agency for the the Cooperation of Energy Regulators)	Regulators	Defined by EU directives and regulations of the 3rd Energy Package, ACER assists with the coordination of the work of national regulators at EU level towards a single, EU energy market for electricity and gas.	Supporting the integration of a single energy market to benefit all EU consumers
ANEC (European Association for the Co-ordination of Consumer Representation in Standardisation)	Organisation	Consumer voice for standardisation	Protection of vulnerable consumers across various sectors and energy efficiency as key approach to addressing energy poverty
BEUC (The European Consumer Organisation)	Organisation	Ensuring energy is affordable and available to all consumers; enable consumers to easily choose between various energy suppliers and switch to the best deal; ensure that smart energy systems and other new developments are affordable and designed to benefit consumers	Consumer rights in energy markets from the consumer perspective, collective switching, affordable energy
CEER (Council of European Energy Regulators)	Regulators	CEER acts as the voice of the national regulators in Europe and provides a platform for cooperation for best practice with the objective of facilitating a "single, competitive, efficient and sustainable EU internal energy market".	Special sub-group on energy; research on procedures for disconnections
Coalition for Energy Savings	Organisation	Voice and centre of expertise on energy efficiency	Linking energy efficiency to improving quality of life
EAPN (European Anti-Poverty Network)	Network	Working on a social Europe free of poverty and social exclusion with access to economic, social and cultural rights for all	Advocating for investment in thermal energy efficiency renovations in low income households

Organisation	Designation	Brief description	Key energy poverty interest
ECCG (European Consumer Consultative group)	Advisory group	European consumer group representative group	Special sub-group on energy; research on procedures for disconnections
ECRB (Energy Community Regulatory Board)	Organisation	Focuses on implementing EU energy legislation in gas, security of supply, oil, renewable energy, energy efficiency, environment, competition and statistics.	Support the extension of the EU internal energy market to South East Europe, which includes fair competition
ERGEG (European Regulators Group for Electricity and Gas)	Regulators	The European Regulators' Group for Electricity and Gas (ERGEG) is an advisory group to the European Commission on internal energy market issues in Europe.	
EuroACE	Organisation	Information portal	
Housing Europe	Network	Network advocating in the field of economy, energy, urban and social issues	In a recent press release, the network quotes 50-125 million people living in energy poverty in Europe, with at least 5 million of these not being in a position to renovate their homes as renter. They advocate for a 20-25% refurbishment subsidy per household (as has already been done in some MS). They advocate that €50 billion of the total €300 billion budget for investment in EU should go towards renovations for the 5 million households most highly affected by energy poverty.

APPENDIX IV. EUROPEAN ENERGY POVERTY RESEARCH INITIATIVES

I.A.1. Action in Low-income Households to Improve Energy Efficiency through Visits and Energy diagnosis (ACHIEVE)

The recognition that increasing energy prices poses a challenge to especially low income households brought the ACHIEVE project to seek out practical solutions to reducing energy poverty through the reduction of energy consumption in Europe (ACHIEVE, 2014). ACHIEVE covered over 1,900 low-income households in Bulgaria, France, Germany, Slovenia and the UK over a period of 3 years from May 2011 – April 2014. Accepting that no EU-wide definition for a fuel poor household is available, the project used the following definition to define a fuel poor household:

A fuel poor household is one that has a perceived difficulty, or sometimes inability, to be able to afford its basic energy needs. Households in fuel poverty have energy costs, which are excessive, compared to overall household income.

They note that estimates of energy poverty in the EU are between 50 and 125 million people, constituting about 10-15% of the population, but that without a definition, the corresponding statistics cannot be collected. They recognise that households in the eastern Member States are particularly vulnerable to the liberalisation of the energy markets, where households used to depend on energy price subsidies and are now faced with rising market costs.

This project aimed to identify fuel poverty vulnerable households and together develop a

response. Consultants (long-term unemployed people) were trained to work with the households by conducting an energy audit and providing information about rational energy use as well as the installation of low-cost energy and water saving devices, such as CFLs, switchable multi-plugs, timers, tap aerators, etc. The results from the project are presented in Table 1. The results show that with an average investment of about 42€ per household, each household was able to save about 331 kWh in electricity and 592 kWh in heating energy annually, amounting to average savings of 90€ per household and annum.

This research initiative has proven immediate financial savings to households and to local government:

- **Financial savings to households.** This methodology proved the effectiveness of applying simple measures resulting in financial benefits to the low-income households thereby improving the ability of households to decrease their energy consumption and, therefore, reduce the cost of their bills.
- **Financial savings to local government.** Furthermore, this project notes that local government also saved money due to the reduction of energy bills such that social transfers or energy subsidies were reduced. This project is sistered with the EC-LINC project, which is described in Section I.A.3 of this appendix.

Table 1: Summary of results from the ACHIEVE research initiative

		BG	FR	DE	SI	UK	Average (project scale)
Households consulted		301	692	504	220	203	384
Average number of installed devices per household		8	22	10	9	8	11
Average investment costs € (devices) per household		30	56	51	29	41	42
Electricity	kWh	336	435	313	274	193	331
	€	34	55	78	39	33	49
	kg CO2	229	151	196	153	86	140
Water	m3	9	34	28	18	4	21
	€	7	97	104	36	8	53
Heat energy	kWh	258	708	751	555	400	592
	€	20	56	65	34	25	42
	kg CO2	114	151	156	168	77	160
Total	€	60	225	247	109	66	
	kg CO2	343	301	352	321	163	

I.A.2. Building Performance Institute of Europe (BPIE)

The Building Performance Institute of Europe performed a review of how investments in home renovations could provide a solution to alleviating poverty in the European Union in the form of a research report (BPIE, 2014). Their approach describes household income, the cost of energy and the energy efficiency of the home as the driving factors of energy poverty. This study also performed a review of the common indicators described in Section III, showing the percentages for the “at risk of poverty” population in comparison to the EU-28 average as depicted in Figure 2 of the main report. The Member States are depicted in Figure 1 and mapped in Figure 8 of the main report according to the share of at risk of poverty population for each of the energy poverty proxy indicators discussed in Section III. This grouping points towards Member States in Central, Eastern and

Mediterranean regions to be more severely affected by energy poverty than Member States in the Northern regions of Europe. Using these indicators, it is estimated that a quarter of the “at risk of poverty” EU-28 population may be experiencing fuel poverty, although no composite estimates were made for each Member State based on these indicators.

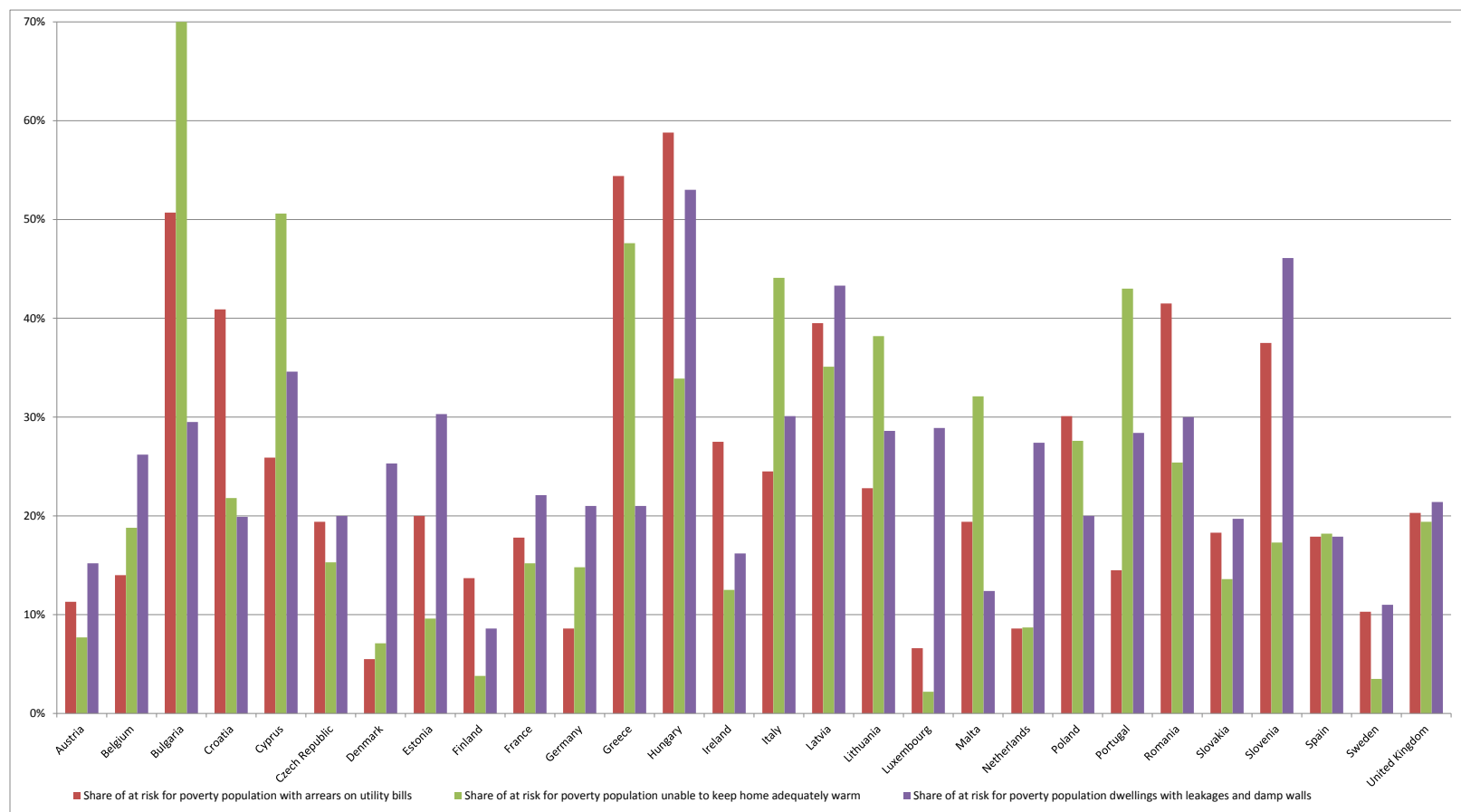


Figure 1: Energy poverty indicators for EU-28 in 2012 (own elaboration based on BPiE 2014, EU-SILC 2012)

Table 2: Member States falling below the 2012 EU-28 average for specific energy poverty indicators (own elaboration based on BPiE 2014)

Share of population at risk of poverty – EU-28 average (25.6%)	Share of at risk of poverty population unable to keep home adequately warm – EU-28 average (23.5%)	Share of at risk of poverty population with arrears on utility bills – EU-28 average (24.5%)	Share of at risk of poverty population living in dwellings with leakages and damp walls – EU-28 average (25.3%)
Bulgaria (49.3%)	Bulgaria (70%)	Hungary (58.8%)	Hungary (53%)
Romania (41.7%)	Cyprus (50.6%)	Greece (54.4%)	Slovenia (46.1%)
Latvia (36.2%)	Greece (47.6%)	Bulgaria (50.7%)	Latvia (43.3%)
Greece (34.6%)	Italy (44.1%)	Romania (41.5%)	Cyprus (34.6%)
Lithuania (32.5%)	Portugal (43%)	Croatia (40.9%)	Estonia (34.6%)
Hungary (32.4%)	Lithuania (38.2%)	Latvia (39.5%)	Italy (30.1%)
Croatia (32.3%)	Latvia (35.1%)	Slovenia (37.5%)	Romania (30%)
Ireland (30%)	Hungary (33.9%)	Poland (30.1%)	Bulgaria (29.5%)
Italy (29.9%)	Malta (32.1%)	Ireland (27.5%)	Luxembourg (28.9%)
Spain (28.2%)	Poland (27.6%)	Cyprus (27.5%)	Lithuania (28.6%)
Cyprus (27.1%)	Romania (25.4%)	Italy (25.9%)	Portugal (28.4%)
Poland (26.7%)			Netherlands (27.4%)
			Belgium (26.2%)
			Denmark (25.3%)

In terms of solutions, recommendations include increasing income and regulating fuel prices (although described as short-term solutions) and energy efficiency improvements. They recognise certain barriers to improving the energy performance of low-income buildings, where homeowners may not have the capital available to invest in costly upgrades and the lack of motivation for landlords to renovate the homes of their

tenants. Key solutions discussed include public finance schemes, such as from the EU regional Cohesion Fund, and regulatory measures. The recommendations include:

- **Energy efficiency investments in buildings.** BPiE argues that investments in energy efficiency improvements in buildings are once-off costs, which go a long way to improving comfort levels and the long-term energy consumption of a household.
- **Financing of energy efficiency investments through public financing schemes.** The EU Cohesion Funds should be allocated towards energy efficiency investments in buildings. An estimated
- **Regulatory support mechanisms.** Regulation would assist in supporting tenants with benefitting from retrofitting schemes.

I.A.3. Energy Check for Low-Income Households (EC-LINC)

A sister project to ACHIEVE, the Energy Check for Low Income Households (EC-LINC, 2015) is a partnership between various stakeholders, such as energy agencies or non-profit groups, from Austria, Belgium, Germany, Hungary and the United Kingdom, which aims to consult low-income households about saving energy and water through behavioural change and the installation of low-cost energy and water saving devices (CFLs, multi-plugs with switched, tap aerators). The partnership has documented training manuals for the consultations, which includes training long-term unemployed people to become consultants about the theory of fuel poverty. This includes recognition that several factors contribute to a households experiencing fuel poverty, such as:

- Inefficiency of the home (building and appliances)

- Low household income
- Fuel prices and costs to heat home
- Under-occupation of a home
- Irrational use of energy

Low-income households are, furthermore, recognised as being more vulnerable to increasing energy prices and not having the ability to upgrade to better efficient technologies due to high upfront costs. These households are threatened by the inability to pay their energy bills, which lead to energy debts and then to disconnections. A basic definition for energy poverty is given, noting that there may be variations for each specific country:

A fuel poor household is one that cannot afford to keep adequately warm at a reasonable cost. This is generally defined as 21 degrees C in the living room and 18 degrees C in the other occupied rooms – the temperatures recommended by the World Health Organization.

The project was put into effect and over 2,400 low-income households were consulted, 53 long-term unemployed consultants were trained, just under 6,000 kWh, 560 € and 1900 kg of CO₂ were saved annually per household as recapped in Table 3.

Table 3: Summary of results from the EC-LINC research initiative

Country	AT	BE	DE	HU	UK
Households consulted	291	205	247	265	1,412
Number of consultants trained	16	14	6	7	10
Energy savings per household and year (kWh)	995	2,427	290	755	1513
Financial savings per household and year (€)	110	228	70	35	114
CO₂ savings per household and year (kg)	276	925	173	194	329

- **Financial savings to households and raising awareness of energy poverty.** Like its sister project, ACHIEVE, EC-LINC also proved the value in simple energy efficiency interventions to save households money and to bring the topic of energy poverty into the public arena so that further action can be taken.

I.A.4. Energy Efficiency in Low Income Housing in the Mediterranean (ELIH-MED)

The ELIH-MED project focused on energy efficiency in low-income housing and ran from April 2011 to March 2014 covering Cyprus, France, Greece, Italy, Malta and Spain (ELIH-MED, 2015). The motivation to focus on these Mediterranean countries was because 30-40% of Mediterranean housing is in the low income sector, the energy performance of the buildings is typically poor, past or current energy efficiency policies do not focus on this sector, and occupants have difficulty accessing financing for investments.

This project performed a thorough documentation of useful resources for the Mediterranean as well as European context, such as:

- *Trend-setting scenario: impact of existing policies and financial resources available on EU 2020 objectives*
- *Typology of LIH building stock in the partner territories and in the Med area*
- *Analysis of potential energy savings in "representative housing" and in the building stock of LIH*
- *Analysis of current projects of multi-energie smart metering in low-income housing (LIH) in the MED area*
- *A Bibliography of Successful European Projects in building sector*
- *A consolidated analysis at Med level of current national, regional and local policies on energy efficiency in low*

income housing and financial resources devoted to EE projects in LIH

- *The impact of smart metering on energy efficiency in low-income housing in Mediterranean*

Finally, a strategy was developed to be applied at the regional Mediterranean level to assist in achieving the EU2020 objectives, as well as *Guidelines on cost-effective refurbishment solutions in Med LIH*, *Guidelines on innovative financing*, and *Guidelines on energy efficiency policies in LIH in the Mediterranean*.

The recommendations in this policy strategy document were derived through the careful study of the retrofitting of over 1000 low income dwellings across the partner countries. This included an ex ante assessment of the policy situation and monitoring of energy consumption after the renovations, in some cases through intelligent energy management systems.

- **Smart meters.** Smart meters offer many benefits to households in terms of providing actual information regarding consumption (reducing the household burden to settle bills for theoretical use) and therefore the ability of households to participate in benefiting from different tariffs, e.g., time-of-use tariffs for water heating. Utility companies are able to harness the interruptible load feature. Customer complaints are reduced.
- **Renovation and retrofitting of old buildings.** Incentives should be provided to homeowners and tenants to encourage renovation. This could be a combination of measures, such as financial loans, subsidies or grants targeted at low-income households, who often require additional assistance and a good example of administering this assistance is the "Living Better" programmes in France. Energy labelling for appliances and buildings promotes awareness. Energy efficiency

certificates for buildings gives owners or tenants knowledge about how energy is used and thereby allows targeted energy efficiency to occur. Further examples include splitting the incentives between tenants and landlords when both parties are resistant to taking action.

- **New building performance requirements and very low energy buildings.** New buildings should aim at incorporating renewable energy systems for space heating, cooling and domestic hot water. There should be a technical and economic feasibility study for new buildings to ensure use of renewables and efficient systems.
- **Funding mechanisms.** National funding schemes must be supplemented by EU funding programmes for energy efficiency. The *European Energy Programme for Recovery (EEPR)* and the *European Energy Efficiency Fund (EEE-F)* are set up to invest in achieving the 20/20/20 targets and should be harnessed. Other flexible schemes include Third Party Financing administered through ESCos or voluntary agreements where industry provides technologies on a large scale at decreased prices. The implementation of low-cost energy efficient installations in low-income households would improve standard of living and reduce household energy consumption (and bills).

I.A.5. Energy Cities

Energy Cities is a network of over 1,000 local authorities and individual members and has been working towards a locally driven energy transition since 1990 (Energy Cities, 2015). Energy Cities has three case studies for an action campaign for a "local fuel poverty eradication plan" with the aim to eradicate the main causes: absence of insulation in residential housing, inefficient heating systems and peri-urban sprawl.

Three members of Energy Cities have undertaken measures against fuel poverty. The first, County Durham in the United Kingdom, created a county-wide “Right to Warmth” partnership aimed at assisting vulnerable citizens, especially the elderly, to plot a course through the sometimes confusing field of energy prices and grants and funding schemes. In particular, the elderly are informed about their rights and the consequences of underheating. They found that the elderly are particularly resistant to accepting help and are often not the target audience for energy efficiency schemes. More research is required to better target this vulnerable customer base.

In Utrecht in the Netherlands, 12,000 low-income households were offered free energy consultations and an energy savings box, which resulted in the education of 50 unemployed and an estimated 6,400 ton reduction of CO₂.

In Kirklees in the United Kingdom, the council fitted 172,000 homes with insulation through its “Warm Zone” project, which cost about €26 million and saved each household about €250 annually in energy savings and a total of 30,000 tons of CO₂.

Based on the experiences of the Energy City members, the following recommendations can be concluded:

- **Better targeting.** More research is required to ensure that vulnerable customers also receive the help that they require.
- **Energy savings check and insulation.** Providing low-income households, or indeed all households, with energy efficiency savings measures save households money and the City saves on carbon emissions.

I.A.6. European fuel Poverty and Energy Efficiency (EPEE)

The European fuel Poverty and Energy Efficiency (EPEE) project (2009) quoted that between 50 and 125 million households in Europe were already affected by energy poverty and expect this figure to increase as energy prices increase. With their assessment of five European countries (Belgium, France, Italy, Spain and the United Kingdom) using a 2005 EU-SILC dataset, they estimated that 1 in 7 households was at risk for poverty with an average of 8% unable to keep home adequately warm, 16% living in houses with leaking roof, dampness or rot and 5% with arrears on utility bills. The prevalence of energy poverty indicators for each of the project countries is provided in Table 4.

Table 4: Prevalence of energy poverty indicators across countries in the EPEE project (2009)

Country	Capacity to pay to keep one's home adequately warm	Leaking roof, damp walls/floors/ foundation or rot in window frames or floor	Arrears on utilities (electricity, water, gas)
BELGIUM	14.6%	14.8%	5.3%
FRANCE	6.2%	12.2%	6.4%
ITALY	10.9%	22.7%	9.0%
SPAIN	9.0%	17.2%	3.3%
UK	5.7%	13.4%	0.1%

However, EPEE concluded that several additional indicators could characterise households experiencing fuel poverty:

- Debts and inability to pay energy accounts
- Cold and damp dwelling
- Disconnection from energy supply
- Self-disconnection (given prepaid meter)
- Health impacts and disease
- Poor energy performance of the dwelling.

This analysis also highlights low household income, inefficient buildings and high energy prices as the key causes of fuel poverty. A

policy and situation analysis was performed in addition to extensive stakeholder consultation in each of the participating Member States. The following recommendations were targeted at policymakers:

- **A common definition.** Although recognition is made that each Member State may need to tailor the definition for their own specific context, this recommendation advocates for strong guidelines for Member States to acknowledge the phenomenon of energy poverty and the inability of certain households to achieve an adequate level of warmth in their dwelling.
- **A legislative framework.** Although legislation exists that either directly or indirectly addresses fuel poverty, amendments would strengthen the support to better tackle fuel poverty. These recommended amendments include:
 - a more detailed role for Member States in the directives adopted on 25 June 2009 to aid vulnerable consumers with *energy efficiency improvements in their dwellings*
 - stricter *energy efficiency requirements for all buildings* in the Directive 2002/91/EC
 - A clause requiring Member States to ensure *energy efficiency standards are met in social and government-owned housing* in Directive 2006/32/EC
 - Provisions could be made for Member States to *offset excess greenhouse gas emissions through energy poverty projects* in other Member States
 - New regulations should include guidelines to Member States highlighting the *link between health and energy poverty* with recommendations on how vulnerable consumers can be

protected, an *Energy Consumers' Charter* that is legally binding would go further to ensure compliance with the commendable intentions, and obliging Member States to report how energy consumers are supported.

- **A fuel poverty special interest group.** A designated *European Fuel Poverty Watch* should be set up to collect data and coordinate and monitor efforts and report on national and European fuel poverty indicators should be supported through EU regulation requiring Member States to report on these. This would ensure that fuel poverty is addressed in the various departments that have the ability to address fuel poverty relief measures, such as for energy, but also health, consumer protection and housing.
- **A consistent diagnosis.** The *quality and consistency of data* would be improved by ensuring the inclusion of useful variables and coordination with existing national energy data collection through a *fuel poverty data working group*.

I.A.7. Energy Vulnerability and Urban Transitions in Europe (EVALUATE)

The EVALUATE project specifically concentrates on energy vulnerability issues in Eastern and Central Europe looking at how urban institutional structure influences energy vulnerability on a geographic scale (EVALUATE, 2015). The geographic scope includes Gdańsk (Poland), Prague (Czech Republic), Budapest (Hungary) and Skopje (Republic of Macedonia). As previous research by the lead researcher of EVALUATE has noted, there are regional observations to be made, for example, also in Mediterranean countries, where households are plagued by a inadequate heating systems, poor building

envelope performance including inefficient insulation and damp conditions, and high energy prices in comparison to income (Bouzarovski, 2011).

To date, the EVALUATE research has documented theoretical and empirical results around energy poverty and the lack of capacity for households to meet their energy needs as a result of either lacking infrastructure or inefficient operation. The consequence is the same: energy poverty is a significant challenge in Southern and Eastern European Member States as can be described with the term “energy divide”.

Their analysis showed a correlation between household energy prices and financial deficits over time and space, which attested to geographic variations and the influence of energy prices on energy poverty. They conclude that energy poverty has increased on the whole in the EU, but that there are regional disparities such that regions experiencing higher rates of general poverty have higher levels of energy poverty (Tirado Herrero and Bouzarovski, 2014).

The research also assessed energy poverty from the perspective of adequate energy services advocating that energy poverty goes beyond the household extending to include the political environment and ineffectual infrastructure to support households using energy rationally and cost-effectively (Bouzarovski et al, 2014).

The recommendations to date include:

- **Supporting household energy needs through better infrastructure.** The infrastructural vulnerability perpetuating energy poverty should be reduced so that households in need should benefit from specially targeted tariffs, disconnection protection, debt counselling and policies.

- **Policy should address energy services.** Policies should be implemented to strategically target energy services rather than household fuels. This highlights the broad sense of energy requirements of the household and enables a variety of stakeholders to take action.

I.A.8. Thomson and Snell (University of York – EU Fuel Poverty Network)

Thomson (2013) provides an extensive analysis of some of the typical energy poverty measurement methodologies and the appropriateness or their use:

- The *expenditure approach*, which, for application on an EU scale, would require detailed data on housing conditions, income (after housing costs) and required fuel costs,
- The *consensual approach*, which surveyed households for whether they were capable of affording “items that the majority of the general public considered to be basic necessities of life” (Gordon, et al. 2000: 7), and includes the three (usual) indicators of being capable of heating the home adequately, ability to pay utility bills and housing condition.

Using a 2007 EU-SILC dataset, Thomson and Snell (2013) used the consensual measurement methodology to estimate energy poverty across Europe using several scenarios by weighting the three indicators with a stronger preference for one and the final scenario weighting the indicators equally, as shown in Table 5. Their research took into account the fact that none of these indicators could be used alone to estimate energy poverty, but rather need to be viewed collectively (Thomson, 2014a).

Table 5: Prevalance of energy poverty across Europe (Thomson and Snell 2013)

Country	Scenario 1	Scenario 2	Scenario 3	Scenario 4
AUSTRIA	6.2%	5.9%	8.2%	6.7%
BELGIUM	9.2%	8.5%	11.9%	9.8%
BULGARIA	31.1%	31.2%	30.5%	30.6%
CROATIA	-	-	-	-
CYPRUS	23.8%	17.8%	22.8%	21.2%
CZECH REPUBLIC	7.5%	6.4%	9.2%	7.6%
DENMARK	2.7%	3.3%	4.8%	3.6%
ESTONIA	6.8%	8.1%	11.0%	8.5%
FINLAND	3.8%	4.7%	4.3%	4.2%
FRANCE	-	-	-	-
GERMANY	7.6%	6.9	9.4%	7.9%
GREECE	16.8%	16.6%	17.5%	16.8%
HUNGARY	16.2%	16.4%	21.3%	17.8%
IRELAND	7.3%	8.2%	9.5%	8.2%
ITALY	13.8%	14.0%	16.1%	14.5%
LATVIA	18.9%	17.0%	20.6%	18.6%
LITHUANIA	19.9%	15.1%	19.8%	18.1%
LUXEMBOURG	4.5%	4.6%	8.1%	5.7%
MALTA	-	-	-	-
NETHERLANDS	5.5%	5.5%	8.9%	6.6%
POLAND	19.0%	15.7%	19.0%	17.7%
PORTUGAL	23.4%	15.3%	19.5%	19.2%
ROMANIA	24.6%	24.0%	24.4%	24.1%
SLOVAKIA	6.4%	5.7%	7.2%	6.3%
SLOVENIA	14.2%	15.7%	20.2%	16.5%
SPAIN	7.6%	7.1%	10.3%	8.2%
SWEDEN	4.1%	5.0%	5.5%	4.8%
UK	6.5%	5.0%	8.4%	6.6%

Scenario 1 = households unable to pay to keep their home adequately warm given stronger weight, Scenario 2 = households in arrears with bills given stronger weight, Scenario 3 = Households in housing that has leaks, damp or rot given stronger weight, Scenario 4 = all equally weighted

After performing logistic regressions on the scenarios, it was revealed that households would be more likely to enter into energy poverty depending on their geographic location, highlighting particularly the dire situation in the Southern and Eastern European Member States with Bulgaria, Cyprus and Romania faring the worst overall.

Thomson and Snell (2013) recommend:

- **Addressing energy poverty through household energy efficiency.** All three energy poverty indicators could be improved through the improvement of energy efficiency in the household which would reduce energy bills and improve the building envelope such that damp and rot would be minimised.
- **Clearer and more coherent policy.** Policy at both the EU and national levels needs to ensure that the drivers of energy poverty (geographic location, housing condition and income) are taken into consideration and that appropriate responses are taken to

address fuel poverty on a European level.

- **Further research on addressing energy poverty in rural areas and infrastructurally weak areas.** There are differences in the energy challenges experienced in households in the rural setting and in areas where the energy infrastructure is limited and these aspects need to be further researched.
- **Further research about the state of energy poverty across the EU and policy to address it in Member States.** Further research is required to assess how Member States are faring in terms of energy poverty (also in terms of trends) and how they can be assisted in addressing energy poverty in their context in relation to other policy objectives. More comprehensive data should be collected to compare how much households are spending on energy.

I.A.9. Financial and Support Instruments for Fuel Poverty in Social Housing (FinSH)

The FinSH research initiative was conducted from December 2007 to May 2011 and looked at developing financial support mechanisms for social housing in France, Germany, Italy, Poland and the United Kingdom. The project assessed the impact and public recognition of energy poverty in the participating Member States as well as explored strategies and financial mechanisms to support households in energy poverty. While the conditions differ between Member States, there are socio-economic factors which cause some households to be more at risk for energy poverty across various countries identified in (Schweizer-Ries, 2009) and these include:

- Low-income (particularly those not qualifying for additional financial assistance)
- Unemployed or retired

- The elderly
- Young families/children, particularly single parent families
- The disabled or chronically ill
- People living alone
- Lower level of education
- Ethnic minority households
- Low income single adults
- Those living in energy inefficient homes
- Single widows or widows living in larger homes

In general, tenants were found to be more vulnerable than owners in Germany and Italy, while overcrowding aggravated energy poverty in France. The general state of poverty in Poland was linked to households falling deeper into energy poverty. The drivers of energy poverty were identified to be low household income, high energy expenditure and a high level of energy consumption due to inefficient use. Extensive research was undertaken to understanding how low-income households use energy, assessing how targets could be identified and determining appropriate measures and the accompanying financial mechanisms.

- Based on the surveys conducted in this research initiative, it became evident that educating consumers about their household energy use behaviour was a significant determinant in improving the household energy consumption without reducing the standard of living. This research initiative concluded the following:
- **Raising awareness is key to changing energy use behaviour.** Households need to be educated about how they are using energy and how energy use can be more efficient through behaviour change or external modifications, particularly building retrofits. Involving tenants in the process is particularly necessary to ensure the successful implementation of energy efficiency retrofits.

- **Use existing financial mechanisms to specifically target the social housing sector.** Energy efficiency measures should specifically target social housing where the occupants have low incomes. These are often on the national level in the form of grants, but typically support for tenants is lacking

I.A.10. Regions at Risk of Energy Poverty (ReRisk of the ESPON 2013 Programme)

This project looked at the effects of rising energy prices on regional competitiveness across Europe, which includes assessing the impacts of energy prices on economies and societies as well as resilience in the face of increasing prices using an “energy vulnerability index” (ESPON 2010). The methodology included looking at industrial competitiveness and employment, dependence on motorised transport, and the main causes of poverty. Regions were clustered by similarities and then long-term developments were analysed in several scenarios. The following five factors are considered significant in identifying zones at risk of energy poverty:

1. Regional economies
2. Low levels of household income
3. Role and dependence on transport
4. Regions with extreme temperatures
5. Potential for generating energy from renewable energy

These five areas were clustered into three dimensions of energy poverty and aligned with socio-economic indicators in order to better assess the vulnerability of the regions and are shown in Table 6.

Table 6: Socio-economic indicators to assess energy poverty in the ReRisk project

Dimension of energy poverty	Indicator
Economic competitiveness	-high energy costs in industries with regional employment -high energy spending in industries with regional GVA
Transport dependency	-regional employment in the transport sector -regional spending on transport fuel commuting between regions -age of regional car parks -regional air travel (passengers)
Social vulnerability	-long-term unemployment -rates of economic activity -age dependency ratio -disposable income

Different scenarios looked at measuring how different regions responded to these indicators. This research initiative showed there is scope for taking action on a regional scope.

- **Policy support.** This research initiative advocates strongly for support to regionally vulnerable regions to deal with increasing energy prices and the related challenges, such as increasing associated costs for travel and reduced revenue from tourism. Coordination of policies on local, regional, national and EU level to ensure energy efficiency measures reach households and industry.