



Funded by the Horizon 2020
Framework Programme of the
European Union



*Forward-looking socio-economic research
on Energy Efficiency in EU countries*
GA 649690

COMPARATIVE ANALYSIS ON HERON RESEARCH OUTCOMES

Aliki-Nefeli MAVRAKI, MSc.

NKUA - KEPA



Università Commerciale
Luigi Bocconi



OXFORD
BROOKES
UNIVERSITY



Wuppertal
Institut



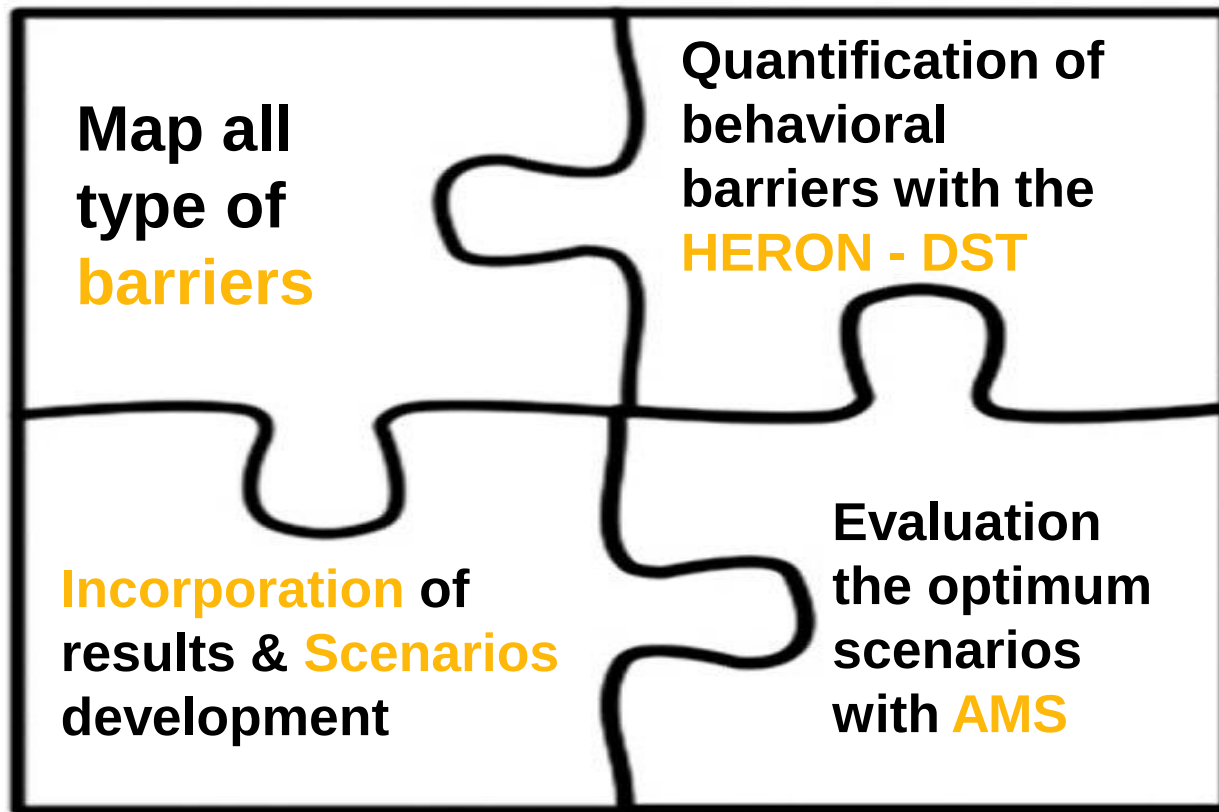
SEI STOCKHOLM
ENVIRONMENT
INSTITUTE

Contents

- The HERON puzzle
- Comparative analysis with HERON – DST on
 - ❖ barriers
 - ❖ technologies
 - ❖ policy mixtures
- Conclusions



The HERON puzzle



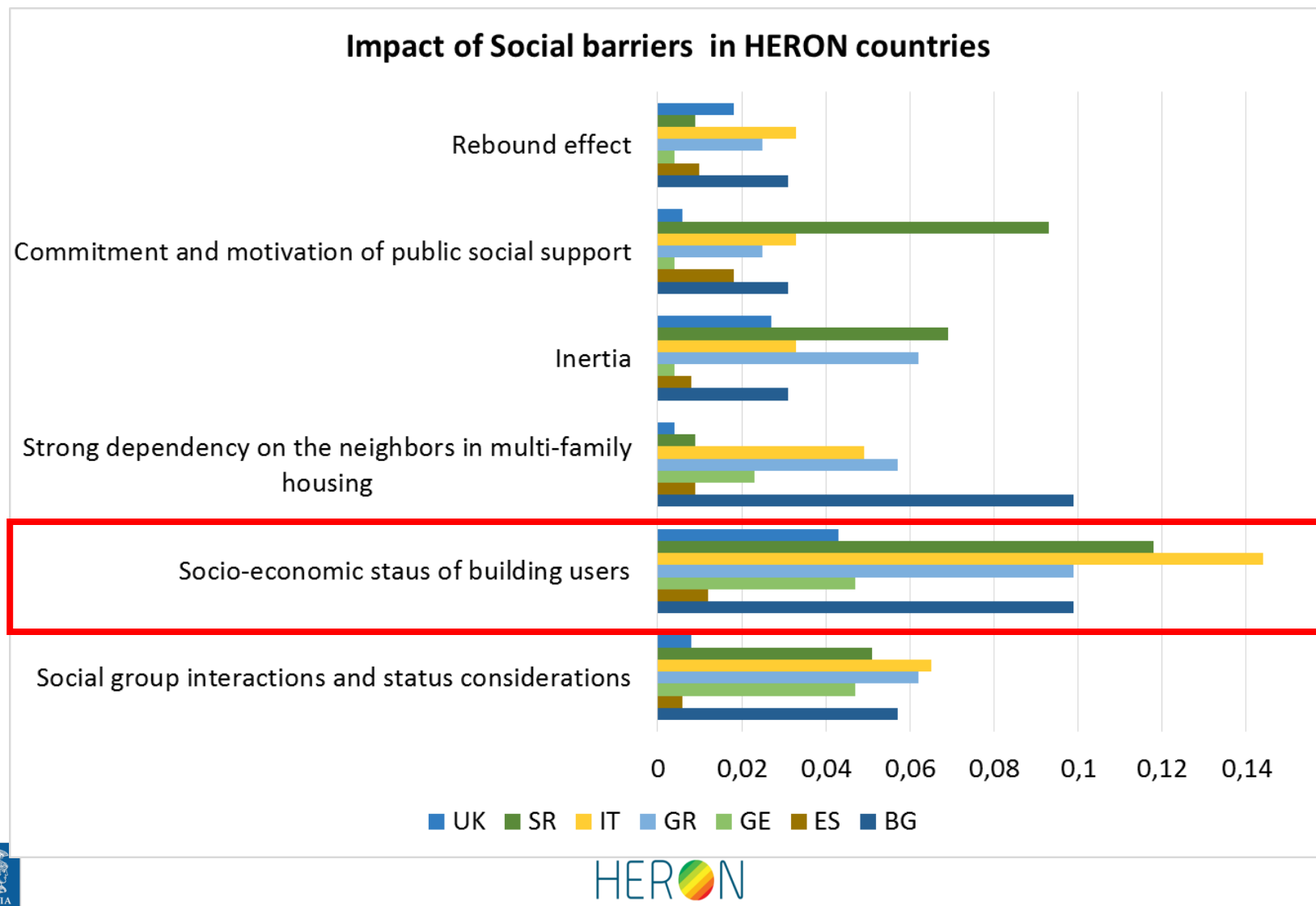
Comparative analysis

The analysis

- Provides **commonalities** and **differences** among the cases in study.
- Shows which are the **common advantages** in confronting barriers linked to end-users behavior.
- Identifies the **framework** that can be implemented at any level in order to reach the EE targets.

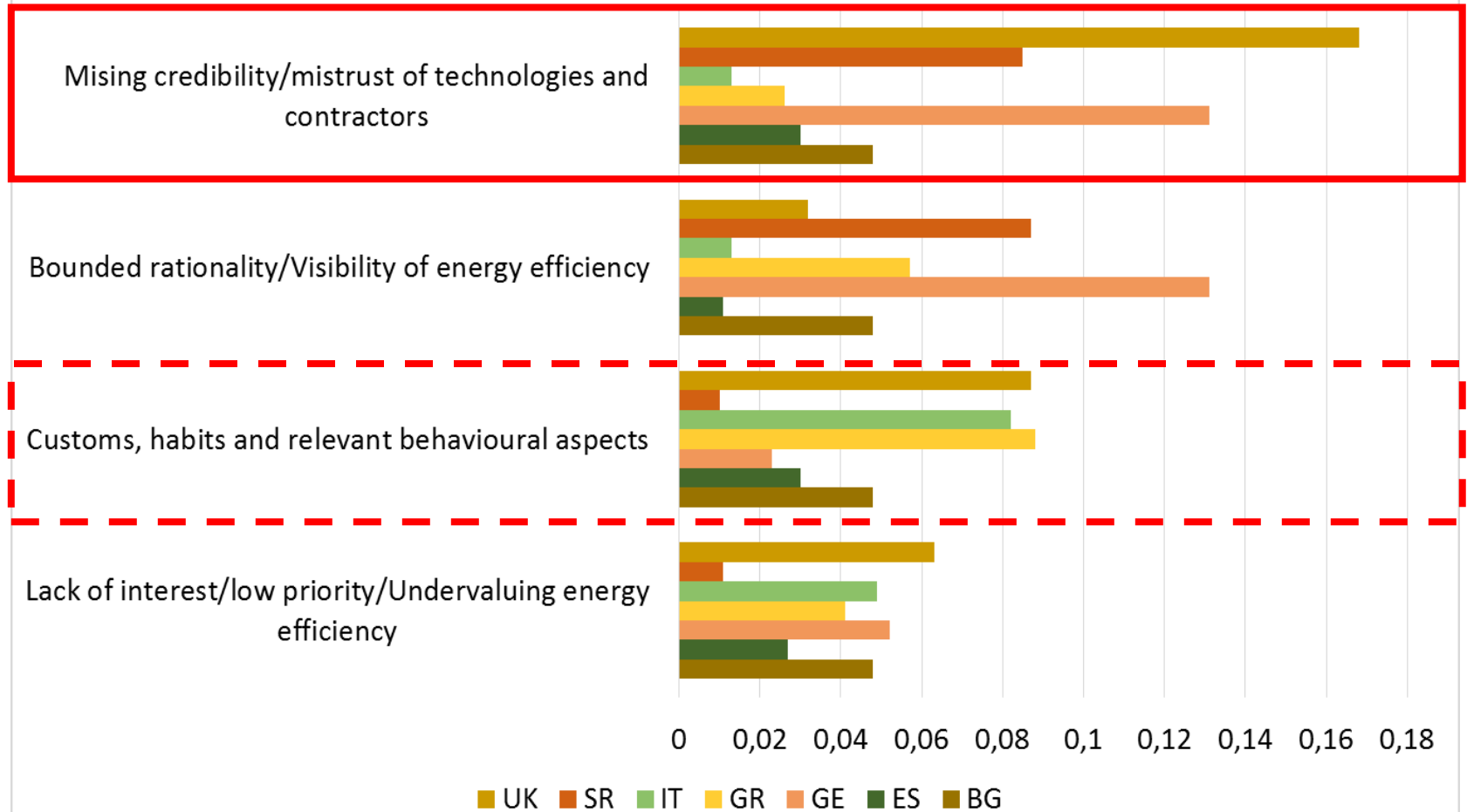
ANALYSIS ON THE BARRIERS WITH THE USE OF HERON-DST BUILDINGS

Social barriers in buildings



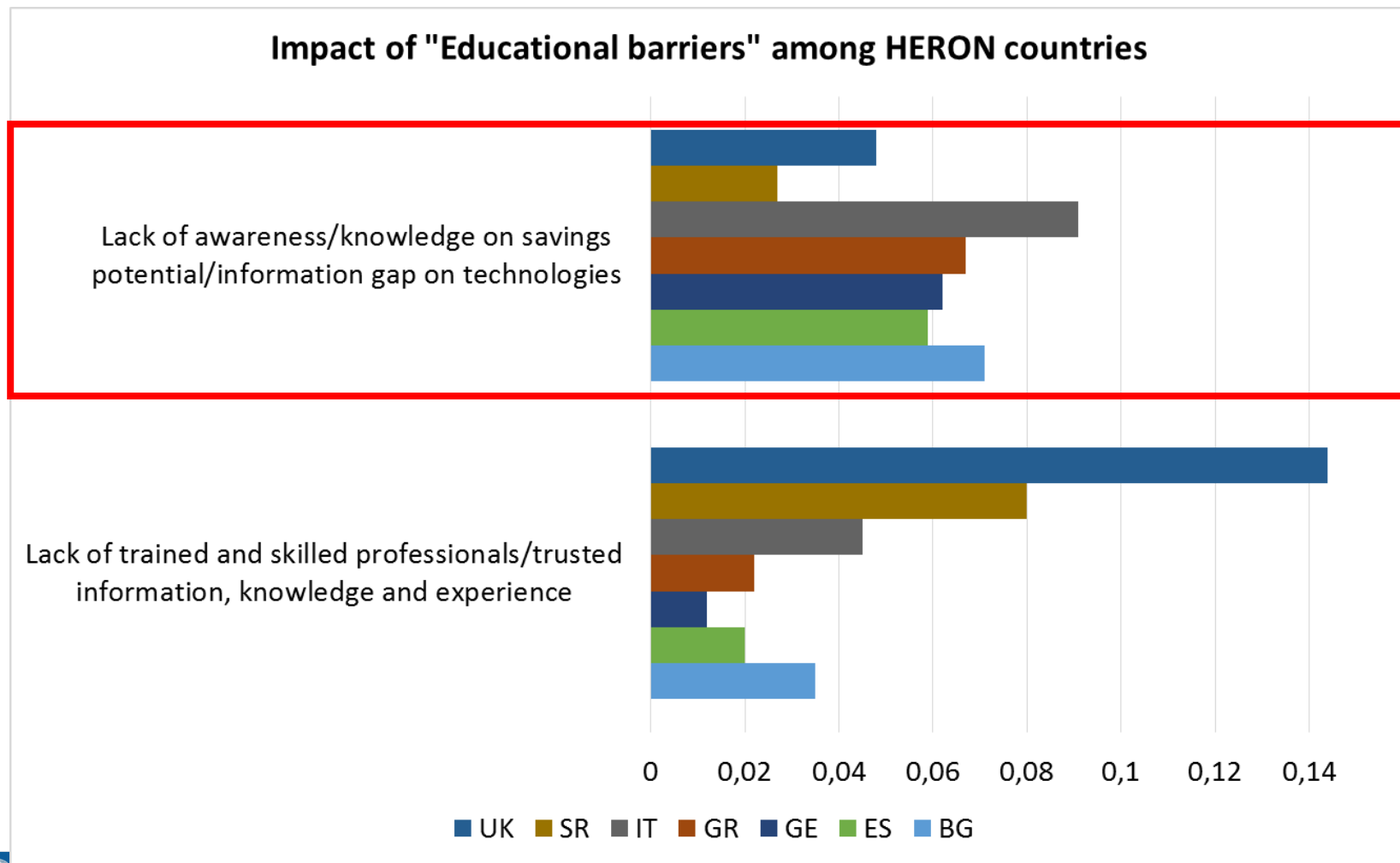
Cultural barriers in buildings

Impact of Cultural barriers in the HERON countries



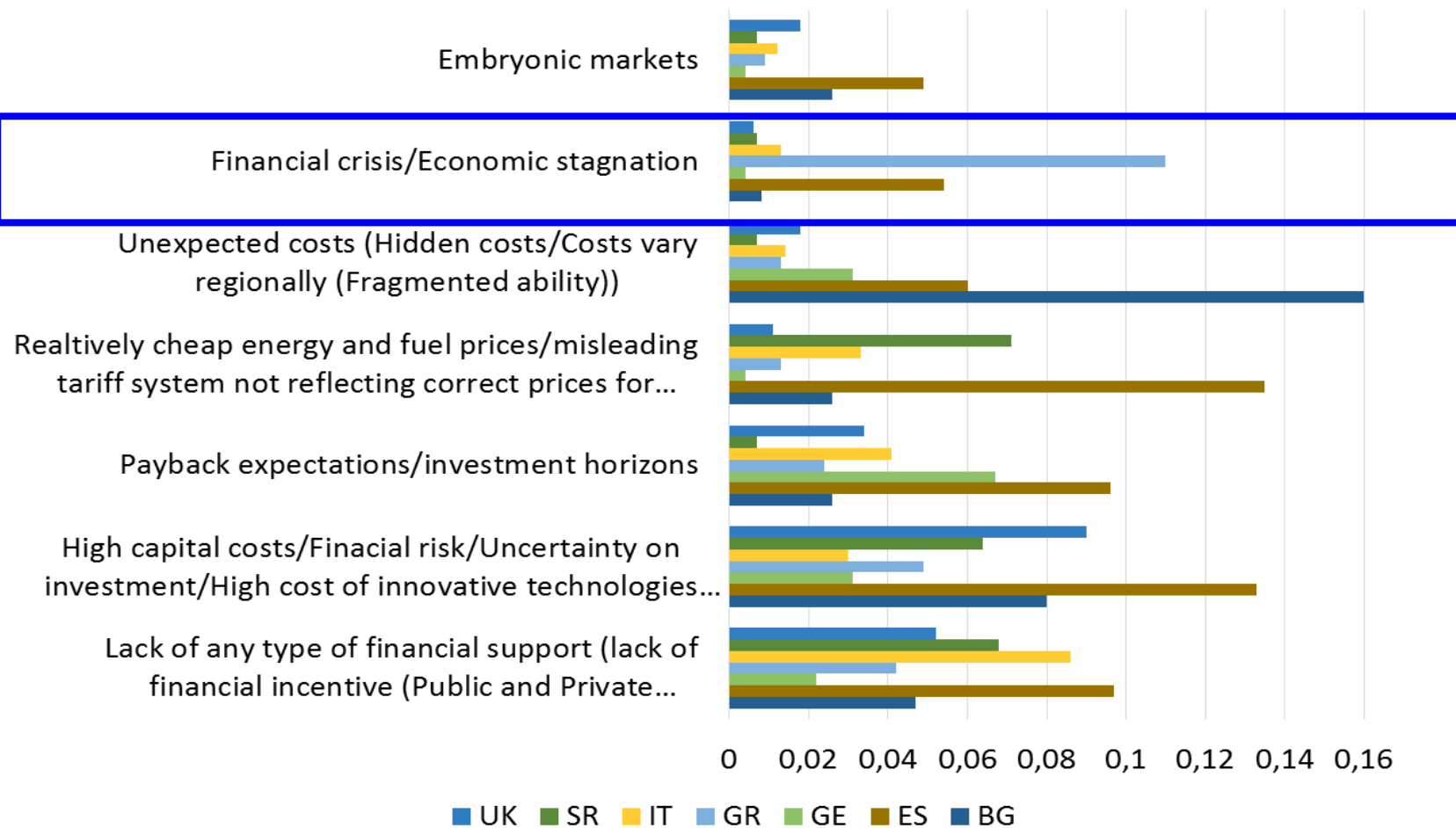
Educational barriers in buildings

Impact of "Educational barriers" among HERON countries



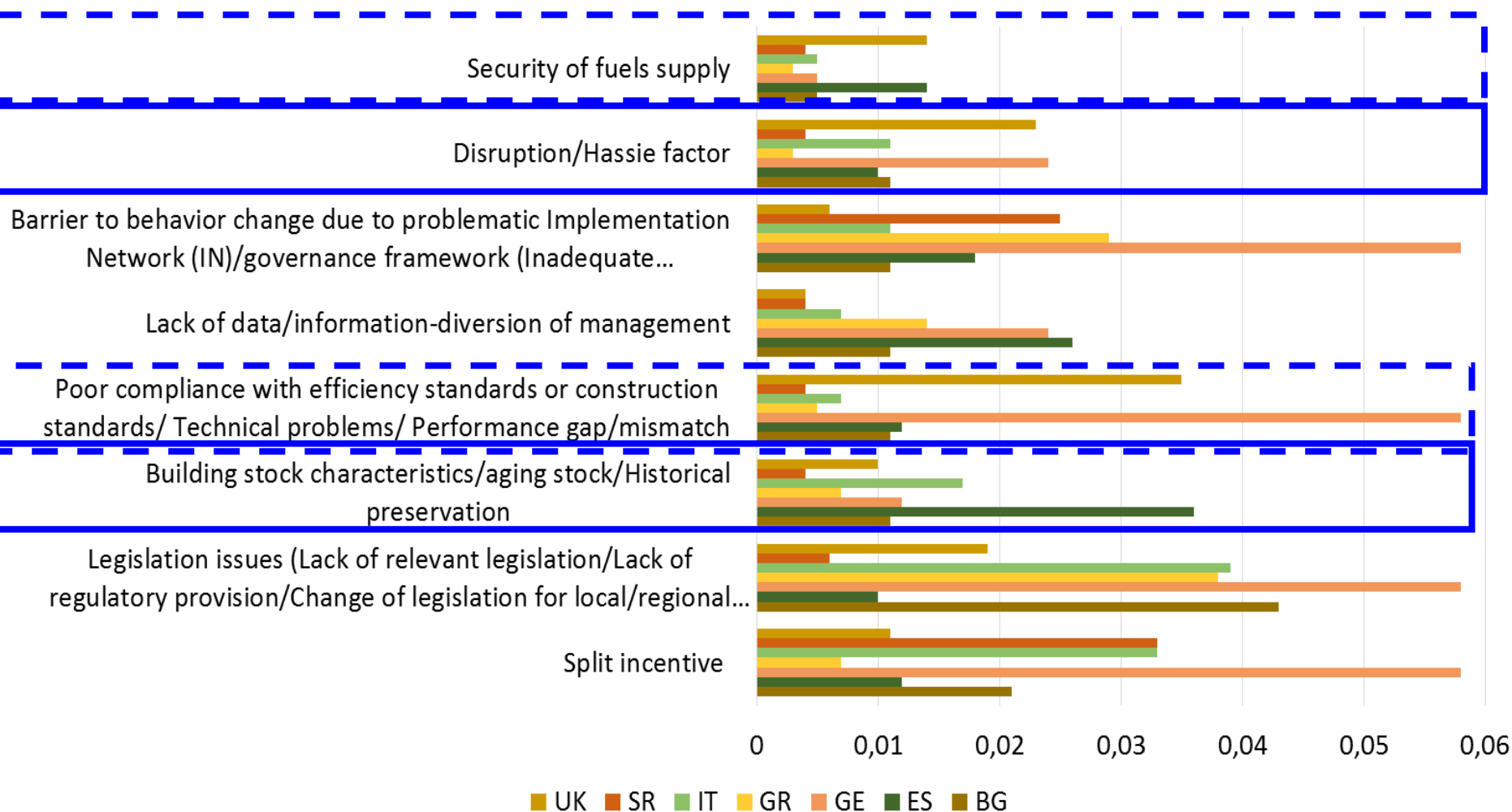
Economic barriers in buildings

Impact of "Economic barriers" among the HERON countries



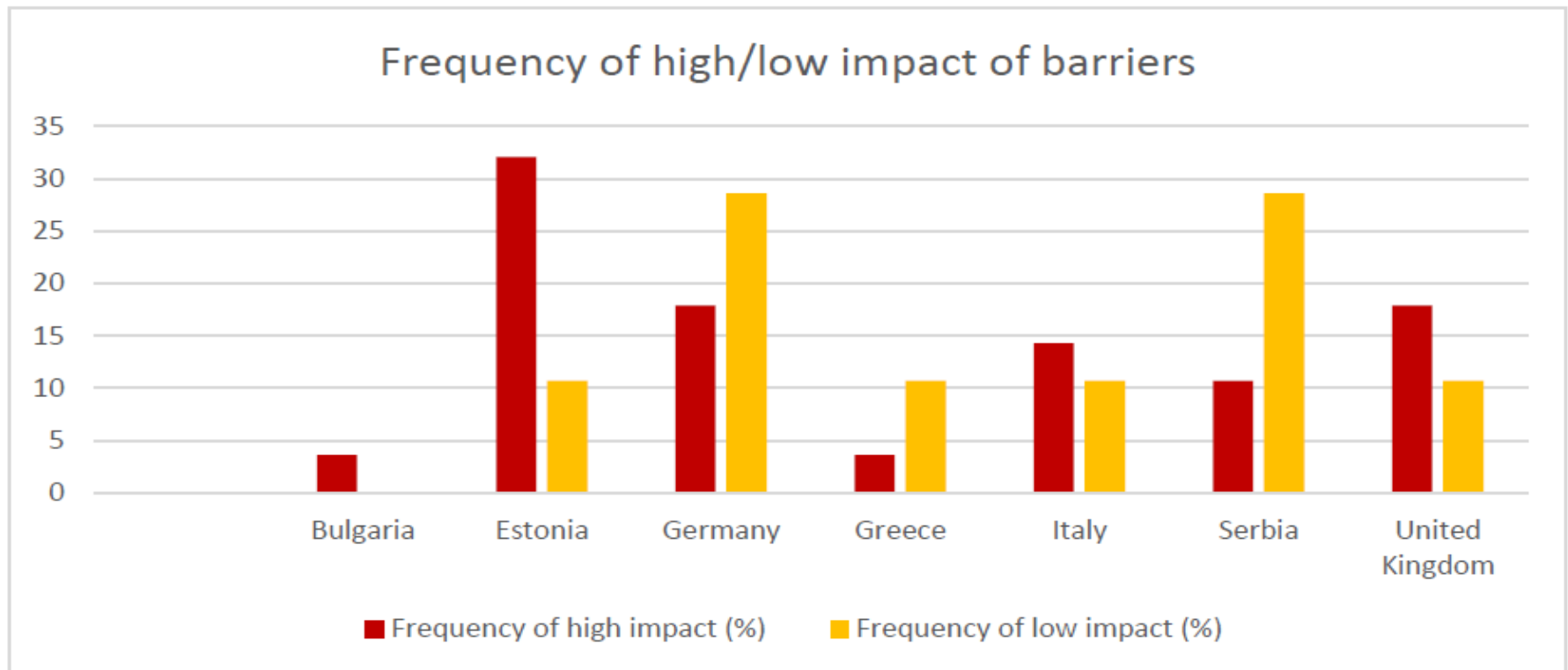
Institutional barriers in buildings

Impact of "Institutional barriers" among the HERON countries



Observations on building barriers

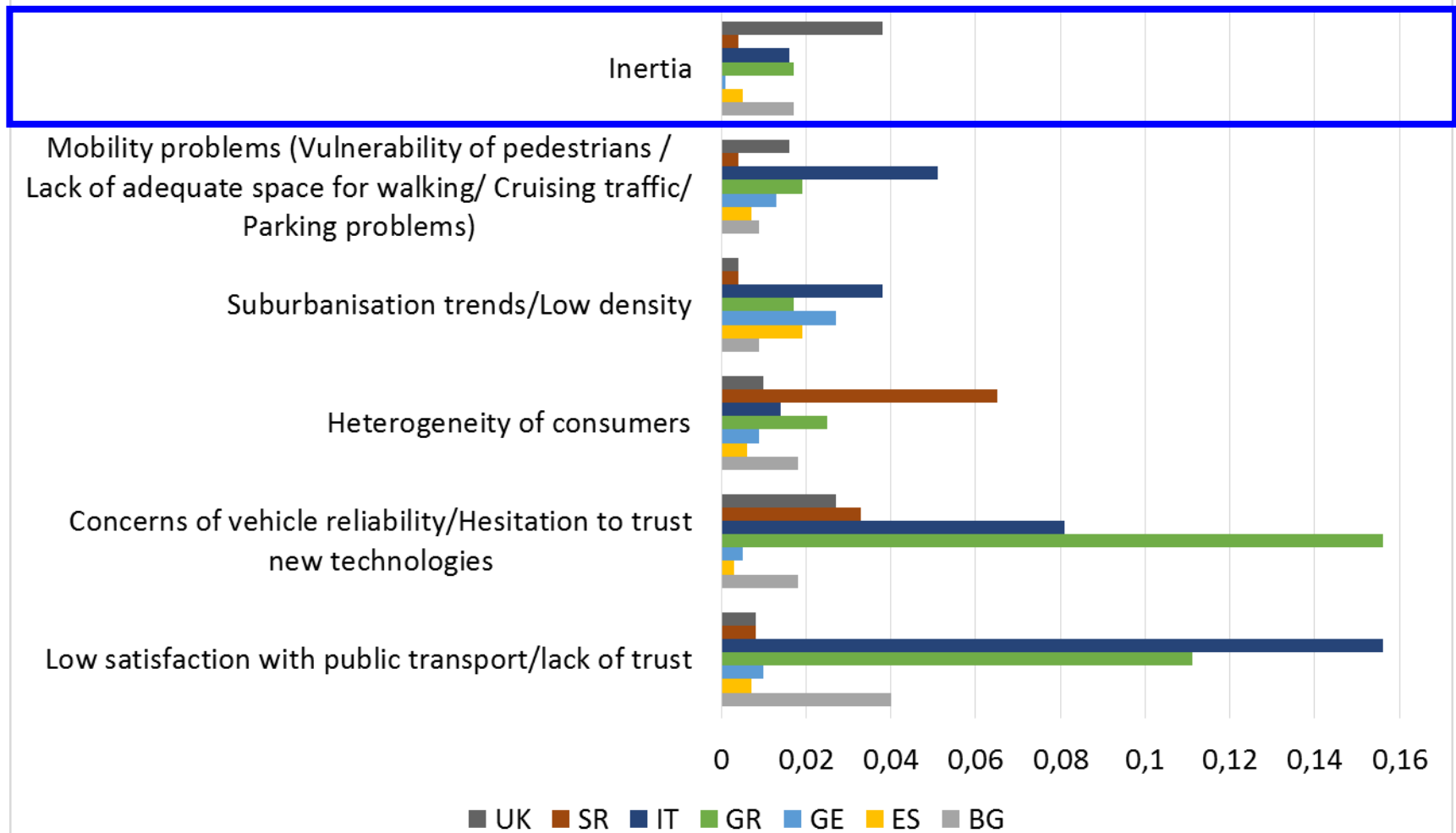
1. **Highest value of impact:** *“Social-Cultural-Educational”* / **Lowest value of impact:** *“Institutional”*
2. **Impact of current policy mixtures on barriers:** Estonia and Serbia have the largest difference between their frequencies of high and low impact, while Germany and Italy have similar to each other.



ANALYSIS ON THE BARRIERS TRANSPORT

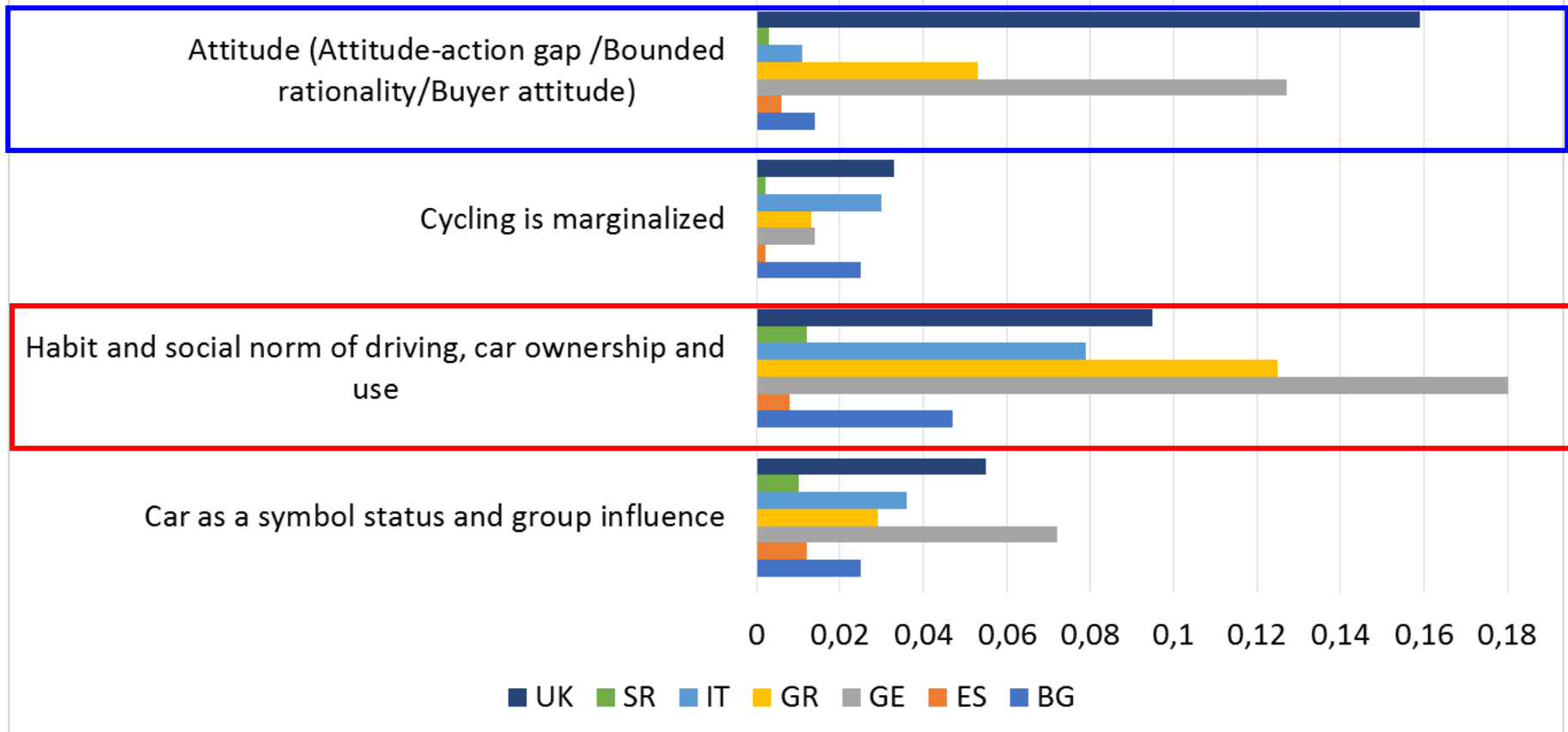
Social barriers in transport

Impact of "Social barriers" for the transport sector among the HERON countries



Cultural barriers in transport

Impact of "Cultural barriers" among the HERON countries



Educational barriers in transport

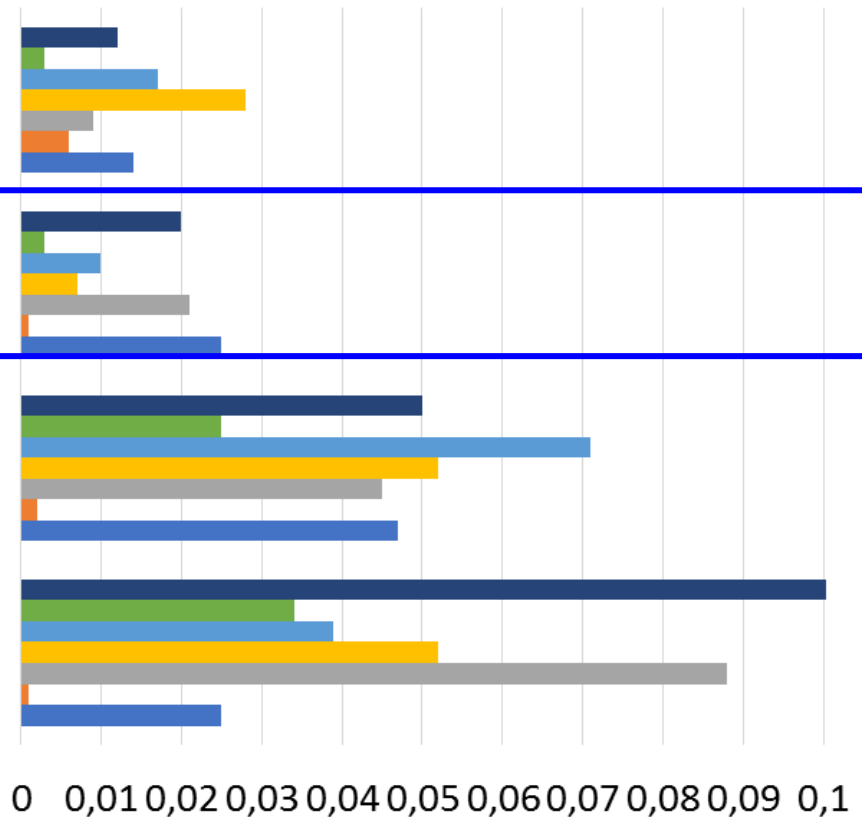
Impact of "Educational barriers" among the HERON countries

Lack of certified instructors/examiners/technicians/professionals for eco-driving /integrated...

Confusion about car and fuel costs (conventional vs ULEVs/Evs) – Negative perception

Low/Limited awareness (of impact of EE in transport /towards eco-driving/benefits-environmental impacts)

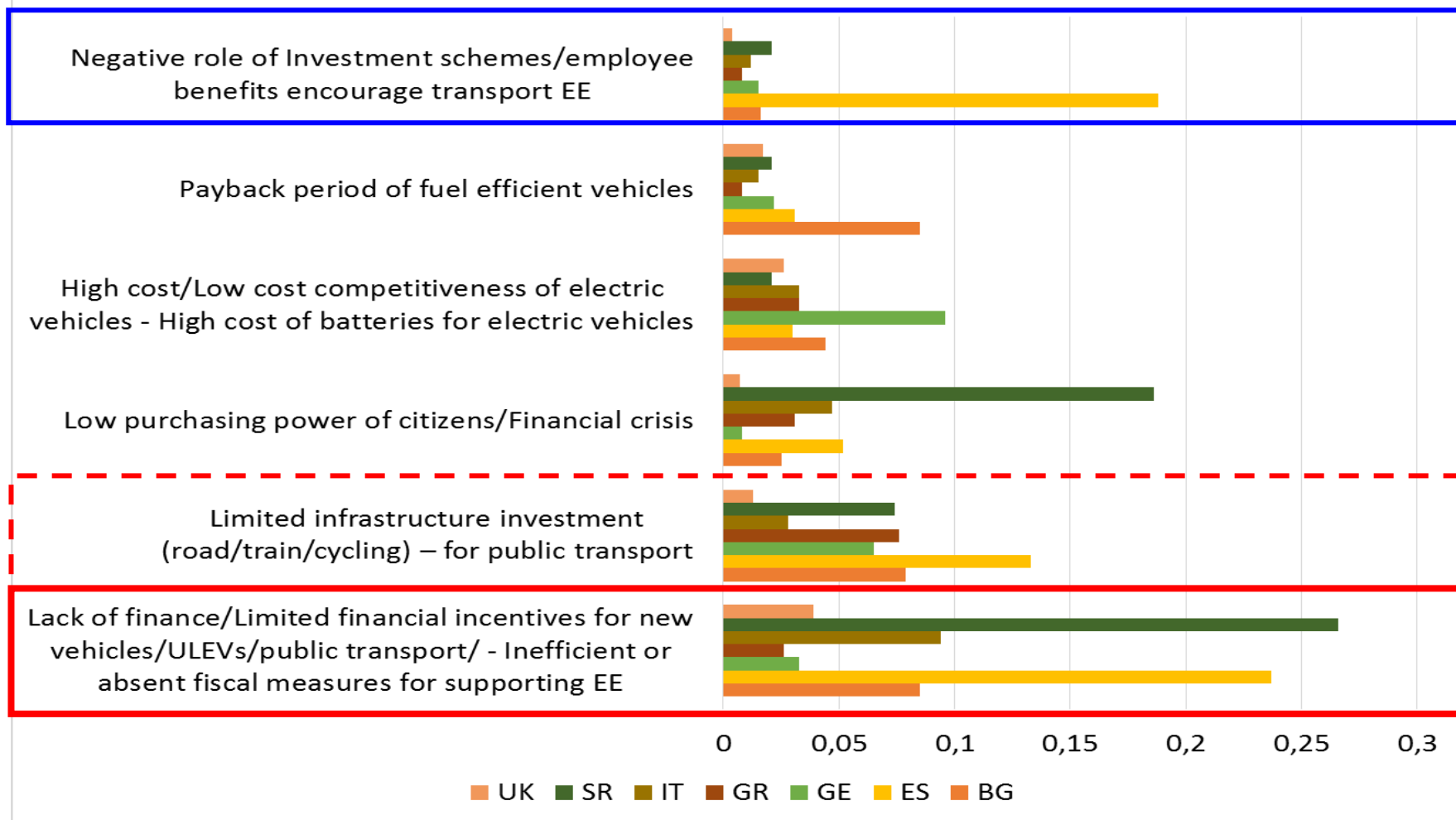
Lack of knowledge/information (on green transport/ULEVs/EVs - fuel economy)



■ UK ■ SR ■ IT ■ GR ■ GE ■ ES ■ BG

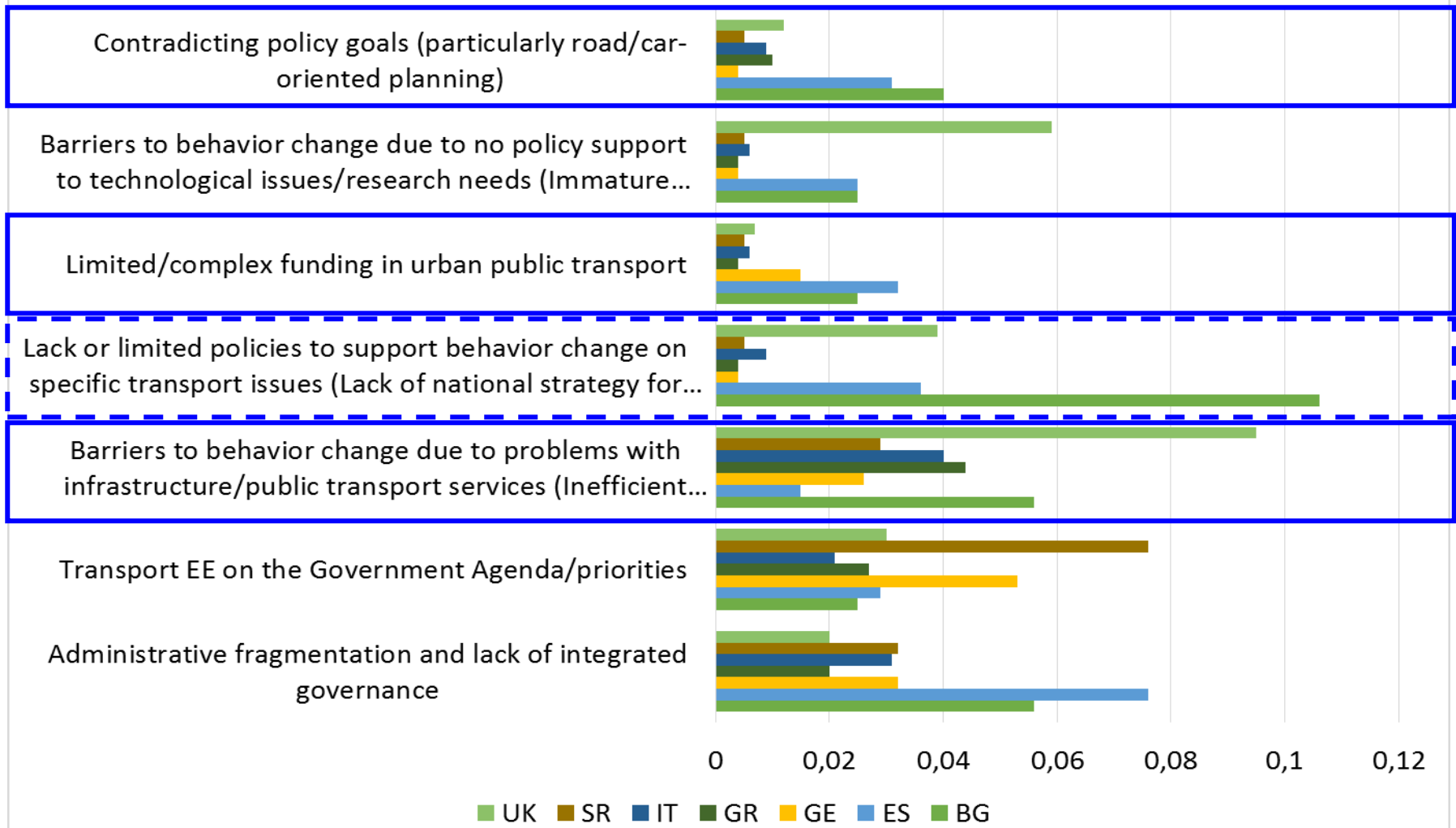
Economic barriers in transport

Impact of "Economic barriers" for the transport sector among the HERON countries



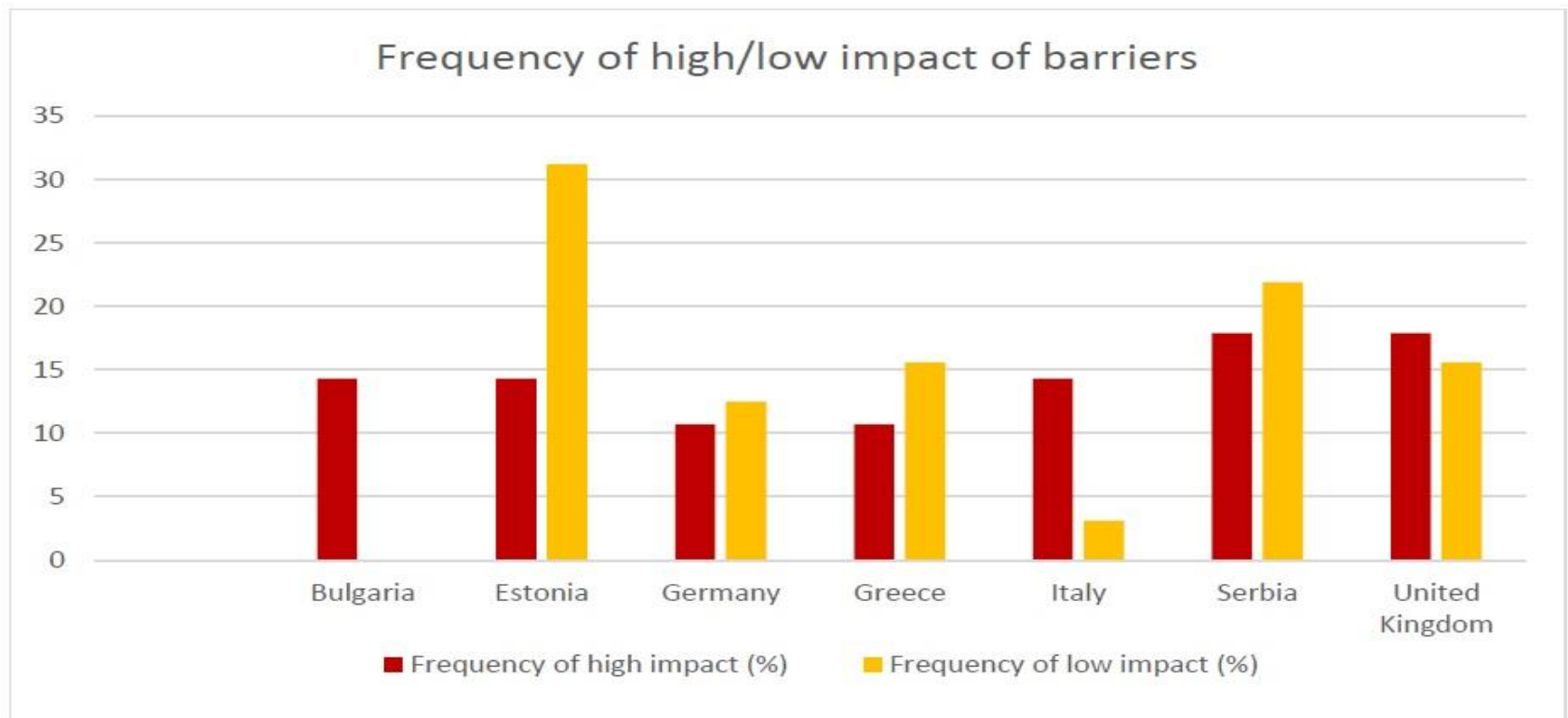
Institutional barriers in transport

Impact of "Institutional barriers" for the transport sector among the HERON countries



Observations on the transport barriers

- **Highest value of impact:** *“Cultural”* & *“Economic”* / **Lowest value of impact:** *“Social”*
- **Impact of current policy mixtures on barriers:** Estonia has the largest difference between its frequencies of high and low impact. Bulgaria did not have the lowest impact value on any barrier.



ANALYSIS ON THE TECHNOLOGIES BUILDINGS & TRANSPORT

Combination of technologies – Most promising policy mixtures – *buildings*

	Countries						
	BG	ES	GE	GR	IT	SR	UK
Technologies	Building Shell Improvement	Building Shell Improvement	Building Shell Improvement	Building Shell Improvement	Efficient heating	Building Shell Improvement	Efficient heating
	Efficient lighting	Efficient lighting	Efficient lighting	Efficient cooling	Efficient cooling	Efficient heating (heat pumps & heating appliances)	Efficient cooling
	Efficient appliances	Efficient appliances	Efficient appliances	Efficient appliances	Heat pumps	Efficient appliances	Efficient lighting
Priority technology	Building Shell Improvement	Building Shell Improvement	Efficient lighting	Building Shell Improvement	Heat pumps	Building Shell Improvement	Efficient heating

Observations on buildings policy mixtures

- “Building Shell Improvement” is linked with a considerable set of barriers that includes common barriers with other EE technologies.

The minimization of barriers for “Building Shell Improvement” affects strongly the penetration of other EE technologies.

- “Efficient appliances” are after the “Building Shell Improvement” the next most frequently encountered technology in these combinations.

Combination of technologies – Most promising policy mixtures – *transport*

	Countries						
	BG	ES	GE	GR	IT	SR	UK
Technologies	Electric & hybrid vehicles	Electric & hybrid vehicles	Electric & hybrid vehicles	Electric & hybrid vehicles	Electric & hybrid vehicles	Use of biofuels	Electric & hybrid vehicles
	Eco – driving	Eco – driving	Modal shift	Modal shift	Modal shift	Eco – driving	Use of biofuels
	More efficient vehicles	More efficient vehicles	More efficient vehicles	More efficient vehicles	Heat pumps	More efficient vehicles	More efficient vehicles
Priority technology	Electric & hybrid vehicles	Electric & hybrid vehicles	Modal shift	Electric & hybrid vehicles	Use of biofuels	Use of biofuels	Electric & hybrid vehicles

Observations on transport policy mixtures

- “Electric & hybrid vehicles”, “More efficient vehicles” and “Use of biofuels” are most frequently encountered technologies/ actions in these combinations.
- “Electric & hybrid vehicles” are linked with a considerable set of barriers that includes common barriers with other EE technologies.

ANALYSIS ON POLICY MIXTURES

BUILDINGS & TRANSPORT

Criteria	Performance of policy mixture						
	BG	ES	GE	GR	IT	SR	UK
Direct contribution to GHG emission reductions (0,833)		↑				↑	
Indirect environmental effects (0,167)		↑				↑	
Environmental performance (0,168) - A		↑				↑	
Cost efficiency (0,474)			↑	↑	↑		↑
Dynamic cost efficiency (0,183)	↑	o		o			o
Competitiveness (0,085)		o	↑	o	o	o	o
Equity (0,175)		↑					
Flexibility (0,051)	↑			o	o	o	o
Stringency for non-compliance (0,032)	o	o	o	o	o	o	o
Political acceptability (0,738) - B			↑		↑		
Implementation network capacity (0,309)	o		o		o	o	o
Administrative feasibility (0,581)	↑	o	o	↑	o	o	o
Financial feasibility (0,110)	↑		↑	o	↑	o	↑
Feasibility of implementation (0,094) - C	↑		↑	o	↑	o	↑

Observations on buildings policy mixtures

- The assumed policy mixtures for the preferable scenarios have the following advantages:
 - They support the **competitiveness** of the country
 - They offer **flexibility** to the end-users
 - Their technological options for promoting EE are **cost-efficient**

Criteria	Scenarios						
	BG	ES	GE	GR	IT	SR	UK
Direct contribution to GHG emission reductions (0,833)		↑	↑	↑		↑	↑
Indirect environmental effects (0,167)			↑	↑		↑	↑
Environmental performance (0,168) - A		↑	↑	↑		↑	↑
Cost efficiency (0,474)	↑	o		o	↑		o
Dynamic cost efficiency (0,183)	↑	o	↑	o	↑	↑	o
Competitiveness (0,085)		o		o	o	↑	o
Equity (0,175)	o	↑	↑	↑		↑	o
Flexibility (0,051)	↑	o	o		o	o	o
Stringency for non-compliance (0,032)		o		o	o	o	o
Political acceptability (0,738) - B	↑	↑		↑		↑	↑
Implementation network capacity (0,309)		o			o	↑	o
Administrative feasibility (0,581)	o	o		↑	o	↑	o
Financial feasibility (0,110)		o		o	o	↑	o
Feasibility of implementation (0,094) - C		o		o	o	↑	o

Observations on transport policy mixtures

- The assumed policy mixtures for the preferable scenarios have the following advantages:
 - They are expected to deliver very good **environmental outcomes** due to their performance in the first criterion (less GHG emissions/ less amount of consumed energy)
 - They have **high political acceptability**
 - They are likely to be **feasible** for implementation

Conclusions

- Commonalities & differences in HERON countries:
 - Majority of barriers with **high impact** fall under the **Social – Cultural – Educational category**.
 - Majority of barriers with **low impact** fall under the **Institutional category**.
 - “Building Shell Improvement” and “Electric/ Hybrid vehicles are the EE **technologies need to be promoted**.”
- Common advantages in EU:
 - A **set of common barriers** for all EU MS would allow the monitoring of progress in the implementation of EE policies.
 - A “**barrier registry**” would demonstrate over time how and if the implemented policies have confronted the identified barriers.
- Framework
 - EU policies should **incorporate the deviations caused by the end-users** behavior in their EE policy making.

THANK YOU FOR YOUR ATTENTION!

Aliki-Nefeli MAVRAKI

Research Associate

*Energy Policy and Development Centre (KEPA)
National and Kapodistrian University of Athens*

anmavraki@uoa.gr

+30 210 727 5732

