EU product policy and consumer purchase decisions – empirical evidence from eight EU member states

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BRISK EE

Behavioural Response to Investment Risks in Energy Efficiency

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Understanding consumer purchase decisions to make effective energy policies

- Consumer purchase decisions influenced by EU product policy
  so households buy more efficient appliances

- Regulation harmonized in EU, still differences in market shares

- How do consumers make purchase decisions?

- How do households differ in their investment behaviour?

- Better understanding can improve policies

- Representative survey in EU project BRISKEE as input to
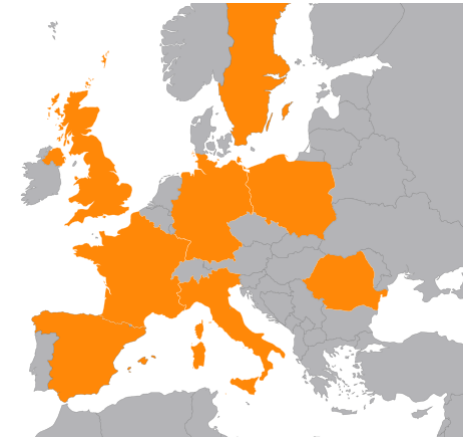 - Energy demand modelling
  - Efficiency policy

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Household survey
Method

Where?

- Representative survey in eight of the largest EU member states

    - About 80 % of EU population, energy use, CO_2 emissions

    - DE, FR, IT, ES, PL, RO, SE, UK

What?

- White goods appliances (refrigerators, freezers, washing machines, dishwashers)

- Lighting

- No major differences between models but largest energy-using products in households

- Choice dominated by purchase price and operation cost, not design or features

- Asked respondents about their **last purchase decision** for a household appliance and a light bulb

    - Which efficiency level? Why?

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# Representative survey in 8 countries on purchase criteria for appliances and lighting

Survey participants	FR	ES	DE	IT	PL	RO	SE	UK	Total
Total sample	2000	2001	2002	2000	2008	1529	1515	2000	15055
Appliances bought within the past 5 years (2012-2016), most recent purchase:									
Refrigerator	522	485	436	519	483	502	224	539	3710
Freezer	149	121	155	106	77	93	94	155	950
Washing machine	583	629	642	744	753	604	294	630	4879
Dishwasher	387	278	328	274	310	65	259	183	2084
Appliances, total	1641	1513	1561	1643	1623	1264	871	1507	11623
Lighting	1558	1762	1576	1741	1854	1482	1281	1497	12751

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Market shares of efficiency classes differ

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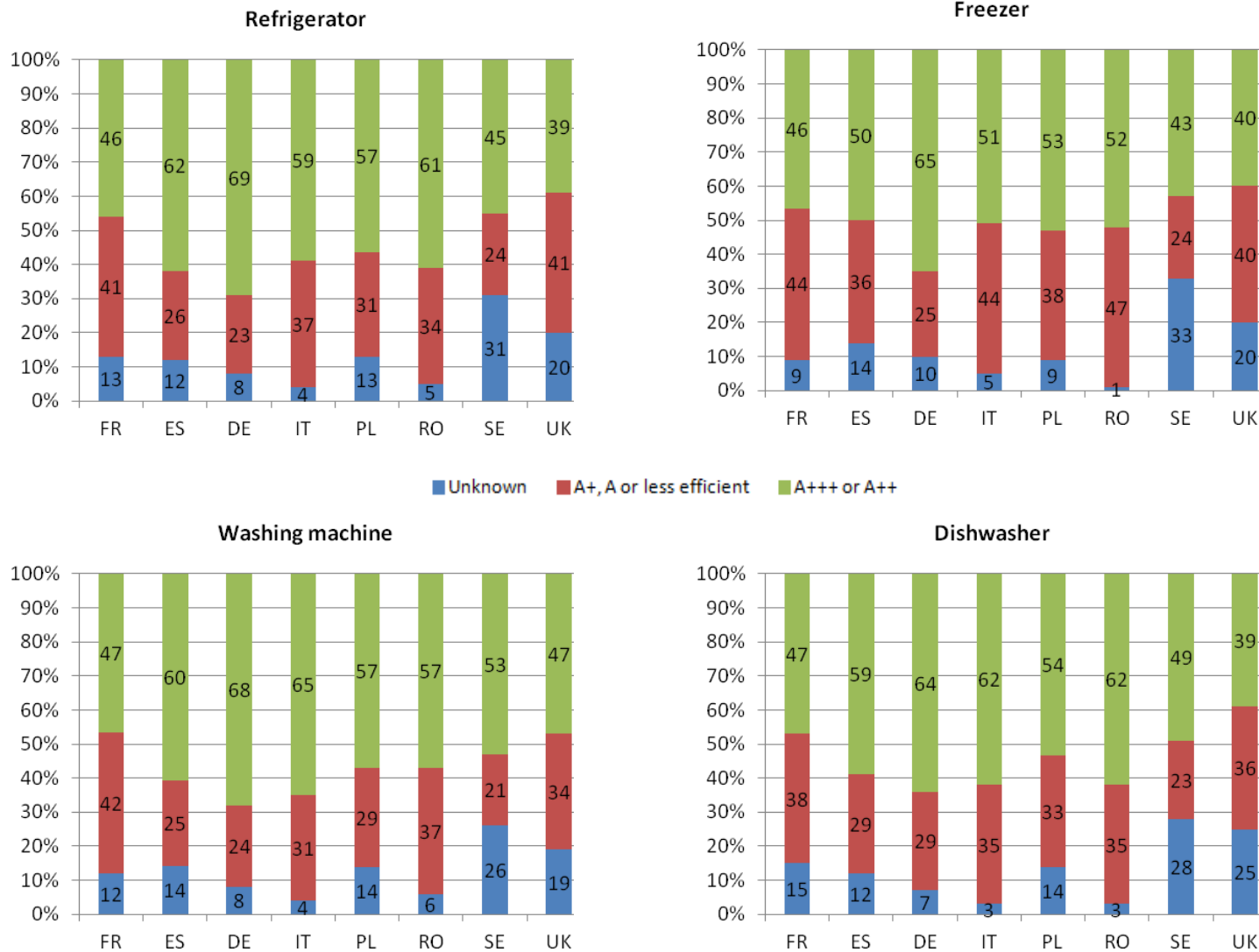
Market shares of lighting technologies differ significantly
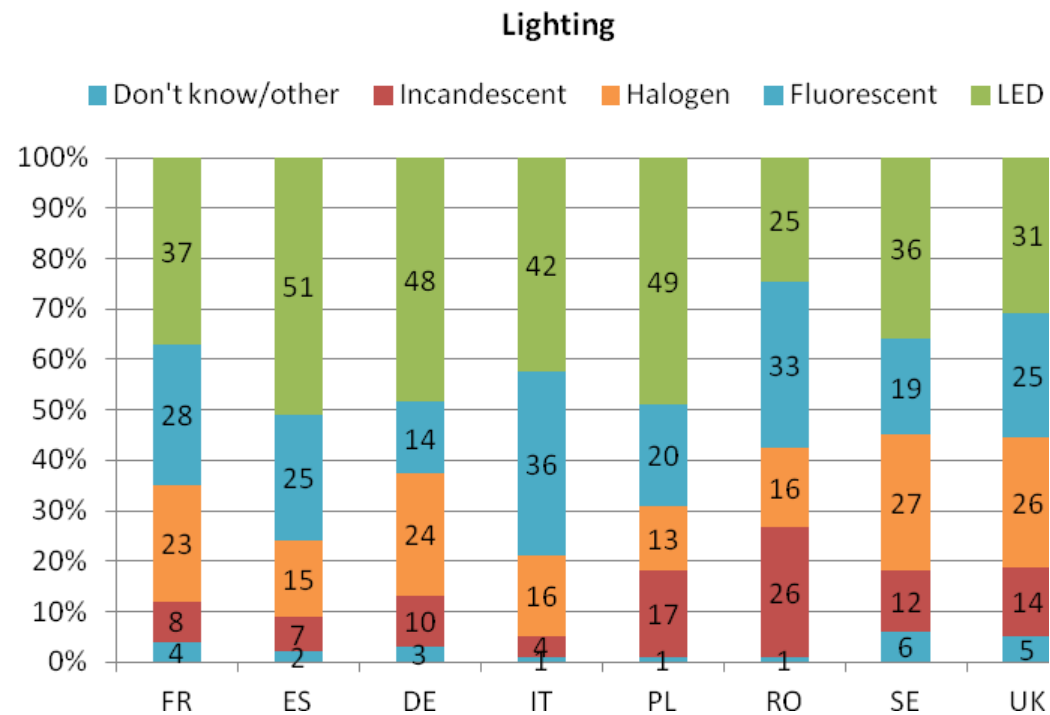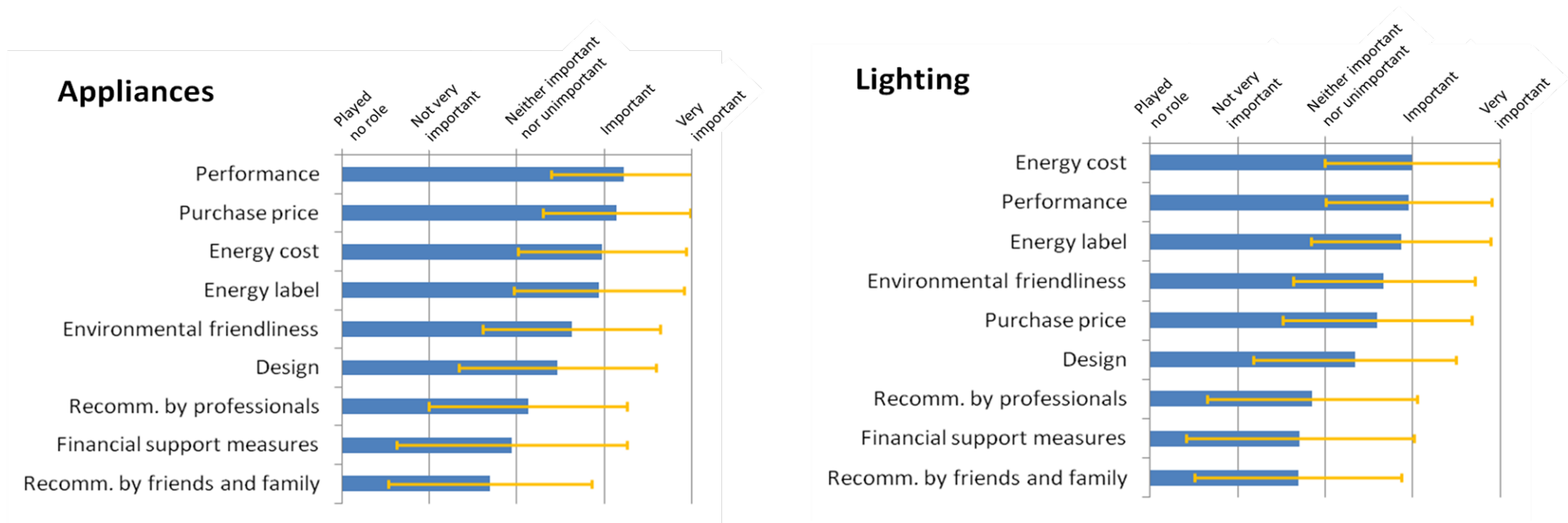

Lighting

2014-2016

Importance rating of purchase criteria
Refrigerator, freezer, washing machine, dishwasher, lighting

- Purchase price

- Energy cost

- Energy label

- Recommendations by friends and family (social influence)

- Recommendations by professionals (e.g. retailers)

- Environmental friendliness

- Financial support (e.g. tax rebates, subsidies)

- Performance (quality, reliability, durability, functionality)

- Design, look, fit with current interior

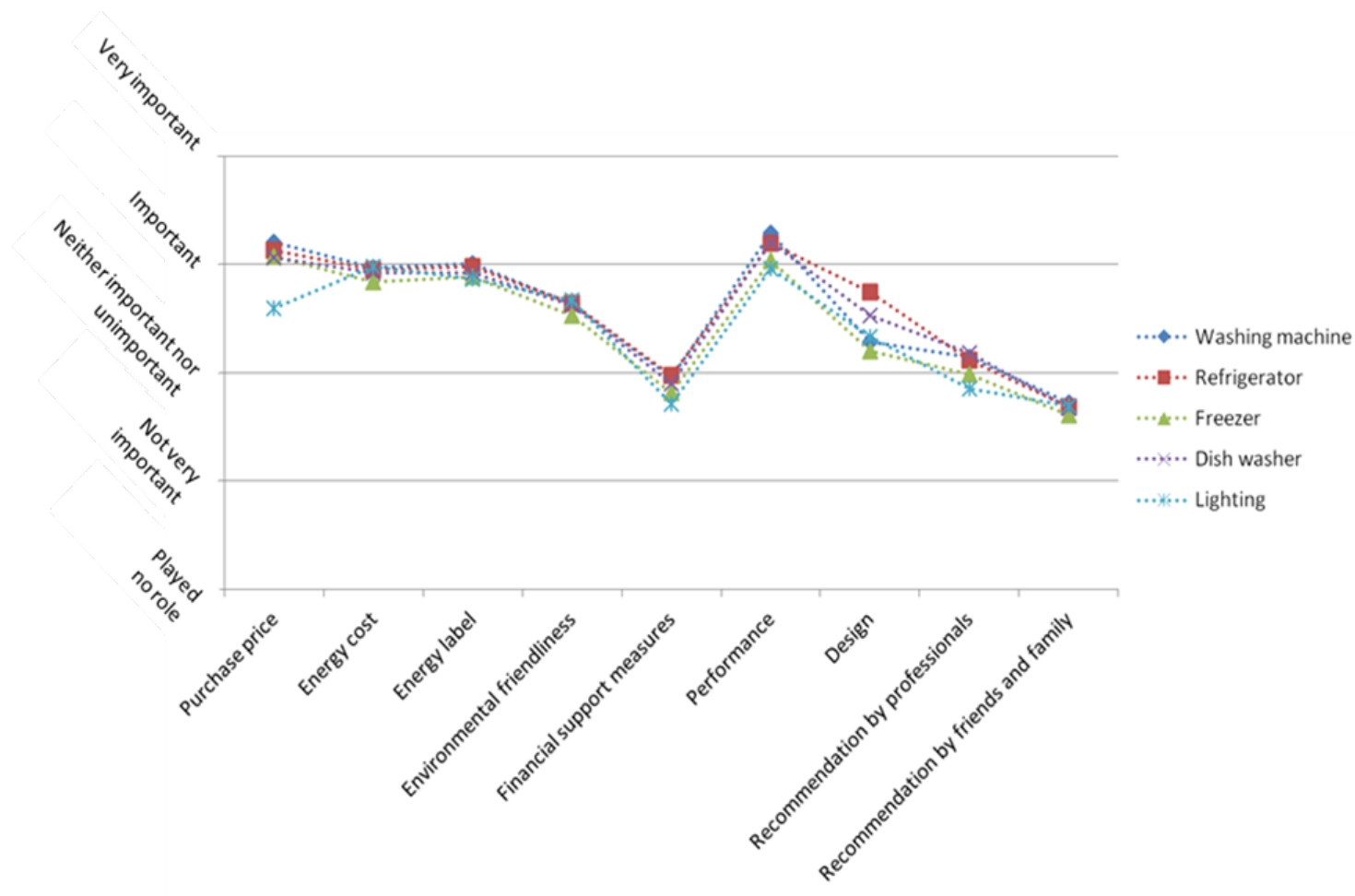- Importance rating from "played no role" to "very important"

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Priority for appliances on purchase price, for lighting on energy cost

Average rating and standard deviation
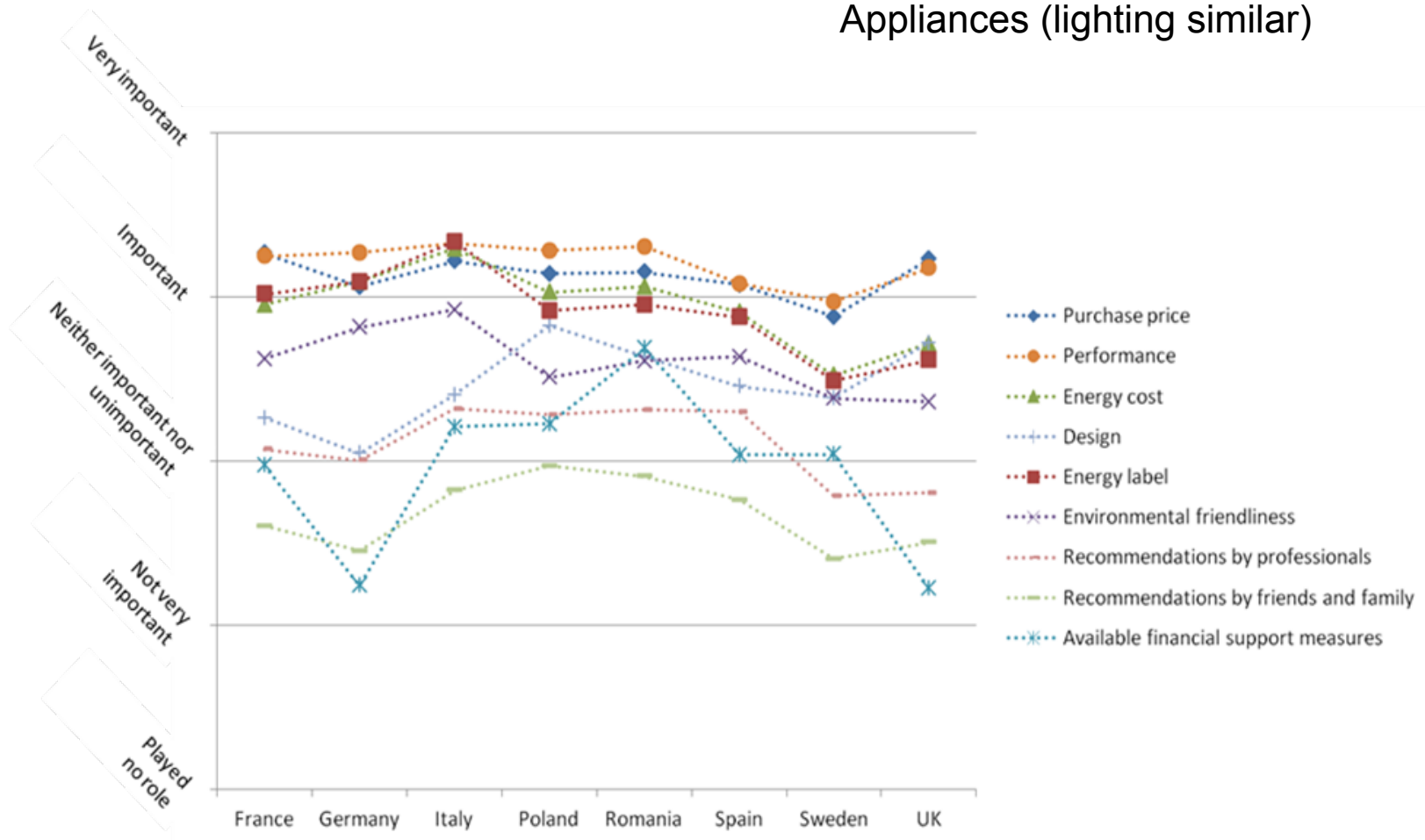
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Little variance between appliance types
Lighting slightly different

Minor differences in ratings between countries

Appliances (lighting similar)

Regression analysis of purchase criteria

- Focus on four criteria considered most relevant for energy efficiency policy

  - Purchase price

  - Energy label

  - Energy cost

  - Recommendations by professionals

Attributes considered in analysis (from literature review)	Name of variable in regression	Variable type and range of values
Respondent age in years	*respAge*	18 – 65; integer
Education group, ranging from value 1 for "no degree or certificate" to 4 in case of a "higher education degree or equivalent"	*educ*	1, 2, 3, 4; integer-coded categories
Having children (1 means respondent has children, 0 means does not have children)	*hasChildren*	0, 1; dummy
Household income in 12 groups, in steps of roughly 800 EUR per month. In countries with low incomes, only the first few groups are significantly populated.	*income*	1 – 12; integer-coded categories
Gender (0 for female, 1 for male)	*gender*	0, 1; dummy
Number of household members	*HHsize*	1 – 6 (99 % of respondents); integer
Housing situation (dummy variable rented vs. owned property)	*renting*	0, 1; dummy
Participant pays for electricity according to consumption (dummy variable)	*paysElectricCons*	0, 1; dummy
Environmental identity (average score from four questions*)	*ENV_ID*	1.00 – 5.00; floating point

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Regression analysis of purchase criteria

Dependent var.: rating of →	Purchase price		Energy cost		Energy label		Recommendations by professionals	
Independent var.: ↓	Coeff.	SE	Coeff.	SE	Coeff.	SE	Coeff.	SE
respAge	-0.002 *	0.001	-0.001	0.001	0.000	0.001	-0.004 *	0.001
educ	-0.007	0.009	-0.034 *	0.009	-0.026 *	0.009	-0.008	0.012
hasChildren	-0.028	0.021	0.045	0.022	0.037	0.022	0.098 *	0.027
income	-0.033 *	0.003	-0.003 *	0.004	0.013 *	0.004	-0.017 *	0.005
gender	-0.039 *	0.017	-0.055 *	0.018	-0.087 *	0.018	-0.091 *	0.023
HHsize	0.003	0.006	0.019 *	0.007	0.012	0.007	0.032 *	0.009
renting	0.051 *	0.020	-0.054 *	0.021	-0.039	0.021	-0.194 *	0.026
paysElectricCons	0.027	0.027	0.125 *	0.029	0.151 *	0.029	0.023	0.036
ENV_ID	0.108 *	0.010	0.464 *	0.011	0.489 *	0.011	0.276 *	0.014
Constant	3.998 *	0.065	2.284 *	0.069	2.013 *	0.068	2.331 *	0.087
R²	0.025		0.168		0.185		0.058	
N	9835		9835		9835		9835	

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Conclusions

- Consumers rate purchase criteria differently for household appliances and for lighting

- Only minor differences regarding socio-demographic attributes
- Largest effect of environmental identity and paying according to consumption

- Suggestion:
  Increase awareness of the energy bill to support the uptake of highly efficient appliances
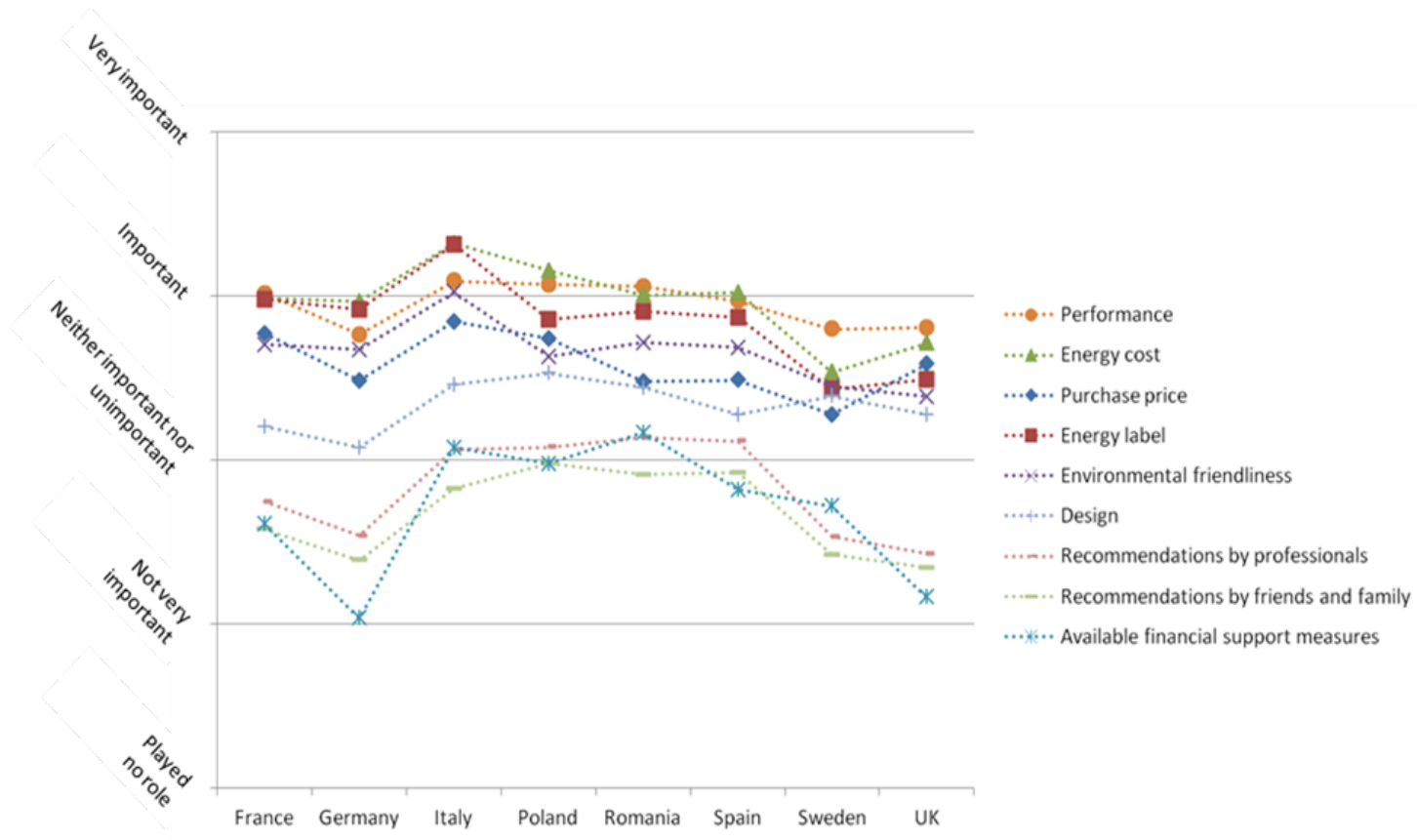
Solutions workshop today 14:00 – 15:00 h (BRISKEE)

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Discussion

Back-up

Minor differences in ratings between countries

Lighting

Environmental identity scale

- Scale by Cardiff University (Whitmarsh and O'Neill 2010) includes four statements on environmental identity (rated from "strongly disagree" with value 1 to "strongly agree" with value 5):

  - To save energy is an important part of who I am.

  - I think of myself as an energy conscious person.

  - I think of myself as someone who is very concerned with environmental issues.

  - Being environmentally friendly is an important part of who I am.

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