

Barriers and drivers in local and regional sustainable energy actions: A review and empirical investigation

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Panel 5. Sustainable communities

ECEEE Summer Study

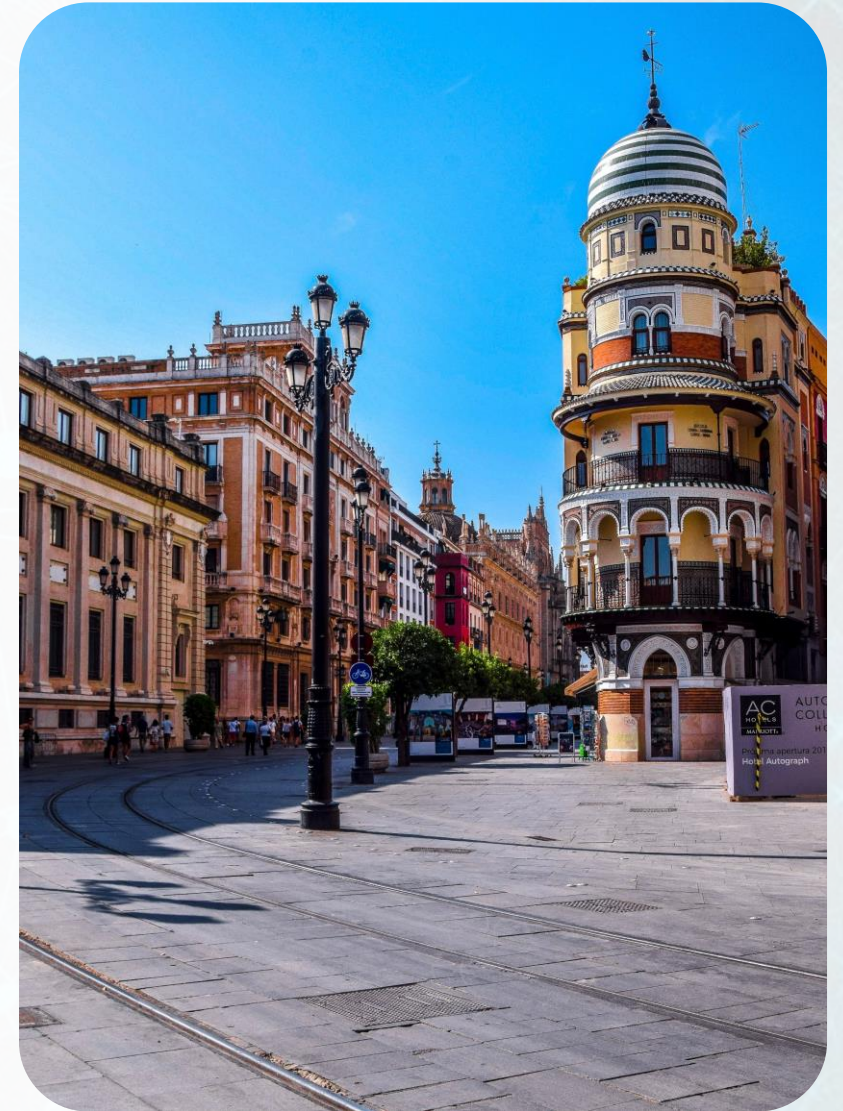
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Introduction

- **Cities** are among the **major energy consumers**, being accountable for **70% of the global energy use** and consequently among the major GHG emitters.
- Cities and regions may also be **part of the solution** as they can act as a **key player** in the way toward achieving the **EU goal for climate neutrality by 2050**.
- They are **best located** in the interface between the individual and household level and the national and international level.
- Local authorities often face **challenges** in several steps of projects planning, financing and implementation.



Introduction



The **PROSPECT+ project** focuses on the development and implementation of a capacity building programme between local/ regional authorities and energy agencies.



Build the **capacity of public authorities in financing sustainable energy plans** through peer-to-peer learning activities



Enhance decision-making of public authorities for them to be leaders in implementing energy efficiency measures



Help public authorities and their agencies **profiting of the rich experience available**, taking inspiration from their peers

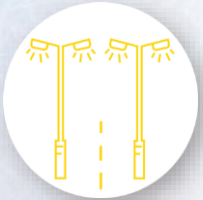
Introduction

The project articulates on **5 thematic areas**.



Public Buildings

Covers buildings and facilities owned, managed or controlled by public authorities. Facilities refer to energy - consuming entities that are not buildings.



Public Lighting

Covers the provision of public lighting (e.g., street lighting and traffic lights) owned or operated by public authorities.



Transport

Covers the provision and management of mass transit systems by public authorities as well as private transport.



Private Buildings

Covers buildings and facilities owned, managed or controlled by private individuals or corporations (primarily the tertiary sector, e.g., private companies, banks, commercial and retail activities, hospitals etc. and residential buildings including social housing).



Cross-sectoral

Covers all those interventions falling under two or more thematic areas, climate change adaptation, local electricity production (e.g., wind power, hydroelectric power, photovoltaic) and local heat/cold (e.g., combined heat and power and district heating plants)

Introduction

Existing studies perform mostly qualitative assessments of the barriers and drivers that cities face when implementing energy efficiency and other sustainable energy projects and/or only for specific sectors and regions each time.

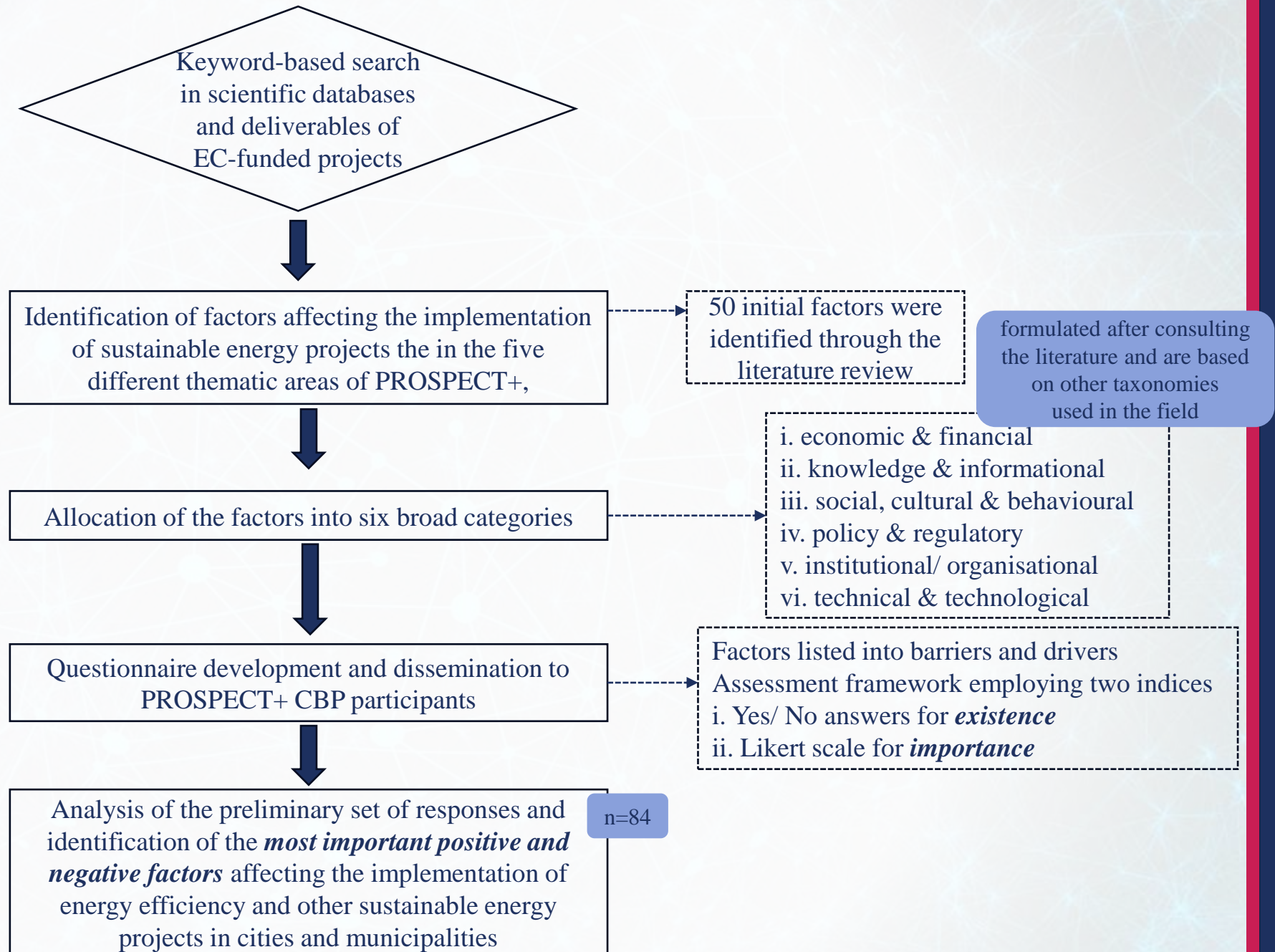
This analysis aims to perform an overall quantitative analysis across multiple countries and sectors.

- Participatory multi-method approach
- Literature review
- Online survey
- Semi quantitative aspect, taking into account stakeholders' perception



Methods

Literature review



Literature review results

	Public Buildings	Private Buildings	Public lighting	Transport	Cross sectoral
Economic and financial factors					
Availability of funding and access to funding sources	✓	✓	✓	✓	✓
Availability of resources	✓	✓	✓		
Initial investment and payback period	✓	✓	✓	✓	✓
Availability of (economic) incentives	✓	✓	✓	✓	✓
Split incentives and principal- agent problem	✓	✓	✓	✓	✓
Profitability	✓	✓			
Anticipated energy/ costs savings	✓	✓	✓		
Other costs (e.g., hidden and transaction costs)	✓	✓	✓	✓	✓
Interference in daily work	✓	✓			
Property value		✓			
Financial crisis	✓	✓		✓	
Energy prices	✓	✓		✓	
Socio-economic status of users		✓		✓	
Risks & uncertainty	✓	✓	✓		✓

Knowledge and information factors	Public Buildings	Private Buildings	Public lighting	Transport	Cross sectoral
Information, knowledge and awareness	✓	✓	✓	✓	✓
Priority	✓	✓	✓	✓	✓
Mistrust	✓	✓		✓	✓
Dissemination and promotion	✓	✓			

Social, cultural and behavioural factors	Public Buildings	Private Buildings	Public lighting	Transport	Cross sectoral
Resistance to change, inertia and lack of interest	✓	✓	✓	✓	✓
Public acceptance, social status consideration, social norms and group influence	✓	✓	✓	✓	
Bounded rationality	✓	✓			
Willingness	✓	✓			
Quality of life		✓			
Waiting for future savings			✓		
Reluctance, confidence in technology and past experience	✓	✓	✓		

Literature review results

Policy and regulatory factors	Public Buildings	Private Buildings	Public lighting	Transport	Cross sectoral
Existence of regulation and legislation and/or conflicting policy	✓	✓	✓	✓	✓
Changes in legislation and/or regulatory framework	✓				
Existence of mandatory requirements and enforcement	✓	✓	✓		✓
Risks and uncertainty	✓	✓			

Institutional/ Organisational factors	Public Buildings	Private Buildings	Public lighting	Transport	Cross sectoral
Institutional practice	✓		✓		
Streamlined processes and complex procedures	✓	✓	✓		
Bureaucracy	✓	✓			
Existence of a long-term vision, plans and strategies				✓	✓
Public budgeting practices	✓				
Management and government support	✓	✓			
Decision-making process	✓				
Partnerships					✓
Power	✓	✓			
Contractual lock-in			✓		

Technical and technological factors	Public Buildings	Private Buildings	Public lighting	Transport	Cross sectoral
Availability of (technical) capacities and skills	✓	✓	✓		✓
Availability of guidance and best practices	✓	✓	✓	✓	✓
Complexity of projects and procedures			✓		
Infrastructure				✓	
Joint ownership	✓	✓		✓	
Availability of technology and maintenance capabilities	✓	✓			✓
Low satisfaction with public transport				✓	
Availability of data	✓	✓			
Technical problems and limitations (including geographical and logistical issues)	✓	✓		✓	✓
Measurement and verification of savings			✓		
Risks & uncertainty	✓	✓	✓		✓

Literature review results



Economic & financial

14 factors



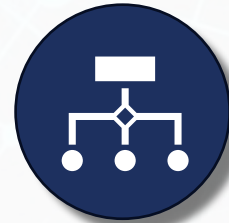
Policy & regulatory

4 factors



Knowledge & informational

4 factors



Institutional/ organisational

10 factors



Social, cultural & behavioural

7 factors



Technical & technological

11 factors

Literature review results



Economic & financial

14 factors

14 barriers
5 drivers



Knowledge & informational

4 factors

4 barriers
3 drivers



Social, cultural & behavioural

7 factors

6 barriers
2 drivers



Policy & regulatory

4 factors

4 barriers
2 drivers



Institutional/ organisational

10 factors

9 barriers
2 drivers



Technical & technological

11 factors

11 barriers
3 drivers

48 barriers

17 drivers

Online survey




User friendly online questionnaire with 4 main sections.

Pages

Start Personal background Thematic area and background of the organisation Barriers in sustainable energy projects

Drivers in sustainable energy projects Other



PROSPECT+
Capacity building for cities and regions
from learning to action!

Welcome and Introduction

Dear participant,

This survey is being conducted as part of the project "PROSPECT+ - Capacity building for cities and regions - from learning to action!" funded by the European Union's Horizon 2020 research and innovation programme under grant agreement No. 101023271. The PROSPECT+ project aims to increase the capacity building in regional and local authorities concerning financing, implementation, proper monitoring and verification of effective, efficient and sustainable energy plans. You can visit the website of the project for further information: <https://h2020prospect.eu/>

In this survey, we aim to identify the factors affecting the implementation of sustainable energy projects by taking input from representatives of local and regional authorities or their energy/climate agencies.

The results of the survey will contribute to identifying challenges and opportunities that can be exploited to successfully implement sustainable energy projects and will refer to a number of important considerations for decision-makers and policymakers, useful when initiating and evaluating local sustainable energy activities.

A. Personal background

- name of the organisation
- the type of the organisation
- country and region
- PROSPECT+ role and PROSPECT participation
- gender
- experience in energy efficiency and energy related issues and
- experience in sustainable energy projects.

B. Thematic area and background of the organisation

- Size of the municipality
- Existence of SECAP or equivalent plan
- Implementation of sustainable energy projects in the municipality in the last 5 and the following 2 years
- Thematic area for which the questionnaire will be filled in

Online survey



User friendly online questionnaire with 4 main sections.

Pages

Start Personal background Thematic area and background of the organisation **Barriers in sustainable energy projects**

Drivers in sustainable energy projects Other

Barriers in sustainable energy projects

Please (i) indicate whether the following factors **exist** as barriers hindering the implementation of sustainable energy projects in your context and (ii) evaluate their **importance** concerning the degree to which they can affect the implementation of sustainable energy projects **based on your experience** (regardless whether this barrier appeared in your project or not).

To rate the importance of each barrier, please use the following rating:

- 1 = not at all important, it does not constrain the improvement of the project.
- 2 = less than quite important
- 3 = quite important, it delays or limits the improvement of the project
- 4 = more than quite important
- 5 = very important, it is critical in preventing the implementation of the project

Economic and financial barriers

* Lack of funding and access to funding sources [**existence**]

Yes No

* Lack of funding and access to funding sources [**importance**]

1 - not at all important
 2
 3
 4

Drivers in sustainable energy projects

Please (i) indicate whether the following factors **exist** as drivers facilitating the implementation of sustainable energy projects in your context and (ii) evaluate their **importance** concerning the degree to which they can affect the implementation of sustainable energy projects **based on your experience** (regardless whether this driver appeared in your project or not).

To rate the importance of each driver, please use the following rating:

- 1 = not at all important, it does not facilitate the improvement of the project.
- 2 = less than quite important
- 3 = quite important, it facilitates the improvement of the project to an extent
- 4 = more than quite important
- 5 = very important, it fosters the implementation of the project

Economic and financial drivers

* Availability of funding and easy access to funding sources [**existence**]

Yes No

* Availability of funding and easy access to funding sources [**importance**]

1 - not at all important
 2
 3
 4
 5 - very important

* Availability of (economic) incentives [**existence**]

Yes No

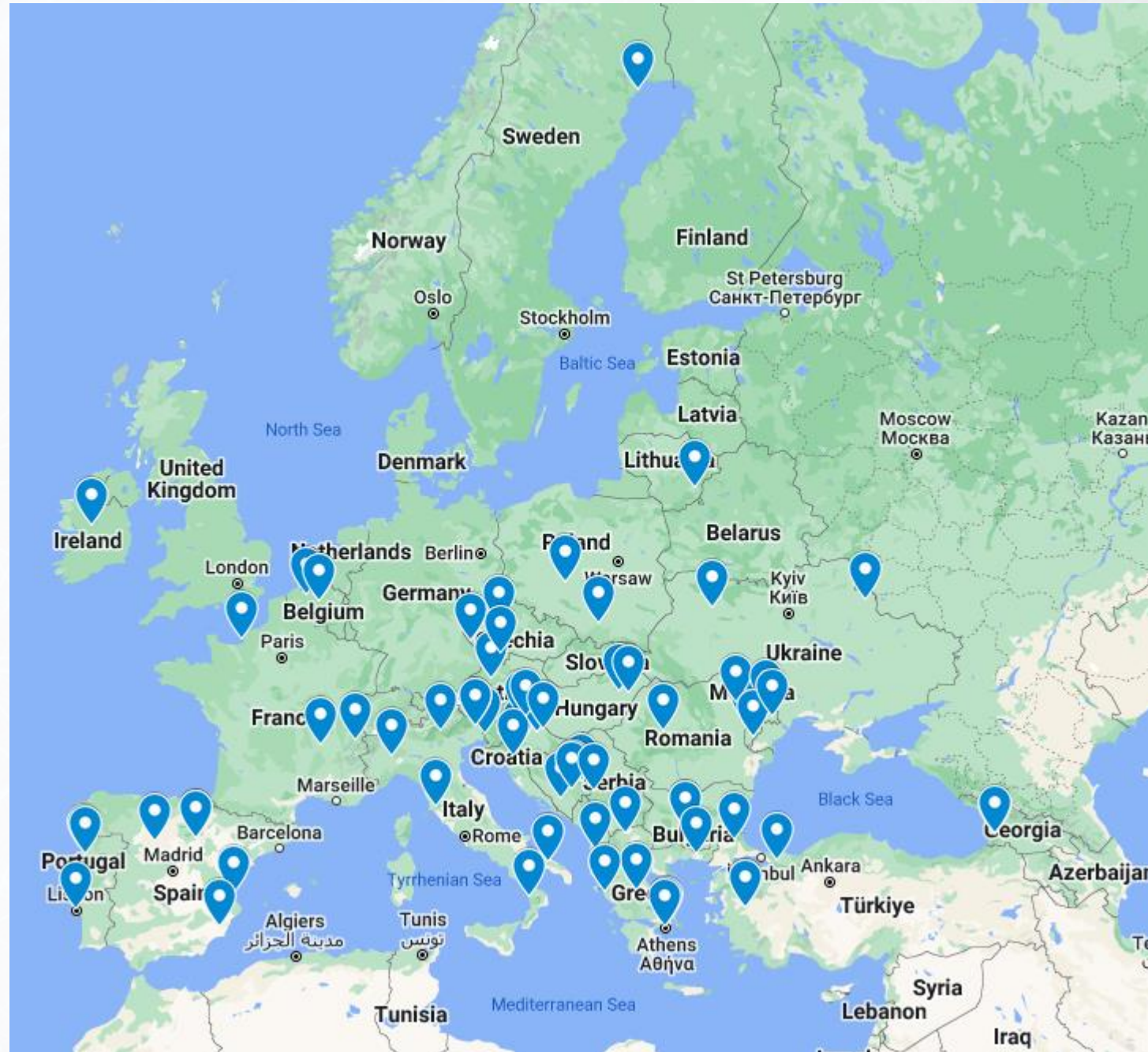
* Availability of (economic) incentives [**importance**]

1 - not at all important
 2

Respondents

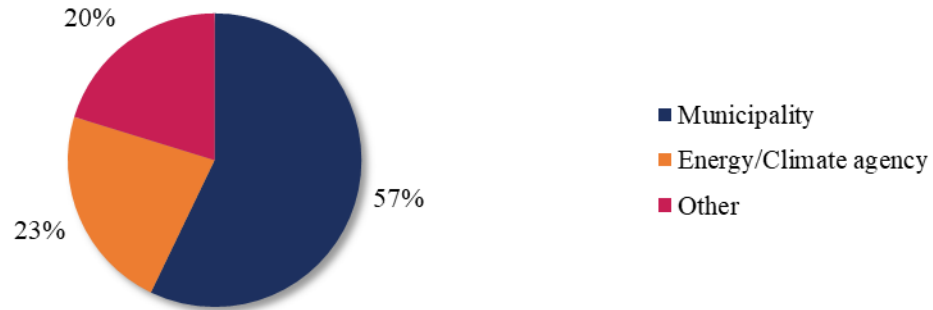


84 responses from all around Europe and beyond

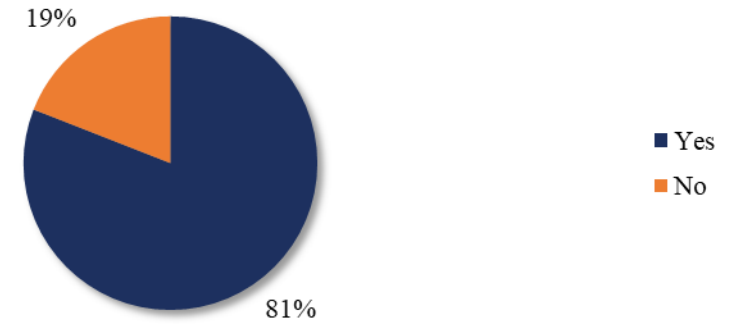


Respondents & Experience

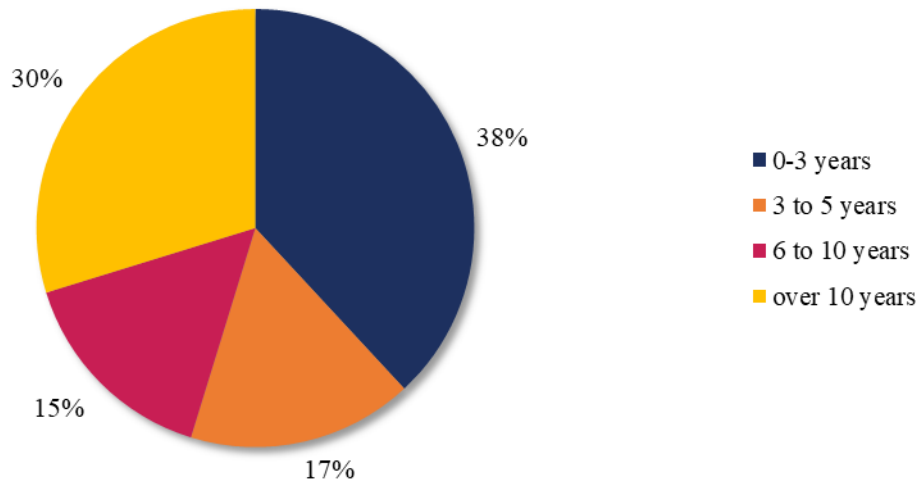
Type of organisation



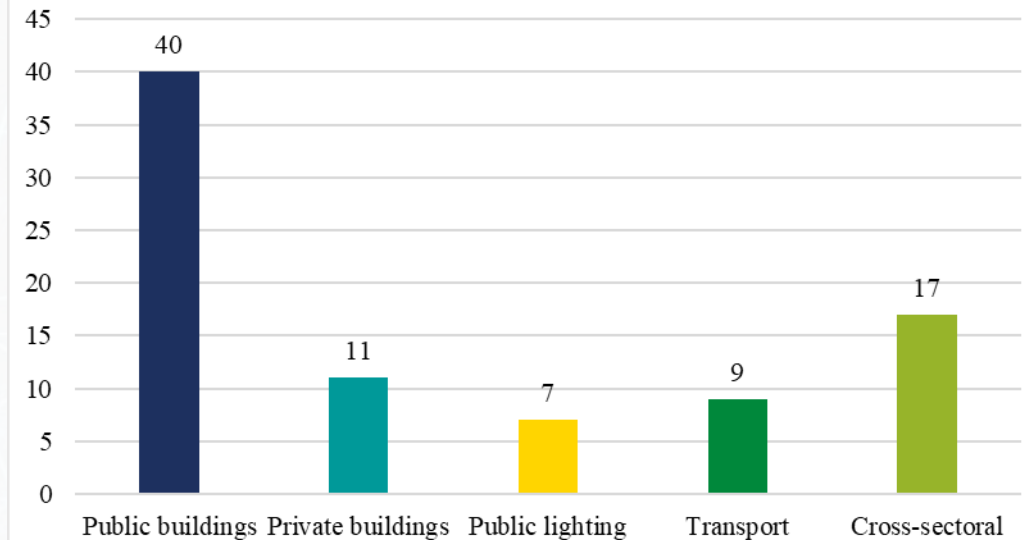
Experience working in sustainable energy projects



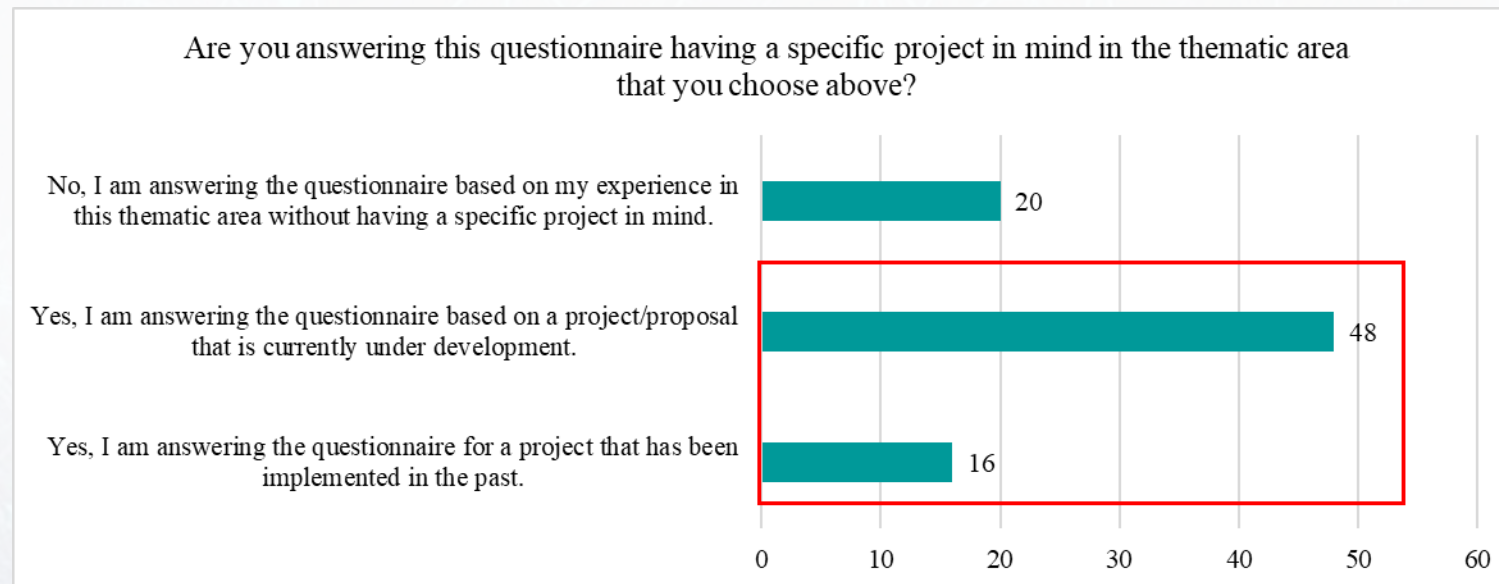
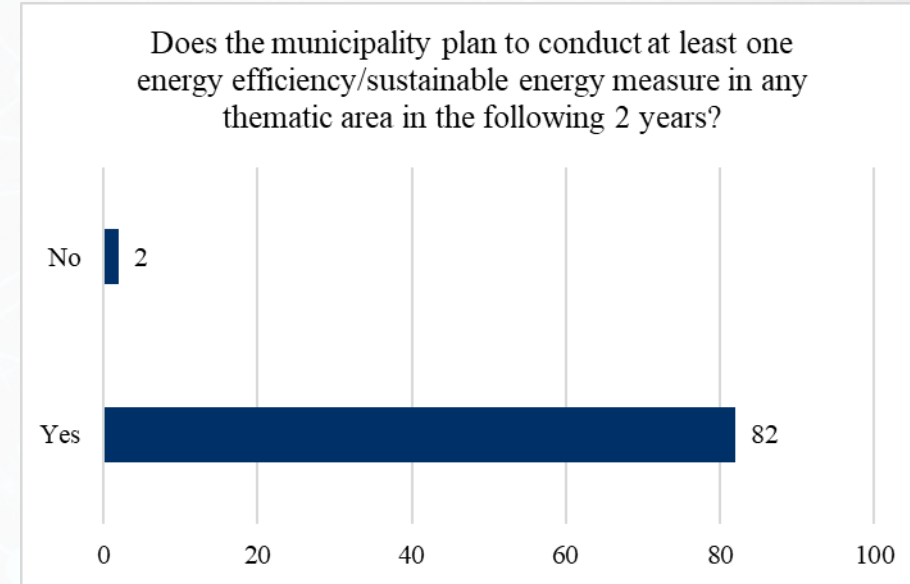
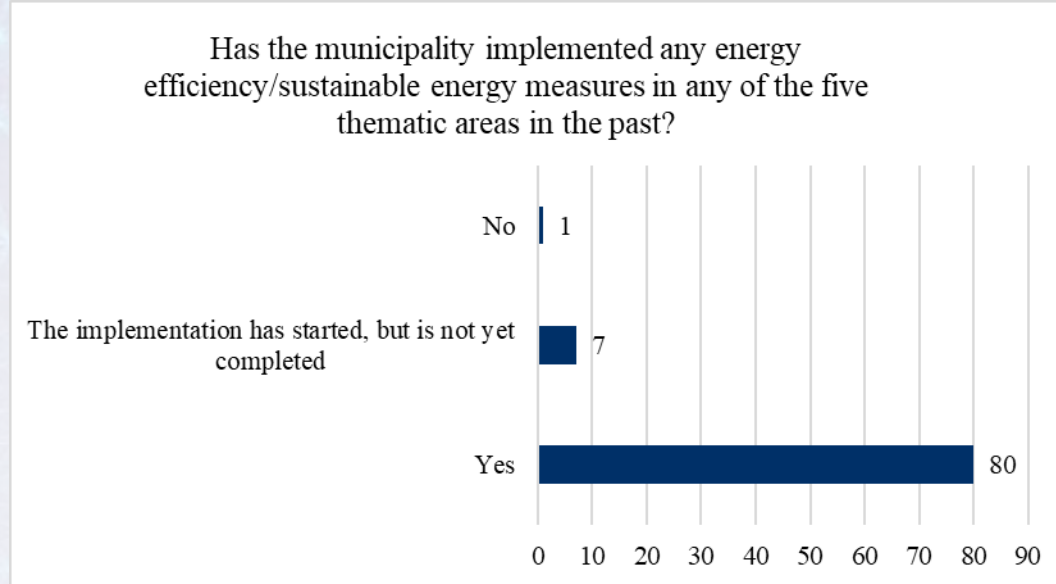
Working experience in energy efficiency and energy-related issues



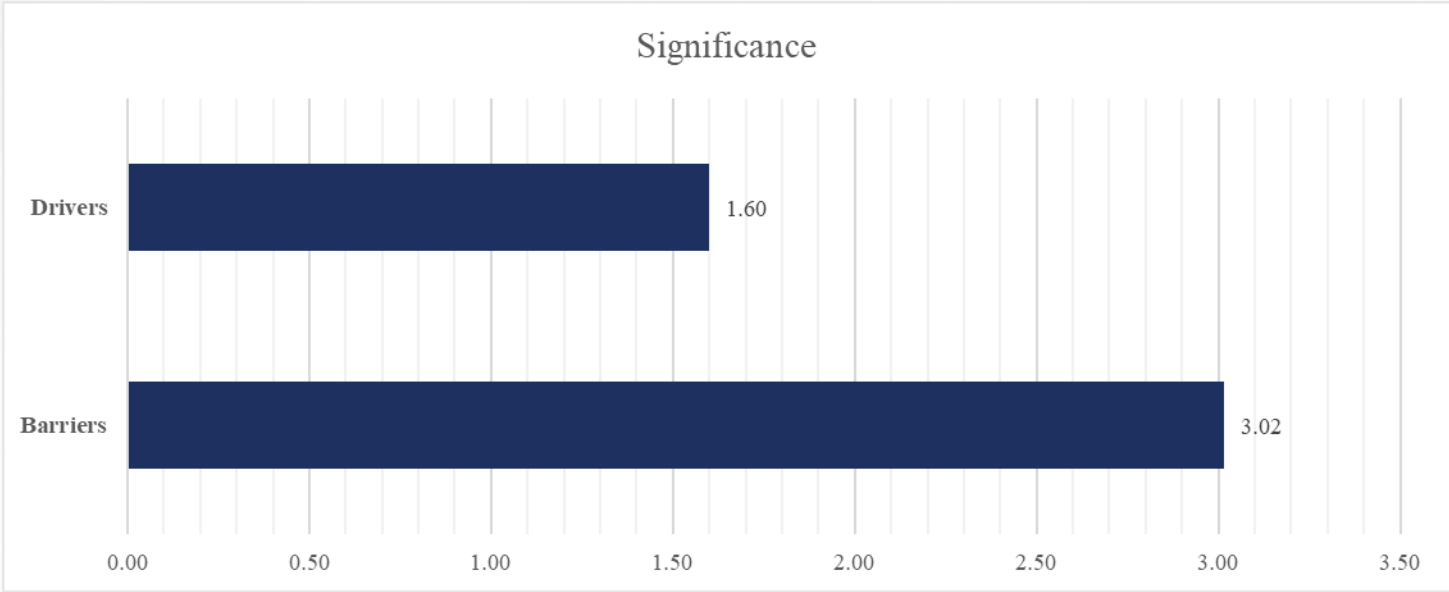
Responses per thematic area



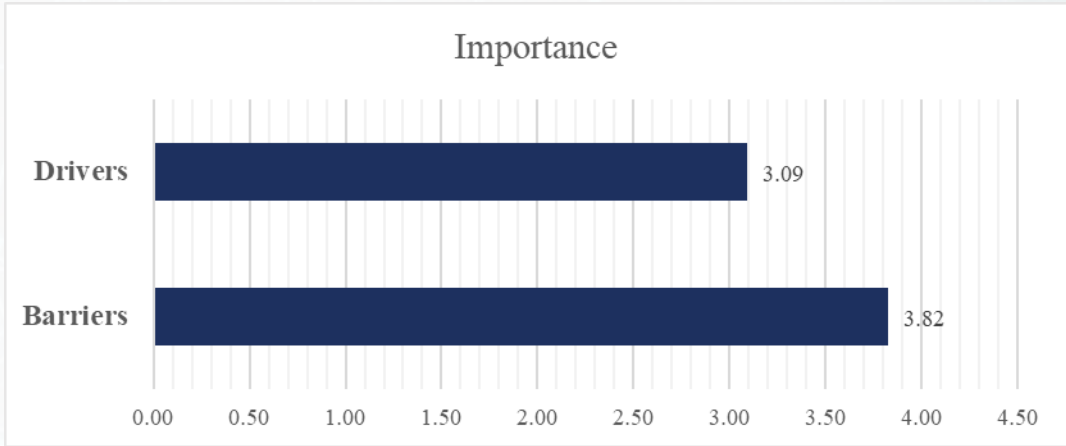
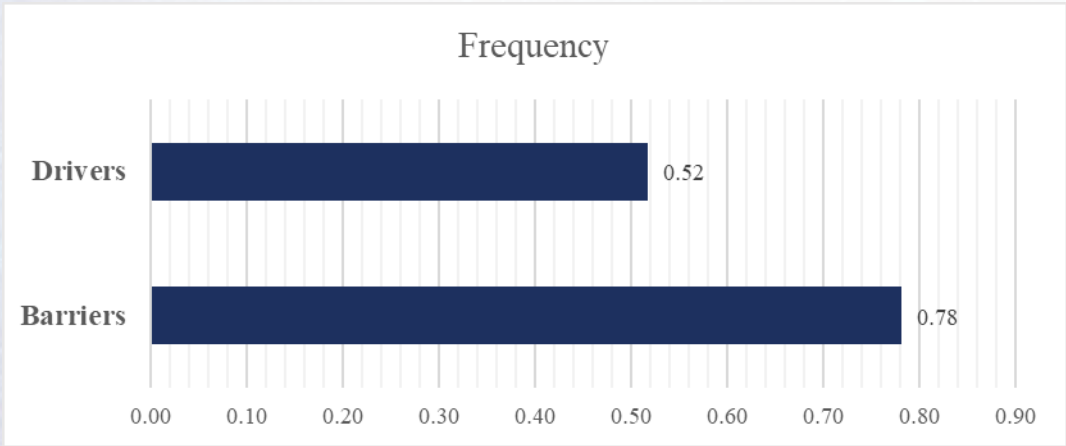
Respondents & Experience



Results

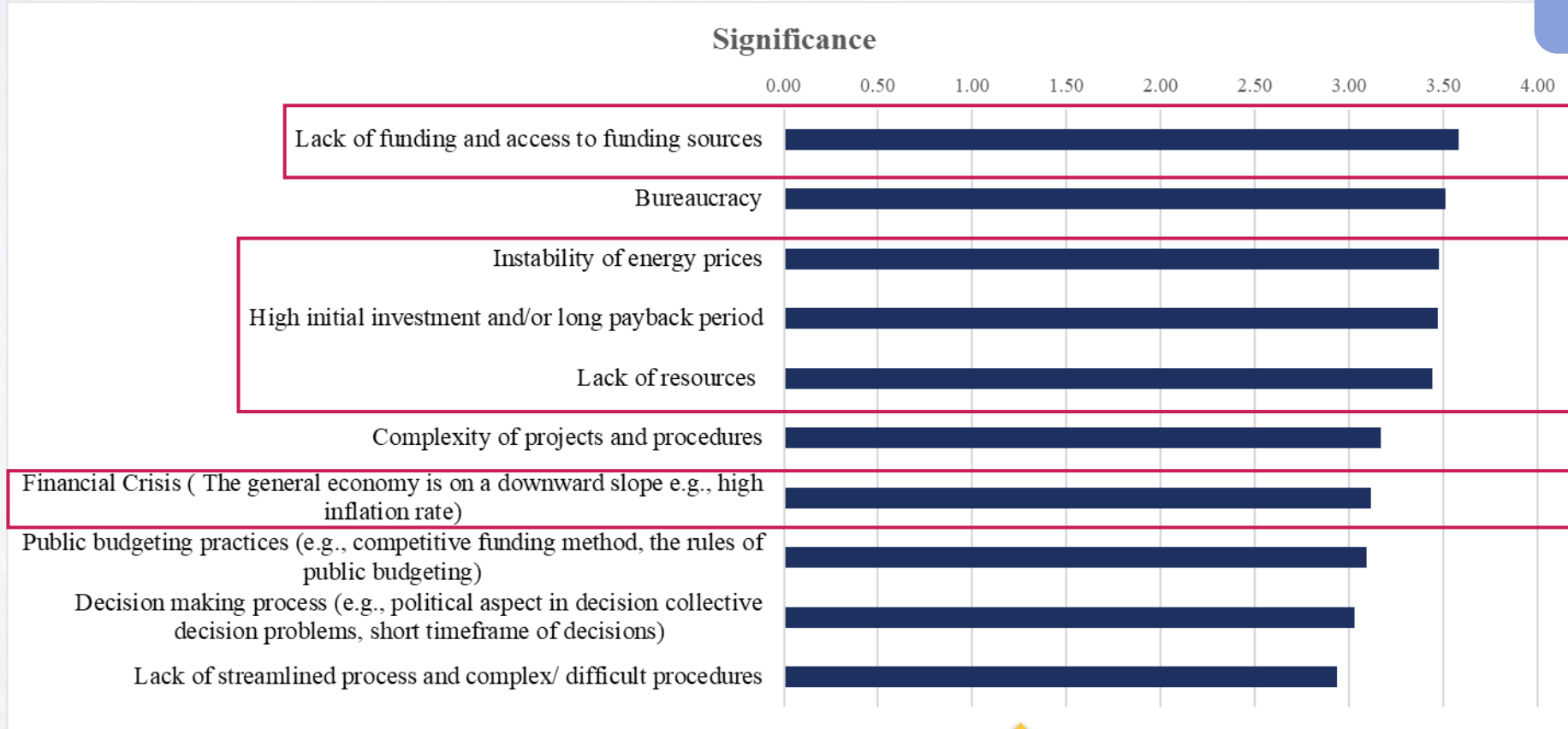


$$\text{Significance} = \text{Frequency} \times \text{Importance}$$



Results - Barriers

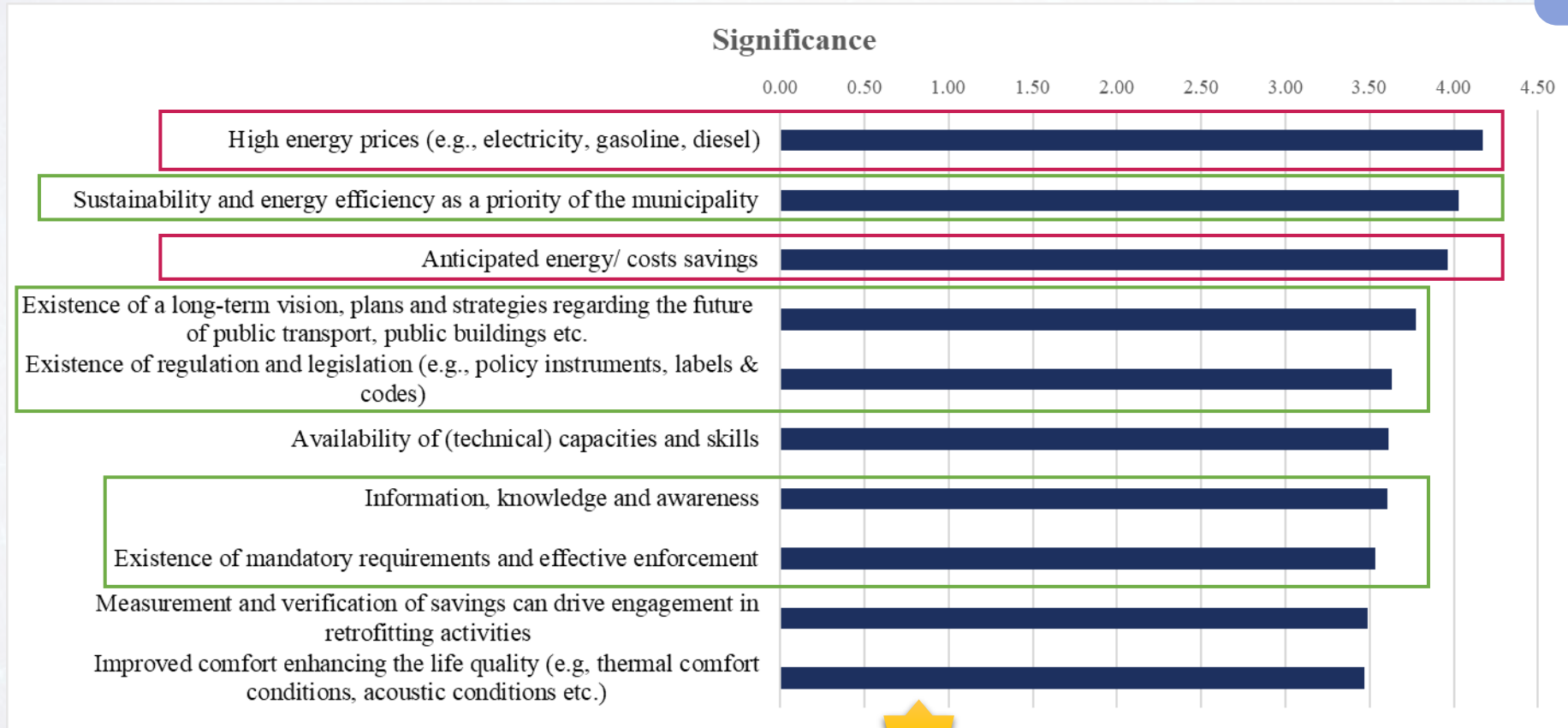
Top 10 barriers



5 out of 10 top barriers are economic and financial

Results - Drivers

Top 10 drivers



Policy and Regulation and Knowledge and Information factors are also significant drivers



economic and financial factors also an important driver

Beyond the literature (barriers)...

High prices for the project implementation than the ones projected in the technical documentation approved before the project implementation

Lack of common interest between technical department and financial department if they are not all convinced by the necessity of action

Unregulated relations and roles among different players in sustainable energy transition sector

Coordination between stakeholders (terms of time, understanding, priorities)

Beyond the literature (drivers)...

Existence of mentoring programs and project calls

Motivation of the public shareholders.

Fear from destructive influence of climate changes and increasing awareness on individual responsibility

Young and resourceful team that learns quickly.
Partnerships with various partners and experience

The project implementation group must include specialists in the field to which the project relates

Monitoring and energy management are crucial of the successful implementation

Early Conclusions

- **Lack of funding and access to funding sources, high initial investment and long payback period** and the **bureaucracy** linked with such activities are the most **significant barriers**.
- **High energy prices, anticipated energy and cost savings** and the municipality **prioritising sustainability and energy efficiency actions** are **crucial drivers** for implementation.
- **Social, cultural and behavioural** factors are not within the most significant barriers negatively affecting the implementation of municipal actions, but they have received **high ranking as drivers**.
- **Policy and Regulation** factors are also not within the most significant barriers but they have received **very high ranking as drivers**.

Next Steps



1

Disseminate the survey further to increase the sample.

2

Apply further analysis to assess differences per thematic area, country etc.

3

Draft policy recommendations based on the results

4

Share the results with the general public to raise awareness and motivate further research.

5

Publish an academic article.

Thank you!



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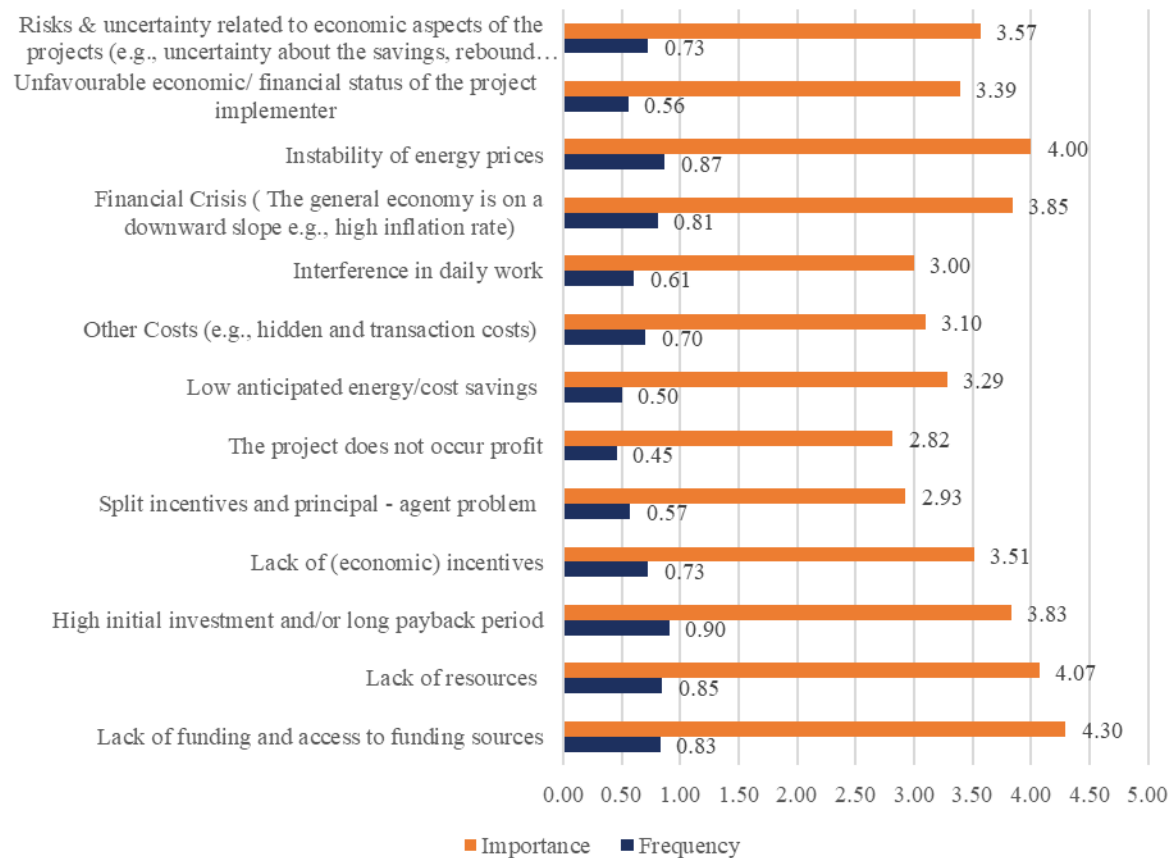


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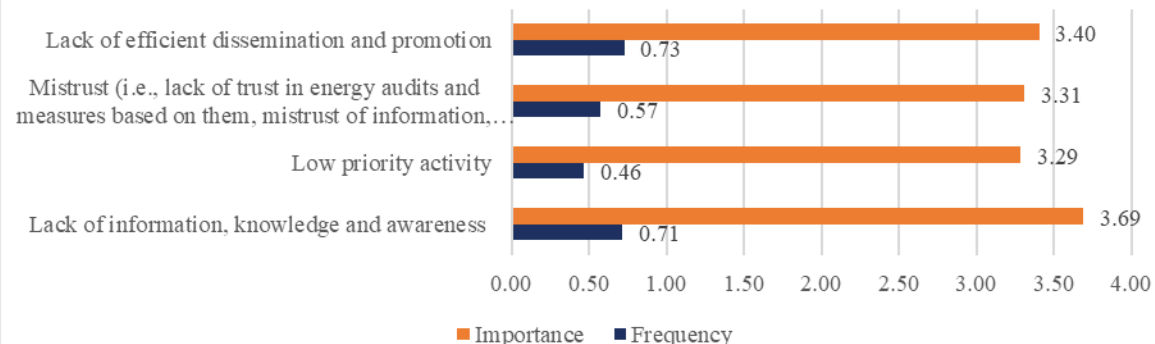
Annex

Barriers

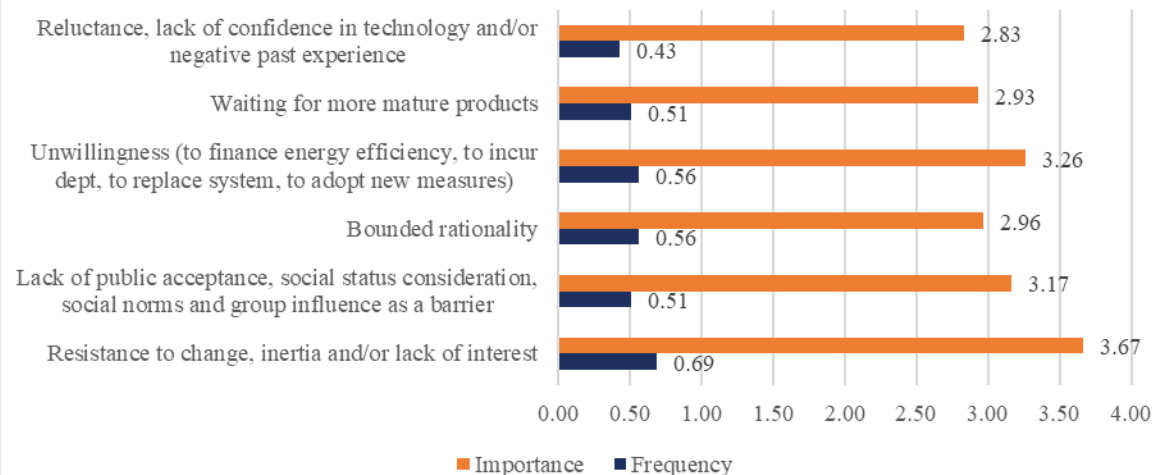
Economic and financial



Knowledge and Information



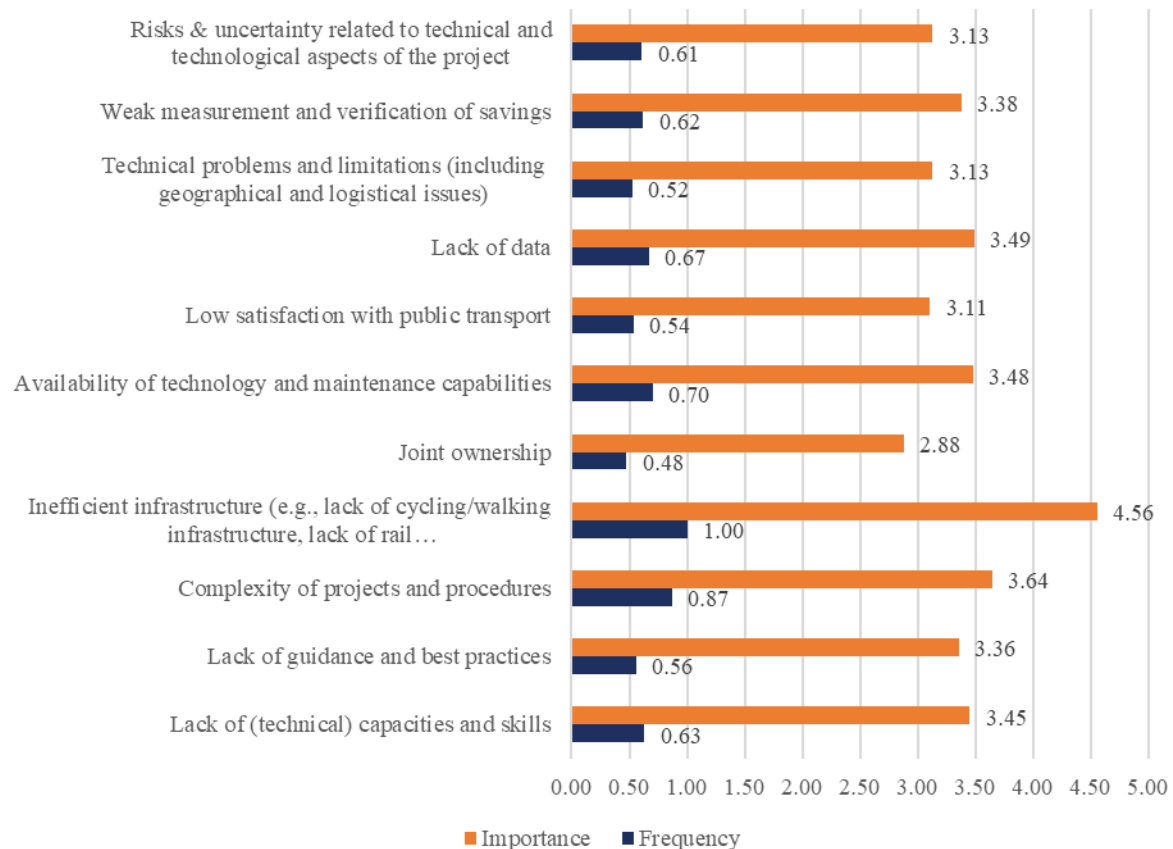
Social, cultural and behavioural



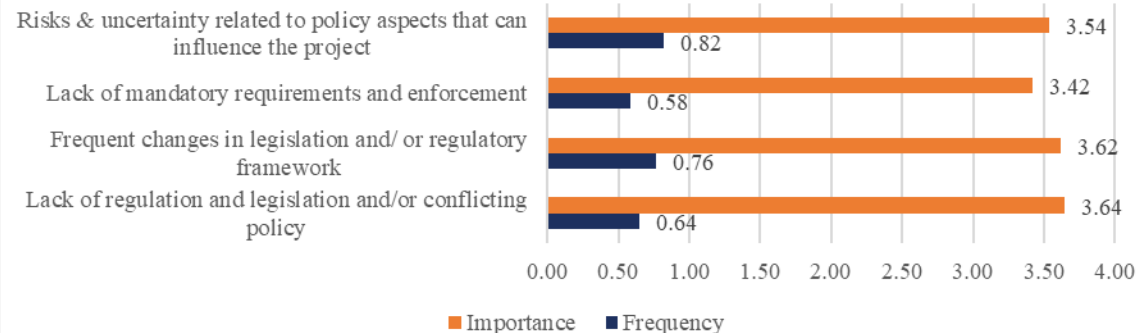
Annex

Barriers

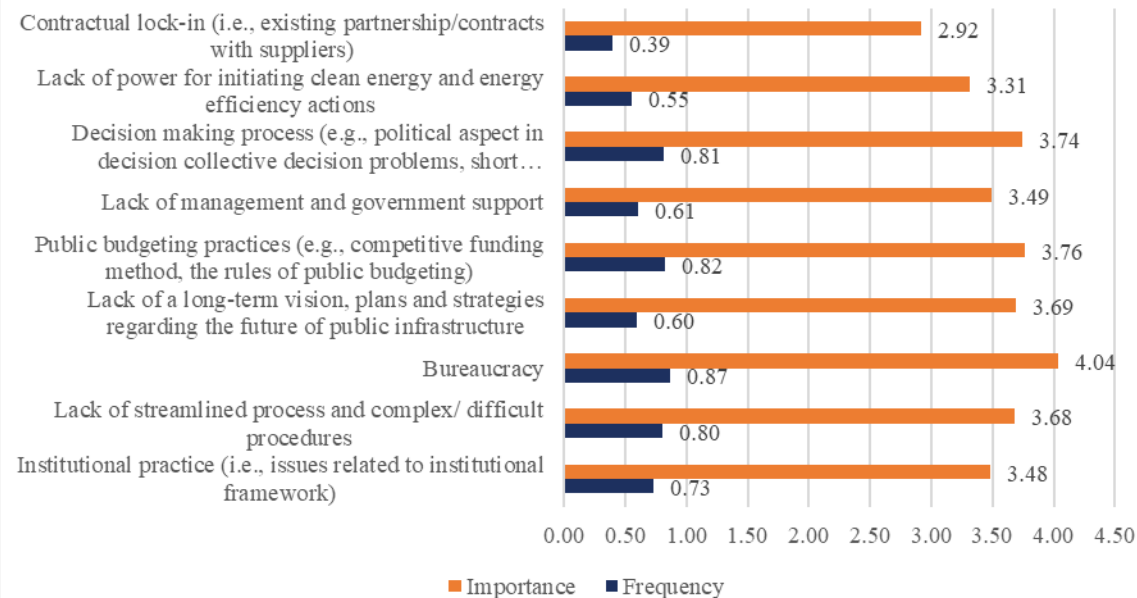
Technical and technological



Policy and regulatory



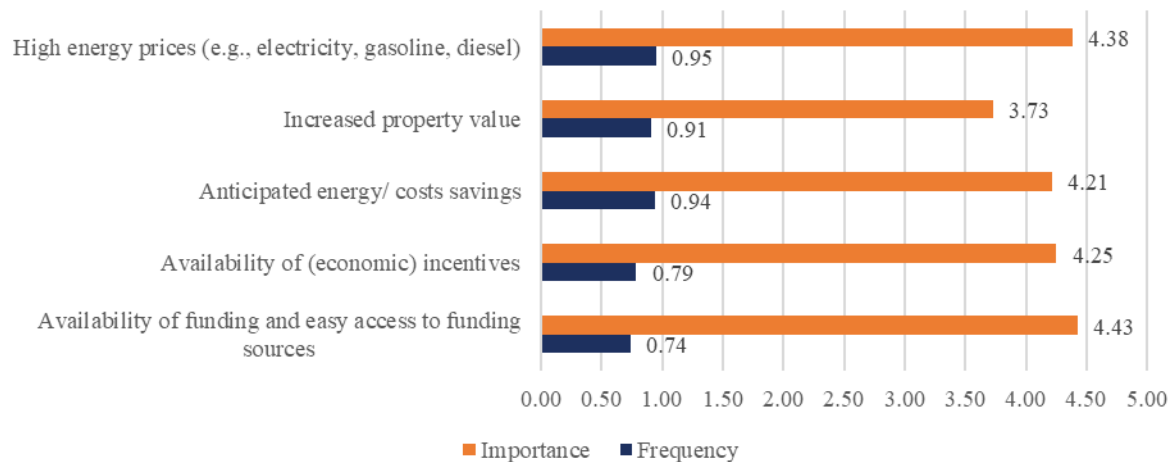
Institutional/ Organisational



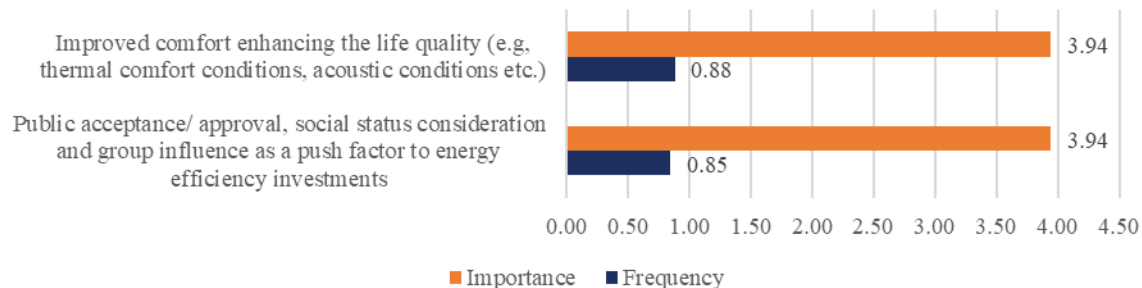
Annex

Drivers

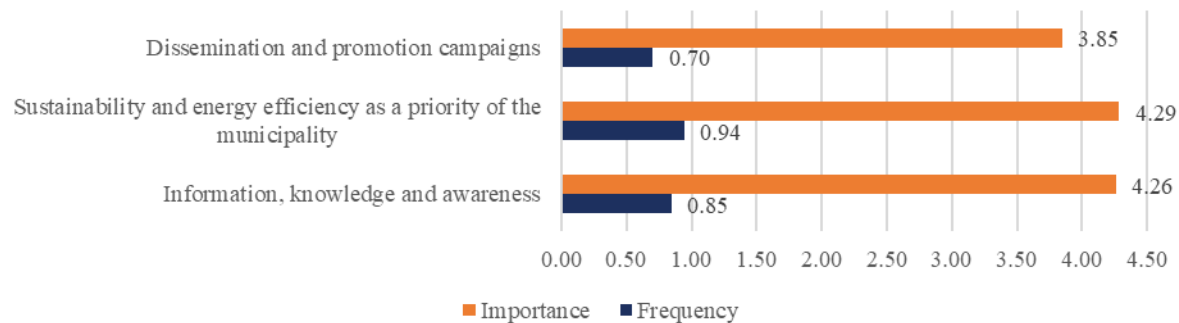
Economic and financial



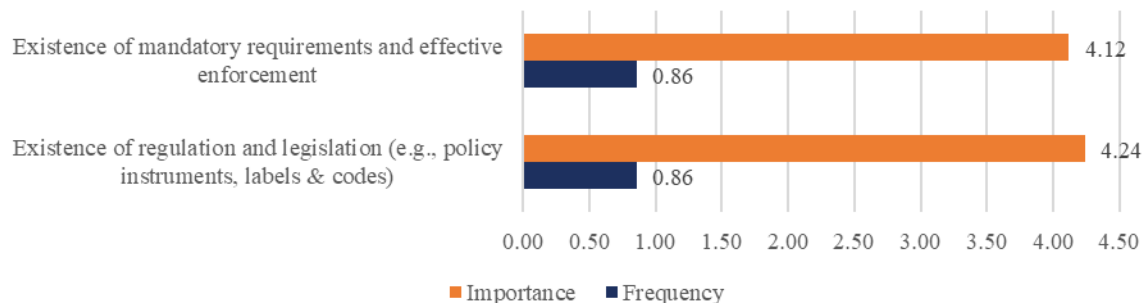
Social, cultural and behavioural



Knowledge and Information



Policy and regulatory



Annex

Drivers

