



Coordination and Support Action
H2020-LC-SC3-EE-2019

Energy savings needs under Article 3 and 7 of EED: Assessment of Member States consultation

Deliverable D4.1

Version N°2

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This project has received funding from the Horizon 2020 programme under grant agreement n°890147.



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Document Information

Grant agreement	890147
Project title	Streamlining Energy Savings Calculations
Project acronym	streamSAVE
Project coordinator	Nele Renders, VITO/EnergyVille
Project duration	1 st September 2020 – 31 st August 2023 (36 months)
Related work package	WP 4 - Capacity Support Facility: implementation of harmonize savings calculations in MS
Related task(s)	Task 4.1 - Identifying cases in partner MS for the capacity support facility
Lead organisation	ISR
Contributing partner(s)	AEA, CIRCE, CRES, VITO, ECI, SEVEN, IEECP, LEA, JSI, ADEME, LEA
Reviewer(s)	Matevž Pušnik (JSI)
Due date	31 April 2022
Submission date	30 May 2022
Dissemination level	Public report





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Abbreviations and acronyms

Acronym	Description
AT	Austria
BE	Belgium
BEMS&BACS	Building Energy Management systems and Building Automation and Control systems
BU	Bottom-Up
BG	Bulgaria
C&I Refrigeration	Commercial and Industrial refrigeration system
CZ	Czechia
CY	Cyprus
DE	Germany
DK	Denmark
EC	European Commission
EED	Energy Efficiency Directive
EE	Estonia
EEOS	Energy Efficiency Obligation schemes
EPBD	Energy Performance of Buildings Directive
EU	European Union
EVs	Electric Vehicles
EVs&Infrastructure	Electric vehicles (private&public) and related infrastructure (charging stations)
MS	Member States
M&V	Measurement and Verification
NECP	National Energy and Climate Plans
PA(s)	Priority Action(s)
RED	Renewable Energy Directive
RES	Renewable energy sources
STK1	Stakeholder group 1: The key stakeholder group of streamSAVE are Public Authority: Ministry/MS officials (Implementing Public Authorities, Managing Authorities, and Participated or Entrusted Third Parties with a prominent role in Article 3 and Article 7 of the EED), Energy Agency and Other Public Authority/Administration
STK2	Stakeholder group 2: Other stakeholders not directly involved with the implementation and monitoring, yet having some responsibility in relation to Article 3 and Article 7 under the EED (technology providers, university/research Institutions, technology expertise, energy auditors/consultants, regulatory bodies, energy distributors, retail energy sales companies, transport fuel distributors or transport fuel retailers, technical associations, industry associations, standardisation bodies, NGOs, others)
WP	Work Package





Summary

This report presents the MS' capacity building needs and priorities concerning energy savings calculations under Article 3 and Article 7 of the EED, evaluated at two different periods, the first round and second round, of the project duration. The needs assessment is based on stakeholders' consultation which was carried out through two online surveys. The first consultation, based on an online survey and interview, was running from October-November 2020; and the second consultation, based on an online survey only, was open from December 2021 to January 2022. Replies from the most relevant stakeholders concerning EED implementation were collected. In the first round, 112 stakeholders replied from 25 EU countries and the UK. In addition, interviews were carried out in 12 partner countries, with their implementing authorities. In the second round, a total of 54 replies were collected, from 15 EU countries.

Starting from the first consultation (online survey and personal interviews carried out during October and November 2020) of EU27 public authorities (incl. the UK), technical experts and market actors, the report describes the Priority Actions or technical savings actions for which the streamSAVE's stakeholders consider project support highly relevant. Next to the Priority Actions, concrete cases for MS support are identified, as well as the extent of interest in streamlining bottom-up energy-saving calculation methodologies. Moreover, the consultation resulted in a better understanding of stakeholders' interest and willingness to collaborate in the dialogue groups and knowledge sharing activities that will take place along the project duration. The second round survey, however, aims to identify five new Priority Actions and give insights on how the stakeholders evaluate the activities carried out so far.

The National Energy & Climate Plans submitted to the European Commission by Member States for the period 2021-2030, reflect MSs additional efforts to increase the ambition to achieve 2030 target contributions and to align national ambition with the EU goals. The streamSAVE consultation shows MSs are well aware of their main needs in relation to complying with EU targets and are committed to improving their performance. Concerning Articles 3 and 7 of the EED, in particular, the main methodological challenges identified during the consultation were additionality, baseline definition, prevention of double counting of savings and assessment of behavioural aspects (spill-over & rebound effects, free riders).

As the sample includes implementing authorities from 21 different countries (representing 75% of the European MS and UK), the results of these consultations can give a reliable picture of the situation and of the main needs within Member States. It can be learned from the analysis of the stakeholder' responses, that savings estimations in relation to the following 10 Priority Actions, during the two rounds of this project, are considered as main challenges by the implementing authorities of energy efficiency policies, regardless of countries' experiences: Heat recovery; Building Automation and Control Systems (BACS); Commercial and Industrial Refrigeration System; Electric Vehicles; Lighting Systems and road lighting; Small-scale renewable central heating; Actions to alleviate energy poverty; Accelerated replacement of inefficient electric motors; Behavioral changes resulting from feedback about energy use or tailored advice toward households; and Modal shift for freight transport.



Main challenges for the first round of Priority Actions.

Heat recovery, such as district heating and excess heat from industry: taking into account the complexity and variety of heat recovery technologies, the standardization of methodologies to evaluate energy savings fostered by excess heat from industry, especially in cases where excess heat is integrated into district heating, is a major challenge for stakeholders.

Building Automation and Control Systems (BACS): although these technologies support data collection, these do not foster savings themselves, but induce savings through complementary actions or measures identified by such systems. Therefore, properly estimating energy savings is considered challenging, among which the specification of indicative values to use deemed savings methods.

Electric vehicles (private & public) and related infrastructure (charging stations): the identified priorities consist of determining indicative reference values for the promotion of different types of private and public e-vehicles to implement a deemed saving method (typical unit consumption and energy-saving factor), as well as the development of the calculation methodology to estimate energy savings from private and public charging infrastructure.

Main challenges for the second round of Priority Actions

Supporting low-income households and improving thermal comfort seems to be a major concern among stakeholders. In addition to the requirements imposed by the EED recast, measures to alleviate energy poverty were the hottest topic because of the high impact of the increasing energy prices on the most vulnerable households. The definition of energy poverty was also an issue of concern and the establishment of a common methodology to evaluate energy savings is much appreciated.

In face of high energy bills and considering the urgent need for building and systems renovations, stakeholders are very concerned with efficiency of space and water heating. Audits being carried out in buildings usually identify high potential energy savings from the replacement of existing heating systems with more efficient ones. However, there have not been real incentives to overcome existing hurdles. Measures addressing small-scale RES central space heating (incl. hot water) tackle the reduction of final and primary energy use, as well as the buildings' decarbonization at the same time, decreasing the fossil fuel dependency.

Stakeholders are very interested to understand possible means to design and evaluate behavioural change programmes. There is a general recognition that stimulating households to save energy with behavioural change is a good opportunity for yielding energy savings as many households have no idea of the impact of their own consumption. However, evaluating the effect of behavioural change interventions on energy consumption is seen as a major challenge.

Having this understanding of stakeholders' needs will ensure that streamSAVE's capacity support is tailored to each country's specific challenges.





Keywords

Streamlining energy savings calculations, Article 7, EED, Additionality, Baseline, Double counting, Needs assessment, Stakeholders consultation, Bottom-up calculation methodologies, Capacity support facility cases, peer-to peer dialogues, knowledge sharing,



Introduction

About streamSAVE

Energy efficiency is one of the five key dimensions of the Energy Union, and consequently of the Member States' National Energy and Climate Plans. The Energy Efficiency Directive sets the 2020 and 2030 energy efficiency targets and a series of measures that contributes to their achievement within the Union. The streamSAVE project streamlines energy savings calculations and provides the support needed to increase Member States' chances of successfully and consistently meeting their energy efficiency targets. The streamSAVE project specifically focuses on Article 3 and 7 of the EED which are devoted to energy efficiency targets and national energy savings obligations, respectively.

Given the importance of deemed savings approaches in Member States' EED reporting streamSAVE focuses on streamlining bottom-up calculations methodologies of standardized technical actions. streamSAVE offers these savings methodologies in a transparent and streamlined way, not only to improve the comparability of savings and related costs between Member States (MS), but also between both EED articles. The savings actions are targeted to those measures with high energy saving potential and considered as priority issues by Member States, the so-called *Priority Actions*.

More broadly, the project aims at fostering transnational knowledge and dialogue between public authorities, technology experts, and market actors. The key stakeholders will improve their energy savings calculation skills and ensure thus the sustainability and replicability of the streamSAVE results towards all European Member States.

Importance of understanding the streamSAVE's stakeholders' needs

streamSAVE organizes multiple activities to engage and support stakeholders on savings calculations both at the European, for a broader audience, and at national level, such as dialogues focusing on the Priority Actions, and in-country meetings and seminars in frame of the Capacity Support Facility. To support the design of these activities, online survey results, as well as the feedback and lessons learnt that have been collected through the several activities carried out so far, are considered to better understand the stakeholders' needs. Addressing stakeholders' needs and their actual priorities is the key driver of the streamSAVE project activities.

Due to the unusual, unpredicted and critical times we are living in, a brief overview of the overall context where this project is running is shortly introduced as the ongoing situation in Europe is having an impact in the energy policy design.

The energy and climate **agenda of the EU, the European Green Deal**, aiming to reduce emissions by 55% by 2030 and reach climate neutrality by 2050, is by far the most ambitious policy framework ever established in Europe to accelerate the clean energy transition (European Commission, 2019). While putting sustainability and fairness at the center, through the involvement and empowerment of the citizens, this instrument will change deeply the way the economy and the society work. Energy efficiency is one of the five key dimensions of the Energy Union, and consequently of the Member States' National Energy and Climate Plans.

The EED sets the 2020 and 2030 energy efficiency targets and a series of measures that contributes to their achievement within the Union. For the past period, the national





indicative targets reported by the Member States in terms of final energy consumption still do not add up to the EU targets, adding up to a total of 1.085 Mtoe, i.e. 1 Mtoe below the target set for the EU. For primary energy consumption, they add up to 1.533 Mtoe, i.e. 50 Mtoe above the target set for the EU (European Commission, 2020). According to this assessment, 12 Member States (MS)¹ managed to reduce or keep the final energy consumption level below their hypothetical linear trajectory for reaching their indicative energy efficiency targets by 2020. For primary energy consumption, 15 MS² were below their hypothetical linear trajectories in 2018 and meet the cumulative obligation to achieve final energy savings.

The task force that has been set up, to mobilise efforts to reach the EU energy efficiency targets, focused on the need to share good practices to deliver further savings. However, MSs have not introduced many new measures recently and have been more focused on preparing the NECP for 2030. With the revision of EED ahead, MS pointed out that there was no incentive to invest in technical measures and waited for the new reporting period to include new measures under Article 7 of the EED (European Commission, 2020). Nevertheless, the recast of the EED is the opportunity to put in place a robust enabling regulatory framework to speed the delivery of energy savings and unlock their multiple benefits.

The Sixth Energy Union Report (State of the Energy Union 2021 – Contributing to the European Green Deal and the Union's recovery) highlights, among other key conclusions, that energy prices have after the fall, started again growing rapidly, the number of the energy poor has risen to 31 million in the EU, investment in research and development has not increased, and the estimated € 177 billion in investment is needed to ensure a fair energy transition. The Commission's terminology and arguments show that it is important to develop energy efficiency scenarios that take into consideration overall development. This coincides with the definition of UNEP's green transition from 2011. The IEA's recommendations (IEA, 2020; IEA, 2021) regarding the current situation with COVID-19 and energy efficiency include prioritization of energy efficiency cross cutting projects with multiple benefits and raising the global energy efficiency ambition. As the Green Deal communication emphasizes, careful attention should be paid when there are potential trade-offs between economic, environmental and social objectives.

The text of the new EED is changed³ in a way that the energy efficiency improvements not only ought but should “help exploit the multiple benefits of energy efficiency for the Union, in particular for citizens and businesses. Implementing energy efficiency improvement measures should also be a priority in alleviating energy poverty. The recast of the Energy Efficiency Directive (EED) is the opportunity to put in place a robust enabling regulatory framework to speed the delivery of energy savings and unlock their multiple benefits by giving predictability to investors and addressing the non-market barriers to energy efficiency. According to a recent position paper from the Coalition of Energy Savings (Coalition Energy Savings, 2022), the Commission's proposal to recast the EED is a solid basis to speed up the uptake of energy savings in Europe, but it could go further to achieve its climate neutrality objective, as more is technically achievable, economically possible, and desirable for the whole European society.

¹ Czechia, Greece, Spain, Croatia, Italy, Cyprus, Latvia, the Netherlands, Portugal, Romania, Slovenia, Finland

² Czechia, Estonia, Greece, Croatia, Italy, Latvia, Lithuania, Luxemburg, Malta, Portugal, Romania, Slovakia, Slovenia, Finland, the United Kingdom

³ COM(2021) 558 final, Proposal for a Directive of the European Parliament and of the Council on Energy Efficiency (Recast), European Commission, 17.07.2021



If the raising prices of gas during the winter of 2021 due to COVID lock downs had put a much stronger emphasis on Energy Efficiency, the war in Ukraine changed the context and is the turning point to the energy agenda in Europe, demanding international concertation towards a future capable of better dealing with and preventing climate change through decarbonization of the economy. In response to the war in Ukraine, the European Commission has urged to publish (18th of May) the REPowerEU plan, with the objective of phasing out fossil fuel imports from Russia well before 2030. On energy savings, the plan recalls the importance of achieving both immediate savings and putting in place mid to long-term energy efficiency measures to ensure a structural reduction of energy demand, giving policy makers a crucial sign towards improving energy efficiency (European Commission, 2022).

In this context, the **streamSAVE project** gains some momentum to increase its impact by fostering transnational knowledge and dialogue between public authorities, technology experts, and market actors, and bringing together key stakeholders from different areas for the discussions. The savings actions of streamSAVE are targeted to those measures with high energy saving potential and considered as priority issues by Member States, the so-called **Priority Actions**. Two rounds of Priority Actions (PA) are running during streamSAVE: the first round (September 2020 – February 2022) covered five actions, namely: Heat recovery; Building Automation and Control Systems (BACS); Commercial and Industrial Refrigeration Systems; Electric Vehicles; and Road Lighting Systems. From March 2022 onwards, the second round will analyze a new set of actions, namely: Small-scale RES central space heating (incl. hot water); Measures alleviating (also) Energy Poverty; Anticipated motor replacement; Providing feedback about energy use and tailored advice toward households: behavioural changes; and Modal shift for freight transport.

Given that streamSAVE project follows a demand driven concept to assist MS in their needs, the MSs' capacity building needs and priorities concerning energy savings calculations under Article 3 and Article 7 of the EED were collected and analysed in two different phases (first round of Priority Actions carried out in the first half of the project, and second round of Priority Actions carried out in the second half of the project), allowing the consortium to develop Bottom-Up (BU) methodologies that better respond to the actual needs of National Implementing Authorities regarding their EE obligations. Hereto, **two stakeholder consultations** were organized (October 2020; December 2021), of which the results are described in this report.

During the first round the stakeholder consultation aimed to validate the PAs and understand the willingness of stakeholders to participate and enrol in the streamSAVE activities. The second round survey, however, aimed to identify the new PAs and give insights into how the stakeholders evaluate the activities carried out in the first round. Therefore, in this report, only the results that are relevant for the Capacity Support Facility are being included as the overall survey analysis is included in Deliverable D4.7 'Monitoring and evaluation of streamSAVE outcomes'.





Chapter 1 Description of the process

streamSAVE targets measures or actions with high energy saving potential, considered as priority issues by the Member States. Therefore, the project focuses on the development of methodologies for energy saving actions that are either not covered by existing catalogues on bottom-up methodologies or are not being applied due to several reasons, for example, the complexity of calculations, lack of indicative values, the robustness of data, etc. The project is designed to be implemented in two main stages, a first round and a second round of Priority Actions, each addressing specific technologies that reflect MS needs.

streamSAVE organises several activities to involve the main target audience of the project, the Partner Countries Implementing Authorities, to address stakeholders' needs and priorities on the implementation of Article 3 and Article 7 of the Energy Efficiency Directive. The needs assessment is based on stakeholders' consultation which was carried out through two online surveys during different time periods of the project. The first consultation, based on an online survey and interview, was running from 19/10/2020 to 30/11/2020; and the second consultation, based on an online survey only, was open from 01/12/2021 to 30/01/2022. Both surveys were launched by ECI (European Copper Institute) and distributed by all partners.

First stakeholder consultation October-November 2020

The results from the first stakeholder consultation are used to **validate the key Priority Actions** which were already identified in another previous survey (Renders, 2019), to determine the major challenges regarding the implementation and monitoring of EED, and to identify concrete cases where partner MS need support which is provided in the streamSAVE Capacity Support Facility. Moreover, the survey also helped to understand stakeholders' interest and willingness to collaborate in the various activities, namely the dialogue groups and knowledge sharing activities, which take place throughout the project duration. The streamSAVE consultation collected replies from the most relevant stakeholders concerning EED implementation. In the first round, a total of 112 replies were collected, from 25 EU countries and the UK. In addition, interviews were carried out in 12 partner countries, with their implementing authorities. The data collected through the surveys is kept strictly confidential and is stored in accordance with the data protection policy associated with the project, as submitted to the EU commission.

The **Capacity Support Facility** was organized into 10 working groups, one per partner country, and focused on technical issues of the Priority Actions providing the capability to each country to apply the savings methodologies for concrete policies or measures (Task 4.2), as well as to test Training module of the streamSAVE platform (Task 4.3) for that Priority Action. It is about going beyond the theoretical BU methodologies to facilitate their application during and after the time horizon of the streamSAVE project taking into consideration national peculiarities, such as the limited availability of the required data, the promotion of specific technologies within the framework of a measure, the difficulty to quantify the behavioural change of the end-users, etc.

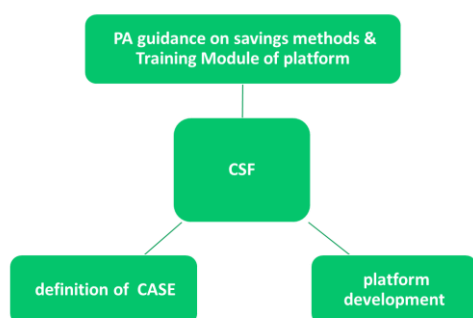


Figure 1: Relation of the CSF with other streamSAVE activities

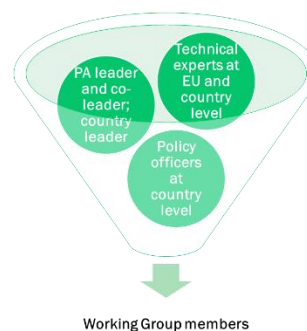


Figure 2: Members' composition of the working groups

Each PA working group gathers technical and country experts from streamSAVE project, as well as the implementing authorities (and/or technical experts) from the partner countries involved. The involvement of the policy officers in the WG is essential in facilitating the actual implementation of the various activities in the national context and to address specific or ad-hoc issues.

Second stakeholder consultation December 2021 – January 2022

The second round of Priority Actions was identified, based on another online survey running halfway through the project, taking into account the lessons already collected, as well as the identified needs of the stakeholders involved in the first round of activities. In the second round, a total of 54 replies were collected, from 15 EU countries. As a result, the streamSAVE project identified a second set of 5 Priority Actions, which are subject to an in-depth analysis and capacity building during the second part of this project, namely:

1. Small-scale renewable central heating (incl. hot water)
2. Energy efficiency actions to alleviate Energy Poverty
3. Accelerated replacement of inefficient electric motors
4. Behavioural changes resulting from feedback about energy use or tailored advice towards households
5. Modal shift for freight transport

Stakeholders involved during the consultation

The streamSAVE consultation collected replies from the most relevant stakeholders concerning EED implementation. In the first round, a total of 112 replies were collected, from 25 EU countries and the UK. In addition, interviews were carried out in 12 partner countries, with their implementing authorities. In the second round, a total of 54 replies were collected, from 15 EU countries.

Regarding the responsibilities of the stakeholders in relation to Art. 3 and Art. 7 under the EED, it was possible to collect replies from:

- **72 implementing public authorities** (38 in the first round; plus 34 in the second round), from 21 different countries, from which 34 entities have the responsibility for the design, implementation, monitoring & verification and/or evaluation of policy measures under Article 7 of the EED; and from which, 23 are responsible for the identification and monitoring of the progress of 2020/2030 energy efficiency targets under Article 3 of the EED.





- **74 other organizations linked to EED** (54 in the first round; plus 20 in the second round) who provide technical support to public authorities and to industrial sectors in terms of energy efficiency and EEOs (e.g. developing calculation methods) and others, particularly research/technology experts.

As the sample includes implementing authorities from 21 different countries (representing 75% of the European MS and UK), the results of this consultation can give a reliable picture of the situation and of the main needs in the MS, which are the basis for supporting the policymaking process. This consultation brings interesting insights regarding EED main challenges for MS in relation to the 10 PAs under analysis in the two rounds of this project, namely:

- Heat recovery: district heating and excess heat from industry
- Building Automation and Control Systems (BACS)
- Commercial and Industrial Refrigeration System (C&I Refrigeration)
- Electric Vehicles (private& public)
- Lighting Systems and road lighting
- Small-scale renewable central heating (incl. hot water), such as heat pumps, solar thermal and biomass boilers in (non-)residential buildings
- Energy efficiency actions to alleviate energy poverty
- Accelerated replacement of inefficient electric motors in industry and tertiary sector
- Behavioural changes resulting from feedback about energy use or tailored advice toward households
- Modal shift for freight transport: from road to rail.



Chapter 2 Stakeholders consultation methodology

According to the literature, a “needs assessment” is a systematic set of procedures that are used to determine needs, examine their nature and causes, and set priorities for future action. Apart from previous projects and streamSAVE’s proposal survey (Renders et al., 2019-), to understand the priority needs of public authorities in relation to the delivery of the Energy Efficiency Directive, streamSAVE envisaged two different means of collecting information among different stakeholders: an online survey and personal interviews. The online survey addresses all EU Countries+UK, but the personal interviews only address the 10 partner countries.

2.1 Framework to conduct the needs assessment

There are many possible ways of conducting a needs assessment, and the type of needs assessment undertaken has to be appropriate to its objective and scope. For example, a large-scale policy revision or strategy may require an extensive and well-resourced needs assessment, while the planning of a single programme may require only a rapid needs assessment completed with minimal resources that yet will deliver significant information. In streamSAVE, the needs assessment was conducted to understand MS needs on future activities regarding energy policy implementation, particularly Article 7 and Article 3 of EED, in two different phases, and therefore a rapid needs assessment was conducted based on an online survey in two rounds, complemented with an interview to the key stakeholders who are responsible for implementing the targeted energy policy. streamSAVE tried to adapt the step-by-step process presented in Figure 3, which is based on a synthesis of research and practice literature to undertake a systematic needs assessment.



Figure 3: Steps of a needs assessment [adapted from: Altschuld and White (2010) and Rabinowitz (2017)]





The main aim of the streamSAVE consultation was **to assess the needs regarding the Priority Actions and identification of cases** within the partner countries, in two different phases of the project.

Apart from previous projects and the proposal survey, two different means of collecting information from stakeholders are envisaged: an **online survey** among all stakeholders in all countries; and **personal interviews** in the partner countries (telephone or a personal meeting supported by online survey & interview questions) among Public Authorities/Ministries, Energy Agencies, and Other Public Authority/Administration. The online survey addressed all EU-27 countries+UK; the personal interviews only addressed the partner countries (as presented in Table 1).

Table 1: Partners' country coverage

Partner	Country Coverage online survey	Country Coverage interviews
VITO	BE, LU	BE
IEECP	NL, DK, FI, SE, HR	NL, HR
ECI	UK, IE	-
AEA	AT, DE, IT	AT
ISR	PT	PT
LGI	HU,	HU
CRES	GR, CY, BG	GR
SEVEN	CZ, PL, SK	CZ
JSI	RO, SI	SI
LEA	EE, LV, LT	LT
ADEME	FR	FR
CIRCE	ES, MT	ES

2.2 Online survey

The survey questions were developed aiming for the assessment of needs regarding Priority Actions and energy savings estimations. Firstly, designed and shared among all partners on a Word file, the questionnaire was then integrated into the SurveyMonkey® online platform for distribution and collection of answers. The questionnaires, first round and second round, were composed of a total of 18 and 20 questions, respectively, divided into 6 and 4 different main sections. According to the initial answers, the survey platform was programmed to convey the user for the questions related to their stakeholders' group and preferences. The majority of the questions were compulsory, with a user-friendly interface and multi optional answering scheme. Only a few questions (3 and 5 questions, respectively) were facultative with open answers.

All stakeholder contacts were identified by each partner, as explained in D5.7 'the Stakeholder Engagement Plan', following GDPR requirements. A guiding document for internal use only was developed, supporting and explaining the process of the online survey to all partners. It described all the different steps, timeline, necessary documents and email templates so a common project approach could be followed by all partners.

The online survey was launched on the 19th October, 2020 (first round) and December 2021 (second round) by each partner, for the countries they target (presented in Table 1). Partners started by sending an explanatory email with a partner-specific link to the survey.



A leaflet of the project⁴ was also sent as an attachment, shortly presenting the streamSAVE project.

Once launched, the survey was monitored on a weekly basis: a weekly update of individual reports was sent to each partner with the status of the complete and incomplete surveys. Quality checks on the collected surveys were also made. Since some of the surveyed contacts were also to be interviewed, the partners could ask for the submitted answers to better prepare for their personal interviews.

A total of 112 surveys in the first round and 54 in the second round were fully completed with relevant information to develop the analysis. Only 7 surveys in the first round were not considered for the analyses since they were not fully completed. A total of 250 emails were sent by different partners, representing a success rate of 45%.

2.3 Personal interview

In the first round, personal interviews were also conducted, ideally, to at least two (2) main stakeholders in each target country referred to in Table 2, who should also fill in the online survey prior to the interview. In some countries, there is only one organization that is the main responsible for both Articles 3 and 7, hence one interview was enough to provide the necessary information for the project.

Another set of questions was then developed aiming for a more in-depth assessment of needs and, if possible, to have a first insight on the identification of potential energy efficiency supportive cases within the partner MS.

Each partner performed the individual scheduling of the personal interviews with the targeted stakeholders, following the developed project internal guidelines. This guidance includes the steps, timeline, necessary documentation (leaflet, questions) and email template. The interviews were scheduled after October 19th, 2020, as it was important that the target stakeholder had filled in the online survey.

A total of 22 stakeholders were interviewed by all partners in 12 different countries.

Table 2: Partners' country coverage and number of interviewed stakeholders

Partner	Country Coverage personal interview	Number of interviewed stakeholders
VITO	BE	2
IEECP	NL, HR	2 + 1
ECI	-	-
AEA	AT	2
ISR	PT	3
LGI	HU	2
CRES	GR	1
SEVEN	CZ	1
JSI	SI	2
LEA	LT	1
ADEME	FR	3
CIRCE	ES	2

⁴ <https://streamsave.eu/wp-content/uploads/2020/09/streamSAVE-flyer-reduced.pdf>





2.4 Confidentiality

In the interview process, several stakeholders raised confidentiality concerns regarding privacy and anonymity, both for individuals and for institutions. This problem was tackled by the streamSAVE Privacy Policy⁵, ensuring confidentiality during and beyond the project duration. Moreover, without consent, no country information will be made publicly available and no use of individual answers in the streamSAVE project; only aggregated information will be published. No sensitive data will be included in public reports or presentations, without the permission of the stakeholders concerned.

It should be noted that the objective of this consultation was not to provide the official view of each MS. The number of answers received per country varies from one country to the other and therefore no results per country are presented and only aggregated analysis per type of stakeholder will be publicly available. Similarly, no country comparisons between the responses from the different countries will be published.

⁵ <http://streamsave.eu/streamsave-platform/privacy-policy/>



Chapter 3 First round stakeholders consultation results

It is important to note that this first consultation process was not only designed to identify the needs and priorities on energy savings calculations under Article 3 and Article 7 of EED in EU MS, but also to engage key stakeholders with the project activities, in particular the peer-to-peer dialogues, knowledge and experience sharing, and capacity building on savings calculations for technical energy savings actions. This chapter briefly presents how the consultation process was structured and how it evolved.

3.1 Timeline

The consultation process was open for 40 days. The online survey was publicly launched on October 19th for one month, but by mid-November, the consortium decided to extend it by two more weeks, being the deadline postponed to November 30th. Figure 4 presents the consultation timeline.

A first reminder was sent to the stakeholders after one week of launching the survey and then, every two weeks. During the first period, the response rate was low and therefore the partners were asked to find strategies to get the replies on due time, which included sending messages by email, looking for and sharing other contacts to approach, using existing networks to pass the word and telephone calls when possible and convenient. The corrective measures were quite effective, and it was possible to collect more than 100 replies. Each MS contacted identified stakeholders by email; in parallel, interviews with key stakeholders (Implementing Public Authorities) were also carried out.

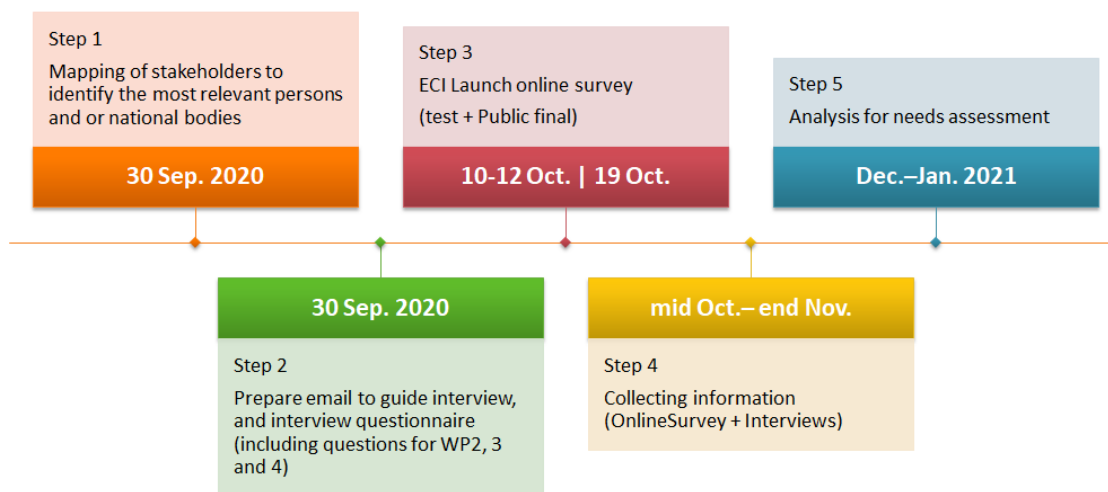


Figure 4: Consultation Timeline

3.2 Target group

Needs assessments are focused on specific target groups. To identify the needs and priorities on energy savings calculations under Article 3 and Article 7 of EED, the streamSAVE stakeholders were initially separated into two main groups, according to their involvement with EED implementation, as follows:

- **The key stakeholder group** (in short STK1) of streamSAVE are Public Authority: Ministry/MS officials (Implementing Public Authorities, Managing Authorities, and Participated or Entrusted Third Parties with a prominent role in Article 3 and Article 7 of the EED), Energy Agency and Other Public Authority/Administration.





- **Other stakeholders** (in short STK2) not directly involved with the implementation and monitoring, yet having some responsibility in relation to Article 3 and Article 7 under the EED (technology providers and experts, university/research Institutions, energy agencies, energy auditors/consultants, regulatory bodies, energy distributors, retail energy sales companies, transport fuel distributors or transport fuel retailers, technical associations, industry associations, standardisation bodies, NGOs, others).

Regarding the representativeness of the sample, to reduce sampling bias to a minimum level, all relevant stakeholders were invited to participate in the consultation. By mapping the stakeholders, streamSAVE succeeded to elaborate a list of 280 different stakeholders in EU MS, from all categories. These are contacts identified by the project partners as eligible entities/persons to take part in streamSAVE activities. Such a sample accurately reflects the targeted population of the streamSAVE and ensures more confident inferences from the results obtained. Figure 5 presents the number of stakeholders that collaborated, per country.

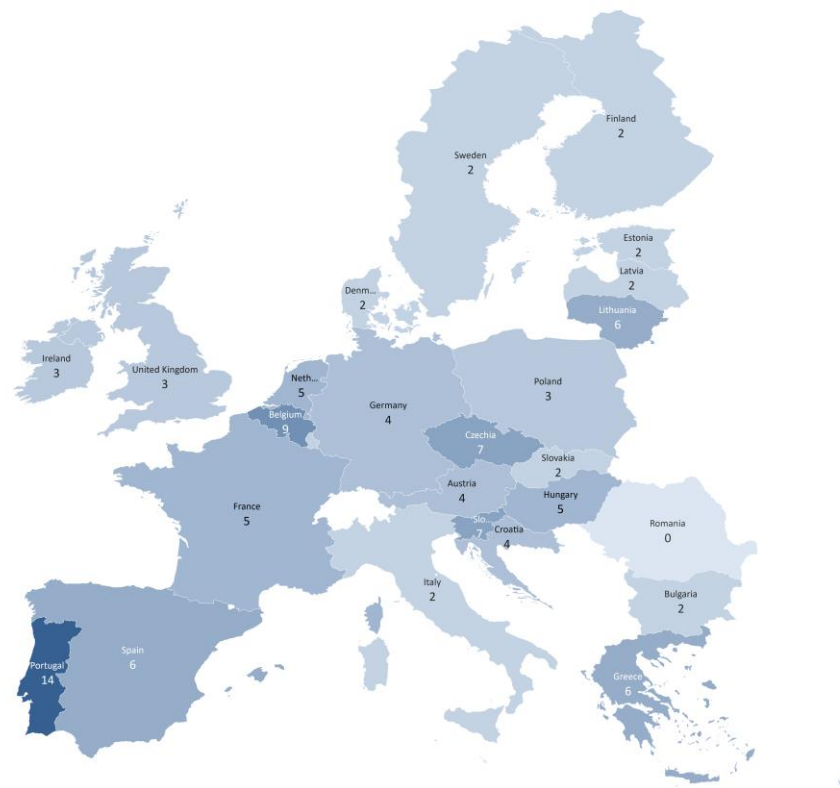


Figure 5: Mapping the stakeholders' collaboration per country (n° of replies collected in online survey)

It was possible to collect a total of 122 online questionnaires from all over Europe, except Malta and Romania, and to carry out 22 interviews, in all partners countries. All the stakeholders being interviewed have also filled in the online survey. A first cleaning of the collected data, to eliminate the incompletes and or unusual replies, led to a sample of 113 valid replies. One valid reply addresses the overall needs at the EU level, and it is therefore not included in the analysis presented in the next Chapters. The total sample was established with the 112 valid replies for specific countries.

Figure 6 presents an overview of the replies per stakeholder group and their responsibility concerning EED implementation. Public authorities responsible for implementing the EED in each country were mainly contacted, but other key stakeholders have also been



addressed, when their voice was considered an added value for streamSAVE, both at the national and EU levels⁶.

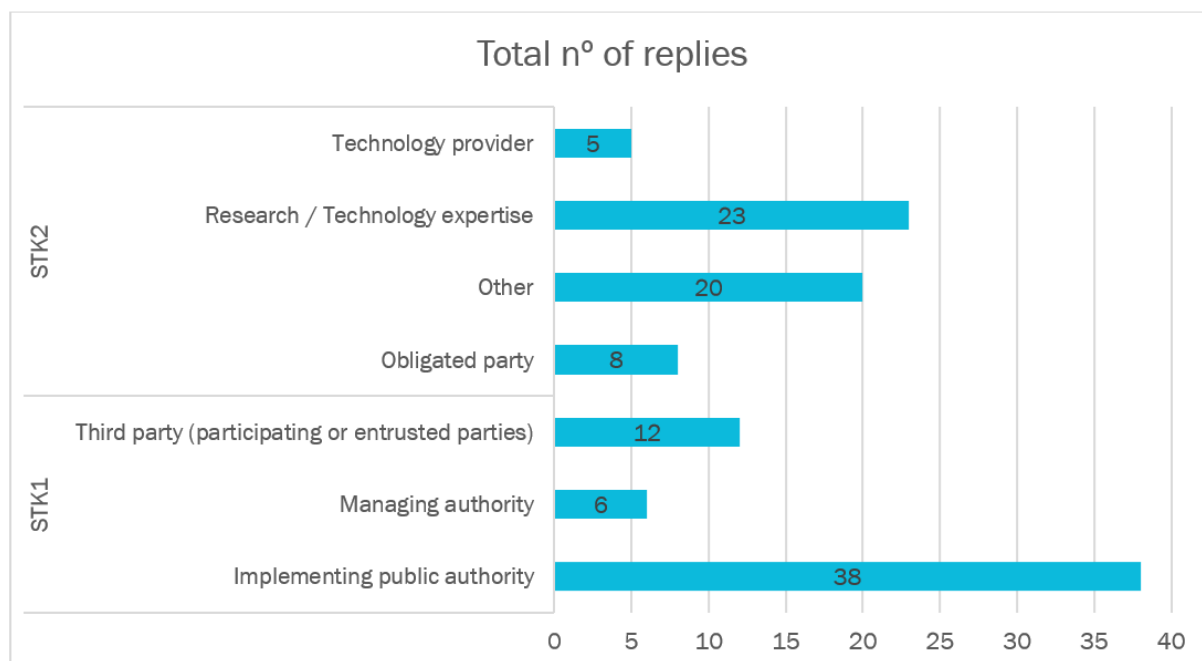


Figure 6: Overview of n° of replies (online survey) per stakeholder group and responsibility concerning EED implementation

Although by coincidence, exactly the same amount of stakeholders replied to each stakeholder group, namely 56 respondents each. and 50% of the respondents were part of stakeholder group I (key stakeholders for streamSAVE) and 50% were part of stakeholder group II (other stakeholders). Among STK1, Public authorities, Ministers, MS officials and other public authorities with responsibility for the implementation of EED, particularly Article 7 and Article 3, represent 30% of the respondents. Other types of organizations representing 14.3% of the total number of collected questionnaires include: (industry – Petrochemicals), (Energy Service Companies), (NGO), (Consulting - Energy Efficiency Consultancy Service, Competence Center), (National Energy and Environment Agencies' Association), (Regional authority), (Research and Technology Development promotion organisation), (Electric Vehicles User's Association), (Trade organisations – trading, operations and distribution of petroleum products). Figure 7 presents the distribution of collected questionnaires by type of organization.

⁶ Those are both entities or individuals not being presently involved in the implementation of EED, but their job is related with regulatory/surveillance in energy policies, and/or have been recently involved with NEEAPs preparation or evaluation at national and EU level, and/or are participating in EED CA.



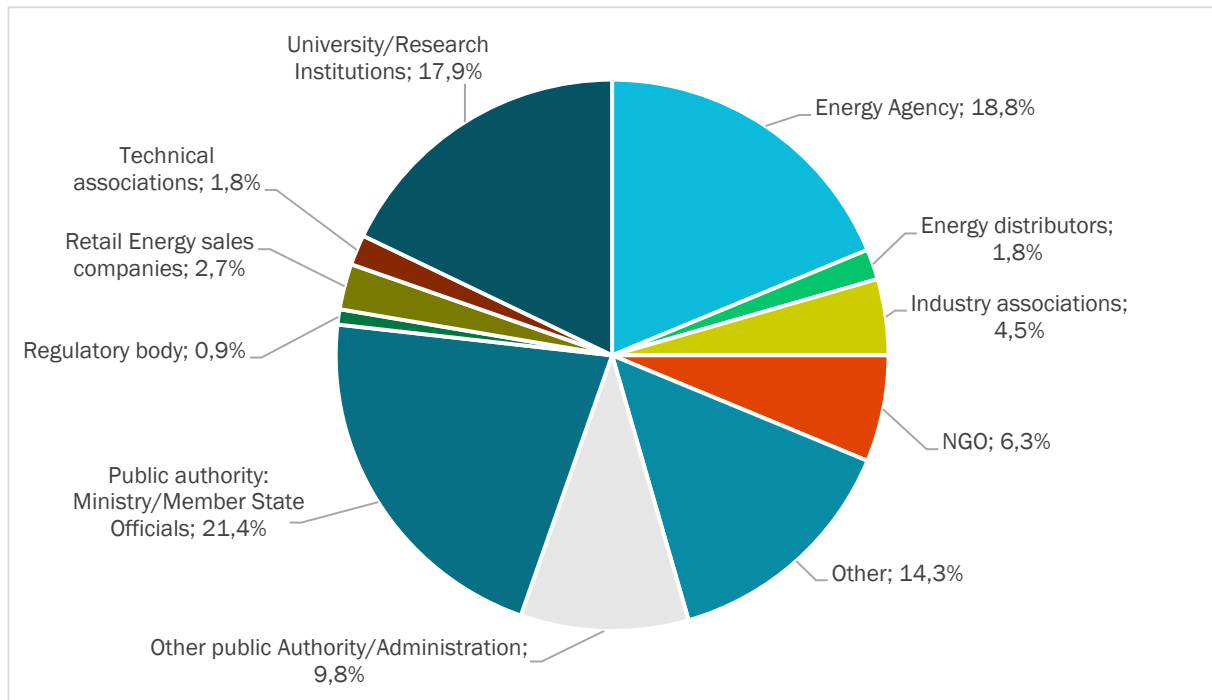


Figure 7: Share of collected questionnaires by type of organisation

3.3 Interview respondents

The interviews were conducted with Ministries involved in the implementation of EED, implementing public authorities and diverse implementing bodies responsible for the preparation of national legislation, the preparation of new savings calculation methodologies, the design of the obligation system, design of energy efficiency programmes, evaluation of energy-saving actions and reporting for Article 3 and Article 7 of EED in Austria, Belgium, Croatia, France, Greece, Hungary, Netherlands, Lithuania, Portugal, Slovenia and Spain. To understand the priority needs of these implementing public authorities, concerning the delivery of the Energy Efficiency Directive Article 3 and Article 7, streamSAVE partners conducted the interviews with the top-level representatives of their countries – having highly relevant responsibility and long experience in these issues. All partners succeed to conduct more than one interview among the list of stakeholders:

- Ministry of Climate Action, of Environment, of Energy, of Mobility, of Innovation and Technology, of Infrastructure; of Industry and Trade; of Ecological Transition
- National Energy Efficiency Monitoring Agency
- Energy efficiency and energy savings governmental departments providing technical assistance in the implementation of EED
- Institute for Diversification and Saving of Energy
- Directorate-General for Energy and Climate
- Obligated parties
- Energy Agencies
- Energy and Public Utility Regulatory Authority



- Entrusted parties in charge of developing, managing and operating energy efficiency programmes
- Entities giving technical support to the Public authorities and also have the expertise for the bottom-up monitoring
- Entities acting as an implementing organisation that supervises compliance

In countries where the responsibilities with regard to energy efficiency are divided between the federal state and their regions, and with the autonomy to make its own policies, it was possible to conduct in-depth interviews with the implementing authorities for the respective regions. That was the case in Flanders and Wallonia in Belgium, and in the Azores in Portugal.

Stakeholders that took part in the interviews are key to helping streamSAVE to identify the main challenges MS face in the implementation of the EED, particularly Article 3 and Article 7, and to identify the priority challenges in order to provide them with demand-driven assistance.

3.4 Survey questions

Within the scope of the streamSAVE objectives, to streamline and improve the energy savings calculation methodologies, the survey questions were split into the following headings, in line with the streamSAVE structure following three axes:

- The **Knowledge Facility**: aiming to gather information on existing bottom-up methodologies applied by the Member States in the context of Article 3 and Article 7 of the EED, to assist MS in further intensifying efforts to deliver energy savings in the short to medium-term 2021-2030, in estimating energy savings aligned more with the actual energy savings achieved.
- The **Knowledge Exchange**: aiming for peer-to-peer dialogues to share knowledge, discuss and reflect on streamlined calculation methodologies. To facilitate experience sharing among the MS, experts' communities will be created to discuss technical and economical details about Priority Action types in relation to Article 3 and Article 7.
- The **Capacity Support Facility**: aiming to provide direct technical support to individual MS to further improve energy savings calculations under Articles 3 and 7 of the EED through a pool of technical and country experts having the right expertise to match the diverse needs of public authorities (advice on methodologies or tools used for savings estimations; support with screening and initial assessment of promising technical savings actions; preparing and holding of meeting to advise on adapting existing practices from the other Member States on calculation methodologies or indicative values; reviewing existing calculation methodologies, etc.).

The survey was initially designed by ISR-UC (in close collaboration with ECI and VITO), and all partners could give input. Questions were created under each heading to establish the extent of existing bottom-up methodologies, to explore the existing needs and priorities on the five identified Actions as well as stakeholders' interests in other Priority Actions.

The suggested Priority Actions, which are actions or measures with high savings potential around which the questions were created, are as follows:





- Heat recovery: district heating and excess heat from industry
- Building Automation and Control Systems (BACS)
- Commercial and industrial refrigeration systems
- Electric vehicles (private & public)
- Lighting systems and road lighting

The questionnaire comprised a series of multiple-choice and free text questions. The survey was designed in such a way that questions could be filtered based on the answers and interests (the type of organisation and responsibility regarding Article 3 and Article 7 of EED). Moreover, key stakeholders (public authorities implementing, managing or administrating EED) were invited for an interview, where the online questionnaire was further elaborated, and additional questions were asked to clearly identify the main challenges MS face. The list of final questions used by all partners is shown in Table 3.

Table 3: Questions used in the online survey

ORGANIZATION AND RESPONSIBILITIES			
	Stakeholder identification		
1		What describes best the type of your organization?	drop down
2		What is the responsibility of your organisation concerning EED implementation?	multiple choice
3		What are your main responsibilities in relation to Article 3 and Article 7 under the Energy Efficiency Directive within your country? (tick as many as applicable)	multiple choice
IDENTIFICATION OF PRIORITY SAVINGS ACTIONS			
	Actions with high energy savings potential		
4		Please indicate, according to the needs in your country, the importance of energy savings calculation methodologies for the five, following actions	scale each option
5		Are there any specific issues related to the calculation of energy savings from the following actions, for which you would be interested in getting more guidance or in discussing with other technical experts?	open question
6		For which of the following technical actions would you welcome the development of standardised or streamlined energy savings calculation methodologies? Please indicate only your top 3 preferred energy saving areas	Select Top 3
KNOWLEDGE FACILITY			
	Identification of catalogues for standardized calculation methodologies		
7		Does your country already have a catalogue (or similar document) describing standardized bottom-up methodologies for savings calculations?	Yes/no
8		In case documents or catalogues are publicly available, please provide a link to the document detailing calculation methodologies in the textbox below or, if possible, please upload the document	
9		How has your country estimated the indicative 2030 national contribution for energy efficiency in the context of Article 3 of the EED?	multiple choice
10		In case documents are publicly available, please provide a link to the document detailing the methodologies concerning Article 3 of the EED in the textbox below or, if possible, please upload the document	



11		Are the estimation approaches in relation to Article 7 savings and the Article 3 contributions aligned to as good as possible extent?	Yes/no
12		Are you aware of any report or study on (methodologies to estimate) cost effectiveness of energy savings actions in your country?	Yes/no
CAPACITY SUPPORT FACILITY			
	Needs assessment and sectoral gaps		
13		Please state your level of interest in receiving one-to-one technical support from the streamSAVE consortium to assist your country with current challenges on savings estimations in the following sectors (the same priority can be given to multiple answers):	scale each option
14		Please state your level of interest in receiving one-to-one technical support from the streamSAVE consortium to assist your country with bottom-up calculation methodologies for the following methodological areas (the same priority can be given to multiple answers):	
15		What are the specific methodological issues on the reporting and implementation of Article 3 or Article 7 that you would appreciate streamSAVE support with? Please explain	
KNOWLEDGE EXCHANGE			
	Tailored peer-to-peer dialogues to share knowledge, discuss and reflect		
16		What is your willingness to facilitate experience sharing among the Member States?	scale options

Regarding the scale to rate the different topics according to the level of preference or priority, a 1-6 rating order scale was used to avoid using the middle term of a Likert-scale and allowing easy and comparable analysis of results and determining the order of preference for a list of items. Where applicable, responses were scaled, according to the definitions listed below:

- 1 = not at all important (negligible) / No interest
- 2 = very low importance (not relevant) / Very Low Priority (Lowest Priority)
- 3 = low importance (on my list but like a c-priority) / Low Priority
- 4 = moderately important (on my list after the top issues) / Moderate Priority
- 5 = very important (among top 3 priorities) / High Priority
- 6 = extremely important (must have, top priority) / Extreme Priority - Top Priority

As the variety of needs of MS is diverse, there was a need to go beyond the rating questions, and obtain qualitative data to better understand the areas where MS would like to receive support. Therefore, some of the (mandatory) questions required a qualitative (open) response. These responses highlight concrete gaps that streamSAVE can address in the CSF.

The online survey was tested with a dummy test by all partners prior to final adjustments and final surveys being sent out to stakeholder lists. At least 10 stakeholders were targeted in each country, with a minimum of 5 responses per partner country required in order to have a minimum response rate of 50%.

3.5 Main Findings first round survey

The findings herein presented were developed based on the results of the online survey targeting all EU countries and key stakeholders, and structured interviews with





implementing authorities in the 12 MS participating in the project (Austria, Belgium, Croatia, Czechia, France, Greece, Hungary, Lithuania, Netherlands, Portugal, Slovenia and Spain). While the online survey aimed to explore the overall needs and priorities in the EED field, the interviews aimed to understand better and in-depth the MS interests as well as current practices of energy savings estimations within the partners' countries. It focused on challenges and success factors regarding delivering energy savings and meeting reduction targets in the context of Article 3 and Article 7 of the EED.

Based on the interviews and online survey, this section presents the main challenges faced by the countries when calculating the energy savings in order to identify the Priority Actions within MS. Stakeholders are confronted with five actions previously identified by streamSAVE (preliminary proposal survey, Renders et al., 2019) as Priority Actions in MS, and are requested to help us understand their needs regarding the selection as well as other Priority Actions not listed.

Figure 8 and Figure 9 present how each stakeholder group, STK1 and STK2, perceive the importance of energy savings calculation methodologies for the five Priority Actions, according to the needs of their countries. Comparing STK responsibilities and looking at levels 5 and 6, it is possible to see that commercial and industrial refrigeration systems (Com&Ind Refrigeration) gain importance for STK2, as expected. Nevertheless, among the five Priority Actions, EVs and BEMS&BACS ranked higher by the respondents for the importance of energy savings calculation methodologies in MS.

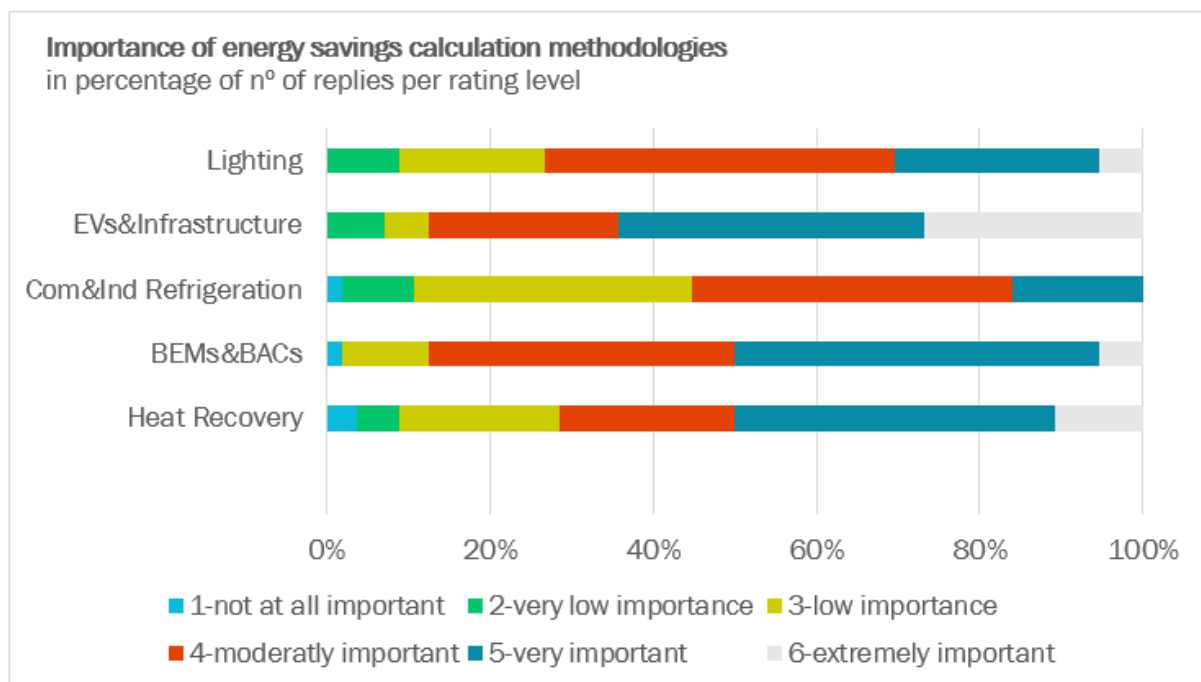


Figure 8: Importance of energy savings calculation methodologies for STK1 per Priority Action, according to the number of replies per stakeholder group per rating level

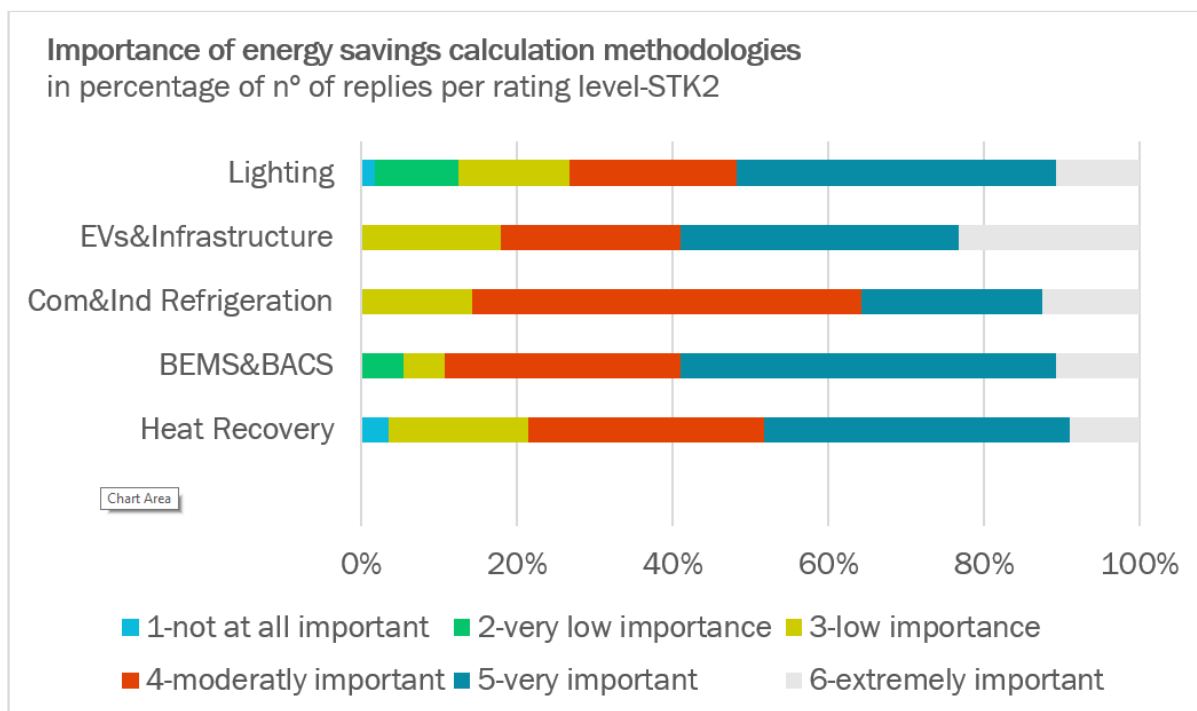


Figure 9: Importance of energy savings calculation methodologies for STK2 per Priority Action, according to the number of replies per stakeholder group per rating level

The evaluation of the ratings of the 5 PAs is presented in Figure 10. Observing the two highest levels of importance, level 5 and level 6, for both stakeholder groups, EV and BEMS&BACS are the areas where there are more needs, followed by heat. Similarly, if we carry out an evaluation of the scores, considering the weighted averages of the number of replies per rating level, the PAs that score higher are EVs, BEMS&BACS and heat for STK1; and EVs, BEMS&BACS, and then, heat and refrigeration with the same score for STK2. The importance of refrigeration can be explained by higher scores for this PA given by technology providers and research and technology experts, who are part of the respondents in STK2. Among the five PAs, EVs and related infrastructure and BEMS&BACS are the Priority Actions ranked higher by the respondents for the importance of energy savings calculation methodologies in MS. EVs were rated important by 95 respondents (out of 112), and BEMS&BACS by 99, by choosing scores of 4, 5 or 6.



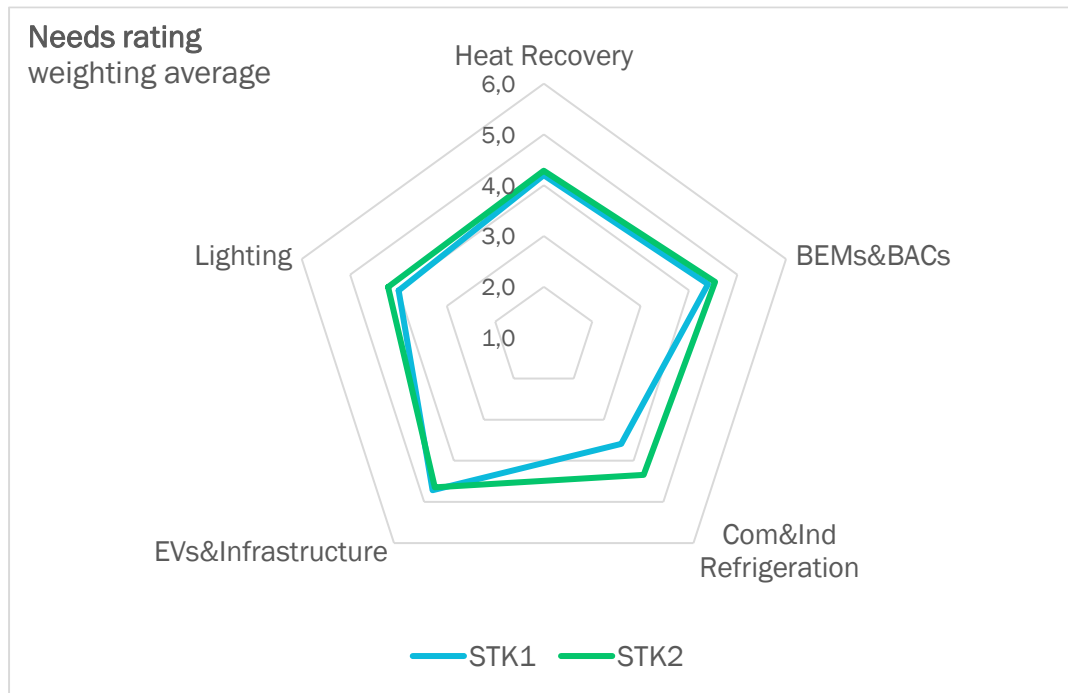


Figure 10: Needs rating of the 5 PAs

The evaluation of the rating of the PAs according to the needs of stakeholders (Figure 11) ranked higher EVs and BEMS&BACS, both for STK1 and STK2, with a weighting average of 4,71 and 4,65, and 4,40 and 4,53 respectively.





Figure 11: Needs rating of the 5 PAs for different stakeholders (Energy Agency, industry associations, other public authority/administration, university/research institution, public authority/Ministry/MS officials, retail energy sales companies and NGOs)

Although in some groups the number of replies is low, it is possible to see a clear tendency for preference for EVs and BEMS&BACS among STK1 replies, followed by Heat recovery, then lighting and Com&Ind Refrigeration. Regarding STK 2, and although it is more heterogeneous, EVs and BEMS&BACS are also the preferred actions, followed by Heat recovery and Com&Ind Refrigeration, ex aequo, and finally lighting.

Figure 12 below compares the importance of energy savings calculation, per country and per priority Action.



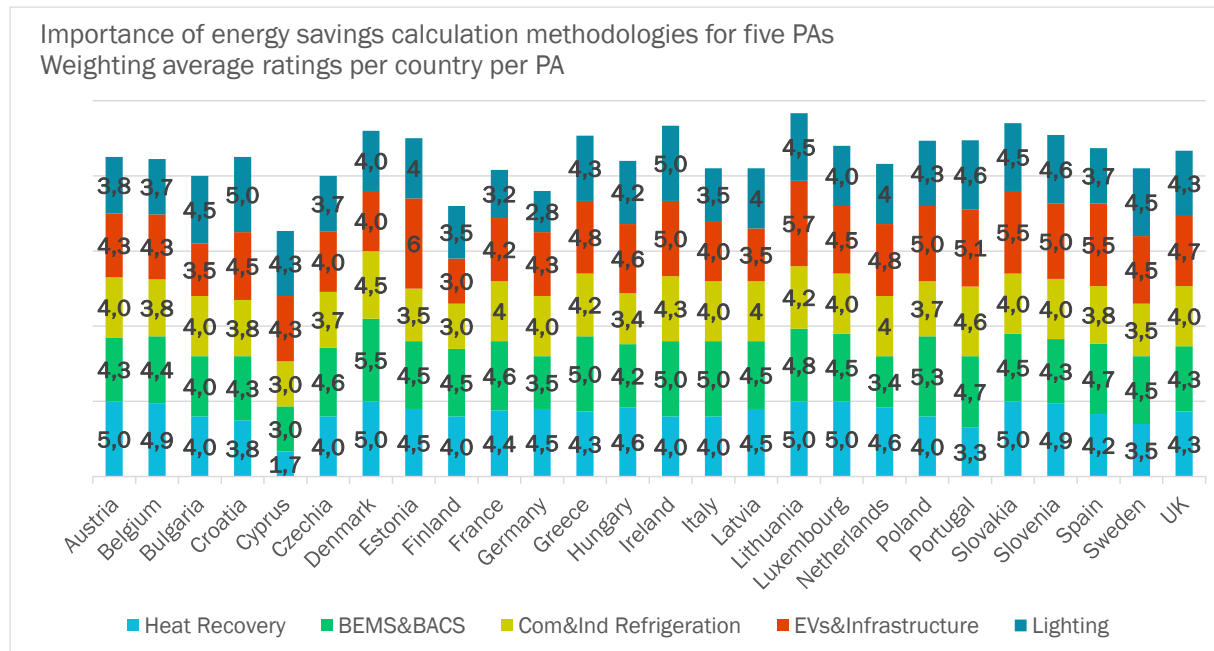


Figure 12: Importance of energy savings calculation for five PAs, per country

3.6 Specific concerns related to the five Priority Actions

The stakeholders had the opportunity to indicate their concerns for each PA in Q5 of the online survey, when they were asked if there are specific issues related to the calculation of energy savings for which they would be interested in getting more guidance or in discussing with other technical experts. An overview of the replies for each PA was aggregated and is presented below. It should be noted that for all PAs stakeholders indicated the need to share experiences and best practices.

3.6.1 Heat recovery: District heating and excess heat from industry

Heat recovery raised concerns among several respondents who claimed the need for clear rules and definitions on how to calculate the net heat being transferred, as well as how to valorize these measures. The main issues in which stakeholders are interested are the following:

- The challenge is the definitions in RED/RED II and EED and how they are interpreted (e.g., waste heat definition, the definition of waste heat from waste incineration plants, ...). All unused wasted energy if recovered/used anywhere else should be able to be counted as energy savings. Several respondents indicated there is a need for clarification regarding what can be counted as final energy savings and what must be seen as effects on the primary energy side.
- Excess heat is only creditable if the energy consumption of an end-user is reduced. However, simply feeding excess heat into a district heating network does not reduce the energy consumption of the end customers. Support in the connection to the circular economy (one industry waste heat can be another industry resource), additionality and baseline definition for counting district heating in Article 7 in relation to Eco-design, is much appreciated.
- Due to the lack of reference values for district heating, some stakeholders show strong interest in knowledge sharing with other Member States regarding the identification of baseline scenarios, technical methods for calculating energy



savings or examples of good practice in this area, especially standardised calculation for energy savings from district heating.

- no consensus was reached regarding the need for streamlining energy savings calculations regarding the exploitation of excess heat and the installation of heat recovery technologies. While some stakeholders indicated there is a need for evaluating, controlling and verifying the implemented heat recovery measures, others say the utilization of excess heat from industry is a complex issue from the point of view of energy flows and system boundaries as well as the definition/inventory/inclusion in energy statistics, and therefore do not see standardisation/streamlining of energy savings calculations as an added value, but rather a barrier.
- In some countries (e.g., Denmark), district heating companies are working hard on replacing oil and gas-powered houses and public buildings with green heat in the form of district heating powered by mostly CO₂ neutral energy sources. Therefore, and since global warming is a global issue, they are very keen on working together with other MS on this topic.

3.6.2 Building Energy Management System (BEMS) and Building Automation and Control Systems (BACS)

Harmonized calculation methods, in particular, deemed savings estimations, seem particularly popular in the building sector. Stakeholders are generally interested in representative studies to gather default values, as well as in sharing best practices and the best available techniques as important issues to be addressed. Streamlined/simplified or standardised methodologies to calculate energy savings are quite often of interest for different stakeholders. The main issues in which stakeholders are interested are the following:

- On top of the list is the lifetime of savings (energy, emissions, and financial savings). Providing evidence of the lifetime of savings, as required by the legislation, is more difficult than calculating the energy savings itself.
- What data to collect and baseline calculation needs should be clearly defined (e.g.: reference situation for building occupancy). Experiences and energy savings by BEMS and BACS are difficult to assess and some guidance regarding calculation principles, shares (%) of energy demand savings, default values for savings (%) by the implementation of BEMS or/and BACS, real benefits, baseline to compare, connection with building energy certificates, was preferred.
- How to manage double counting and additionality: how to include indirect emissions; how to connect and overlap with Article 8 of the EED; quantification of savings in relation to existing standards (e.g. EN 15232), Smart readiness indicator in EPBD in commercial buildings.
- Evaluation of multiple benefits: how to assess/estimate the potential benefits of implementing such systems, also going beyond energy savings (comfort, productivity, health, etc.)?

3.6.3 Commercial and Industrial Refrigeration Systems

The growing potential of commercial and industrial refrigeration systems and their complexity due to variance in the design, energy flows and connections to on-site RES, makes this PA interesting to be worked out in streamSAVE and for sharing existing best





practices and knowledge. Although this field is somehow well covered by experts (auditors (Art.8) and EEO (Art.7)), there are still gaps to be addressed, namely on:

- Baseline definition to ensure additionality seems to be the main difficulty with these systems. Moreover, the calculation of cooling efficiency is quite complex and on-site data collection is complicated.
- Streamlined/simplified engineering methods, deemed or scaled savings to calculate energy savings for these systems (including waste heat recovery from refrigeration) to avoid the need to collect large amounts of data and calculations, as metering based M&V is too expensive relative to the potential savings achieved.

Therefore, guiding calculation methodologies, including reference parameters, are welcome.

3.6.4 Electric vehicles (private & public) and related infrastructure (charging stations)

Besides the need for a common uniform methodology to calculate the savings, stakeholders raised concerns about dealing with both actions, EVs and infrastructure, more specifically, on the definition of reference values for consumption and other parameters. Double counting and additionality were by far the most frequent concerns indicated. Stakeholders need clarification on whether infrastructure generates savings, and if so, how to split the energy savings between both actions to avoid double-counting, when there are policy measures (grant schemes, subsidies, etc.) in place for both actions. Moreover, stakeholders wonder if the savings calculation shouldn't include a correction for the primary energy factor.

The main issues in which stakeholders are interested are the following:

- Standardized deemed savings calculations for both Electric Vehicles and for infrastructure to avoid double counting.
- Availability and reliability of historic data is a need in order to calculate baselines and thus make ex-post evaluations (default values for mileage of electric vehicles, information from private persons, ...)
- Sector coupling and related efficiencies: the need for methodologies to evaluate the savings when there is an energy switch. In relation to primary or final energy savings evaluation, the debate about decarbonization vs energy and resource efficiency was raised.
- Knowledge sharing among member states and guidance focusing on technical methods for calculating energy savings and good practice examples.

3.6.5 Lighting systems and road lighting

Even though lighting has been the target of attention in many MS, and many stakeholders find it easy to calculate the lighting savings, there is a need to improve the calculation methodologies because besides the efficiency of the lamps/systems, other criteria such as lighting levels and quality of service should also be considered in the equation. The main issues in which stakeholders are interested are the following:

- Additionality: how to consider Eco-design standards in the evaluation of savings.
- How to calculate energy savings through lighting controls (e.g., using traffic detection systems, which make sure that public lights are only switched on when traffic is present), etc.



- M&V: Disaggregation of energy savings when there is no individual monitoring of each type of load; how to consider patterns of behaviour and safety standards?

3.6.6 Miscellaneous: requests from stakeholders

Considering the limited time available, stakeholders suggest aligning the streamSAVE activities with the EED official reporting periods, and to plan the activities well in advance, so they can conciliate their participation in the webinars, workshops and peer-to-peer exchanges with the reporting period.

Stakeholders would like streamSAVE to develop reliable methodologies to include carbon savings linked to energy savings in EEOs and other schemes.

Cost-effectiveness analysis of the measures is not regular practice and is considered critical for the evaluation of the measures – it's considered as a top-priority along with the lifetime of individual energy saving measures.

Request to develop simplified methodologies for energy savings calculation because if they are "too complicated", or require a lot of different input data, they risk having very limited or no effect at all (as these measures will just not be used or at least not be taken into account in monitoring the savings).

The enforcement of the EED on an EU level would be key to implementing it properly. Where EEO is currently being put in place, public authorities would need help in developing the catalogues of eligible measures and calculation methodologies. Moreover, besides assisting countries, it would be interesting for streamSAVE to assist also European regions, especially the outermost regions, given that they provide the perfect location to deliver rapidly scalable savings to meet their energy savings targets.

Moreover, there were also some suggestions that go beyond the streamSAVE activities, for instance, interest in econometric models, decomposition analysis and top-down energy savings calculations, in particular for fiscal measures.

3.7 Existing bottom-up calculation methodologies

To assist MS to intensify their efforts in delivering energy savings in the short to medium term, 2021-2030, and to streamline and improve the calculation methodologies to estimate energy savings aligned more with the actual energy savings achieved, the project starts with comparing current practices on estimation methodologies being used by MS. As a first step, the project inquired the MS about the existence of bottom-up calculation methodologies.

Several respondents indicated that energy efficiency targets are set in National Energy and Climate Action Plans for 2021-2030 and provided links where the documents detailing the methodologies concerning Article 3 and 7 of the EED are publicly available.

3.7.1 Available Documents

The number of countries with catalogues describing the methodologies for bottom-up calculations is mostly available in countries where EEOs are in place. Among the 28 countries of the study (EU27+UK), 57% state there is a catalogue available (dark colour in Figure 13). In some of these countries, the catalogues are too old or outdated, not detailed enough nor transparent in specifying the methodologies and parameters behind the calculations and only provide an indication of a theoretical formula without establishing baselines.



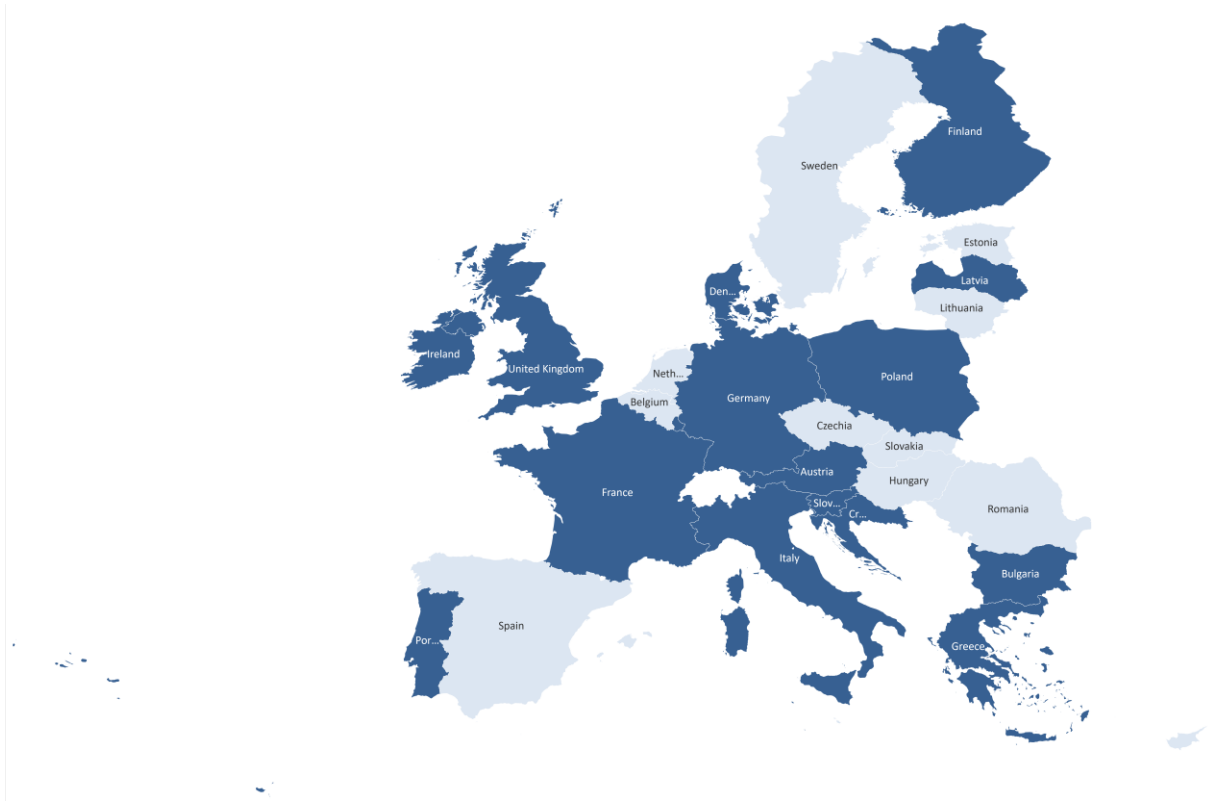


Figure 13: Countries where a catalogue for BU methodologies exists

In order to streamline and improve the energy savings calculation methodologies, a comparison of current practices on estimation methodologies has been carried out within streamSAVE – see Deliverable D2.1 ‘Status of energy savings calculations for priority actions in European countries. The consultation also tried to gather as many details as possible regarding how indicative 2030 national contribution for energy efficiency, in the context of Article 3 of the EED was estimated. The stakeholders were given four different options and were free to include other approaches rather than the suggested ones (Scenario, baseline, ESD, energy intensity productivity). The definitions of the approaches were:

- Baseline scenario approach: Member States defined their target in a similar way as the EU, namely by applying a percentage reduction to the projected energy consumption levels in a Business as Usual (BAU) baseline scenario.
- Scenario approach: Member States derived the 2030 contributions from the With Existing Measures (WEM) or With Additional Measures (WAM) projections, as reported in the National Energy & Climate Plans NECPs.
- ESD approach: Member States took the approach from the Energy Services Directive ESD as an example and implemented it to set their energy efficiency targets. This means that the energy savings are calculated as a percentage reduction of average historical energy consumption over a predefined period.
- Energy intensity/productivity: This approach entails setting a percentage reduction in energy intensity for 2030 compared to a base year; in other words, the energy supplied per unit of GDP in fixed prices must be reduced by x% in 2030 compared to the levels in a base year.



Table 4 presents a comparison of current practices being used to estimate the indicative 2030 national contribution for energy efficiency in the context of Article 3 of the EED. It also gives an indication of where catalogues describing standardized bottom-up methodologies for savings calculations are available. This information should be considered with caution as it reflects the respondents' views, and does not reflect MS official reporting.

Table 4: Comparison of current practices to estimate the indicative 2030 national contribution

N° of replies per country		Q9. Methodology approach to estimate indicative 2030 national contribution of Article 3 of the EED				
		Baseline	Scenario	ESD	Energy intensity	Other
4	Austria				X	
9	Belgium	X	X			X
2	Bulgaria		X			
4	Croatia	X	X			
3	Cyprus		X			
7	Czechia	X			X	X
2	Denmark	X				X
2	Estonia	X	X			
2	Finland		X			
5	France	X	X			X
4	Germany	X	X			X
6	Greece	X	X	X		
5	Hungary	X	X			
3	Ireland	X	X			X
2	Italy		X	X		
2	Latvia	X	X			
6	Lithuania		X	X		X
2	Luxembourg					X
5	Netherlands		X			X
3	Poland	X	X			
14	Portugal	X	X			X
2	Slovakia	X	X			
7	Slovenia	X	X			
6	Spain		X		X	
2	Sweden				X	
3	UK	X				
112						

Note: This information should be considered with caution, as it reflects the respondents' views and does not reflect MS official EED reporting.

As expected, there is not a single methodology to calculate the national contributions to energy efficiency. The calculation methodologies available in most countries are set up by the implementing authorities or third parties that are responsible for administering the schemes. In general, countries refer to the NECP and the NEEAPs for further information on the measures and modelling. Several respondents also indicated that energy efficiency targets are set in National Energy and Climate Action Plans for 2021-2030, and provided links when the documents detailing the methodologies concerning Article 3 of the EED are publicly available. Besides the calculation of the reference consumption, the frequency and





to which criteria and data these baselines should be updated, and concerns with the approach to additionality, most MS did not indicate major problems regarding Article 3 implementation.

The consultation carried out in streamSAVE does not wish to infer the accuracy of the current practices to estimate the indicative 2030 national contributions, nor to highlight any good or bad example. It is rather intended to identify specific issues where MS need support concerning the implementation and reporting of Article 3 and Article 7, to support them to reinforce the implementation of energy efficiency measures at a national level.

In some countries, it is not clear whether a catalogue describing the bottom-up methodologies that are used to calculate the energy savings is available or not. Some respondents indicated that only general approaches are described in some publications. There were also references to some old documents describing calculation methods with more detail, but these are probably outdated as they were developed within the scope of the implementation of the first NEEAPs (back to 2012-2014). In general, it can be stated that where an EEO is in place, catalogues or other documents like guidelines or ordinances do exist.

3.7.2 Alignment with EED

When asked about the alignment of existing practices regarding the estimation approaches in relation to Article 7 savings and Article 3 contributions, the vast majority of implementing authorities replied positively. Yet, in some countries, there were conflicting responses and some implementing authorities indicated they do not know if their estimation approaches are aligned or not.

3.7.3 Cost-effectiveness practices

According to the 2020 online survey, studies on the cost-effectiveness of energy savings actions are available in 14 countries with diverse degrees of experience (Czechia, France, Germany, Greece, Hungary, Ireland, Italy, Lithuania, The Netherlands, Poland, Portugal, Slovenia, Spain and Sweden). Some respondents were able to provide the link for the reports. Cost-effectiveness analyses are available both for EEOs and for alternative measures. Sometimes, the analysis is a merit order list of different actions that can be used to guide obligated parties. In countries where white certificates are available, like France and Italy, cost-effectiveness analysis is more consistently implemented and documents are publicly available. However, in other countries like Hungary and Ireland, the information is not publicly available, to avoid possible misinterpretations.

The interviews carried out with implementing authorities, enabled us to collect some extra information regarding the partners' country practices in terms of cost-effectiveness. Sometimes, cost-effectiveness is investigated for the energy savings achieved for the Article 7 option of alternative measures only. Extensive experience with energy savings calculation and cost-effectiveness analysis is only available in a few countries and the criteria used for evaluating the cost-effectiveness are often not clear. To increase a higher acceptance and understanding of these issues, the preparation of new calculation methodologies needs to involve different players: technical experts, interest groups, advocacy groups as well as stakeholders from the obligated parties.



3.8 Other Energy Saving Areas

In order to identify specific measures and or actions where support is welcome for the second round of Priority actions, the respondents were asked to identify three top priorities among a list of 22 typical technical actions, together with an open reply. Figure 14 presents the energy savings areas for which the development of streamlined energy savings calculation methodologies is preferred: modal shift, small-scale RES heating and improvements of heating and cooling efficiencies are the most popular actions.

Table 5 lists the additional technical actions indicated by the stakeholders, which were not included in the list of options provided in the survey, for which stakeholders would welcome the development of standardised or streamlined energy savings calculation methodologies.

Table 5: Technical actions suggested by respondents:

Technical actions	Type of stakeholder	Group of stakeholders
Baseline data in waste heat processes and how to execute projects to be able to evaluate savings	EnergyConsultant	STK2
District heating	ManagAuthority	STK1
Power network savings due to small-scale renewable technologies (namely PV)	PubAuthority	STK2
Lighting sensors and control systems	PubAuthority	STK2
Building envelope insulation	PubAuthority	STK2
Windows substitution	PubAuthority	STK2
Information measures	Research	STK2
How to calculate savings from behavioural measures in general	ImpAuth	STK1
Soft measures - information campaign effect on energy savings	ImpAuth	STK1
Efficient driving program for new drivers	ImpAuth	STK1
CHP	Research	STK2
Embodied carbon	TechProvider	STK2
Development of more efficient and competitively priced EV batteries	PubAuthority	STK1



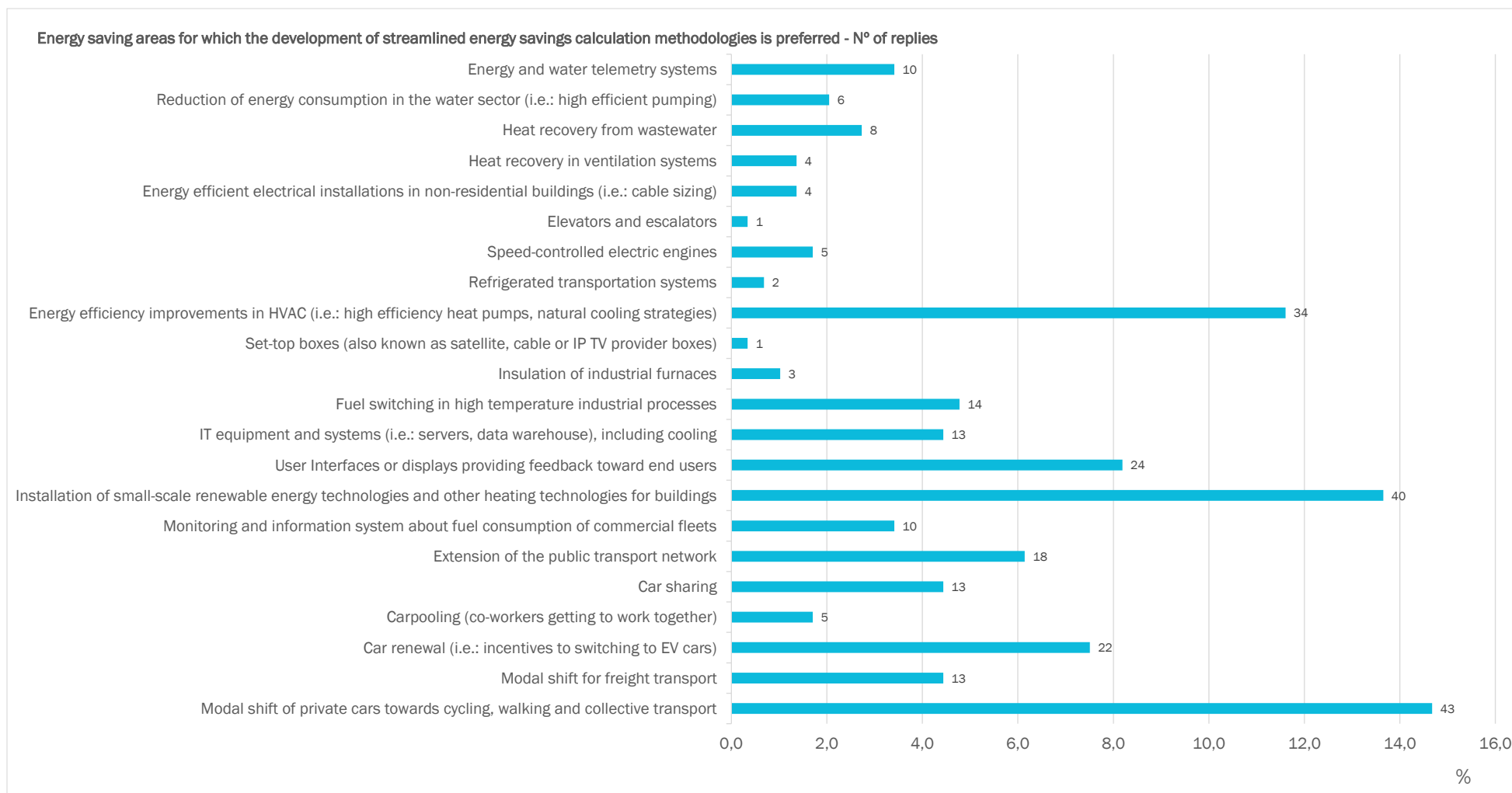


Figure 14: Energy savings areas for which the development of streamlined energy savings calculation methodologies is preferred



3.9 Identified cases for the Capacity Support Facility

The interest in receiving technical support was evaluated in Q13. Such a section was not available for all respondents. Since the Capacity Support Facility provides direct technical support to individual MS to further improve energy savings calculations under Article 3 and Article 7 of the EED, only Public Authorities, Energy Agencies and other Public Authority/Administration from the partner countries are targeted within this support.

Figure 15 presents the interest in receiving one-to-one technical support by sector for key stakeholders. Then, Figure 16 presents the total high (rate 5) and extreme priority (rate 6) in receiving one-to-one technical support by sector. On a scale from one to six, it was assumed that a low level of interest is considered when the respondents score 1, 2 or 3, a medium when the score is 4 and a high level of interest when the respondents score 5 or 6.

In line with the earlier results, it is possible to see that **Transports and Services** are the sectors where the key stakeholders have a higher level of interest in receiving one-to-one technical support from the streamSAVE consortium to assist their country with current challenges on savings estimations.

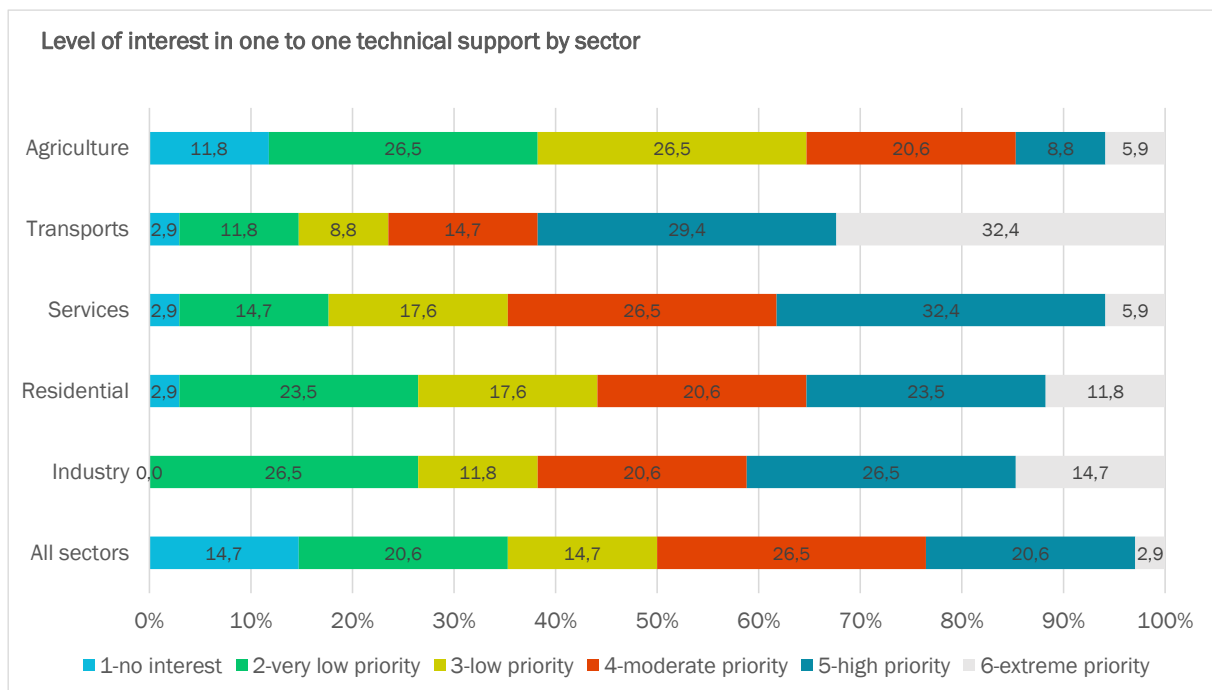


Figure 15: Interest of key stakeholders in receiving one-to-one technical support by sector

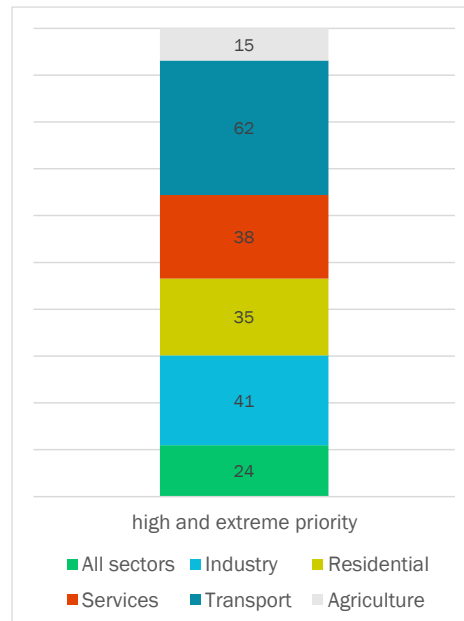


Figure 16: Total high (5) and extreme (6) priority in receiving one-to-one technical support by sector

Concerning the level of interest in receiving one-to-one technical support, the survey participants were asked in Q14 to rate the following methodological areas, distinguishing between Article 3 and Article 7, by giving a priority level from the scale: 1 (no interest) to 6 (extreme priority/top priority):

- Determining the reference consumption baseline for a Priority Action
- How frequently and according to which criteria and data these baselines should be updated
- Additionality
- Double counting
- Behavioural aspects (spill-over & rebound effects, free riders)
- Correction factors (e.g. climate zones)
- Missing information/statistical data & improving monitoring program
- Streamlining savings estimations between Article 3 and Article 7

According to the number of replies per priority level of interest, weighted average replies are presented in Figure 17 for Article 3 and Article 7, with the following rating scale: 1-no interest; 2-very low priority; 3-low priority; 4-moderate priority; 5-high priority; 6-extreme priority/top priority.

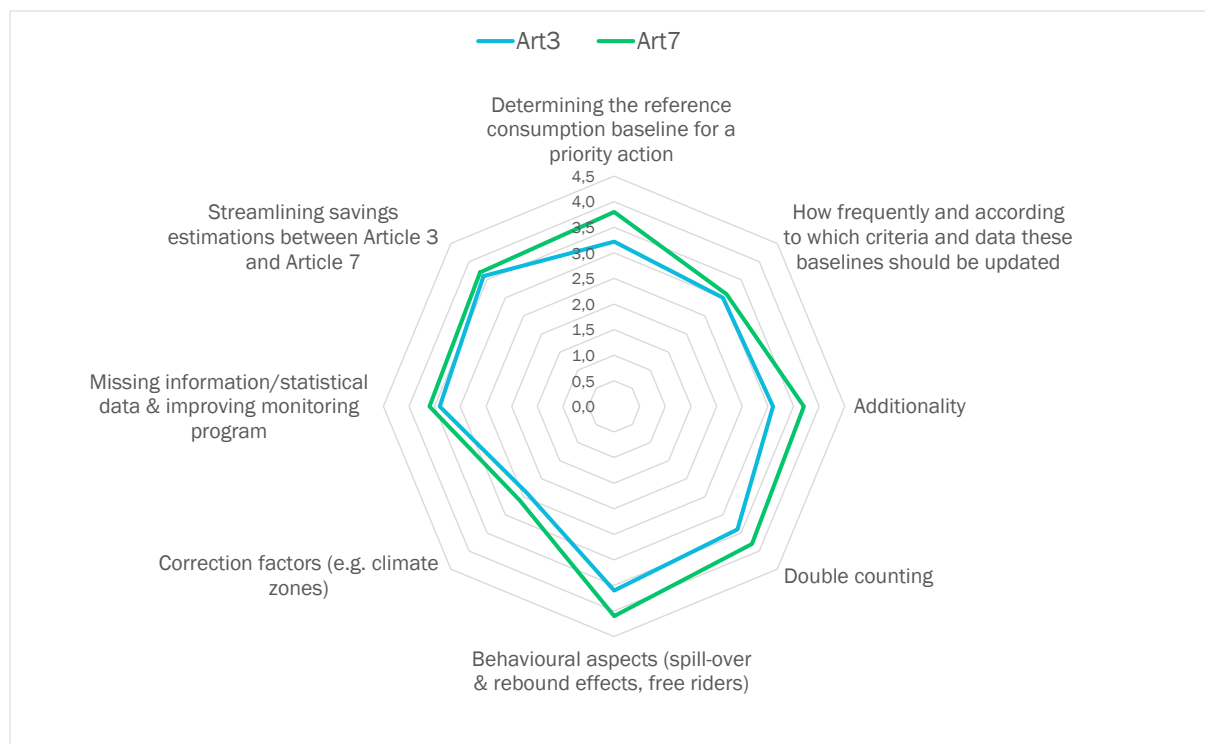


Figure 17: MS needs rating regarding Article 3 and Article 7 methodological areas

Article 7 raised a slightly higher interest in all provided methodological areas particularly to those aspects related to Annex V⁷ and Article 24 of the Directive. Behavioural aspects (spill-over, rebound effects, and free riders), double counting, additionality, and determining the reference consumption seem to be the topics with a higher interest in receiving support, as presented in Figure 18. Regarding Article 7, the topic with the highest score, and therefore the highest need for support is behavioural aspects, which is in line with the information gathered during interviews in partner MS, through which it has been found that implementing authorities have difficulty in assessing these factors.

⁷ Annex V Common methods and principles for calculating the impact of energy efficiency obligation schemes or other policy measures under Articles 7, 7a, and 7b and Article 20(6).



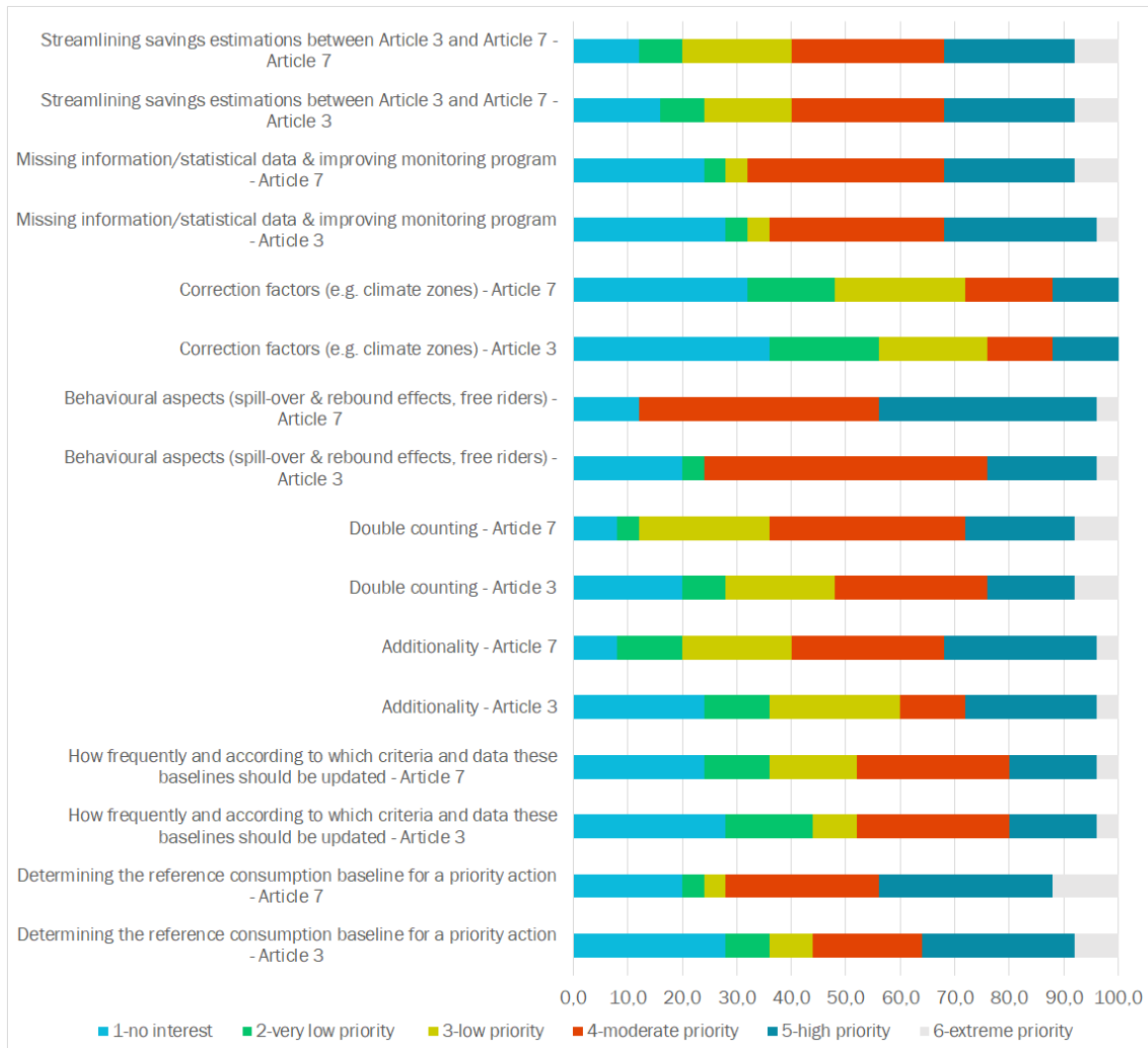


Figure 18: Level of interest in receiving one-to-one technical support with BU calculation methodologies

Regarding the support MSs prefer on specific methodological issues, stakeholders - even those with a lot of experience in preparing standardized calculation methodologies – raised the following topics of interest during the interviews:

- Energy savings versus final energy savings: Concerns about correctly differentiating between primary and final energy savings. Some actions/measures are very relevant to improving energy efficiency but are not eligible under Article 7 (for example, energy recovered that is fed into a grid, cannot be considered final energy consumption).
- BU calculation methodologies and parameters are missing to evaluate savings in a simplified, yet accurate manner, on switching from one energy carrier to another (for example, heat pumps and electric vehicles).
- Data availability, collection & monitoring still encounter challenges that need to be tackled by MS. Lack of data or poor-quality data, coherence between Article 7 and governance reporting requirements, baseline definition, etc., are lacking or are not always aligned with EU standards (or benchmarks).



- The link with Eco-design, building regulations, the EU standards on vehicle emissions and other EU legislation, to ensure that the additionality and materiality criteria are being applied correctly, is an important topic for discussion.
- The consolidation between bottom-up and top-down calculation methodologies: increasing transparency by building guidance on how to consolidate both types of methodologies, is preferred by multiple stakeholders. This guidance can avoid that MS efforts in implementing EED rules are considered ineligible.
- avoid double-counting the savings: solutions to efficiently detect double-counting need to be available to help MS to allocate energy savings to the appropriate measures.

3.10 Knowledge Exchange

This chapter is focused on the Knowledge Exchange Facility which is based on peer-to-peer dialogues and activities to facilitate experience sharing among the Member States. Besides delivering tailored peer-to-peer dialogues, streamSAVE aims at creating expert communities to discuss technical and economical details about Priority Action types in relation to Article 3 and Article 7. Acknowledging the resources limitations of stakeholders, streamSAVE focuses on online exchanges, nevertheless still providing the opportunity for face-to-face workshops.

Concerning the willingness to participate in peer-to-peer dialogues to share knowledge, discuss and reflect on streamlined calculation methodologies, the survey participants were asked to rate the following peer-to-peer activities (scale from 1 (not willing) to 6 (yes, for sure)):

- Consult resources available online (e.g. examples of calculation methodologies, set of values documented with sources)
- Attend webinars where experience from other Member States is presented
- Attend online workshops where technical or methodological issues on the identified Priority Actions can be discussed
- Attend face-to-face workshops where technical or methodological issues on the Priority Actions can be discussed
- Take part in technical or methodological discussions in a secured online forum
- Consult resources available online (e.g. examples of calculation methodologies, set of values documented with sources)

The results of the online survey indicate that STK1 have a strong interest to participate in online activities to discuss issues or good practices with peers, as presented in Figure 19. The interest to participate in an online forum is rather low.



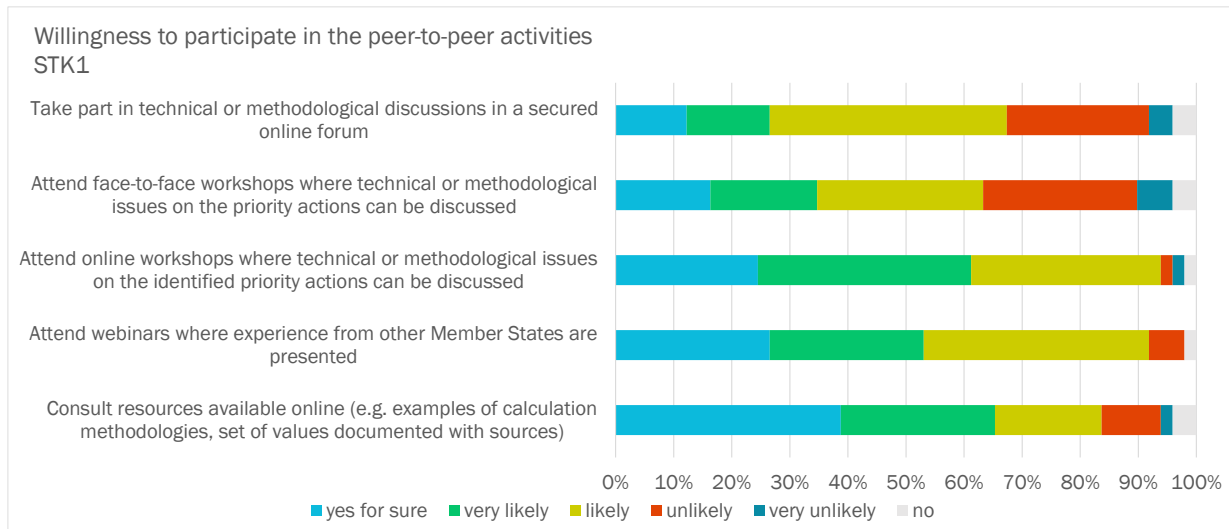


Figure 19: Interest of STK1 according to the order of willingness, to discuss issues or good practices for specific Priority Actions with peers

The willingness of STK2 to participate in the peer-to-peer activities is aligned with STK1 in what concerns the rates of willingness by type of knowledge sharing, but less pronounced, as presented in Figure 20.

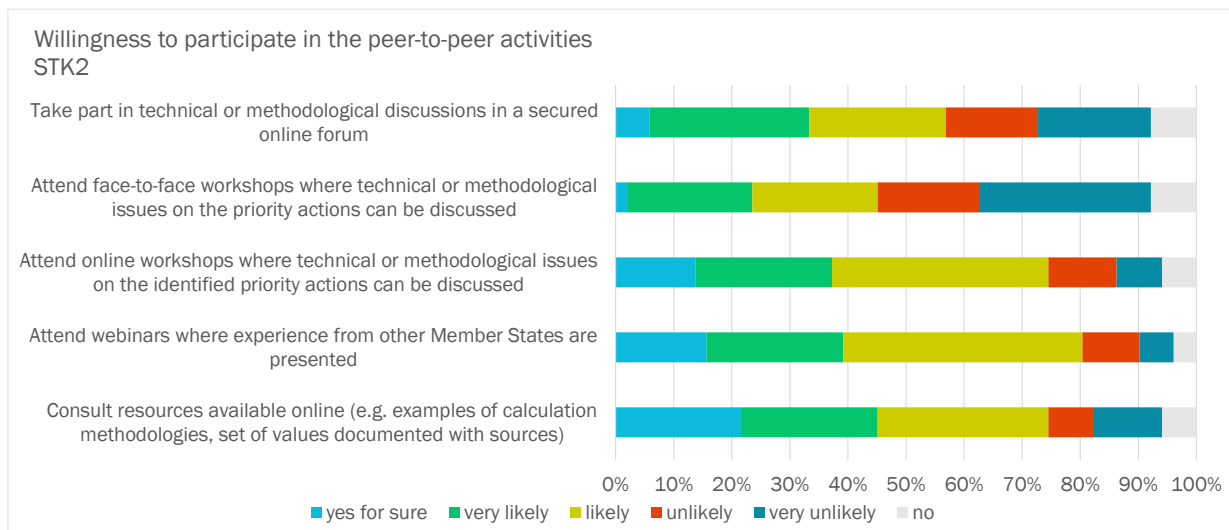


Figure 20: Interest of STK2 according to the order of willingness, to discuss issues or good practices for specific Priority Actions with peers

Figure 21 presents a comparison of the interests of the different stakeholder groups. The results presented are weighted average values per number of replies in each rating level (1 to 6), for the 112 survey replies collected.



Figure 21: Stakeholders willingness in in taking part in peer-to-peer discussions on BU calculation methodologies

While STK1 (a more homogeneous group) rated the several peer-to-peer activities higher, STK2 (a more eclectic group) rated the options lower. Nevertheless, as was expected in the amid of Covid, both groups are more interested to participate in online resources rather than face to face activities. Surprisingly, in some countries where traditionally there is more experience, the interest to take part in online forums ranked quite low. It should, however, be noted that the number of replies in some countries was too low so we cannot infer the country's interests with accuracy.

From the interviews carried out, it was noticed that implementing authorities having less experience see these knowledge sharing activities among MS as very important and needed. The tailored support provided by streamSAVE is like a balm for several countries, when new measures/actions have to be designed in the near future, when energy efficiency funds are planned to be implemented, and when the revision of calculation methods is underway, etc. The revision of the EED, the new reporting period, the time horizon of 2030 for ambitious targets, new technologies being incorporated into the plans, etc., constitute major drivers for raising interest in the knowledge sharing activities.





Chapter 4 Second round stakeholders consultation results

In the second part of the project, from March 2022 onwards, **the project will target a new set of Priority Actions that need to be identified based on the stakeholders' needs.** Therefore, a second round of consultation aiming to identify the new set of Priority Actions was launched. This consultation benefits from the experience gained in previous consultations as well as from the several activities carried out during the first part of the project, namely dialogue meetings, advisory board meetings, internal meetings and public webinars. This second round process was, therefore, less intensive and even though the 2nd round of online survey addressed all EU Countries, more emphasis was given to countries already involved and engaged with the ongoing project activities.

Over couple of months, there was a selection process running to define a short-list of possible Priority Actions for the second round of PAs. The streamSAVE's online survey from October 2020 (first round) already indicated the first set of technology groups that public authorities would strongly welcome the development of standardised calculation methods for this second round (Figure 14). This input, gathered in the first round, was the basis to identify the list of options to be included in the second stakeholders consultation survey carried out in the middle of the project. In addition to this input, a desk research to better understand the current needs among MS, taking into consideration the energy and climate challenges ahead, as well as revision of the state of the art, technology developments and the regulatory frameworks (fit for 55, etc.), has been carried out. In parallel, the Advisory Board was consulted for recommendations, and their guidance and suggestions were also considered. This wider assessment to identify existing needs was then streamlined in the short-list of seven priority technology groups, as presented below. This list was the starting point for designing the second survey which would guide understanding the actual scope of the main issues being faced by the stakeholders.

The **short-list of seven actions** presented in the second online survey is listed below. In the survey, stakeholders could rate their interest in each of the actions. For each of the actions, a list of possible options was offered regarding the scope of the action, so stakeholders could already indicate, in the survey, which options they prefer. Based on the results of this online, feedback survey, a decision on the new 5 Priority Actions for the second round, as well as on their scope, was identified.

- **Small-scale renewable, central space heating (incl. hot water)**, such as heat pumps, solar thermal and biomass boilers in (non-)residential buildings
 - o Residential heat pumps (air/ground/water)
 - o Non-residential heat pumps (air/ground/water)
 - o Residential & non-residential solar thermal
 - o Residential & non-residential biomass boiler
 - o Switch to low-temperature district heating fed by collective RES heating (heat pump/solar boiler/biomass)
- **More efficient space cooling**, comprising active and natural cooling in (non-)residential buildings
 - o Residential sector (active cooling via heat pumps ground/water, natural cooling techniques)



- Non-residential sector: natural or passive comfort cooling
- Non-residential sector: active comfort cooling
- **Small and medium data centres**, having a size up to 5.000 m² and 300kW IT power
 - IT equipment and services (e.g., hardware, software, data management)
 - Cooling (e.g., air flow management, cooling management, free cooling, air conditioners, waste heat recovery)
 - Data centre power equipment (e.g., interruptible power supplies, power distribution units, cabling)
- **Actions to alleviate (also) energy poverty**: development of standardized savings methodologies & indicative values to comply with EED Art.7(11) reporting requirements. These will be illustrated with streamSAVE's Priority Actions, being relevant for vulnerable consumers, such as BACS, RES heating or cooling.
- **Accelerated replacement of inefficient electric motors** in industry and tertiary sector: Motivating the early replacement of old IE0 and IE1 electric motors with high efficiency IE3 and IE4 motors would generate significant eligible energy savings, by applying the Eco-design regulations.
 - Replacement of motors in industry
 - Replacement of motors in non-residential buildings
 - Upgrade of motor systems with variable speed drives
- **Behavioural changes** resulting from feedback about energy use or tailored advice toward households
- **Modal shift for freight transport**: from road to rail or waterways
 - From road transport to rail
 - From road transport to inland waterways

4.1 Online survey

After presenting the needs assessment carried out in the first round, this chapter presents the main results of the stakeholders consultation running from December 2021 to the end of January 2022, based on the annual feedback survey which aimed to collect stakeholders' feedback on streamSAVE activities and collect suggestions for the foreseen future activities. The chosen format was an online survey, set up in SurveyMonkey.

Annual feedback surveys among the Priority Action dialogue groups and working groups aim to evaluate how well the issues and needs of the key stakeholders have been addressed, how easy-to-use the newly developed streamlined calculation methods are, how the use of the platform is experienced, and whether the MS plans any actions as a result of streamSAVE's work. In addition, the opportunity is taken to **get a better insight into the needs and priorities** regarding calculation methodologies, which will serve as input for deciding on the **second round of Priority Actions**.

The survey aimed primarily at national (and regional) authorities and their energy agencies who are responsible for implementing measures and policies to achieve the national targets established by the Energy Efficiency Directive, in their role as both supervisory and implementing bodies. In addition to public authorities, technology group experts such as standardisation bodies and knowledge institutes, having expertise in energy savings





evaluations related to energy efficiency actions and demand side management, are also relevant stakeholders as they have a significant role in helping understand how technology develops and what is the potential for addressing innovation in energy policy making, and therefore they have also been approached.

The questionnaire was comprised of a series of multiple-choice and free text questions. The survey was designed in such a way that questions are filtered based on stakeholders answers and interests. Unlike the first survey, carried out early in the project mainly to validate the PA identified in the proposal, this questionnaire aimed to identify the Priority Actions for the next round; next to that, the survey aimed to evaluate how stakeholders appreciated the activities already organized during the first 18 months of the project duration and to collect suggestions for improving the activities to be carried out in the future, so that these are aligned with their expectations and needs.

The survey comprised 20 questions and covered the following topics:

- Who is the respondent: Organization and responsibilities
- Feedback on streamSAVE dialogues (*only to complete if a participant of dialogues*)
- **Second round of Priority Actions:** (*for all stakeholders invited to complete survey*)
 - o In which actions is the respondent interested; and,
 - o Clarifying the scope of these actions
- Feedback on Capacity Support Facility CSF: (*only for participants of working groups*)
 - o Short evaluation of the support they have received; and,
 - o What are possible cases for support during the second round of Priority Actions

4.2 Timeline

The consultation process in the Second Round was open for a shorter period, namely from 01/12/2021 to 30/01/2022. The online survey has been shared with the streamSAVE stakeholders, among which the Priority Action dialogue groups and working groups. Three reminders have been shared along the process, as the response rate was initially considered too low and therefore some strategies to get more replies were established, which included sending personalised messages from partners by email to their stakeholders, looking for and sharing other contacts to approach, in particular in potential replication countries, use existing networks to pass the word and telephone calls when possible and convenient. It was possible to collect 54 valid replies. Each partner contacted stakeholders already involved in the CSF to stress the importance to obtain their replies to help the selection of the new PAs.

4.3 Survey questions for the second round of Priority Actions

The feedback survey was initially designed by VITO (in close collaboration with ECI and ISR), and all partners could give input. The questionnaire is comprised of a series of multiple-choice and free text questions. The survey is designed in such a way that questions are filtered based on the answers and interests (the type of organisation and responsibility regarding Article 3 and Article 7 of EED).



Within the scope of the second round of Priority Actions and streamSAVE objective to streamline and improve the energy savings calculation methodologies, the survey questions were split into the following headings:

- Understanding the actual scope of stakeholders' needs
- Understanding the interest of key stakeholders (public authorities implementing, managing, or administrating EED) in receiving one-to-one technical support during the second round of Priority Actions

The list of questions aimed at assessing the stakeholders needs for the second round is shown in Table 6.

Table 6: Questions used in the 2nd round of Priority Actions

Organisations and Responsibilities			
	Stakeholder identification		
1		What describes best the type of your organization?	drop down
2		What is the responsibility of your organisation concerning EED implementation?	multiple choice
3		What are your main responsibilities in relation to Article 3 and Article 7 under the Energy Efficiency Directive within your country? (tick as many as applicable)	multiple choice
Second Round of Priority Actions			
	Understanding the actual scope of the stakeholders needs		
11		Please rate, according to the needs in your country, the importance of energy savings calculation methodologies for the seven, following actions	Scale each option
11a		Looking at the actions you rated very to extremely important, what are the reasons for your high interest in getting more guidance on calculation of energy savings?	open question
12		For these actions you rated very to extremely important what is the scope of these actions you are mainly interested in?	Select 1 up to max. 3 options
Support on the second round of Priority Actions			
	Standardized calculation methodologies for the second round		
18		Having upcoming EED reporting improvements or policy developments within your country in mind, for which of the following priority Actions would you be interested to receive support?	Indicate max. 3 options
19		Please indicate which type of support would be of most added value for EED implementation within your country ?	Multiple answers possible
20		Are there policy developments within your country for Article 3 and or Article 7 of the EED where you would appreciate streamSAVE's support? Would it be possible to clarify the support you would like to receive (i.e. policy context of the savings action and your preferred support)?	Free text

Regarding the scale to rate the different topics according to the level of preference or priority, a 1-6 rating order scale was used to avoid using the middle term of a Likert-scale and allowing easy and comparable analysis of results. The questions were phrased to allow for responses to be scaled, according to the definitions listed below:





- 1= not at all important (negligible) / No interest
- 2= very low importance (not relevant) / Very Low Priority (Lowest Priority)
- 3= low importance (on my list but like a c-priority) / Low Priority
- 4= moderately important (on my list after the top issues) / Moderate Priority
- 5= very important (among top 3 priorities) / High Priority
- 6= extremely important (must have, top priority) / Extreme Priority - Top Priority

4.4 Interview respondents

Despite all the efforts made while the survey was running, the second-round online survey cannot be considered as representative and statistically significant sample of the EU situation. Nevertheless, 63% of all replies collected (34 in a total of 54 responses) are from entities categorised under Implementing Public Authority, which is the main target stakeholder group of streamSAVE. These entities are mostly policymakers with some responsibility in relation to Article 3 and Article 7 implementation. The other stakeholders who answered the survey are also relevant for streamSAVE, mostly scientists and researchers, who are highly knowledgeable and have a strong interest in these matters as they are giving consultancy to their national agencies.

Table 7: Type of respondents for feedback survey

Type of organisation	N° of replies
Implementing public authority	34
Energy Agency	16
Public authority: Ministry/Member State Officials	10
Other public Authority/Administration	6
other (please specify)	2
Other organisations linked to EED	20
University/Research Institutions	10
Technical associations	1
Regulatory body	1
Retail Energy sales companies	1
Standardisation body	1
other (please specify)	6

4.5 Main findings of the second round of Priority Actions

The findings herein presented were developed based on the results of the online survey targeting all EU countries and key stakeholders that replied to the questionnaire for selecting the Priority Areas for the second round.

The first question included in the survey, which was related to the second round (Q11 “Please rate, according to the needs in your country, the importance of energy savings calculation methodologies for the seven, following actions”), was asking stakeholders to



rate the importance of energy savings calculation methodologies for the seven technology groups listed above, providing six possible reply options, what can be translated into the overall interest that stakeholders have on each technology.

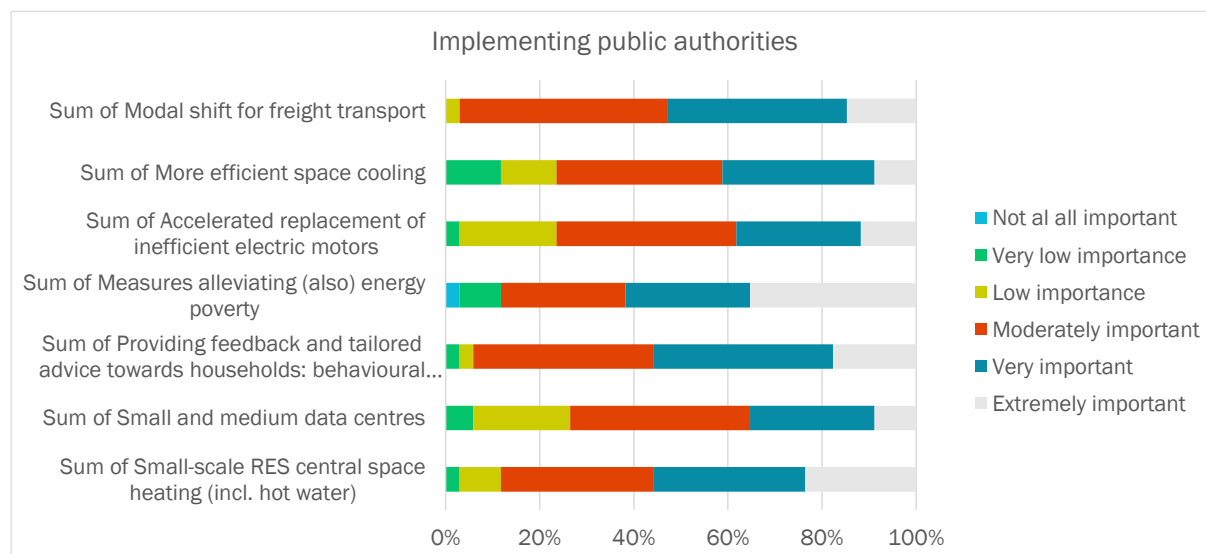


Figure 22: Share of replies for each action according to importance in group "implementing public authorities (STK1)"

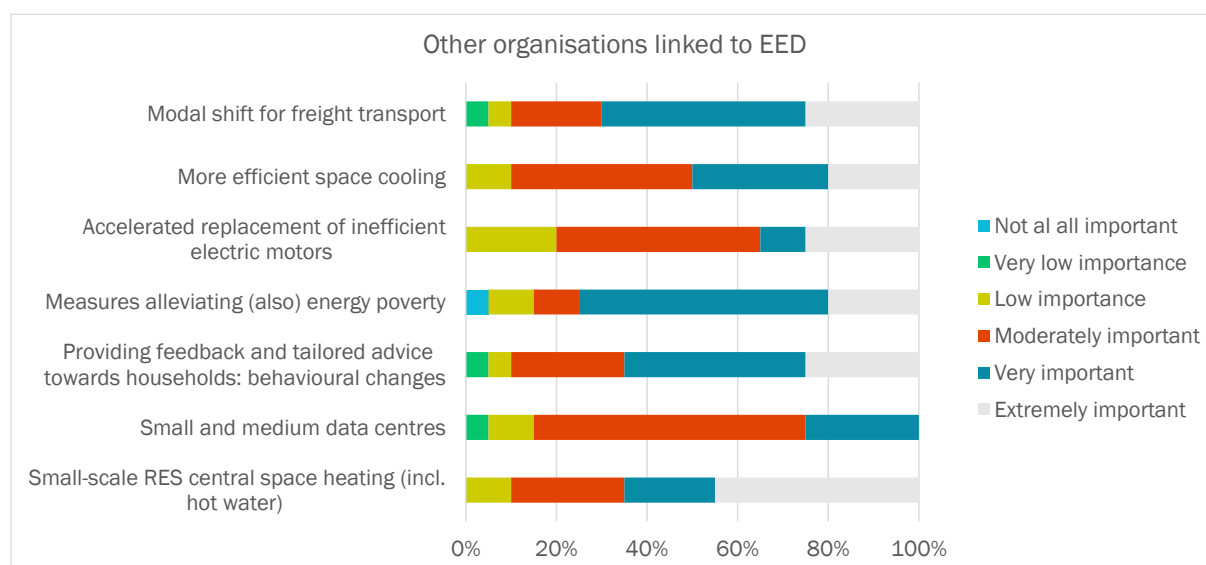


Figure 23: Share of replies for according to importance in group "other organisations (STK2)"

When rating the options with one to six points (from 0% to 100%), the total score reached by each option can be compared for the most relevant stakeholders for streamSAVE. The evaluation of the rating of the PAs according to the needs of stakeholders in stakeholder group 1 (Figure 24) ranked highest (with an average of 74.1) for the action 'measures alleviating (also) energy poverty'. For the topics 'small scale RES', 'providing feedback' and 'modal shift' yielded an equal interest with an average score of 72.9.



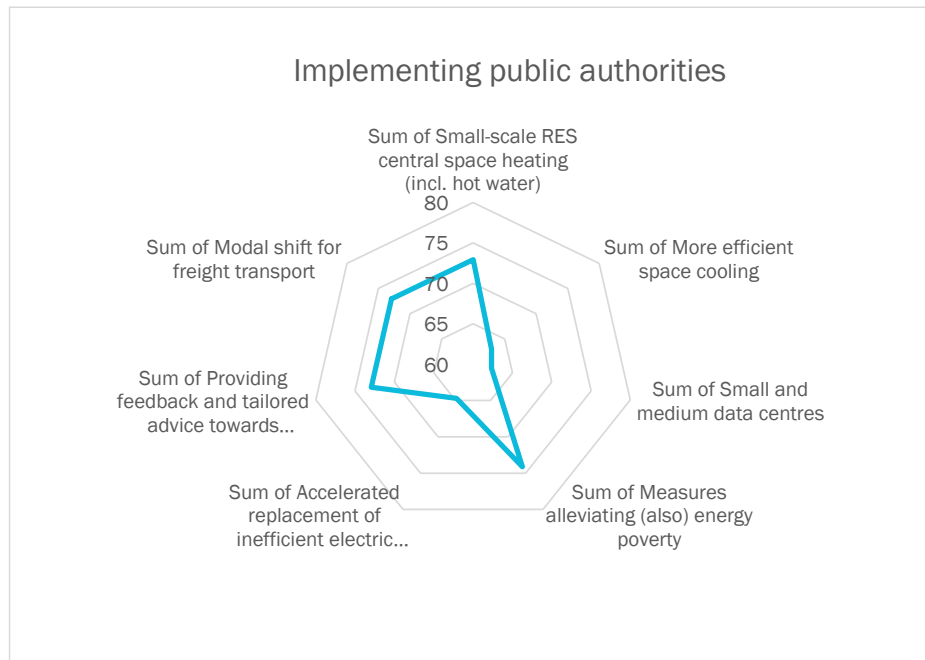


Figure 24: Rating of actions according to importance in group “implementing public authorities (STK1)”

The same evaluation for stakeholder group 2 (Figure 25) yields slightly different results, with the action of ‘small scale RES’ ranking highest with an average of 80, followed by ‘modal shift’ (76) and ‘providing feedback’ (75).

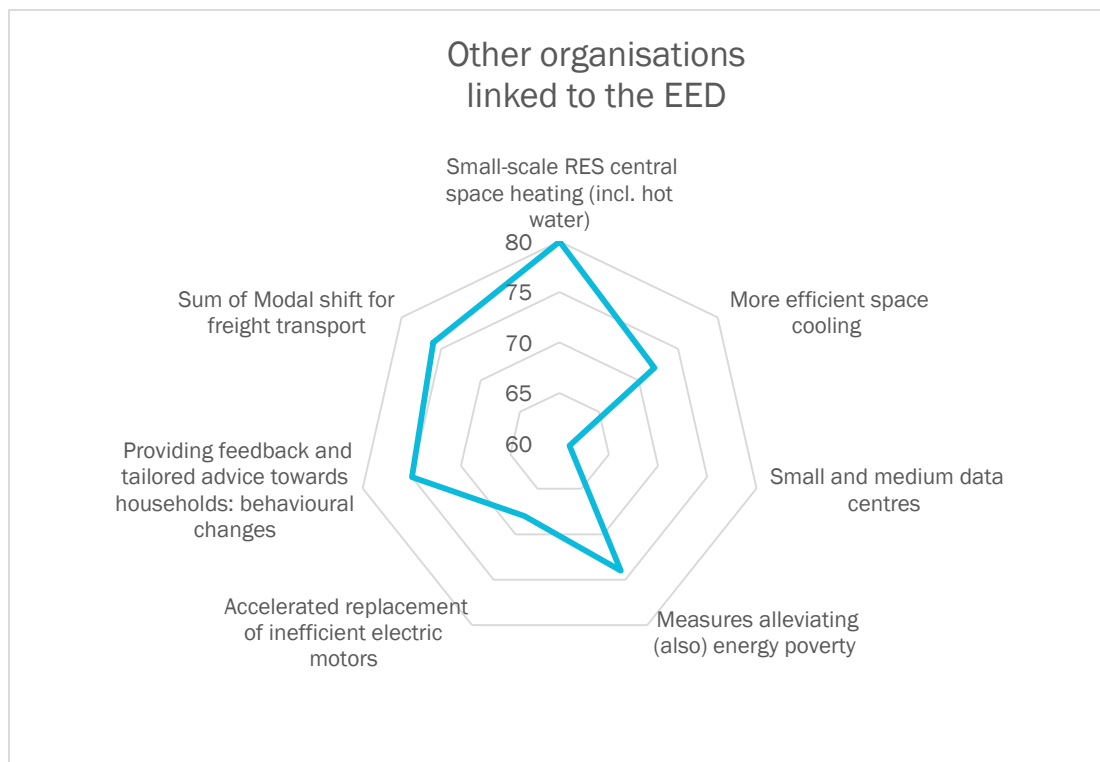


Figure 25: Rating of actions according to importance in group “other stakeholders (STK2)”

So, as a result, looking at the top-five for the main target group of streamSAVE, namely Implementing Public Authorities, the following actions emerge: 1) The measures to



alleviate energy poverty scores the highest (74); 2 – 4) The actions ‘small scale RES’, ‘providing feedback’ and ‘modal shift’ yielded an equal interest with an average score of 73; 5) Accelerated motor replacement is the fifth ranked option (65). Therefore, it has been decided that this the following list of actions **will constitute the second round of five Priority Actions** for which streamSAVE will provide support towards Member States:

- Measures alleviating (also) Energy Poverty
- Small-scale RES central space heating (incl. hot water)
- Providing feedback about energy use and tailored advice toward households: behavioural changes
- Modal shift for freight transport
- Anticipated motor replacement

Despite efficient space cooling and data centers scored still relatively well and play an important role in the fit-for 55 package, these actions should not be the target for developing new BU methodologies as they overlap with the first round of Priority Actions heat recovery and refrigeration, respectively.

Due to the relatively reduced number of replies, particularly in some countries, and the weak sample representativeness, care should be taken on what order of priority should be given to the Priority Actions under evaluation. To get a better understanding of the existing needs for the second round of activities, complementary information beyond the online survey is provided in the next section to reflect the existing knowledge and importance of the selected actions.

4.6 Other studies strengthening and supporting PA selection

The main criterion for the selection of the PAs was demand driven, to ensure we are addressing stakeholders’ needs and tackling the existing major gaps regarding the implementation and monitoring of EED. However, due to uncertainty in the survey results (low representativeness for some Member States), care should be taken on the order of priority of the Priority Actions under evaluation. Therefore, other recent studies were also taken into consideration to better understand the actual scope or the issues MS are facing.

The world’s first comprehensive study (IEA, 2021) of how to transition to a net-zero energy system by 2050 while ensuring stable and affordable energy supplies, providing universal energy access, and enabling robust economic growth was launched recently by the IEA. It sets out a cost-effective and economically productive pathway, resulting in a clean, dynamic and resilient energy economy dominated by renewables like solar and wind instead of fossil fuels. It also pointed out that scaling up energy efficiency improvements is among the key solutions. The report is a clear indication that Governments need to set near-term milestones to get on track for the long-term targets. On a global level, IEA presents the pathway to net-zero, detailing more than 400 sectoral and technology milestones to guide the global journey to net-zero by 2050. In the next graph, the key milestones for each sector are indicated, including the electrification of the transport sector, electric motors in industry and heat pumps.



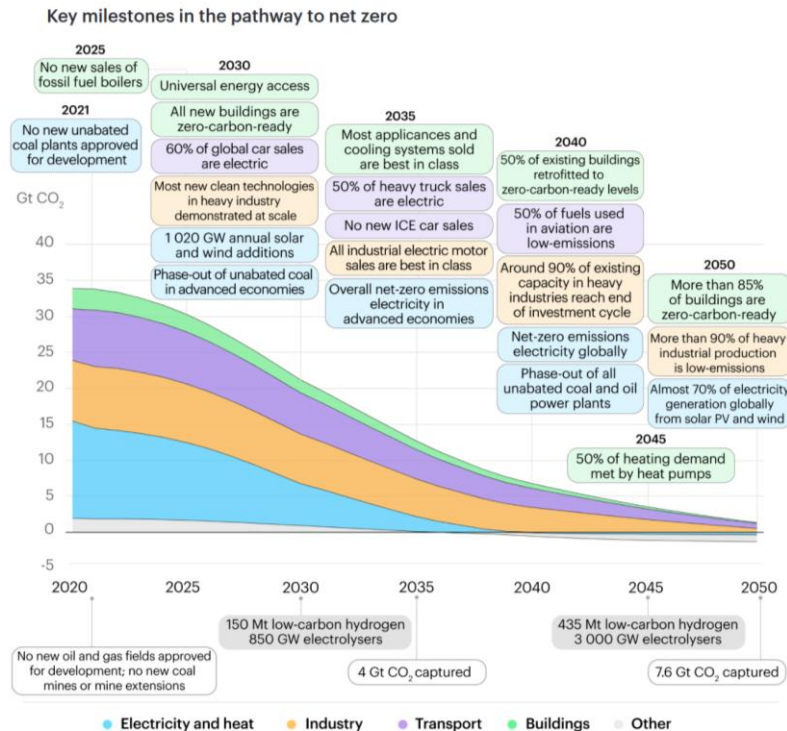


Figure 26: Key milestones in the pathway to net zero (IEA, 2021)

The selected actions make special sense in the context of the increased European ambition set by the “Fit for 55” package, which requires a maximum final energy consumption of 787 Mtoe/year by 2030. However, a number of gaps have to be addressed, such as: the exchange of insights and sharing of best practices within and across Member States; the design of effective policies; the monitoring and evaluation of policy implementation; the development of easy and streamlined savings calculation methodologies; and the integrated collection of data, verification, monitoring, evaluation and reporting. These gaps could be addressed through a coordinated action with the key stakeholders and national energy agencies within the streamSAVE project.

Moreover, the identified Priority Actions are aligned with the existing need to saving energy, to reduce the EU’s dependence on fossil fuels. For example, experts have long been announcing heat pumps (Rosenow and Gibb, 2022) as one of the main solutions for tackling the carbon emissions associated with buildings heat demand. Yet sales of the technology often likened to a fridge running in reverse, have remained low in many countries. Suddenly, there is a war in Europe that is jeopardizing the gas supply for many households. Meanwhile, a new Intergovernmental Panel on Climate Change (IPCC, 2022) report was released which notes that “*any further delay in concerted global action on adaptation and mitigation will miss a brief and rapidly closing window of opportunity to secure a liveable and sustainable future for all.*” When the electricity used to power a heat pump is produced from low-carbon sources, the heat can also be considered as low carbon. Due to the forementioned technology properties, the heat pumps are considered as a key technology in most pathways to net-zero.



4.7 Specific concerns related to the Priority Actions for the Second Round

To better understand stakeholders' choices and the rationale behind the rating that was given, Q11 a), an open qualitative question, asked about their reasons for their rating rationale. The stakeholders had the opportunity to indicate the reasons for their interest in getting more guidance on the calculation of energy savings for the PAs rated very to extremely important. An overview of the replies for each action was aggregated and is presented below.

4.7.1 Small scale RES central-Space heating (inc. hot water)

In face of high energy bills and awareness of the urgent need for building renovation, stakeholders are very concerned with the heat losses due to low rate of buildings and systems retrofits for many years. Audits being carried out in buildings usually identify high potential energy savings from the replacement of existing heating systems with more efficient ones. However, there have not been real incentives to overcome existing hurdles. Measures addressing heating systems tackle the reduction of final and primary energy use, as well as the buildings' decarbonization at the same time, decreasing the fossil fuel dependency.

The main drivers for stakeholders' interest are related to the new requirements for buildings, in particular EPBD and nZEB, to achieve energy efficiency reduction targets, particularly related to article 7 EED measures, and measures to alleviate energy poverty, as well as to achieve climate neutrality. It was also mentioned the need to promote heat pumps and show their good performance with evidence-based cases.

4.7.2 More efficient space cooling

Besides the concerns with legal requirements (EPBD, RESD, EED, ...), space cooling is gaining more importance as the living standards increase and climate change is changing the climate conditions increasing air temperatures in many regions, including the northern countries. Cooling demand is expected to have a rising trend in the future, so more efficient space cooling, based on RES electricity, will play an important role to reduce energy bills and CO₂ emissions, while increasing indoor comfort. Although cooling needs are increasing, there is regularly no methodology or data (energy use and cooling degree-days) available. This methodology could reduce the need for monitoring and verifications services in implementing EED.

4.7.3 Small and medium data centres

As a growing load, small and medium data centres are recognized as an important load for increasing energy efficiency. Moreover, the recast of the EED sets a focus on data centres recognizing their high potential for energy savings. Our respondents indicate the need for specification of energy consumption and analysis of energy efficiency measures in these loads, as well as the development of a methodology to evaluate the energy savings. There were also specific concerns, namely:

"Small and medium ones are less efficient than large ones, i.e. should be targeted. But how to overcome data challenges?"

"Looking at the development of such data centres we should develop an offer to accompany actors in this environment."





4.7.4 Measures alleviating energy poverty

Besides the legal requirements imposed by the recast of EED to implement measures tackling energy poverty under Article 7, this was probably the hottest topic, because of the high impact of the increasing energy prices on the most vulnerable households. Supporting low-income households and improving thermal comfort seems to be a major concern among stakeholders. Moreover, there is no definition of energy poverty at the EU level and establishing some methodologies to evaluate energy savings is much appreciated. Energy poverty is high on the energy agenda of all countries, particularly in eastern and southern countries.

“Currently there are no specific policies in place targeting energy poverty but there is a specific requirement for the EEOS to implement measures for energy poor/vulnerable consumers. It would be very important to see practices for such measures and most importantly how the savings can be calculated.”

“Measures with multiple benefits are more relevant than others in my view”.

4.7.5 Accelerated replacement of inefficient electric motors

Replacement of inefficient electric motors would be an excellent measure in the industrial sector because there is a high potential for installed old inefficient motors to be replaced by more efficient ones bringing significant amounts of energy savings at interesting cost/benefit ratios, with short paybacks. Moreover, the multiple benefits of this measure are vast and well known: reduced maintenance, reduced downtime, increased productivity and better process control in many situations when associated with a Variable Speed Drive or digitalization. The accelerated replacement of inefficient electric motors - before the Eco-design legislation enters into force - will make additional savings eligible for the EED.

4.7.6 Providing feedback and tailored advice towards households: behavioural changes

Because of Eco-design regulation that already establishes minimum energy efficiency requirements in most appliances, there is a growing interest in behavioural changes to reduce energy consumption in the residential sector. However, evaluating the effect of behavioural change interventions on energy consumption is a major challenge. Stakeholders are very interested to understand possible means to design and evaluate behavioural change programmes. Stimulating households to save energy with behavioural change is an opportunity for yielding energy savings as many households have no idea of the impact of their own consumption.

“It is therefore very important for us to know the real impact of behaviour change. It is also important to know which energy saving tips are most affecting energy consumers, or affect them at all. There is a need to learn about possible ways to calculate potential savings, ways to measure actual energy savings.”

“Is always a difficult topic to monitor, given the complexity of different situations.”

“Very important that consumers know the impact of behaviours in energy consumption.”

4.7.7 Modal shift for freight transport

Mobility is probably the most important issue in frame of the energy transition and electrification. This particular action, modal shift for freight transport, gained the attention from the policy makers, because of the growing energy demand area that the pandemic has strengthened. The transport sector has the highest share in final energy consumption



(Odyssee-Mure, 2022), and a modal shift for freight transport could contribute to significant savings. In some countries, the rail system has been systematically neglected in the past decades, and needs significant investment. Besides energy savings, other benefits would be road congestion reduction and emission reductions. Overall, since electrification of freight transport should be happening at a rapid pace, sharing information on this energy transition is well seen and most welcome by respondents. Energy saving actions in this sector are challenging to evaluate and there are only a few methods available. Stakeholders expect streamSAVE to create the conditions for sharing knowledge and contribute to developing BU methodologies for the freight sector.

4.8 Scope of the second round of Priority Actions

For the development of BU methodologies, a clear understanding of the scope of each Priority Action is of major importance. For those actions rated very to extremely important by the key stakeholders, they were asked about the scope of the action they are mainly interested in. Stakeholders could select 1 up to max 3 options of the set of options that was provided for each action, as presented in the next Table.

Table 8: List with the potential scope of the actions

PA	Scope PA
Small-scale RES central space heating, incl. SHW	Residential heat pumps (air/ground/water)
	Non-residential heat pumps (air/ground/water)
	Residential & non-residential solar thermal
	Residential & non-residential biomass boiler
	Switch to low-temperature district heating fed by collective RES heating
	others
More efficient space cooling	Residential sector
	Non-residential sector: natural or passive comfort cooling
	Non-residential sector: active comfort cooling
	others
Small and medium data centres	IT equipment and services
	Cooling
	Data centre power equipment
	others
Replacement of electric motors	Replacement of motors in industry
	Replacement of motors in non-residential buildings
	Upgrade of motor systems with variable speed drives
	others
Modal shift for freight transport	From road to rail
	From road to inland waterways
	others





The results obtained from the survey are presented in Figure 27 which will be taken into account by the streamSAVE consortium in defining the actual scope of the second round of PA:

- Small-scale renewable central heating: the high interest of stakeholders in RES heating is also reflected in the broad scope of the action that the stakeholders are interested in. However, heat pumps (air/ground/water) in residential as well as non-residential buildings are considered as priority by the respondents.
- Accelerated replacement of inefficient electric motors: motors are responsible for 70% of industrial electricity consumption and over 35% of the electricity consumption in buildings – a figure that is growing fast due to electrification (IEA World Energy Outlook, 2016). There are many old and inefficient motors still in service. Replacing those motors with high-efficiency types would yield substantial additional energy savings and provide a significant contribution to EU climate objectives. Therefore, an equal preference was indicated by the stakeholders for the 3 options in the survey, namely motors in industry as well as non-residential buildings, besides upgrade of the motor system by variable speed drives.
- Modal shift for freight transport: stakeholders clearly prefer a focus on a modal shift of freight transport from road to rail. A modal shift in freight transport provides multiple benefits. Aside from the higher efficiency and lower emissions connected to rail transport, it reduces the volume of traffic on roads. However, calculating the effect of actions taken in this area can be complicated, as the data needed is often hard to find.

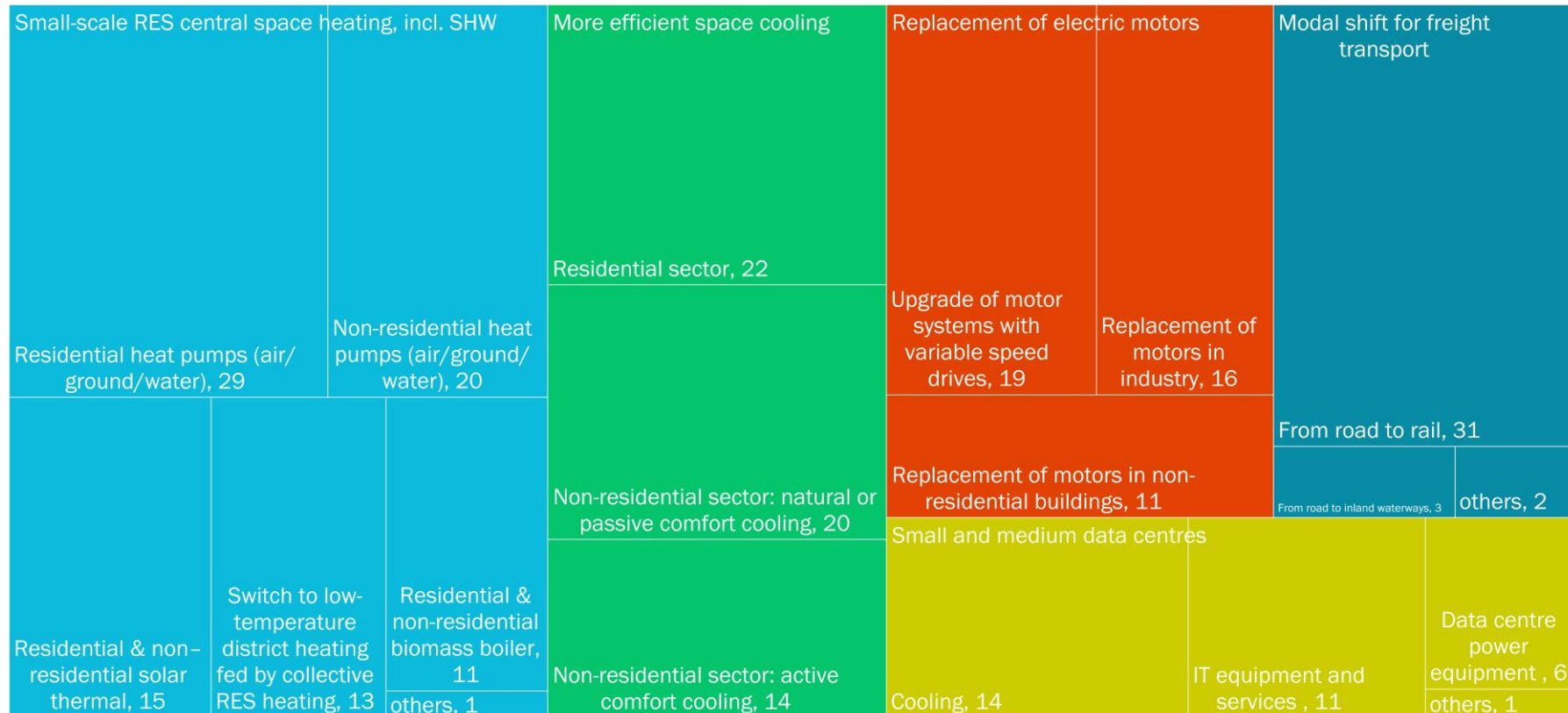


Figure 27: Scope per PA, all stakeholders



4.9 CSF Interesting Cases for the Second Round of Priority Actions

The interest in receiving technical support was evaluated in Q18 but wasn't available for all respondents. Since the Capacity Support Facility provides direct technical support to individual MS to further improve energy savings calculations under Article 3 and Article 7 of the EED, only Public Authorities, Energy Agencies and other Public Authority/Administration from the partner countries are targeted within this support. The key stakeholders were asked about which Priority Actions they are interested to receive support, having in mind the upcoming EED reporting improvements or policy developments within their countries.

When posing the question to indicate a maximum of **three Priority Actions**, in which **respondents would be interested to receive support**, the actions 'measures alleviating (also) 'energy poverty', 'small-scale RES' and 'providing feedback' make up the top three. The distribution of answers across the different options for Priority Actions is presented in Figure 28.

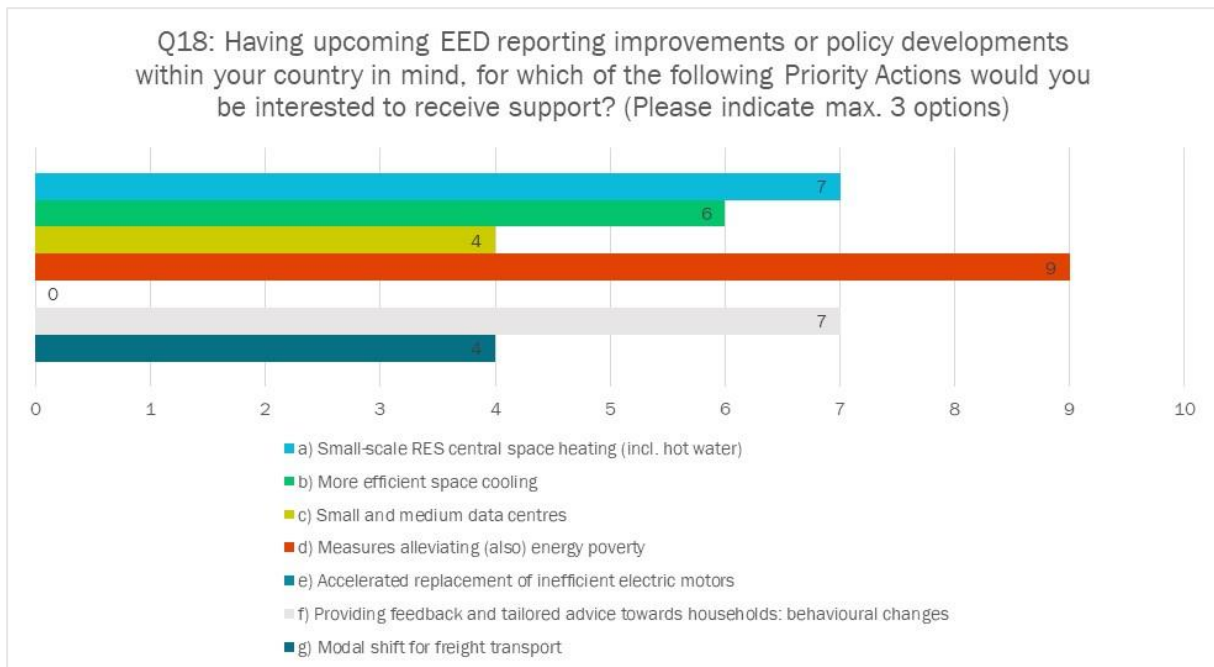


Figure 28: Rating of actions according to interest in support

According to the pure analytical counting analysis, motors do not score when the implementing authorities are asked about their interest to receive support during the second round. However, if we are selecting the PAs merely on this result the overall picture is missed, because the representativeness of the sample was not robust and it is possible to understand that people replying to the survey were not always deeply involved with the implementation of the EED article 7. Even though there is a small risk of not testing the motors BU methodology during the CSF, the evidence collected with the "other stakeholders" clearly indicates motors in the group of five Priority Areas.

Moreover, a deepen analysis of the stakeholders who replied to the survey, clearly indicates this cannot be taken as the sole criteria. It is difficult to get a strong engagement from the implementing authorities with the project activities, because they are very busy with other duties and there is a considerable lack of technical staff in the ministries. Moreover, policymakers need to better understand the relevance and the impact of the measures being implemented in the scope of their NECPs. Furthermore, unless energy efficiency long-



term comprehensive solutions are implemented, Europe's energy crisis (price and security of supply) will be recurring. In that sense, measures reported under Article 7 that offer long-lasting energy savings need to be promoted over measures that have only a short-term influence on consumer and investment behaviour.

Inefficient electric motors in industry and tertiary sector(s) remain in service for much longer than their expected lifetime. Most installed motors are IE0 or IE1, some of them having been repaired several times. This hampers the achievement of savings expected to be obtained by the application of Eco-design regulations. Motivating the replacement of old IE0 and IE1 electric motors with high efficiency IE3 and IE4 motors would generate significant energy savings, anticipating the expected savings of Eco-design regulations, that otherwise tend to be much delayed in time. Inefficient electric motors is a dynamic concept and at the present time, in the EU, inefficient motors are motors with an efficiency below IE3, but MEPS (Minimum Energy Performance Standards) are moving up in the future.

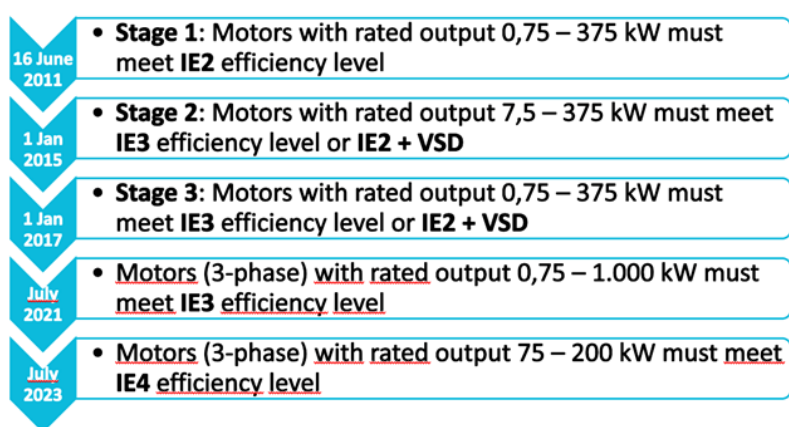


Figure 29: Enforcement dates of Ecodesign Regulations for motors (adapted from EC Regulations 640/2009 and 2019/1781)

All respondents had the opportunity to indicate which **type of support** would be the main added value for the EED implementation within their countries. *Improving saving methodologies or indicative values based on existing practices from other EU Member States* scored the highest, with 5 replies out of the eight being from main streamSAVE stakeholders, the implementing authorities. This was followed by the issue of *additionality, missing information/statistical data & improving the monitoring program, Determining the reference consumption baseline for a Priority Action*, which was mainly indicated by the implementing authorities. These results reinforce the importance of the BU methodologies being developed and the usefulness of the CSF that runs during the streamSAVE, fully aligned with the stakeholders' needs. The development of calculation methodologies to map the EE-savings of a modal shift to rail was also indicated by one respondent, in addition to the options provided. Figure 30 summarizes the results on which type of support is preferred by the stakeholders.



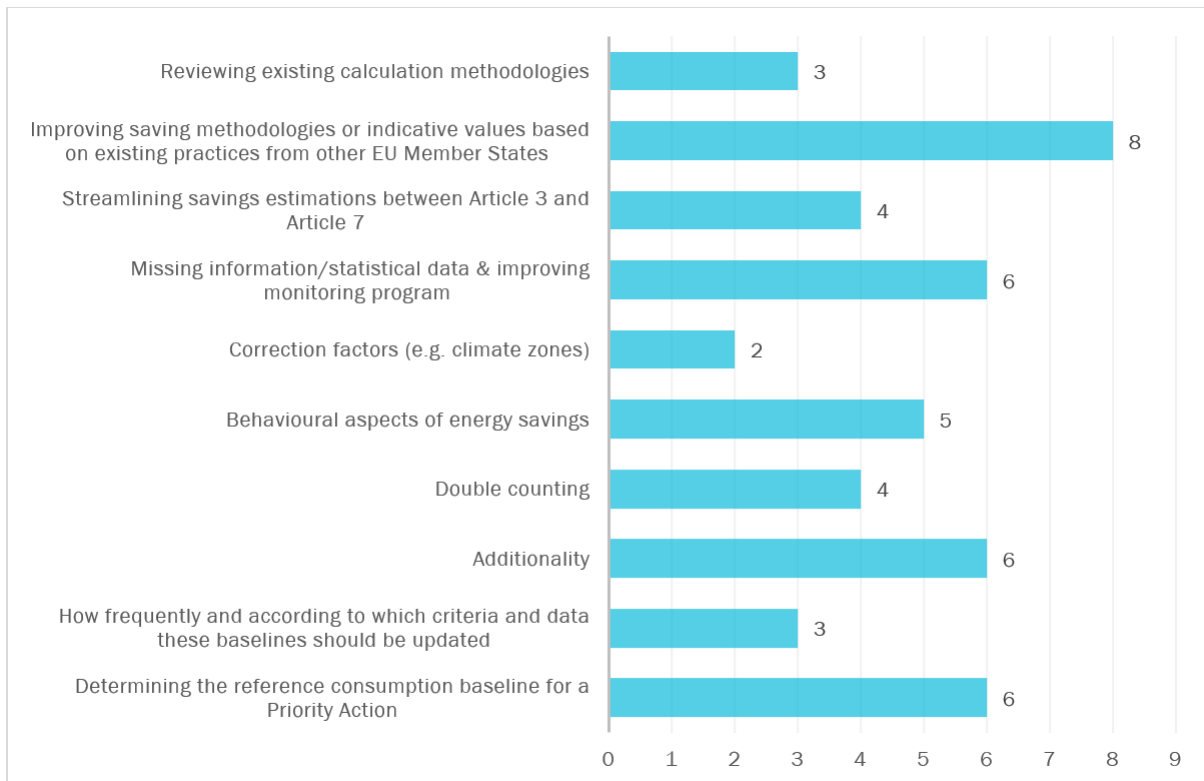


Figure 30: Support needs regarding the EED implementation

Last, but not the least, the survey asked if there are policy developments within their countries for Article 3 and or Article 7 of the EED where streamSAVE's support would be appreciated and the replies received are very encouraging for the second round. The next lines are the quotes received in the survey.

"How to systemically address energy poverty."

"The need for more and better information adapted to the specificities and vicissitudes of the outermost regions, particularly the Autonomous Region of the Azores."

"The streamSAVE project really supports the calculation work."

"Thank you very much for the capacity support. The added value cannot be underestimated."

"Compliments for your good work!"



Conclusion

This consultation (online surveys and personal interviews) allowed to collect key stakeholders' opinions, comments and suggestions in relation to the activities to be carried out in the streamSAVE project. Besides being recognized as an important initiative to help MS realize their energy-saving targets, some stakeholders were worried about the large number of similar projects being supported by EASME in H2020 programme on the same topic, and fear getting puzzled. Therefore, to avoid misunderstandings, stakeholders advised streamSAVE to build upon results and knowledge, and cooperate with existing initiatives as much as possible, such as Concerted Actions EED, EPBD & RES; ENSPOL; EPATEE; ENSMOV and Odyssee/Mure. Moreover, it was recommended that streamSAVE should build further on the revisions of EU Directives and take into consideration any findings identified in existing assessment reports.

It was generally recognized, even by countries having more experience in preparing standardized calculation methodologies, that the definition of baselines and additionality of savings are still challenging issues in the implementation of the EED. MS also indicate that the revision of the scheme for the period 2030 brings an excellent opportunity to revise and update calculation methodologies. Hence, streamSAVE capacity support and knowledge exchange activities are highly appreciated, particularly online resources and online peer-to-peer activities.

The **transport sector** is considered the most important sector to be addressed in all countries, due to the potential for achieving savings being high, and is a strategic sector for decarbonization. On top, it has not been widely addressed in previous EED reporting periods. However, it raises challenges to the baseline definition, primary and or final energy savings, additionality and double counting, free ridership, behaviour (and persistence of savings), reference values, data sources for imports and exports, lifetime, etc. Concerning the other Priority Actions, in the first round the calculation methodologies to evaluate energy savings yielded by **BACS**, were rated as a second priority by the respondents, followed by **heat recovery** (both excess heat utilization and excess heat incorporated into district heating). However in the second round, in the amid of an energy crisis and the rising prices of gas, measures to alleviate **energy poverty** were the hottest topic. Supporting low-income households and improving thermal comfort seems to be a major concern among stakeholders. In addition, and considering the urgent need for building and systems renovations, stakeholders are very concerned with the efficiency of space and water heating. Measures addressing **small-scale RES central space heating** (incl. hot water) tackle the reduction of final and primary energy use, as well as the buildings' decarbonization at the same time, decreasing the fossil fuel dependency. Stakeholders also recognize **behavioural change measures** are a good opportunity for yielding energy savings, but the evaluation of conservation behaviour is a major challenge. Last, but not the least, the accelerated replacement of inefficient electric motors before the Eco-design legislation enters into force will result in additional savings, bringing multiple benefits beyond cost-effective energy savings.

Methodological challenges arise given the technical background of the involved staff and the **complexity of the calculations** themselves. More specifically, streamlining calculation methodologies requires accuracy to characterize the complexity of the situation, and at the same time simplicity to lighten the monitoring and evaluation procedures. Those responsible for monitoring the implementation of Articles 3 and 7 of the EED and also in charge of verifying the energy-saving actions reported by obligated parties, often lack the expertise and technical background to apply complex methodologies. The preparation of





new calculation methodologies should involve technical experts, interest or advocacy groups of the relevant topic as well as stakeholders from the obligated parties, to increase the acceptance of the methodologies presented.

Concerning the additionality criteria, which was the most cited methodological challenge, the **definition of the baselines** still raises concerns regardless of the Priority Action and the country. Ensuring the baseline is correctly defined and regularly updated was indicated mostly by the stakeholders as a point of attention, as they considered as a necessary condition to accurately assess the reported energy savings.

Regarding the **data collection**, there is a lack of data in some sectors which is hindering the development of BU methodologies to estimate the energy savings. Respondents also struggle with the collection of appropriate data to fulfil the requirements of Article 7. Recognizing the challenge to reach a balance between the amounts of data to collect, and the appropriateness of the data (consistent with report requirements to verify the implemented action and costs), respondents are interested in guidance on data collection (amount, type and methodology) and technical support for calculation of baselines, and calculation methodologies for evaluating energy savings.

Stakeholders are concerned with the need to meet the targets; the assessments carried out recently show indeed MS are not coming close to meeting their current obligations (Economidou, 2020), (EC, 2020). Hence, recognizing the need to drive the implementation of more and new energy efficiency actions, as required by Article 3 and Article 7, stakeholders' willingness to cooperate with streamSAVE, certainly when they benefit from the project, is very high. The streamlining of saving calculation BU methodologies and reference values at the EU level are most welcome - as long as country-specific realities and characteristics are taken into consideration - because a lot of the companies operate in several EU countries and would benefit from a similar methodology.



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