Coordination and Support Action

H2020-LC-SC3-EE-2019

Capacity Support Facility - Activity report

Deliverable D4.3 - first PA round

Version N°2

Authors: Christos Tourkolias (CRES), Argyro Giakoumi (CRES)

with contributions from Elisabeth Böck (AEA), Kelsey van Maris (VITO), Nele Renders (VITO), Václav Šebek (SEVEn), Ivana Rogulj (IEECP), Erik Faassen (IEECP), Karolis Januševičius (LEA), Matevž Pušnik (JSI) and Gema Millán Ballesteros (CIRCE)

@streamsaveh2020

www.streamsave.eu

@stream_save

contact@streamsave.eu

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

Disclaimer

The content of this deliverable reflects only the author's view. The European Commission is not responsible for any use that may be made of the information it contains.

Document Information

Grant agreement	890147
Project title	Streamlining Energy Savings Calculations
Project acronym	streamSAVE
Project coordinator	Nele Renders, VITO/EnergyVille
Project duration	1st September 2020 – 31st August 2023 (36 months)
Related work package	WP 4 – Capacity Support Facility
Related task(s)	Task 4.2 - Capacity Support Facility to improve energy savings calculations for Priority Actions
Lead organisation	CRES
Contributing partner(s)	AEA, CIRCE, VITO, SEVEn, IEECP, LEA, ISR & JSI
Due date	31/03/2022 (intermediate); 28/02/2023 (final)
Submission date	31/03/2022
Dissemination level	Public

Table of Contents

List of figures

List of tables

Abbreviations and acronyms

Acronym	Description
ASHRAE	American Society of Heating, Refrigerating and Air-Conditioning Engineers
BACS	Building Automation and Control System
BEMS	Buildings Energy Management System
BU	Bottom-Up
CSF	Capacity Support Facility
EC	European Commission
EU	European Union
EED	Energy Efficiency Directive
EEOs	Energy Efficiency Obligation scheme
EPBD	Energy Performance of Buildings Directive
GHG	Greenhouse Gas
HDV	Heavy Duty Vehicle
IPMVP	International Performance Measurement and Verification Protocol
LDV	Light Duty Vehicle
MS	Member State
NECP	National Energy and Climate Plan
NEEAP	National Energy Efficiency Action Plan
PA	Priority Action
UNFCCC	United Nations Framework Convention on Climate Change
WG	Working Group

Summary

The current report presents the provided technical support of the Capacity Support Facility to the 10 consortium Member States during the streamSAVE project. The Capacity Support Facility (CSF) has been established within the H2020 project streamSAVE aiming to streamline energy savings calculations according to Article 3 and 7 of the Energy Efficiency Directive. The CSF provides one-to-one technical support to Member States facilitating the energy savings calculations for different Priority Actions (PA) by means of the real-case application and validation of the streamlined bottom-up calculation methodologies and related indicative values so as to further intensify their efforts to deliver energy efficiency improvements by 2030. The Priority Actions are technical solutions with high energy savings potential and considered as priority issues by Member States.

The activities of the CSF were conducted from September 2021 until January 2022 for the first round of PAs. The first round of Priority Actions covered the following five actions: building automation & control systems, refrigeration systems, public lighting systems, electric vehicles and heat recovery. In each involved country, concrete cases were selected and defined in demand-driven way, and therefore in close contact with the public authorities.

The application of the CSF was facilitated by an **operational framework** to maximize the triggered impacts of the CSF and to provide useful lessons and feedback from policy officers on the improvement of the streamSAVE's guidance and platform. Main pillar of the operational framework was the PA Working Groups (WGs). The Working Groups gathered technical and country experts from the consortium, as well as the implementing authorities (and/or technical experts) from the consortium countries involved. The involvement of the policy officers into the WG was essential facilitating the actual implementation of the various activities in the national context.

Generally, the technical support was provided by phone/online workshop in combination with online/email support for the 10 Member States. The desk research conducted by the consortium constituted as an alternative approach for the vast majority of the involved countries, while the organization of in-country workshop and peer-peer exchange of experience between countries were less applied within the CSF.

Technical support for the case of BACS was provided to three different countries (Austria, Lithuania and Slovenia). The compliance with Article 7 of the EED was considered as priority by all involved countries (and not Article 3 of the EED). Moreover, the data collection procedures and the estimation of the delivered energy savings through deemed savings methods were recognized as important technical aspects for the case of BACS. For the case of electric vehicles, the technical support was provided to four different countries (Belgium, Netherlands, Portugal and Spain). Again, the compliance with Article 7 constituted as priority for the majority of the involved countries (Belgium, Portugal and Spain), next to the determination of the baseline, data collection procedures and the estimation of the energy savings through deemed savings methodologies. The technical support for the case of heat recovery was provided to three different countries (Czechia, Croatia and Greece). The country needs were similar to the case of electric vehicles, although the assessment of cost effectiveness was also considered as important.

Concerning **main lessons learnt**, all the BU methodologies developed by streamSAVE seem to be useful for the involved policy officers as these foster credible estimations of savings, as well as effective monitoring, control and verification procedures of the delivered energy savings.

For the case of BACS, all important elements have been integrated into the developed BU calculation methodologies such as indicatively the foreseen BACS factors in accordance with EN15232 (2018) and the provisions of Article 14 and Article 15 of the EPBD (European Commission, 2018b). Nevertheless, difficulties were recognized in translating the BACS methodology to national circumstances in case of non-residential buildings, emphasizing the need to develop specialized data collection procedures for national reference values without neglecting the exploitation of the existing data sources.

The lack of a standardized and robust data exchange procedures was highlighted for the case of electric vehicles. The establishment of standardized data collection is considered as a prerequisite for an effective design and implementation of these policies and measures. Furthermore, the comparison of the resulted savings based on the streamSAVE BU calculation methodology with the national ones, improves the reliability and accuracy of both savings methodologies. More emphasis should be given on the compliance with the additionality criterion and the promotion of soft modes of transport.

The application of the metered method for heat recovery technologies is considered as feasible, despite the preference of policy officers for deemed methods (low administrative burden). Nevertheless, the potential application of a scaled method should be examined. For heat recovery, detailed explanation on the required control and verification procedures, as well as the on specifications of the metering systems is a crucial ingredient to translate accurately and efficiently the savings estimations into practice.

The provided technical assistance led also to meaningful horizontal recommendations. Indicatively, it is mentioned that the BU calculation methodologies can improve the coordination of required monitoring, reporting and verification procedures and can facilitate the cooperation and communication of the different bodies being responsible for monitoring the implemented energy efficiency measures. Special attention should be given to the data collection procedure, which can indisputably improve the monitoring and reporting of energy efficiency policies and measures. Finally, the integration of the developed BU methodologies will spur both the obligated parties and the responsible authorities of alternative measures to design and implement energy efficiency measures covering additional savings actions.

The delivered **impacts by the first cycle of the CSF** in the involved countries can be assessed as successful, as in total:

- 30 policy officers have participated to the implemented activities representing 18 public bodies or organizations.
- 13 workshops and 11 meetings have been organized.
- 18 energy efficiency policies might be improved covering the Priority Actions.

The type of activities conducted within the first cycle of the CSF can be assessed as rather effective despite the imposed difficulties by COVID-19. Nevertheless, physical meetings are important for providing technical assistance to public bodies, while they have to be accompanied by the type of activities organized within the framework of the CSF in order to maximize their impact.

Note: In this intermediate deliverable, the CSF of the first round of Priority Actions is described. In the second part of the project, the support of five new Priority Actions will be included.

Keywords

Deemed savings; bottom-up calculation methodologies for energy efficiency; energy savings calculations; costs of energy efficiency actions; GHG savings; Article 3 of EED; Article 7 of EED; Capacity support

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.

Capacity Support Facility CSF

The establishment of the Capacity Support Facility is foreseen within streamSAVE in order to test the actual application of the streamSAVE "Guidance on standardized saving methodologies" (streamSAVE, 2021b) within 10 consortium Member States as well to test the streamSAVE platform[1] for the selected Priority Actions. Therefore, the CSF will facilitate the introduction of bottom-up energy savings calculations within the involved countries to achieve the untapped energy savings potentials. Moreover, the existing Member States' reporting on the delivered energy savings of the Priority Actions will be improved based on streamSAVE's resources, by implementing and sharing expert knowledge and experiences regarding successful estimation methods being used to implement and report on Articles 3 and 7 of the EED.

The CSF activity report describes and analyses the support or cases in the 10 involved countries, next to its main findings and results on the implementation of the streamlined calculation methodologies and related indicative values. Detailed information is provided about the definition of the CSF framework, focusing on the specification of roles and responsibilities and on the assistance to partners in order to complete all required actions. The examined country cases are analyzed, by presenting all the activities within the CSF for each PA separately: description of the support, the conducted activities and the key outputs and impacts per case. Finally, the main lessons learned are outlined for each of the savings actions based on the analysis of the performed activities within the CSF.

[1] https://streamsave.flexx.camp/training

Chapter 1 Capacity Support Facility

In the Capacity Support Facility (CSF) actual support is provided to consortium or partner Member States (MS). The streamlined calculation methods and indicative values, which have been defined in streamSAVE project (streamSAVE, 2021b), are hereto applied in concrete country cases (ten in total). It should be mentioned that the streamlined calculation methodologies were developed taking into consideration the existing practices in all MS (streamSAVE, 2021a). The cases were selected in demand-driven way, and therefore in close contact with the public authorities. The main objective of the CSF is to improve the implementation and reporting on specific energy efficiency policies and measures, which either have been implemented or are planned in the involved partner countries.

In the current chapter, the CSF is presented including description of its objectives, the operational framework, the type of the organized activities and its expected impacts. Furthermore, the scope of the country cases and the policies or measures targeted by the support are introduced.

1.1 Description of the Capacity Support Facility

The Capacity Support Facility CSF focused on technical issues of the energy savings actions providing the capability to each country to apply the savings methodologies for concrete policies or measures, as well as to test Training Module of the streamSAVE platform for the selected Priority Actions. The main aim of the CSF was to improve MSs' obligations under Article 3 and Article 7 of the Energy Efficiency Directive, namely an improved implementation and reporting on EED policies and measures.

A guidance note was prepared within the framework of the streamSAVE project in order to facilitate the effective implementation of the foreseen activities and the fulfilment of the specified targets. More specifically, the main objective of the guidance note was to explain the procedure in order to establish, monitor and report on the progress and the outcomes of the CSF, the related PAs working groups and testing/validation of the streamSAVE platform (Training module).

Detailed information was provided about the definition of the capacity building programme, focusing on the specification of roles and responsibilities and on assistance to partners in order to complement all required actions. Moreover, guidelines were formulated for the establishment of working groups per PA, as well as the development of the strategy and related procedures to coordinate these. Finally, the timeline of all suggested steps in relation to the working groups and platform testing were described analytically.

1.1.1 Objectives

The "Capacity Support Facility to improve energy savings calculations for Priority Actions", as it is called, aimed at the capacity building of ten partner countries within the streamSAVE project. Hereto, the CSF facilitates the application of the standardized savings methodologies and the defined indicative values in the concrete cases. The application was facilitated by an operational framework enabling the evaluation of the triggered impacts of the CSF, and providing useful lessons and feedback on the improvement of the developed calculation methods. Figure 1 presents graphically the relation of the CSF with the other streamSAVE activities.

During the CSF the use and contents of the streamSAVE platform were tested and validated resulting in an improved and more user-friendly platform (streamSAVE, 2021c). Emphasis was given on the Training Module, which have been developed and integrated into streamSAVE platform, including the indicative values and the BU calculation methodologies for PAs. The potential users have the opportunity to use the developed BU calculation methodologies as an online tool or can download an excel file to calculate their own estimates of energy savings delivered by one of the examined PAs.

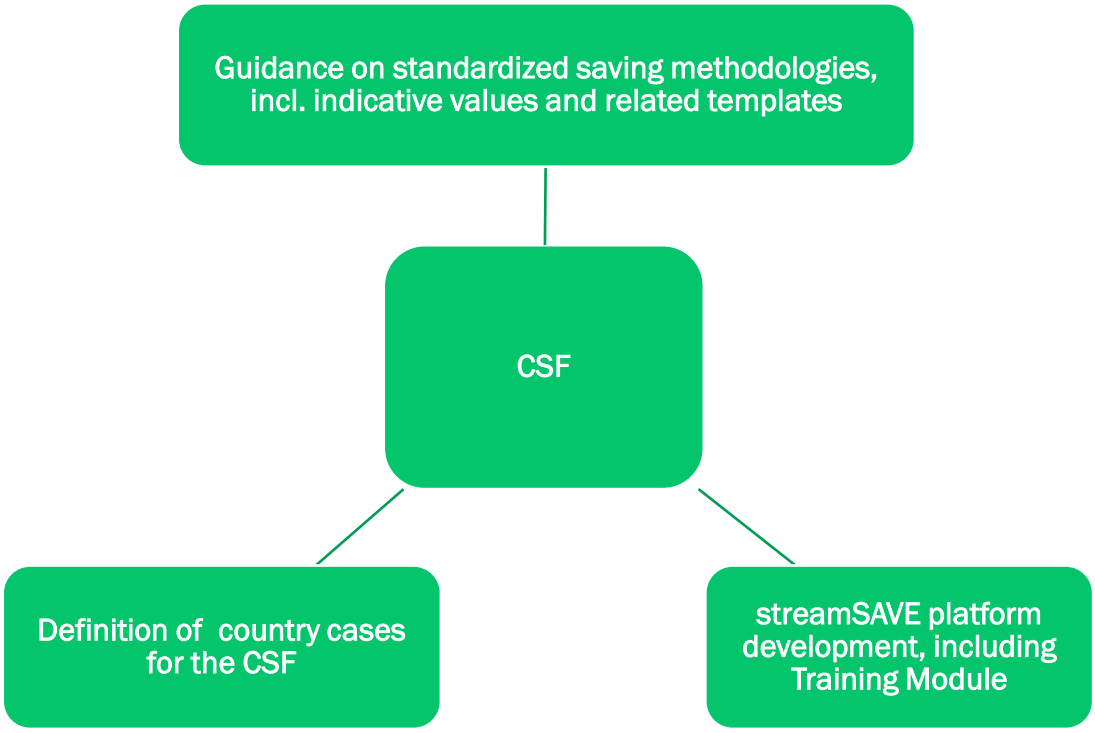

Figure 1: Relation of the CSF with the other activities within streamSAVE project.

1.1.2 Operational framework

The CSF was provided from September 2021 until January 2022 by the PA Working Groups WGs for the first round of PA, which were established and led by the Technical PA leader (with the support of the PA co-leader).

The Working Group gathered 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 into the WG were essential facilitating the actual implementation of the various activities in the national context.

The WGs supported policy officers in each country on the identified cases in relation to the PAs. Consequently, five different working WGs were established during the first cycle of the streamSAVE project according to the selected PAs, which are presented in Figure 2.

Figure 2: Selected PAs in the first cycle of the streamSAVE project.

It should be noted that during the second cycle of the streamSAVE project, new WGs will be set up focused on the new set of five PAs.

Where needed, the PA leader and the country leader identified relevant technical experts at EU level and at national level. The partners worked directly alongside with experts from MS in-country, to address specific or ad-hoc issues or questions. A graphical depiction of the WG's composition is presented in Figure 3.

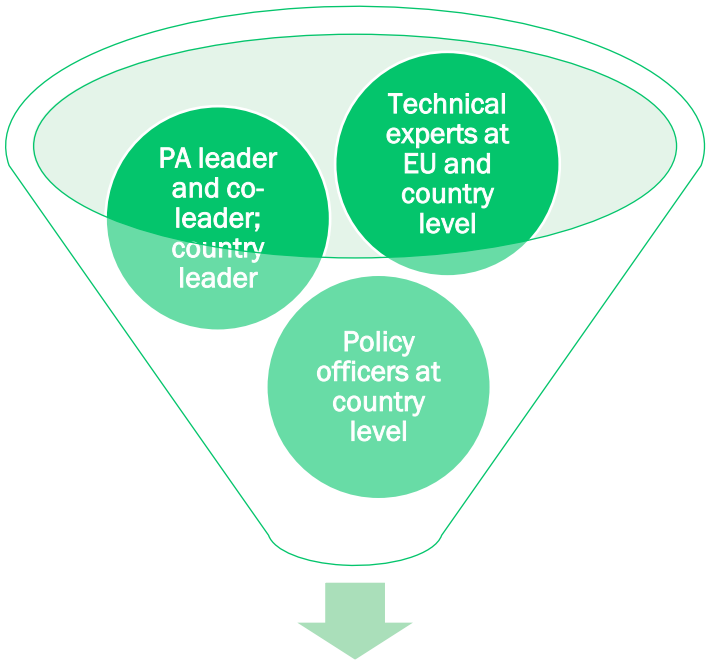

Figure 3: Members' composition of the WGs.

Totally, ten partner countries were supported technically for the cases selected. The consortium supported on average 2 cases per country for both cycles together.

The cases were selected in demand-driven way, and therefore in close contact with the public authorities. More precisely, at the start of the project, phone interviews were scheduled with the public authorities in the ten partner countries to detect possible cases. In the course of 2021, the cases were further detailed while the streamSAVE output on savings methodologies and became clearer and more straightforward for the involved

policy officers. Information about the countries, the responsible partner and the selected PAs is provided in Table 1.

Table 1: Information about the countries, responsible partner and selected PA per CSF case.

Country	Responsible partner	Selected PA for the first cycle
Austria (AT)	AEA	BACS
Belgium (BE)	VITO	Electric Vehicle
Czechia (CZ)	SEVEn	Heat recovery
Croatia (HR)	IEECP	Heat Recovery
Greece (GR)	CRES	Heat recovery
Netherlands (NL)	IEECP	Electric Vehicle
Lithuania (LT)	LEA	BACS
Portugal (PT)	ISR-UC	Electric Vehicle
Slovenia (SI)	JSI	BACS
Spain (ES)	CIRCE	Electric Vehicle

(*) Note: France was originally foreseen as a country to give support, but given its long experience on savings methodologies, and as Croatia indicated a strong interest for support, it was decided to include Croatia instead of France.

The operational framework of the CSFs is presented in Figure 4. At national level, the country leader facilitated the communication of the PA Working Group with the policy officers within their partner country. The technical PA leader with the support of the PA co-leader was responsible for the coordination and operation of each WG.

The country leader, who was appointed for each country separately, acted both as country expert and facilitator, as well as being the point of contact with the PA leader. Moreover, the country leader arranged and undertook the support, testing and validation activities in his country with the actual participation of policy officers for each selected case.

The PA leader was responsible to solve technical issues, which are related to the streamlined calculation methodologies and the indicative values of the PA, while the PA co-leader was responsible for supporting the testing and validation of the streamSAVE platform, particularly regarding its use and contents (i.e., user friendliness and testing of the Training Module).

The PA leaders and country leaders were responsible for informing CRES and CIRCE about the performed actions, to monitor the progress of the foreseen activities.

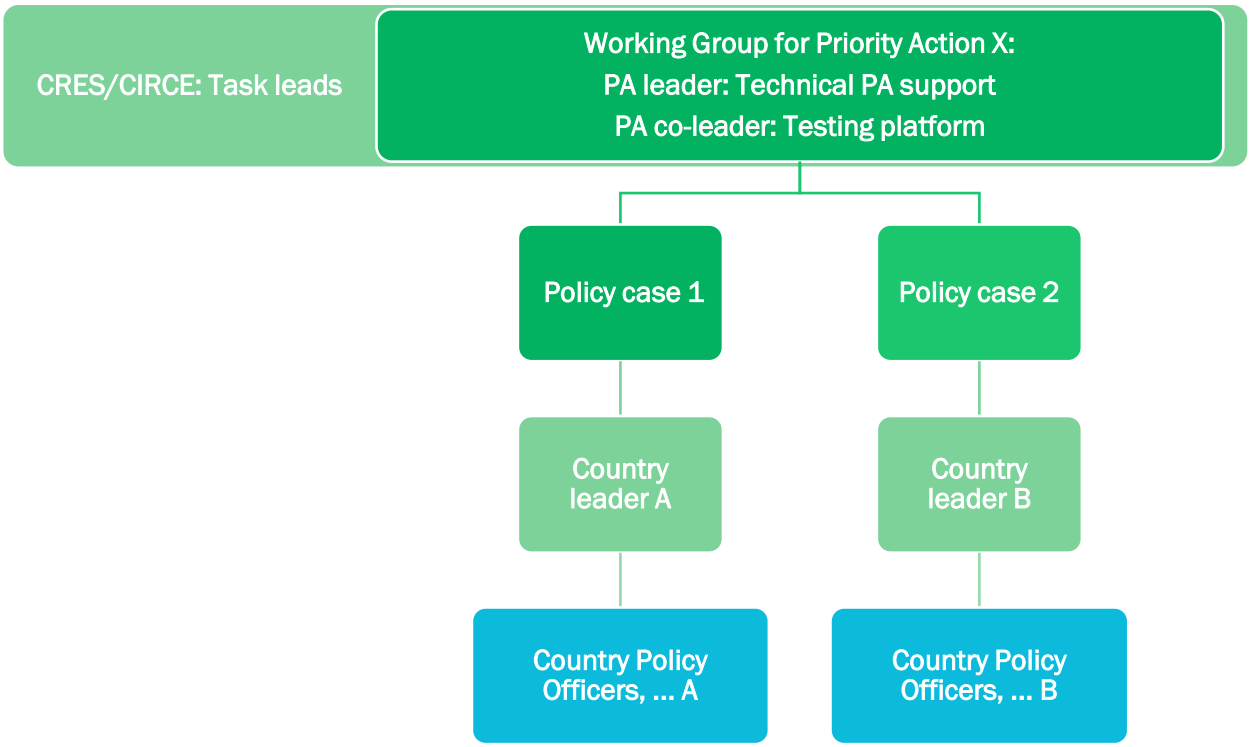

Figure 4: Operational framework of the CSFs for a specific WG.

Various recommendations were applied to produce interesting outcomes of the WGs such as:

- Establishment of an explicit goal and communicate it clearly to the participants so as to lead to a common understanding.
- Effective completion of all the duties of the facilitator (country leader), such as arranging the meetings, ensuring that the meetings are effective, running on-time and inclusive meetings, setting the agenda for each meeting in advance, fostering a productive environment for discussion by actively taking into account the positions of the participants etc.
- Definition of the rules for the operation of the WG and specify the responsibilities and the roles of the participants taking into account both their characteristics/capabilities and time and resource restrictions.
- Engagement of all the participants equivalently and controlling that they will be able to fulfil the assigned tasks and activities.
- Creation of a realistic timeline with clear milestones providing sufficient time for the efficient completion of the foreseen tasks and activities.
- Transparent operation regarding the assigned tasks and activities, effective dissemination of the main findings and organization of an additional round for discussion in order to validate the results.
- Creation of trust to the participants and fulfilment of consensus through the fruitful discussion of all positions.

- Efficient management of the potential conflicts aiming at their immediate solution and reaching consensus before fulfilling all the activities.
- Maintenance of good records for all the conducted activities.
- Continuous evaluation of the performed work of the WG and be aware of the participants' level of satisfaction.
- Discussion of targeted proposals and recommendations by the participants for a more effective operation of the WGs.

1.1.3 Type of organized activities

The foreseen capacity building within the CSF was conducted through the provision of direct technical support to individual MSs to further improve energy savings calculations under Articles 3 and 7 of the EED. As noted, the operational objective of the CSF was the adaptation of the proposed BU calculation methodology and the indicative values to the national context of each involved country. The involvement of the involved policy officers and other country experts was performed through the following type of activities:

- Identification and documentation of a selected case for each round of the CSF being supported by the PA leaders and the country leaders.
- Participation into the planned in-country ad-hoc meetings (maximum of three meetings per round).
- Application of BU calculation methodologies for the selected cases supported by the PA leader and the country leader.
- Testing & validation of the streamSAVE platform being supported by the PA co-leader and the country leader.
- Participation of policy officers into the planned workshops on voluntary basis.

The implementation of the calculation methodologies started through the application of the proposed BU calculation methodology to an existing or a planned policy measure in the involved country. Moreover, dedicated questions and requests for more specialized information were formulated, ensuring the actual involvement of the policy officers.

Generally, an introductory meeting was organised with the targeted policy officers at the beginning of the CSF to clarify the objectives of the CSF and presenting the developed calculation methodologies and the defined indicative values. The conduction of this meeting enhanced their understanding about the role of the CSF and increased their engagement.

The country leaders interacted directly with the public authorities via different means, such as email/online support, phone support, in-country meetings or workshops, as well as via peer-to-peer dialogue groups that are organized within the streamSAVE project.

The provided technical support covered a wide range of methodological support related to the PAs. Indicatively, the following topics were studied:

- Adapting countries' existing savings methodologies and defining a monitoring program for a new Priority Action covered by policies or measures under Article 7.
- Streamlining savings estimations of a Priority Action between Article 3 and Article 7 of the EED.

- Identifying and assessing monitored data within a country to improve savings through the application a BU calculation methodology.
- Determining the baseline consumption for a Priority Action in relation to Article 7 and/or Article 3.
- Correcting estimated energy savings by including behavioural aspects, such as rebound effects.

Finally, the technical support resulted in multiple types of outputs per case, such as the:

- Meeting minutes of workshops on improving savings estimations for a policy in the partner country.
- Compilation of supporting material, such as technical reports or memos on energy savings estimations and country specific assumptions.

All streamSAVE documentation were prepared in English including both the meeting minutes and the supporting material. Nevertheless, the in-country meetings or workshops were organized in national language, to facilitate the participation and to improve the engagement of the national experts and policy officers.

1.1.4 Impacts

As described previously, the CSF is about going beyond the theoretical BU calculation 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 in frame of a policy measure, the difficulty to quantify the behavioural change of the end-users etc. Therefore, the expected impacts of the CSF are presented in Table 2 (considering two PA rounds).

Table 2: Impacts to be realized during CSF over the course of the 2 rounds of PAs.

Number of public officers with improved capacities/skills on BU calculations according to Article 7 and Article 3	
Target group	Key stakeholders (public authorities) from 10 partner MS and (at least) 3 replication countries
Performance indicator: Output	On average 2 cases per partner MS will be supported by priority action working groups; and 1 case in replication countries
Performance indicator: Outcome	At least 15 public officers in 10+3 MS having improved skills/capacity due to streamSAVE, assuming active involvement of 1 or 2 public officers per MS and that 80% out of officers confirm their capacity was improved
Means of monitoring	– Monitoring of CSF by activity reports per MS case – Annual feedback surveys among key stakeholders to monitor priority action working groups and dialogue groups – Bilateral call with replication countries to evaluate training – Google analytics of platform downloads or visits per priority action
Number of policies influenced through the actions	
Target group	Policy makers in each MS and market players, expert in field of energy savings estimations

Performance indicator: Output	On average 2 cases per partner MS will be supported; and 1 case in replication countries
Performance indicator: Outcome	We expect all 10 partner MS to initiate/take into consideration 2 changes of their Art. 3 & 7 reporting or EED related policies on average; in total 20 adapted policies related to the priority actions
Means of monitoring	Annual feedback surveys sent to key stakeholders, in which MS also provide feedback about undertaken or planned amendments at the end of the project
Number of MS with improved implementation of Article 7 and Article 3, including improved MRV systems, through harmonized BU calculations	
Target group	Public authorities in each MS and market parties expert in field of energy savings estimations
Performance indicator: Output	At least 10+3 MS take part in the streamSAVE to improve their Art. 3 & 7 EED implementation On average 2 cases per partner MS will be supported in CSF; and 1 case in replication countries
Performance indicator: Outcome	Assuming 80% of the CSF cases will directly result in improved Art. 3 & 7 implementations, we can expect at least 18 initiatives within 15 MS on improved EED implementation
Means of monitoring	Annual feedback surveys sent to key stakeholders, in which MS also provide feedback about undertaken or planned EED amendments at the end of the project

1.2 Examined cases and improved policy measures within the CSF

The main objective of the CSF was to improve specific policies and measures, which either have been implemented or are planned in the involved countries through the examination of the selected cases. Both the cases and the targeted policies and measures are presented separately for each country including the expected changes of the policies, which will be influenced by the CSF.

1.2.1 Austria

The CSF supported the Federal Ministry for Climate Action, Environment, Energy, Mobility, Innovation and Technology (BMK) and the National Monitoring Agency to quantify the delivered energy savings reported within the framework of Article 7 for the case of policies and measures, which promote the implementation of BACS.

The main goal was to present the developed methodology on BACS within streamSAVE project and then to adapt the methodology to the national circumstances. Emphasis was given on the required data, while the final energy demand of the building was adapted according to Austria's reference buildings.

Moreover, the lifetime of the delivered savings was determined for estimating the cumulative savings, while the potential integration of additional technology areas of the BACS into the methodology and the required verification activities of the implemented BACS system were discussed also as important issues.

Specific improvements to the implemented policies and measures in Austria were fostered, while the potential introduction of the proposed BACS methodology and the specified

indicative calculation values into the Austrian catalogue of BU calculation methodologies were examined.

Nevertheless, the actual inclusion of the methodology could not be ensured due to the fact that it depends on various political processes going beyond the WG's capacity to influence (implementation of the new Energy Efficiency Act and supporting legislation).

1.2.2 Belgium

The CSF supported the Federal Public Service (FPS) Economy to quantify energy savings from the promotion of the electric vehicles in the transport sector (fuel switch) within the context of two policy measures, which might be reported as alternative measures within the framework of Article 7 in the future.

Firstly, the FPS Economy and "Het Federaal Instituut voor Duurzame Ontwikkeling" (FIDO) were interested in calculating energy savings from the fuel switch in the federal car fleet. More specifically, data were gathered and a preliminary BU calculation methodology was developed, while specific questions were formulated concerning the validity of this methodology in the EU context (Clean Vehicle Directive). Moreover, more concrete issue lied with the comparison of fossil and electric vehicles.

The second policy measure aimed at the company cars. The federal government (FPS Finance and FPS Mobility), recently communicated that from 2026 onwards fiscal deduction will be provided for the case of leased company cars under the precondition that they are zero emission. Setting up a methodology to calculate the savings from this measure was considered as a very concrete case where the CSF could add value for fostering the implementation of this measure and providing technical support for the compliance with the criterion of additionality and the green character of the consumed electricity.

Concerning the expected changes, the aim of the CSF was to improve the planned policies and measures and most importantly, to introduce them into the alternative measures, which have been initiated for achieving the target of Article 7.

1.2.3 Czechia

The CSF supported the Ministry of Industry and Trade (MIT), which is responsible for the promotion of energy efficiency and meeting the EED objectives and manages the available funds within the key operational programme OP TAC (Operational Programme Technologies and Applications for Competitiveness). The CSF assisted the MIT to quantify the energy savings delivered within the framework of the OP TAC. OP TAC provides financial support to energy efficiency projects of the industrial and commercial sectors, while the other OPs promote energy efficiency interventions in public or residential sectors. Therefore, the PA for heat recovery seemed capable of reinforcing the current level of knowledge for the implementation of energy efficiency projects in the industrial sector.

The eligibility of the specific energy efficiency measures was examined within the framework of Article 7 of the EED ensuring that the energy savings delivered with support of OP TAC complies with the provisions of the EED and could be included in the savings reported under EED.

Emphasis was given on buildings renovation and the utilization of energy performance certificates, next to measures in transport sector and the water-energy nexus.

The main objectives comprised the implementation of effective verification procedures, the adoption of streamSAVE methodologies, the improved quality of the OP TAC funded

projects, the increased efficiency of the allocated European Structural and Investment Funds (ESIF) and the facilitation of energy efficiency targets' achievement.

1.2.4 Croatia

The CSF aimed at supporting the Ministry of Economy and Sustainable Development (MoESD) and Energy Institute Hrvoje Požar (EIHP) to quantify the delivered energy savings from policies and measures in the industrial sector. More specifically, the main objective was the development of a calculation method for the delivered energy savings and the avoided CO_2 emissions from the promotion of heat recovery systems in industry and other large potential facilities (e.g., data centres).

The main intention of the CSF was to add new calculation methodologies into the relevant regulation for the measurement of the achieved energy savings. Obviously, this indicates that the Croatian catalogue did not include similar methodologies before: all developed methods from streamSAVE could be adjusted to the Croatian context and added to the official Regulation of the catalogue with the available calculation methods.

1.2.5 Greece

The CSF supported the Ministry of Environment and Energy (MoEE) and CRES to quantify the triggered energy savings reported within the framework of Article 7, as will be delivered by the promotion of heat recovery systems by the Energy Efficiency Obligation scheme as well as the alternative measures in industrial sector.

The CSF focused on the installation of heat recovery systems by presenting the methodology on heat recovery, which was developed within streamSAVE project and adapting this to the national circumstances. Indicative values both for the potential exploitation of the excess heat and the installation of heat recovery technologies in industrial sector were specified (such as unitary energy consumption, energy saving factor etc.). Emphasis was given on the specification of the most appropriate expression of the unitary energy consumption for the constitution of the baseline (i.e., kWh/industrial unit, kWh/tonne of produced products etc.), which can be used for the comparative analysis of the implemented policies and measures.

Furthermore, technical support was provided for the identification of the implementation cost of the foreseen technologies, the evaluation of the potential reduction of the delivered energy savings over the years, the determination of the lifetime for the different technologies and the procedure for controlling and verifying the implemented policies and measures.

The expected changes included the addition of a specialised equation for the promotion of the heat recovery in industrial sector into the Greek catalogue on BU calculation methodologies within the framework of the EEOs. Other changes dealt with the likely use of the developed equation and the installation costs, provided by streamSAVE, within the planned Recovery and Resilience Fund programme to improve energy efficiency in the industrial sector.

1.2.6 Netherlands

The CSF focused on the development of a BU calculation methodology for the delivered energy savings and the avoided CO_2 emissions from the further penetration of new and used electric vehicles for passengers, light duty and heavy-duty transport.

The CSF supported the Ministry of Economic Affairs and Climate Policy through the Rijksdienst Voor Ondernemend Nederland (RVO), also known as the Dutch Enterprise

Agency, by quantifying the delivered energy savings from existing policies and measures to stimulate the introduction of electric vehicles, such as the following ones:

- SEPP Subsidy scheme electric passenger cars.
- SEBA Subsidy Scheme Zero Emission Company Cars.
- National Agenda on charging infrastructure.
- SEB subsidy scheme for electric non-mobile machinery.
- Fiscal benefits for zero emission vehicles (both for consumers and business).

Despite the fact that no direct changes in policies and measures were expected from the provided support within the framework of the CSF on the short term, the monitoring of the implemented policies and measures will be considerably improved through the potential changes on the long term. More specifically, the Electric Vehicles methodology and outcomes are to be continuously used to facilitate the comparative analysis with the RVO's internal calculations and to analyse potential deviations. Obviously, the created impact and the need for a follow-up discussion might arise, depending on the identified discrepancies.

Finally, the triggered impacts due to the replacement of typical means of transport with alternatives soft modes may lead to the introduction and development of a specialised program to stimulate the modal shift and to address problem with imports. It should be highlighted that it is not easy to result in significant impacts due to the fact that cycling is main pillar of the Dutch strategy with the required infrastructure already available.

1.2.7 Lithuania

The CSF supported the Ministry of Energy to quantify the delivered energy savings from the implementation of BACS systems in buildings. Consequently, the provided support will affect all the planned measures and policies for the further deployment of BACS systems.

The CSF facilitated the development of a deemed method for quantifying the delivered energy savings, the specification of the required input data as well as the related data collection procedures and the formulation of recommendations in order to comply with the requirements of the additionality criterion according to Article 7 of the EED.

1.2.8 Portugal

The CSF provided technical support to Directorate General of Energy and Geology (DGEG) and its National Energy Efficiency Action Plan (NEAAP) by presenting the methodology on electric vehicles, which was developed within streamSAVE project, and adapting this general methodology to the national circumstances. The provided support covered the indicative values such as the typical unit consumption, the mileage and the energy saving factor, providing the opportunity to estimate energy savings through a deemed saving method, aligned with the EED requirements (Article 3 and Article 7).

The adaptation of the methodology into the national context was achieved through the establishment of the baseline and the quantification of the delivered savings by policies and measures to promote electric vehicles (subsidy schemes and fiscal benefits for consumers), while the methodology was also adapted to include the lifetime for the different categories of vehicles. Moreover, the specification of the required data for the verification, as well as the provision of guidance and sharing practices about the indicative values for different types of private vehicles (bikes, motorcycles, passengers' cars, LDV, HDV, buses) and public e-vehicles (buses, train, tram, metro) were also addressed in the CSF to improve the effective reporting and to ensure the reliable evaluation of the delivered energy savings.

It should be noted that indicative values for the specific consumption of both conventional and electric vehicles and for the emissions factor according to the Portuguese mix were collected also.

Furthermore, the CSF also included the analysis of simplified BU calculation methods being used in other countries to calculate energy savings for modal shift of private cars towards cycling, walking and collective transport as well as for the extension of the public transport network. The performed analysis was based on Greek examples.

Therefore, the main objective of the CSF consisted of estimating the contribution of the promoted electric vehicles to the fulfilment of the targets under Articles 3 and 7 and utilizing the developed streamSAVE methodology and the indicative calculating values during the implementation of following programmes, which will be initiated according to the provisions of the Portuguese National Energy and Climate Plan:

- "Maintain and promote incentives for the purchase of 100% electric light vehicles, as well as the existing framework of tax incentives" programme.
- "Promote electric vehicles for urban micro-logistics" programme.
- "Promote the introduction and use of low emission vehicles and sustainable mobility in the state" programme.

1.2.9 Slovenia

The CSF supported the Ministry for Infrastructure (Mzl) and relevant advisors from Jožef Stefan Institute (JSI) to quantify the delivered energy savings reported under the Energy Efficiency Obligation Scheme and the implemented alternative measures.

Despite the fact that the Slovenian catalogue has an existing method for estimating savings for energy management system implementation, it is difficult to evaluate energy savings delivered by BEMS or BACS systems accurately.

The methodology on BACS prepared within the streamSAVE project was presented including its adaptation to the national circumstances, while the new methodology can improve the existing methodologies for estimating the savings achieved by the implementation of the energy management system.

Moreover, technical assistance was provided to ensuring a solid system to prevent double counting of energy savings considering the guidelines for monitoring and reporting on the implementation of the NECP. Furthermore, the collection of appropriate data is also challenging for obligated parties (EEOs).

The objective was to integrate the developed streamSAVE methodology and the indicative calculation values into the national catalogue for quantifying the energy savings by energy efficiency policies and measures.

1.2.10 Spain

The CSF focused on the promotion of electric vehicles in Spain through the MOVES PLANs programme. More specifically, the Instituto para la Diversificación y Ahorro de la Energía (IDAE) and the Ministerio para la Transición Ecológica y el reto demográfico (MITECO) were informed by presenting the methodology on electric vehicles, which has been developed within streamSAVE project and be adapted to the national circumstances.

Emphasis was given on the determination of indicative values for the different types of vehicles. Due to the fact that common interest was expressed for Spain and Portugal, the potential similarities between both countries were highlighted. Moreover, the support also

included reference values on typical unit consumption, mileage, and energy savings factor providing the opportunity to estimate the energy savings delivered through a deemed saving method.

Beyond reference values or indicative values, technical support was provided on the development of the baseline, the requirements for complying with the additionality criterion in Article 7, the evaluation of the contribution of each factor to the resulted energy savings, the quantification of the impact of some factors, the assessment of the energy savings potential, the determination of the lifetime for the different types of vehicle categories and the specification of the required data to verify the implemented policies and measures.

Concluding, the CSF provided useful insights for assessing the already implemented measures and policies in Spain, which can be taken into consideration during the anticipated national mobility support programmes. More specifically, the planned programmes can benefit from the application of the methodology developed in the framework of the streamSAVE project addressing the problem that the current calculations are based on the non-adoption of the scrapping hypothesis. It should be noted that the adoption of the scrapping was considered in the case of the replacement of conventional passenger vehicles with electric ones, resulting in lower savings that those generated according to the existing calculation framework.

Chapter 2 Analysis of activities within CSF

In this chapter, the performed activities within the framework of the CSF are presented for each PA separately. The resulting impacts and the key outputs of this support are also explained.

2.1 Building Automation and Control Systems

Technical support through the CSF was provided to three different countries (Austria, Lithuania and Slovenia) for the PA of BACS.

2.1.1 Focus of support

Seven policy officers participated into the CSF's activities in the three countries representing five different organizations (Table 3).

Table 3: Involved policy officers and organizations within the CSF for the PA of BACS.

Metric	Austria	Lithuania	Slovenia
Number of involved policy officers	3	1	3
Number of organizations	2	1	2
Involved organizations	Federal Ministry for Climate Action, Environment, Energy, Mobility, Innovation and Technology (BMK) Austrian Energy Agency (AEA)	Climate Change Management Group Ministry of Energy of the Republic of Lithuania	Ministry for Infrastructure (MzI) Jožef Stefan Institute (JSI)

The technical issues, which were addressed by the CSF, are presented in Table 4.

The compliance with Article 7 of the EED constituted as priority by all involved countries (and not Article 3 of the EED), while the estimation of the delivered energy savings through deemed savings methods were recognised as the most crucial technical aspects for the case of BACS. Special emphasis was given also on data collection or on the assessment of monitored data by Austria and Slovenia.

Two countries (Lithuania and Slovenia) aimed at adapting or improving existing practices from the other MSs on calculation methodologies or indicative values.

Table 4: Addressed technical issues within the CSF for the PA of BACS.

Technical aspect	Austria	Lithuania	Slovenia
Baseline			X
Data collection or assessment of monitored data	X		X
Energy savings based on deemed streamSAVE methods	X	X	X
Cost effectiveness			

CO_2 savings		X	
Behavioural aspects			X
Calculation of rebound, spill-over and free-rider effects			
Article 3			
Article 7	X	X	X
Streamlining between Article 3 and Article 7			
Screening and initial assessment of promising technical savings actions			X
Adapting or improving existing practices from the other MSs on calculation methodologies or indicative values		X	X
Reviewing existing calculation methodologies			
Other issues and targets	X		X

Additional technical issues were also discussed during the support, such as the lifetime and the calculation of the cumulative energy savings (Austria), the required documentation for verifying the achieved energy savings (Austria), the avoidance of double counting of energy savings (Slovenia) and the establishment of data collection procedures in consistency with the guidelines for monitoring and reporting the outcomes of implemented policies and measures (Slovenia).

2.1.2 Conducted activities

For the three country cases, the support comprised phone/online workshop in combination with online/email support (Table 5). The desk research conducted by the consortium constituted as alternative approach in two countries (Austria and Slovenia), while the organization of in-country workshop (due to covid) and peer-peer exchange of experience between countries were less applied for the CSF.

Table 5: Type of conducted activities within the CSF for the PA of BACS.

Activity	Austria	Lithuania	Slovenia
In-country workshop			X
Telephone support/Online workshop	X	X	X
Online/email support	X	X	X
Desk research consortium	X		X
Peer-peer exchange of experience between countries			
Other activities			

In **Austria**, the developed methodology for BACS was presented during the first workshop (on October 21st, 2021) including suggestions on how to adapt the streamSAVE methodology to the national circumstances and what data should be collected for the

verification of the energy savings. BMK and AEA then prepared feedback and questions on the presented methodology and suggestions.

The CSF (via desk-research) helped with the adaption of the indicative calculation values according to the national circumstances taking into account the obtained feedback. Hereto, the data of the Austrian catalogue with regards to the BU calculation methodologies (e.g., reference buildings) were studied.

Moreover, the CSF proposed what should be collected from the obligated parties for conducting the required verification activities. All these activities led to a strategy for reporting the delivered energy savings for the first year. The results were presented and discussed with the Austrian Institute of Construction Engineering (OIB) and AEA in a second workshop on January 24th ,2022. The final version of the suggested methodology was sent to the Federal Ministry for Climate Action, Environment, Energy, Mobility, Innovation and Technology.

In **Slovenia**, the main objective of the first meeting (on October 19th, 2021) was to present the developed methodology for BACS, to formulate proposals for its adaptation to the national context and to define appropriate data collection procedures for conducting the required verification procedures.

JSI checked the compliance of the proposed figures within the developed streamSAVE BU calculation methodology for the different types of buildings with both the existing rules for determining energy savings and the Slovenian strategy for energy renovation of buildings in Slovenia by 2050. The streamSAVE platform was also presented to the stakeholders and tested for the PAs of BACS and heat recovery.

Moreover, the CSF supported (via desk-research) the adaption of the national values, examined the possibility to adapt and improve the existing methodologies and proposed the data that should be collected from obligated parties. The results were presented and discussed with the Ministry (MzI) and JSI at the second national meeting (on January 21st, 2022).

Finally, the Slovenian Statistical Office also requested support on developing methodologies for monitoring and verifying the implemented policies and measures within the framework of the NECP. JSI presented the streamSAVE methodologies for the PA of heat recovery on January 14th ,2022 and agreed to support the development of the methodological framework for monitoring the installed heat recovery systems based on statistical data.

2.1.3 Key outputs and impacts

The CSF in **Austria** resulted into a ready-to use methodology for BACS, which can be integrated into the Austrian catalogue enabling:

- The specification of national calculation values for residential and non-residential buildings, in compliance with the requirements of Article 7.
- The establishment of verification requirements.

Considering the impacts, the above outputs will benefit the Austrian Obligation Scheme through:

- The detailed and robust reporting of the implemented policies and measures due to less complicated reporting process via the standardized BU calculation methodology and the defined national calculation values.

- The increased quality in the calculation of energy savings delivered by the implementation of BACS in buildings.
- The improved awareness of obligated parties on BACS.

In **Lithuania**, the conduction of the of the CSF activities facilitated the revision of the calculation methodologies and will consequently improve the procedures for the estimation of the delivered energy savings of BACS in buildings.

The possibility was discussed in **Slovenia** for the potential integration of the developed BACS methodology in the Slovenian catalogue, which can be beneficial for the estimation of the achieved energy savings.

The developed BACS methodology was adapted appropriately for the case of Slovenia through the determination of national calculation values for residential buildings, the update of the energy carrier shares so as to be aligned with the strategy for energy renovation of buildings in Slovenia by 2050; and the specifications of the required verification procedures.

Other potential impacts comprise streamlining of the reporting process regarding the implemented policies and measures within the NECP; improving the existing awareness of the obligated parties on BACS; and support of the national Statistical Office on the development of the monitoring the savings methodology.

2.2 Electric Vehicles

In the CSF technical support was provided to four different countries (Belgium, Netherlands, Portugal and Spain) for the PA of electric vehicles.

2.2.1 Focus of support

Sixteen policy officers participated into the CSF's activities in the four countries representing eight different organizations (Table 6). The technical issues, which were addressed by the CSF, are presented in Table 7.

The compliance with Article 7 constituted as priority for the majority of the involved countries (Belgium, Portugal and Spain), while the determination of the baseline was recognised by all involved countries as the most crucial technical aspect for the case of electric vehicles. Moreover, technical support was requested on data collection procedures and the estimation of the energy savings through deemed methods. Three countries (Netherlands, Portugal and Spain) aimed at adapting or improving existing practices from other MSs on calculation methodologies or indicative values.

Table 6: Involved policy officers and organizations within the CSF for the PA of electric vehicles.

Metric	Belgium	Netherlands	Portugal	Spain
Number of involved policy officers	5	3	5	3
Number of involved organizations	4	1	2	1
Organizations	SPF Economy – Directorate General Energy SPF Finance Defence Ministry Federal Institute for Sustainable Development	Rijksdienst voor Ondernemend Nederland (RVO)	Direção Geral de Energia e Geologia, Ministry of Environment and Energy (DGEG) Plano Nacional de Ação para a Eficiência Energética - NEAAP	Instituto para la diversificación y ahorro de la energía (IDAE)

Table 7: Addressed technical issues within the CSF for the PA of electric vehicles.

Technical aspect	Belgium	Netherlands	Portugal	Spain
Baseline	X	X	X	X
Data collection or assessment of monitored data	X		X	X
Energy savings based on deemed streamSAVE methods		X	X	X
Cost effectiveness				X
CO_2 savings		X		X
Behavioural aspects				
Calculation of rebound, spill-over and free-rider effects				
Article 3		X		
Article 7	X		X	X
Streamlining between Article 3 and Article 7				
Screening and initial assessment of promising technical savings actions	X			
Adapting or improving existing practices from the other MSs on calculation methodologies or indicative values		X	X	X
Reviewing existing calculation methodologies		X		

Other issues and targets	X		X	X

Additional technical issues were covered by the CSF, such as the compliance with the additionality criterion to the clean vehicle directive (Belgium), the specification of lifetime and the documentation requirements for verification (Spain). Furthermore, a methodology for the evaluation of savings from soft modes in transport based on desk research and sharing of experiences from other countries was discussed, going beyond the initial scope of the PA (Portugal).

2.2.2 Conducted activities

For the four country cases, the technical support was provided combining phone/online workshops, online/email support and desk research (Table 8). The organization of in-country workshops (due to covid) and peer-to-peer exchange of experiences between countries were considered as less popular approaches.

Table 8: Type of conducted activities within the CSF for the PA of electric vehicles.

Activity	Belgium	Netherlands	Portugal	Spain
In-country workshop				
Telephone support/Online workshop	X	X	X	X
Online/email support	X	X	X	X
Desk research consortium	X	X	X	X
Peer-peer exchange of experience between countries			X	
Other activities			X	

In **Belgium**, the developed methodology for electric vehicles was presented during the first online workshop (on October 14th, 2021). The Federal Public Service Economy presented the examined policy programmes pinpointing the existing questions and bottlenecks. More specifically, the applied approach should comply with the Art. 7 additionality criterion for the two federal programmes, namely of the federal car fleet and the zero emission company cars. The CSF examined the identified issues (e.g., data availability, calculation method, additionality towards Clean Vehicle Directive) and proposed potential solutions for addressing these.

For the case of the policy measure for the federal car fleet, the methodology and indicative values were adapted to the national context and a proposal was developed for the data collection procedure, which was presented in the second workshop (on November 25th, 2021). During the workshop, the excel calculation sheet for the federal car fleet was presented in order to highlight the required data for calculation of the energy savings at national level. Finally, the compliance with the additionality criterion toward the Clean Vehicle Directive was discussed extensively. The discussion of the excel calculation sheet managed to provide a sufficiently concrete input to the policy officers of the SPF Finance on what data would be needed for calculating the energy savings from the zero emission company cars measure. After the second workshop, the required data was gathered, and another excel calculation sheet was developed in order to facilitate the calculation of these specific savings.

It should be noted that the required data for developing the calculation tool for the case of federal car fleet, were collected by the FPS Economy, such as the distribution of purchased cars per year and per fuel type and the distance travelled. For the case of the zero-emission company cars, the collection of the required data was more difficult as relying more on scenario analysis and surveys of lease companies and company car users.

In the **Netherlands**, three online workshops were organised to discuss the developed BU calculation methodologies and to share good practices (kick-off on October 15th, 2021, on November 17th, 2021 and on February 4th 2022) enabling the review of the existing methods and data availability at the side of the RVO.

Good practices and state of the art calculation methods (deemed savings) were presented also focusing on the establishment of baseline/reference values and taking into account the different technical requirements such as additionality, avoidance of double counting, lifetimes, import/export etc.

The utilised vehicle data by RVO were collected for estimating the achieved energy savings in transport sector. The required data were available through the cooperation of RVO with Netherlands Vehicle Authority (RDW), which is the Dutch authority for registering any motorized vehicles (amongst others).

Moreover, materials (such as documents/e-mails) were exchanged with hands-on advice and suggestions, while peer-to-peer knowledge exchange on best practices for electric vehicles energy saving calculations was performed focusing on vehicle imports and fuel saving calculations of replacing buses and vans. It should be noted that another important topic was the promotion of soft modes of transportation (e.g., promotion of bikes, walking, other means of transport over motorized).

In **Portugal**, several contacts were made (email and telephone) with DGEG before starting the CSF. The CSF focused on policies and measures implemented under the scope of the NEEAP, which were evaluated by the EC for the period up to 2020.

The first workshop (on October 12th, 2021) focused on the presentation of the streamSAVE methodology for electric vehicles and identified how it could be applied for the Portuguese case. A preliminary assessment to identify the policies and measures for testing the methodology and validate the streamSAVE platform was carried out by ISR in advance of the meeting (desk research), through screening the available public documents and legislation related to the Portuguese NEEAP. This meeting also aimed at identifying the needs and the existing data sources at national level, investigating their robustness and availability and understanding the type of support to be delivered. Finally, specific recommendations were discussed on how it can be adapted to the national circumstances and what data needs be collected for the required control and verification procedures.

The CSF provided continuous support upon request by the involved public officers. Some additional bilateral meetings were carried out (on November 3rd and on November 12th, 2021) and several email communications was exchanged, mainly to discuss the robustness of the national values and the adaptation of the methodology to national circumstances, the identification of the most effective data collection procedures and the differences in the vehicle distances being used compared to the baseline consumption.

During the second meeting, the streamSAVE methodology for electric vehicles was tested in programmes, which have been implemented within the framework of NEEAP (promotion of electric vehicles to replace conventional vehicles) and are accounted for the achievement of 2020 target. During this meeting, a full test of the streamSAVE platform was conducted using streamSAVE indicative values as well as national indicative values for

the case of electric vehicles. The obtained results were compared with current practices pointing to a small difference due to a smaller value of baseline consumption of existing vehicles. The analysis led to the conclusion that the used reference values can be revised taking into account the ongoing market developments.

Additional targeted meetings were carried out in mid-November, which focused on the implementation of BU calculation methodologies in order to evaluate policies and measures for promoting soft modes (e.g., bicycles and scooters in the replacement of conventional vehicles, as well as greater use of public transport, e.g., social pass). Hereto, ISR collected the best available information from other countries, among the consortium partners and via desk research. The provided data within the framework of Eurobarometer surveys and the Urban Mobility Scoreboard were examined even if no useful data nor any indicative values for energy savings evaluation were found.

Moreover, ISR also provided a translation, from German to English, of the Austrian methodology based on the EEOs catalogue, while a particular interest to understand the process in southern countries, like Greece, as there are similarities between Athens and Lisbon was arisen. CRES provided the utilised methodology to assess the delivered energy savings by the promoted e-bikes in Greece including the defined indicative values. A calculation sheet was distributed also so as to facilitate the application of the developed methodology as an alternative approach.

Finally, it was decided that the representatives of NEEAP would assess individually the streamSAVE Training Module both for lighting and electric vehicles and complete the word feedback questionnaire.

In **Spain**, the developed streamSAVE methodology for electric vehicles was presented in the first workshop (on October 19th, 2021) including recommendations about its adaptation to the national circumstances and the required data for the control and verification procedures. IDAE explained the implemented programmes for promoting mobility (Sustainable Mobility – MOVES in its different editions) and the applied approach for addressing the before-mentioned technical issues.

The CSF supported IDAE with desk research in order to adapt the used national values considering the indicative values as proposed by streamSAVE. A detailed review of the existing sources was conducted, while the involved IDEA experts reviewed their existing procedures in order to become more effective concerning the data collection procedures. IDAE provided indicative values for CO_2 emissions for different types of vehicles, while they specified the National GHG Inventory as the most reliable source of information for calculating GHG emissions within the framework of the UNFCCC for the potential revision of the streamSAVE BU calculation methodology.

Moreover, special guidance was provided on additional technical issues, such as the estimated energy savings by the developed streamSAVE methodology were compared with the existing ones identifying potential differences and assessing their effectiveness.

After a period of consideration, exchange of documentation and testing of streamSAVE platform, a second workshop was organised (on January 19th, 2022). The objective of the second workshop was to evaluate together with IDAE the conclusions from CSF activities and to share their experience of using the streamSAVE platform. The experiences shared with policy officers associated with the mobility department in IDAE and the lessons learned were analysed in order to integrate these into the new sustainable mobility programmes, which promote the purchase or the replacement of conventional vehicles with electric vehicles, not only private vehicles but also public vehicles.

Obviously, the current programme cannot be adapted, as it is already in progress, but the developed BU calculation methodology seems to be very useful and can be taken into account in the potential re-design of the programme. A potential improvement can be the exclusion of the scrappaging during the calculation of the delivered energy savings. Finally, the performance of the streamSAVE platform was discussed leading to the conclusion that the tool is user-friendly and understandable according to IDEA's responses.

2.2.3 Key outputs and impacts

In **Belgium**, the final output consisted of a ready-to-use calculation sheet (in excel) for each of the two affected measures. The developed calculation sheets facilitate the compliance with the following aspects:

- Data gathering of the relevant data types.
- Setting up of the baseline, in which the additionality criterion has been incorporated.
- Specifying national calculation values.
- Estimating the total annual and cumulative energy savings according to the requirements of Article 7.

For the measure of the federal car fleet, the discussion centered more on the additionality towards the Clean Vehicle Directive and the impact on the baseline due to the fact that the majority of the required data was available. For the measure of the zero emission company cars, the collection of the required data was more challenging, while it was considered as a good starting point for notifying this measure and calculating energy savings from it in frame of Article 7.

The impacts triggered by the activities of the CSF include the incorporation of the developed streamSAVE BU calculation methodology into the revised Circular 307septies and the planned notification of both measures within framework of Article 7.

In **Netherlands**, the main outputs consisted of concrete suggestions for the development of a robust and cost-effective method for the calculation of Article 7 energy savings and CO_2 emission reductions using the data available covering the following issues:

- Advice on good practices to improve monitoring and data collection.
- Advice on parameters (such as reference values, lifetimes etc.).
- Address the impact of imports on energy savings calculations.
- Advice on dealing with soft modes for transportation replacing motorized equipment.
- Advice on baselines and standardized values for various means of transport (busses, trams, vans and ferries in particular).
- Quantify the petrol energy consumption figures for vans (amongst other modes of transport).

Considering the impacts, the conduction of more accurate estimations of energy savings and CO_2 emission reductions triggered by the promoted electric vehicles as realized by the adapted RVO's monitoring practices and calculations is expected. Furthermore, more specific figures on different means of transport (busses and vans in particular) will become available, including a methodology for estimating accurately the impact of imports on energy savings calculations.

In **Portugal**, the key outputs included the specification of national calculation values for different types of private and public vehicles, the development of data collection procedure guidelines and the enhancement of the control and verification requirements according to the provisions of the EED.

Moreover, a detailed assessment was carried out to identify the policies and measures included in the NECP for 2020-2030 horizon to promote electric vehicles and the consequent decarbonization of the transport sector. Last but not least, guidance was provided for calculating the energy savings for modal shift of private cars towards cycling, walking and collective transport as well as for the extension of the public transport network.

The expected impacts in Portugal consist of the design and implementation of new energy efficiency measures (particularly soft modes) delivering new energy savings, the improvement of the reporting quality, the enhanced awareness of the involved parties on actions for the promotion of electromobility, the evaluation of the already implemented policies and measures through the comparison of the applied national methodology with the streamSAVE methodology and the potential adoption of the streamSAVE methodologies for programmes advocated in the NECP.

In **Spain**, the key outputs included the specification of national calculation values for different types of private and public vehicles (focus on emission factor for electricity), the establishment of data collection procedures, the fulfilment with the control and verification requirements and the determination of a factor of additionality for the case of scrapping.

The obtained outputs though the CSF can lead to considerable impacts, such as:

- Foster the estimation of final energy savings.
- Improve the foreseen reporting of the implemented actions due to less complicated reporting process.
- Increase the accuracy of the calculations for the delivered energy savings.
- Improve the awareness of the involved parties on actions for the promotion of the electromobility.
- Expand the framework for calculating the energy savings including those vehicles that are scrapped.

2.3 Heat Recovery

Technical support through the CSF was provided to three different countries (Czechia, Croatia and Greece) for the PA of heat recovery.

2.3.1 Focus of support

Seven policy officers participated into the CSF's activities in the three countries representing five different organizations (Table 9).

Table 9: Involved policy officers and organizations within the CSF for the PA of heat recovery.

Metric	Czechia	Croatia	Greece
Number of involved policy officers	2	3	2
Number of involved organizations	1	2	2
Organizations	Ministry of Industry and Trade (MIT)	Energy Institute Hrvoje Požar (EIHP) Ministry of Economy and Sustainable Development (MoESD)	Ministry of Environment and Energy (MoEE) Centre for Renewable Energy Sources and Saving (CRES)

The technical issues, which were addressed by the CSF, are presented in Table 10. The compliance with Article 7 constituted as priority by all involved countries. Moreover, definition of the baseline and data collection or assessment of the monitored data were identified as crucial technical aspects for the case of heat recovery.

Nevertheless, the estimation of energy savings based on deemed streamSAVE methods and the cost effectiveness were considered also as important aspect for the case of Croatia and Greece. Finally, the need to quantify the delivered energy savings within the framework of Article 3 was mentioned in two countries (Czechia and Croatia).

Two countries (Croatia and Greece) aimed at adapting or improving existing practices based on calculation methodologies or indicative values from other MSs. Moreover, screening and an initial assessment of promising technical savings actions was selected as well, highlighting the fact that no sufficient knowledge is available for estimating the achieved energy savings by the promoted heat recovery systems.

Table 10: Addressed technical issues within the CSF for heat recovery.

Technical aspect	Czechia	Croatia	Greece
Baseline	X	X	X
Data collection or assessment of monitored data	X	X	X
Energy savings based on deemed streamSAVE methods		X	X
Cost effectiveness		X	X
CO_2 savings		X	
Behavioural aspects		X	
Calculation of rebound, spill-over and free-rider effects		X	
Article 3	X	X	
Article 7	X	X	X
Streamlining between Article 3 and Article 7			

Screening and initial assessment of promising technical savings actions		X	X
Adapting or improving existing practices from the other MSs on calculation methodologies or indicative values		X	X
Reviewing existing calculation methodologies	X		
Other issues and targets			

Additional technical issues were discussed in the CSF, such as the procedure for controlling and verifying the achieved energy savings and the specification of the lifetime (Greece).

2.3.2 Conducted activities

For all country cases, the technical support was provided combining phone/online workshops and desk research (Table 11). Online/email support was provided for the case of two countries (Czechia and Croatia), while the organization of in-country workshop (due to covid) and peer-peer exchange of experience between countries were less applied approaches.

Table 11: Type of conducted activities within the CSF for the PA of heat recovery.

Activity	Czechia	Croatia	Greece
In-country workshop			X
Telephone support/Online workshop	X	X	X
Online/email support	X	X	
Desk research consortium	X	X	X
Peer-peer exchange of experience between countries		X	
Other activities	X		

In **Czechia**, the MIT collected a set of questions related to the Articles 3 and 7 of the EED and the implemented policies and measures. The questions covered various fields, such as buildings, transport and cross-cutting issues; emphasis was given on the energy saving calculation methodologies.

Three meetings and some additional informal exchange took place with the Ministry's representatives. The first contact was organised in October requiring specific clarification about the eligibility of the various measures, while the second meeting was conducted in December (on December 15th, 2021). It should be noted that the preliminary version of OP TAC Terms of Reference and the national energy savings catalogue, which has been drafted by the Ministry and is currently under review by the European Commission, was assessed.

The conclusions, the streamSAVE platform and the utilised methodologies were presented in the final workshop (on January 10th, 2022).

In **Croatia**, expert advice was provided on good practices and state of the art approaches for utilizing deemed methods for the estimation of energy savings, establishing baseline/reference values and taking into account additionality, avoidance of double counting, lifetimes, import/export etc. The first contact was arranged in September 2021

to discuss the most important technical issues and decide on the applied approach within the framework of the CSF.

The first CSF workshop was held on November 26th, 2021 as an online meeting. The challenges in Croatia regarding calculation methodologies were presented as none of the 33 existing EEO methodologies in the Regulation has focused on heat recovery. Therefore, the objective was to check initially whether the developed streamSAVE methodologies satisfies the needs of Croatian Regulation. Obviously, the developed streamSAVE methodologies could be used as the part of the Guidelines during the revision of the existing framework.

The fruitful discussion on the methods was focused on the reporting data and factors, behavioural elements, assumptions etc. Finally, the streamSAVE platform was shown to the participants with the links to guidelines and calculation excel, while it was requested to fill in the questionnaire.

A second meeting was organised also (on February 16th, 2022) with representatives of EIHP in order to assess the lessons learnt of the CSF activity and to explore the possibility to integrate officially the developed streamSAVE calculation methodologies into the national catalogue.

In **Greece**, the first meeting with the representatives of MoEE and CRES was performed on September 17th, 2021 though phone calls. It was agreed that the first national workshop will be organized in the middle of October 2021 aiming at the presentation of the developed methodology within the streamSAVE project. Specific recommendations were given on how the proposed methodology can be applied in order to estimate the energy savings from the planned policy programme within the Recovery and Resilience Plan for improving the energy efficiency in industrial sector. Emphasis was given both on the required data for the calculation of the energy savings and the control and verification activities that have to be carried out after the completion of the policy programme.

The first workshop was conducted via teleconference on November 3rd, 2021. The discussion focused initially on the developed methodologies for quantifying the delivered energy savings from the installation of heat recovery systems. The development of deemed method is preferred generally so as to facilitate the participation into the planned Recovery and Resilience Fund programme and to simplify the required control and verification activities.

Moreover, additional information was required for the specifications of the metering systems. A guidance was provided to apply the provisions of IPMVP and ASHRAE protocols so as to respond to the previous request.

In summary, it was agreed to assess:

- The applicability of the proposed methodologies with the responsible authority of the planned Recovery and Resilience Fund programme, including a preliminary estimation of the expected energy savings.
- The potential use of the reported data in the Energy Audit Registry for estimating specific indicators.
- The integration of the proposed BU calculation methodologies into the national catalogue of the Energy Efficiency Obligation EEO scheme.

After the organized workshop, the representatives of the Administrator for the Calculation, Monitoring, Control and Verification of the EEOs in cooperation with the country leader quantified the expected energy savings triggered by the planned policy programme

identifying the appropriate input data and specifying the required data collection procedures after the initiation of the policy programme.

Afterwards, a teleconference was organized on November 17th, 2021 to present the streamSAVE platform to the representatives of the MoEE and CRES elaborating different scenarios for all PAs. Moreover, it was decided the representatives to assess individually the streamSAVE platform and to complete the respective questionnaire. As a result, the streamSAVE platform was tested for all the examined PA by MoEE (heat recovery and EV), and by CRES (all PAs). The completed questionnaires were sent on November 29th, 2021.

The reported data in the Energy Audit Registry were analysed in order to estimate specific indicators for the case of heat recovery technologies in industrial units and to examine the possibility to develop a BU equation based on deemed savings. In total, 39 energy efficiency proposals were identified and analysed leading to the acquisition of useful statistics figures, such as the delivered final and primary energy savings on annual basis, the foreseen investments, the CO_2 reduction and the cost effectiveness ratio as calculated by the division of the foreseen investments with the delivered primary energy savings and the CO_2 reduction on annual basis for each industrial unit separately. All the findings are summarized into the technical memo entitled «Analysis of heat recovery technologies in industrial sector», which was prepared and distributed to the involved stakeholders in order to explore the possibility to develop a deemed method.

The obtained results were discussed with the representatives of the MoEE (phone call on January 9th, 2022) including the possibility to develop a BU equation. It was concluded that the development of a BU equation based on deemed savings seems to be feasible. Nevertheless, the conduction of energy audit before the installation of the heat recovery technologies is preferred facilitating the collection and verification of the required data.

It was agreed to postpone the second national workshop until the appointment of the responsible authority for the administration of the planned Recovery and Resilience Fund programme (possibly to be fulfilled within the first semester of 2022). Moreover, the possibility will be explored for integrating the developed BUs into the national catalogue for assessing the delivered energy savings within the framework of the EEOs.

2.3.3 Key outputs and impacts

In **Czechia**, the CSF is expected to lead to specific impacts on the OP TAC requirements:

- Improve the quality of the targeted scheme for industry and services.
- Extend the existing project portfolio supported by OP TAC.
- Increase the quality and comprehensiveness requirements on energy savings measures in the projects supported by OP TAC.

In **Croatia**, the key outputs triggered by the implemented activities of the CSF included:

- The formulation of concrete suggestions for the development of a robust and cost-effective method for the calculation of Article 7 energy savings and CO_2 emission reductions using the data available.
- The revision of the existing calculating methodologies.
- The provision of advice on good practices to improve monitoring and data collection.
- The definition of specific parameters (e.g., reference values, lifetimes etc.).

The CSF will lead to the potential integration of the developed methodology into the national catalogue and will therefore motivate the obligated parties to implement such types of policies and measures. Moreover, additional impacts will be derived as the quantification of the delivered energy savings will become feasible. Moreover, the awareness of the involved parties on actions for the further penetration of heat recovery technologies will improve, as well as the compliance with the technical requirements of Annex V of the EED.

In **Greece**, the modification of the existing Greek catalogue within the framework of the EEO scheme constitutes the main impact of the CSF. More specifically, the integration of a specialized equation for promoting heat recovery in the industrial sector will be performed, while the required data collection and control and verification procedures will be specified.

The preparation of the technical memo «Analysis of heat recovery technologies in industrial sector» is also a beneficial output, increasing the possibility to develop a deemed method for calculating the delivered energy savings by the installed heat recovery systems.

Finally, the application of the adapted methodology will lead to considerable impacts such as:

- Improve the quantification of the delivered energy savings by programmes for the promotion of heat recovery technologies in the industrial sector.
- Increase the accuracy of the calculations for the delivered energy savings.
- Enable the calculation of the cost effectiveness ratio to facilitate the evaluation of the implemented policies and measures.
- Improve the awareness of the involved parties on actions for the further penetration of heat recovery technologies.
- Facilitate the effective compliance with the technical requirements of Annex V of the EED.

Chapter 3 Lessons Learnt

The most important lessons learnt are presented in this chapter for all examined PAs within the framework of the CSF based on the performed activities.

Generally, the performed activities within the CSF for providing technical assistance concluded that all developed BU calculation methodologies seem to be operational and useful for the involved policy officers improving considerably the existing estimation of savings, as well as the monitoring, control and verification procedures of the delivered energy savings for all examined technical efficiency actions.

3.1 Building Automation and Control Systems

The developed BACS methodology can be adapted to the national conditions facilitating the estimation of the delivered energy savings from the installation of the respective systems in all MS. Nevertheless, the adaptation of the developed BACS methodology to the national circumstances is easier to be applied for the case of residential buildings compared to the non-residential ones. This is explained by the lack of data on the total floor area and the final energy demand for the different types of non-residential buildings. The non-residential buildings differ significantly across the various sectors of economic activity, while no information about the utilised technologies and equipment is available for all end-uses.

Nevertheless, the streamSAVE BACS methodology has managed to intercorporate various technical issues, such as indicatively the foreseen BAC energy efficiency factors before and after implementation of an energy efficiency action according to EN15232 (2018), both for new installation and upgrades of BACS, and the provisions of Articles 14 and 15 of the Energy Performance Building Directive.

In any case, specialised data collection procedures should be established by the Member States aiming at the effective data collection to determine national reference values, which are beneficial for the utilization of the developed BU calculation methodology.

Finally, emphasis should be given on facilitating the access to the existing data sources, which are not easily accessible, in order to address the limited data availability both for the case of residential and non-residential buildings.

3.2 Electric Vehicles

Despite the fact that various approaches have been initiated to estimate the achieved energy savings by the promotion of electric vehicles, the lack of a standardized and robust data exchange procedure is obvious in all almost examined countries, while the existing data sources are not easily accessible.

Therefore, the establishment of a standardised data collection mechanism should be spurred based on a robust and independent monitoring and verification structure leading to the effective design and implementation of the required energy efficiency policies and measures for the further penetration of electric vehicles. The developed streamSAVE BU calculation methodology can be utilized for designing and developing the foreseen data collection procedure.

A comparison study on the differences and similarities between MS should be conducted, especially concerning practicalities such as conversion to soft modes, hypotheses of

scrapping and import percentages. The outcomes of this research will facilitate the standardisation of energy savings reported for different policies and measures across MS.

The comparison of the resulted savings based on the application of streamSAVE BU calculation methodology with the national ones provides valuable insights about the reliability and accuracy of both applied savings methodologies. In the case the differences are considerable, it is essential to identify the parameters, which contribute to these deviations so as to select the most effective approach.

More emphasis should be given on the compliance with the additionality criterion and the promotion of soft modes of transport. It is recommended to examine potential discrepancies of the actual lifetime of vehicles with the theoretical ones as specified in the respective legislative framework.

Last but not least, the potential expansion of the measurement methodology with CO_2 emission reductions can provide a different perceptive for the selection of the most effective policies facilitating the energy transition of the transport sector towards carbon neutrality.

3.3 Heat Recovery

The suggested, metered method within the streamSAVE BU calculation methodology for the energy efficiency interventions in the industrial sector, including heat recovery technologies, is considered as an applicable approach by the involved policy officers.

The high preference for deemed methods was articulated in order to minimize the administrative burden and facilitate the calculation of the energy savings. Nevertheless, the implementation of deemed method is not easy due to the difficulty to specify indicative value for the different types of industrial units.

Moreover, the application of a scaled method (e.g., by utilizing engineering estimates for the calculation of the energy savings) can be examined as an alternative method.

In any case, the developed BU calculation methodology has a considerable usefulness providing insights for different technical aspects, such as the calculation of the final energy consumption before and after the implementation of an action. During the support, more information was requested about the required control and verification procedures focusing mainly on the specifications of the metering systems, which are required for the estimation of the final energy consumption before and after the installation of the heat recovery technologies.

3.4 Horizontal considerations

Meaningful horizontal lessons were derived by the provided activities within the CSF.

Firstly, the BU calculation methodologies can improve the coordination of monitoring, reporting and verification procedures and streamline the cooperation and communication of the different bodies being responsible for monitoring the implemented energy efficiency measures. Obviously, the official definition and appointment of the foreseen duties and responsibilities for all the involved bodies, including the specification of the required time plan and activities, will facilitate the coordination of the monitoring, reporting and verification procedures.

Special attention should be given on the data collection procedures, which can indisputably foster both the monitoring and reporting of the implementation of the energy efficiency

policies and measures to reach the national targets within the framework of Article 3 and Article 7 of the EED.

The development of BU calculation methodologies is a fundamental pillar in the design and implementation of a holistic Monitoring Reporting and Verification system outlining all the necessary activities. More specifically, the development of streamlined BU calculation methodologies and indicative values at European level for all MS, will improve considerably:

- The determination of the national calculation values, by showcasing which types of data and possible data sources could be used.
- The collection of the required data.
- The effective application of the monitoring, control and verification procedures and compliance with quality requirements.
- The fulfilment with the EED reporting obligations.

Indisputably, the developed streamSAVE BU calculation methodologies can enhance the existing understanding of policy officers on the technical requirements to measure the delivered energy savings along with the facilitation of the data collection. The CSF therefore showcases that the streamSAVE guidance addresses multiple barriers to estimate and report credible savings within MS, such as the lack of skilful staff among policy officers, the continuous difficulty to comply with the technical requirements of the EED, the inability to ensure continuity due to the rapid changes, etc.

Finally, the provided support by standardized BU calculation methodologies can motivate the responsible authorities and other involved parties to design and implement energy efficiency policies and measures targeting the technical Priority Actions, which still have considerable unexploitable energy savings potential.

Last but not least, a comparative analysis of the planned and implemented policies and measures can be undertaken based on the assessment of cost effectiveness. This assessment will support that the most efficient and beneficial ones will be promoted to facilitate the fulfilment of the ambitious energy efficiency targets at national and European level.

Conclusions

The establishment of the CSF within streamSAVE project seems to be effective for all the 10 involved countries as it addresses significant barriers, which hinder constantly the effective implementation and reporting on energy efficiency policies & measures covering the Priority Actions, next to the required monitoring, reporting and verification procedures.

The indicators monitored during the CSF show that the impacts triggered by the performed activities within the CSF for the first round of PAs are satisfactory.

For the first round of PA, 30 policy officers have participated into the implemented activities representing 18 public bodies or organizations (Table 12).

Table 12: Influenced policy officers by the activities of the CSF in the involved countries.

Country	Number of involved policy officers	Number of organizations
Austria	3	2
Belgium	5	4
Czechia	2	1
Croatia	3	2
Greece	2	2
Netherlands	3	1
Lithuania	1	1
Portugal	5	2
Slovenia	3	2
Spain	3	1
Total	30	18

In total, 18 policies and measures related to the PAs will be affected by the conducted activities within the framework of the CSF, as illustrated in Table 13.

Table 13: Influenced policies related to the PAs by the CSF activities in the involved countries.

Country	Targeted policies
Austria	I. Integration into the national catalogue
Belgium	I. Promotion of fuel switch in the federal fleet II. Promotion of fuel switch at the company cars
Czechia	I. OP TAC (Operational Programme Technologies and Applications for Competitiveness)
Croatia	I. Integration into the national catalogue
Greece	I. Integration into the national catalogue of the EEOs II. Recovery and Resilience Fund programme for improving the energy efficiency in industrial sector
Netherlands	I. SEPP Subsidy scheme electric passenger cars

Country	Targeted policies
	II. SEBA Subsidy Scheme Zero Emission Company Cars III. National Agenda on charging infrastructure IV. SEB subsidy scheme for electric non-mobile machinery V. Fiscal benefits for zero emission vehicles (both for consumers and business)
Lithuania	I. Installation of BACS systems in buildings though the developed BU calculation methodology
Portugal	I. "Maintain and promote incentives for the purchase of 100% electric light vehicles, as well as the existing framework of tax incentives" programme II. "Promote electric vehicles for urban micro-logistics" programme III. "Promote the introduction and use of low emission vehicles and sustainable mobility in the state" programme
Slovenia	I. Integration into the national catalogue
Spain	I. Next MOVE (sustainable mobility) aid programme
Total	**18 policies related to the PAs**

Table 14 presents the conducted workshops and meeting during the CSF for each involved country to facilitate the actual involvement of the policy officers to improve their current level of knowledge and skills.

Table 14: Conducted workshops and meeting within the framework of the CSF in the involved countries.

Country	Conducted workshops and meetings
Austria	Two workshops
Belgium	Two workshops
Czechia	One workshop and two meetings
Croatia	One workshop and two meetings
Greece	One workshop and two meetings
Netherlands	Three workshops
Lithuania	To be completed
Portugal	One workshop and two meetings
Slovenia	Three meetings
Spain	Two workshops
Total	**13 workshops and 11 meetings**

Concluding, the involved policy officers are willing to integrate the developed BU calculation methodologies into the national catalogues or estimations to quantify energy savings from new policies and measures. This illustrates the successfulness of the provided technical support on the selected PAs during the CSF.

Generally, the need to provide technical support to policy officers in Member states is imperative, while cross-country exchanges on calculation methodologies can further contribute to streamline existing practices or improve the overall coverage of calculation methods among MS. The horizontal approach of streamSAVE's dialogue groups structured in accordance with the selected PAs and where stakeholders discuss various essential methodological and techno-economical topics is indisputably beneficial and can be considered as a valid, supplementary tool to the CSF.

Finally, the establishment and operation of the CSF can be assessed as rather effective despite the difficulties, which have been imposed by the restrictions due to COVID-19. Nevertheless, physical meetings are important for providing technical assistance to the public bodies, but preferably accompanied by the diverse activities organized within CSF in order to maximize the expected impacts.

Bibliography

EN 15232, 2018. Standard Energy Performance of Buildings - Energy performance of buildings.

European Commission, 2012. Directive (EU) 2012/27 of the European Parliament and of the Council of 25 October 2012 on energy efficiency, amending Directives 2009/125/EC and 2010/30/EU and repealing Directives 2004/8/EC and 2006/32/EC.

European Commission, 2018a. Directive (EU) 2018/2002 of the European Parliament and of the Council of 11 December 2018 amending Directive 2012/27/EU on energy efficiency.

European Commission, 2018b. Directive (EU) 2018/844 of the European Parliament and of the Council of 30 May 2018 amending Directive 2010/31/EU on the energy performance of buildings and Directive 2012/27/EU on energy efficiency.

streamSAVE, 2021a. Status of energy savings calculations for priority actions in European countries, available at: https://streamsave.eu/wp-content/uploads/2020/09/D2.1_StatusSavingsCalculationsEU-1.pdf.

streamSAVE, 2021b. Standardized saving methodologies - Energy, CO2 savings and costs, available at: https://streamsave.eu/wp-content/uploads/2020/09/D2-2_PracticalGuidance_IntermediateVersion-5.pdf.

streamSAVE, 2021c. streamSAVE platform, available at: https://streamsave.flexx.camp/login

CONTACT THE PROJECT

@stream_save

@streamsaveh2020

contact@streamsave.eu

www.streamsave.eu

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