STREAMSAVE DIALOGUE GROUPS

PRIORITY ACTIONS:

- **FEEDBACK AND TAILORED ADVICE FOR BEHAVIOUR CHANGES**

- **SMALL-SCALE RES FOR HEATING (INCLUDING DOMESTIC HOT WATER)**

MINUTES OF MEETING 1
WEDNESDAY 11 MAY 2022

Short summary

This meeting discussed calculation methodologies and related issues about energy savings from (1) feedback and tailored advice for behaviour changes, and (2) small-scale RES for heating (including Domestic Hot Water). Key points highlighted in the discussions:

General:

– The European Commission's recommendation (EU) 2019/1658 on the implementation of Article 7 EED published in September 2019 provides guidelines for the calculation methodologies for both action types.

About feedback and tailored advice for behaviour changes:

– The methodologies available from Member States about energy savings from behaviour changes are mostly focused on electricity savings in the residential sector. However, very few of these methodologies present the sources they have used. The streamSAVE team is therefore reviewing recent studies and sources to provide an updated list of sources and indicative values.
– The literature review shows that the savings lifetime is commonly assumed to be equivalent to the duration of the intervention promoting behaviour changes.
– The approaches used in the behaviour change interventions vary broadly, and so their results. Which makes it difficult to compare their results.
– Requiring empirical studies to prove the effects of the behaviour interventions can be a way to improve the reliability of the reported energy savings, especially when the studies include pilot trials and a well-documented methodology.
– The data collection should not be limited to direct monitoring of energy consumption, and should also include complementary relevant data / variables.
– It can be difficult to separate the effects of the behaviour interventions from other factors, especially in a context of rapidly changing energy prices.

About small-scale RES for heating (including Domestic Hot Water)

– The main parameters in the calculation formulas are the building area, the specific heat demand and demand in domestic hot water – DHW (in kWh/m².year) and the efficiency of the baseline and new systems for space heating and DHW.
– European standards and regulations provide a first basis, however difficulties were encountered in finding standardised data at European level, as the values used in the national methodologies used by Member States may vary significantly.
– The definition of the baseline might need to consider when the policy measure promotes fuel switching, as in this case it might be relevant to define a baseline according to the type of technology of the replaced system.
– The choice for the indicator of specific energy demand for domestic hot water might depend on the data availability: per person might be more accurate, but data per m² seem to be more commonly available.
– The requirements set in Article 7 and Annex V of the EED make that only final energy savings can be reported. In practice, small-scale RES technologies do not always lead to final energy savings. In this case, these actions are not eligible to Article 7.
– The strong changes in energy prices since 2021 have a major impact on the costs of the different options for heating systems. Which can have a major influence on the decision of the building owners.

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(All times are in CEST)

Part 1: Feedback and tailored advice for behaviour changes

Methodology scoping and approach to be followed, by Carlos Patrão (ISR-UC)

(*See presentation file available on the streamSAVE Knowledge and support facility*)

Carlos Patrão clarified the **scope** of the Priority Action (PA) considered in streamSAVE, dealing with **behaviour changes related to using energy**. Behaviours related to investment decisions (e.g., adopting a new technology) is out of the scope of this PA.

The literature has shown that energy-using behaviours can be **as important as the physical characteristics** of the buildings or appliances. And the more efficient the buildings or appliances, the higher the influence of the users.

The literature also shows that evaluating energy savings from measures on behavioural changes remains challenging. The focus of streamSAVE PA is on feedback and tailored advice about energy-using behaviours in the residential sector.

The **European Commission's recommendation** on the implementation of Article 7 EED published in September 2019[1] includes an appendix about calculating energy savings from behavioural measures (Appendix VI). This has been used as a starting point for developing the streamSAVE methodology for this PA.

The **collection of existing methodologies** in Member States found 16 methodologies (in 10 countries) about energy savings from behavioural measures, plus three methodologies from the former European project multEE[2].

These methodologies are **mostly focused on electricity savings in the residential sector**. Most of them follow a similar simplied calculation formula, as suggested from the Energy Efficiency Directive and related guidelines.

However, one difficulty is that **very few methodologies present the sources** they have used, and when it is the case, it is often based on studies that are now old (from the 2000's).

The streamSAVE is therefore currently reviewing more recent studies and sources to provide an updated list of sources and indicative values.

Another challenge is to find **cost data** related to the behavioural measures.

The **lifetime** of energy savings is a key issue when dealing with behavioural measures. Based on the literature, a common assumption is to consider a lifetime **equivalent to the duration of the intervention** promoting behaviour changes, as effects diminish over time.

Double counting can also be an important issue, especially when the interventions do not make it possible to clearly identify the participants. There might indeed be **overlaps between several interventions or programmes** led at the same time. Or when an intervention is repeated, the participants might be partly the same.

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[1] https://eur-lex.europa.eu/eli/reco/2019/1658
[2] https://multee.eu/

Q&A

- *among the methodologies collected, were some methodologies based on doing first a pilot test to assess the savings effect (with measurements or other approaches)?*

This was not documented in the methodologies analysed so far. In some cases, there were some ex-post surveys, sometimes complemented with on-spot measurement of energy consumption on samples.

- *How do these methodologies compare in terms of indicative values?*

The ratios of energy saving effect are different according to the countries. And the information available rarely provide the sources or basis used to define these ratios.

Moreover, the target groups or the intervention approaches also differ from one case to the other, which also makes it difficult to compare their results.

- *Will you give recommendations what is NOT eligible information measures? For example, what format of awareness campaign can be eligible? (some very general camapings were reported in the past, with large amount of savings claimed)*

The streamSAVE project cannot clarify what is eligible or not. However, the project could identify sources documenting what approaches have been proven to be effective.

An example was mentioned about Austria, where the public authorities demanded empirical studies about the effect for awareness and information campaigns, when reported to the EEOS. If no empirical study was available, the measures and related energy savings were not accepted.

Methodology to assess the impacts of behavioural changes from the NUDGE pilot projects, by Dr. Stratos Keranidis (domX, Greece)

(See presentation file available on the streamSAVE Knowledge and support facility)

Stratos Keranidis presented the five main challenges or limitations identified in the NUDGE project about behavioural interventions, and especially that interventions are **not always tailored** to the specific psychological or contextual features of individual consumers.

He also emphasised the **need for pilot trials and well-documented methodology** about the interventions and their evaluation.

One of the four objectives of NUDGE has been to develop a protocol to evaluate the effects of the behavioural interventions, tested on pilot trials. The methodology includes the following phases:

1) **Pre-pilot phase**: installing energy monitoring and management tools; providing digital user interfaces for end-users to be able to monitor and improve their use of energy; and deploying a central data platform to collect the data from the pilots.

2) **Pilot phase**: going through **three steps** (pre-intervention phase, testing phase and post-intervention phase) that provide the data to evaluate the effects (from the baseline situation to the post-intervention situation).

The project is currently at the middle of the process, in the testing phase, with **five different pilot trials**, each with different target groups, scope and types of behaviour changes.

The data collection is based on **direct monitoring of energy consumption**, for example through a smart heating controller, **as well as complementary data / variables**, from smartphones or sets of sensors.

The protocol has defined the metrics and Key Performance Indicators (KPIs) to be monitored, to provide a common framework for all pilot trials whose data all feed in the NUDGE central data collection platform. Some data are collected in all trials, some are more specific to the types of interventions and their scope.

Stratos Keranidis then illustrated the approach showing data collected for some of the current trials, where dashboards make possible to view the progress and trends.

Q&A

– *What is the main component of the interventions tested?*
In all the pilots, the approach is to use nudges through a smartphone application. The frequency of the information / messages varies according the pilots.

– *Are some first results available?*
Not yet, the assessments are on-going. It is particularly difficult to separate the effects of the behaviour interventions from other factors, especially in a context of rapidly changing energy prices.

– *How many households have been involved in Greece and Portugal projects?*

The target is to have about 100 househoulds per pilot, so 500 households in total.

– *How do you select the participants? How representative is your sample?*

The approach was not necessarily to have representative samples, but to cover different target groups with tailored interventions. The pilots thus cover five countries (Greece, Belgium, Germany, Portugal and Croatia), in different environments (residential, energy communities, schools), with different age groups and income classes, being served by different energy carriers (electricity, natural gas), including residential prosumers and EV drivers.

– *Did you assess how the interest of participants about the information provided over time? (as previous projects showed it tends to diminish over time)*

It is indeed monitored. However, it is too early to have a view on this, as the project is still in the testing phase.

Part 2: Small-scale RES for heating (including Domestic Hot Water)

Methodologies scoping and approach to be followed, by Gema Millan Ballesteros (CIRCE, Spain)

(See presentation file available on the streamSAVE Knowledge and support facility)

Gema Millan Ballesteros explained the scope of this streamSAVE Priority Action (PA), that deals with technology using RES (renewable energy sources) to generate a significant share of space heating or domestic hot water in buildings.

These RES technologies are major solutions to reduce GHG emissions related to these energy end-uses. They are also contributing to energy efficiency improvements.

The PA is **focused on heat pumps, solar systems for domestic hot water and biomass boilers**.

The **collection of existing methodologies** in Member States found 11 methodologies (in 6 countries and from the multEE project).

The main parameters in the calculation formulas are the **building area**, the **specific heat demand and demand in domestic hot water** (in kWh/m².year) and the **efficiency of the baseline and new systems** for space heating and domestic hot water.

The heat demand is related to the heating degree days.

The baseline systems are defined according to "average" systems.

Complementary calculation formulas integrate emission factors to calculate the CO_2 savings.

Key sources per type of technology include:

– About heat pumps:

Data were first searched in the ecodesign regulations 813/2013 and 2016/2281, and related impact assessments and preparatory studies, and will then be complemented with other sources currently collected.

– About solar systems for domestic hot water:

Standard EN 12975-2:2006 Thermal Solar Systems And Components - Solar Collectors - Part 2: Test Methods

ISO/TC 180 Solar Energy (ISO Technical Committees on Solar Energy)

CEN/TC 312 Thermal solar systems and components

Solar Heat Europe (ESTIF - European Solar Thermal Industry Federation)

– About biomass boilers:

CEN Standard EN-303-5 Heating boilers - Part 5: Heating boilers for solid fuels, manually and automatically stoked, nominal heat output of up to 500 kW - Terminology, requirements, testing and marking

Difficulties were encountered in finding standardised data at European level, as the values used in the national methodologies may vary significantly.

Q&A

- *could you explain how the "average system" is defined (when defining the Baseline)? Is it about the market average or related to the Ecodesign régulations?*

About heat pumps and biomass boilers, it seems more relevant to define a baseline according to the market average, as was done previously in streamSAVE about the methodology for industrial and commercial refrigeration systems.

About solar systems, this is still under development.

The case of policy measure explicitly promoting fuel switching will be considered, as then it might be relevant to define a baseline according to the type of technology of the replaced system (e.g., ecodesign requirements set for gas boilers in case a gas boiler is replaced with a heat pump).

- *did you consider using a ratio per occupants instead of per m² for the formula about domestic hot water?*

This is under discussion. It also depends on the data available, and whether there would be a significant difference when using per m² instead of per occupant. For the moment, the choice is to use an indicator per m² as the related data seems easier to collect.

- to what extent is it possible to report energy savings from small-scale RES in the context of Article 7 EED?

All the streamSAVE methodologies take into account the context of Article 7 EED, therefore the calculation formulas are developed to be in line with the EED requirements.

These requirements indeed make that only final energy savings can be reported. In practice, small-scale RES technologies do not always lead to final energy savings. For example, when replacing a gas boiler with a biomass boiler, the efficiency of the biomass boiler is usually lower, so there is no final energy savings.

It will be checked how this issue can be clarified in the streamSAVE methodology. However, the streamSAVE project has not the role to specify what can be eligible or not.

Insights from the 'REPLACE your Heating System Calculator', by Tadeja Janša and dr. Gašper Stegnar (Jožef Stefan Institute – Slovenia)

(See [presentation file](#) available on the streamSAVE [Knowledge and support facility](#))

Tadeja Janša briefly presented the context and objectives of the [REPLACE](#) project, and the large energy savings potentials from heating and cooling systems, due to a large share of the systems currently in operation having low efficiency.

The REPLACE project thus aims at promoting the replacement of the old and inefficient heating systems, through different types of interventions and resources. The REPLACE

project is focused on the residential sector in 9 pilot regions, each with a local working group gathering the key stakeholders in this field.

A few cases were presented to illustrate the currently on-going campaigns that are being implemented, including an Austrian one-stop-shop, a Spanish subsidy scheme and a Slovenian campaign promoting the use of the Heating System Calculator as part of a subsidy scheme.

This presentation was focused on one of the resources developed by the project: the Heating System Calculator. It is meant to provide the building owners with information to aid their decision-making process about choosing their new heating system. It covers all relevant information, dealing for example with heating costs as well as subsidies available in the respective country.

It has been developed based on a calculator available from the Austrian klimaaktiv programme.

It provides data in terms of full annual heating costs, heating and CO2 savings, comparing the existing system with possible renewable-heating-based options for replacing it.

Tadeja Janša showcased the tool online, where you can select the country and language, then the type of existing heating system and provide a few input data about the building. Then the tool can simulate the results (heating and CO2 savings, etc.) for different types of new heating systems.

Q&A

- What sources were used when developing the tool?

The calculation methodology of total costs is carried out in accordance with guideline VDI 2067 from Germany. In the scope of REPLACE project, the calculator was adjusted later on to each country. The project partners used local information sources about the heating technologies, system efficiencies, subsidies, CO_2 tax, energy prices, etc. The project partners committed themselves to regularly update the calculator, which is very important from the aspect of variable energy prices that have a major influence on the overall decision.

- Any feedback already from users of the tool?

In Slovenia, a "fuel-oil out" campaign was carried out in 2021. The main focus was the replacement of fuel oil boilers, that are still being used in Slovenia on a large scale. The campaign was carried out in cooperation with local heat pump manufacturers, the local REPLACE project partner and energy advisory network. Overall, more than 130 fuel oil boilers were replaced with heat pumps, following the use of the calculator.

List of participants

34 participants

Name	First name	Organisation	Country
Agius	Matthias	The Energy and Water Agency	Malta
Bakas	Rimantas	Lithuanian Energy Institute	Lithuania
Borg Sant	Juliet	The Energy and Water Agency	Malta
Bukarica	Vesna	EIHP	Croatia
Faber	Marine	IEECP	France
Fong	João	ISR - University of Coimbra	Portugal
García	Aurora	CIRCE	Spain
Gillessen	Samuel	Klima-Agence	Luxembourg
Honzík	Miroslav	Ministry of Industry and Trade	Czech Republic
Hudetz	Lana	SEAI	Ireland
Isikli	A. Naci	EYODER	Turkey
Janša	Tadeja	CEU / Jozef Stefan Institute	Slovenia
Keranidis	Stratos	DOMX	Greece
Magyar	Jan	Slovak Innovation and Energy Agency	Slovakia
Masiulionis	Ričardas	Lithuanian Energy Agency	Lithuania
Mazeike	Darja	Lithuanian Energy Agency	Lithuania
Mikusova	Martina	Ministry of Trade and Industry	Czech Republic
Morrissey	Maeve	SEAI	Ireland
Moura	Pedro	University of Coimbra	Portugal
O'Connor	Sean	SEAI	Ireland
Pisano	Julie	ATEE	France
Praher	Christian	Austrian Energy Agency	Austria
Renders	Nele	VITO/EnergyVille	Belgium
Sijaric	Denis	Ministry for Energy and Spatial Planning	Luxembourg
Smeets	Niels	FPS Economy	Belgium
Stoniene	Agne	Lithuanian Energy Agency	Lithuania
Vaitulevice	Asta	Ignitis group	Lithuania
Project dialogue team (organisation)			
Patrão	Carlos	ISR - University of Coimbra	Portugal
Fonseca	Paula	ISR - University of Coimbra	Portugal
Pusnik	Matevz	Jozef Stefan Institute	Slovenia
Millán	Gema	CIRCE	Spain
Garcia-Polanco	Nelson	CIRCE	Spain
Šebek	Václav	SEVEn	Czechia
Broc	Jean-Sébastien	IEECP	France