# streamSAVE+ Dialogue Meeting #06

*Streamlining Energy Savings Calculations*

# Energy savings from heat recovery in ventilation systems

## MINUTES OF THE MEETING

**Date:** 09 October 2025 **Duration:** 11.00-12.00 CEST
**Online**

## Short summary:


- The streamSAVE+ methodology is focused on energy savings from heat recovery in ventilation systems, taking into account the energy used by the ventilation system (e.g. auxiliaries)
- The methodology is applicable to all EU Member States, considering three main climatic zones, differentiating between residential and non-residential, retrofitted and non-retrofitted, as well as between replacement or new installation of ventilation units.
- The key source of energy savings is the thermal efficiency of the heat exchanger. The methodology accounts for gains on space heating only (it does not cover possible gains on space cooling).



Co-funded by the
European Union

## Contents



## Agenda

| | |
|---|---|
| 11:00 – 11:05 | Quick updates about streamSAVE+ \| **Jiří Karásek** (SEVEn) |
| 11:05 – 11:35 | The new streamSAVE Plus methodology to calculate energy savings from heat recovery in ventilation systems \| **Jan Verheyen** (VITO) |
| 11:35 – 11:50 | Q&A |
| 11:50 – 12:00 | Open discussion, and what's next |

## Part 1 - Quick updates about streamSAVE+

(see also presentation file available on the streamSAVE+ website)

Jiří pointed out that the report detailing the development of the calculation methodologies for the new PAs, as well as all materials from the Dialogue meetings, are publicly available on the project website: https://streamsaveplus.eu/article/11-results

He also invited all participants to the following Dialogue meetings:

Thursday 20 November 2025 on public traffic management: registration link

Thursday 4 December 2025 on deep renovation in buildings: registration link

Jiří then summarised recent developments to the StreamSAVE+ platform. The calculations for all PAs will shortly be available online. Finally, he encouraged everyone to subscribe to the project newsletter, the first of which had been released (subscription link).

## Part 2 - The new streamSAVE Plus methodology to calculate energy savings from heat recovery in ventilation systems

(see also presentation file available on the streamSAVE+ website and the online platform https://streamsaveplus.eu/priority-actions#priority-13).

At the beginning of his presentation, Jan reminded that the presentation focuses on the objective and context of the StreamSAVE+ Priority Action on Heat Recovery in Ventilation Systems. The purpose is to develop a bottom-up, harmonized methodology for calculating the energy savings achieved through heat recovery in ventilation units, to support EU Member States in implementing Articles 4 and 8 of the Energy Efficiency Directive. The methodology provides a consistent framework for estimating final and primary energy savings and GHG reductions, in line with the **Ecodesign Regulation for Ventilation Units**.

Jan then introduced the technical background of the ventilation systems. These are based on natural ventilation, mechanical ventilation, or hybrid systems. The major features include a heat exchanger that transfers heat from the exhaust air to the external air used as supply air. Jan stated that the purpose of ventilation systems is to ensure **indoor air quality** (IAQ). When adding the **heat recovery device**, it then improves the space heating efficiency. To accomplish this, the system makes use of **auxiliary energy** (for example, fans, controllers, and defrosting) that needs to be deducted from the energy savings gains of the heat recovery.

In practice, installing a heat recovery system may be combined with additional measures to improve the building's energy performance (e.g. insulation of the building envelope, actions improving air tightness or increasing fan efficiency, smart controls). This may need to be examined to avoid double-counting of energy savings (between individual actions that may overlap).

In the second part of his presentation, Jan highlighted the assumptions made when establishing the approach for calculating energy savings.

The **main types of heat recovery systems** considered are:

- Plate or cross-flow heat exchangers: simple, compact, only sensible heat recovery.
- Counter-flow (or tube) heat exchangers: higher efficiency, compact design.
- Rotary (enthalpy) wheels: regenerative devices that can recover latent (moisture) energy in addition to sensible heat.
- Run-around coil systems: involve a liquid loop between two heat exchangers (supply and exhaust sides), allowing flexible installation when ducts are not adjacent.
- Thermal bypass facility: enables bypassing the heat exchanger during summer (mandatory in Ecodesign regulation since 2016).

The methodology follows the Ecodesign Regulation and applies to bi-directional ventilation units (BVUs) equipped with a heat recovery component. It includes both local units (LBVUs) and central units (CBVUs/CHRVs) used in **residential and non-residential buildings**.

Excluded from the scope are:

- Ventilation units without heat recovery,
- Units with integrated heat pumps (e.g. ventilation heat pumps using exhaust air as the source for DHW or space heating),
- Units for special conditions (hazardous environments, kitchen hoods, extreme temperatures).

The exclusion of heat pump systems avoids double counting savings that can be already covered under other energy efficiency actions.

The methodology is applicable to all EU Member States, considering **three main climatic zones**, and all types of buildings. About the types of buildings, the methodology differentiates between residential and non-residential, and between retrofitted & non-retrofitted.

The methodology also covers the cases of either **replacement or new installation** of a ventilation unit. For replacement, the specific case of early replacement (prior the end of lifetime of the previous system) is considered.

A **review and comparison of existing methodologies** were carried out to support the development of the StreamSAVE+ approach. The comparison included EU-level methods, research projects, and national schemes. Based on this review, preferred methodological choices were identified and adopted for the new harmonized methodology, as shown in the development table (with selected approaches highlighted). The literature review identified several existing methodologies and data sources, including:

- **EU-level sources**: Ecodesign methodology, CEN standards (EN 16798 series), EPBD-related methods.
- **EU projects**: MULTI-EE, COMBI, ODYSSEE-MURE, ENERFUND.
- **National methodologies**: identified in Germany, Belgium, the Netherlands, Denmark, and Sweden.

The key source of energy savings is the **thermal efficiency of the heat exchanger**. The methodology is focused only the gains on space heating and it does not cover the possible gains in summer on space cooling.

In the final part, Jan explained the deemed savings methodology. The calculation comprises determining the final energy savings, which are the difference in conventional final energy consumption before and after the action is implemented, as well as applying a factor for behavioural effects.

The baseline (condition before to adoption of the measure) for the initial state represents the EU's average building stock. Furthermore, additional auxiliary energy used by fans, defrosting energy, and energy-saving measures like air tightness, building envelope enhancement, or smart controls are not taken into consideration by the suggested methodology. The method is primarily concerned with the savings obtained by heat recovery.

Then conversion factors are used to calculate primary energy consumption. And the same for the reductions in GHG emissions.

The methodology also includes an EU wide indicative value that a user can use if no national data are known.

Details about the data sources and assumptions can be found in chapter 5 of D2.2 report.

Main sources used for the proposed indicative values include:

- Ecodesign Regulation (EU 1253/2014) – definitions and minimum requirements.
- CEN EN 16798 series – ventilation parameters.
- ODYSSEE-MURE and JRC IDEES databases – behavioural factors, conversion factors, and GHG coefficients.
- Eurostat – national energy balances.

Jan concluded by pointing out that Member States can use the methodology for calculating energy savings through heat recovery in ventilation systems to help them implement Articles 4 and 8 of the EED (EU/2023/1791) as this methodology is:

- Broadly applicable; scope aligned with Ecodesign requirements for VUs (EU 1253/2014).
- Accounts for space heating energy savings from heat transfer between exhaust and supply air.
- Inputs: national and case-specific data preferred, but default values provided.
- Outputs: TFES (final energy savings), EPEC (primary energy savings), GHGSAV (GHG reductions), and overview of costs.
- Full description in the report publically available on the project website (D2.2.)
- A calculation tool is available on the StreamSAVE+ platform.

Reminder about the rationale for ventilation systems, to ensure indoor air quality (IAQ).

Ventilation systems are usually based on natural ventilation systems, mechanical ventilation systems, or hybrid systems.

A heat recovery system includes an heat exchanger to transfer heat from the exhaust air to the outdoor air used for the supply air.

The system uses auxiliary energy (e.g. for fans, controls, defrosting). This should be deducted from the gains from the heat recovery.

In practice, the installation of a heat recovery system may come with other types of actions improving the energy performance of the building (e.g. insulation of the building envelope, actions improving air tightness or increasing fan efficiency, smart controls). This may need to be considered to avoid double counting of energy savings.

Starting point for the methodology includes the documents related to the ecodesign regulation on ventilation systems.

# overview of the main types of heat recovery systems #

# about the scope, check the point about excluding the case of Vus with heat exchanger and heat pump → probably useful to add the explanation about this here#

The methodology is applicable to all EU Member States, considering three main climatic zones, and all types of buildings. About the types of buildings, the methodology differentiates between residential and non-residential, and between retrofitted & non-retrofitted.

The methodology also covers the cases of either replacement or introduction of a ventilation unit. For replacement, the specific case of early replacement (prior the end of lifetime of the previous system) is considered.

The literature review found about **## existing methodologies**, either in EU standards or documents, or national methodologies (# add the countries #).

# some gaps in my notes here #

The key source of energy savings is the **thermal efficiency of the heat exchanger**. The methodology is focused on the gains on **space heating**. It does not cover the possible gains in summer on space cooling.

For the deemed savings methodology, the baseline (situation before implementation of the action) is specified with default assumptions.

The calculation starts with assessing the final energy savings, as the difference in conventional final energy consumption before and after implementation of the action, then applying a factor for behavioural effects.

# some explanations to be added about the main parameters of the calculation formula #

Then conversion factors are used to calculate primary energy consumption. And the same for the reductions in GHG emissions.

Details about the data sources and assumptions can be found in chapter 5 of D2.2 report.

# remind here the main sources #

# conclusion to be summarised here from the concluding slide:

- A methodology for the calculation of the energy savings via heat recovery in ventilation systems is available to support MS in the implementation of Art. 4 & 8 of the EED (EU/2023/1791)
  - Broadly applicable; Scope ~ Ecodesign requirements for VUs (EU 1253/2014)
  - It accounts for the space heating energy savings due to the energy transfer between the extracted air and the outdoor air through the heat exchanger in the ventilation unit.
  - Input: National and case specific values are preferred, default values are available*
  - Output: TFES, EPEC, GHGSAV, Overview of Costs
  - A full description of the methodology is available in StreamSAVE+ D2.2
  - Calculation tool will be available via the StreamSAVE+ platform (expected autumn 2025).

## Q&A

— *Could you say a bit more about parameters to be the technology compliant with Ecodesign requirements? Any minimum efficiency requirement?*

According to Ecodesign, the heat recovery system consists of a heat exchanger and a bi-directional ventilation system. The Ecodesign specifies some minimum efficiency requirements.

It is important to note that there are other factors that contribute to energy efficiency comparing to the baseline situation that and are typically associated with the installation or improvement of a ventilation unit in heat recovery, such as improving the building envelope, air tightness, increasing fan efficiency, and smart controls. These influence the total energy balance.

Often, natural ventilation serves as the baseline. The mechanical ventilation renewal rate of indoor air is increased.

— *Could you please describe what is and is not included in the developed approach regarding energy consumption?*

The developed methodology for the StreamSave Plus includes only the contribution of the heat exchanger to the energy performance improvements of space heating via the thermal efficiency of the heat exchanger. In addition, the methodology considers the winter operational mode, i.e. the space heating not the cooling in summer mode. In general, the runaround systems have lower efficiency.

The indicated values for the initial state include the baseline, which represents the average building stock in the EU. Also, the developed methodology does not account for additional auxiliary energy use by fans, defrosting energy, or additional energy improvements such as air tightness, building envelope improvement or smart controls. The method is primarily concerned with the savings achieved by heat recovery.

## Open discussion

- *Is it possible to use the developed methodology in any MS, and what adjustments must be made?*

The calculation can be used as-is. There is the option of using indictive values to the calculation referring to the EU level, as well as a combination of national and indicative values. However, it has to conform to the specification of the indicative values, and the user has to ensure accurate interpretation to use it.

- *Some Member States are using Energy Performance Certificates to monitor energy savings from energy efficiency improvements in buildings. What would be the pros and cons of using a methodology like the one developed in streamSAVE Plus vs. using EPCs?*

It depends on the methods/models used for the EPCs and how the energy balance is estimated. If it is based on metered data, then the comparison of the EPCs before and after implementation of the intervention should capture the energy savings. However, it will not distinguish the share of savings coming from the efficient ventilation system, if the intervention combines several actions (e.g. the improvement of building envelope, etc.).

In other cases, the energy savings in EPC is based on simplified models, which may not accurately reflect changes in ventilation systems.

More generally, the use of EPC to assess energy savings may include the EPC after intervention only and take average values from the national EPC database to define the baseline situation. This may create bias, because the buildings where interventions are done might not match well with the typology used in the EPC database, and because the buildings registered in the national EPC database may not provide a sample representative of the whole building stock: EPCs are primarily issued for buildings in case of sale or renting.

- *Can the cost-optimal studies prepared by Member States for the EPBD be a useful source of national data to implement this methodology?*

In my opinion, generally speaking, yes. It may be useful to make assumptions about the characteristics of the building stock and their national representation.

- *Were Member States' reports on cost-optimal levels of energy performance as a source of national data when implementing the streamSAVE Plus' methodology?*

In general, these studies can indeed be a valuable source of data. Then the different archetypes considered in these studies may not always match with the typologies used to monitor actions. And

heat recovery in ventilation systems might not be well addressed in the studies, especially about what is considered to define the baseline / stock average.

## List of participants:

28 participants

| Name | First name | Organisation | Country |
|---|---|---|---|
| Agnė | Stonienė | Lithuania Energy Agency | LT |
| Agniete | Melninkaitiene | Lithuanian energy agency | LT |
| Aleksandrs | Zajacs | Riga Technical University | LV |
| Andrejs | Zambzetskis | Ministry of Economics | LV |
| arne | seurinck | VEB | BE |
| Carlos | Pinho | Savemoneycutcarbon | GB |
| Darius | Pranckevičius | Lithuanian Energy Institute | LT |
| Elisabeth | Sibille | Austrian Energy Agency | AT |
| Gerhard | Bucar | Grazer Energieagentur GmbH | AT |
| Ginta | Samulienė | Lithuanian energy agency | LT |
| Gintarė | Guobytė-Žiliukė | AB Amber Grid | LT |
| Hana | Gerbelová | SEVEn | CZ |
| Ilze | Vjatere Meinarte | The Ministry of Economics Republic of Latvia | LV |
| inese | berzina | Ministry of economics | LV |
| Jan | Verheyen | VITO/EnergyVille | BE |
| Jean-Sébastien | Broc | IEECP | FR |
| Jiří | Karásek | SEVEn, The Energy Efficiency Center | CZ |
| Marco | Peretto | IEECP | NL |
| Matevz | Pusnik | Jožef Stefan Institute | SI |
| Mindaugas | Mizutavicius | LEA | LT |
| Naghmeh | Altmann | Austrian Energy Agency | AT |
| Ričardas | Stankevičius | MEPCO | LT |
| Solenne | Toum | ATEE | FR |
| Tom | Rayeck | Klima-Agence | LU |
| Una | Rogule-Lazdiņa | Ekonomikas ministrija | LV |
| Vanja | Hartman | Energy Institute Hrvoje Požar | HR |
| Vesna | Bukarica | Energy Institute Hrvoje Pozar | HR |
| Vita | Borodulina | Ministry of Economics | LV |