streamSAVE Dialogue Groups

Priority Actions:

BACS (Building Automation & Control SYstems) &

Road Lighting

Minutes of Meeting 3

Tuesday 9 November 2021

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

www.streamsave.eu
contact@streamsave.eu

Short summary

This meeting presented and discussed the calculation methodologies developed by streamSAVE for energy savings from BACS (Building Automation & Control Systems) and Road Lighting. Key points highlighted in the discussions:

- BACS represent a significant and cost-effective energy savings potential (hence the new provisions on BACS in the amending EPBD2018)
- There is no generic source of data that would provide the share of BAC classes in the buildings stock in each individual Member State, however streamSAVE provides indicative values for three EU regions: North, West and South. National surveys might be needed to further define the baseline.
- Due to the diversity of the service sector, deemed unitary savings for BACS should be differentiated according to the branches or sub-sectors.
- Deemed unitary savings can be useful to monitor energy savings from BACS for large schemes such as EEOS. However, at project level, BACS should enable to use measured data.
- Conservative values of deemed savings can be a way to encourage the use of standard methods with data specific to the energy efficiency projects, when specific data can easily be collected (e.g., for road lighting projects).
- Offering two alternatives (deemed savings or scaled savings) can provide flexibility for project holders to report data in a cost-effective manner.

Contents

Agenda

03.00-03.05	Introduction to the meeting
	PART 1: the streamSAVE methodologies and Training Module
03.05-03.20	Presentation by Kelsey van Maris (VITO) and Carlos Patrão (ISR-UC) about the final streamSAVE methodologies for BACS and Road lighting
03.20-03.25	Preview of the **streamSAVE Training Module**
03.25-03.30	Q & A
	PART 2: Experience sharing about energy savings from BACS
03.30-03.45	Presentation by **Hadrien Serougne (ADEME)** about the French standardised calculation methods for energy savings from BACS
03.45-03.55	Presentation by **Bonnie Brook (eu.bac)** on the BAC classes
03.55-04.05	Open discussions about energy savings calculations for BACS, and about BAC classes *moderated by Kelsey van Maris (VITO, Belgium)*
	PART 3: Experience sharing about energy savings from Road Lighting
04.05-04.20	Monitoring and verification of energy savings due to renovation of outdoor lighting systems – case study Slovenia Presentation by **Dr. Boris Sucic (Jozef Stefan Institute)**
04.20-04.30	Open discussions about energy savings calculations for Road Lighting Moderated by Carlos Patrão (ISR-University of Coimbra) Wrap-Up

(All times are in CEST)

GA N°890147

Part 1: the streamSAVE methodologies and Training Module

Presentation by Kelsey van Maris (VITO) and Carlos Patrão (ISR-UC) about the final streamSAVE methodologies for BACS and Road lighting

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

Kelsey van Maris provided an overview of the streamSAVE methodology for BACS, highlighting that the so-called BACS factor is a key parameter.

A new addition to the methodology deals with indicative costs of BACS (expressed as a function of the building type, and the BACS class, for classes A and C).

Carlos Patrão then provided an overview of the streamSAVE methodology for Road Lighting, that includes two possible calculation approaches (simplified and project-based), indicative values for the parameters needed to calculate the energy savings and indicative cost values (expressed per light point).

Preview of the streamSAVE Training Module

Participants are invited to test the Training Module and make comments, either with open comments (cf. "feedback" button) or more detailed feedback (cf. feedback questionnaire available once a module is completed).

Reminder that users need to log in to the platform to access the Training Module.

In case of difficulty to access it, contact dialogues@streamsave.eu

The Training Module enables users to directly use the streamSAVE methodology.

Users can select the type of action they are interested in. Then they get the description of the methodology, see the input data needed, provide input data and get results.

The Training Module is available on the streamSAVE platform from Friday 22 October 2021: https://streamsave.flexx.camp/training

A more complete demo of the Training Module will be done at the dialogue meeting of 23 November 2021 (registration here).

Q&A on streamSAVE methodologies and Training Module

- Question about the Guidance document available on the platform, and whether it already includes the latest additions (e.g., cost data)

The report available is up-to-date, and includes all the data presented today.

Part 2: Experience sharing about energy savings from BACS

Presentation by Hadrien Serougne (ADEME) about the French standardised calculation methods for energy savings from BACS

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

Hadrien Serougne presented the scope of technical building management system for heating and domestic hot water, that is also related to other technical building management systems (e.g., safety, lighting, …). Then the key calculation parameters were discussed.

Three climate zones are considered in France, with corresponding weather factors when calculating savings related to heating.

The baseline unitary energy consumption (in kWh/m².year) are based on surveys done by CEREN and CODA (both organisations are specialised in surveys and market research in energy markets), distinguishing the main end-uses (e.g., heating and domestic hot water), and per type of energy used and per main branch of the service sector.

Another important element of the baseline is that the share of existing commercial buildings already equipped with BACS of class A is negligible. The CODA survey of 2012 gave a share of about 15% of the buildings in class B, 65% in class C and 20% in class D. Only BACS of classes A and B are eligible to white certificates in France.

The energy efficiency improvement is assessed according to the BACS classes, taking into account the current shares per class in the stock.

Lifetime is estimated to be 15 years, as a conservative assumption from the literature and experts' views.

Then for the white certificates scheme, energy savings are discounted with a 4%/year rate, which gives an equivalent "discounted lifetime" of 11.5 years.

Efficiency coefficients for each type of end-use (heating and cooling, and DHW – Domestic Hot Water) have been defined according to the BAC classes, based on the national version of the European standard NF EN 15232-1.

Then when calculating the deemed savings, the efficiency of the BACS used is compared to a weighted average efficiency based on the shares of each class in the stock and the efficiency coefficient of each class.

The deemed savings are calculated as lifetime-cumulated and discounted ("cumac") unitary energy savings in kWh cumac per m². The values of deemed savings are differentiated per branch or sub-sector of the service sector, per climate zone, and per efficiency class of the BACS implemented (A or B).

The project holders reporting BACS actions therefore need to provide data about the BACS class, the branch or sub-sector (within services), the climate zone and the building area.

Q&A

- Would it be possible to indicate how you collected the BACS distribution in the existing building stock (e.g., 65% class C)?

The shares (0% for class A; 15% for class B; 65% for class C and 20% for class D) are based on surveys of representative samples of buildings in the service sector, done by CEREN and CODA, that are specialised in surveys and market research about energy consumption and energy services respectively.

- If I'm correct, when buildings get equipped with BACS, you assume that it will be mainly class B to estimate to estimate the standardized values?

Yes, the final value is a weighted average assuming a distribution of BACS installed with 80% (4/5) class B and 20% (1/5) class A. This has been chosen to simplify the method and focus on class B systems.

Presentation by Bonnie Brook (eu.bac) on the BAC classes

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

Bonnie Brook reminded that it is estimated that about 30% of energy used in buildings would be used inefficiently or wasted. There are therefore large energy savings potentials in improving the control and maintenance related to using energy in buildings.

BACS are one of the solutions to achieve these improvements, with shorter payback times than most of the other energy efficiency action types for buildings.

A key European standard in this field is EN 15232 (Energy performance of buildings: impact of building automation, controls and building management)[1], especially the way it describes buildings' energy systems, with the demand (rooms, end-uses) and supply (energy generation and distribution) sides. This shows that demand control is essential to ensure energy efficiency and optimize the energy use.

The standard also describes the interactions between each component or system of the building.

The BAC classes are defined partly according to the scope covered by the control systems. The narrower the scope, the less efficient. The classes are also defined according to the degree of automation and optimisation enabled by the control systems.

Class D corresponds to an inefficient energy management (mostly manual controls).

Class C is a "basic" energy management (minimum set of automated controls).

Classes B and A include additional control systems improving the degree of automation and optimisation (e.g., variable temperature controls).

Bonnie Brooke also presented an overview of the distribution of BAC classes according to sub-sectors (in the service sector), highlighting the possible impact of the Energy Performance of Buildings Directive (cf. Articles 14(4) and 15(4) of the current EPBD; see

[1] About this standard, see for example a study by Siemens on EN 15232 (publicly available): https://sid.siemens.com/v/u/A6V10258635

also the minutes of the previous dialogue meeting on BACS about the impact of the EPBD provisions on BACS).

eu.bac developed a compliance verification checklist to help with the implementation of the EPBD provisions.

Open discussions about energy savings calculations for BACS, and about BAC classes

- The EPBD Articles 14(4) and 15(4) make the installation of BACS systems mandatory after 31/12/2025, with certain funcionalities as a requirement. Is it possible to state that, those funcionalities align with a certain efficiency class? Class B? A?

Class B is complying with the EPBD requirements.

You can find in the streamSAVE methodology how to take this EPBD requirement into account to estimate the related energy savings.

- How is it possible to assess the distribution of BAC classes according to the sub-sectors?

There is no generic data source that would be available in all Member States. The current estimates are based on a set of assumptions. streamSAVE provides indicative values for three regions in the EU: North, West and South. In practice, a data collection or assessment is needed to set a national baseline, as is the case in the French method with the data from the CEREN and CODA surveys.

More generally, it is recommended when possible to use actual metered data when assessing energy savings for a given project or building. While the use of standardised energy savings can be relevant for the monitoring of a policy (and especially for an EEOS). In practice, BACS should also make it easier to collect specific data (at the project level).

Part 3: Experience sharing about energy savings from Road Lighting

Presentation by Dr. Boris Sucic (Jozef Stefan Institute): Monitoring and verification of energy savings due to renovation of outdoor lighting systems – case study Slovenia

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

Boris Sucic reminded the importance of knowledge and skills to ensure that energy efficiency improvements are achieved.

There is a long tradition of energy auditing in Slovenia. More specifically, educational programs for energy managers have been in place since 2008 (first through the EUREM project).

When developing the energy efficiency schemes (particularly the EEOS and the EcoFund), there was a need for methods to monitor and verify the energy savings. This was done through a systematisation of knowledge and developing methods for energy savings assessment.

About outdoor lighting, two approaches are used, similarly to the streamSAVE methodology. To be eligible, the energy saving projects should deliver at least 30% energy consumption reduction.

The method based on design/operational data, shows similarities to the streamSAVE "project-based approach" and uses data collected directly by the lighting system operators. A specific calculation formula is used in case of projects related to new lighting points (in case of new roads).

The calculation method based on standardized average annual energy savings per lighting source/system can be used when specific data cannot be collected or are inaccurate. This is similar to the developed streamSAVE "simplified approach".

The deemed savings have been defined based on actual measurements for standard cases, with both laboratory tests and field measurements. The deemed savings values are differentiated according to the type of new lighting source used.

Boris Sucic then discussed the importance to address uncertainties, and illustrated that with a quizz about changes in oil prices over time. Uncertainties in key parameters such as electricity prices in the case of road lighting can have a major influence on the cost-effectiveness of energy efficiency projects.

Q & A about energy savings calculations for Road Lighting

- Are the methods presented used for the EEOS in Slovenia?

Yes

- Does the criteria on 30% savings mean that major retrofitting of road lighting shall use the design/operational method, while smaller projects can use the deemed savings?

No, the 30% savings threshold is an eligibility criteria. This requirement applies whatever the type of calculation method used.

The deemed savings are based on conservative values, which makes that in practice most projects are reported with scaled savings (i.e. with the design/operational method).

- How often are the values updated?

The need to update values is reviewed every year. Therefore, values are revised regularly. There is not always a need to update them.

- Are there difficulties in data collection for the calculations?

In Slovenia there are no major difficulties on data collection. The lighting system operators share all required information for the savings calculation. Preferably the method that needs design/operational data is used, otherwise it is used the method that performs the calculation based on the revised standardized average annual energy savings per lighting point.

List of participants

22 participants

Name	First name	Organisation	Country
Brook	Bonnie	eu.bac	Switzerland
Fragoso	Rui	ADENE	Portugal
Gillessen	Samuel	myenergy	Luxembourg
Lopez	Maria	CIRCE	Spain
Masiulionis	Ričardas	LEA (Lithuanian Energy Agency)	Lithuania
Moura	Pedro	ISR - University of Coimbra	Portugal
Perednis	Eugenijus	LEI (Lithuanian Energy Institute)	Lithuania
Pisano	Julie	ATEE	France
Santiago	André	ENSE-EPE	Portugal
Savva	Savvas	Cyprus Energy Agency	Cyprus
Serougne	Hadrien	ADEME	France
Sijaric	Denis	Ministry for Energy and Spatial Planning	Luxembourg
Stonienė	Agnė	LEA (Lithuanian Energy Agency)	Lithuania
Stougiannis	Evangelos	Ministry of Energy, Trade and Industry	Cyprus
Sucic	Boris	Jožef Stefan Institute	Slovenia
Twardowski	Jan	FEWE	Poland
Project dialogue team (organisation)			
van Maris	Kelsey	VITO	Belgium
Patrão	Carlos	ISR - University of Coimbra	Portugal
Renders	Nele	VITO	Belgium
Tourkolias	Christos	CRES	Greece
Šebek	Václav	SEVEn	Czechia
Broc	Jean-Sébastien	IEECP	France

GA N°890147