PROGRAMME PEP ecopassport®

PSR

SPECIFIC RULES FOR THERMAL SOLAR COLLECTORS

PSR-0017-ed2-FR-2023 10 19

According to PSR-model-ed2-EN-2021 11 18

Contents

1. **Introduction** 4

2. **Scope** 5

2.1. Definition of the product families concerned 5
2.2. Taking into account of technical developments 6

3. **Product life cycle assessment** 6

3.1. Functional unit and reference flow description 6
3.2. System boundaries 7
3.3. Cut-off criteria 9
3.4. Specific allocation rules 9
3.5. Development of scenarios (default scenarios) 10
3.6. Rules for extrapolation to a homogeneous environmental family 15
3.7. Rules applying to joint environmental declaration 15
3.8. Requirements concerning environmental data 16
3.9. Calculation of environmental impact 16

4. **Drafting of the Product Environmental Profile** 17

4.1. General information 17
4.2. Constituent materials 18
4.3. Additional environmental information 18
4.4. Environmental impacts 18

6. **Appendices** 20

6.1. Glossaire 20
6.2. References 20
6.3. Declaration of conformity 21

List of the modifications of the present document

Online version 2023/10/19:

Modified section Ed 1 to ed 2	Modification
§ 3.1.2	Addition of the declared units definition
§ 3.2.4	Consideration of fluid-transfer fluids
§ 3.5	Addition of rules for the justification of without default scenario values

1. Introduction

This reference document complements and explains the Product Environmental Profile (PEP) Drafting Rules defined by the PEP ecopassport® program (PEP-PCR-ed4-EN-2021 09 06), available at www.pep-ecopassport.org).

It defines the additional requirements applicable to thermal solar collectors. Compliance with these requirements is necessary to:

- Qualify the environmental performance of these products on an objective and consistent basis,
- Publish PEPs compliant with the PEP ecopassport® program and international reference standards.[1]

This reference document was drawn up in compliance with the open, transparent rules of the PEP ecopassport® program with the support of stakeholders and professionals in the thermal solar collector market and the interested parties.

	www.pep-ecopassport.org
PSR reference	PSR-0017-ed2-EN-2023 10 19
Critical review	The third-party Critical review was carried out by Tim Osmond d'EVEA. The declaration of conformity published on 30/06/2023 can be found in the Appendices.
Availability	The Critical review report is available on request from the P.E.P. Association contact@pep-ecopassport.org
Scope of validity	The critical review report and the declaration of conformity remain valid within 5 years or until the PEP Drafting Rules, or the normative reference texts to which they refer, are modified.

1 ISO 14025, ISO 14040 and ISO 14044 standards

2. Scope

In accordance with the General Instructions of the PEP ecopassport® program (PEP-General Instructions-ed-4.1-EN-2017 10 17) and additional to the PCR, “Product Category Rules” of the PEP ecopassport® eco-declaration program (PEP-PCR-ed4-EN-2021 09 06), this document sets out the specific rules for the thermal solar collector and defines the product specifications to be adopted by manufacturers in the development of their PRODUCT ENVIRONMENTAL PROFILES (PEPs) particularly with regard to:

- the technology and its type of application,
- the reference life time (RLT) taken into account for the products Life Cycle Assessment (LCA),
- the conventional use scenarios to be adopted during the product use phase.

The main purpose of those specific rules is to provide a shared basis to manufacturers when developing life cycle assessments for their products. The various thermal solar collector technologies available are presented. Thermal solar collector are technical subsystems that can be used, for example, by systems dedicated to the exclusive production of hot water defined by the PSR-0004-ed4.0-EN-2023 05 16.

Are excluded from the scope:

- Photovoltaic collectors
- Parabolic or cylindro-parabolic collectors (collectors used for the process or the production of electricity from the steam produced by the collectors)
- Hybrid collectors (thermal and photovoltaic)

2.1. Definition of the product families concerned

The product family is concerned is designated by the following terminology: "THERMAL SOLAR COLLECTOR" which is a "device for absorbing solar radiation and transmitting the heat thus produced to a heat-transfer fluid[1]".

This family includes at the writing day of this PSR two categories of products presented below.

2.1.1. Liquid flow collector

These are solar collectors in which the heat-transfer fluid is a liquid. This family includes:

- Glazed flat plate solar collectors
- Unglazed flat plate solar collectors
- Vacuum glass tube solar collectors
- Vacuum glass tube solar collectors with optical concentration system of solar flux

[1] From NF EN ISO 9488 standard

2.1.2. Air flow collector

These are solar collectors in which the heat-transfer fluid is air. This family includes collectors:

- Glazed flat plate solar collectors with a closed circuit
- Glazed flat plate solar collectors with outside fresh air in collector input
- Unglazed flat plate solar collectors (unglazed plan placed between the solar flux and the collector absorber) with a closed circuit
- Unglazed flat plate solar collectors (plan without glazing placed between the solar flux and the absorber of the collector) with fresh air outside the collector inlet

2.2. Taking into account of technical developments

The specific rules to thermal solar collector will take into account any technological advance, as long as it is the subject of a request for inclusion in the specific rules to thermal solar collector to the PEP Association, which will decide according to the presentation of the new technology and the justification of the claimed performances.

3. Product life cycle assessment

3.1. Functional unit and reference flow description

These specific rules are additional to section 2.1. "Functional unit and reference flow description" of the current PCR (PEP-PCR-ed4-EN-2021 09 06).

3.1.1. Functional unit

The functional unit is:

« Absorb the solar radiation and transmit 1 kW of heat to the heat transfer fluid, according to the reference use scenario over a period of 25 years »

The power of the collector (xx kW) taken into account is that defined in the conditions of use of the ISO 9806 standard with an overall irradiation of 1000 W / m² for a DeltaT of 40 K. It should be noted that this power takes into account the efficiency collector energy. This power corresponds to the output power of the collector.

3.1.2. Declared unit

Decladred unit can be used as complementary information in order to help future PEP users.
For French scope, the declared unit has to be applied if no functional unit can be defined.

The declared unit is:

« Absorb the solar radiation with a xx kW solar thermic collector of 1 m2 , for a reference lifetime of 25 years of the product »

The power of the collector (xx kW) taken into account is that defined in the conditions of use of the ISO 9806 standard with an overall irradiation of 1000 W / m² for a DeltaT of 40 K. It should be noted that this power takes into account the efficiency collector energy. This power corresponds to the output power of the collector

3.1.3. Reference product and reference flow description

The study is realized:

- on a solar thermal collector with its packaging and the installation elements delivered with the product,
- on a reference lifetime of 25 years,
- then the impacts are reported to the functional unit according to the method described in paragraph 3.9. To move from the functional unit to the declared unit, refer to paragraph 4.4.

The reference lifetime of solar thermal collectors is 25 years. This duration corresponds to the reference lifetime of a building when carrying out LCA building studies. Manufacturers involved in the development of this PSR believe that solar thermal collectors are structural equipment of the building that is not subject to any renewal.

In the case of a declaration for a homogeneous product family, the environmental statement and the associated study will relate to a reference product with the following characteristics:

- A solar thermal collector with an area of 2 m² or on the nearest surface product. This surface is judged as the most used surface. The choice of the latter will facilitate the comparison between the PEP forms.

An extrapolation rule to other products, in accordance with section 3.6, will apply and will be documented in the LCA report and the PEP form.

3.2. System boundaries

These specific rules are additional to section 2.2. « System boundaries » of the current PCR (PEP-PCR-ed4-EN-2021 09 06).

3.2.1. Manufacturing stage

All the components delivered with the product and allowing its proper functioning must be included in the scope of the study.

In the case of solar thermal collectors, the elements to include are the panel and its mounting bracket.

The items to be excluded from the scope of study are the fluid and the elements outside the collector such as the primary flexible pipes and the circulation pump. These elements are to be considered at the system level using the thermal collector.

3.2.2. Distribution stage

For this step, the rules defined in the current PCR (PEP-PCR-ed4-EN-2021 09 06) apply.

3.2.3. Installation stage

Conventionally, the solar thermal collectors installation involves:

- The manufacturing and processing of the components of the equipment necessary for its installation but which would be integrated only at the time of its installation.
- The processes and energies that are implemented at the time of installation.

The flows related to the installation process, when necessary for the proper functioning of the equipment at its place of implementation, may be:

  - Transport by lifting equipment on site
  - The energy consumed during a test phase at the place of life

- The treatment of packaging waste. In fact, the packaging waste generated during the installation stage is supposed to be eliminated by the installer once the equipment is installed.

Are not considered:

- The connection of the collector to the other elements of the building heat transfer system such as heat transfer fluid, primary flexible pipes, circulation pump. These components are excluded from the scope of the study and are to be considered at the system level using the solar thermal collector. These elements may be the subject of a specific declaration.
- Energy flows associated with the use of portable hand tools to install solar thermal collectors may be neglected.
- Any modification of the frame and / or addition of elements not foreseen by the manufacturer. The actual impact of these operations is to be calculated by the user of the declaration if he wishes according to the installation elements used during the construction phase.

3.2.4. Use stage

A solar thermal collector requires no maintenance for the following reasons:

- In normal use conditions, a solar thermal collector does not require any maintenance-type maintenance or change of parts.
- Maintenance of other components of the building heat transfer system (such as heat transfer fluid, primary flexible pipes, circulation pump) is not considered. These maintenance operations are to be considered at the system level using the solar thermal collector.
- Due to the difficulty of allocating the impacts of control visits between the solar thermal collector and the system using the collector, it is considered that control visits are to be considered at the system level using the solar thermal collector.

- At the building level, maintenance or renovation work on the roof can be carried out. Depending on the types of poses (especially on the roof and terrace), these interventions can lead to a removal and reassembly of the collectors. Energy flows related to the use of portable hand tools may be neglected.

The following maintenance operation have to be considered:

- Heat-transfer fluid refill

According to the breakdown of module B, as defined in section 2.2.6. of the current PCR (PEP-PCR-ed4-EN-2021 09 06), use stage environmental impacts must be split in the following way for all product families concerned by the PSR.

B1 : Use phase	Not applicable. Module equal to 0.
B2 : Maintenance	Heat-transfer fluid refill
B3 : Repair	Not applicable. Module equal to 0.
B4 : Replacement	Not applicable. Module equal to 0.
B5 : Rehabilitation	Not applicable. Module equal to 0.
B6 : Energy consumption during use phase	Solar energy production (taken into account in the "energy supplied externally" indicator)
B7 : Water consumption during use phase	Not applicable

For information, the breakdown of module B is mandatory in France.

3.2.5. End of life stage

For this step, the rules defined in the current PCR (PEP-PCR-ed4-EN-2021 09 06) apply.

3.2.6. Benefits and loads beyond the system boundaries

For this stage, the rules defined in the current PCR (PEP-PCR-ed4-EN-2021 09 06) apply.

For information, module D declaration is mandatory for products placed on the French market and planned to be used on a building LCA.

3.3. Cut-off criteria

The rules specified in the paragraph 2.3. "Cut-off rules" of the current PCR (PEP-PCR-ed4-EN-2021 09 06) apply.

3.4. Specific allocation rules

These specific rules complete the paragraph 2.4. "Rules for allocation between co-products" of the current PCR (PEP-PCR-ed4-EN-2021 09 06).

Any other rule has to be justified in the LCA report and mentioned on the PEP.

3.5. Development of scenarios (default scenarios)

These specific rules are additional to the section 2.5. "Development of scenarios (default scenarios)" of the PCR (PEP-PCR-ed4-EN-2021 09 06).

Each modification concerning default scenarios defined below must be justified in the LCA report and mentioned in the PEP.

Accepted evidences in order to modify default scenarios

The current PSR has hypothesis and default scenarios. If the declarant wants to use specific data, this data must be justified in the LCA report. This data, given by industrials, doesn't have to be certified but based on evidence. This evidence is engaging the declarant, supplier, or third-party responsibility. This evidence will have to be available if claimed.

Recycled content of raw materials (see paragraph 3.5.1. "Manufacturing stage") can be justified with suppliers' data but can't be justified with common data (professional associations, ADEME, industries). If there is no justified and specific recycled content, the default data given in section 3.5.1.1. has to be taken.

Raw materials loss rate (see paragraph 3.5.1. "Manufacturing stage") can be justified with an internal document from the production plant. If there is no specific justified rate, the default data given in section 3.5.1.3. has to be taken.

End of life waste treatment (see paragraphs "3.5.1. Manufacturing stage", "3.5.3. Installation stage", "3.5.6. End of life stage") can be justified with an attestation of the waste treatment company. If there is no specific data or default data for installation stage et end-of-life stage, table 7 of appendix D (PEP-PCR-ed4-EN-2021 09 06) applies.

3.5.1. Manufacturing stage (module A1-A3)

A solar thermal collector consists of components supplied by the manufacturer:

- directly shaped by the manufacturer,
- or ready to be assembled.

The rules defined in section 3.8.1. "Primary and secondary data collection requirements" of these current specific rules apply.

3.5.1.1. Recycled content of raw materials

If there is no justified specific data on recycled content, 0% recycled content must be applied.

3.5.1.2. Raw materials and components

Raw materials packaging, their components and their transports to manufacturing sites must be taken into account. Suppliers' data must be used. If no justification is given, an average packaging rate of 5% of the reference equipment mass (equipment + packaging) as defined below, must be taken:

- Wood 50%
- Cardboard 40%
- Low-density polyethylene 10%

Loss materials of these packaging have to be taken into account with an average rate of 5%.

Reused packagings on site are not taken into consideration.

Packaging end of life treatment is modeling as defined in the paragraph 3.5.3.2. of the current PSR.

3.5.1.3. Waste from the manufacturing stage

The manufacturing of waste and their treatment are included in the manufacturing phase.

Manufacturers can eliminate manufacturing wastes themselves, or under their responsibility. The LCA report precise how the manufacturer, or any person working on his behalf, fulfill those steps by distinguishing hazardous from non-hazardous manufacturing wastes, and by providing proof of those allegations.

When they are known, treatment processes (energy valorization, landfill, and incineration without valorization) must be presented and justified in the LCA report, and the related environmental impacts must be taken into account as indicated in the section 2.5.6. "Product end-of-life treatment scenarios" of the PCR in force (PEP-PCR-ed4-EN-2021 09 06).

The treatment processes justification must be defined, in the LCA report, by explaining the treatment sector and the valorization ratio selected for each waste (e.g. via an annual report on the end-of-life processing of equipment by an eco-organization).

When the manufacturer does not provide evidence of the processes used to treat the waste generated during the manufacturing stage of the device concerned, the treatment process shall be calculated by default as follows:

- For non-hazardous waste generated by raw material and components:

The amount of waste is calculated by multiplying the material quantity of the total product (finished product and associated packaging) by 0,05 for plastic injection processes and elastomer, and 0,3 for other manufacture processes. Non-hazardous waste treatment is modelling as follows: 100% of incinerated waste (without waste-to-energy recovery)

- For hazardous waste generated by raw material and components:

The amount of waste is calculated by multiplying the material quantity of the total product (finished product and associated packaging) by 0,05 for plastic injection processes and elastomer, and 0,3 for other manufacture processes. Hazardous waste treatment is modelling as follows: 100% of incinerated waste (without waste-to-energy recovery)

If applicable, when the worst performer value is used by default, no waste-to-energy recovery will be taken into account. The production of this lost material must be taken into account.

The table below sums up default loss rate for each constituent material of the total product (finished product and associated packaging(s))

Process	Default loss rate	Material mass after manufacture	Material mass to take into account (including loss)
Plastic injection and elastomer	5%	1kg	1,05kg
Other processes	30%	1kg	1,30kg

Table 1 : Default loss rate for each constituent material of the total product (finished product and associated packaging(s))

Application examples of the default scenario:

If 1 kg of a bare product (final mass of the part excluding packaging) is composed of 1kg of steel

Waste mass = steel mass x 0.3 = 1 kg x 0.3 = 0.30 kg of incinerated waste (without waste-to-energy recovery)

Any other waste treatment during manufacture stage which is taken into account for calculation has to be justified on the LCA report and mentioned in the PEP.

By sector-based agreement, the transport stage for this waste shall be taken into account, assuming that it is trucked over a distance of 100 km.

3.5.2. Distribution stage (module A4)

The distribution stage must be analyzed in accordance with the section 2.5.3. “Transport scenario” of the current PCR (PEP-PCR-ed4-EN-2021 09 06).

3.5.3. Installation stage (module A5)

3.5.3.1. Type of installation

A solar thermal collector can be installed according to 3 types of installation: roof, terrace or integrated. The choice of the type of installation chosen should be justified in the LCA report and indicated in the PEP form.

3.5.3.2. Waste from the installation stage

The end of life of the packaging, whose production was taken into account during the manufacturing stage, is taken into account during the installation stage.
The packaging waste from produced during the installation stage is classed as non-hazardous waste and, in principle, shall be disposed of by the installer once the equipment has been installed.

If there is no specific end of life evidence, treatment scenarios showed in the table below are applies by default. Tables below are representative of year 2019. It’s possible to use Eurostat recent consolidated data

if they are available from the following website: https://ec.europa.eu/eurostat/databrowser/view/ENV_WASPAC__custom_3801295/default/bar?lang=fr. The reference year or used data shall be mentioned in the PEP.

For France scope, the default values below shall be used:

	Recycling rate	Incineration with energy production	Incineration without energy production	Burial rate
Metal	83%	1%	0%	16%
Steel	88%	0%	0%	12%
Aluminium	60%	7%	0%	33%
Paper-Cardboard	91%	5%	0%	4%
Wood	7%	31%	0%	62%
Plastic	27%	43%	0%	30%

For Europe scope, the default values below shall be used:

	Recycling rate	Incineration with energy production	Incineration without energy production	Burial rate
Metal	77%	2%	0%	21%
Paper-Cardboard	82%	9%	0%	9%
Wood	31%	31%	0%	38%
Plastic	41%	37%	0%	22%

For other scopes, waste shall be treated according to section 2.5.6. “End-of-life treatment scenario” of the current PCR (PEP-PCR-ed4-EN-2021 09 06).

By sector-based agreement, the transport stage for this waste shall be taken into account, assuming that it is trucked over a distance of 100 km.

Plastic film, straps, packing notes, labels or any other paper on or inside the package of the solar thermal collector are considered to be insignificant and will not be included in the life cycle assessment for packaging waste if these items represent in total less than 10% of the total mass of the packaging.

3.5.4. Use stage (modules B1-B7)

3.5.4.1. Maintenance stage (module B2)

The use stage of the solar thermal collector involves, once the element installed, only heat-transfer fluids refill. Other maintenance operations have to be considered at the system level using the thermal solar collector.

Replacement of the heat transfer fluid should be considered at a frequency of 2 times over the VRF. The end-of-life of these elements is then dealt with in the same way as described in paragraph 3.5.5 "End-of-life stage" of this document. By sector-based agreement, the transport of these elements is taking into account by a transport hypothesis of 100 km in lorry.

3.5.4.2. Energy consumption

The use stage of the solar thermal collector involves, once the element installed, no consumption of energy.

The following formula makes it possible to calculate the amount of solar energy absorbed by the solar thermal collector over its reference life, denoted E_{solar} and expressed in Wh:

$$E_{solar} = I * S* \eta*50$$

With:

- I : annual solar irradiation for the city of Strasbourg, 1848 kWh / m².an
- S : solar collector area (in m²)
- η : collector efficiency $\eta = \eta0 – (a1*DT/G) - a2*DT²/G$

With:

- G : overall average irradiance of 1000 W / m² (southern exposure, inclination at 45 °)
- DT : temperature difference between the average temperature of the solar collector and the outside temperature. The value of DT is set to DT = 40K.
- η0 : optical performance of the collector
- a_1 : first order coefficient, representing constant percentage losses (in W / m².K)
- a_2 : first order coefficient, representing losses at constant percentage (in W / m².K²)

The solar energy production is to be modeled with the elementary flow “energy supplied externally”.

3.5.5. End-of-life stage (C1-C4)

Within the European Union, waste from thermodynamic generators is classed as WEEE (Waste from Electrical and Electronic Equipment).

After presenting the local requirements for managing end-of-life thermal collectors, the LCA report will explain the organization of known disposal and/or recovery systems, the associated environmental impacts and how the manufacturer shall meet these requirements, if applicable. These items will determine the applicable end-of-life treatment and collection rate.

ICV Ecosystem modules can be used solely in France and Europe.

For the devices which are not concerned by the WEEE Directive and/or if there is no justification on the end of life treatment for these equipment, the default scenario from the current PCR (PEP-PCR-ed4-EN-2021 09 06) apply.

By sector-based agreement, the collection transport and transfer of the end-of-life product from the use site until its last treatment site is accounting as a transport hypothesis of 100 km in lorry for France scope.

3.5.6. Benefits and loads beyond the system boundaries stage

For this step, the rules defined in in the current PCR (PEP-PCR-ed4-EN-2021 09 06) apply.

Note : The "Energy supplied externally" indicator in module D calculated in the PEP comes from the benefits and loads associated with end-of-life treatment only[2].

3.6. Rules for extrapolation to a homogeneous environmental family

No default extrapolation rule has been defined in the context of developing this PSR.

If an extrapolation rule is used, it has to be defined according the rules precised in the section 2.6. "Rule(s) for extrapolation to a homogeneous environmental family" of the PCR (PEP-PCR-ed4-EN-2021 09 06).

3.7. Rules applying to joint environmental declaration

These rules are complementary to the section 2.7. "Rules for the preparation of collective environmental declarations" of the PCR (PEP-PCR-ed4-EN-2021 09 06).

For a joint environmental declaration, the study must cover a typical product with a reference surface of 2 m², or, failing that, any other surface closest to it. This surface is judged as the most used surface. It will facilitate the comparison between the PEP cards. Moreover, if extrapolation rules are defined, it's necessary to mention in the PEP the validity framework of these rules based on technical criteria, in order to check that the products belong to the same homogeneous environmental family as the typical product.

[2] 15804 7.2.5 « Other environmental information describing different categories of waste and outgoing flows" note 5: Energy supplied externally refers to energy from waste incineration and landfill sites.

3.8. Requirements concerning environmental data

3.8.1. Requirements concerning the collection of primary and secondary data

These rules are additional to the section 2.9.1. "Requirements for the collection of primary data" and "Requirements for secondary data" of the PCR (PEP-PCR-ed4-EN-2021 09 06).

As far as possible, the primary data (i.e. all the data associated with the manufacturing stage of the reference product and specific to an organization) is to be preferred and shall be justified in the LCA report, specifying:

1) primary data in case of a single supplier,
2) in case of procurement from several suppliers, the primary data to be taken into account is the data provided by major suppliers representing at least 50% of the procurement by volume (with respect to the total quantity bought). For example, for ten suppliers each providing 10 % of the procurement volume, at least five suppliers shall be considered in order to obtain an overall view of the primary information provided. Any other distribution rule should be mentioned in the LCA report and in the PEP.

If primary data are shared with products other than those referred to in these specific rules, the calculation of impacts will be done in proportion to the mass of the products manufactured.

The ICV module used to model the raw material or the component can include a default loss rate.

- If the default loss rate included in the ICV module can be changed: Default values defined in the paragraph 3.5.1.3. have to be applied.
- If the default loss rate included in the ICV can not be changed:
    - The loss rate is below the default values defined in the paragraph 3.5.1.3. : this loss rate has to be mentioned in the LCA report and the modelling has to be adapted as much as possible in order to take into account the difference between generated waste (hazardous or non-hazardous)
    - The loss rate is higher to the default values defined in the paragraph 3.5.1.3. : the loss rate has to be mentioned in the LCA.

3.8.2. Evaluation of data quality

The rules given in the paragraph 2.9.3. « Evaluation of data quality and characteristics » of the current PCR (PEP-PCR-ed4-EN-2021 09 06) apply.

3.9. Calculation of environmental impact

3.9.1. Calculation of environmental impact on the scale of the functional unit (FU)

To ensure consistency of the results of environmental impacts between the functional unit and the reference product, the PEP shall show the environmental impacts of the manufacturing, distribution, installation, use (modules B1 to B7) and end-of-life stages as follows:

Environmental impacts from the PEP (for 1 kW) =
Environmental impacts of the reference product / Power of the reference product (in kW)

With:
Power of the reference product = power of the collector defined in the conditions of use of the ISO 9806 standard with an overall irradiation of 1000 W / m² for a DeltaT of 40 K.

3.9.2. Calculation of environmental impact on the product scale (declared unit)

The results of the environmental impacts generated by the life cycle of the reference product at the declared unit scale can be declared in the PEP form as additional environmental information. The expression of the unit declared and the method of calculation to be applied are detailed in section 4.3.

For the biogenic carbon storage, two assessment methodologies 0/0 or -1/+1 are accepted until the environmental database update. The methodology used has to be mentioned in the PEP and the LCA report.

The environmental database version has to be mentioned in the PEP and the LCA report (included the Environmental Footprint version number).

4. Drafting of the Product Environmental Profile

4.1. General information

These rules supplement the 4.1. section "General Information" of the current PCR (PEP-PCR-ed4-EN-2021 09 06).

In addition to the information required by the PCR, the PEP must include:

- Family and collector type according to paragraph 2.1
- The elements that make up the thermal collector. The following statement will appear: "The heat transfer fluid and the elements outside the collector such as the primary flexible pipes and the circulation pump are excluded. These elements are to be considered at the system level using the thermal collector. "
- The collector area expressed in m²
- Its energy efficiency

- The reference power in kW
- The type of installation considered (roof, terrace or integrated)
- The baseline usage scenario as defined in section 3.5.4.2
- The manufacturer's reference usage type (s) provided by the manufacturer
- The absence of maintenance operations considered at the scale of the solar thermal collector. The following statement will appear: "Maintenance operations, such as control visits and fluid changes, are to be considered system-wide using the solar thermal collector."
- In the case of using extrapolation rules, the area, yield and power considered for each thermal solar collector covered by the PEP for the product range

4.2. Constituent materials

The rules specified in section 4.2. "Constituent materials" of the current PCR (PEP-PCR-ed4-EN-2021 09 06) apply.

4.3. Additional environmental information

These specific rules are additional to section 4.3. "Additional environmental information" of the PCR (PEP-PCR-ed4-EN-2021 09 06).

4.4. Environmental impacts

In the context of performing Life Cycle Analyses on the scale of a building, the environmental impacts of the equipment must be considered on the scale of the product and the impacts related to energy consumption in the use stage must be treated separately.

To facilitate the use of the PEP in conducting a building LCA, the PEP may include:

- The table of the environmental impacts of the reference product expressed on the scale of the declared unit (here the m²) in addition to the table at the level of the functional unit. The values should then be given in numerical values, expressed in the appropriate units with three significant digits (and, optionally, as a percentage) for each stage of the life cycle, and the total for each indicator of the complete life cycle assessment.
  The details below should then be indicated in the PEP, in order to guarantee clarity and transparency for the user:
  - For the environmental impacts expressed by functional unit, the following statement will appear: "per kW corresponding to the functional unit". In order to lighten the reading, the mention can be reduced to "per kW" or "per UF".
  - For environmental impacts expressed per unit reported, the following statement will appear: "per m²".
- The declared unit corresponds to: "1 m² of solar thermal collector operating according to the reference use scenario over a period of 50 years".

- The calculation of the environmental impact at the product level (declared unit) is as follows:

  Environmental impacts reported in the PEP (for 1 m²) =
  Environmental impacts of the reference product / Reference product area (in m²)

  The results of the environmental impacts in the use stage according to a breakdown of Module B (B1 to B7) in compliance with standards EN 15978 and EN 15804. In the case of solar thermal collectors, module B6 includes the quantity of solar energy absorbed by the collector in the "Energy supplied to the outside" indicator. In this case, the following precision should be indicated in the PEP: "module B6 includes the amount of solar energy absorbed by the collector in the "Energy supplied to the outside" indicator." The values of the other modules B are zero.

  - The results of module D. The following statement will appear in the PEP: "The "Energy supplied externally" indicator calculated in the PEP comes from the benefits and costs associated with end-of-life treatment only[3]. Energy from solar production is declared in the "Energy supplied externally" indicator of module B6.

To meet the requirements of the current PCR PEP-PCR-ed4-EN-2021 09 06), the results presented in the table of environmental impacts are related to the implementation of the functional unit, namely the provision of 1 kW of power by a thermal collector over a period of 25 years.

To know the impact of the product over its lifecycle, the PEP user must multiply the results to the functional unit by total power in kW of installed collector as defined in section 3.9.1.

The following clarification should be completed and presented in the PEP, in order to guarantee clarity and transparency for the user:
In order to develop the PEP, the impacts were reported to provide 1 kW of heat. The impact of the life cycle stages of the installed product is to be calculated by the user of the declaration by multiplying the impact considered by the total energy output of the product. The maintenance step of the solar thermal collector is not included. For the LCA of the building, the maintenance operations of the system must be considered separately (module B2 according to EN 15978).
The results of this PEP form can be compared directly with the results of another PEP form. The results take into account the performance and performance of the collectors.

In the case of a PEP covering a family of products, the extrapolation rules must be mentioned and the accuracy below must be entered in the PEP form:
The extrapolation coefficients are given for the environmental impact of the functional unit ie the supply of 1 kW of heat. For each stage of the life cycle, the environmental impacts of the product under consideration are calculated by multiplying the impacts of the declaration corresponding to the reference product by the extrapolation coefficient. The "Total" column is to be calculated by adding the environmental impacts of each stage of the life cycle.

[3] NF EN 15978:2012 “Net benefits and loads beyond the system boundaries for externally supplied energy shall be recorded in module D by calculating impacts and displaced aspects from the most likely corresponding energy source, based on average current technology and practice. Within module D, the net benefits and/or loads of externally supplied energy shall be recorded separately."

5. PEP update rule

Any PEP document recorded by the P.E.P. Association shall be updated and re-registered when the individual, standalone devices for production of stored domestic hot water only to which it refers is modified, by an increase or reduction of more than 5% in:

- mass,
- new components,
- its environmental indicators considered as relevant,
- any other element considered as relevant,
- material used.

6. Appendices

6.1. Glossaire

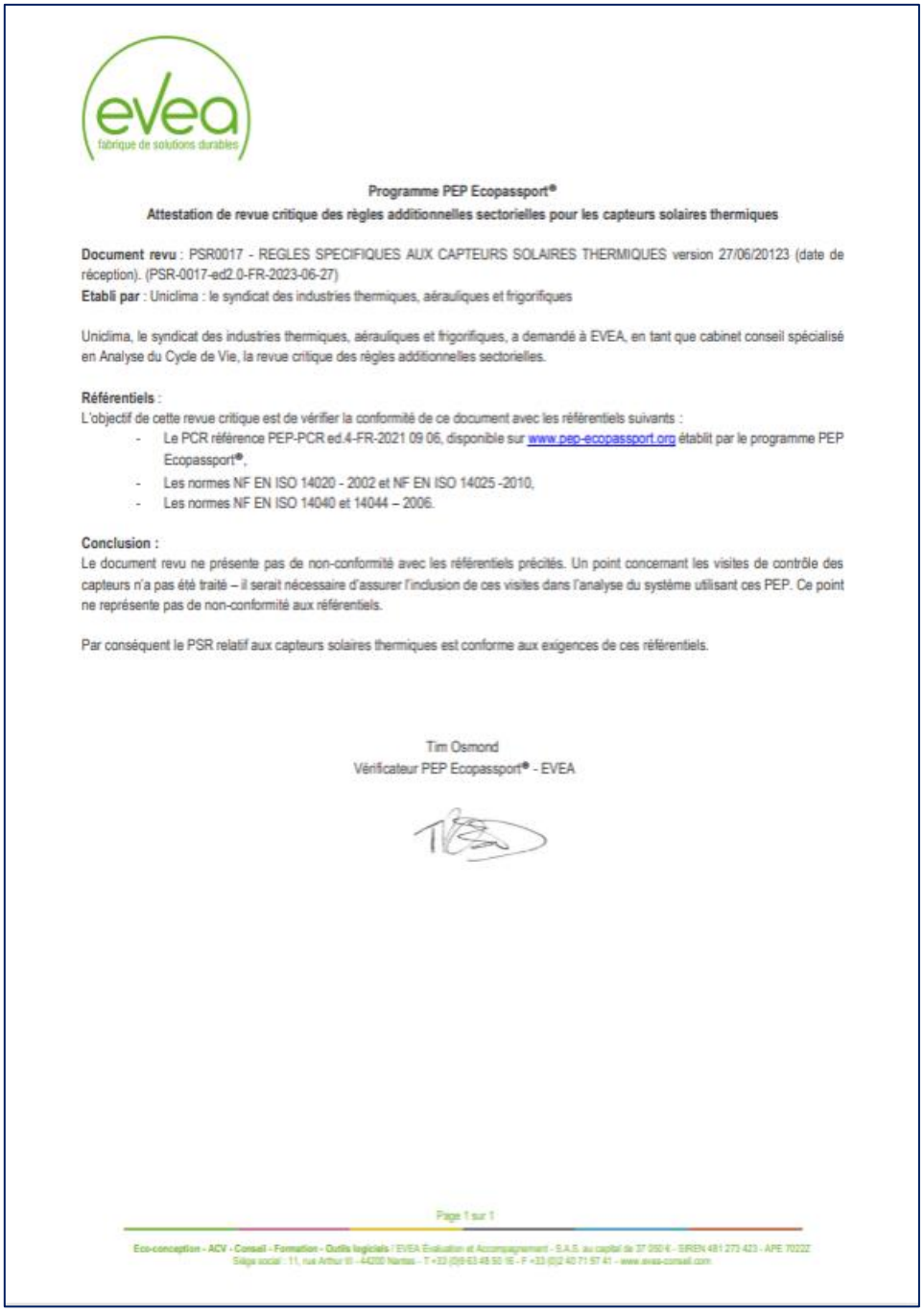
LCA	Life Cycle Assessment
EC	European Community
IEC	International Electrotechnical Commission
CEM	Electromagnetic compatibility
CENELEC	European Committee for Electromagnetic Standardization
ES	European standards
EEE	Electrical and Electronic Equipment
EU	European Union
LCI	Life Cycle Inventory
Kg	Kilogram

6.2. References

Chapter	Subject	Sources
2.1	Definition of a solar thermal collector.	NF EN ISO 9488 January 2000 "Solar energy - Vocabulary"
3.1	Power definition	ISO 9806:2013 - Solar energy - Solar thermal collectors - Test methods
3.5.3.2.	End of life	Eurostat statistic database :

	packaging treatment default scenarios	https://ec.europa.eu/eurostat/databrowser/view/ENV_WASPAC__custom_3801295/default/bar?lang=fr

6.3. Declaration of conformity



Programme PEP Ecopassport®

Attestation de revue critique des règles additionnelles sectorielles pour les capteurs solaires thermiques

Document revu : PSR0017 - REGLES SPECIFIQUES AUX CAPTEURS SOLAIRES THERMIQUES version 27/06/20123 (date de réception). (PSR-0017-ed2.0-FR-2023-06-27)
Etabli par : Uniclima : le syndicat des industries thermiques, aérauliques et frigorifiques

Uniclima, le syndicat des industries thermiques, aérauliques et frigorifiques, a demandé à EVEA, en tant que cabinet conseil spécialisé en Analyse du Cycle de Vie, la revue critique des règles additionnelles sectorielles.

Référentiels :
L'objectif de cette revue critique est de vérifier la conformité de ce document avec les référentiels suivants :

- Le PCR référence PEP-PCR ed.4-FR-2021 09 06, disponible sur www.pep-ecopassport.org établit par le programme PEP Ecopassport®,
- Les normes NF EN ISO 14020 - 2002 et NF EN ISO 14025 -2010,
- Les normes NF EN ISO 14040 et 14044 – 2006.

Conclusion :
Le document revu ne présente pas de non-conformité avec les référentiels précités. Un point concernant les visites de contrôle des capteurs n'a pas été traité – il serait nécessaire d'assurer l'inclusion de ces visites dans l'analyse du système utilisant ces PEP. Ce point ne représente pas de non-conformité aux référentiels.

Par conséquent le PSR relatif aux capteurs solaires thermiques est conforme aux exigences de ces référentiels.

Tim Osmond
Vérificateur PEP Ecopassport® - EVEA