

hagergroup

Environmental Product Declaration

Lesson

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Agenda

01 Introduction

02 Different environmental labels and declarations

03 PEP ecopassport program

04 EPD international program

Lesson goals

Key takeaways

Know different environmental declarations

How to avoid green whashing

01 Introduction

Introduction

Why?

REGULATORY information

e.g. CO2 emissions/km for cars
e.g. Eco-Design Regulation (ESPR)

MARKETING information

e.g. Water bottle containing 50% recycled material

Inform customers/consumers to allow them to choose the most sustainable products



Watch out for GREENWASHING!

Introduction

Problem statement

You are at the supermarket and you have to choose the less environmentally impacting bottle of orange juice. Which one do you choose?



Introduction

Problem statement

Listing criteria influencing the environmental impact:

Material

Capacity

Weight

Origin of the oranges

Organic



Introduction

Problem statement

For a whole cart



Introduction

Problem statement

At a company level



Introduction

Problem statement

At a building level



Introduction

What is an effective Environmental statement

Easily acces to a **trusted, representative** information allowing to **compare** products.

Transparency

Accuracy/Reliability

Comparability

Introduction

Need of a common framework

Methodology

Evidences



**Verification
Control**

02

Environmental statement types

Environmental statement types

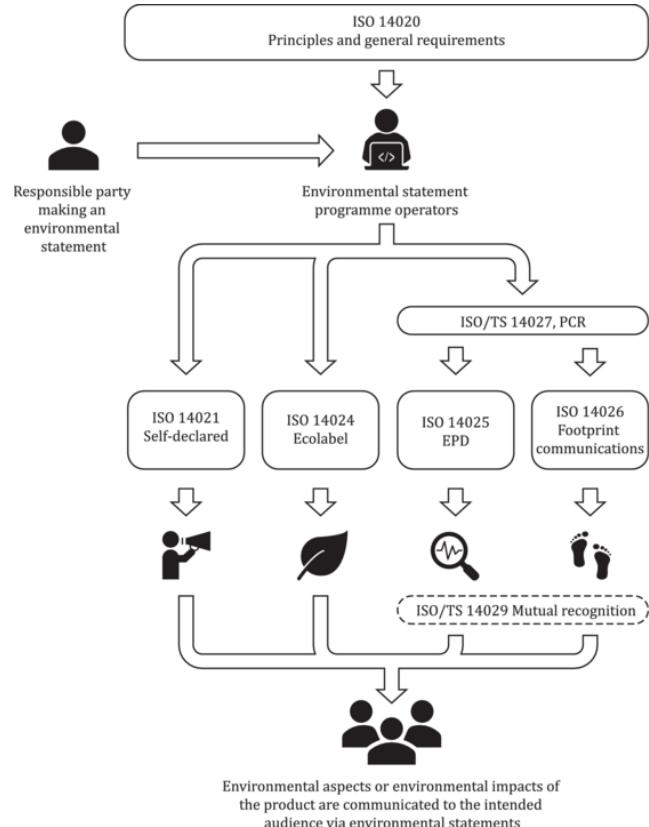
Environmental statement - Definition

Information on one or more **environmental aspect(s)** or environmental impact(s) of a product which intends to inform an **intended audience** and intends to **influence the market** of this product.

Source: ISO 14020:2022

Environmental statement types

Standards framework



02
01

**Self-declared
environmental
claim**

Environmental statement types

Self-declared environmental claim - Definition

Environmental statement which is **self-declared** by a responsible party.

Applicable standard **ISO 14021:2016**

Environmental statement types

Self-declared environmental claim - Characteristics

No specific framework and methodology.

Under the full responsibility of the claimer.

Importance of transparency of calculation and evidences.

Third-party verification highly recommended.

Great risk of greenwashing.

Environmental statement types

Self-declared environmental claim

Terms commonly used

- Compostable
- Degradable
- Designed for disassembly
- Extended life product
- Recovered energy
- Recyclable
- Recycled content
- Pre-consumer material
- Post-consumer material
- Recycled material
- Recovered [reclaimed] material
- Reduced energy consumption
- Reduced resource use
- Reduced water consumption
- Reusable
- Refillable
- Waste reduction

Environmental statement types

Self-declared environmental claim - Examples

Bouteilles faites de bouteilles recyclées

En 2020, evian franchit une étape majeure dans sa transition vers des emballages plus vertueux :

Toutes nos petites bouteilles sont désormais 100% en matière recyclée (rPET)¹. evian devient ainsi l'une des premières marques d'eaux minérales naturelles en France à proposer des bouteilles entièrement recyclées sur l'ensemble de ses gammes.

¹hors étiquette et bouchon, mais nous y travaillons !



Environmental statement types

Self-declared environmental claim - Examples

The screenshot shows the Schneider Electric website with a search bar and navigation menu. The main content area displays the 'Mureva Styl' product line, which consists of robust and weather-resistant electrical components. A large image of a black outdoor outlet is shown on the right. Below it, three smaller product cards are displayed with their names and prices: 'MUR35021 Mureva Styl - Va et vient - sallie - IP55 - IK08 - connexion auto - gris' (13,89 EUR), 'MUR37021 Mureva Styl - Va et vient - composable - IP55 - IK08 - connexion auto - gris' (10,40 EUR), and 'MUR35024 Mureva Styl - Va et vient lumineuxLED - sallie - IP55 IK08 - connexion auto - gris' (25,76 EUR). The left sidebar includes a 'Sélecteur de produit' button and a 'Assistance' link.



Nos critères en matière de performance environnementale



Matériau à faible impact

Les critères relatifs aux matériaux à faible impact sont appliqués aux produits qui contiennent du plastique recyclé.



Durée de vie prolongée

La durée de vie prolongée exige la réparabilité et la durabilité. Les produits Green Premium revendiquant une durée de vie prolongée sont au moins 5 % plus durables que les produits classiques et disposent de pièces facilement remplaçables, répondant aux deux critères.



Efficacité énergétique

L'efficacité énergétique dans Green Premium définit les produits dont l'efficacité énergétique est supérieure d'au moins 10 % à la moyenne du marché.



Reprise

Le critère de reprise est attribué lorsque le produit est autorisé à être inclus dans un scénario de reprise Schneider Electric.



Utilisation minimale de substances dangereuses

Schneider continue de faire preuve de transparence vis-à-vis de ses clients, en fournissant des informations sur les substances RoHS et REACH et en allant au-delà des réglementations en appliquant les mêmes règles quelle que soit la zone géographique.

Source : <https://www.se.com>

Environmental statement types

Self-declared environmental claim - Examples



Source : <https://www.microsoft.com>

Recycler le plastique océanique pour aider à nettoyer nos océans

La souris Microsoft Ocean Plastic Mouse est un petit progrès sur le chemin de la durabilité. La coque est fabriquée avec 20% de plastique océanique recyclé, une avancée dans la technologie des matériaux qui commence par l'élimination des déchets plastiques des océans et des cours d'eau. La petite boîte est 100% recyclable.



QUALITES ET CARACTERISTIQUES ENVIRONNEMENTALES

DÉCRET N° 2022-748 DU 29 AVRIL 2022¹

PRODUCT/ PRODUIT: MICROSOFT BLUETOOTH MOUSE
(OCEAN PLASTIC)
MODEL/ MODÈLE #: 1929

PRODUIT	
MATIÈRES RECYCLÉES	LE PRODUIT CONTIENT AU MOINS 10 % DE MATIÈRES RECYCLÉES
MÉTAUX PRÉCIEUX	LE PRODUIT CONTIENT AU MOINS 10 MG DE MÉTAUX PRÉCIEUX

Environmental statement types

Self-declared environmental claim - Examples



Plus l'on roule avec Mirai, plus l'on purifie de l'air

Grâce à son système de purification de l'air, Toyota Mirai neutralise et élimine jusqu'à 95% des polluants contenus dans l'air. La quantité d'air purifié par la Toyota Mirai sur 10.000 kilomètres équivaut à la quantité d'air respirée par une personne sur une année complète.

Source : <https://www.toyota.fr/vehicules-neufs/mirai>

02 Ecolabel

02

Environmental statement types

Ecolabel - Definition

Environmental statement which indicates a product **fulfils the criteria** of an ecolabelling **programme**.

Source: ISO 14020:2022

Applicable standard **ISO 14024:2018**

Environmental statement types

Ecolabel- Characteristics

Methodology and framework operated by a third party programme (public or private).

Using a « label » to identify products that are fulfilling the requirements and considered environmentally preferable.

Methodology is based on a set of requirements to fulfill for a given product category.

Easily understandable by consumers.

Environmental statement types

Ecolabel- Examples (Public)



Discover the full range of EU Ecolabel product groups



Cleaning

Clean privately or professionally with less substances.



Clothing and textiles

Textiles and footwear with sustainable fibres.



Coverings

Floor, roof, and all coverings reducing an impact on land.



Do it yourself

Paint and varnishes which are safe for you, your family, and the environment.



Electronic equipment

Energy efficient screens and displays, built for the future.



Furniture and mattresses

Make the spaces we are in safer, reducing impacts on the forests.



EU Ecolabel
Paints and
Varnishes
(indoor and
outdoor)

User Manual



European Commission
EU Ecolabel Paints and Varnishes (indoor and
outdoor)
Commission Decision 2016/912/EU
Version 1.7 May 2023

Source :

https://environment.ec.europa.eu/topics/circular-economy/eu-ecolabel-home_en

Environmental statement types

Ecolabel- Examples



EU ECOLABEL PAINTS AND VARNISHES USER MANUAL Commission Decision of for the award of the EU Ecolabel for paints and varnishes (2014/312/EU)

Criterion 3: Efficiency in use

In order to demonstrate the efficiency in use of paints and varnishes the following tests per type of paint and/or varnish, as indicated in Table 2, shall be undertaken:

Table 2. Performance requirements for different kinds of paints and varnishes

Criteria	Paints and Varnishes (with their subcategories identified according to the Directive 2004/CE/42)							
	Indoor paint (a, b)	Outdoor paint (c)	Trim and cladding (d)	Thick ⁹ decorative coating indoor and outdoor (l)	Varnish and woodstain (e, f)	One pack or two pack performance and floor covering paint (j)	Primer (g)	Undercoat and primer (h)
3(a) Spreading rate (only for white and light coloured paints, including the white base paints used in tinting systems) – EN ISO 6504-1 or ISO 6504-3 or also NF T 30 073 (for the thick coats only) Not applicable to varnishes, lasures, transparent adhesion primers or any other transparent coatings	8 m ² /L	4 m ² /L (elastomeric paint) 6 m ² /L (masonry paint)	Outdoor products 6 m ² /L Indoor products 8 m ² /L	1 m ² /kg	-	Outdoor products 6 m ² /L Indoor products 8 m ² /L	6 m ² /L (with specific blocking/sealing, penetrating/binding or special adhesion properties and opacity) 8 m ² /L (with opacity)*	6 m ² /L (with specific blocking/sealing, penetrating/binding or special adhesion properties and opacity) 8 m ² /L (with opacity)*
3(b) Resistance to water– EN ISO 2812-3	-	-	-	-	Resistant to water	Resistant to water	-	-

⁹ Thick is an 'interpretation of criteria' and it can be for e.g. 'decorative effect coating' as in Directive 2004/42/CE sub-categories.

Environmental statement types

Ecolabel- Examples



EU ECOLABEL PAINTS AND VARNISHES USER MANUAL

Commission Decision of for the award of the EU Ecolabel for paints and varnishes (2014/312/EU)

Criterion 2: Titanium dioxide pigment

If the product contains more than 3.0% w/w of titanium dioxide, the emissions and discharges of wastes from the production of any titanium dioxide pigment used shall not exceed the following^a:

For the sulphate process:

- SO_x calculated as SO₂: 7.0 kg /tonne TiO₂ pigment
- Sulphate waste: 500 kg /tonne TiO₂ pigment.

For the chloride process:

- If natural rutile ore is used, 103 kg chloride waste /tonne TiO₂ pigment
- If synthetic rutile ore is used, 179 kg chloride waste /tonne TiO₂ pigment
- If slag ore is used, 329 kg chloride waste/tonne TiO₂ pigment

If more than one type of ore is used, the values will apply in proportion to the quantity of the individual ore types used.



Note: SO_x emissions only apply to the sulphate process.

The Waste Framework Directive 2008/98/EC Article 3 shall be used for the definition of waste. If the TiO₂ producer can satisfy Article 5 (by-product production) of the Waste Framework Directive for its solid wastes then, the wastes shall be exempted.

① Interpretation of criterion:

TiO₂ is the chemical formula for titanium dioxide and can be considered identical.

SO_x means oxygenated sulphur emissions to air.

The sulphate and chloride processes are two industrial methods for producing TiO₂ from rutile (the mineral from which TiO₂ is produced).

Some TiO₂ producers classify the chloride waste as a by-product for further processing and use. This by-product is exempt from the calculation if the TiO₂ producer can satisfy the Waste Framework Directive definition of by-product. However, it is still necessary to state the amount of chloride by-product (kg/tonne) within the declaration and provide evidence that the by-product is not classified as a waste.

The TiO₂ manufacturer has to submit the values of the production waste (kg chloride waste / tonne TiO₂ pigment), and, if more than one type of ore is used, the values shall be calculated in proportion to the types of ores used. If information on the composition is not provided, the worst case option should be considered.

^a As derived from the Reference Document on Best Available Technology for the Manufacture of Large Volume Inorganic Chemicals (BREF), August 2007.

Environmental statement types

Ecolabel– Examples (Private)



A	B	C+	C-	D
<p>Products that</p> <ul style="list-style-type: none">1. give minimal health or environmental impacts associated with the PRIO properties defined in the Swedish Chemicals Inspectorate priority guide PRIO (e.g. carcinogenic, toxic to reproduction, endocrine disruptors, allergens etc.)2. are not classified as hazardous for health or the environment during the construction phase3. do not affect the indoor environment negatively through high emissions of volatile organic compounds4. give minimal contribution to smog formation5. do not emit excessive levels of formaldehyde (according to the E1 standard)6. provide a minimal strain on natural resources and less to landfill mountains7. have a long service life (for selected product groups)8. are not likely to contribute to unsustainable forestry9. have poor transparency regarding the product contents	<p>Products that do not qualify for A and do not match the criteria for C+ and/or C-.</p>	<p>Products for which workers, nearby communities and the environment risk exposure to substances of very high concern used for the manufacture of polymers.</p>	<p>Products that</p> <ul style="list-style-type: none">1. could lead to an exposure to substances with PRIO properties (e.g. carcinogenic, toxic to reproduction, endocrine disruptors, allergens)2. could lead to exposure to substances with other toxic properties3. risk affecting the indoor environment negatively through high emissions of volatile organic compounds4. contribute to smog formation through emissions of volatile organic compounds with high photochemical ozone creation potentials5. contain substances or are produced with substances that at very low emissions can have a big impact on the climate6. risk contributing to unsustainable forestry	<p>Products with insufficient documentation for an assessment.</p>

Source: <https://www.sundahus.se/en/>

Environmental statement types

Ecolabel – Examples (Find the odd one out)



**02 EPD
(Environmental
Product
Declaration)**

03

Environmental statement types

Environmental Product Declaration (EPD) - Definition

Environmental statement providing **environmental data** of a product using predetermined parameters resulting from a **life cycle assessment** (LCA) and **additional environmental information**.

Source: ISO 14020:2022

Applicable standard **ISO 14025:2006**

Environmental statement types

EPD - Characteristics

Quantified environmental information on the life cycle of a product.

Communicated through a third party program (public or private) called a **Program operator**.

Methodology and instructions are given by **Product Category Rules (PCR)**.

Multi-step and multi-criteria approach leading to complex results. (Business to Business)

Environmental statement types

EPD – Program Operator (Definition)

body or bodies that **conduct** a voluntary program for the development and use of Type III environmental declarations, based on a **set of operating rules**

(Note: A program operator can be a company or a group of companies, industrial sector or trade association, public authorities or agencies, or an independent scientific body or other organization)

Source: ISO 14025:2006

Environmental statement types

EPD – Program Operator (examples)

Construction material

Electric and electronic
equipments for
buildings

Heat, Ventilation and
Air Conditioning



Environmental statement types

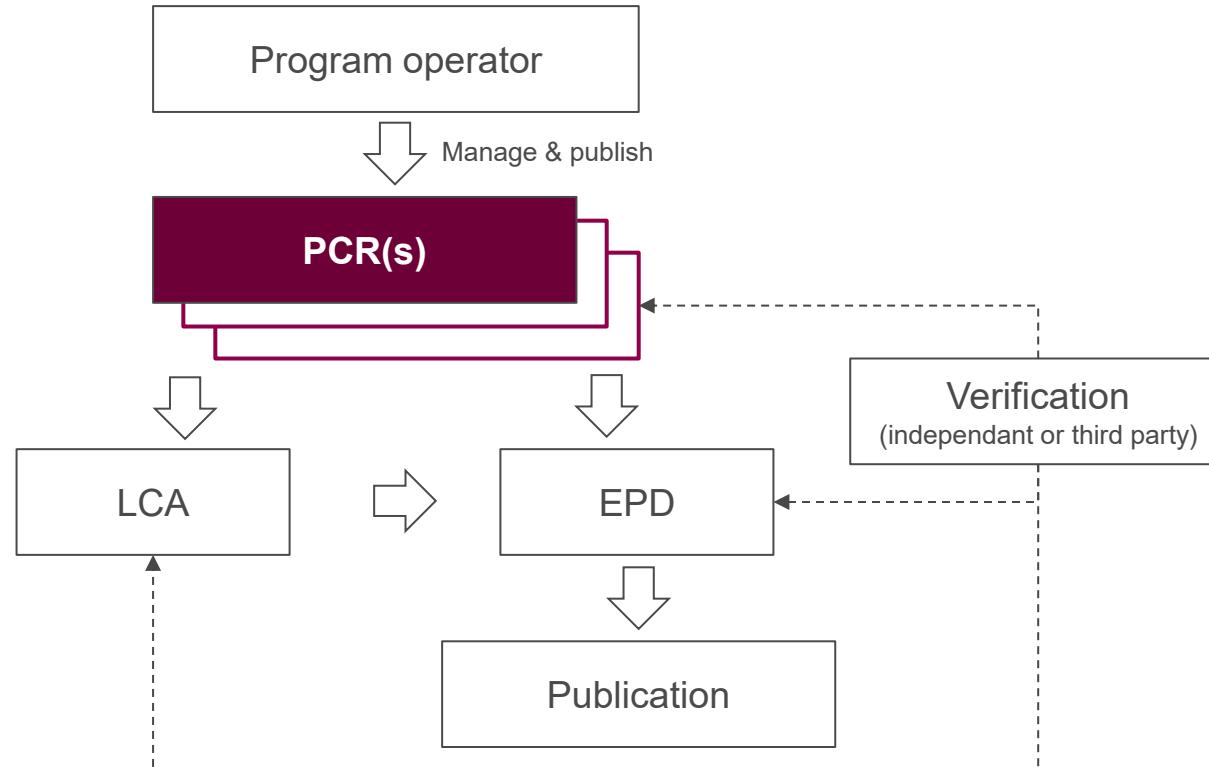
EPD – Product Category Rules (PCR)

set of specific **rules, requirements and guidelines** for developing Type III environmental declarations for one or more group of products that can fulfil equivalent functions (i.e. product categories).

Source: ISO 14025:2006

Environmental statement types

EPD – Product Category Rules (PCR)



Environmental statement types

EPD – How to create an EPD



 Ecochain

03 PEP ecopassport

PEP ecopassport

Context



**PEP
eco
PASS
PORT®**

Scope: International.

Product category: Electric, electronic and HVAC (heating, ventilation, air-conditioning, refrigeration) products.

Applicable standards: EN 50693, NF C08-100-1, ISO 14040, ISO 14044, ISO 14025, ISO/TS 14027

Regulation: RE2020 (décret n° 2021-1004), EPD for construction (décret n° 2021-1674).

Website: www.pep-ecopassport.org, register.pep-ecopassport.org, <https://www.inies.fr/>

PEP ecopassport

Example of a PEP



Product Environmental Profile ESSENSYA USB PD 65W WHITE



Company information

Hager
132 Boulevard d'Europe
F 67215 Obernai Cedex
www.hagergroup.com

A question concerning the Product Environmental Profile:
infopep@hager.com

References covered

WXF115X

Methodology

PEP has been performed according to the PCR version PEP-PCR-ed4-2021 09 06 and PSR version PSR-0005-ed3-EN-2023 06 06 issued by the PEP ecopassport program.
For further information, please see the website of the program www.pep-ecopassport.org

Reference product

Reference product identification
WE115

Use scenario based on :
PSR product Category : PSR-0005-ed3-EN-2023 06 06
Sockets' family - USB charging socket

Functional unit

Provide one USB C connection type charging point PD module, 65W, according to the appropriate use scenario, and for the reference service life of the product of 10 years.

The functional unit is based on the use scenario recommended by the PCR for the category of the reference product.

:hager

Source : <https://assets.hager.com/step-content>

Materials and substances

All useful measures have been adopted to ensure that the materials used in the composition of the product do not contain any substances banned by the legislation in force at the time of marketing.

Plastics	Metals		Others		
	g	%	g	%	
PC	19.91	14.5%	Steel	20.21	14.7%
Epoxy resin	3.61	2.6%	Ferrites	11.85	8.6%
Phenolic resin	0.79	0.6%	Copper	5.76	4.2%
PE-LD	0.65	0.5%	Brass	3.00	2.2%
PA66	0.65	0.5%	Steel	2.50	1.8%
Other	2.24	1.6%	Other	6.66	4.9%
Total mass of reference product with new material packaging	137.27 g		Total mass of reference product (Product + packaging)	129.49 g	

System Boundaries

The environmental information included in the PEP covers all the stages of the life cycle, from "cradle to grave".

Raw material extraction and processing	Manufacturing			Distribution			Installation			Use						End of life			Module b	
	Transport to the manufacturer	Manufacturing	Distribution to place of question	Installation on the place of question	User or application of the product installed	Maintenance	Repair	Replacement	Reseason	Energy requirements during the use phase	Waste requirements during the use phase	Demolition	Transport to the waste treatment site	Treatment of waste in view of reuse, recovery and/or recycling	Disposal	Briefs and tools beyond the system boundaries	D			
A1	A2	A3	A4	A5	B1	B2	B3	B4	B5	B6	B7	C1	C2	C3	C4	D				
Life cycle stages																				

Manufacturing

These products are manufactured by a site that has received an environmental certification ISO 14001.

Distribution

The packaging has been designed in accordance with current regulations. In particular, the European directive 94/62/CE relative to packaging and packaging waste. The packaging is 100% recyclable or recoverable. Packaging and logistic flows are continuously improved in order to reduce their impact.

Installation

Installation processes

The processes to install the product are not considered in this study because of their weak impact compared to the other life cycles steps.

Installation elements (non delivered with the product)

Elements non delivered with the product and needed to install the product are not considered.

PEP ecopassport

Example of a PEP

Use														
For the considered scenario, the product has an average power of 6.040 W in active mode during 30% of the time and 0.084 W in turn off mode during 70% of the time. This corresponds to a total energy consumption of 163.862 kWh for the use span of 10 years.														
Energy model of the use phase :														
France														
Consumables and maintenance :														
None														
End of life														
Considering the complexity of the recycling channels for electric and electronic equipment impacts, we rely mainly on ESR modules (datasets for WEEE product end of life).														
The recycling potential of the product is: 42%. The calculation of this rate is based on the method of the IEC/TR 62655.														
Environmental impacts														
Evaluation of the environmental impact covers the following life cycle stages: raw materials + manufacturing (RMM), distribution (D), installation (I), use (U) and end of life (EoL).														
All calculations are done with EIME software version 6.0.0 with the database version/version CODDE® 2023-02 .														
Indicators set : Indicators for PEF EF 3.0 (Compliance: PEP ed4, EN15804+A2) v2.0														
PEP representative of the covered products marketed in: Europe														
Energy models considered for each phase														
Manufacturing A1-A3	Distribution A4	Installation A5	Use B1-B7	End Of Life C1-C4										
Europe	-	France	France	France										
Environmental indicators														
Indicators	Unit	Manufacturing A1-A3	Distribution A4	Installation A5	Use B1-B7	End Of Life C1-C4	GLOBAL	Module D						
Acidification (PEF-AAP)	kg H ₂ SO ₄ eq	8.93E-03	4.13E-05	1.11E-04	6.34E-02	1.91E-03	7.44E-02	4.49E-03						
Climate change (PEF-GWP)	kg CO ₂ eq	3.38E-03	3.36E-10	4.02E-02	1.08E+01	1.25E-01	1.27E+01	3.11E-01						
Climate change-Biogenic (PEF-GWPb)	kg CO ₂ eq	2.42E-02	2.45E-09	1.59E-03	2.83E-02	7.89E-03	6.19E-02	4.71E-03						
Climate change-Fossil (PEF-GWPf)	kg CO ₂ eq	1.57E+00	1.94E-05	3.84E-02	1.09E+01	1.17E-01	1.26E+01	2.09E-01						
Climate change-Land use and land use change (PEF-GWPw)	kg CO ₂ eq	2.99E-05	2.12E-04	0.00E+00	0.00E+00	0.00E+00	2.42E-04	0.00E+00						
Cotoxicity, freshwater (PEF-CTUe)	CTUe	4.33E+01	1.15E-13	4.59E-01	7.73E+01	4.89E+01	1.70E+02	6.30E+01						
Eff-particulate Matter (PEF-PM)	kg PM _{2.5} eq	4.97E-08	1.24E-11	8.77E-10	2.46E-06	6.58E-09	2.51E-06	2.15E-08						
Ecotoxicity, terrestrial (PEF-ET)	kg N eq	3.30E-06	1.59E-05	4.72E-07	5.21E-04	2.78E-06	5.43E-04	1.11E-03						
Ecotoxicity, marine (PEF-EM)	kg N eq	1.20E-03	0.00E+00	5.44E-05	8.72E-03	1.24E-03	1.12E-02	5.61E-04						
Eutrophication, terrestrial (PEF-EP)	kg N eq	1.20E-02	1.00E-11	3.60E-04	1.29E-01	1.28E-03	1.40E-01	7.20E-03						
Eutrophication, marine (PEF-EM)	kg N eq	1.23E-08	5.36E-05	3.86E-09	1.98E-10	5.38E-05	9.94E-10							
Human toxicity, cancer (PEF-CTHc)	CTUh	1.64E-07	5.36E-05	3.86E-09	1.98E-10	5.38E-05	9.94E-10							
Human toxicity, noncancer (PEF-CTHn)	CTUh	6.23E-08	9.10E-10	1.73E-10	7.91E-10	1.36E-08	9.10E-02	5.62E-08						
Irradiation, human health (PEF-IHU)	kg U235 eq	1.81E+01	2.57E-10	5.12E-03	2.84E-02	7.71E-03	3.02E+02	6.77E-03						
Land use (PEF-LU)	No dimension	9.20E-02	2.48E-05	9.16E-05	3.49E-01	3.73E-01	9.14E-01	3.09E+00						
Ozone depletion (PEF-ODP)	kg CFC-11 eq	2.89E-07	0.00E+00	4.59E-10	1.61E-07	1.11E-08	4.61E-07	1.41E-08						
Photocatalytic ozone formation - human health (PEF-POCP)	% of NO _x eq	4.29E-03	Dish†	8.52E-05	2.58E-02	4.23E-04	3.06E-02	1.81E-03						
Resource use, fossils (PEF-ADF)	kg St eq	3.59E+01	5.77E-07	3.54E-01	2.10E+03	1.47E+00	2.14E+03	2.17E+00						
Resource use, minerals and metals (PEF-ADF)	kg St eq	3.18E-04	9.11E-02	8.81E-06	5.19E-06	2.71E-07	9.15E-02	2.78E-04						
Water use (PEF-WU)	m ³ eq	6.22E-01	9.10E-02	3.30E-03	7.93E-01	3.34E+01	3.50E+01	5.39E+01						
PEP ecopassport														
3/5					HAGE-00746-V01.01-EN									
Resource use indicators														
Indicators	Unit	Manufacturing A1-A3	Distribution A4	Installation A5	Use B1-B7	End Of Life C1-C4	GLOBAL	Module D						
Net use of fresh water	MJ	1.48E-02	5.77E-07	7.69E-05	1.85E-02	9.03E-01	9.37E-01	-1.36E+00						
Total use of primary energy	MJ	3.68E+01	9.11E-02	3.97E-01	2.30E+03	1.63E+00	2.34E+03	-2.67E+00						
Total use of non-renewable primary energy resources	MJ	3.58E+01	9.10E-02	3.54E-01	2.10E+03	1.47E+00	2.14E+03	-2.17E+00						
Total use of renewable primary energy resources	MJ	8.69E-01	1.21E-04	4.35E-02	1.94E+02	1.60E-01	1.95E+02	-5.02E-01						
Use of non-renewable primary energy, excluding non-renewable primary energy resources used as raw materials	MJ	3.46E+01	9.10E-02	3.54E-01	2.10E+03	1.47E+00	2.14E+03	-2.17E+00						
Use of non-renewable primary energy resources as raw materials	MJ	1.18E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	1.18E+00	0.00E+00						
Use of non-renewable secondary fuels	MJ	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00						
Use of renewable primary energy, excluding renewable primary energy resources used as raw materials	MJ	6.54E-01	1.21E-04	4.35E-02	1.94E+02	1.60E-01	1.95E+02	-5.02E-01						
Use of renewable primary energy resources as raw materials	MJ	2.14E-01	0.00E+00	0.00E+00	0.00E+00	0.00E+00	2.14E-01	0.00E+00						
Use of renewable secondary fuels	MJ	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00						
Use of secondary materials	m ³	3.29E-02	0.00E+00	0.00E+00	0.00E+00	0.00E+00	3.29E-02	0.00E+00						
Waste category indicators														
Indicators	Unit	Manufacturing A1-A3	Distribution A4	Installation A5	Use B1-B7	End Of Life C1-C4	GLOBAL	Module D						
Hazardous waste disposed	kg	5.10E+00	0.00E+00	8.39E-04	1.63E-01	1.01E+05	5.27E+00	1.25E-26						
Non-hazardous waste disposed	kg	6.77E-01	2.29E-04	2.30E-02	1.05E+00	4.70E-02	1.80E+00	2.70E-26						
Radioactive waste disposed	kg	2.27E-03	1.63E-07	1.74E-06	4.42E-04	2.85E-07	2.71E-03	0.00E+00						
Output flow indicators														
Indicators	Unit	Manufacturing A1-A3	Distribution A4	Installation A5	Use B1-B7	End Of Life C1-C4	GLOBAL	Module D						
Components for re-use	kg	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00						
Recovered energy	MJ	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00						
Materials for energy recovery	kg	0.00E+00	0.00E+00	1.08E-02	0.00E+00	0.00E+00	1.08E-02	0.00E+00						
Materials for recycling	kg	2.49E-02	0.00E+00	0.00E+00	0.00E+00	0.00E+00	2.49E-02	0.00E+00						
Extrapolation rules														
No extrapolation rules														
4/5					HAGE-00746-V01.01-EN									
Use														
For the considered scenario, the product has an average power of 6.040 W in active mode during 30% of the time and 0.084 W in turn off mode during 70% of the time. This corresponds to a total energy consumption of 163.862 kWh for the use span of 10 years.														
Energy model of the use phase :														
France														
Consumables and maintenance :														
None														
End of life														
Considering the complexity of the recycling channels for electric and electronic equipment impacts, we rely mainly on ESR modules (datasets for WEEE product end of life).														
The recycling potential of the product is: 42%. The calculation of this rate is based on the method of the IEC/TR 62655.														
Environmental impacts														
Evaluation of the environmental impact covers the following life cycle stages: raw materials + manufacturing (RMM), distribution (D), installation (I), use (U) and end of life (EoL).														
All calculations are done with EIME software version 6.0.0 with the database version/version CODDE® 2023-02 .														
Indicators set : Indicators for PEF EF 3.0 (Compliance: PEP ed4, EN15804+A2) v2.0														
PEP representative of the covered products marketed in: Europe														
Energy models considered for each phase														
Manufacturing A1-A3	Distribution A4	Installation A5	Use B1-B7	End Of Life C1-C4										
Europe	-	France	France	France										
Environmental indicators														
Indicators	Unit	Manufacturing A1-A3	Distribution A4	Installation A5	Use B1-B7	End Of Life C1-C4	GLOBAL	Module D						
Acidification (PEF-AAP)	kg H ₂ SO ₄ eq	8.93E-03	4.13E-05	1.11E-04	6.34E-02	1.91E-03	7.44E-02	4.49E-03						
Climate change (PEF-GWP)	kg CO ₂ eq	3.38E-03	3.36E-10	4.02E-02	1.08E+01	1.25E-01	1.27E+01	3.11E-01						
Climate change-Biogenic (PEF-GWPb)	kg CO ₂ eq	2.42E-02	2.45E-09	1.59E-03	2.83E-02	7.89E-03	6.19E-02	4.71E-03						
Climate change-Fossil (PEF-GWPf)	kg CO ₂ eq	1.57E+00	1.94E-05	3.84E-02	1.09E+01	1.17E-01	1.26E+01	2.09E-01						
Climate change-Land use and land use change (PEF-GWPw)	kg CO ₂ eq	2.99E-05	2.12E-04	0.00E+00	0.00E+00	0.00E+00	2.42E-04	0.00E+00						
Cotoxicity, freshwater (PEF-CTUe)	CTUe	4.33E+01	1.15E-13	4.59E-01	7.73E+01	4.89E+01	1.70E+02	6.30E+01						
Eff-particulate Matter (PEF-PM)	kg PM _{2.5} eq	4.97E-08	1.24E-11	8.77E-10	2.46E-06	6.58E-09	2.51E-06	2.15E-08						
Ecotoxicity, terrestrial (PEF-ET)	kg N eq	3.30E-06	1.59E-05	4.72E-07	5.21E-04	2.78E-06	5.43E-04	1.11E-03						
Ecotoxicity, marine (PEF-EM)	kg N eq	1.20E-03	0.00E+00	5.44E-05	8.72E-03	1.24E-03	1.12E-02	5.61E-04						
Eutrophication, terrestrial (PEF-EP)	kg N eq	1.20E-02	1.00E-11	3.60E-04	1.29E-01	1.28E-03	1.40E-01	7.20E-03						
Eutrophication, marine (PEF-EM)	kg N eq	1.20E-08	5.36E-05	3.86E-09	1.98E-10	5.38E-05	9.94E-10							
Human toxicity, cancer (PEF-CTHc)	CTUh	1.64E-07	5.36E-05	3.86E-09	1.98E-10	5.38E-05	9.94E-10							
Human toxicity, noncancer (PEF-CTHn)	CTUh	6.23E-08	9.10E-10	1.73E-10	7.91E-10	1.36E-08	9.10E-02	5.62E-08						
Irradiation, human health (PEF-IHU)	kg U235 eq	1.81E+01	2.57E-10	5.12E-03	2.84E-02	7.71E-03	3.02E+02	6.77E-03						
Land use (PEF-LU)	No dimension	9.20E-02	2.48E-05	9.16E-05	3.49E-01	3.73E-01	9.14E-01	3.09E+00						
Ozone depletion (PEF-ODP)	kg CFC-11 eq	2.89E-07	0.00E+00	4.59E-10	1.61E-07	1.11E-08	4.61E-07	1.41E-08						
Photocatalytic ozone formation - human health (PEF-POCP)	% of NO _x eq	4.29E-03	Dish†	8.52E-05	2.58E-02	4.23E-04	3.06E-02	1.81E-03						
Resource use, fossils (PEF-ADF)	kg St eq	3.59E+01	5.77E-07	3.54E-01	2.10E+03	1.47E+00	2.14E+03	2.17E+00						
Resource use, minerals and metals (PEF-ADF)	kg St eq	3.18E-04	9.11E-02	8.81E-06	5.19E-06	2.71E-07	9.15E-02	2.78E-04						
Water use (PEF-WU)	m ³ eq	6.22E-01	9.10E-02	3.30E-03	7.93E-01	3.34E+0								

PEP ecopassport

Example of a PEP

Verification

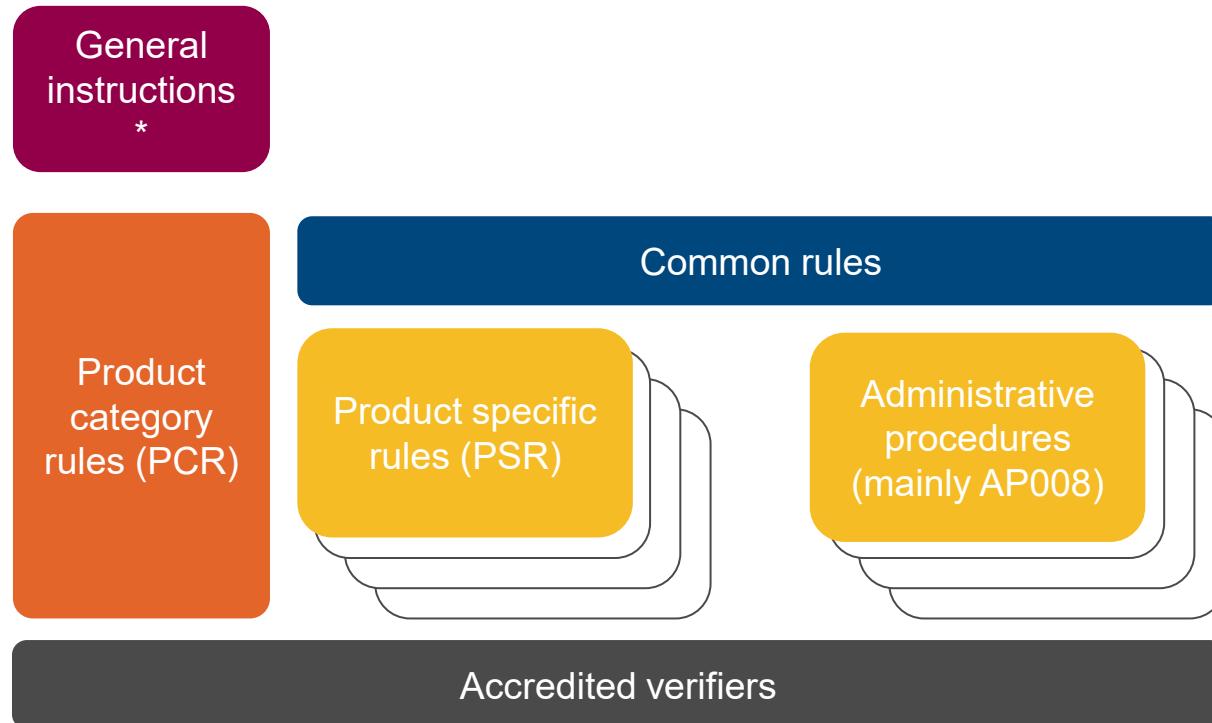
Registration N°: HAGE-00746-V01.01-EN	Drafting Rules	PEP-PCR-ed4-2021.09.06
	Supplemented by	PSR-0005-ed3-EN-2023.08.06
Vetiver accreditation N°: VH37	Information and reference documents: www.pep-ecopassport.org	
Date of issue: 7-2023	Validity period: 3 years	
Independent verification of the declaration and data, in compliance with ISO 14025 : 2006		
Internal • External		
The PCR review was conducted by a panel of experts chaired by Philippe Oissel (SOLINNEN)		
PEP are compliant with XP C08-105-1:2014 The elements of the present PEP cannot be compared with elements from another program		
Document in compliance with ISO 14025 : 2006 « Environmental labels and declarations. Type III environmental declarations »		

Note :

The picture has no contractual value.
All numerical values indicated in this document may vary and depend of many factors such as the tolerance related to materials, the usage and environment conditions of the products, installation characteristics ... real values for a product in a concrete application may therefore change.
The average value in this document is an average value chosen for the need of the calculations. This value cannot be assimilated to the minimum, average or real life time.
The responsibility of the company issuing the document can never be engaged if differences could be noticed between the values given by this document and real ones, whatever the causes and/or consequences would be.

PEP ecopassport

Program reference documents



*General instructions: scope of the program and how it works.

PEP ecopassport

Program reference documents

The Product Category Rules (PCR) provides common rules to apply for Life Cycle Assessment of electrical, electronic and HVAC-R products:

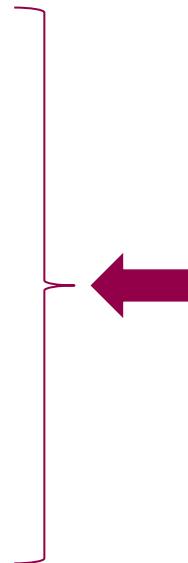
- PCR of the PEP ecopassport program (ed 3) (until 2022/12/31)
- PCR of the PEP ecopassport program (ed 4) (from 2021/09/06)



Common rules applicable to all products

This document is completed by several Product Specific Rules (PSR):

- PSR0001 - Wires, cables and accessories (Since 2022/11/16)
- PSR0002 - Direct, visible, fixed electric heating appliances (Since 2023/06/06)
- PSR0003 - Cable management (Since 2023/06/06)
- PSR0004 - Individual and standalone domestic storage water heater
- PSR0005 - Electrical switchgear and controlgear solutions (Since 2023/06/06)
- PSR0006 - Drives for blinds and closures installed in buildings (Since 2023/06/06)
- PSR0007 - Self-contained emergency electrical equipment (Since 2023/06/06)
- PSR0008 - Ventilation Air Treatment Filtration and Mechanical Smoke Exhaust Equipment
- PSR0009 - Comfort Terminal Units
- PSR0010 - Uninterruptible power supply (UPS)
- PSR0011 - Hot water radiators or towel radiators
- PSR0012 - Gas, fuel oil, or biomass boilers
- PSR0013 - Thermodynamic generators with electric compression for heating and/or cooling of premises and/or the production of domestic hot water (Since 2023/06/06)
- PSR0014 - Luminaires (Since 2023/07/13)
- PSR0015 - Wood heating system appliance for individual dwellings
- PSR0016 - Storage Tanks
- PSR0017 - Thermal solar collectors
- PSR0018 - Specific rules for electric vehicle charging infrastructures
- ANNEXE PSR0018 - Specific rules for electric vehicle charging infrastructures
- PSR0019 - Fire Safety System (Since 2023/06/06)



Specific rules applicable to certain products

PEP ecopassport

3 types of declarations

Single product declaration

a declaration performed for a single commercial reference

Products family declaration

a declaration performed for several commercial references, from a single manufacturer, belonging to a homogeneous environmental family.

homogeneous environmental family = Same main functionality, same product standards, similar manufacturing technology (same type of materials and manufacturing processes).

Joint declaration

a declaration performed for several products across multiple manufacturers.

04 EPD international

EPD international Context

Scope: International.

Product category: Multi product categories



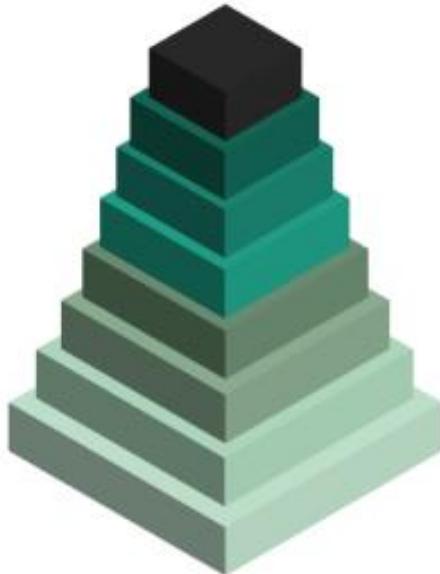
Applicable standards: EN 50693, ISO 14040, ISO 14044, ISO 14025, ISO/TS 14027

Regulation: Depending on the product categories

Website: <https://www.environdec.com/>

EPD international

Program reference documents



01 COMPLEMENTARY PRODUCT CATEGORY RULES (C-PCRs)

Additional rules for a specific product group within a product category

02 PRODUCT CATEGORY RULES (PCRs)

Specific rules for one or more product categories

03 PRODUCT SPECIFIC STANDARDS

EN 15804, ISO 21930, etc.

04 GENERAL PROGRAMME INSTRUCTIONS (GPI)

Regulation on overall administration and operation

05 ECO PLATFORM STANDARDS

Regulation on administration, calculation and verification

06 EPD STANDARDS

ISO 14025, ISO 14026, ISO/TS 14027 and ISO/TS 14029

07 LCA STANDARDS

ISO 14040, ISO 14044, ISO 14067 and ISO/TS 14071

08 ORGANISATIONAL STANDARDS

ISO 9001, ISO/IEC 17029, ISO 14065 and ISO/IEC 17065

EPD international

Example of EPD



ENVIRONMENTAL PRODUCT DECLARATION

IN ACCORDANCE WITH ISO 14025 FOR:
210 SERIES SINGLE-GLASS
MONOCRYSTALLINE PHOTOVOLTAIC MODULES
FROM
RISEN ENERGY CO., LTD.

Programme: The International EPD® System, www.environdec.com
Programme operator: EPD International AB
PCR: 2007-08 Electricity, steam and hot water generation and distribution (Version 4.2)
EPD registration number: S-P-04780
Publication date: 2022-01-05
Revision date: 2023-03-22
Valid until: 2026-12-21



Programme information

The International EPD® System EPD International AB Box 210 60 SE-100 31 Stockholm Sweden www.environdec.com info@.environdec.com	
Product category rules (PCR) PCR 2007-08 Electricity, steam and hot water generation and distribution (Version 4.2)	
PCR review was conducted by Karin Lundmark, Vattenfall AB, karin.lundmark@vattenfall.com Sara McGowan, Vattenfall AB, sara.mcgowan@vattenfall.com	
Independent third-party verification of the declaration and data, according to ISO 14025:2006: <input type="checkbox"/> EPD process certification <input checked="" type="checkbox"/> EPD verification	
Third party verifier: Leo Breived, 2B Sri E-mail: breived@2b-be.it	
Approved by: The International EPD® System	
Procedure for follow-up of data during EPD validity involves third party verifier: <input checked="" type="checkbox"/> Yes <input type="checkbox"/> No	

The EPD owner has the sole ownership, liability, and responsibility for the EPD. EPDs within the same product category but from different programmes may not be comparable.

Version history

This document has been issued in the following versions:

- 2022-01-05: Version 1.0
- 2023-01-25: Version 2.0. Downstream module results have been updated, statements of existing processes have been changed, and company contact email address has been changed
- 2023-03-02: The system diagram and the description of life cycle processes have been changed. The processes results have also been reallocated according to the corrected system boundary.

Environmental performance

Since all the PV modules share the same production processes and have similar life cycle stages, thus RSM110-8-560M and RSM120-8-610M were chosen as the representative to show the results. The result was allocated by stages, as shown in tables below. The contribution analysis of the PV module products on various impact categories reveals that PV module, including raw materials stage (A1) and PV plant installation stage (A5) are the main contributions to environmental impact categories. In terms of raw materials stage, solar cell, glass, and frame are three key impact components, and for the PV plant installation stage, cable and bracket used for PV plant infrastructures are the key impact components.

Table 6 Environmental impacts of RSM110-8-560M

Parameter	Unit	Upstream	Core infrastructure	Core operation	Total generated	Downstream process	Downstream infrastructure	Total
Global warming potential – Fossil (GWP-fossil)	kg CO ₂ eq	1.61E-04	1.45E-02	5.98E-04	1.52E-02	7.35E-04	3.83E-05	1.60E-02
Global warming potential – Biogenic (GWP-biogenic)	kg CO ₂ eq	1.72E-06	1.23E-04	5.88E-06	1.25E-04	5.90E-06	4.71E-08	1.31E-04
Global warming potential – Land use and Land transformation (GWP-lutuc)	kg CO ₂ eq	1.48E-07	1.41E-05	6.85E-08	1.43E-05	6.79E-07	5.84E-08	1.51E-05
Global warming potential (GWP) – Total	kg CO ₂ eq	1.63E-04	1.46E-02	5.98E-04	1.54E-02	7.42E-04	3.84E-05	1.62E-02
Acidification potential (AP)	kg SO ₂ eq	1.18E-06	8.37E-05	2.89E-06	8.78E-05	4.16E-06	1.99E-07	9.21E-05
Eutrophication potential (EP)	kg PO ₄ ⁻³ eq	4.09E-07	3.23E-05	5.74E-07	3.33E-05	1.58E-06	6.88E-08	3.49E-05
Photochemical oxidant formation potential (POFP)	kg tN MMVOC _x eq	7.60E-07	5.80E-05	1.99E-06	5.87E-05	2.78E-06	1.64E-07	6.17E-05
Particulate matter	kg PM _{2.5} eq	1.62E-07	1.39E-05	6.81E-07	1.47E-05	7.00E-07	3.17E-08	1.54E-05
Abrupt depletion potential – Elements	kg Sb eq	5.30E-09	4.47E-07	8.04E-10	4.53E-07	2.15E-08	2.02E-09	4.76E-07
Abrupt depletion potential – Fossil fuels	Mt, net calorific value	1.58E-03	1.63E-01	5.53E-03	1.70E-01	8.18E-03	3.70E-04	1.79E-01
Water scarcity footprint	m ³ H ₂ O eq	4.86E-05	1.56E-02	7.24E-05	1.58E-02	7.52E-04	9.99E-06	1.65E-02

Table 7 Environmental impacts of RSM120-8-610M

Parameter	Unit	Upstream	Core infrastructure	Core operation	Total generated	Downstream process	Downstream infrastructure	Total distributed
Global warming potential – Fossil (GWP-fossil)	kg CO ₂ eq	1.77E-04	1.58E-02	6.65E-04	1.66E-02	8.01E-04	3.94E-05	1.75E-02
Global warming potential – Biogenic (GWP-biogenic)	kg CO ₂ eq	1.89E-06	1.30E-04	6.43E-06	1.32E-04	6.25E-06	4.91E-08	1.38E-05
Global warming potential – Land use and Land transformation (GWP-lutuc)	kg CO ₂ eq	1.63E-07	1.35E-05	7.61E-08	1.35E-05	7.35E-07	6.04E-08	1.38E-05

Source : <https://api.environdec.com/api/v1/EPDLibrary/Files/605e495b-7927-4ab8-9bf1-08db7e35bd3c/Data>



**Thank you
for your attention!**

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