Declaration Owner
Ceilume
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Product:
Random Gray Tiles and Panels

Functional Unit
The functional unit is 0.093 m^2 (1 ft^2) of installed panel with a reference service life (RSL) of 30 years

EPD Number and Period of Validity
SCS-EPD-10592
EPD Valid February 13, 2026, through February 12, 2031

Product Category Rule
UL Product Category Rule (PCR) Guidance for Building-Related Products and Service, Part A: Life Cycle Assessment Calculation Rule and Report Requirements. Version 4.0. March 2022.

UL Product Category Rule (PCR) Guidance for Building-Related Products and Services, Part B: Non-Metal Ceiling and Interior Wall Panel System EPD Requirements. Version 2.0. April 13, 2021.

Program Operator
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Declaration owner:	Ceilume
Address:	9270 Graton Road, PO Box 511 Graton, CA 95444
Declaration Number:	SCS-EPD-10592
Date of Issue:	February 13, 2026
Declaration Validity Period:	EPD Valid February 13, 2026 through February 12, 2031
Program Operator:	SCS Global Services, 2000 Powell Street, Ste. 600, Emeryville, CA 94608 USA
Declaration URL Link:	https://www.scsglobalservices.com/certified-green-products-guide
General Program Instructions:	SCS Type III Environmental Declaration Program: Program Operator Manual. V12.0 December 2023.
Product(s):	Random Gray Tiles and Panels
Declared Unit or Functional Unit:	0.093 m2 (1 ft2) of installed panel with a reference service life (RSL) of 30 years
Product's Intended Application and Use:	For installation in drop ceiling grid systems or as a covering for existing ceilings and walls
Product RSL (if applicable):	30 years
Markets of Applicability:	North America
EPD Type:	Product specific
EPD Scope:	Cradle to grave
Year(s) of Reported Manufacturer Primary Data:	2023-2024
LCA Software & Version Number:	OpenLCA 2.4.0
LCI Database(s) & Version Number:	EcoInvent 3.11
LCIA Methodology & Version Number:	TRACI 2.1
Reference PCR:	UL Product Category Rule (PCR) Guidance for Building-Related Products and Services, Part B: Non-Metal Ceiling and Interior Wall Panel System EPD Requirements. Version 2.0. April 13, 2021.
Sub-category PCR review:	Lindita Bushi, Sustainable Materials Institute, Tom Gloria, Industrial Ecology Consultants; Olivia Palmer, Simpson Gumpertz & Heger
LCA Practitioner:	Milly Gabriel, SCS Global Services
Independent critical review of the LCA and data, according to ISO 14044 and the PCR:	☐ internal ☒ external
LCA Reviewer:	Lindita Bushi, PhD., Athena Sustainable Materials Institute
Independent verification of the declaration and data, according to ISO 14025 and the PCR:	☐ internal ☒ external
EPD Verifier:	Lindita Bushi, PhD., Athena Sustainable Materials Institute
Declaration Contents:	

Disclaimers: *This EPD conforms to ISO 14025, 14040, 14044, and ISO 21930.*

Scope of Results Reported: *The PCR requirements limit the scope of the LCA metrics such that the results exclude environmental and social performance benchmarks and thresholds, and exclude impacts from the depletion of natural resources, land use ecological impacts, ocean impacts related to greenhouse gas emissions, risks from hazardous wastes and impacts linked to hazardous chemical emissions.*

Accuracy of Results: *Due to PCR constraints, this EPD provides estimations of potential impacts that are inherently limited in accuracy.*

Comparability: *The PCR this EPD was based on was not written to support comparative assertions. EPDs based on different PCRs, or different calculation models, may not be comparable. When attempting to compare EPDs or life cycle impacts of products from different companies, the user should be aware of the uncertainty in the final results, due to and not limited to, the practitioner's assumptions, the source of the data used in the study, and the specifics of the product modeled.*

In accordance with ISO 21930:2017, EPDs are comparable only if they comply with the core PCR, use the same sub-category PCR where applicable, include all relevant information modules and are based on equivalent scenarios with respect to the context of construction works. The owner of the declaration shall be liable for the underlying information and evidence; SCS shall not be liable with respect to manufacturer information, life cycle assessment data, and evidence supplied or made available to SCS.

1. Ceilume

Ceilume is committed to providing customers with high quality, sustainable products, and dedicated to preserving natural resources and minimizing the environmental impacts associated with manufacturing. They source their raw material from responsible companies located within the United States, have in place an extensive program to reuse materials that might otherwise end up in a landfill, and routinely reevaluate ways in which they can make their processes more efficient and environmentally friendly.

2. Random Gray Tiles and Panels

2.1 PRODUCT DESCRIPTION

Ceilume's tiles (2 ft x 2 ft) and panels (2 ft x 4 ft) are thermoformed from rigid vinyl plastic and are designed for use in both commercial and private spaces. They are composed of a polyvinylchloride (PVC) base, some with a laminate composite covering, and are available in a variety of styles and colors. All Ceilume tiles and panels are Class A fire rated, 100% recyclable, completely waterproof, Greenguard Gold Certified for indoor air quality, and made in the USA.

The products in scope for this EPD are Ceilume's "Random Gray" tiles and panels, made from 100% recycled materials sourced entirely in-house from manufacturing scrap and product received from customers by way of Ceilume's take-back program - part of their effort to provide customers with a product that continually circulates in a sustainable loop.

Figure 1. *Various Ceilume ceiling tile styles (Evangeline, Bistro, Madison, and Bentley) featured in Random Gray.*

2.2 PRODUCT SPECIFICATION

The Ceilume products covered in this study belong to the Construction Specification Institute (CSI) codes 09 56 00 (Textured Ceiling Panels) and 09 72 16.16 (Rigid Sheet Vinyl Wall Coverings) and the following UNSPSC codes: 30161602 (Ceiling Panels) and 30161500 (Wall Panels).

2.3 FLOW DIAGRAM

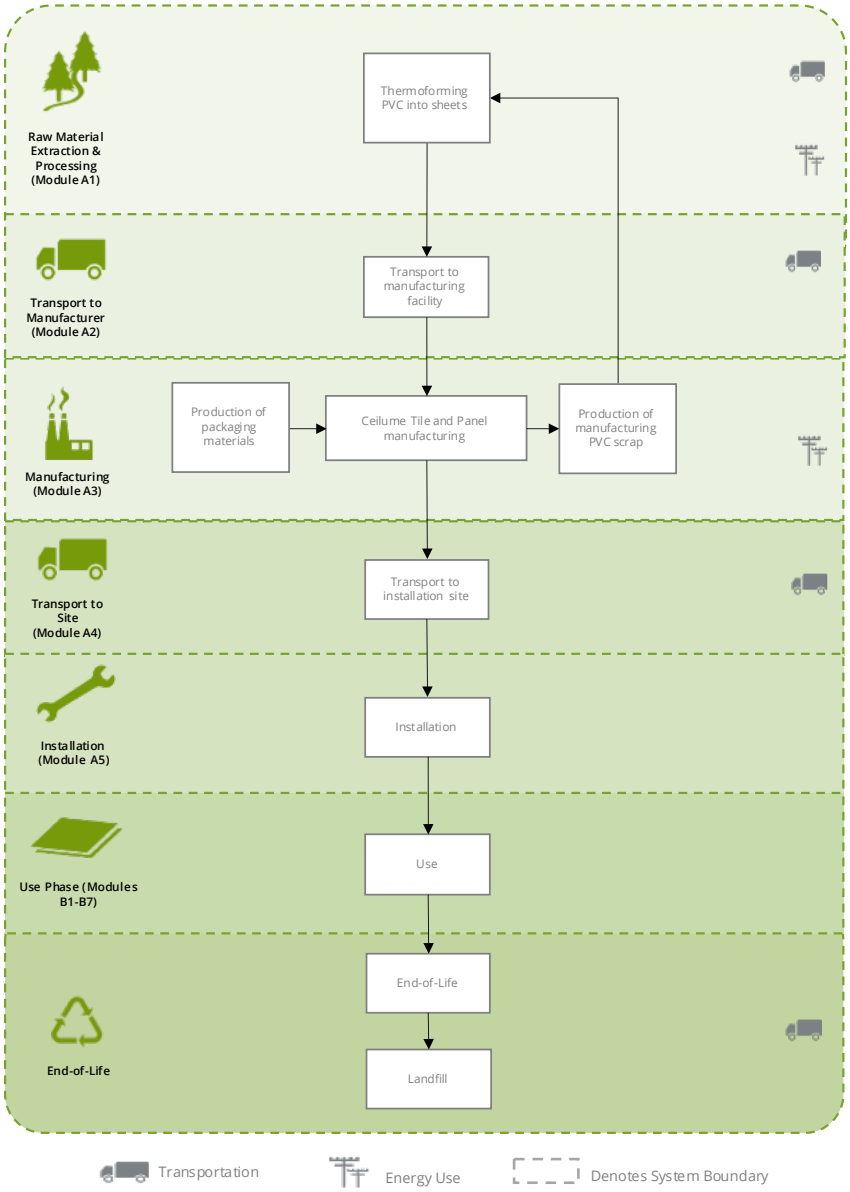

Figure 2. *Flow diagram and system boundaries for the life cycle of the Ceilume Random Gray panel products in this study.*

2.4 PRODUCT AVERAGE

All products were assessed on the basis of a representative product that is 0.093 m^2 (1 ft^2) in area. As such the distinction between tiles (2 ft x 2 ft) and panels (2 ft x 4 ft) is irrelevant. The product may be referred to as ceiling panels in the remainder of this document, and it should be understood to be a reference to 0.093 m^2 of tiles and panels that can be applied either to a ceiling or a wall. Results for the two product thicknesses manufactured by Ceilume (Feather-Light and Signature) were calculated based on manufacturer provided data representing a mass-based average of product materials, packaging materials, and total annual production for each of the two thicknesses.

2.5 APPLICATION

The Ceilume products in this study are designed for installation in ceilings and on walls of residential and commercial buildings and have both decorative and functional applications.

2.6 TECHNICAL REQUIREMENTS

Ceilume panels are Greenguard Gold Certified for low-volatile organic compound (VOC) emissions. They comply with California's Department of Public Health Services Standard Practice for Specification Section 01350 for chemical emissions from building products used in schools, healthcare and critical facilities. Other qualities such as light reflectivity and burning characteristics can be found below in Table 1.

Table 1. *Technical specifications for Ceilume panels in scope for this study.*

Technical Data	Unit	Random Gray
Sound absorption coefficient (ASTM C423)	n/a	0.15
Interzone Attenuation of Open Office Components (ASTM E1111 and ASTM E1110)	n/a	n/a
Sound Transmission Class (ASTM E413 and ASTM E90)	dB	15
Sound Attenuation Between Rooms Sharing a Common Ceiling Plenum (ASTM E1414 and Classification E413)	dB	21
Surface burning characteristics of building materials (ASTM E84, ASTM E1264)	Flame spread/smoke developed	Class A
Flood Damage-Resistant Material Requirements for Buildings Located in Special Flood Hazard Areas under the National Flood Insurance Program; Technical Bulletin 2 (2008)	n/a	Class 4

2.7 PROPERTIES OF DECLARED PRODUCT AS DELIVERED

Properties of the declared panels in this study reported above can be found in the Safety Data Sheet for Ceilume ceiling tiles and panels at the following link: https://static.ceilume.com/static/pdfs/ceilume-safety-data-sheet.pdf

3. LCA: Calculation Rules

3.1 FUNCTIONAL UNIT

According to ISO 14044, the functional unit is "the quantified performance of a product system, for use as a reference unit." The functional unit for Ceilume Feather-Light and Signature tiles and panels is defined as 0.093 m^2 of installed panel with a reference service life (RSL) of 30 years.

Table 2. *Functional unit properties for the Ceilume panels in scope for this study.*

Property	Unit	Random Gray
Functional Unit	m^2	0.093
Thickness	mm	7.62×10^{-2}
Surface Weight per Functional Unit	kg/m^2	9.67×10^{-2}
Density per Functional Unit	kg/m^3	1364

3.2 SYSTEM BOUNDARY

The scope of the EPD is cradle-to-grave, including raw material extraction and processing, transportation, product manufacture, product delivery, installation, maintenance, and product disposal. The life cycle phases included in the EPD scope are described in Table 3 below.

Table 3. *System boundary for the Ceilume panels in this study.*

Product			Construction		Use							End-of-life				Benefits and loads beyond the system boundary
A1	A2	A3	A4	A5	B1	B2	B3	B4	B5	B6	B7	C1	C2	C3	C4	D
Raw material extraction and processing	Transport to manufacturer	Manufacturing	Transport	Construction - installation	Use	Maintenance	Repair	Replacement	Refurbishment	Operational energy use	Operational water use	Deconstruction demolition	Transport	Waste processing	Disposal	Reuse, recovery and/or recycling potential
X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	MND

X = Module Included | MND = Module Not Declared

3.3 REFERENCE SERVICE LIFE AND ESTIMATED BUILDING SERVICE LIFE

The tiles and panels in this study have a Reference Service Life (RSL) of 30 years and Estimated Building Service Life (ESL) of 75 years according to the Product Category Rule (PCR).

3.4 ALLOCATION

This study follows the allocation guidelines of ISO 14044 and sought to minimize the use of allocation wherever possible. In general, manufacturing facilities may produce multiple products, and in such cases it is necessary to divide the environmental impacts between the different products. The Part A PCR and Part B PCR require the use of mass or other physical relationship (e.g., mass, volume) for allocation of multi-input and output processes. Resource and electricity use for the manufacturing facility was allocated using a mass-based approach based on the total production of Feather-Light and Signature tiles and panels for the Graton, California facility. Note that no green power is used in this EPD project and no CO_2 certificates are used in this EPD project.

The secondary databases used for the product system apply allocation based primarily on physical relationships (e.g., volume, energy content, or mass-based relationships). Impacts from the transportation, including product distribution to the installation site, were allocated based on the mass of material and distance transported.

3.5 CUT-OFF RULES

No data gaps were allowed which were expected to significantly affect the outcome of the indicator results. No known flows are deliberately excluded from this EPD. No burdens are allocated across the system boundary with secondary material, secondary fuel, or recovered energy flows arising from waste.

3.6 DATA SOURCES

The life cycle inventory (LCI) of each unit process comprises material and energy inputs, emissions, and wastes. Primary data, as well as datasets from commercial LCI databases are used to model each unit process within the product system and include data quantifying the elementary and technology flows necessary to calculate environmental impacts in each LCIA phase. These include the following general types of data:

- Inputs from nature: biotic and abiotic resources
- Inputs from the technosphere: ancillary materials, services such as waste management and transport, energy inputs, etc.; and
- Outputs to nature: emission to air, water, and soil.

To the extent available, primary data are used for foreground processes (e.g., product manufacturing), while background processes are modeled using secondary data sourced from the EcoInvent 3.11 LCI databases with a bias towards the most recent and representative data.

Unit processes were developed with the OpenLCA v2.4 LCI model, drawing data from multiple sources. Primary data were provided by Ceilume for the manufacturing facility in Graton, California. The principal source of secondary LCI data is the Ecoinvent database. The datasets used in the LCA model to represent the manufacture of the panels in this study are shown below in Table 4.

Table 4. *LCI datasets and associated databases used to model the Ceilume panels in this study.*

Flow	Dataset	Data Source	Publication Date
Raw Materials			
Body	waste polyvinylchloride, for recycling, unsorted, Recycled Content cut-off | waste polyvinylchloride, for recycling, unsorted | Cutoff, U - GLO	EcoInvent 3.11	2024
	market for thermoforming of plastic sheets | thermoforming of plastic sheets | Cutoff, U - GLO	EcoInvent 3.11	2024
Packaging			
Cardboard	market for corrugated board box | corrugated board box | Cutoff, U – US (modified to reflect 37% recycled content)	EcoInvent 3.11	2024
Foam Pads	market for polyurethane, flexible foam | polyurethane, flexible foam | Cutoff, U - RoW	EcoInvent 3.11	2024
Manufacturing Inputs			
Electricity	market for electricity, medium voltage | electricity, medium voltage | (modified for regional electricity grid using eGRID data)	EcoInvent 3.11	2024
Water	market for tap water | tap water | Cutoff, U - RoW	EcoInvent 3.11	2024
Transport			
Truck Transport	market for transport, freight, lorry 16-32 metric ton, EURO4 | transport, freight, lorry 16-32 metric ton, EURO4 | Cutoff, U - RoW	EcoInvent 3.11	2024
Waste Outputs			
Wastewater	market for wastewater, average | wastewater, average | Cutoff, U - RoW	EcoInvent 3.11	2024
Polyvinylchloride	treatment of waste polyvinylchloride, sanitary landfill | waste polyvinylchloride | Cutoff, U - RoW	EcoInvent 3.11	2024
Foam Pads	treatment of waste polyurethane foam, collection for final disposal | waste polyurethane foam | Cutoff, U - RoW	EcoInvent 3.11	2024
Cardboard	treatment of waste paperboard, inert material landfill | waste paperboard | Cutoff, U - RoW	EcoInvent 3.11	2024
	treatment of waste paperboard, municipal incineration | waste paperboard | Cutoff, U - GLO	EcoInvent 3.11	2024

3.7. DATA QUALITY

The data quality assessment addressed the following parameters: time-related coverage, geographical coverage, technological coverage, precision, completeness, representativeness, consistency, reproducibility, sources of data, and uncertainty.

Table 5. *Data quality assessment.*

Data Quality Parameter	Data Quality Discussion
Time-Related Coverage: Age of data and the minimum length of time over which data is collected	The manufacturer provided primary data on product manufacturing for the Graton, California facility on an annual production scale for 2024. Representative datasets (secondary data) for upstream and background processes are generally less than 5 years old.
Geographical Coverage: Geographical area from which data for unit processes is collected to satisfy the goal of the study	The data used in the analysis provide the best possible representation available with current data. Electricity use for products manufactured is modeled using representative data modelled for the specific electricity grids represented in this study. Surrogate data used in the assessment are representative of global operations and are considered sufficiently similar to actual processes.
Technology Coverage: Specific technology or technology mix	For the most part, data are representative of the actual technologies used for processing, transportation, and manufacturing operations. Representative component datasets, specific to the type of material, are used to represent the actual processes, as appropriate.
Precision: Measure of the variability of the data values for each data expressed	Precision of results are not quantified due to a lack of data. Data collected for operations were typically averaged for one more years and over multiple operations, which is expected to reduce the variability of results.
Completeness: Percentage of flow that is measured or estimated	The LCA model included all known mass and energy flows for production of the products. In some instances, surrogate data used to represent upstream and downstream operations may be missing some data which is propagated in the model. No known processes or activities contributing to more than 1% of the total environmental impact for each indicator are excluded.
Representativeness: Qualitative assessment of the degree to which the data set reflects the true population of interest	Data used in the assessment represents typical or average processes as currently reported from multiple data sources and are therefore generally representative of the range of actual processes and technologies for production of these materials. Considerable deviation may exist among actual processes on a site-specific basis; however, such a determination would require detailed data collection throughout the supply chain back to resource extraction.
Consistency: Qualitative assessment of whether the study methodology is applied uniformly to the various components of the analysis	The consistency of the assessment is considered to be high. Data sources of similar quality and age are used; with a bias towards the most recent dataset where available. Different portions of the product life cycle are equally considered.
Reproducibility: Qualitative assessment of the extent to which information about the methodology and data values would allow an independent practitioner to reproduce the results reported in the study	Based on the description of the data and assumptions used, this assessment would be reproducible by other practitioners. All assumptions, models, and data sources are documented.
Sources of the Data: Description of all primary and secondary data sources	Data representing energy use at the Graton California facility represent a 12-month average and are considered of high quality due to the length of time over which these data are collected, as compared to a snapshot that may not accurately reflect fluctuations in production. For secondary LCI data, Ecoinvent v3.11 data are used.
Uncertainty of the Information: Uncertainty related to data, models, and assumptions	Uncertainty related to materials in the products and packaging is low. Actual supplier data for upstream operations was not available for all suppliers and the study relied upon the use of existing representative datasets. These datasets contained relatively recent data (<10 years) but lacked geographical representativeness. Uncertainty related to the impact assessment methods used in the study are high. The impact assessment methodology includes impact potentials, which lack characterization of providing and receiving environments or tipping points.

3.8 PERIOD UNDER REVIEW

The period of review is October 1st, 2023 through September 30th, 2024.

3.9 COMPARABILITY AND BENCHMARKING

The PCR this EPD was based on was not written to support comparative assertions. EPDs based on different PCRs, or different calculation models, may not be comparable. When attempting to compare EPDs or life cycle impacts of products from different companies, the user should be aware of the uncertainty in the final results, due to and not limited to, the practitioner's assumptions, the source of the data used in the study, and the specifics of the product modeled.

3.10 ESTIMATES AND ASSUMPTIONS

The assessment relied on a number of assumptions related to material composition, processing, installation, use and end-of-life disposal. The major assumptions used in the assessment are described below.

- Total facility production for each product type over a 12-month period from October 1st, 2023 to September 30th, 2024 was provided by Ceilume.
- For the 100% recycled product Random Gray a transportation distance of 3,138 km was utilized to represent the distance manufacturing scrap regrind travels to be recycled at a 3rd party facility based on data provided by the manufacturer.
- Installation of the products is assumed to be manual, requiring no additional energy use.
- Product waste from installation is assumed to be 7% per the PCR Part B.
- Transport of the packaging waste at installation is assumed to be 100 km by truck.
- Packaging waste is disposed of in accordance with the packaging disposal assumptions by region laid out in the PCR Part A for the United States.
- The product is assumed to require no repair or refurbishment over its RSL.
- The ESL of the building/construction works was assumed to be 75 years, per the PCR, in order to be consistent with ASHRAE 189.1 (2014, Section 9.5.1).
- According to the manufacturer, the product can be cleaned at any point during it's lifetime using a soapy water solution, but it is not necessary to do so. Therefore cleaning was excluded from this life cycle assessment.
- The product requires no operational energy or operational water usage during its service life.
- Transport of the product at end-of-life to waste processing and disposal is assumed to be 100 km by truck.
- For the product end-of-life, disposal of product is assumed to be in a landfill.

3.11 UNITS

All data and results are presented using SI units.

4. LCA: Scenarios and Additional Technical Information

4.1 MATERIAL COMPOSITION

Table 6 summarizes the components by weight and material type for each product line, including product scrap, as well as the packaging materials for each product. Also presented are the material components as a percent of total mass.

Table 6. *Material component summary for Ceilume Random Gray products in this study, per 0.093 m^2 of panel.*

Raw Materials	Recycled Content (%)	Mass Final Product (kg)	Percent of Product (%)
Polyvinylchloride	100	$9.67x10^{-2}$	100
Total:		**$9.67x10^{-2}$**	**100**
Biogenic Carbon Content in Product:		**0.00 kg CO_2**	
Packaging		**Mass (kg)**	**Packaging (%)**
Cardboard	37	$4.54x10^{-3}$	95.3
Foam Pads	0.00	$3.76x10^{-4}$	4.70
Total:		**$4.91x10^{-3}$**	**100**
Biogenic Carbon Content in Packaging:		**$8.32x10^{-3}$ kg CO_2**	

**May not sum due to rounding*

4.2 MANUFACTURE

Ceilume ceiling tiles and panels are manufactured in Graton, California. To create their Random Gray line, manufacturing waste and Ceilume tile returns from the consumer (without insulation) are carefully sorted to ensure cleanliness and consistency. This material source is fed into granulators and then sent off to a 3rd party recycler to be processed into sheet form (either 2x2 tiles or 2x4 panels), resulting in a material entirely made from repurposed materials. The product has the potential to be shredded again and reused by Ceilume in their manufacturing process for producing more Random Gray tiles or panels.

The manufacturing process itself involves rolled sheet vinyl pulled out flat through a heating element which softens the vinyl. The sheet is then pulled down onto a mold with small vacuum holes throughout. The vacuum pulls down the heated vinyl onto the mold, and a trim die cuts the shaped tile material away from the surrounding scrap. Scrap is pulled off the machine in rolls to be fed back into the recycling process. The manufacturer provided primary data for twelve months of manufacturing data for the process described including production, resource, electricity consumption, and waste generation at the facility. Electricity consumption is modeled using Ecoinvent datasets for the region.

4.3 PACKAGING

The thin nature of the product allows it to be shipped efficiently and with minimal packaging. The product is shipped inside cardboard boxes and foam pads to protect it.

4.4 TRANSPORTATION

Transportation for the LCA model is based on data provided by the manufacturer for transport from the component manufacturer (1st tier supplier) to the production facility in Graton, California. Transportation data for 2nd tier suppliers (material supplier to component manufacturer) are based on data embedded in the representative LCI datasets. Transport from manufacturer to installation is modeled through primary data provided by Ceilume and was calculated based on percentages of each product transported to major regions of the United States. Road transport is assumed to be by diesel truck.

Table 7. *Distribution transportation summary for Ceilume panels in this study, per 0.093 m^2 of panel.*

Name	Unit	Random Gray Panel
Vehicle type	-	Truck
Fuel type	-	Diesel
Lites of fuel	l/100km	18.7
Transport distance	km	3412
Capacity utilization	%	-
Gross density of products transported	kg/m^3	-
Capacity utilization volume factor	-	1
Gross mass of products transported including packaging	kg	0.102

4.5 INSTALLATION IN THE BUILDING

Installation of the panels is completed manually without the aid of machinery. Waste is generated from the disposal of the packaging material and is modeled as required in the Part A PCR. Table 8 summarizes the modeling parameters for the product installation phase including scrap losses.

Table 8. *Installation summary for Ceilume panels in this study, per 0.093 m^2.*

Name	Unit	Value
Ancillary materials	kg	0.00
Net freshwater consumption specified by water source	m^3	0.00
Other resources	kg	0.00
Electricity consumption	kWh	0.00
Other energy carriers	MJ	0.00
Product loss per functional unit		
Random Gray Panel	kg	$6.77x10^{-3}$
Waste materials at the construction site before waste processing, generated by product installation		
Random Gray Panel	kg	$6.77x10^{-3}$
Output materials resulting from on-site waste processing (specified by route)		
	kg	0.00
Mass of packaging waste specified by type		
Recycle	kg	0.00
Landfill		
Random Gray Panel	kg	$4.91x10^{-3}$
Biogenic carbon contained in packaging		
Random Gray Panel	kg CO_2	$8.32x10^{-3}$
Direct emissions to ambient air, soil and water	kg	0.00
VOC emissions	$\mu g/m^3$	0.00

4.6 PRODUCT USE

This study includes impacts associated with use phase scenarios. Module B1 is assumed to have no impacts. Module B2 includes the maintenance of the product, which is not required as specified by the manufacturer. Module B2 is then assumed to have no impacts. Module B3 includes the impacts associated with the repair of the product. No repairs of the product are required, as indicated by the manufacturer. The Reference Service Life (RSL) of the product is 30 years. During the Estimated Service Life (ESL) of 75 years the product will have to be replaced 1.5 times, the impacts of which are captured in Module B4. Modules B5 through B7 are assumed to have no impacts.

4.7 END-OF-LIFE

Impacts for deconstruction and dismantling processes (Module C1) were not applicable to this study as it is a manual process with hand tools and does not require energy for the removal of the product. Transport of the waste material at end-of-life is assumed to be 100 km. Module C3 (Waste Processing) is not applicable to this study as the end-of-life disposal is assumed to be 100% landfilled with a transportation distance of 100 km from the installation site to landfill. Module C4 represents the typical disposal of Ceilume products. Table 9 summarizes the relevant information for the end-of-life of Ceilume products within the system boundaries.

Table 9. *End-of-Life summary for Ceilume panels, per 0.093 m².*

Name		Unit	Random Gray Panel
Assumptions for scenario development			
Collection process (specified by type)	Collected separately	kg	0.00
	Collected with mixed construction waste	kg	$9.67x10^{-2}$
Recovery (specified by type)	Reuse	kg	0.00
	Recycling	kg	0.00
	Landfill	kg	0.00
	Incineration	kg	0.00
	Incineration with energy recovery	kg	0.00
	Energy conversion (specify efficiency rate)		0.00
Disposal (Landfill for final disposal)	Product or material for final deposition	kg	$9.67x10^{-2}$
Removals of biogenic carbon (excluding packaging)		kg CO2	0.00

4.8 RE-USE PHASE

Ceilume's offered Random Gray variety made from 100% recycled materials is made from post-manufacturing waste and post-consumer returned tiles. This material source is fed into granulators at the manufacturing site and then sent to a 3rd party processing center to be melted and thermoformed into sheets resulting in a recyclable material made from recycled materials. The product has the potential to be shredded again and reused by Ceilume in their manufacturing process for producing more Random Gray tiles or panels.

5. LCA: Results

Results of the Life Cycle Assessment are presented below. It is noted that LCA results are relative expressions and do not predict impacts on category endpoints, the exceeding of thresholds, safety margins or risks.

The following environmental impact category indicators are reported using characterization factors based on TRACI 2.1 characterization methodology. These six impact categories are globally deemed mature enough to be included in Type III environmental declarations. Other categories are being developed and defined and LCA should continue making advances in their development. However, the EPD users shall not use additional measures for comparative purposes. Results reported in MJ are calculated using lower heating values. All values are rounded to three significant digits and are reported for 0.093 m^2 of installed panel with a reference service life (RSL) of 30 years.

TRACI 2.1 Impact Category	Unit
Global Warming Potential (GWP) - 100, IPCC 2013 AR5	kg CO_2 eq
Ozone Depletion Potential (ODP)	kg CFC-11 eq
Eutrophication Potential (EP)	kg N eq
Acidification Potential (AP)	kg SO_2 eq
Smog Formation Potential (SFP)	kg O_3 eq
Abiotic Resource Depletion Potential of Non-renewable (fossil) energy resources (ADP_{fossil})	MJ, LHV

5.1 Ceilume Random Gray Product Results

Table 10. *TRACI 2.1 Impact Results for Ceilume Random Gray panel products, per 0.093 m^2 of installed panel.*

Module	Global Warming Potential	Ozone Depletion Potential	Eutrophication Potential	Acidification Potential	Smog Formation Potential	Fossil Fuel Depletion
	kg CO2 eq	kg CFC-11 eq	kg N eq	kg SO2 eq	kg O3 eq	MJ, LHV
A1	$1.25x10^{-1}$	1.43×10^{-9}	5.30×10^{-4}	5.10×10^{-4}	$9.70x10^{-3}$	$1.72x10^{-1}$
A2	$6.13x10^{-2}$	9.76×10^{-10}	6.83×10^{-5}	2.30×10^{-4}	5.95×10^{-3}	$1.22x10^{-1}$
A3	4.13×10^{-3}	1.86×10^{-11}	4.70×10^{-5}	5.40×10^{-5}	1.11×10^{-4}	$4.42x10^{-2}$
A1-A3 Total:	**$1.90x10^{-1}$**	**$2.42x10^{-9}$**	**$6.45x10^{-4}$**	**$7.94x10^{-4}$**	**$1.58x10^{-2}$**	**$3.33x10^{-1}$**
A4	$6.92x10^{-2}$	1.10×10^{-9}	7.71×10^{-5}	2.60×10^{-4}	6.72×10^{-3}	$1.37x10^{-1}$
A5	1.85×10^{-1}	2.48×10^{-9}	6.76×10^{-4}	9.48×10^{-4}	1.59×10^{-2}	3.34×10^{-1}
B1	0.00	0.00	0.00	0.00	0.00	0.00
B2	0.00	0.00	0.00	0.00	0.00	0.00
B3	0.00	0.00	0.00	0.00	0.00	0.00
B4	$7.38x10^{-1}$	$9.24x10^{-9}$	$5.31x10^{-3}$	$7.50x10^{-3}$	$5.93x10^{-2}$	1.26
B5	0.00	0.00	0.00	0.00	0.00	0.00
B6	0.00	0.00	0.00	0.00	0.00	0.00
B7	0.00	0.00	0.00	0.00	0.00	0.00
C1	0.00	0.00	0.00	0.00	0.00	0.00
C2	1.82×10^{-3}	2.90×10^{-11}	2.03×10^{-6}	6.94×10^{-6}	1.80×10^{-4}	$2.62x10^{-2}$
C3	0.00	0.00	0.00	0.00	0.00	0.00
C4	$4.57x10^{-2}$	1.28×10^{-10}	2.14×10^{-3}	2.99×10^{-3}	1.02×10^{-3}	$6.59x10^{-3}$

Table 11 summarizes the nomenclature and reporting units for the additional inventory parameters (energy and waste flows), as specified in the PCR, while Tables 12 and 13 present these results according to the life cycle module definitions for the ceiling tiles and panels.

Table 11. *Nomenclature and reporting units for resource use and waste flows.*

Parameter	Units
Resources	
Renewable primary resources used as energy carrier (RPR_E)	MJ, LHV
Renewable primary resources used as material (RPR_M)	MJ, LHV
Non-renewable primary resources used as an energy carrier ($NRPR_E$)	MJ, LHV
Non-renewable primary resources used as material ($NRPR_M$)	MJ, LHV
Secondary materials (SM)	kg
Renewable secondary fuels (RSF)	MJ, LHV
Non-renewable secondary fuels (NRSF)	MJ, LHV
Recovered energy (RE)	MJ, LHV
Use of net freshwater resources (FW)	m^3
Wastes	
Non-hazardous waste disposed (NHWD)	kg
Hazardous waste disposed (NWD)	kg
High-level radioactive waste (HLRW)	kg
Intermediate- and low-level radioactive waste (ILLRW)	kg
Components for re-use (CRU)	kg
Materials for recycling (MR)	kg
Materials for energy recovery (MER)	kg
Recovered energy exported from the product system (EE)	MJ

Table 12. *Resource use indicator results for Ceilume Random Gray panel products, per 0.093 m² of installed panel.*

Module	RPR_E	RPR_M	$NRPR_E$	$NRPR_M$	SM	RSF	NRSF	RE	FW
	MJ	MJ	MJ	MJ	kg	MJ	MJ	MJ	m3
A1	$1.26x10^{-1}$	0.00	1.54	1.94	$9.67×10^{-2}$	0.00	0.00	0.00	$2.00x10^{-2}$
A2	$1.00x10^{-2}$	0.00	$8.71x10^{-1}$	0.00	0.00	0.00	0.00	0.00	$5.14x10^{-3}$
A3	$1.49x10^{-2}$	0.00	$4.50x10^{-2}$	$2.05x10^{-1}$	0.00	0.00	0.00	0.00	$2.29x10^{-4}$
A1-A3 Total:	**$1.51x10^{-1}$**	**0.00**	**2.46**	**2.15**	**$9.67x10^{-2}$**	**0.00**	**0.00**	**0.00**	**$2.54x10^{-2}$**
A4	$1.20x10^{-2}$	0.00	$9.83x10^{-1}$	0.00	0.00	0.00	0.00	0.00	$2.64x10^{-3}$
A5	$1.14x10^{-1}$	0.00	2.41	$2.72x10^{-1}$	$6.77×10^{-2}$	0.00	0.00	0.00	$1.97×10^{-2}$
B1	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
B2	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
B3	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
B4	$4.22x10^{-1}$	0.00	8.90	6.24	$2.47x10^{-1}$	0.00	0.00	0.00	$7.33x10^{-2}$
B5	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
B6	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
B7	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
C1	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
C2	$3.44x10^{-4}$	0.00	$2.60x10^{-2}$	0.00	0.00	0.00	0.00	0.00	$1.44×10^{-5}$
C3	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
C4	$3.52x10^{-3}$	0.00	$5.50x10^{-2}$	1.74	0.00	0.00	0.00	0.00	$1.10×10^{-3}$

Table 13. *Waste and output indicator results for Ceilume Random Gray panel products, per 0.093 m² of installed panel.*

Module	HWD	NHWD	HLRW	ILLRW	CRU	MFR	MER	EEE	EET
	kg	kg	kg	kg	kg	kg	kg	MJ Surplus	MJ Surplus
A1	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
A2	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
A3	0.00	$1.10x10^{-2}$	0.00	0.00	0.00	0.00	0.00	0.00	0.00
A1-A3 Total:	**0.00**	**$1.10x10^{-2}$**	**0.00**	**0.00**	**0.00**	**0.00**	**0.00**	**0.00**	**0.00**
A4	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
A5	0.00	$2.24×10^{-2}$	0.00	0.00	0.00	0.00	0.00	0.00	0.00
B1	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
B2	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
B3	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
B4	0.00	$1.95×10^{-1}$	0.00	0.00	0.00	0.00	0.00	0.00	0.00
B5	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
B6	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
B7	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
C1	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
C2	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
C3	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
C4	0.00	$9.67x10^{-2}$	0.00	0.00	0.00	0.00	0.00	0.00	0.00

5.2 Ceilume Random Gray Product Results with Take-Back Participation

Ceilume offers a take-back program where tiles and panels at the end of their service life are sent back to the manufacturing facility for re-use as an input material into the Random Gray line. The following results represent a scenario where the tiles and panels at the end of their service life are sent back to the manufacturing facility instead of being sent to a landfill, and are fed back into the manufacturing process to produce more Random Gray.

Table 14. *TRACI 2.1 Impact Results for Ceilume Random Gray panel products that participate in a take-back program, per 0.093 m^2 of installed panel.*

Module	Global Warming Potential	Ozone Depletion Potential	Eutrophication Potential	Acidification Potential	Smog Formation Potential	Fossil Fuel Depletion
	kg CO2 eq	kg CFC-11 eq	kg N eq	kg SO2 eq	kg O3 eq	MJ, LHV
A1	1.25x10^{-1}	1.43×10^{-9}	5.30×10^{-4}	5.10×10^{-4}	9.70x10^{-3}	1.72x10^{-1}
A2	6.13x10^{-2}	9.76×10^{-10}	6.83×10^{-5}	2.30×10^{-4}	5.95×10^{-3}	1.22x10^{-1}
A3	4.13×10^{-3}	1.86×10^{-11}	4.70×10^{-5}	5.40×10^{-5}	1.11×10^{-4}	4.42x10^{-2}
A1-A3 Total:	**1.90x10^{-1}**	**2.42x10^{-9}**	**6.45x10^{-4}**	**7.94x10^{-4}**	**1.58x10^{-2}**	**3.38x10^{-1}**
A4	6.92x10^{-2}	1.10×10^{-9}	7.71×10^{-5}	2.60×10^{-4}	6.72×10^{-3}	1.37x10^{-1}
A5	1.85x10^{-1}	2.48×10^{-9}	2.57×10^{-4}	4.30×10^{-4}	1.17×10^{-2}	3.33x10^{-1}
B1	0.00	0.00	0.00	0.00	0.00	0.00
B2	0.00	0.00	0.00	0.00	0.00	0.00
B3	0.00	0.00	0.00	0.00	0.00	0.00
B4	7.62x10^{-1}	1.05x10^{-8}	6.77x10^{-4}	1.48x10^{-3}	5.16x10^{-2}	1.40
B5	0.00	0.00	0.00	0.00	0.00	0.00
B6	0.00	0.00	0.00	0.00	0.00	0.00
B7	0.00	0.00	0.00	0.00	0.00	0.00
C1	0.00	0.00	0.00	0.00	0.00	0.00
C2	6.31x10^{-2}	1.00×10^{-9}	7.02×10^{-5}	2.40×10^{-4}	6.12×10^{-3}	1.25x10^{-1}
C3	0.00	0.00	0.00	0.00	0.00	0.00
C4	0.00	0.00	0.00	0.00	0.00	0.00

Table 15. *Resource use indicator results for Ceilume Random Gray panel products that participate in a take-back program, per 0.093 m^2 of installed panel.*

Module	RPR_E	RPR_M	$NRPR_E$	$NRPR_M$	SM	RSF	NRSF	RE	FW
	MJ	MJ	MJ	MJ	kg	MJ	MJ	MJ	m3
A1	1.26x10^{-1}	0.00	1.54	1.94	9.67×10^{-2}	0.00	0.00	0.00	2.00x10^{-2}
A2	1.00x10^{-2}	0.00	8.71x10^{-1}	0.00	0.00	0.00	0.00	0.00	5.14x10^{-3}
A3	1.49x10^{-2}	0.00	4.50x10^{-2}	2.05x10^{-1}	0.00	0.00	0.00	0.00	2.29x10^{-4}
A1-A3 Total:	**1.51x10^{-1}**	**0.00**	**2.46**	**2.15**	**9.67x10^{-2}**	**0.00**	**0.00**	**0.00**	**2.54x10^{-2}**
A4	1.20x10^{-2}	0.00	9.83x10^{-1}	0.00	0.00	0.00	0.00	0.00	2.64x10^{-3}
A5	1.14x10^{-1}	0.00	2.41	2.72x10^{-1}	6.77×10^{-2}	0.00	0.00	0.00	1.97×10^{-2}
B1	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
B2	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
B3	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
B4	4.34x10^{-1}	0.00	10.1	3.63	2.47x10^{-1}	0.00	0.00	0.00	7.95x10^{-2}
B5	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
B6	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
B7	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
C1	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
C2	1.19x10^{-2}	0.00	8.97x10^{-1}	0.00	0.00	0.00	0.00	0.00	5.28×10^{-3}
C3	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
C4	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00

Table 16. *Waste and output indicator results for Ceilume Random Gray panel products that participate in a take-back program, per 0.093 m^2 of installed panel.*

Module	HWD	NHWD	HLRW	ILLRW	CRU	MFR	MER	EEE	EET
	kg	kg	kg	kg	kg	kg	kg	MJ Surplus	MJ Surplus
A1	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
A2	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
A3	0.00	$1.10x10^{-2}$	0.00	0.00	0.00	0.00	0.00	0.00	0.00
A1-A3 Total:	**0.00**	**$1.10x10^{-2}$**	**0.00**	**0.00**	**0.00**	**0.00**	**0.00**	**0.00**	**0.00**
A4	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
A5	0.00	$2.24×10^{-2}$	0.00	0.00	0.00	0.00	0.00	0.00	0.00
B1	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
B2	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
B3	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
B4	0.00	$5.01×10^{-2}$	0.00	0.00	0.00	0.00	0.00	0.00	0.00
B5	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
B6	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
B7	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
C1	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
C2	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
C3	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
C4	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00

6. LCA: Interpretation

Excluding Module B4 which represents the replacement of the product over a building's lifetime, contributions to total impact indicator results for these Ceilume products are dominated by the A1 module stemming from raw material extraction and processing of materials, mainly the suspension polymerization of polyvinyl chloride. Module C4 in which impacts from product disposal are captured also contributes a large percentage to the overall product impacts. The impacts associated with manufacturing at the Graton facility are relatively low due to the low energy requirements for manufacture of the tile and panel products. Overall the results of this study highlight the impacts of Module A1 and the potential benefits of recycling product materials when possible to reduce impacts at the end of a product's life.

7. Additional Environmental Information

7.1 Take-back Program

Ceilume offers a take-back program where ceiling tiles are sent back to Ceilume at the end of their service life. The returned tiles are reground and sent to a third-party recycling facility, where they are processed into input materials used to produce new Random Gray ceiling tiles, which themselves can be returned back to Ceilume at the end of their service life for further recycling. The integration of a take-back program would reduce the overall emissions associated with the product and bolster Ceilume's efforts to product a product that is part of a circular economy.

7.2 ENVIRONMENT AND HEALTH DURING MANUFACTURING

The Safety Data Sheet (SDS) for Ceilume ceiling tiles and panels can be found at the following link: https://static.ceilume.com/static/pdfs/ceilume-safety-data-sheet.pdf

7.3 ENVIRONMENT AND HEALTH DURING INSTALLATION

Please see the aforementioned Safety Data Sheet.

7.4 EXTRAORDINARY EFFECTS

Product performance ratings and approvals for use in building construction include:

- California State Fire Marshal Listing 2200-1622:100
- IAPMO-UES Evaluation Report 310
- Class A Fire Rated per ASTM E84
- Greenguard Gold Certified for Indoor Air Quality

7.5 ENVIRONMENTAL ACTIVITIES AND CERTIFICATIONS

Ceilume tiles and panels have also received the following environmental building credits and codes:

- ASHRAE 189.1
  - 8.4.2.6: Ceiling & Wall Systems
  - 8.5.2 c: Ceiling Tiles
- CHPS
  - 2.2.6: Ceiling Systems
- Green Globes
  - 3.7.2.1.4: Volatile Organic Compound - Flooring & Other Interior Products
- Green Guide for Health Care 2.2
  - EP Credit 3.1: Ceiling Systems
- International Green Construction Code
  - 806.5 (2): Ceiling & Wall Systems
  - A108.5: TVOC Project Elective

7.6 FURTHER INFORMATION

Further information about these products can be found on the company website: www.ceilume.com

8. References

- Life Cycle Assessment of Ceilume Products. SCS Global Services Report. Prepared for Ceilume Ceiling Tiles. January 2026.
- ISO 14025:2006 Environmental labels and declarations – Type III environmental declarations – Principles and Procedures.
- ISO 14040: 2006/Amd1:2020 - Environmental Management – Life cycle assessment – Principles and Framework
- ISO 14044: 2006 Amd1 2017/Amd2 2020 Environmental Management – Life cycle assessment – Requirements and Guidelines.
- ISO 21930: 2017 - Sustainability in buildings and civil engineering works - Core rules for environmental product declarations of construction products and services.
- SCS Type III Environmental Declaration Program: Program Operator Manual. V12.0 December 2023. SCS Global Services.
- UL Product Category Rule (PCR) Guidance for Building-Related Products and Service, Part A: Life Cycle Assessment Calculation Rule and Report Requirements. Version 4.0. March 2022.
- UL Product Category Rule (PCR) Guidance for Building-Related Products and Services, Part B: Non-Metal Ceiling and Interior Wall Panel System EPD Requirements. Version 2.0. April 13, 2021.
- OpenLCA 2.4.0, GreenDelta, 2024. https://www.openlca.org/releases/
- Ecoinvent Centre (2024) ecoinvent data from v3.11. Swiss Center for Life Cycle Inventories, Dubendorf, 2024. http://www.ecoinvent.org
- EPA Clean Energy Resource eGRID2024, January 17th 2025. https://www.epa.gov/cleanenergy/energy-resources/egrid

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