LIFE CYCLE ASSESSMENT (LCA) OF W. R. MEADOWS VOCOMP AND MEL-PRIME

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1 INTRODUCTION

1.1 Opportunity

W. R. MEADOWS, a well-established manufacturer in the building materials industry, offers a broad spectrum of products ranging from concrete protection and sealing solutions to expansion joints, concrete restoration, and moisture control systems. Sustainability and environmental responsibility lie at the heart of W. R. MEADOWS' operations, with the company continually integrating innovative and resource-efficient strategies into its processes and product offerings.

In response to the growing demand for transparency in the construction industry and to uphold its internal sustainability commitments, W. R. MEADOWS has embarked on an initiative to better understand the environmental impacts of its concrete curing and sprayed or rolled adhesive product lines. This effort involves conducting a cradle-to-grave life cycle assessment (LCA) to evaluate the environmental footprint of its products, focusing on stages from raw material acquisition to final product disposal. By utilizing plant-specific data from its eight facilities across North America, W. R. MEADOWS aims to assess the potential environmental impacts of the water-based concrete curing products VOCOMP-20, VOCOMP-25, and VOCOMP-30; and solvent- and water-based adhesive products MEL-PRIME, MEL-PRIME N.E., and MEL-PRIME W/B. This comprehensive approach to LCA underscores the company's dedication to making informed decisions that support sustainable practices across its operations.

To enhance transparency and environmental communication, W. R. MEADOWS is interested in having Sustainable Minds Transparency Reports [EPDs]™ (TRs) for VOCOMP and MEL-PRIME to enhance transparency and environmental communication. These TRs are ISO 14025 Type III [1] environmental declarations that can be used for communication with and amongst other companies, architects, and consumers, and that can also be utilized in whole building LCA tools in conjunction with the LCA background report and life cycle inventory (LCI). This study conforms to the requirements of ISO 14044 [2], ISO 21930:2017 [3], ISO 14040 [4], and the NSF Product Category Rule for Architectural Coatings (version 2, extended) [5].

1.2 Life cycle assessment

LCA is performed to comprehensively explore, quantify, and interpret the potential environmental impacts associated with a product or service throughout its entire life cycle. A product's life cycle consists of various stages, starting from raw material acquisition and manufacturing to product use and maintenance, plus final product disposal. Depending on the inclusion and exclusion of life cycle stages, an LCA could be cradle to gate (from raw material acquisition to the manufactured product ready to be shipped), cradle to gate with options (which also optionally includes other modules such as shipment and installation), and cradle to grave (which includes all other stages including the use phase and disposal once the useful life is over).

Any LCA conducted with the intention of publishing EPDs needs to comply with the internationally accepted ISO 14040 and ISO 14044 standards. ISO 14040 provides principles and frameworks for conducting an LCA, while ISO 14044 specifies requirements and provides guidelines for an LCA. ISO 14040 sets out a four-phase methodology framework for completing a LCA, as depicted in Figure 1.

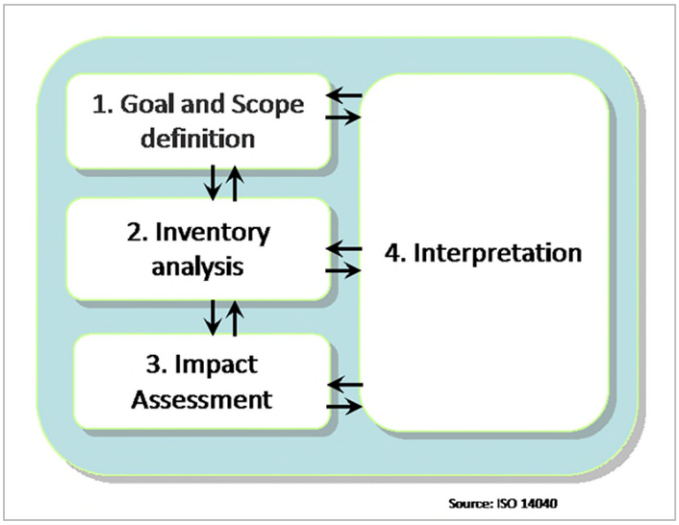

Figure 1. Phases of an LCA

- **Goal and scope definition:** Goals refer to establishing the purpose of the LCA, and they define the environmental aspects to be studied and the intended audience. Scope outlines the system boundaries, the functional unit of analysis, and the life cycle stages to be included. System boundaries set up inclusions and exclusions in an LCA. PCRs usually specify whether the boundary must be cradle-to-gate, cradle-to-installation, or cradle-to-grave.

- **Life cycle inventory analysis:** In this step, a detailed inventory of all the environmental inputs and outputs associated with each stage of the product's life cycle is compiled. Primary data about materials, energy, and emissions assessing the upstream supply chain, company's manufacturing operations, and downstream processes (after product leaves the factory gate) are collected via LCI data collection templates or tools. Annual data is suggested in most cases to be representative of the manufacturing operations. In the case of multi outputs, resources can be allocated to the product of interest via mass or volume, or as relevant. The inventory is then scaled to meet the functional unit of the LCA.

- **Life cycle impact assessment:** The compiled LCI is then modeled using an LCA software like SimaPro, GaBi, openLCA, or others using suitable background data sets available on their databases. Each is assigned to categories according to different impact methodologies, and the software provides final impact values for those different environmental impact categories. Several LCIA methodologies exist in the market including ReCiPe, TRACI, CML, and ILCD, which differ in terms of their approaches, characterization factors, evaluated impact categories, and modeling assumptions. Practitioners can choose a combination of LCIA methodologies to provide a holistic view of the environmental performance of a product.

- **Interpretation of results:** In this step, the LCIA results are analyzed and presented via an LCA report. This stage helps draw conclusions about the environmental performance of the product, identify any environmental hotspots, make recommendations, and assess the significance of the findings. Sensitivity analysis, scenario studies, and uncertainty assessment are often included as a part of the interpretation to ensure the reliability and robustness of the results. LCA, if well interpreted and evaluated, presents a number of opportunities for the manufacturer in developing sustainability goals and initiatives.

This LCA study follows an attributional approach and uses a cradle-to-grave system boundary. This report incorporates LCA terminology. To assist the readers in understanding LCA, special attention has been given to list definitions of important terms used at the end of this report.

A critical review of the LCA and an independent verification of the TRs are required for ISO 14025 Type III environmental declarations. Both are included in this project.

1.3 Team

This LCA report is the outcome of efforts of the project team led by Kimberly A. Lombardozzi and the plant managers on behalf of W. R. MEADOWS. Sustainable Minds led the development of the LCA modeling, results, report, and Transparency Reports [EPDs]™.

1.4 Status

All information in this report reflects the best possible inventory by W. R. MEADOWS at the time it was collected, and Sustainable Minds and W. R. MEADOWS adhered to best practices in transforming the inventory into this report.

Primary data was provided for manufacturing activities from CY2023 from the W. R. MEADOWS facilities in Milton, Ontario, Canada; Sherwood Park, Alberta, Canada; Cartersville, GA; Ft Worth, TX; Goodyear, AZ; Hampshire, IL; York, PA; and Benicia, CA. Where data was missing, assumptions were made from manufacturing data for the facility based upon expertise from the W. R. MEADOWS plant manager and their upstream suppliers. This study also includes background data to complete the inventory and fill gaps where necessary.

This is a supporting LCA report for the TRs and was evaluated for conformance to the PCRs according to the ISO 14025 and ISO 14040/14044 standards. The LCA review and verification of the Sustainable Minds Transparency Reports [EPDs]™ were carried out by Lindita Bushi, Ph.D., Athena Sustainable Materials Institute to determine conformance to ISO 14040/14044, ISO 21930:2017, and the relevant PCR. The critical review statement is included below.

2 GOAL AND SCOPE

This chapter explains the goal and scope of the LCA study. The aim of the goal and scope is to define the product under study and the depth and breadth of the analysis.

2.1 Intended application and audience

This report aims to define the specific application of the LCA methodology to the life cycle of VOCOMP-20, VOCOMP-25, and VOCOMP-30; and MEL-PRIME, MEL-PRIME N.E., and MEL-PRIME W/B. The report serves both internal and external purposes and is intended for a diverse audience. The intended audience includes the program operator (Sustainable Minds) and reviewers who will be assessing the LCA for conformance to the PCR, as well as W. R. MEADOWS' internal stakeholders involved in marketing and communications, operations, and design.

The results presented in this document are not meant to support comparative claims. The outcomes will be made available to the public in Sustainable Minds Transparency Reports [EPDs]™ (Type III environmental declarations per ISO 14025), which are intended for communication between businesses and consumers (B2C).

2.2 Product description

This LCA study covers VOCOMP and MEL-PRIME products manufactured in eight W. R. MEADOWS facilities across North America. VOCOMP can be sprayed or rolled onto concrete surfaces to form a protective, transparent film that enhances durability (Figure 2). On new concrete, it helps retain moisture for proper curing, while on older concrete, it acts as a sealer to protect against stains and wear. MEL-PRIME is applied using a roller or brush at a coverage rate of 250–300 ft^2/gal (6.14–7.37 m^2/L) and should only be used on areas where the membrane will be installed within 24 hours. The primer is suitable for membrane application and remains effective at temperatures of 0°F (-18°C) and above. Complete product descriptions for the covered products are listed in Table 1.

VOCOMP-20, VOCOMP-25, and VOCOMP-30 are water-based concrete curing products that serve as a liquid solution applied to freshly poured concrete to retain moisture and ensure proper hydration during the curing process. It forms a thin, protective film on the surface, reducing water evaporation and enhancing strength development.

MEL-PRIME, MEL-PRIME N.E., and MEL-PRIME W/B are solvent- and water-based ready-to-use adhesive specifically formulated to meet the maximum VOC content limits of 200g/L for quick dry primers. A solvent- or water-based ready-to-use adhesive is a pre-mixed bonding solution that uses organic solvents or water as the carrier to dissolve or disperse adhesive components. It provides adhesion to various substrates, including wood, metal, plastics, and composites. The solvent or water evaporates upon application, leaving a solid adhesive film that forms a durable bond. These adhesives are used in construction, automotive, and industrial applications where resistance to moisture, temperature, and mechanical stress is required.

Table 1. Product descriptions

Product series	Product name	Product description
VOCOMP Water-based concrete curing and sealing compound	VOCOMP-20 https://www.wrmeadows.com/vocomp-20-concrete-curing-sealing-compound/	VOCOMP-20 is a water-based acrylic concrete curing and sealing compound is formulated using acrylic polymers in a water-based carrier. VOC compliant.
	VOCOMP-25 https://www.wrmeadows.com/vocomp-25-concrete-curing-sealing-compound/	VOCOMP-25 is a water-based acrylic concrete curing and sealing compound is formulated with 25% solids using acrylic polymers in a water-based carrier. VOC compliant.
	VOCOMP-30 https://www.wrmeadows.com/vocomp-30-concrete-curing-sealing-compound/	VOCOMP-30 is a water-based acrylic concrete curing and sealing compound is formulated with 25% solids using acrylic polymers in a water-based carrier. VOC compliant.
MEL-PRIME Solvent- and water-based, ready-to use adhesive	MEL-PRIME https://www.wrmeadows.com/mel-prime-solvent-based-voc-adhesive/	MEL-PRIME is a solvent-based, ready-to-use adhesive for W. R. MEADOWS membrane systems. It is red to reddish-brown in color. It is designed for surfaces to receive waterproofing and air/vapor barrier systems from W. R. MEADOWS.
	MEL-PRIME N.E. https://www.wrmeadows.com/mel-prime-n-e/	MEL-PRIME N.E. solvent-based VOC adhesive is a ready-to-use adhesive specifically formulated to meet the maximum VOC content limits of 200 g/L for quick dry primers as required by VOC regulations in the northeastern U.S. It is red to reddish-brown in color and is furnished in one-gallon cans or five-gallon pails.
	MEL-PRIME W/B https://www.wrmeadows.com/mel-prime-water-base-primer/	MEL-PRIME W/B water-based adhesive is a ready-to-use compound specifically formulated with polymers in a true water-based emulsion.

Visual representations of the studied products are presented in Figure 2.

Product series	Product as delivered on site			Application
VOCOMP	 VOCOMP-20	 VOCOMP-25	 VOCOMP-30	
MEL-PRIME	 MEL-PRIME	 MEL-PRIME N.E.	 MEL-PRIME W/B	

Figure 2. Visual representation of evaluated products and their applications

Table 2 lists the product information including the declaration name, products included in the declaration, CSI MasterFormat® classification, manufacturing location, and the type of declaration.

Table 2. Declaration names with product represented and type of declaration

Transparency Report [EPD]™ name	Included products	CSI MasterFormat®	Manufacturing locations	Type of declaration
VOCOMP	VOCOMP-20 VOCOMP-25 VOCOMP-30	03 39 23 Membrane Concrete Curing	Cartersville, GA, USA; Ft Worth, TX, USA; Goodyear, AZ, USA; Hampshire, IL, USA; York, PA, USA; Benicia, CA, USA; Milton, Ontario, CAN; Sherwood Park, Alberta, CAN	Plant-specific, product-specific declaration for one manufacturer
MEL-PRIME	MEL-PRIME MEL-PRIME N.E. MEL-PRIME W/B	07 13 53 Elastomeric sheet waterproofing	Hampshire, IL, USA	

Table 3. Other product information

Product name	Product specifications
VOCOMP-20	• AASHTO M 148 Type 1, Class A and B • ASTM C309 Type 1, Class A and B • Complies with all current federal, state, and local maximum allowable VOC requirements, including National EPA VOC Emission Standard for Architectural Coatings, CARB, LADCO, OTC Phase I and II, and SCAQMD • Dried film is USDA accepted • Tested per CDPH/EHLB Standard Method V1.2-2017 Emission Testing Method (Report available upon request) • Meets Class A requirements of the ultraviolet light degradation/yellowing classification of ASTM C 1315, Section 6.4.1 • Meets Class A requirements of the ultraviolet light • VOC Content: 20g/L
VOCOMP-25	• AASHTO M 148, Type 1 or Type 2, Class A & B • ASTM C 309, Type 1 or Type 2, Class A & B • ASTM C 1315, Type I, Class A • Complies with all current federal, state, and local maximum allowable VOC requirements, including U.S. EPA, SCAQMD, and OTC. • Dried film is USDA accepted. • VOC Content: 54 g/L
VOCOMP-30	• AASHTO M 148, Type 1, Class A & B • ASTM C309 Type 1, Class A & B • ASTM C1315, Type I, Class A • Tested per CDPH/EHLB Standard Method V1.2-2017 Emission Testing Method (Report available upon request) • Complies with all current federal, state, and local maximum allowable VOC requirements, including National EPA VOC Emission Standard for Architectural Coatings, CARB, LADCO, OTC Phase I and II, Arizona Maricopa County, Utah Department of Air Quality, Colorado AIM VOC requirements, and SCAQMD • Dried film is USDA accepted • VOC Content: 157 g/L
MEL-PRIME	• High solids for optimum performance • Ready to use: no mixing or dilution required • For exterior vertical and horizontal applications • Coverage: 250 to 300 sq.ft/gal • VOC Content: 439 g/L
MEL-PRIME N.E.	• High solids for optimum performance • Ready to use, no mixing or dilution required • For exterior vertical and horizontal applications • Coverage: 150-250 ft.2/gal • VOC Content: 186 g/L
MEL-PRIME W/B	• High solids for optimum performance • Ready to use: no mixing or dilution required • For exterior vertical and horizontal applications • Coverage: 250 to 300 sq.ft/gal • VOC Content: 0 g/L

For more information about the products, including details about the materials that conform to the relevant standards, visit the links below:

- VOCOMP-20: https://www.wrmeadows.com/vocomp-20-concrete-curing-sealing-compound/
- VOCOMP-25: https://www.wrmeadows.com/vocomp-25-concrete-curing-sealing-compound/
- VOCOMP-30: https://www.wrmeadows.com/vocomp-30-concrete-curing-sealing-compound/
- MEL-PRIME: https://www.wrmeadows.com/mel-prime-solvent-based-voc-adhesive/
- MEL-PRIME N.E. https://www.wrmeadows.com/mel-prime-n-e/
- MEL-PRIME W/B: https://www.wrmeadows.com/mel-prime-water-base-primer/

2.3 Functional unit

This LCA covers the cradle-to-grave life cycle stages for VOCOMP and MEL-PRIME products. According to the PCR, the functional unit is:

> 1 m^2 of covered and protected substrate for a period of 60 years (the assumed average lifetime of a building).

W. R. MEADOWS' VOCOMP and MEL-PRIME products fall within the general category of curing, sealing, and priming coatings. The product life for coatings is typically defined by market lifetime (5 years) and technical life (either 5, 10, or 20 years), depending on performance in durability tests as outlined in the PCR.

However, no market life was considered in the LCA model for VOCOMP and MEL-PRIME because both products are designed for one-time application only. VOCOMP functions as a curing and sealing compound applied to concrete surfaces immediately after placement, while MEL-PRIME is a primer used to enhance adhesion for subsequent membrane applications. These products do not require reapplication over the lifetime of a structure.

The results of the LCA in this report are expressed in terms of the functional unit. There are different theoretical coverages for VOCOMP and MEL-PRIME when following the application methods specified in the W. R. MEADOWS product data sheets. Each product must be applied at the recommended coverage rate to achieve the intended protection and performance.

Since VOCOMPs are curing and sealing products, a single-use application was considered for the purposes of this study, and the functional unit considers only the initial application with no additional reapplications over the 60-year lifespan of a building. The results in this report are presented per functional unit. The mass of the declared products that meet the market-based life of 1 m^2 of covered and protected substrate is listed in Table 4.

Table 4. Functional unit properties for each product

Product	Density (lb/gal)	Coverage (m^2/L)	Reference flow (kg/functional unit)
VOCOMP-20	8.59	7.36	0.14
VOCOMP-25	8.59	9.82	0.10
VOCOMP-30	8.62	9.82	0.11
MEL-PRIME	7.8	6.75	0.14
MEL-PRIME N.E.	8.8	4.9	0.21
MEL-PRIME W/B	8.3	4.29	0.23

2.4 System boundary

This section describes the system boundary for the analysis. The system boundary defines which life cycle stages are included and which are excluded.

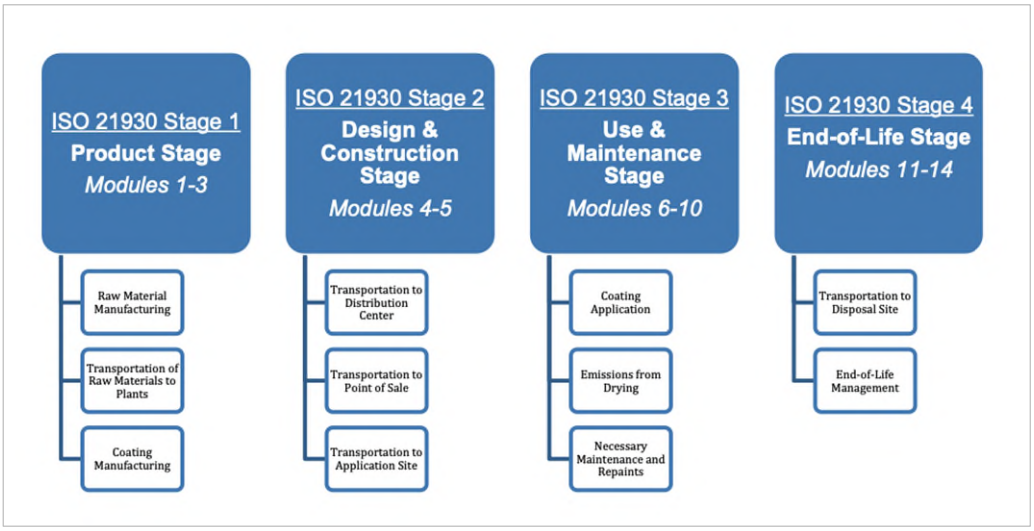

Figure 3. Applied system boundary

Figure 3 illustrates all the life cycle phases included in this study. This LCA's system boundary is from cradle to grave. Therefore, the life cycle activities and related processes shall include modules 1-14. This includes the product stage, design & construction stage, use & maintenance stage, and end-of-life stage. Table 5 lists specific inclusions and exclusions for the system boundary. This study follows the modularity principle, where all environmental impacts and potential impacts are declared in the life cycle stage where they can be attributed.

Table 5. System boundary inclusions and exclusions

Included	Excluded
● Raw material acquisition and processing ● Processing of materials ● Energy production ● Transport of raw materials ● Outbound transportation of products ● Overhead energy (heating, lighting, forming, finishing, etc.) of manufacturing facilities ● Packaging of raw materials and the disposal of that packaging ● Packaging of final products ● Installation and maintenance, including material loss, energy use, and auxiliary material requirements ● Emissions to air from drying ● End of life, including transportation ● Final disposition	● Personnel impacts ● Research and development activities ● Business travel ● Secondary packaging ● Point of sale infrastructure ● Coating applicator ● Construction of major capital equipment ● Maintenance and operation of support equipment ● Human labor and employee transport ● Manufacturing facility domestic water use (not directly associated with production)

2.4.1. Product stage (modules 1-3)

The production stage starts when raw materials are extracted from nature and ends when the product is packaged and ready to be loaded onto a transport vehicle at the W. R. MEADOWS facility.

The production stage includes three product life cycle modules:

I. **Raw material manufacturing**
   - Extraction and processing of raw materials
   - Average transport of raw materials from extraction/production to manufacturer

- Energy and water consumption for raw material manufacturing

II. **Transportation of raw materials to plants**
- Transport of raw materials to manufacturer
- Packaging for raw material transportation

III. **Coating manufacturing**
- Energy and water consumption for coating manufacturing
- Releases to environmental media (air, soil, ground, and surface water)
- Manufacturing waste, packaging waste, and scrap
- Waste transportation from manufacturing plant to disposal sites
- Waste disposal

2.4.2. Design and construction stage (modules 4-5)

The design and construction stage includes the following:
- Transportation of VOCOMP and MEL-PRIME products from manufacturer to distributor
- Transportation of the product from distributor to point of sale
- Transportation of the product from point of sale to application site

2.4.3. Use and maintenance stage (modules 6-10)

The use and maintenance stage includes the following:
- Application on the building including any materials specifically required for application
- Releases to environmental media (air, soil, ground, and surface water)
- Unused coating product remains in the pail and paint sprayer or roll
- Number of replacements of the product
- Maintenance of the coating that under normal conditions will be necessary to achieve the defined reference service life
- Releases to environmental media (air, soil, ground, and surface water) from drying processes
- Packaging waste after installation

2.4.4. End of life stage (modules 11-14)

The end of life stage includes the following:
- Dismantling/Demolition
- Transport from building site to final disposition
- Final disposition (e.g., recycling / reuse / landfill / waste incineration / conversion to energy)

3 LIFE CYCLE INVENTORY ANALYSIS

This chapter includes an overview of the obtained data and data quality that has been used in this study. A comprehensive life cycle inventory calculation workbook, which catalogs the flows crossing the system boundary and provides the starting point for life cycle impact assessment, can be found in the appendix.

3.1 Data collection procedures

Primary data was provided by W. R. MEADOWS representing the production and stage and distribution module for the products. Data was collected in a consistent manner and level of detail to ensure high-quality data. All submitted data were checked for quality multiple times on the plausibility of inputs and outputs using mass balance and benchmarking. All questions regarding data, including gaps, outliers, and any inconsistencies, were resolved with W. R. MEADOWS and plant managers.

Twelve months of data (CY2023) was collected at eight W. R. MEADOWS facilities in Cartersville, GA; Ft Worth, TX; Goodyear, AZ; Hampshire, IL; York, PA; Benicia, CA; Milton, Ontario, CAN; and Sherwood Park, Alberta, CAN. An analyst at Sustainable Minds developed the resulting inventory calculations and subsequently checked them internally.

Expert judgment was used in selecting appropriate data sets to model the associated activities in this study, including materials and energy, which have been noted in the following sections. Databases adopted in the model include ecoinvent v3.10 and US-EI 2.2 databases. Overall, the quality of the data used in this study is considered good and representative of the described systems. All appropriate means were employed to guarantee the data quality and representativeness, as described below.

3.2 Primary data

Primary data were collected for every process in the product system under the W. R. MEADOWS's control. If direct measurements were not available, primary data were collected using the W. R. MEADOWS facility representative personnel's best engineering estimates based on actual production.

3.2.1. Production

These modules represent raw materials extraction, preprocessing/upstream processing, transportation to the manufacturing facility, and coating production.

W. R. MEADOWS provided the full bills of material (BOMs) with a detailed breakdown of the raw materials mass percentage for each product, as summarized in Table 6 and Table 7. Waste and scrap created during raw material manufacturing and the emissions associated with transporting waste and scrap to the point of disposal were included in the background data sets used to model the raw materials. Materials that are considered hazardous substances according to the standards or regulations of the Resource Conservation and Recovery Act (RCRA), Subtitle C or materials characterized as hazardous by the TRI are included despite 5% cut-off point. Raw materials are extracted and manufactured by raw material suppliers.

Table 6. VOCOMP product raw material composition

Raw material	VOCOMP-20	VOCOMP-25	VOCOMP-30
Polymer emulsion	70-81%	75-84%	75-89%
Solvent	<5%	<5%	<5%
Plasticizer	0%	<5%	0%
Additives	<3%	<3%	<3%
Packaging, plastic	<5%	<1%	<1%
Packaging, steel drum	<5%	<1%	<1%
Packaging, wood pallet	<1%	<1%	<1%
Packaging, stretch film	<1%	<1%	<1%
Total	**100%**	**100%**	**100%**

Table 7. MEL-PRIME product raw material composition

Raw material	MEL-PRIME	MEL-PRIME N.E.	MEL-PRIME W/B
Asphalt emulsion	0%	0%	75-95%
Polymer solution	75-95%	75-95%	5-10%
Oils	5-10%	5-10%	5-10%
Additives	<1%	<1%	<1%
Ethanol	0%	0%	<1%
Dye	<1%	<1%	<1%
Packaging, plastic	<1%	<5%	<1%
Packaging, wood pallet	<1%	1%	<1%
Packaging, steel can	<5%	<5%	0%
Total	**100%**	**100%**	**100%**

Suppliers transport raw materials to the W. R. MEADOWS's manufacturing plant. All ingredients sourced in North America are transported by 24T truck & trailer, bulk tanker truck, semi-trailer, and box truck. [redacted] Transportation modes and distances for each of the raw materials supplied are provided in Table 8 and Table 9.

Table 8. VOCOMP raw material supplier transportation modes and distances

Raw material	Road distance (miles)	Means of transportation
Water	City water pipeline	Utility piping
Acrylic emulsion	[redacted]	Truck & trailer, 24t
[redacted]	[redacted]	Truck & trailer, 24t
[redacted]	[redacted]	Truck & trailer, 24t
[redacted]	[redacted]	Truck & trailer, 24t
[redacted]	[redacted]	Truck & trailer, 24t
[redacted]	[redacted]	Truck & trailer, 24t

Table 9. MEL-PRIME raw material supplier transportation modes and distances

Raw material	Road distance (miles)	Means of transportation
[redacted]	[redacted]	Bulk tanker truck
[redacted]	[redacted]	Semi-trailer
[redacted]	[redacted]	Semi-trailer
[redacted]	[redacted]	Bulk tanker truck
[redacted]	[redacted]	Semi-trailer
[redacted]	[redacted]	Box truck
[redacted]	[redacted]	Bulk tanker truck
[redacted]	[redacted]	Utility piping
[redacted]	[redacted]	Semi-trailer
[redacted]	[redacted]	Semi-trailer
[redacted]	[redacted]	Semi-trailer

Table 10. VOCOMP and MEL-PRIME raw material transportation to manufacturing location per functional unit

Manufacturing location	VOCOMP-20 (lbmi)	VOCOMP-25 (lbmi)	VOCOMP-30 (lbmi)	MEL-PRIME (lbmi)	MEL-PRIME N.E. (lbmi)	MEL-PRIME W/B (lbmi)
Cartersville, GA	[redacted]	[redacted]	[redacted]	[redacted]	[redacted]	[redacted]
Fort Worth, TX	[redacted]	[redacted]	[redacted]	[redacted]	[redacted]	[redacted]
Goodyear, AZ	[redacted]	[redacted]	[redacted]	[redacted]	[redacted]	[redacted]
Hampshire, IL	[redacted]	[redacted]	[redacted]	[redacted]	[redacted]	[redacted]
York, PA	[redacted]	[redacted]	[redacted]	[redacted]	[redacted]	[redacted]
Benicia, CA	[redacted]	[redacted]	[redacted]	[redacted]	[redacted]	[redacted]
Milton, Ontario, Canada	[redacted]	[redacted]	[redacted]	[redacted]	[redacted]	[redacted]
Sherwood Park, Alberta, Canada	[redacted]	[redacted]	[redacted]	[redacted]	[redacted]	[redacted]

The manufacturing process of VOCOMP starts with [redacted], where a [redacted]. [redacted] is then weighed and added, followed by a [redacted] to ensure complete dissolution.

Once the chelating agent is fully dispersed, [redacted] are incorporated. For [redacted], [redacted] are introduced using an [redacted] , followed by an [redacted] . [redacted] , however, follows a different sequence [redacted]. Afterward, [redacted] are incorporated to complete the polymer phase.

Following polymer addition[redacted]is introduced manually and mixed for another ten minutes to [redacted] . This is followed by the addition of [redacted] , such as [redacted] , along with [redacted] . These components are weighed, manually added, and mixed for fifteen minutes under appropriate safety precautions. Once [redacted] is complete, a sample is collected and sent to the laboratory for quality control testing. If the formulation meets the required specifications, the final product is packaged into plastic drums, pails, or jugs using an air-run system for pails, an air pump for drum filling, and a gravity-fed system for jugs. Each [redacted] variant follows this general process, with adjustments in ingredient ratios and sequencing to achieve different levels of solids content and performance characteristics.

Energy usage is calculated based on the annual production mass allocated to the functional unit weight. Each facility has its own energy and electricity input to reflect its specific manufacturing activities. The electricity consumption is also adjusted to align with the regional grid mix [13]. Table 11 presents the manufacturing electricity needed for producing one functional unit of VOCOMP.

Table 11. VOCOMP manufacturing electricity inputs per functional unit

Manufacturing location	VOCOMP-20 (kWh)	VOCOMP-25 (kWh)	VOCOMP-30 (kWh)
Cartersville, GA	[redacted]	[redacted]	[redacted]
Fort Worth, TX	[redacted]	[redacted]	[redacted]
Goodyear, AZ	[redacted]	[redacted]	[redacted]
Hampshire, IL	[redacted]	[redacted]	[redacted]
York, PA	[redacted]	[redacted]	[redacted]
Benicia, CA	[redacted]	[redacted]	[redacted]
Milton, Ontario, Canada	[redacted]	[redacted]	[redacted]
Sherwood Park, Alberta, Canada	[redacted]	[redacted]	[redacted]

MEL-PRIME is produced by [redacted]. The process begins with [redacted] into a [redacted]. Agitation is initiated to create a [redacted] before the addition of key active ingredients. Once [redacted] is fully dispersed, [redacted] are gradually introduced to [redacted]. These [redacted] are weighed, [redacted] to ensure proper dissolution. [redacted], such as [redacted] may be incorporated to improve product consistency and long-term stability. After the [redacted] , a sample is collected and sent for laboratory testing to verify compliance with quality specifications, including adhesion strength, drying time, and viscosity. Upon approval, the finished product is packaged into appropriate containers, such as [redacted] . Proper handling and storage conditions are maintained to preserve the product's effectiveness and stability before use.

Energy usage is calculated based on the annual production mass allocated to the functional unit weight. Each facility has its own energy and electricity input to reflect its specific manufacturing activities. The electricity consumption is also adjusted to align with the regional grid mix [13]. Table 12 presents the manufacturing inputs needed for producing one functional unit of MEL-PRIME.

Table 12. MEL-PRIME manufacturing inputs per functional unit

Input parameters	MEL-PRIME	MEL-PRIME N.E.	MEL-PRIME W/B
Electricity (kWh/FU)	[redacted]	[redacted]	[redacted]
Natural gas (therms/FU)	[redacted]	[redacted]	[redacted]
Water (gal/FU)	[redacted]	[redacted]	[redacted]

Figure 4 illustrates the cradle-to-grave system process flow diagram for W. R. MEADOWS VOCOMP and MEL-PRIME products. This study has included all upstream energy and material flows related to production.

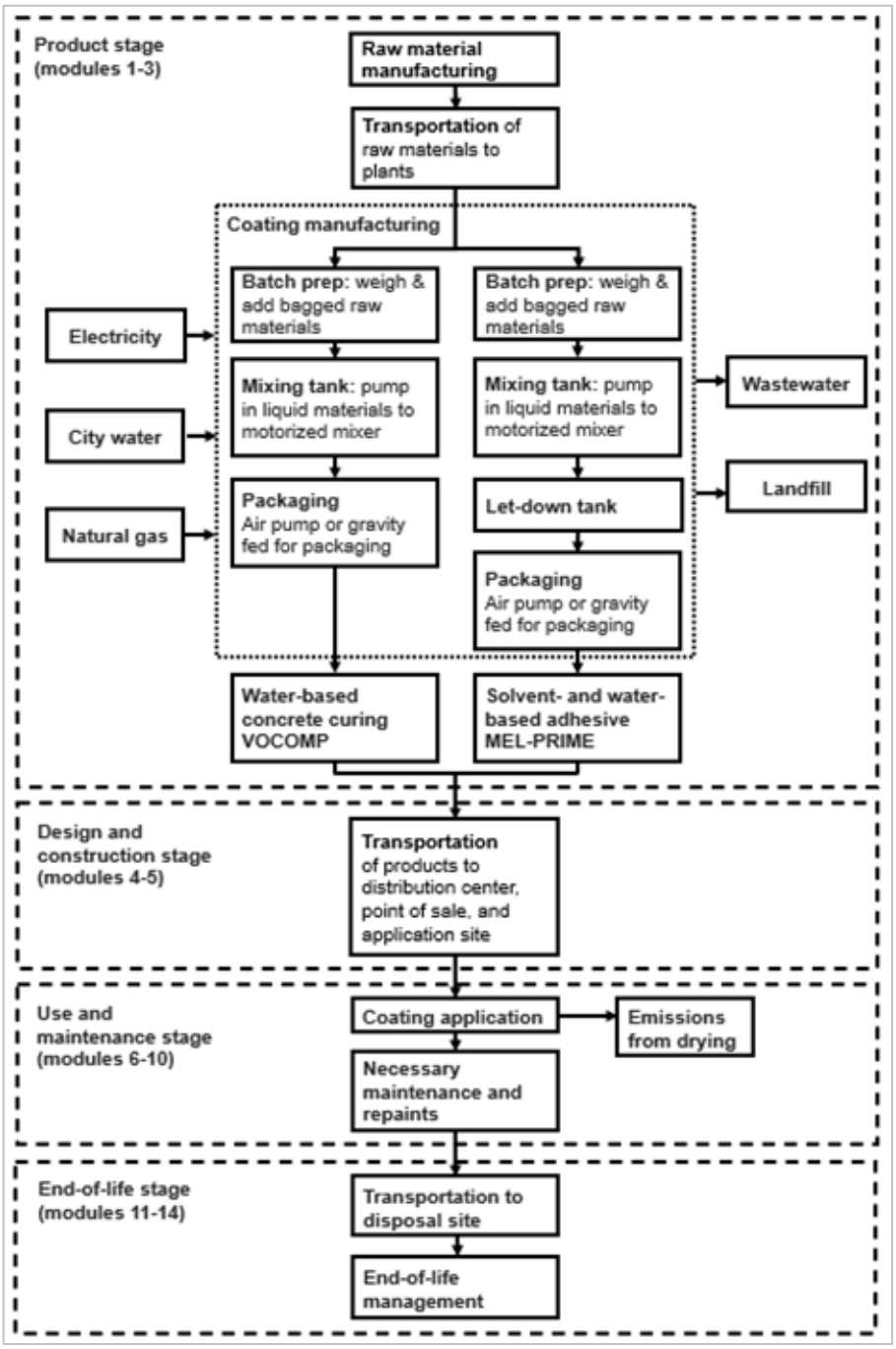

Figure 4. System boundary and product flow diagram for VOCOMP and MEL-PRIME manufacturing

VOCOMP is available in three packaging options: a 1-gallon plastic jug, a 5-gallon plastic pail, or a 54-gallon steel drum. After the product is pumped into its final packaging, the containers are [redacted]. Manufacturing plants allocate production volumes differently across packaging types. Packaging inputs are calculated based on the final packaging weight allocated to the functional unit, adjusted by the production percentage assigned to each packaging type at the respective plant.

MEL-PRIME is typically packaged in a 5-gallon plastic pail and a 1-gallon metal can. The final packaging weight shown in Table 13 is determined based on annual production volumes and allocated [redacted]. The distribution of these packaging types is calculated to

reflect the production ratios at the Hampshire, IL plant. Once MEL-PRIME is dispensed into its packaging, the containers are placed on wooden pallets for storage and transport.

Table 13. VOCOMP and MEL-PRIME final packaging inputs per functional unit

Product	Plastic jugs and pails (kg)	Steel drums and metal can (kg)	Wood pallet (kg)	Stretch film (kg)
VOCOMP-20	[redacted]	[redacted]	[redacted]	[redacted]
VOCOMP-25	[redacted]	[redacted]	[redacted]	[redacted]
VOCOMP-30	[redacted]	[redacted]	[redacted]	[redacted]
MEL-PRIME	[redacted]	[redacted]	[redacted]	[redacted]
MEL-PRIME N.E.	[redacted]	[redacted]	[redacted]	[redacted]
MEL-PRIME W/B	[redacted]	[redacted]	[redacted]	[redacted]

Packaging waste from raw materials is designated for landfill disposal. All water used in the MEL-PRIME manufacturing process turns into wastewater and is directed to a [redacted]. Solid waste and scrap from the manufacturing process are transported by truck to a landfill located a production-weighted average [redacted] miles away for VOCOMP and [redacted] miles away for MEL-PRIME. No emissions to air occur during the manufacturing processes. Table 14 lists the manufacturing outputs generated from producing one functional unit of VOCOMP and MEL-PRIME.

Table 14. VOCOMP and MEL-PRIME product manufacturing outputs per functional unit

Product	Paper bag-landfilled (kg)	Corrugated box- landfilled (kg)	Steel drum-recycled (kg)	Waste transport (lbmi)
VOCOMP-20	[redacted]	[redacted]	[redacted]	[redacted]
VOCOMP-25	[redacted]	[redacted]	[redacted]	[redacted]
VOCOMP-30	[redacted]	[redacted]	[redacted]	[redacted]
MEL-PRIME	[redacted]	[redacted]	[redacted]	[redacted]
MEL-PRIME N.E.	[redacted]	[redacted]	[redacted]	[redacted]
MEL-PRIME W/B	[redacted]	[redacted]	[redacted]	[redacted]

3.2.2. Design and construction

Concrete curing and adhesive, including their packaging, are transported from the manufacturing plant to their distributor warehouse and project sites by truck. This module includes transportation's air emissions as well as fuel, vehicle, and infrastructure production. Based on W. R. MEADOWS records, all products are shipped by a combination of truck and trailer. The transportations distances are reported by manufacturing plants as shown in Table 15, and default PCR transportation modes and distances were used.

Table 15. VOCOMP and MEL-PRIME transportation to distribution center per functional unit

Manufacturing location	VOCOMP-20 (lbmi)	VOCOMP-25 (lbmi)	VOCOMP-30 (lbmi)	MEL-PRIME (lbmi)	MEL-PRIME N.E. (lbmi)	MEL-PRIME W/B (lbmi)
Cartersville, GA	[redacted]	[redacted]	[redacted]	[redacted]	[redacted]	[redacted]
Fort Worth, TX	[redacted]	[redacted]	[redacted]	[redacted]	[redacted]	[redacted]
Goodyear, AZ	[redacted]	[redacted]	[redacted]	[redacted]	[redacted]	[redacted]
Hampshire, IL	[redacted]	[redacted]	[redacted]	[redacted]	[redacted]	[redacted]
York, PA	[redacted]	[redacted]	[redacted]	[redacted]	[redacted]	[redacted]
Benicia, CA	[redacted]	[redacted]	[redacted]	[redacted]	[redacted]	[redacted]
Milton, Ontario, Canada	[redacted]	[redacted]	[redacted]	[redacted]	[redacted]	[redacted]
Sherwood Park, Alberta, Canada	[redacted]	[redacted]	[redacted]	[redacted]	[redacted]	[redacted]

3.2.3. Use and maintenance

According to the PCR, the use stage begins when the user applies the product to a substrate and ends with any leftover coating and discarded packaging entering the end-of-life stage. It shall also be assumed that 10% of the wet mass of the coating remains unused and is properly disposed.

At the application site, VOCOMP and MEL-PRIME are unpackaged and applied to the concrete surface using a hand-operated sprayer, roller, or brush. Hand-spraying is the recommended method to ensure even coverage and proper curing performance. Since VOCOMP application does not require powered spraying equipment, electricity use during the application process is considered negligible. The model accounts for 10% of wet mass and final packaging waste.

VOCOMP products dry quickly, and it is recommended to restrict foot traffic for at least four hours. MEL-PRIME products are left to dry for one hour or until the surface feels tacky but does not pick up when touched. During drying, the solvent-based products emit VOCs, as shown in Table 16.

Table 16. Solvent-based product application VOCs per functional unit

Product	VOCs emitted during drying (kg)
MEL-PRIME	[redacted]
MEL-PRIME N.E.	[redacted]

Both VOCOMP and MEL-PRIME do not require maintenance or reapplication after initial application due to their inherent properties. VOCOMP, as a curing and sealing compound, forms a protective film that seals concrete upon first use and does not degrade under normal conditions, eliminating the need for re-coating. Similarly, MEL-PRIME functions as a primer designed to bond with subsequent membrane applications, meaning it does not require maintenance or additional layers once applied since it is not accessible once a membrane is applied. The performance characteristics of both products ensure long-term durability without the need for repainting or ongoing upkeep.

3.2.4. End of life

At the end of their life cycle, both VOCOMP and MEL-PRIME are assumed to remain adhered to their substrates and are not typically removed before deconstruction or demolition. As a result, no deconstruction or demolition impacts are attributed to these products.

Waste transport modeling follows the default PCR [5] transportation modes and distances, with waste coatings assumed to travel 7 miles (11 km) to a disposal site. According to the 2012 EPA Waste Reduction Model (WARM model) [14], it is assumed that 10% of the wet mass of the coating remains unused after application and is properly disposed of.

VOCOMP and MEL-PRIME W/B, being water-based curing and sealing compounds and adhesives, are 100% landfilled with no additional processing. MEL-PRIME and MEL-PRIME N.E., solvent-based primers, follows a different disposal pathway, with 100% of waste coatings sent to incineration for energy recovery.

Packaging waste is also modeled based on WARM model assumptions. Plastic pails, steel drums, and packaging film are assumed to travel 7 miles before being 100% landfilled, while wood pallets are assumed to be recycled.

3.3 Background data

This section details the background data sets used for modeling all relevant activities associated with the cradle-to-grave life cycle of the products. Each table lists the data set name, database, reference year, and geography. The LCA model was created using SimaPro Analyst 9.6. The ecoinvent v3.10 and US-EI 2.2 databases provided the life cycle inventory data of the raw materials and processes for modeling the products.

3.3.1. Raw materials

Data representing upstream and downstream raw materials were obtained from the ecoinvent v3.10 database. Table 17 lists the most relevant LCI data sets used in modeling the raw materials.

Table 17. Key material data sets used in inventory analysis

Raw material	Data set	Database	Technology	Reference year	Geography
Water	Tap water {RoW}| market for tap water | Cut-off, U	ecoinvent v3.10	Appropriate technology	2019	Rest of World (non-Europe)
Acrylic emulsion	Acrylic binder, with water, in 54% solution state {RoW}| market for acrylic binder, with water, in 54% solution state | Cut-off, U	ecoinvent v3.10	Appropriate technology	2023	Rest of World (non-Europe)
Styrene butadiene	Custom dataset: [redacted] styrene-acrylonitrile copolymer {GLO} | market for styrene-acrylonitrile copolymer | Cut-off,U, [redacted] Tap water {RoW}| market for tap water | Cut-off, U	ecoinvent v3.10	Appropriate technology	2023 2019	Global (GLO) Rest of World (non-Europe)
Glycol ether PPH	Ethylene glycol monoethyl ether {RoW}| market for ethylene glycol monoethyl ether | Cut-off, U	ecoinvent v3.10	Appropriate technology	2023	Rest of World (non-Europe)
EDTA	EDTA, ethylenediaminetetraacetic acid {GLO}| market for EDTA, ethylenediaminetetraacetic acid | Cut-off, U	ecoinvent v3.10	Appropriate technology	2011*	Global (GLO)
Ammonium hydroxide	Custom dataset: [redacted] Ammonia, anhydrous, liquid {RoW}| market for ammonia, anhydrous, liquid | Cut-off, U, [redacted] Tap water {RoW}| market for tap water | Cut-off, U	ecoinvent v3.10	Appropriate technology	2011* 2019	Rest of World (non-Europe)
[redacted] oil	Lubricating oil {RoW}| market for | Cut-off, U	ecoinvent v3.10	Appropriate technology	2011*	Rest of World (non-Europe)

Solvent	Solvent,organic {GLO} market for solvent, organic | Cut-off,U	ecoinvent v3.10	Appropriate technology	2023	Global (GLO)
Mastic asphalt	Mastic asphalt {GLO}| market for mastic asphalt | Cut-off, U	ecoinvent v3.10	Appropriate technology	2011*	Global (GLO)
Polyethylene	Polyethylene, linear low density, granulate {GLO}| market for polyethylene, linear low density, granulate | Cut-off, U	ecoinvent v3.10	Appropriate technology	2023	Global (GLO)
Ethanol	Ethanol, without water, in 99.7% solution state, from ethylene {RoW}| market for ethanol, without water, in 99.7% solution state, from ethylene | Cut-off, U	ecoinvent v3.10	Appropriate technology	2011*	Rest of World (non-Europe)

*Data sets older than 10 years were chosen because they closest represent the technology used to manufacture the material and are assumed to be more accurate than other potential proxies with more precise geography and temporal representativeness

3.3.2. Transportation

Transportation distances and modes of transport were included for transporting raw materials to the manufacturing facility. The typical vehicle used for shipment is a semi-truck. As the transportation data sets represent load factors as an average of empty and fully loaded (i.e., average load factor), empty backhauls are accounted for in the model. Table 18 shows the most relevant LCI data sets used in modeling transportation.

Table 18. Transportation data set used in inventory analysis

Vehicle type	Data set	Database	Technology	Reference year	Geography
Semi-truck	Transport, freight, lorry 16-32 metric ton, EURO6 {RoW}| market for transport, freight, lorry 16-32 metric ton, EURO6 | Cut-off, U	ecoinvent v3.10	Appropriate technology	2011*	Rest of World (non-Europe)
Passenger car	Transport, passenger car, small size, petrol, EURO 5 {GLO}| transport, passenger car, small size, petrol, EURO 5 | Cut-off, U	ecoinvent v3.10	Appropriate technology	2012*	Global (GLO)

*Data sets older than 10 years were chosen because they closest represent the technology used to manufacture the material and are assumed to be more accurate than other potential proxies with more precise geography and temporal representativeness

3.3.3. Fuels and energy

National and regional averages for fuel inputs and electricity grid mixes were sourced from SimaPro. Table 19 lists the key LCI datasets used in product system modeling. Background data older than five years were selected based on their technological relevance for raw materials. For the manufacturing stage, the Emissions & Generation Resource Integrated Database (eGRID) data sets were used to reflect the environmental characteristics of the U.S.-based W. R. MEADOWS manufacturing facilities' geographic subregions. US-EI 2.2 data sets were used to reflect the grid activity of manufacturing plants located in Canada. Table 19 shows the most relevant LCI data sets used in modeling fuels and energy.

Table 19. Energy data sets used in inventory analysis

Energy source	Data set	Database	Technology	Reference year	Geography
Electricity	Electricity mix, eGrid subregion, SRSO/US U	Environmental Protection Agency (EPA)	Appropriate technology	2023	Cartersville, GA
Electricity	Electricity mix, eGrid subregion, ERCT/US U	Environmental Protection Agency (EPA)	Appropriate technology	2023	Fort Worth, TX
Electricity	Electricity mix, eGrid subregion, AZNM/US U	Environmental Protection Agency (EPA)	Appropriate technology	2023	Goodyear, AZ
Electricity	Electricity mix, eGrid subregion, RFCW/US U	Environmental Protection Agency (EPA)	Appropriate technology	2023	Hampshire, IL
Electricity	Electricity mix, eGrid subregion, RFCW/US U	Environmental Protection Agency (EPA)	Appropriate technology	2023	York, PA
Electricity	Electricity mix, eGrid subregion, CAMX/US U	Environmental Protection Agency (EPA)	Appropriate technology	2023	Benicia, CA
Electricity	Electricity mix, Ontario/CA U	Government of Canada, Canada Energy Regulator	Appropriate technology	2023	Milton, Ontario, Canada
Electricity	Electricity mix, Alberta/CA U	Government of Canada, Canada Energy Regulator	Appropriate technology	2023	Sherwood Park, Alberta, Canada
Natural gas	Heat, district or industrial, natural gas {RoW}| market for heat, district or industrial, natural gas | Cut-off, U	ecoinvent v3.10	Appropriate technology	2023	United States
Water	Tap water {RoW}| market for tap water | Cut-off, U	ecoinvent v3.10	Appropriate technology	2019	Rest of World (RoW)

3.3.4. Disposal

Disposal processes were obtained from the ecoinvent v3.10 database. These processes were selected to correspond to the disposal of manufacturing waste, installation waste, packaging waste, and product waste. Table 20 lists the relevant disposal data sets used in the model.

Table 20. Key disposal data sets used in inventory analysis

Disposal activity	Data set	Database	Reference year	Geography
Landfill of solid waste	Municipal solid waste {RoW}| treatment of municipal solid waste, open dump, dry infiltration class (100mm) | Cut-off, U	ecoinvent v3.10	2023	Rest of World (non-Europe)
Landfill of plastic liner	Waste polyethylene {RoW}| market for waste polyethylene | Cut-off, U	ecoinvent v3.10	2023	Rest of World (non-Europe)
Landfill of waste coatings	Waste paint {RoW}| treatment of waste paint, sanitary landfill | Cut-off, U	ecoinvent v3.10	2023	Rest of World (non-Europe)
Road transport for collecting municipal waste	Municipal waste collection service by 21 metric ton lorry {RoW}| market for municipal waste collection service by 21 metric ton lorry | Cut-off, U	ecoinvent v3.10	2012*	Rest of World (non-Europe)

*Data sets older than 10 years were chosen because they closest represent the technology used to manufacture the material and are assumed to be more accurate than other potential proxies with more precise geography and temporal representativeness

3.3.5. Emission to air, water, and soil

Disposal VOC emissions during drying processes reported by W. R. MEADOWS for the use and maintenance stage were taken into account in the study. The data set for VOC emissions is displayed in Table 21.

Table 21. VOC emission data set used in the inventory analysis

Emission	Dataset name	Primary source	Reference year
VOC	VOC, volatile organic compounds, unspecified origin	SimaPro LCI	---

3.4 Cut-off criteria

The cut-off criteria on a unit process level can be summarized as follows:

- All inputs and outputs to a (unit) process shall be included in the calculation of the pre-set parameters results, for which data are available. Data gaps shall be filled by conservative assumptions with average, generic or proxy data. Any assumptions for such choices shall be documented. Assumptions and proxies, whenever used, have been explained in this report.
- Mass – If a flow is less than 1% of the cumulative mass of the model it may be excluded, providing its environmental relevance is not a concern. Select mass flows have been omitted in this study where they were deemed environmentally irrelevant.
- Energy – If a flow is less than 1% of the cumulative energy of the model it may be excluded, providing its environmental relevance is not a concern. No known energy flow has been omitted in this study.
- Environmental relevance – If a flow meets the above criteria for exclusion, yet it is thought to potentially have a significant environmental impact, it is included. No hazardous materials were omitted in this study.
- Hazardous and toxic materials – The study shall include all hazardous and toxic materials in the inventory therefore the cutoff rules shall not apply to such substances. No substances required to be reported as hazardous were omitted in this study.
- The sum of the neglected material flows does not exceed 5% of mass, energy or environmental relevance for flows indirectly related to the process (e.g., operating materials).

In this report, flows of less than 1% of the cumulative mass were excluded from modeling when their environmental relevance was not a concern, and the sum of excluded mass and energy flows was below 5%; therefore, these criteria have been met. The completeness of the bill of materials defined in this report satisfies the above-defined cut-off criteria.

3.5 Allocation

Whenever a system boundary is crossed, environmental inputs and outputs must be assigned to the different products. Where multi-inputs or multi-outputs are considered, the same applies. The PCR prescribes to report where and how allocation occurs in the modeling of the LCA.

The W. R. MEADOWS facilities produce multiple types of panel products each year. To allocate electricity and natural gas consumption accurately to each product, total annual energy consumption was distributed based on the proportion of each product's annual production (by mass) relative to the total plant production. This approach assigns manufacturing activities proportionally to each product type.

The facilities produce different kinds of products. Therefore, electricity, water, and natural gas inputs were allocated using annual production quantities in mass. Similarly, waste disposal outputs were allocated based on the ratio of total plant production to each product's production and then normalized to functional unit mass. There are no co-products produced during their manufacturing processes.

The model used in this report ensures that the sum of the allocated inputs and outputs of a unit process shall be equal to the inputs and outputs of the unit process before allocation. This means that no double counting or omissions of inputs or outputs through allocation is occurring. The allocation procedures used in background data sets were accepted without modification.

3.6 Discussion of data quality

Inventory data quality is judged by its precision (measured, calculated, or estimated), completeness (e.g., unreported emissions), consistency (degree of uniformity of the methodology applied on a study serving as a data source), and representativeness (geographical, temporal, and technological).

To cover these requirements and to ensure reliable results, first-hand industry data in combination with consistent background LCA information from the ecoinvent v3.10 and US-EI 2.2 databases were used.

Precision and completeness

- *Precision:* As the relevant foreground data is primary data or modeled based on primary information sources of the owner of the technology, precision is considered to be high. Background data are from the ecoinvent v3.10 and US-EI 2.2 databases with documented precision to the extent available.

- *Completeness:* Sustainable Minds worked with W. R. MEADOWS to obtain a comprehensive set of primary data associated with the manufacturing processes. The product system was checked for mass balance and completeness of the inventory. The data set was considered complete based on our understanding of the manufacturing site and a review with key stakeholders on the W. R. MEADOWS team, and cut-off criteria were observed consistent with those prescribed in the PCR. Besides capital equipment, no data was knowingly omitted.

Consistency and reproducibility

- *Consistency*: Primary data were collected with a similar level of detail, while background data were sourced primarily from the ecoinvent database. Other databases were used if data were not available in ecoinvent or the data set was judged to be more representative. Other methodological choices were made consistently throughout the model.

- *Reproducibility*: Reproducibility is warranted as much as possible through the disclosure of input-output data, data set choices, and modeling approaches in this report. Based on this information, a knowledgeable third party should be able to approximate the results of this study using the same data and modeling approaches.

Representativeness

- *Temporal:* All primary data were collected for CY2023, ensuring the representativeness of the manufacturing process. Secondary data were obtained from the ecoinvent v3.10 and US-EI 2.2 databases and are typically representative of the recent years.

- *Geographical:* The geographical coverage for this study is based on United States and Canada system boundaries for all processes and products. Whenever North American background data was not readily available, rest of world (non-Europe) data or global data were used. Input and output data for modeling come from the manufacturing facilities which are responsible for production.

- *Technological*: All primary and secondary data were modeled to be specific to the technologies under study. Technological representativeness is considered to be high.

3.7 Comparability

ISO 21930:2017 section 5.5 highlights the following limitations and clarifications in EPD comparability: EPDs are comparable only if they use the same PCR (or sub-category PCR where applicable), include all relevant information modules, and are based on equivalent scenarios with respect to the context of construction works.

EPDs can only be compared when the same functional requirements between products are ensured and the requirements of ISO 21930:2017 section 5.5 are met. However, variations and deviations are possible. For example, different LCA software and background LCI data sets may lead to different results for the life cycle stages declared.

3.8 Assumptions and limitations

A life cycle assessment of a product system is broad and complex, and it inherently requires assumptions and simplifications. The following limitations of the study should be recognized:

- Primary data were modeled based on the information provided by W. R. MEADOWS and supplemented by data contained in the technical and safety data sheets. Proxy materials were used when matching secondary data sets were not identified.
- Since energy inputs were not available per product's manufacturing process, electricity and natural gas consumption were allocated proportionately based on the annual square foot production percentage for individual panel products versus total site production.
- According to the PCR, 10% of the wet mass for all products is assumed to remain unused and is properly disposed of during the used stage.
- It is recommended that the VOCOMP and MEL-PRIME products are not mixed or diluted with any other products are liquids, including colorants. Therefore, colorants were excluded from the scope of this study.
- Generic data sets used for material inputs, transport, and waste processing are considered good quality, but actual impacts from material suppliers, transport carriers, and local waste processing may vary.
- The impact assessment methodology categories do not represent all possible environmental impact categories.
- Characterization factors used within the impact assessment methodology may contain varying levels of uncertainty.
- LCA results are relative expressions and do not predict impacts on category endpoints, the exceeding of thresholds, safety margins, or risks.
- When specific data were not available, generic data which fulfilled the minimum criteria of the PCR were used. The ecoinvent database v3.10 served as the main source of secondary data. It should be noted that most, though not all, of the data within ecoinvent are, of European origin and developed to represent European industrial conditions and process. Therefore, in some cases, these modules were further adapted io enhance their representativeness of the products and contexts being examined.
- It was also assumed that no emissions or uptake from calcination and carbonation took place during the life cycle of W. R. MEADOWS VOCOMP and MEL-PRIME products.
- Other assumptions included in this LCA were related to raw material modeling and transportation, which can be referred to the sections above.
- No "green power" is used in this LCA.
- No renewable certificates or purchased CO_2 offsets are included in the LCA.

4 IMPACT ASSESSMENT METHODS

4.1 Impact assessment characterization

The environmental indicators as required by the PCR are included as well as other indicators required to use the SM2013 Methodology [6] (see Table 22). The impact indicators are derived using the 100-year time horizon[1] factors, where relevant, as defined by TRACI 2.1 classification and characterization [7]. Long-term emissions (>100 years) are not taken into consideration in the impact estimate. USEtox indicators[2] are used to evaluate toxicity. Emissions from waste disposal are considered part of the product system under study, according to the "polluter pays principle".

Table 22. Selected impact categories and units

Impact category	Unit	Description
Acidification	kg SO_2 eq (sulphur dioxide)	Acidification processes increase the acidity of water and soil systems and causes damage to lakes, streams, rivers and various plants and animals as well as building materials, paints and other human-built structures.
Ecotoxicity	CTUe	Ecotoxicity causes negative impacts to ecological receptors and, indirectly, to human receptors through the impacts to the ecosystem.
Eutrophication	kg N eq (nitrogen)	Eutrophication is the enrichment of an aquatic ecosystem with nutrients (nitrates and phosphates) that accelerate biological productivity (growth of algae and weeds) and an undesirable accumulation of algal biomass.
Global warming	kg CO_2 eq (carbon dioxide)	Global warming is an average increase in the temperature of the atmosphere near the Earth's surface and in the troposphere.
Ozone depletion	kg CFC-11 eq	Ozone depletion is the reduction of ozone in the stratosphere caused by the release of ozone depleting chemicals.
Carcinogenics	CTUh	Carcinogens have the potential to form cancers in humans.
Non-carcinogenics	CTUh	Non-Carcinogens have the potential to causes non-cancerous adverse impacts to human health.
Respiratory effects	kg $PM_{2.5}$ eq (fine particulates)	Particulate matter concentrations have a strong influence on chronic and acute respiratory symptoms and mortality rates.
Smog	kg O_3 eq (ozone)	Smog formation (photochemical oxidant formation) is the formation of ozone molecules in the troposphere by complex chemical reactions.
Fossil fuel depletion	MJ surplus	Fossil fuel depletion is the surplus energy to extract minerals and fossil fuels.

With respect to global warming potential, biogenic carbon uptake and removal are included in impact category calculations. The biogenic carbon measured in this study originates from the pallets and cardboard used in the packaging. Greenhouse gas emissions from land-use change are expected to be insignificant and were not reported. Carbon emissions during carbonation and calcination were also considered in this study, and no carbonation or calcination are expected to occur. No delayed

[1]The 100-year period relates to the period in which the environmental impacts are modeled. This is different from the time period of the declared unit. The two periods are related as follows: all environmental impacts that are created in the period of the declared unit are modeled through life cycle impact assessment using a 100-year time horizon to understand the impacts that take place.
[2] USEtox is available in TRACI and at http://www.usetox.org/

emissions from a temporary carbon sequestration are expected to occur. It shall be noted that the above impact categories represent impact potentials. They are approximations of environmental impacts that could occur if the emitted molecules follow the underlying impact pathway and meet certain conditions in the receiving environment while doing so. In addition, the inventory only captures that fraction of the total environmental load that corresponds to the chosen functional unit (relative approach).

The results from the impact assessment indicate potential environmental effects and do not predict actual impacts on category endpoints, the exceedance of thresholds, or safety margins or risks.

4.2 Normalization and weighting

To arrive at a single score indicator, normalization [8] and weighting [9] as shown in Table 23 conforming to the SM2013 Methodology were applied. The SM2013 Methodology uses TRACI 2.1 impact categories developed by the U.S. EPA, and North American normalization and weighting values developed by the EPA and NIST respectively, to calculate single figure LCA results. Sustainable Minds recognizes that weighting is socially defined based on the importance that society attaches to the different environmental impact categories. However, these single score indicators serve as an easy starting point to get to know the product under consideration across all impact categories, rather than focusing all efforts on just one impact category (like global warming potential). The interpretation of the results starts with the Sustainable Minds single score results and then allows users to further explore the underlying impact categories individually. Details including the characterization models, factors, and methods used, including all assumptions and limitations, can be found in the SM2013 Methodology Report [6].

Table 23. Normalization and weighting factors

Impact category	Normalization	Weighting (%)
Acidification	90.9	3.6
Ecotoxicity	11000	8.4
Eutrophication	21.6	7.2
Global warming	24200	34.9
Ozone depletion	0.161	2.4
Carcinogenics	5.07E-05	9.6
Non-carcinogenics	1.05E-03	6.0
Respiratory effects	24.3	10.8
Smog	1390	4.8
Fossil fuel depletion	17300	12.1

5 ASSESSMENT AND INTERPRETATION

This chapter includes the results from the LCA for the products studied. It details the results per functional unit, outlines the sensitivity analysis, and concludes with recommendations.

5.1 Data quality assessment

The quality of inventory data is evaluated based on its precision, completeness, consistency, and representativeness. The data used in this study is regarded as reliable and representative of the described systems, as well as their geographical, temporal, and technological contexts. When direct measurements were unavailable, the best engineering estimates based on actual production were applied. Every effort was made to ensure the highest data quality.

5.2 Resource use and waste flows

Resource use indicators, output flows and waste category indicators, and carbon emissions and removals are presented in this section. These life cycle inventory (LCI) indicators reflect the flows from and to nature for the product system, prior to characterization using an impact assessment methodology to calculate life cycle impact assessment (LCIA) results (as shown in section 5.3).

LCI flows were calculated with the help of American Center for Life Cycle Assessment's (ACLCA) guidance to the ISO 21930:2017 metrics [10]. The consumption of freshwater indicator, which was calculated in accordance with this guidance, is reported in compliance with ISO 14046. Use of renewable and non-renewable energy resources with energy content were calculated using the Cumulative Energy Demand (LHV) impact assessment methodology [11]. Abiotic depletion potential was calculated using the CML impact assessment methodology [12]. LCI flows were reported in conformance to ISO 21930:2017.

Resource use indicators represent the amount of materials consumed to produce not only the product itself but also the raw materials, electricity, natural gas, etc. that go into the product’s life cycle.

Primary energy is an energy form found in nature that has not been subjected to any conversion or transformation process and is expressed in energy demand from renewable and non-renewable resources. Efficiencies in energy conversion are considered when calculating primary energy demand from process energy consumption. Water use represents the total water used over the entire life cycle. No renewable energy was used in production beyond that accounted for in the eGRID for manufacture plants that located in the United States, and US-EI 2.2 for manufacture plants that located in Canada, and no energy was recovered.

Hazardous and non-hazardous wastes are calculated based on the amount of waste generated during the life cycle of each product studied, mainly during the manufacturing of the products. All waste treatments in models were considered based on the real facility activities. Waste treatments included within the system boundary are reported. Unrecyclable waste is disposed of in landfills.

Resource use, output flows, waste categories, and carbon emissions & removals for the studied products have been tabulated in the sections below. The acronyms used for those indicators are shown in Table 24.

Table 24. Resource use and waste flow indicators

Indicators	Acronyms used
Resource use indicators	
Renewable primary energy used as energy carrier (fuel)	**RPR_E**
Renewable primary resources with energy content used as material	**RPR_M**
Total use of renewable primary resources with energy content	**RPR_{total}**
Non-renewable primary resources used as an energy carrier (fuel)	**$NRPR_E$**
Non-renewable primary resources with energy content used as material	**$NRPR_M$**
Total use of non-renewable primary resources with energy content	**$NRPR_{total}$**
Abiotic Depletion Potential (fossil)	**ADP**
Secondary materials	**SM**
Renewable secondary fuels	**RSF**
Non-renewable secondary fuels	**NRSF**
Recovered energy	**RE**
Use of net fresh water resources	**FW**
Output flows and waste category indicators	
Hazardous waste disposed	**HWD**
Non-hazardous waste disposed	**NHWD**
High-level radioactive waste, conditioned, to final repository	**HLRW**
Intermediate- and low-level radioactive waste, conditioned, to final repository	**ILLRW**
Components for re-use	**CRU**
Materials for recycling	**MR**
Materials for energy recovery	**MER**
Exported energy	**EE**
Carbon emissions and removals	
Biogenic Carbon Removal from Product	**BCRP**
Biogenic Carbon Emission from Product	**BCEP**
Biogenic Carbon Removal from Packaging	**BCRK**
Biogenic Carbon Emission from Packaging	**BCEK**
Biogenic Carbon Emission from Combustion of Waste from Renewable Sources Used in Production Processes	**CBCEW**
Calcination Carbon Emissions	**CCE**
Carbonation Carbon Removals	**CCR**
Carbon Emissions from Combustion of Waste from Non-Renewable Sources used in Production Processes	**CWNR**

5.2.1. VOCOMP-20

5.2.1.1. Benicia, California

Table 25. Resource use and waste flows for VOCOMP-20 per declared unit (1m^2) at Benicia, California

Parameters	Unit	Stage 1 - Product Stage			Stage 2 - Design & Construction Stage			Stage 3 - Use & Maintenance Stage			Stage 4 - End-of-Life Stage		Total
		1-1	1-2	1-3	2-1	2-2	2-3	3-1	3-2	3-3	4-1	4-2	
Resource use indicators													
RPR_E	MJ, NCV	6.20E-02	3.91E-04	5.06E-01	4.45E-04	3.77E-04	0	6.21E-03	3.00E-06	0	1.30E-05	7.47E-05	**5.76E-01**
RPR_M	MJ, NCV	0	0	0	0	0	0	0	0	0	0	0	**0**
RPR_{total}	MJ, NCV	6.20E-02	3.91E-04	5.06E-01	4.45E-04	3.77E-04	0	6.21E-03	3.00E-06	0	1.30E-05	7.47E-05	**5.76E-01**
$NRPR_E$	MJ, NCV	2.46E+00	2.55E-01	3.77E+00	2.90E-01	2.46E-01	0	2.46E-01	3.41E-04	0	7.21E-03	8.50E-03	**7.29E+00**
$NRPR_M$	MJ, NCV	9.95E-01	0	0	0	0	0	9.95E-02	0	0	0	0	**1.09E+00**
$NRPR_{total}$	MJ, NCV	3.46E+00	2.55E-01	3.77E+00	2.90E-01	2.46E-01	0	3.46E-01	3.41E-04	0	7.21E-03	8.50E-03	**8.38E+00**
ADP	MJ	0	2.20E+00	2.40E-01	3.06E+00	2.73E-01	2.31E-01	0	2.20E-01	3.17E-04	0	6.77E-03	**6.23E+00**
SM	kg	0	0	0	0	0	0	0	0	0	0	0	**0**
RSF	MJ, NCV	0	0	0	0	0	0	0	0	0	0	0	**0**
NRSF	MJ, NCV	0	0	0	0	0	0	0	0	0	0	0	**0**
RE	MJ, NCV	0	0	0	0	0	0	0	0	0	0	0	**0**
FW	m^3	2.36E-01	1.89E-03	8.76E-01	2.16E-03	1.83E-03	0	2.36E-02	1.99E-05	0	5.66E-05	4.95E-04	**1.14E+00**
Output flows and waste category indicators													
HWD	kg	2.93E-03	5.57E-05	7.93E-04	6.34E-05	5.38E-05	0	2.93E-04	1.52E-07	0	2.77E-07	3.78E-06	**4.20E-03**
NHWD	kg	1.91E-02	2.21E-04	1.73E-01	2.51E-04	2.13E-04	0	8.84E-03	6.93E-03	0	6.01E-06	1.73E-01	**3.81E-01**
HLRW	kg	2.04E-07	2.94E-09	1.17E-07	3.32E-09	2.82E-09	0	2.05E-08	1.59E-11	0	9.20E-11	3.97E-10	**3.51E-07**
ILLRW	kg	6.91E-07	5.76E-09	4.10E-06	6.51E-09	5.52E-09	0	6.91E-08	3.69E-11	0	2.10E-10	9.18E-10	**4.88E-06**
CRU	kg	0	0	0	0	0	0	0	0	0	0	0	**0**
MR	kg	4.27E-04	0	0	0	4.07E-03	0	0	0	0	0	0	**4.50E-03**
MER	kg	0	0	0	0	0	0	0	0	0	0	0	**0**
EE	MJ	0	0	0	0	0	0	0	0	0	0	0	**0**
Carbon emissions and removals													
BCRP	kg CO_2	0	0	0	0	0	0	0	0	0	0	0	**0**
BCEP	kg CO_2	0	0	0	0	0	0	0	0	0	0	0	**0**
BCRK	kg CO_2	-1.08E-03	0	-7.49E-03	0	0	0	0	0	0	0	0	**-8.57E-03**
BCEK	kg CO_2	0	0	1.08E-03	0	0	0	7.49E-03	0	0	0	0	**8.57E-03**
CBCEW	kg CO_2	0	0	0	0	0	0	0	0	0	0	0	**0**
CCE	kg CO_2	0	0	0	0	0	0	0	0	0	0	0	**0**
CCR	kg CO_2	0	0	0	0	0	0	0	0	0	0	0	**0**
CWNR	kg CO_2	0	0	0	0	0	0	0	0	0	0	0	**0**

5.2.1.2. Cartersville, Georgia

Table 26. Resource use and waste flows for VOCOMP-20 per declared unit (1m^2) at Cartersville, Georgia

Parameters	Unit	Stage 1 - Product Stage			Stage 2 - Design & Construction Stage			Stage 3 - Use & Maintenance Stage			Stage 4 - End-of-Life Stage		Total
		1-1	1-2	1-3	2-1	2-2	2-3	3-1	3-2	3-3	4-1	4-2	
Resource use indicators													
RPR_E	MJ, NCV	6.20E-02	6.84E-05	2.62E-02	4.97E-04	3.77E-04	0	6.21E-03	3.00E-06	0	1.30E-05	7.47E-05	**9.55E-02**
RPR_M	MJ, NCV	0	0	0	0	0	0	0	0	0	0	0	**0**
RPR_{total}	MJ, NCV	6.20E-02	6.84E-05	2.62E-02	4.97E-04	3.77E-04	0	6.21E-03	3.00E-06	0	1.30E-05	7.47E-05	**9.55E-02**
$NRPR_E$	MJ, NCV	2.46E+00	4.47E-02	1.82E+00	3.25E-01	2.46E-01	0	2.46E-01	3.41E-04	0	7.21E-03	8.50E-03	**5.16E+00**
$NRPR_M$	MJ, NCV	9.95E-01	0	0	0	0	0	9.95E-02	0	0	0	0	**1.09E+00**
$NRPR_{total}$	MJ, NCV	3.46E+00	4.47E-02	1.82E+00	3.25E-01	2.46E-01	0	3.46E-01	3.41E-04	0	7.21E-03	8.50E-03	**6.25E+00**
ADP	MJ	0	2.20E+00	4.19E-02	1.66E+00	3.05E-01	2.31E-01	0	2.20E-01	3.17E-04	0	6.77E-03	**4.66E+00**
SM	kg	0	0	0	0	0	0	0	0	0	0	0	**0**
RSF	MJ, NCV	0	0	0	0	0	0	0	0	0	0	0	**0**
NRSF	MJ, NCV	0	0	0	0	0	0	0	0	0	0	0	**0**
RE	MJ, NCV	0	0	0	0	0	0	0	0	0	0	0	**0**
FW	m^3	2.36E-01	3.32E-04	1.40E-01	2.41E-03	1.83E-03	0	2.36E-02	1.99E-05	0	5.66E-05	4.95E-04	**4.04E-01**
Output flows and waste category indicators													
HWD	kg	2.93E-03	9.76E-06	1.06E-03	7.09E-05	5.38E-05	0	2.93E-04	1.52E-07	0	2.77E-07	3.78E-06	**4.42E-03**
NHWD	kg	1.91E-02	3.86E-05	2.32E-01	2.81E-04	2.13E-04	0	8.84E-03	6.93E-03	0	6.01E-06	1.73E-01	**4.40E-01**
HLRW	kg	2.04E-07	5.15E-10	1.56E-07	3.72E-09	2.82E-09	0	2.05E-08	1.59E-11	0	9.20E-11	3.97E-10	**3.88E-07**
ILLRW	kg	6.91E-07	1.01E-09	3.93E-07	7.28E-09	5.52E-09	0	6.91E-08	3.69E-11	0	2.10E-10	9.18E-10	**1.17E-06**
CRU	kg	0	0	0	0	0	0	0	0	0	0	0	**0**
MR	kg	4.27E-04	0	0	0	4.07E-03	0	0	0	0	0	0	**4.50E-03**
MER	kg	0	0	0	0	0	0	0	0	0	0	0	**0**
EE	MJ	0	0	0	0	0	0	0	0	0	0	0	**0**
Carbon emissions and removals													
BCRP	kg CO_2	0	0	0	0	0	0	0	0	0	0	0	**0**
BCEP	kg CO_2	0	0	0	0	0	0	0	0	0	0	0	**0**
BCRK	kg CO_2	-1.08E-03	0	-7.49E-03	0	0	0	0	0	0	0	0	**-8.57E-03**
BCEK	kg CO_2	0	0	1.08E-03	0	0	0	7.49E-03	0	0	0	0	**8.57E-03**
CBCEW	kg CO_2	0	0	0	0	0	0	0	0	0	0	0	**0**
CCE	kg CO_2	0	0	0	0	0	0	0	0	0	0	0	**0**
CCR	kg CO_2	0	0	0	0	0	0	0	0	0	0	0	**0**
CWNR	kg CO_2	0	0	0	0	0	0	0	0	0	0	0	**0**

5.2.1.3. Fort Worth, Texas

Table 27. Resource use and waste flows for VOCOMP-20 per declared unit (1m^2) at Fort Worth, Texas

Parameters	Unit	Stage 1 - Product Stage			Stage 2 - Design & Construction Stage			Stage 3 - Use & Maintenance Stage			Stage 4 - End-of-Life Stage		Total
		1-1	1-2	1-3	2-1	2-2	2-3	3-1	3-2	3-3	4-1	4-2	
Resource use indicators													
RPR_E	MJ, NCV	6.20E-02	2.50E-04	2.03E-02	2.31E-04	3.77E-04	0	6.21E-03	3.00E-06	0	1.30E-05	7.47E-05	**8.95E-02**
RPR_M	MJ, NCV	0	0	0	0	0	0	0	0	0	0	0	**0**
RPR_{total}	MJ, NCV	6.20E-02	2.50E-04	2.03E-02	2.31E-04	3.77E-04	0	6.21E-03	3.00E-06	0	1.30E-05	7.47E-05	**8.95E-02**
$NRPR_E$	MJ, NCV	2.46E+00	1.63E-01	2.99E-01	1.51E-01	2.46E-01	0	2.46E-01	3.41E-04	0	7.21E-03	8.50E-03	**3.58E+00**
$NRPR_M$	MJ, NCV	9.95E-01	0	0	0	0	0	9.95E-02	0	0	0	0	**1.09E+00**
$NRPR_{total}$	MJ, NCV	3.46E+00	1.63E-01	2.99E-01	1.51E-01	2.46E-01	0	3.46E-01	3.41E-04	0	7.21E-03	8.50E-03	**4.68E+00**
ADP	MJ	0	2.20E+00	1.53E-01	2.61E-01	1.42E-01	2.31E-01	0	2.20E-01	3.17E-04	0	6.77E-03	**3.21E+00**
SM	kg	0	0	0	0	0	0	0	0	0	0	0	**0**
RSF	MJ, NCV	0	0	0	0	0	0	0	0	0	0	0	**0**
NRSF	MJ, NCV	0	0	0	0	0	0	0	0	0	0	0	**0**
RE	MJ, NCV	0	0	0	0	0	0	0	0	0	0	0	**0**
FW	m^3	2.36E-01	1.21E-03	5.47E-02	1.12E-03	1.83E-03	0	2.36E-02	1.99E-05	0	5.66E-05	4.95E-04	**3.19E-01**
Output flows and waste category indicators													
HWD	kg	2.93E-03	3.57E-05	4.29E-04	3.30E-05	5.38E-05	0	2.93E-04	1.52E-07	0	2.77E-07	3.78E-06	**3.78E-03**
NHWD	kg	1.91E-02	1.41E-04	6.60E-03	1.31E-04	2.13E-04	0	8.84E-03	6.93E-03	0	6.01E-06	1.73E-01	**2.15E-01**
HLRW	kg	2.04E-07	1.88E-09	4.21E-08	1.73E-09	2.82E-09	0	2.05E-08	1.59E-11	0	9.20E-11	3.97E-10	**2.74E-07**
ILLRW	kg	6.91E-07	3.68E-09	1.58E-07	3.39E-09	5.52E-09	0	6.91E-08	3.69E-11	0	2.10E-10	9.18E-10	**9.32E-07**
CRU	kg	0	0	0	0	0	0	0	0	0	0	0	**0**
MR	kg	4.27E-04	0	0	0	4.07E-03	0	0	0	0	0	0	**4.50E-03**
MER	kg	0	0	0	0	0	0	0	0	0	0	0	**0**
EE	MJ	0	0	0	0	0	0	0	0	0	0	0	**0**
Carbon emissions and removals													
BCRP	kg CO_2	0	0	0	0	0	0	0	0	0	0	0	**0**
BCEP	kg CO_2	0	0	0	0	0	0	0	0	0	0	0	**0**
BCRK	kg CO_2	-1.08E-03	0	-7.49E-03	0	0	0	0	0	0	0	0	**-8.57E-03**
BCEK	kg CO_2	0	0	1.08E-03	0	0	0	7.49E-03	0	0	0	0	**8.57E-03**
CBCEW	kg CO_2	0	0	0	0	0	0	0	0	0	0	0	**0**
CCE	kg CO_2	0	0	0	0	0	0	0	0	0	0	0	**0**
CCR	kg CO_2	0	0	0	0	0	0	0	0	0	0	0	**0**
CWNR	kg CO_2	0	0	0	0	0	0	0	0	0	0	0	**0**

5.2.1.4. Goodyear, Arizona

Table 28. Resource use and waste flows for VOCOMP-20 per declared unit (1m^2) at Goodyear, Arizona

Parameters	Unit	Stage 1 - Product Stage			Stage 2 - Design & Construction Stage			Stage 3 - Use & Maintenance Stage			Stage 4 - End-of-Life Stage		Total
		1-1	1-2	1-3	2-1	2-2	2-3	3-1	3-2	3-3	4-1	4-2	
Resource use indicators													
RPR_E	MJ, NCV	6.20E-02	2.76E-04	3.88E-02	3.21E-04	3.77E-04	0	6.21E-03	3.00E-06	0	1.30E-05	7.47E-05	**1.08E-01**
RPR_M	MJ, NCV	0	0	0	0	0	0	0	0	0	0	0	**0**
RPR_{total}	MJ, NCV	6.20E-02	2.76E-04	3.88E-02	3.21E-04	3.77E-04	0	6.21E-03	3.00E-06	0	1.30E-05	7.47E-05	**1.08E-01**
$NRPR_E$	MJ, NCV	2.46E+00	1.80E-01	6.12E-01	2.10E-01	2.46E-01	0	2.46E-01	3.41E-04	0	7.21E-03	8.50E-03	**3.97E+00**
$NRPR_M$	MJ, NCV	9.95E-01	0	0	0	0	0	9.95E-02	0	0	0	0	**1.09E+00**
$NRPR_{total}$	MJ, NCV	3.46E+00	1.80E-01	6.12E-01	2.10E-01	2.46E-01	0	3.46E-01	3.41E-04	0	7.21E-03	8.50E-03	**5.07E+00**
ADP	MJ	0	2.20E+00	1.69E-01	4.31E-01	1.97E-01	2.31E-01	0	2.20E-01	3.17E-04	0	6.77E-03	**3.45E+00**
SM	kg	0	0	0	0	0	0	0	0	0	0	0	**0**
RSF	MJ, NCV	0	0	0	0	0	0	0	0	0	0	0	**0**
NRSF	MJ, NCV	0	0	0	0	0	0	0	0	0	0	0	**0**
RE	MJ, NCV	0	0	0	0	0	0	0	0	0	0	0	**0**
FW	m^3	2.36E-01	1.34E-03	1.21E-01	1.56E-03	1.83E-03	0	2.36E-02	1.99E-05	0	5.66E-05	4.95E-04	**3.85E-01**
Output flows and waste category indicators													
HWD	kg	2.93E-03	3.94E-05	5.05E-04	4.58E-05	5.38E-05	0	2.93E-04	1.52E-07	0	2.77E-07	3.78E-06	**3.87E-03**
NHWD	kg	1.91E-02	1.56E-04	9.53E-03	1.81E-04	2.13E-04	0	8.84E-03	6.93E-03	0	6.01E-06	1.73E-01	**2.18E-01**
HLRW	kg	2.04E-07	2.08E-09	4.95E-08	2.40E-09	2.82E-09	0	2.05E-08	1.59E-11	0	9.20E-11	3.97E-10	**2.82E-07**
ILLRW	kg	6.91E-07	4.07E-09	1.35E-06	4.70E-09	5.52E-09	0	6.91E-08	3.69E-11	0	2.10E-10	9.18E-10	**2.13E-06**
CRU	kg	0	0	0	0	0	0	0	0	0	0	0	**0**
MR	kg	4.27E-04	0	0	0	4.07E-03	0	0	0	0	0	0	**4.50E-03**
MER	kg	0	0	0	0	0	0	0	0	0	0	0	**0**
EE	MJ	0	0	0	0	0	0	0	0	0	0	0	**0**
Carbon emissions and removals													
BCRP	kg CO_2	0	0	0	0	0	0	0	0	0	0	0	**0**
BCEP	kg CO_2	0	0	0	0	0	0	0	0	0	0	0	**0**
BCRK	kg CO_2	-1.08E-03	0	-7.49E-03	0	0	0	0	0	0	0	0	**-8.57E-03**
BCEK	kg CO_2	0	0	1.08E-03	0	0	0	7.49E-03	0	0	0	0	**8.57E-03**
CBCEW	kg CO_2	0	0	0	0	0	0	0	0	0	0	0	**0**
CCE	kg CO_2	0	0	0	0	0	0	0	0	0	0	0	**0**
CCR	kg CO_2	0	0	0	0	0	0	0	0	0	0	0	**0**
CWNR	kg CO_2	0	0	0	0	0	0	0	0	0	0	0	**0**

5.2.1.5. Hampshire, Illinois

Table 29. Resource use and waste flows for VOCOMP-20 per declared unit (1m^2) at Hampshire, Illinois

Parameters	Unit	Stage 1 - Product Stage			Stage 2 - Design & Construction Stage			Stage 3 - Use & Maintenance Stage			Stage 4 - End-of-Life Stage		Total
		1-1	1-2	1-3	2-1	2-2	2-3	3-1	3-2	3-3	4-1	4-2	
Resource use indicators													
RPR_E	MJ, NCV	6.20E-02	6.84E-05	1.85E-02	1.89E-04	3.77E-04	0	6.21E-03	3.00E-06	0	1.30E-05	7.47E-05	**8.74E-02**
RPR_M	MJ, NCV	0	0	0	0	0	0	0	0	0	0	0	**0**
RPR_{total}	MJ, NCV	6.20E-02	6.84E-05	1.85E-02	1.89E-04	3.77E-04	0	6.21E-03	3.00E-06	0	1.30E-05	7.47E-05	**8.74E-02**
$NRPR_E$	MJ, NCV	2.46E+00	4.47E-02	4.42E-01	1.23E-01	2.46E-01	0	2.46E-01	3.41E-04	0	7.21E-03	8.50E-03	**3.58E+00**
$NRPR_M$	MJ, NCV	9.95E-01	0	0	0	0	0	9.95E-02	0	0	0	0	**1.09E+00**
$NRPR_{total}$	MJ, NCV	3.46E+00	4.47E-02	4.42E-01	1.23E-01	2.46E-01	0	3.46E-01	3.41E-04	0	7.21E-03	8.50E-03	**4.67E+00**
ADP	MJ	0	2.20E+00	4.19E-02	3.59E-01	1.16E-01	2.31E-01	0	2.20E-01	3.17E-04	0	6.77E-03	**3.17E+00**
SM	kg	0	0	0	0	0	0	0	0	0	0	0	**0**
RSF	MJ, NCV	0	0	0	0	0	0	0	0	0	0	0	**0**
NRSF	MJ, NCV	0	0	0	0	0	0	0	0	0	0	0	**0**
RE	MJ, NCV	0	0	0	0	0	0	0	0	0	0	0	**0**
FW	m^3	2.36E-01	3.32E-04	5.14E-02	9.14E-04	1.83E-03	0	2.36E-02	1.99E-05	0	5.66E-05	4.95E-04	**3.14E-01**
Output flows and waste category indicators													
HWD	kg	2.93E-03	9.76E-06	3.63E-04	2.69E-05	5.38E-05	0	2.93E-04	1.52E-07	0	2.77E-07	3.78E-06	**3.68E-03**
NHWD	kg	1.91E-02	3.86E-05	5.60E-03	1.06E-04	2.13E-04	0	8.84E-03	6.93E-03	0	6.01E-06	1.73E-01	**2.13E-01**
HLRW	kg	2.04E-07	5.15E-10	3.57E-08	1.41E-09	2.82E-09	0	2.05E-08	1.59E-11	0	9.20E-11	3.97E-10	**2.66E-07**
ILLRW	kg	6.91E-07	1.01E-09	5.04E-07	2.76E-09	5.52E-09	0	6.91E-08	3.69E-11	0	2.10E-10	9.18E-10	**1.27E-06**
CRU	kg	0	0	0	0	0	0	0	0	0	0	0	**0**
MR	kg	4.27E-04	0	0	0	4.07E-03	0	0	0	0	0	0	**4.50E-03**
MER	kg	0	0	0	0	0	0	0	0	0	0	0	**0**
EE	MJ	0	0	0	0	0	0	0	0	0	0	0	**0**
Carbon emissions and removals													
BCRP	kg CO_2	0	0	0	0	0	0	0	0	0	0	0	**0**
BCEP	kg CO_2	0	0	0	0	0	0	0	0	0	0	0	**0**
BCRK	kg CO_2	-1.08E-03	0	-7.49E-03	0	0	0	0	0	0	0	0	**-8.57E-03**
BCEK	kg CO_2	0	0	1.08E-03	0	0	0	7.49E-03	0	0	0	0	**8.57E-03**
CBCEW	kg CO_2	0	0	0	0	0	0	0	0	0	0	0	**0**
CCE	kg CO_2	0	0	0	0	0	0	0	0	0	0	0	**0**
CCR	kg CO_2	0	0	0	0	0	0	0	0	0	0	0	**0**
CWNR	kg CO_2	0	0	0	0	0	0	0	0	0	0	0	**0**

5.2.1.6. York, Pennsylvania

Table 30. Resource use and waste flows for VOCOMP-20 per declared unit (1m^2) at York, Pennsylvania

Parameters	Unit	Stage 1 - Product Stage			Stage 2 - Design & Construction Stage			Stage 3 - Use & Maintenance Stage			Stage 4 - End-of-Life Stage		Total
		1-1	1-2	1-3	2-1	2-2	2-3	3-1	3-2	3-3	4-1	4-2	
Resource use indicators													
RPR_E	MJ, NCV	6.20E-02	1.40E-04	1.54E-02	1.08E-04	3.77E-04	0	6.21E-03	3.00E-06	0	1.30E-05	7.47E-05	**8.44E-02**
RPR_M	MJ, NCV	0	0	0	0	0	0	0	0	0	0	0	**0**
RPR_{total}	MJ, NCV	6.20E-02	1.40E-04	1.54E-02	1.08E-04	3.77E-04	0	6.21E-03	3.00E-06	0	1.30E-05	7.47E-05	**8.44E-02**
$NRPR_E$	MJ, NCV	2.46E+00	9.13E-02	2.97E-01	7.04E-02	2.46E-01	0	2.46E-01	3.41E-04	0	7.21E-03	8.50E-03	**3.43E+00**
$NRPR_M$	MJ, NCV	9.95E-01	0	0	0	0	0	9.95E-02	0	0	0	0	**1.09E+00**
$NRPR_{total}$	MJ, NCV	3.46E+00	9.13E-02	2.97E-01	7.04E-02	2.46E-01	0	3.46E-01	3.41E-04	0	7.21E-03	8.50E-03	**4.52E+00**
ADP	MJ	0	2.20E+00	8.57E-02	2.17E-01	6.61E-02	2.31E-01	0	2.20E-01	3.17E-04	0	6.77E-03	**3.02E+00**
SM	kg	0	0	0	0	0	0	0	0	0	0	0	**0**
RSF	MJ, NCV	0	0	0	0	0	0	0	0	0	0	0	**0**
NRSF	MJ, NCV	0	0	0	0	0	0	0	0	0	0	0	**0**
RE	MJ, NCV	0	0	0	0	0	0	0	0	0	0	0	**0**
FW	m^3	2.36E-01	6.78E-04	6.82E-02	5.22E-04	1.83E-03	0	2.36E-02	1.99E-05	0	5.66E-05	4.95E-04	**3.31E-01**
Output flows and waste category indicators													
HWD	kg	2.93E-03	1.99E-05	5.05E-04	1.54E-05	5.38E-05	0	2.93E-04	1.52E-07	0	2.77E-07	3.78E-06	**3.82E-03**
NHWD	kg	1.91E-02	7.89E-05	7.75E-03	6.08E-05	2.13E-04	0	8.84E-03	6.93E-03	0	6.01E-06	1.73E-01	**2.16E-01**
HLRW	kg	2.04E-07	1.06E-09	4.95E-08	8.06E-10	2.82E-09	0	2.05E-08	1.59E-11	0	9.20E-11	3.97E-10	**2.80E-07**
ILLRW	kg	6.91E-07	2.07E-09	6.04E-07	1.58E-09	5.52E-09	0	6.91E-08	3.69E-11	0	2.10E-10	9.18E-10	**1.37E-06**
CRU	kg	0	0	0	0	0	0	0	0	0	0	0	**0**
MR	kg	4.27E-04	0	0	0	4.07E-03	0	0	0	0	0	0	**4.50E-03**
MER	kg	0	0	0	0	0	0	0	0	0	0	0	**0**
EE	MJ	0	0	0	0	0	0	0	0	0	0	0	**0**
Carbon emissions and removals													
BCRP	kg CO_2	0	0	0	0	0	0	0	0	0	0	0	**0**
BCEP	kg CO_2	0	0	0	0	0	0	0	0	0	0	0	**0**
BCRK	kg CO_2	-1.08E-03	0	-7.49E-03	0	0	0	0	0	0	0	0	**-8.57E-03**
BCEK	kg CO_2	0	0	1.08E-03	0	0	0	7.49E-03	0	0	0	0	**8.57E-03**
CBCEW	kg CO_2	0	0	0	0	0	0	0	0	0	0	0	**0**
CCE	kg CO_2	0	0	0	0	0	0	0	0	0	0	0	**0**
CCR	kg CO_2	0	0	0	0	0	0	0	0	0	0	0	**0**
CWNR	kg CO_2	0	0	0	0	0	0	0	0	0	0	0	**0**

5.2.1.7. Milton, Canada

Table 31. Resource use and waste flows for VOCOMP-20 per declared unit (1m^2) at Milton, Ontario, Canada

Parameters	Unit	Stage 1 - Product Stage			Stage 2 - Design & Construction Stage			Stage 3 - Use & Maintenance Stage			Stage 4 - End-of-Life Stage		Total
		1-1	1-2	1-3	2-1	2-2	2-3	3-1	3-2	3-3	4-1	4-2	
Resource use indicators													
RPR_E	MJ, NCV	6.20E-02	2.76E-04	2.15E-02	5.51E-04	3.77E-04	0	6.21E-03	3.00E-06	0	1.30E-05	7.47E-05	**9.11E-02**
RPR_M	MJ, NCV	0	0	0	0	0	0	0	0	0	0	0	**0**
RPR_{total}	MJ, NCV	6.20E-02	2.76E-04	2.15E-02	5.51E-04	3.77E-04	0	6.21E-03	3.00E-06	0	1.30E-05	7.47E-05	**9.11E-02**
$NRPR_E$	MJ, NCV	2.46E+00	1.80E-01	2.50E-01	3.59E-01	2.46E-01	0	2.46E-01	3.41E-04	0	7.21E-03	8.50E-03	**3.76E+00**
$NRPR_M$	MJ, NCV	9.95E-01	0	0	0	0	0	9.95E-02	0	0	0	0	**1.09E+00**
$NRPR_{total}$	MJ, NCV	3.46E+00	1.80E-01	2.50E-01	3.59E-01	2.46E-01	0	3.46E-01	3.41E-04	0	7.21E-03	8.50E-03	**4.86E+00**
ADP	MJ	0	2.20E+00	1.69E-01	1.62E-01	3.37E-01	2.31E-01	0	2.20E-01	3.17E-04	0	6.77E-03	**3.32E+00**
SM	kg	0	0	0	0	0	0	0	0	0	0	0	**0**
RSF	MJ, NCV	0	0	0	0	0	0	0	0	0	0	0	**0**
NRSF	MJ, NCV	0	0	0	0	0	0	0	0	0	0	0	**0**
RE	MJ, NCV	0	0	0	0	0	0	0	0	0	0	0	**0**
FW	m^3	2.36E-01	1.34E-03	1.25E-01	2.67E-03	1.83E-03	0	2.36E-02	1.99E-05	0	5.66E-05	4.95E-04	**3.90E-01**
Output flows and waste category indicators													
HWD	kg	2.93E-03	3.94E-05	4.75E-04	7.85E-05	5.38E-05	0	2.93E-04	1.52E-07	0	2.77E-07	3.78E-06	**3.88E-03**
NHWD	kg	1.91E-02	1.56E-04	7.29E-03	3.11E-04	2.13E-04	0	8.84E-03	6.93E-03	0	6.01E-06	1.73E-01	**2.15E-01**
HLRW	kg	2.04E-07	2.08E-09	4.66E-08	4.11E-09	2.82E-09	0	2.05E-08	1.59E-11	0	9.20E-11	3.97E-10	**2.81E-07**
ILLRW	kg	6.91E-07	4.07E-09	7.26E-07	8.05E-09	5.52E-09	0	6.91E-08	3.69E-11	0	2.10E-10	9.18E-10	**1.50E-06**
CRU	kg	0	0	0	0	0	0	0	0	0	0	0	**0**
MR	kg	4.27E-04	0	0	0	4.07E-03	0	0	0	0	0	0	**4.50E-03**
MER	kg	0	0	0	0	0	0	0	0	0	0	0	**0**
EE	MJ	0	0	0	0	0	0	0	0	0	0	0	**0**
Carbon emissions and removals													
BCRP	kg CO_2	0	0	0	0	0	0	0	0	0	0	0	**0**
BCEP	kg CO_2	0	0	0	0	0	0	0	0	0	0	0	**0**
BCRK	kg CO_2	-1.08E-03	0	-7.49E-03	0	0	0	0	0	0	0	0	**-8.57E-03**
BCEK	kg CO_2	0	0	1.08E-03	0	0	0	7.49E-03	0	0	0	0	**8.57E-03**
CBCEW	kg CO_2	0	0	0	0	0	0	0	0	0	0	0	**0**
CCE	kg CO_2	0	0	0	0	0	0	0	0	0	0	0	**0**
CCR	kg CO_2	0	0	0	0	0	0	0	0	0	0	0	**0**
CWNR	kg CO_2	0	0	0	0	0	0	0	0	0	0	0	**0**

5.2.1.8. Sherwood, Alberta, Canada

Table 32. Resource use and waste flows for VOCOMP-20 per declared unit (1m^2) at Sherwood, Alberta, Canada

Parameters	Unit	Stage 1 - Product Stage			Stage 2 - Design & Construction Stage			Stage 3 - Use & Maintenance Stage			Stage 4 - End-of-Life Stage		Total
		1-1	1-2	1-3	2-1	2-2	2-3	3-1	3-2	3-3	4-1	4-2	
Resource use indicators													
RPR_E	MJ, NCV	6.20E-02	1.05E-03	3.39E-02	9.07E-05	3.77E-04	0	6.21E-03	3.00E-06	0	1.30E-05	7.47E-05	**1.04E-01**
RPR_M	MJ, NCV	0	0	0	0	0	0	0	0	0	0	0	**0**
RPR_{total}	MJ, NCV	6.20E-02	1.05E-03	3.39E-02	9.07E-05	3.77E-04	0	6.21E-03	3.00E-06	0	1.30E-05	7.47E-05	**1.04E-01**
$NRPR_E$	MJ, NCV	2.46E+00	6.84E-01	6.69E-01	5.92E-02	2.46E-01	0	2.46E-01	3.41E-04	0	7.21E-03	8.50E-03	**4.38E+00**
$NRPR_M$	MJ, NCV	9.95E-01	0	0	0	0	0	9.95E-02	0	0	0	0	**1.09E+00**
$NRPR_{total}$	MJ, NCV	3.46E+00	6.84E-01	6.69E-01	5.92E-02	2.46E-01	0	3.46E-01	3.41E-04	0	7.21E-03	8.50E-03	**5.48E+00**
ADP	MJ	0	2.20E+00	6.42E-01	6.08E-01	5.55E-02	2.31E-01	0	2.20E-01	3.17E-04	0	6.77E-03	**3.96E+00**
SM	kg	0	0	0	0	0	0	0	0	0	0	0	**0**
RSF	MJ, NCV	0	0	0	0	0	0	0	0	0	0	0	**0**
NRSF	MJ, NCV	0	0	0	0	0	0	0	0	0	0	0	**0**
RE	MJ, NCV	0	0	0	0	0	0	0	0	0	0	0	**0**
FW	m^3	2.36E-01	5.08E-03	1.13E-01	4.39E-04	1.83E-03	0	2.36E-02	1.99E-05	0	5.66E-05	4.95E-04	**3.80E-01**
Output flows and waste category indicators													
HWD	kg	2.93E-03	1.49E-04	4.90E-04	1.29E-05	5.38E-05	0	2.93E-04	1.52E-07	0	2.77E-07	3.78E-06	**3.93E-03**
NHWD	kg	1.91E-02	5.91E-04	7.52E-03	5.11E-05	2.13E-04	0	8.84E-03	6.93E-03	0	6.01E-06	1.73E-01	**2.16E-01**
HLRW	kg	2.04E-07	2.08E-09	4.66E-08	4.11E-09	2.82E-09	0	2.05E-08	1.59E-11	0	9.20E-11	3.97E-10	**2.81E-07**
ILLRW	kg	6.91E-07	4.07E-09	7.26E-07	8.05E-09	5.52E-09	0	6.91E-08	3.69E-11	0	2.10E-10	9.18E-10	**1.50E-06**
CRU	kg	0	0	0	0	0	0	0	0	0	0	0	**0**
MR	kg	4.27E-04	0	0	0	4.07E-03	0	0	0	0	0	0	**4.50E-03**
MER	kg	0	0	0	0	0	0	0	0	0	0	0	**0**
EE	MJ	0	0	0	0	0	0	0	0	0	0	0	**0**
Carbon emissions and removals													
BCRP	kg CO_2	0	0	0	0	0	0	0	0	0	0	0	**0**
BCEP	kg CO_2	0	0	0	0	0	0	0	0	0	0	0	**0**
BCRK	kg CO_2	-1.08E-03	0	-7.49E-03	0	0	0	0	0	0	0	0	**-8.57E-03**
BCEK	kg CO_2	0	0	1.08E-03	0	0	0	7.49E-03	0	0	0	0	**8.57E-03**
CBCEW	kg CO_2	0	0	0	0	0	0	0	0	0	0	0	**0**
CCE	kg CO_2	0	0	0	0	0	0	0	0	0	0	0	**0**
CCR	kg CO_2	0	0	0	0	0	0	0	0	0	0	0	**0**
CWNR	kg CO_2	0	0	0	0	0	0	0	0	0	0	0	**0**

5.2.2. VOCOMP-25

5.2.2.1. Benicia, California

Table 33. Resource use and waste flows for VOCOMP-25 per declared unit (1m^2) at Benicia, California

Parameters	Unit	Stage 1 - Product Stage			Stage 2 - Design & Construction Stage			Stage 3 - Use & Maintenance Stage			Stage 4 - End-of-Life Stage		Total
		1-1	1-2	1-3	2-1	2-2	2-3	3-1	3-2	3-3	4-1	4-2	
Resource use indicators													
RPR_E	MJ, NCV	9.18E-02	6.20E-04	3.66E-01	2.25E-04	2.83E-04	0	9.18E-03	3.00E-06	0	3.91E-05	5.60E-05	**4.68E-01**
RPR_M	MJ, NCV	0	0	0	0	0	0	0	0	0	0	0	**0**
RPR_{total}	MJ, NCV	9.18E-02	6.20E-04	3.66E-01	2.25E-04	2.83E-04	0	9.18E-03	3.00E-06	0	3.91E-05	5.60E-05	**4.68E-01**
$NRPR_E$	MJ, NCV	3.92E+00	4.05E-01	1.84E+00	1.47E-01	1.85E-01	0	3.92E-01	3.41E-04	0	2.17E-02	6.38E-03	**6.92E+00**
$NRPR_M$	MJ, NCV	1.55E+00	0	0	0	0	0	1.55E-01	0	0	0	0	**1.70E+00**
$NRPR_{total}$	MJ, NCV	5.47E+00	4.05E-01	1.84E+00	1.47E-01	1.85E-01	0	5.47E-01	3.41E-04	0	2.17E-02	6.38E-03	**8.62E+00**
ADP	MJ	0	3.50E+00	3.80E-01	1.40E+00	1.38E-01	1.74E-01	0	3.50E-01	3.17E-04	0	2.04E-02	**5.96E+00**
SM	kg	0	0	0	0	0	0	0	0	0	0	0	**0**
RSF	MJ, NCV	0	0	0	0	0	0	0	0	0	0	0	**0**
NRSF	MJ, NCV	0	0	0	0	0	0	0	0	0	0	0	**0**
RE	MJ, NCV	0	0	0	0	0	0	0	0	0	0	0	**0**
FW	m^3	3.62E-01	3.01E-03	5.81E-01	1.09E-03	1.37E-03	0	3.62E-02	1.99E-05	0	1.70E-04	3.71E-04	**9.86E-01**
Output flows and waste category indicators													
HWD	kg	4.52E-03	8.84E-05	2.21E-05	3.20E-05	4.04E-05	0	4.52E-04	1.52E-07	0	8.33E-07	2.83E-06	**5.16E-03**
NHWD	kg	4.05E-02	3.50E-04	5.50E-03	1.27E-04	1.60E-04	0	9.25E-03	6.93E-03	0	1.81E-05	1.29E-01	**1.92E-01**
HLRW	kg	3.11E-07	4.63E-09	3.25E-09	1.68E-09	2.12E-09	0	3.11E-08	1.59E-11	0	2.77E-10	2.98E-10	**3.54E-07**
ILLRW	kg	1.06E-06	9.08E-09	2.87E-06	3.29E-09	4.14E-09	0	1.06E-07	3.69E-11	0	6.34E-10	6.89E-10	**4.05E-06**
CRU	kg	0	0	0	0	0	0	0	0	0	0	0	**0**
MR	kg	2.10E-04	0	0	0	3.05E-03	0	0	0	0	0	0	**3.26E-03**
MER	kg	0	0	0	0	0	0	0	0	0	0	0	**0**
EE	MJ	0	0	0	0	0	0	0	0	0	0	0	**0**
Carbon emissions and removals													
BCRP	kg CO_2	0	0	0	0	0	0	0	0	0	0	0	**0**
BCEP	kg CO_2	0	0	0	0	0	0	0	0	0	0	0	**0**
BCRK	kg CO_2	-3.77E-03	0	-5.60E-03	0	0	0	0	0	0	0	0	**-9.37E-03**
BCEK	kg CO_2	0	0	3.77E-03	0	0	0	5.60E-03	0	0	0	0	**9.37E-03**
CBCEW	kg CO_2	0	0	0	0	0	0	0	0	0	0	0	**0**
CCE	kg CO_2	0	0	0	0	0	0	0	0	0	0	0	**0**
CCR	kg CO_2	0	0	0	0	0	0	0	0	0	0	0	**0**
CWNR	kg CO_2	0	0	0	0	0	0	0	0	0	0	0	**0**

5.2.2.2. Cartersville, Georgia

Table 34. Resource use and waste flows for VOCOMP-25 per declared unit (1m^2) at Cartersville, Georgia

Parameters	Unit	Stage 1 - Product Stage			Stage 2 - Design & Construction Stage			Stage 3 - Use & Maintenance Stage			Stage 4 - End-of-Life Stage		Total
		1-1	1-2	1-3	2-1	2-2	2-3	3-1	3-2	3-3	4-1	4-2	
Resource use indicators													
RPR_E	MJ, NCV	9.18E-02	1.08E-04	4.37E-03	5.66E-05	2.83E-04	0	9.18E-03	3.00E-06	0	3.91E-05	5.60E-05	**1.06E-01**
RPR_M	MJ, NCV	0	0	0	0	0	0	0	0	0	0	0	**0**
RPR_{total}	MJ, NCV	9.18E-02	1.08E-04	4.37E-03	5.66E-05	2.83E-04	0	9.18E-03	3.00E-06	0	3.91E-05	5.60E-05	**1.06E-01**
$NRPR_E$	MJ, NCV	3.92E+00	7.04E-02	1.33E-01	3.70E-02	1.85E-01	0	3.92E-01	3.41E-04	0	2.17E-02	6.38E-03	**4.76E+00**
$NRPR_M$	MJ, NCV	1.55E+00	0	0	0	0	0	1.55E-01	0	0	0	0	**1.70E+00**
$NRPR_{total}$	MJ, NCV	5.47E+00	7.04E-02	1.33E-01	3.70E-02	1.85E-01	0	5.47E-01	3.41E-04	0	2.17E-02	6.38E-03	**6.47E+00**
ADP	MJ	0	3.50E+00	6.61E-02	1.10E-01	3.47E-02	1.74E-01	0	3.50E-01	3.17E-04	0	2.04E-02	**4.25E+00**
SM	kg	0	0	0	0	0	0	0	0	0	0	0	**0**
RSF	MJ, NCV	0	0	0	0	0	0	0	0	0	0	0	**0**
NRSF	MJ, NCV	0	0	0	0	0	0	0	0	0	0	0	**0**
RE	MJ, NCV	0	0	0	0	0	0	0	0	0	0	0	**0**
FW	m^3	3.62E-01	5.23E-04	9.40E-03	2.74E-04	1.37E-03	0	3.62E-02	1.99E-05	0	1.70E-04	3.71E-04	**4.11E-01**
Output flows and waste category indicators													
HWD	kg	4.52E-03	1.54E-05	4.38E-05	8.08E-06	4.04E-05	0	4.52E-04	1.52E-07	0	8.33E-07	2.83E-06	**5.08E-03**
NHWD	kg	4.05E-02	6.09E-05	5.61E-03	3.20E-05	1.60E-04	0	9.25E-03	6.93E-03	0	1.81E-05	1.29E-01	**1.92E-01**
HLRW	kg	7.68E-07	1.56E-09	1.52E-07	8.20E-10	4.10E-09	0	7.68E-08	3.65E-11	0	6.27E-10	6.83E-10	**1.00E-06**
ILLRW	kg	6.05E-07	8.23E-10	3.98E-08	4.32E-10	2.16E-09	0	6.05E-08	1.63E-11	0	2.83E-10	3.04E-10	**7.09E-07**
CRU	kg	0	0	0	0	0	0	0	0	0	0	0	**0**
MR	kg	2.10E-04	0	0	0	3.05E-03	0	0	0	0	0	0	**3.26E-03**
MER	kg	0	0	0	0	0	0	0	0	0	0	0	**0**
EE	MJ	0	0	0	0	0	0	0	0	0	0	0	**0**
Carbon emissions and removals													
BCRP	kg CO_2	0	0	0	0	0	0	0	0	0	0	0	**0**
BCEP	kg CO_2	0	0	0	0	0	0	0	0	0	0	0	**0**
BCRK	kg CO_2	-3.77E-03	0	-5.60E-03	0	0	0	0	0	0	0	0	**-9.37E-03**
BCEK	kg CO_2	0	0	3.77E-03	0	0	0	5.60E-03	0	0	0	0	**9.37E-03**
CBCEW	kg CO_2	0	0	0	0	0	0	0	0	0	0	0	**0**
CCE	kg CO_2	0	0	0	0	0	0	0	0	0	0	0	**0**
CCR	kg CO_2	0	0	0	0	0	0	0	0	0	0	0	**0**
CWNR	kg CO_2	0	0	0	0	0	0	0	0	0	0	0	**0**

5.2.2.3. Fort Worth, Texas

Table 35. Resource use and waste flows for VOCOMP-25 per declared unit (1m^2) at Fort Worth, Texas

Parameters	Unit	Stage 1 - Product Stage			Stage 2 - Design & Construction Stage			Stage 3 - Use & Maintenance Stage			Stage 4 - End-of-Life Stage		Total
		1-1	1-2	1-3	2-1	2-2	2-3	3-1	3-2	3-3	4-1	4-2	
Resource use indicators													
RPR_E	MJ, NCV	9.18E-02	3.98E-04	7.57E-03	1.25E-04	2.83E-04	0	9.18E-03	3.00E-06	0	3.91E-05	5.60E-05	**1.09E-01**
RPR_M	MJ, NCV	0	0	0	0	0	0	0	0	0	0	0	**0**
RPR_{total}	MJ, NCV	9.18E-02	3.98E-04	7.57E-03	1.25E-04	2.83E-04	0	9.18E-03	3.00E-06	0	3.91E-05	5.60E-05	**1.09E-01**
$NRPR_E$	MJ, NCV	3.92E+00	2.60E-01	1.42E-01	8.18E-02	1.85E-01	0	3.92E-01	3.41E-04	0	2.17E-02	6.38E-03	**5.01E+00**
$NRPR_M$	MJ, NCV	1.55E+00	0	0	0	0	0	1.55E-01	0	0	0	0	**1.70E+00**
$NRPR_{total}$	MJ, NCV	5.47E+00	2.60E-01	1.42E-01	8.18E-02	1.85E-01	0	5.47E-01	3.41E-04	0	2.17E-02	6.38E-03	**6.71E+00**
ADP	MJ	0	3.50E+00	2.44E-01	1.23E-01	7.68E-02	1.74E-01	0	3.50E-01	3.17E-04	0	2.04E-02	**4.49E+00**
SM	kg	0	0	0	0	0	0	0	0	0	0	0	**0**
RSF	MJ, NCV	0	0	0	0	0	0	0	0	0	0	0	**0**
NRSF	MJ, NCV	0	0	0	0	0	0	0	0	0	0	0	**0**
RE	MJ, NCV	0	0	0	0	0	0	0	0	0	0	0	**0**
FW	m^3	2.36E-01	1.21E-03	5.47E-02	1.12E-03	1.83E-03	0	2.36E-02	1.99E-05	0	5.66E-05	4.95E-04	**3.19E-01**
Output flows and waste category indicators													
HWD	kg	2.93E-03	3.57E-05	4.29E-04	3.30E-05	5.38E-05	0	2.93E-04	1.52E-07	0	2.77E-07	3.78E-06	**3.78E-03**
NHWD	kg	1.91E-02	1.41E-04	6.60E-03	1.31E-04	2.13E-04	0	8.84E-03	6.93E-03	0	6.01E-06	1.73E-01	**2.15E-01**
HLRW	kg	3.11E-07	2.97E-09	3.25E-09	9.36E-10	2.12E-09	0	3.11E-08	1.59E-11	0	2.77E-10	2.98E-10	**3.52E-07**
ILLRW	kg	1.06E-06	5.82E-09	8.19E-08	1.83E-09	4.14E-09	0	1.06E-07	3.69E-11	0	6.34E-10	6.89E-10	**1.26E-06**
CRU	kg	0	0	0	0	0	0	0	0	0	0	0	**0**
MR	kg	2.10E-04	0	0	0	3.05E-03	0	0	0	0	0	0	**3.26E-03**
MER	kg	0	0	0	0	0	0	0	0	0	0	0	**0**
EE	MJ	0	0	0	0	0	0	0	0	0	0	0	**0**
Carbon emissions and removals													
BCRP	kg CO_2	0	0	0	0	0	0	0	0	0	0	0	**0**
BCEP	kg CO_2	0	0	0	0	0	0	0	0	0	0	0	**0**
BCRK	kg CO_2	-3.77E-03	0	-5.60E-03	0	0	0	0	0	0	0	0	**-9.37E-03**
BCEK	kg CO_2	0	0	3.77E-03	0	0	0	5.60E-03	0	0	0	0	**9.37E-03**
CBCEW	kg CO_2	0	0	0	0	0	0	0	0	0	0	0	**0**
CCE	kg CO_2	0	0	0	0	0	0	0	0	0	0	0	**0**
CCR	kg CO_2	0	0	0	0	0	0	0	0	0	0	0	**0**
CWNR	kg CO_2	0	0	0	0	0	0	0	0	0	0	0	**0**

5.2.2.4. Goodyear, Arizona

Table 36. Resource use and waste flows for VOCOMP-25 per declared unit (1m^2) at Goodyear, Arizona

Parameters	Unit	Stage 1 - Product Stage			Stage 2 - Design & Construction Stage			Stage 3 - Use & Maintenance Stage			Stage 4 - End-of-Life Stage		Total
		1-1	1-2	1-3	2-1	2-2	2-3	3-1	3-2	3-3	4-1	4-2	
Resource use indicators													
RPR_E	MJ, NCV	9.18E-02	4.51E-04	2.33E-02	1.68E-04	2.83E-04	0	9.18E-03	3.00E-06	0	3.91E-05	5.60E-05	**1.25E-01**
RPR_M	MJ, NCV	0	0	0	0	0	0	0	0	0	0	0	**0**
RPR_{total}	MJ, NCV	9.18E-02	4.51E-04	2.33E-02	1.68E-04	2.83E-04	0	9.18E-03	3.00E-06	0	3.91E-05	5.60E-05	**1.25E-01**
$NRPR_E$	MJ, NCV	3.92E+00	2.94E-01	4.53E-01	1.10E-01	1.85E-01	0	3.92E-01	3.41E-04	0	2.17E-02	6.38E-03	**5.38E+00**
$NRPR_M$	MJ, NCV	1.55E+00	0	0	0	0	0	1.55E-01	0	0	0	0	**1.70E+00**
$NRPR_{total}$	MJ, NCV	5.47E+00	2.94E-01	4.53E-01	1.10E-01	1.85E-01	0	5.47E-01	3.41E-04	0	2.17E-02	6.38E-03	**7.08E+00**
ADP	MJ	0	3.50E+00	2.76E-01	3.19E-01	1.03E-01	1.74E-01	0	3.50E-01	3.17E-04	0	2.04E-02	**4.74E+00**
SM	kg	0	0	0	0	0	0	0	0	0	0	0	**0**
RSF	MJ, NCV	0	0	0	0	0	0	0	0	0	0	0	**0**
NRSF	MJ, NCV	0	0	0	0	0	0	0	0	0	0	0	**0**
RE	MJ, NCV	0	0	0	0	0	0	0	0	0	0	0	**0**
FW	m^3	3.62E-01	2.19E-03	4.79E-02	8.15E-04	1.37E-03	0	3.62E-02	1.99E-05	0	1.70E-04	3.71E-04	**4.51E-01**
Output flows and waste category indicators													
HWD	kg	4.52E-03	6.43E-05	2.21E-05	2.40E-05	4.04E-05	0	4.52E-04	1.52E-07	0	8.33E-07	2.83E-06	**5.13E-03**
NHWD	kg	4.05E-02	2.54E-04	5.50E-03	9.49E-05	1.60E-04	0	9.25E-03	6.93E-03	0	1.81E-05	1.29E-01	**1.92E-01**
HLRW	kg	3.11E-07	8.06E-10	3.25E-09	1.35E-09	2.12E-09	0	3.11E-08	1.59E-11	0	2.77E-10	2.98E-10	**3.50E-07**
ILLRW	kg	1.06E-06	1.58E-09	3.53E-07	2.65E-09	4.14E-09	0	1.06E-07	3.69E-11	0	6.34E-10	6.89E-10	**1.53E-06**
CRU	kg	0	0	0	0	0	0	0	0	0	0	0	**0**
MR	kg	2.10E-04	0	0	0	3.05E-03	0	0	0	0	0	0	**3.26E-03**
MER	kg	0	0	0	0	0	0	0	0	0	0	0	**0**
EE	MJ	0	0	0	0	0	0	0	0	0	0	0	**0**
Carbon emissions and removals													
BCRP	kg CO_2	0	0	0	0	0	0	0	0	0	0	0	**0**
BCEP	kg CO_2	0	0	0	0	0	0	0	0	0	0	0	**0**
BCRK	kg CO_2	-3.77E-03	0	-5.60E-03	0	0	0	0	0	0	0	0	**-9.37E-03**
BCEK	kg CO_2	0	0	3.77E-03	0	0	0	5.60E-03	0	0	0	0	**9.37E-03**
CBCEW	kg CO_2	0	0	0	0	0	0	0	0	0	0	0	**0**
CCE	kg CO_2	0	0	0	0	0	0	0	0	0	0	0	**0**
CCR	kg CO_2	0	0	0	0	0	0	0	0	0	0	0	**0**
CWNR	kg CO_2	0	0	0	0	0	0	0	0	0	0	0	**0**

5.2.2.5. Hampshire, Illinois

Table 37. Resource use and waste flows for VOCOMP-25 per declared unit (1m^2) at Hampshire, Illinois

Parameters	Unit	Stage 1 - Product Stage			Stage 2 - Design & Construction Stage			Stage 3 - Use & Maintenance Stage			Stage 4 - End-of-Life Stage		Total
		1-1	1-2	1-3	2-1	2-2	2-3	3-1	3-2	3-3	4-1	4-2	
Resource use indicators													
RPR_E	MJ, NCV	9.18E-02	1.08E-04	4.96E-03	1.81E-04	2.83E-04	0	9.18E-03	3.00E-06	0	3.91E-05	5.60E-05	**1.07E-01**
RPR_M	MJ, NCV	0	0	0	0	0	0	0	0	0	0	0	**0**
RPR_{total}	MJ, NCV	9.18E-02	1.08E-04	4.96E-03	1.81E-04	2.83E-04	0	9.18E-03	3.00E-06	0	3.91E-05	5.60E-05	**1.07E-01**
$NRPR_E$	MJ, NCV	3.92E+00	7.04E-02	1.94E-01	1.18E-01	1.85E-01	0	3.92E-01	3.41E-04	0	2.17E-02	6.38E-03	**4.91E+00**
$NRPR_M$	MJ, NCV	1.55E+00	0	0	0	0	0	1.55E-01	0	0	0	0	**1.70E+00**
$NRPR_{total}$	MJ, NCV	5.47E+00	7.04E-02	1.94E-01	1.18E-01	1.85E-01	0	5.47E-01	3.41E-04	0	2.17E-02	6.38E-03	**6.61E+00**
ADP	MJ	0	3.50E+00	6.61E-02	1.45E-01	1.11E-01	1.74E-01	0	3.50E-01	3.17E-04	0	2.04E-02	**4.37E+00**
SM	kg	0	0	0	0	0	0	0	0	0	0	0	**0**
RSF	MJ, NCV	0	0	0	0	0	0	0	0	0	0	0	**0**
NRSF	MJ, NCV	0	0	0	0	0	0	0	0	0	0	0	**0**
RE	MJ, NCV	0	0	0	0	0	0	0	0	0	0	0	**0**
FW	m^3	3.62E-01	5.23E-04	7.00E-03	8.79E-04	1.37E-03	0	3.62E-02	1.99E-05	0	1.70E-04	3.71E-04	**4.09E-01**
Output flows and waste category indicators													
HWD	kg	4.52E-03	1.54E-05	2.21E-05	2.59E-05	4.04E-05	0	4.52E-04	1.52E-07	0	8.33E-07	2.83E-06	**5.08E-03**
NHWD	kg	4.05E-02	6.09E-05	5.50E-03	1.02E-04	1.60E-04	0	9.25E-03	6.93E-03	0	1.81E-05	1.29E-01	**1.92E-01**
HLRW	kg	3.11E-07	8.06E-10	3.25E-09	1.35E-09	2.12E-09	0	3.11E-08	1.59E-11	0	2.77E-10	2.98E-10	**3.50E-07**
ILLRW	kg	1.06E-06	1.58E-09	3.53E-07	2.65E-09	4.14E-09	0	1.06E-07	3.69E-11	0	6.34E-10	6.89E-10	**1.53E-06**
CRU	kg	0	0	0	0	0	0	0	0	0	0	0	**0**
MR	kg	2.10E-04	0	0	0	3.05E-03	0	0	0	0	0	0	**3.26E-03**
MER	kg	0	0	0	0	0	0	0	0	0	0	0	**0**
EE	MJ	0	0	0	0	0	0	0	0	0	0	0	**0**
Carbon emissions and removals													
BCRP	kg CO_2	0	0	0	0	0	0	0	0	0	0	0	**0**
BCEP	kg CO_2	0	0	0	0	0	0	0	0	0	0	0	**0**
BCRK	kg CO_2	-3.77E-03	0	-5.60E-03	0	0	0	0	0	0	0	0	**-9.37E-03**
BCEK	kg CO_2	0	0	3.77E-03	0	0	0	5.60E-03	0	0	0	0	**9.37E-03**
CBCEW	kg CO_2	0	0	0	0	0	0	0	0	0	0	0	**0**
CCE	kg CO_2	0	0	0	0	0	0	0	0	0	0	0	**0**
CCR	kg CO_2	0	0	0	0	0	0	0	0	0	0	0	**0**
CWNR	kg CO_2	0	0	0	0	0	0	0	0	0	0	0	**0**

5.2.2.6. York, Pennsylvania

Table 38. Resource use and waste flows for VOCOMP-25 per declared unit (1m^2) at York, Pennsylvania

Parameters	Unit	Stage 1 - Product Stage			Stage 2 - Design & Construction Stage			Stage 3 - Use & Maintenance Stage			Stage 4 - End-of-Life Stage		Total
		1-1	1-2	1-3	2-1	2-2	2-3	3-1	3-2	3-3	4-1	4-2	
Resource use indicators													
RPR_E	MJ, NCV	9.18E-02	2.23E-04	5.41E-03	8.33E-05	2.83E-04	0	9.18E-03	3.00E-06	0	3.91E-05	5.60E-05	**1.07E-01**
RPR_M	MJ, NCV	0	0	0	0	0	0	0	0	0	0	0	**0**
RPR_{total}	MJ, NCV	9.18E-02	2.23E-04	5.41E-03	8.33E-05	2.83E-04	0	9.18E-03	3.00E-06	0	3.91E-05	5.60E-05	**1.07E-01**
$NRPR_E$	MJ, NCV	3.92E+00	1.45E-01	2.12E-01	5.44E-02	1.85E-01	0	3.92E-01	3.41E-04	0	2.17E-02	6.38E-03	**4.93E+00**
$NRPR_M$	MJ, NCV	1.55E+00	0	0	0	0	0	1.55E-01	0	0	0	0	**1.70E+00**
$NRPR_{total}$	MJ, NCV	5.47E+00	1.45E-01	2.12E-01	5.44E-02	1.85E-01	0	5.47E-01	3.41E-04	0	2.17E-02	6.38E-03	**6.64E+00**
ADP	MJ	0	3.50E+00	1.36E-01	1.56E-01	5.11E-02	1.74E-01	0	3.50E-01	3.17E-04	0	2.04E-02	**4.39E+00**
SM	kg	0	0	0	0	0	0	0	0	0	0	0	**0**
RSF	MJ, NCV	0	0	0	0	0	0	0	0	0	0	0	**0**
NRSF	MJ, NCV	0	0	0	0	0	0	0	0	0	0	0	**0**
RE	MJ, NCV	0	0	0	0	0	0	0	0	0	0	0	**0**
FW	m^3	3.62E-01	1.08E-03	7.64E-03	4.04E-04	1.37E-03	0	3.62E-02	1.99E-05	0	1.70E-04	3.71E-04	**4.10E-01**
Output flows and waste category indicators													
HWD	kg	4.52E-03	3.17E-05	2.21E-05	1.19E-05	4.04E-05	0	4.52E-04	1.52E-07	0	8.33E-07	2.83E-06	**5.08E-03**
NHWD	kg	4.05E-02	1.26E-04	5.50E-03	4.70E-05	1.60E-04	0	9.25E-03	6.93E-03	0	1.81E-05	1.29E-01	**1.92E-01**
HLRW	kg	3.11E-07	1.66E-09	3.25E-09	6.22E-10	2.12E-09	0	3.11E-08	1.59E-11	0	2.77E-10	2.98E-10	**3.50E-07**
ILLRW	kg	1.06E-06	3.26E-09	4.14E-07	1.22E-09	4.14E-09	0	1.06E-07	3.69E-11	0	6.34E-10	6.89E-10	**1.59E-06**
CRU	kg	0	0	0	0	0	0	0	0	0	0	0	**0**
MR	kg	2.10E-04	0	0	0	3.05E-03	0	0	0	0	0	0	**3.26E-03**
MER	kg	0	0	0	0	0	0	0	0	0	0	0	**0**
EE	MJ	0	0	0	0	0	0	0	0	0	0	0	**0**
Carbon emissions and removals													
BCRP	kg CO_2	0	0	0	0	0	0	0	0	0	0	0	**0**
BCEP	kg CO_2	0	0	0	0	0	0	0	0	0	0	0	**0**
BCRK	kg CO_2	-3.77E-03	0	-5.60E-03	0	0	0	0	0	0	0	0	**-9.37E-03**
BCEK	kg CO_2	0	0	3.77E-03	0	0	0	5.60E-03	0	0	0	0	**9.37E-03**
CBCEW	kg CO_2	0	0	0	0	0	0	0	0	0	0	0	**0**
CCE	kg CO_2	0	0	0	0	0	0	0	0	0	0	0	**0**
CCR	kg CO_2	0	0	0	0	0	0	0	0	0	0	0	**0**
CWNR	kg CO_2	0	0	0	0	0	0	0	0	0	0	0	**0**

5.2.2.7. Milton, Canada

Table 39. Resource use and waste flows for VOCOMP-25 per declared unit (1m^2) at Milton, Ontario, Canada

Parameters	Unit	Stage 1 - Product Stage			Stage 2 - Design & Construction Stage			Stage 3 - Use & Maintenance Stage			Stage 4 - End-of-Life Stage		Total
		1-1	1-2	1-3	2-1	2-2	2-3	3-1	3-2	3-3	4-1	4-2	
Resource use indicators													
RPR_E	MJ, NCV	9.18E-02	4.51E-04	2.67E-03	3.40E-03	2.83E-04	0	9.18E-03	3.00E-06	0	3.91E-05	5.60E-05	**1.08E-01**
RPR_M	MJ, NCV	0	0	0	0	0	0	0	0	0	0	0	**0**
RPR_{total}	MJ, NCV	9.18E-02	4.51E-04	2.67E-03	3.40E-03	2.83E-04	0	9.18E-03	3.00E-06	0	3.91E-05	5.60E-05	**1.08E-01**
$NRPR_E$	MJ, NCV	3.92E+00	2.94E-01	9.61E-02	1.22E+00	1.85E-01	0	3.92E-01	3.41E-04	0	2.17E-02	6.38E-03	**6.13E+00**
$NRPR_M$	MJ, NCV	1.55E+00	0	0	0	0	0	1.55E-01	0	0	0	0	**1.70E+00**
$NRPR_{total}$	MJ, NCV	5.47E+00	2.94E-01	9.61E-02	1.22E+00	1.85E-01	0	5.47E-01	3.41E-04	0	2.17E-02	6.38E-03	**7.83E+00**
ADP	MJ	0	3.50E+00	2.76E-01	8.78E-02	1.14E+00	1.74E-01	0	3.50E-01	3.17E-04	0	2.04E-02	**5.55E+00**
SM	kg	0	0	0	0	0	0	0	0	0	0	0	**0**
RSF	MJ, NCV	0	0	0	0	0	0	0	0	0	0	0	**0**
NRSF	MJ, NCV	0	0	0	0	0	0	0	0	0	0	0	**0**
RE	MJ, NCV	0	0	0	0	0	0	0	0	0	0	0	**0**
FW	m^3	3.62E-01	2.19E-03	3.72E-03	1.28E-02	1.37E-03	0	3.62E-02	1.99E-05	0	1.70E-04	3.71E-04	**4.19E-01**
Output flows and waste category indicators													
HWD	kg	4.52E-03	6.43E-05	2.21E-05	1.86E-04	4.04E-05	0	4.52E-04	1.52E-07	0	8.33E-07	2.83E-06	**5.29E-03**
NHWD	kg	4.05E-02	2.54E-04	5.50E-03	1.18E-03	1.60E-04	0	9.25E-03	6.93E-03	0	1.81E-05	1.29E-01	**1.93E-01**
HLRW	kg	3.11E-07	3.37E-09	3.25E-09	2.02E-08	2.12E-09	0	3.11E-08	1.59E-11	0	2.77E-10	2.98E-10	**3.71E-07**
ILLRW	kg	1.06E-06	6.60E-09	1.00E-08	5.58E-08	4.14E-09	0	1.06E-07	3.69E-11	0	6.34E-10	6.89E-10	**1.25E-06**
CRU	kg	0	0	0	0	0	0	0	0	0	0	0	**0**
MR	kg	2.10E-04	0	0	0	3.05E-03	0	0	0	0	0	0	**3.26E-03**
MER	kg	0	0	0	0	0	0	0	0	0	0	0	**0**
EE	MJ	0	0	0	0	0	0	0	0	0	0	0	**0**
Carbon emissions and removals													
BCRP	kg CO_2	0	0	0	0	0	0	0	0	0	0	0	**0**
BCEP	kg CO_2	0	0	0	0	0	0	0	0	0	0	0	**0**
BCRK	kg CO_2	-3.77E-03	0	-5.60E-03	0	0	0	0	0	0	0	0	**-9.37E-03**
BCEK	kg CO_2	0	0	3.77E-03	0	0	0	5.60E-03	0	0	0	0	**9.37E-03**
CBCEW	kg CO_2	0	0	0	0	0	0	0	0	0	0	0	**0**
CCE	kg CO_2	0	0	0	0	0	0	0	0	0	0	0	**0**
CCR	kg CO_2	0	0	0	0	0	0	0	0	0	0	0	**0**
CWNR	kg CO_2	0	0	0	0	0	0	0	0	0	0	0	**0**

5.2.2.8. Sherwood, Alberta, Canada

Table 40. Resource use and waste flows for VOCOMP-25 per declared unit (1m^2) at Sherwood, Alberta, Canada

Parameters	Unit	Stage 1 - Product Stage			Stage 2 - Design & Construction Stage			Stage 3 - Use & Maintenance Stage			Stage 4 - End-of-Life Stage		Total
		1-1	1-2	1-3	2-1	2-2	2-3	3-1	3-2	3-3	4-1	4-2	
Resource use indicators													
RPR_E	MJ, NCV	9.18E-02	1.40E-04	1.98E-02	1.79E-04	2.83E-04	0	9.18E-03	3.00E-06	0	3.91E-05	5.60E-05	**1.21E-01**
RPR_M	MJ, NCV	0	0	0	0	0	0	0	0	0	0	0	**0**
RPR_{total}	MJ, NCV	9.18E-02	1.40E-04	1.98E-02	1.79E-04	2.83E-04	0	9.18E-03	3.00E-06	0	3.91E-05	5.60E-05	**1.21E-01**
$NRPR_E$	MJ, NCV	3.92E+00	9.13E-02	5.00E-01	1.17E-01	1.85E-01	0	3.92E-01	3.41E-04	0	2.17E-02	6.38E-03	**5.23E+00**
$NRPR_M$	MJ, NCV	1.55E+00	0	0	0	0	0	1.55E-01	0	0	0	0	**1.70E+00**
$NRPR_{total}$	MJ, NCV	5.47E+00	9.13E-02	5.00E-01	1.17E-01	1.85E-01	0	5.47E-01	3.41E-04	0	2.17E-02	6.38E-03	**6.93E+00**
ADP	MJ	0	3.50E+00	8.57E-02	4.58E-01	1.10E-01	1.74E-01	0	3.50E-01	3.17E-04	0	2.04E-02	**4.70E+00**
SM	kg	0	0	0	0	0	0	0	0	0	0	0	**0**
RSF	MJ, NCV	0	0	0	0	0	0	0	0	0	0	0	**0**
NRSF	MJ, NCV	0	0	0	0	0	0	0	0	0	0	0	**0**
RE	MJ, NCV	0	0	0	0	0	0	0	0	0	0	0	**0**
FW	m^3	3.62E-01	6.78E-04	4.32E-02	8.67E-04	1.37E-03	0	3.62E-02	1.99E-05	0	1.70E-04	3.71E-04	**4.45E-01**
Output flows and waste category indicators													
HWD	kg	4.52E-03	1.99E-05	2.21E-05	2.55E-05	4.04E-05	0	4.52E-04	1.52E-07	0	8.33E-07	2.83E-06	**5.08E-03**
NHWD	kg	4.05E-02	7.89E-05	5.50E-03	1.01E-04	1.60E-04	0	9.25E-03	6.93E-03	0	1.81E-05	1.29E-01	**1.92E-01**
HLRW	kg	3.11E-07	3.37E-09	3.25E-09	2.02E-08	2.12E-09	0	3.11E-08	1.59E-11	0	2.77E-10	2.98E-10	**3.71E-07**
ILLRW	kg	1.06E-06	6.60E-09	1.00E-08	5.58E-08	4.14E-09	0	1.06E-07	3.69E-11	0	6.34E-10	6.89E-10	**1.25E-06**
CRU	kg	0	0	0	0	0	0	0	0	0	0	0	**0**
MR	kg	2.10E-04	0	0	0	3.05E-03	0	0	0	0	0	0	**3.26E-03**
MER	kg	0	0	0	0	0	0	0	0	0	0	0	**0**
EE	MJ	0	0	0	0	0	0	0	0	0	0	0	**0**
Carbon emissions and removals													
BCRP	kg CO_2	0	0	0	0	0	0	0	0	0	0	0	**0**
BCEP	kg CO_2	0	0	0	0	0	0	0	0	0	0	0	**0**
BCRK	kg CO_2	-3.77E-03	0	-5.60E-03	0	0	0	0	0	0	0	0	**-9.37E-03**
BCEK	kg CO_2	0	0	3.77E-03	0	0	0	5.60E-03	0	0	0	0	**9.37E-03**
CBCEW	kg CO_2	0	0	0	0	0	0	0	0	0	0	0	**0**
CCE	kg CO_2	0	0	0	0	0	0	0	0	0	0	0	**0**
CCR	kg CO_2	0	0	0	0	0	0	0	0	0	0	0	**0**
CWNR	kg CO_2	0	0	0	0	0	0	0	0	0	0	0	**0**

5.2.3. VOCOMP-30

5.2.3.1. Benicia, California

Table 41. Resource use and waste flows for VOCOMP-30 per declared unit (1m^2) at Benicia, California

Parameters	Unit	Stage 1 - Product Stage			Stage 2 - Design & Construction Stage			Stage 3 - Use & Maintenance Stage			Stage 4 - End-of-Life Stage		Total
		1-1	1-2	1-3	2-1	2-2	2-3	3-1	3-2	3-3	4-1	4-2	
Resource use indicators													
RPR_E	MJ, NCV	1.07E-01	7.14E-04	4.00E-01	1.84E-04	2.83E-04	0	1.08E-02	3.00E-06	0	3.93E-05	5.60E-05	**5.19E-01**
RPR_M	MJ, NCV	0	0	0	0	0	0	0	0	0	0	0	**0**
RPR_{total}	MJ, NCV	1.07E-01	7.14E-04	4.00E-01	1.84E-04	2.83E-04	0	1.08E-02	3.00E-06	0	3.93E-05	5.60E-05	**5.19E-01**
$NRPR_E$	MJ, NCV	4.60E+00	4.66E-01	4.08E+00	1.20E-01	1.85E-01	0	4.63E-01	3.41E-04	0	2.18E-02	6.38E-03	**9.94E+00**
$NRPR_M$	MJ, NCV	1.82E+00	0	0	0	0	0	1.82E-01	0	0	0	0	**2.00E+00**
$NRPR_{total}$	MJ, NCV	6.42E+00	4.66E-01	4.08E+00	1.20E-01	1.85E-01	0	6.45E-01	3.41E-04	0	2.18E-02	6.38E-03	**1.19E+01**
ADP	MJ	0	4.11E+00	4.38E-01	3.43E+00	1.13E-01	1.74E-01	0	4.13E-01	3.17E-04	0	2.04E-02	**8.69E+00**
SM	kg	0	0	0	0	0	0	0	0	0	0	0	**0**
RSF	MJ, NCV	0	0	0	0	0	0	0	0	0	0	0	**0**
NRSF	MJ, NCV	0	0	0	0	0	0	0	0	0	0	0	**0**
RE	MJ, NCV	0	0	0	0	0	0	0	0	0	0	0	**0**
FW	m^3	4.34E-01	3.46E-03	7.57E-01	8.91E-04	1.37E-03	0	4.36E-02	1.99E-05	0	1.71E-04	3.71E-04	**1.24E+00**
Output flows and waste category indicators													
HWD	kg	2.35E-03	1.92E-06	7.67E-04	4.95E-07	7.62E-07	0	2.38E-04	4.52E-07	0	7.89E-07	8.45E-06	**3.37E-03**
NHWD	kg	2.60E-04	4.34E-05	4.14E-03	1.12E-05	1.72E-05	0	2.63E-05	4.12E-08	0	6.20E-06	7.70E-07	**4.50E-03**
HLRW	kg	3.11E-07	4.63E-09	3.25E-09	1.68E-09	2.12E-09	0	3.11E-08	1.59E-11	0	2.77E-10	2.98E-10	**3.54E-07**
ILLRW	kg	1.06E-06	9.08E-09	2.87E-06	3.29E-09	4.14E-09	0	1.06E-07	3.69E-11	0	6.34E-10	6.89E-10	**4.05E-06**
CRU	kg	0	0	0	0	0	0	0	0	0	0	0	**0**
MR	kg	4.27E-04	0	0	0	3.05E-03	0	0	0	0	0	0	**3.48E-03**
MER	kg	0	0	0	0	0	0	0	0	0	0	0	**0**
EE	MJ	0	0	0	0	0	0	0	0	0	0	0	**0**
Carbon emissions and removals													
BCRP	kg CO_2	0	0	0	0	0	0	0	0	0	0	0	**0**
BCEP	kg CO_2	0	0	0	0	0	0	0	0	0	0	0	**0**
BCRK	kg CO_2	-4.45E-03	0	-5.60E-03	0	0	0	0	0	0	0	0	**-1.00E-02**
BCEK	kg CO_2	0	0	4.45E-03	0	0	0	5.60E-03	0	0	0	0	**1.00E-02**
CBCEW	kg CO_2	0	0	0	0	0	0	0	0	0	0	0	**0**
CCE	kg CO_2	0	0	0	0	0	0	0	0	0	0	0	**0**
CCR	kg CO_2	0	0	0	0	0	0	0	0	0	0	0	**0**
CWNR	kg CO_2	0	0	0	0	0	0	0	0	0	0	0	**0**

5.2.3.2. Cartersville, Georgia

Table 42. Resource use and waste flows for VOCOMP-30 per declared unit ($1m^2$) at Cartersville, Georgia

Parameters	Unit	Stage 1 - Product Stage			Stage 2 - Design & Construction Stage			Stage 3 - Use & Maintenance Stage			Stage 4 - End-of-Life Stage		Total
		1-1	1-2	1-3	2-1	2-2	2-3	3-1	3-2	3-3	4-1	4-2	
Resource use indicators													
RPR_E	MJ, NCV	1.07E-01	1.24E-04	3.81E-02	2.27E-04	2.83E-04	0	1.08E-02	3.00E-06	0	3.93E-05	5.60E-05	**1.57E-01**
RPR_M	MJ, NCV	0	0	0	0	0	0	0	0	0	0	0	**0**
RPR_{total}	MJ, NCV	1.07E-01	1.24E-04	3.81E-02	2.27E-04	2.83E-04	0	1.08E-02	3.00E-06	0	3.93E-05	5.60E-05	**1.57E-01**
$NRPR_E$	MJ, NCV	4.60E+00	8.09E-02	2.36E+00	1.48E-01	1.85E-01	0	4.63E-01	3.41E-04	0	2.18E-02	6.38E-03	**7.87E+00**
$NRPR_M$	MJ, NCV	1.82E+00	0	0	0	0	0	1.82E-01	0	0	0	0	**2.00E+00**
$NRPR_{total}$	MJ, NCV	6.42E+00	8.09E-02	2.36E+00	1.48E-01	1.85E-01	0	6.45E-01	3.41E-04	0	2.18E-02	6.38E-03	**9.87E+00**
ADP	MJ	0	4.11E+00	7.59E-02	2.14E+00	1.39E-01	1.74E-01	0	4.13E-01	3.17E-04	0	2.04E-02	**7.07E+00**
SM	kg	0	0	0	0	0	0	0	0	0	0	0	**0**
RSF	MJ, NCV	0	0	0	0	0	0	0	0	0	0	0	**0**
NRSF	MJ, NCV	0	0	0	0	0	0	0	0	0	0	0	**0**
RE	MJ, NCV	0	0	0	0	0	0	0	0	0	0	0	**0**
FW	m^3	4.34E-01	6.00E-04	1.81E-01	1.10E-03	1.37E-03	0	4.36E-02	1.99E-05	0	1.71E-04	3.71E-04	**6.63E-01**
Output flows and waste category indicators													
HWD	kg	2.35E-03	3.33E-07	7.67E-04	6.12E-07	7.62E-07	0	2.38E-04	4.52E-07	0	7.89E-07	8.45E-06	**3.37E-03**
NHWD	kg	2.60E-01	7.53E-03	2.65E-01	1.38E-02	1.72E-02	0	2.63E-02	4.12E-05	0	6.20E-03	7.70E-04	**5.96E-01**
HLRW	kg	3.76E-07	5.34E-09	1.99E-07	1.37E-09	2.12E-09	0	3.78E-08	1.59E-11	0	2.78E-10	2.98E-10	**6.22E-07**
ILLRW	kg	1.26E-06	1.05E-08	3.37E-06	2.69E-09	4.14E-09	0	1.26E-07	3.69E-11	0	6.36E-10	6.89E-10	**4.77E-06**
CRU	kg	0	0	0	0	0	0	0	0	0	0	0	**0**
MR	kg	4.27E-04	0	0	0	3.05E-03	0	0	0	0	0	0	**3.48E-03**
MER	kg	0	0	0	0	0	0	0	0	0	0	0	**0**
EE	MJ	0	0	0	0	0	0	0	0	0	0	0	**0**
Carbon emissions and removals													
BCRP	kg CO_2	0	0	0	0	0	0	0	0	0	0	0	**0**
BCEP	kg CO_2	0	0	0	0	0	0	0	0	0	0	0	**0**
BCRK	kg CO_2	-4.45E-03	0	-5.60E-03	0	0	0	0	0	0	0	0	**-1.00E-02**
BCEK	kg CO_2	0	0	4.45E-03	0	0	0	5.60E-03	0	0	0	0	**1.00E-02**
CBCEW	kg CO_2	0	0	0	0	0	0	0	0	0	0	0	**0**
CCE	kg CO_2	0	0	0	0	0	0	0	0	0	0	0	**0**
CCR	kg CO_2	0	0	0	0	0	0	0	0	0	0	0	**0**
CWNR	kg CO_2	0	0	0	0	0	0	0	0	0	0	0	**0**

5.2.3.3. Fort Worth, Texas

Table 43. Resource use and waste flows for VOCOMP-30 per declared unit (1m^2) at Fort Worth, Texas

Parameters	Unit	Stage 1 - Product Stage			Stage 2 - Design & Construction Stage			Stage 3 - Use & Maintenance Stage			Stage 4 - End-of-Life Stage		Total
		1-1	1-2	1-3	2-1	2-2	2-3	3-1	3-2	3-3	4-1	4-2	
Resource use indicators													
RPR_E	MJ, NCV	1.07E-01	4.52E-04	4.06E-02	3.36E-05	2.83E-04	0	1.08E-02	3.00E-06	0	3.93E-05	5.60E-05	**1.60E-01**
RPR_M	MJ, NCV	0	0	0	0	0	0	0	0	0	0	0	**0**
RPR_{total}	MJ, NCV	1.07E-01	4.52E-04	4.06E-02	3.36E-05	2.83E-04	0	1.08E-02	3.00E-06	0	3.93E-05	5.60E-05	**1.60E-01**
$NRPR_E$	MJ, NCV	4.60E+00	2.95E-01	2.37E+00	2.20E-02	1.85E-01	0	4.63E-01	3.41E-04	0	2.18E-02	6.38E-03	**7.96E+00**
$NRPR_M$	MJ, NCV	1.82E+00	0	0	0	0	0	1.82E-01	0	0	0	0	**2.00E+00**
$NRPR_{total}$	MJ, NCV	6.42E+00	2.95E-01	2.37E+00	2.20E-02	1.85E-01	0	6.45E-01	3.41E-04	0	2.18E-02	6.38E-03	**9.96E+00**
ADP	MJ	0	4.11E+00	2.77E-01	2.15E+00	2.06E-02	1.74E-01	0	4.13E-01	3.17E-04	0	2.04E-02	**7.16E+00**
SM	kg	0	0	0	0	0	0	0	0	0	0	0	**0**
RSF	MJ, NCV	0	0	0	0	0	0	0	0	0	0	0	**0**
NRSF	MJ, NCV	0	0	0	0	0	0	0	0	0	0	0	**0**
RE	MJ, NCV	0	0	0	0	0	0	0	0	0	0	0	**0**
FW	m^3	4.34E-01	2.19E-03	1.77E-01	1.63E-04	1.37E-03	0	4.36E-02	1.99E-05	0	1.71E-04	3.71E-04	**6.59E-01**
Output flows and waste category indicators													
HWD	kg	2.35E-03	1.22E-06	7.67E-04	9.05E-08	7.62E-07	0	2.38E-04	4.52E-07	0	7.89E-07	8.45E-06	**3.37E-03**
NHWD	kg	2.60E-01	2.75E-02	2.82E-01	2.05E-03	1.72E-02	0	2.63E-02	4.12E-05	0	6.20E-03	7.70E-04	**6.22E-01**
HLRW	kg	3.76E-07	3.37E-09	1.99E-07	2.51E-10	2.12E-09	0	3.78E-08	1.59E-11	0	2.78E-10	2.98E-10	**6.19E-07**
ILLRW	kg	1.26E-06	6.60E-09	5.68E-07	4.92E-10	4.14E-09	0	1.26E-07	3.69E-11	0	6.36E-10	6.89E-10	**1.96E-06**
CRU	kg	0	0	0	0	0	0	0	0	0	0	0	**0**
MR	kg	4.27E-04	0	0	0	3.05E-03	0	0	0	0	0	0	**3.48E-03**
MER	kg	0	0	0	0	0	0	0	0	0	0	0	**0**
EE	MJ	0	0	0	0	0	0	0	0	0	0	0	**0**
Carbon emissions and removals													
BCRP	kg CO_2	0	0	0	0	0	0	0	0	0	0	0	**0**
BCEP	kg CO_2	0	0	0	0	0	0	0	0	0	0	0	**0**
BCRK	kg CO_2	-4.45E-03	0	-5.60E-03	0	0	0	0	0	0	0	0	**-1.00E-02**
BCEK	kg CO_2	0	0	4.45E-03	0	0	0	5.60E-03	0	0	0	0	**1.00E-02**
CBCEW	kg CO_2	0	0	0	0	0	0	0	0	0	0	0	**0**
CCE	kg CO_2	0	0	0	0	0	0	0	0	0	0	0	**0**
CCR	kg CO_2	0	0	0	0	0	0	0	0	0	0	0	**0**
CWNR	kg CO_2	0	0	0	0	0	0	0	0	0	0	0	**0**

5.2.3.4. Goodyear, Arizona

Table 44. Resource use and waste flows for VOCOMP-30 per declared unit (1m^2) at Goodyear, Arizona

Parameters	Unit	Stage 1 - Product Stage			Stage 2 - Design & Construction Stage			Stage 3 - Use & Maintenance Stage			Stage 4 - End-of-Life Stage		Total
		1-1	1-2	1-3	2-1	2-2	2-3	3-1	3-2	3-3	4-1	4-2	
Resource use indicators													
RPR_E	MJ, NCV	1.07E-01	5.01E-04	5.61E-02	2.02E-04	2.83E-04	0	1.08E-02	3.00E-06	0	3.93E-05	5.60E-05	**1.75E-01**
RPR_M	MJ, NCV	0	0	0	0	0	0	0	0	0	0	0	**0**
RPR_{total}	MJ, NCV	1.07E-01	5.01E-04	5.61E-02	2.02E-04	2.83E-04	0	1.08E-02	3.00E-06	0	3.93E-05	5.60E-05	**1.75E-01**
$NRPR_E$	MJ, NCV	4.60E+00	3.27E-01	2.67E+00	1.32E-01	1.85E-01	0	4.63E-01	3.41E-04	0	2.18E-02	6.38E-03	**8.41E+00**
$NRPR_M$	MJ, NCV	1.82E+00	0	0	0	0	0	1.82E-01	0	0	0	0	**2.00E+00**
$NRPR_{total}$	MJ, NCV	6.42E+00	3.27E-01	2.67E+00	1.32E-01	1.85E-01	0	6.45E-01	3.41E-04	0	2.18E-02	6.38E-03	**1.04E+01**
ADP	MJ	0	4.11E+00	3.07E-01	2.34E+00	1.24E-01	1.74E-01	0	4.13E-01	3.17E-04	0	2.04E-02	**7.49E+00**
SM	kg	0	0	0	0	0	0	0	0	0	0	0	**0**
RSF	MJ, NCV	0	0	0	0	0	0	0	0	0	0	0	**0**
NRSF	MJ, NCV	0	0	0	0	0	0	0	0	0	0	0	**0**
RE	MJ, NCV	0	0	0	0	0	0	0	0	0	0	0	**0**
FW	m^3	4.34E-01	2.43E-03	2.21E-01	9.81E-04	1.37E-03	0	4.36E-02	1.99E-05	0	1.71E-04	3.71E-04	**7.04E-01**
Output flows and waste category indicators													
HWD	kg	2.35E-03	1.35E-06	7.67E-04	5.45E-07	7.62E-07	0	2.38E-04	4.52E-07	0	7.89E-07	8.45E-06	**3.37E-03**
NHWD	kg	2.60E-04	3.05E-05	7.59E-04	1.23E-05	1.72E-05	0	2.63E-05	4.12E-08	0	6.20E-06	7.70E-07	**1.11E-03**
HLRW	kg	3.76E-07	3.74E-09	1.99E-07	1.51E-09	2.12E-09	0	3.78E-08	1.59E-11	0	2.78E-10	2.98E-10	**6.21E-07**
ILLRW	kg	1.26E-06	7.33E-09	1.46E-06	2.96E-09	4.14E-09	0	1.26E-07	3.69E-11	0	6.36E-10	6.89E-10	**2.86E-06**
CRU	kg	0	0	0	0	0	0	0	0	0	0	0	**0**
MR	kg	4.27E-04	0	0	0	3.05E-03	0	0	0	0	0	0	**3.48E-03**
MER	kg	0	0	0	0	0	0	0	0	0	0	0	**0**
EE	MJ	0	0	0	0	0	0	0	0	0	0	0	**0**
Carbon emissions and removals													
BCRP	kg CO_2	0	0	0	0	0	0	0	0	0	0	0	**0**
BCEP	kg CO_2	0	0	0	0	0	0	0	0	0	0	0	**0**
BCRK	kg CO_2	-4.45E-03	0	-5.60E-03	0	0	0	0	0	0	0	0	**-1.00E-02**
BCEK	kg CO_2	0	0	4.45E-03	0	0	0	5.60E-03	0	0	0	0	**1.00E-02**
CBCEW	kg CO_2	0	0	0	0	0	0	0	0	0	0	0	**0**
CCE	kg CO_2	0	0	0	0	0	0	0	0	0	0	0	**0**
CCR	kg CO_2	0	0	0	0	0	0	0	0	0	0	0	**0**
CWNR	kg CO_2	0	0	0	0	0	0	0	0	0	0	0	**0**

5.2.3.5. Hampshire, Illinois

Table 45. Resource use and waste flows for VOCOMP-30 per declared unit (1m^2) at Hampshire, Illinois

Parameters	Unit	Stage 1 - Product Stage			Stage 2 - Design & Construction Stage			Stage 3 - Use & Maintenance Stage			Stage 4 - End-of-Life Stage		Total
		1-1	1-2	1-3	2-1	2-2	2-3	3-1	3-2	3-3	4-1	4-2	
Resource use indicators													
RPR_E	MJ, NCV	1.07E-01	1.24E-04	3.81E-02	1.42E-04	2.83E-04	0	1.08E-02	3.00E-06	0	3.93E-05	5.60E-05	**1.57E-01**
RPR_M	MJ, NCV	0	0	0	0	0	0	0	0	0	0	0	**0**
RPR_{total}	MJ, NCV	1.07E-01	1.24E-04	3.81E-02	1.42E-04	2.83E-04	0	1.08E-02	3.00E-06	0	3.93E-05	5.60E-05	**1.57E-01**
$NRPR_E$	MJ, NCV	4.60E+00	8.09E-02	2.42E+00	9.28E-02	1.85E-01	0	4.63E-01	3.41E-04	0	2.18E-02	6.38E-03	**7.87E+00**
$NRPR_M$	MJ, NCV	1.82E+00	0	0	0	0	0	1.82E-01	0	0	0	0	**2.00E+00**
$NRPR_{total}$	MJ, NCV	6.42E+00	8.09E-02	2.42E+00	9.28E-02	1.85E-01	0	6.45E-01	3.41E-04	0	2.18E-02	6.38E-03	**9.87E+00**
ADP	MJ	0	4.11E+00	7.59E-02	2.17E+00	8.71E-02	1.74E-01	0	4.13E-01	3.17E-04	0	2.04E-02	**7.05E+00**
SM	kg	0	0	0	0	0	0	0	0	0	0	0	**0**
RSF	MJ, NCV	0	0	0	0	0	0	0	0	0	0	0	**0**
NRSF	MJ, NCV	0	0	0	0	0	0	0	0	0	0	0	**0**
RE	MJ, NCV	0	0	0	0	0	0	0	0	0	0	0	**0**
FW	m^3	4.34E-01	6.00E-04	1.80E-01	6.89E-04	1.37E-03	0	4.36E-02	1.99E-05	0	1.71E-04	3.71E-04	**6.61E-01**
Output flows and waste category indicators													
HWD	kg	2.35E-03	3.33E-07	7.67E-04	3.83E-07	7.62E-07	0	2.38E-04	4.52E-07	0	7.89E-07	8.45E-06	**3.37E-03**
NHWD	kg	2.60E-01	7.53E-03	2.77E-01	8.64E-03	1.72E-02	0	2.63E-02	4.12E-05	0	6.20E-03	7.70E-04	**6.03E-01**
HLRW	kg	3.76E-07	9.25E-10	1.99E-07	1.06E-09	2.12E-09	0	3.78E-08	1.59E-11	0	2.78E-10	2.98E-10	**6.17E-07**
ILLRW	kg	1.26E-06	1.81E-09	8.34E-07	2.08E-09	4.14E-09	0	1.26E-07	3.69E-11	0	6.36E-10	6.89E-10	**2.23E-06**
CRU	kg	0	0	0	0	0	0	0	0	0	0	0	**0**
MR	kg	4.27E-04	0	0	0	3.05E-03	0	0	0	0	0	0	**3.48E-03**
MER	kg	0	0	0	0	0	0	0	0	0	0	0	**0**
EE	MJ	0	0	0	0	0	0	0	0	0	0	0	**0**
Carbon emissions and removals													
BCRP	kg CO_2	0	0	0	0	0	0	0	0	0	0	0	**0**
BCEP	kg CO_2	0	0	0	0	0	0	0	0	0	0	0	**0**
BCRK	kg CO_2	-4.45E-03	0	-5.60E-03	0	0	0	0	0	0	0	0	**-1.00E-02**
BCEK	kg CO_2	0	0	4.45E-03	0	0	0	5.60E-03	0	0	0	0	**1.00E-02**
CBCEW	kg CO_2	0	0	0	0	0	0	0	0	0	0	0	**0**
CCE	kg CO_2	0	0	0	0	0	0	0	0	0	0	0	**0**
CCR	kg CO_2	0	0	0	0	0	0	0	0	0	0	0	**0**
CWNR	kg CO_2	0	0	0	0	0	0	0	0	0	0	0	**0**

5.2.3.6. York, Pennsylvania

Table 46. Resource use and waste flows for VOCOMP-30 per declared unit (1m^2) at York, Pennsylvania

Parameters	Unit	Stage 1 - Product Stage			Stage 2 - Design & Construction Stage			Stage 3 - Use & Maintenance Stage			Stage 4 - End-of-Life Stage		Total
		1-1	1-2	1-3	2-1	2-2	2-3	3-1	3-2	3-3	4-1	4-2	
Resource use indicators													
RPR_E	MJ, NCV	1.07E-01	2.49E-04	3.85E-02	5.69E-04	2.83E-04	0	1.08E-02	3.00E-06	0	3.93E-05	5.60E-05	**1.58E-01**
RPR_M	MJ, NCV	0	0	0	0	0	0	0	0	0	0	0	**0**
RPR_{total}	MJ, NCV	1.07E-01	2.49E-04	3.85E-02	5.69E-04	2.83E-04	0	1.08E-02	3.00E-06	0	3.93E-05	5.60E-05	**1.58E-01**
$NRPR_E$	MJ, NCV	4.60E+00	1.63E-01	2.43E+00	3.71E-01	1.85E-01	0	4.63E-01	3.41E-04	0	2.18E-02	6.38E-03	**8.25E+00**
$NRPR_M$	MJ, NCV	1.82E+00	0	0	0	0	0	1.82E-01	0	0	0	0	**2.00E+00**
$NRPR_{total}$	MJ, NCV	6.42E+00	1.63E-01	2.43E+00	3.71E-01	1.85E-01	0	6.45E-01	3.41E-04	0	2.18E-02	6.38E-03	**1.02E+01**
ADP	MJ	0	4.11E+00	3.07E-01	2.11E+00	6.96E-01	1.74E-01	0	4.13E-01	3.17E-04	0	2.04E-02	**7.83E+00**
SM	kg	0	0	0	0	0	0	0	0	0	0	0	**0**
RSF	MJ, NCV	0	0	0	0	0	0	0	0	0	0	0	**0**
NRSF	MJ, NCV	0	0	0	0	0	0	0	0	0	0	0	**0**
RE	MJ, NCV	0	0	0	0	0	0	0	0	0	0	0	**0**
FW	m^3	4.34E-01	1.21E-03	1.81E-01	2.76E-03	1.37E-03	0	4.36E-02	1.99E-05	0	1.71E-04	3.71E-04	**6.64E-01**
Output flows and waste category indicators													
HWD	kg	2.35E-03	6.71E-07	7.67E-04	1.53E-06	7.62E-07	0	2.38E-04	4.52E-07	0	7.89E-07	8.45E-06	**3.37E-03**
NHWD	kg	2.60E-01	1.52E-02	2.90E-01	3.46E-02	1.72E-02	0	2.63E-02	4.12E-05	0	6.20E-03	7.70E-04	**6.50E-01**
HLRW	kg	3.11E-07	4.63E-09	3.25E-09	1.68E-09	2.12E-09	0	3.11E-08	1.59E-11	0	2.77E-10	2.98E-10	**3.54E-07**
ILLRW	kg	1.06E-06	9.08E-09	2.87E-06	3.29E-09	4.14E-09	0	1.06E-07	3.69E-11	0	6.34E-10	6.89E-10	**4.05E-06**
CRU	kg	0	0	0	0	0	0	0	0	0	0	0	**0**
MR	kg	4.27E-04	0	0	0	3.05E-03	0	0	0	0	0	0	**3.48E-03**
MER	kg	0	0	0	0	0	0	0	0	0	0	0	**0**
EE	MJ	0	0	0	0	0	0	0	0	0	0	0	**0**
Carbon emissions and removals													
BCRP	kg CO_2	0	0	0	0	0	0	0	0	0	0	0	**0**
BCEP	kg CO_2	0	0	0	0	0	0	0	0	0	0	0	**0**
BCRK	kg CO_2	-4.45E-03	0	-5.60E-03	0	0	0	0	0	0	0	0	**-1.00E-02**
BCEK	kg CO_2	0	0	4.45E-03	0	0	0	5.60E-03	0	0	0	0	**1.00E-02**
CBCEW	kg CO_2	0	0	0	0	0	0	0	0	0	0	0	**0**
CCE	kg CO_2	0	0	0	0	0	0	0	0	0	0	0	**0**
CCR	kg CO_2	0	0	0	0	0	0	0	0	0	0	0	**0**
CWNR	kg CO_2	0	0	0	0	0	0	0	0	0	0	0	**0**

5.2.3.7. Milton, Canada

Table 47. Resource use and waste flows for VOCOMP-30 per declared unit (1m^2) at Milton, Ontario, Canada

Parameters	Unit	Stage 1 - Product Stage			Stage 2 - Design & Construction Stage			Stage 3 - Use & Maintenance Stage			Stage 4 - End-of-Life Stage		Total
		1-1	1-2	1-3	2-1	2-2	2-3	3-1	3-2	3-3	4-1	4-2	
Resource use indicators													
RPR_E	MJ, NCV	1.07E-01	5.01E-04	3.58E-02	2.26E-03	2.83E-04	0	1.08E-02	3.00E-06	0	3.93E-05	5.60E-05	**1.57E-01**
RPR_M	MJ, NCV	0	0	0	0	0	0	0	0	0	0	0	**0**
RPR_{total}	MJ, NCV	1.07E-01	5.01E-04	3.58E-02	2.26E-03	2.83E-04	0	1.08E-02	3.00E-06	0	3.93E-05	5.60E-05	**1.57E-01**
$NRPR_E$	MJ, NCV	4.60E+00	3.27E-01	2.32E+00	7.44E-01	1.85E-01	0	4.63E-01	3.41E-04	0	2.18E-02	6.38E-03	**8.67E+00**
$NRPR_M$	MJ, NCV	1.82E+00	0	0	0	0	0	1.82E-01	0	0	0	0	**2.00E+00**
$NRPR_{total}$	MJ, NCV	6.42E+00	3.27E-01	2.32E+00	7.44E-01	1.85E-01	0	6.45E-01	3.41E-04	0	2.18E-02	6.38E-03	**1.07E+01**
ADP	MJ	0	4.11E+00	1.18E+00	2.48E+00	4.98E-02	1.74E-01	0	4.13E-01	3.17E-04	0	2.04E-02	**8.43E+00**
SM	kg	0	0	0	0	0	0	0	0	0	0	0	**0**
RSF	MJ, NCV	0	0	0	0	0	0	0	0	0	0	0	**0**
NRSF	MJ, NCV	0	0	0	0	0	0	0	0	0	0	0	**0**
RE	MJ, NCV	0	0	0	0	0	0	0	0	0	0	0	**0**
FW	m^3	4.34E-01	2.43E-03	1.78E-01	8.24E-03	1.37E-03	0	4.36E-02	1.99E-05	0	1.71E-04	3.71E-04	**6.68E-01**
Output flows and waste category indicators													
HWD	kg	2.35E-03	1.35E-06	7.67E-04	2.40E-05	7.62E-07	0	2.38E-04	4.52E-07	0	7.89E-07	8.45E-06	**3.39E-03**
NHWD	kg	2.60E-01	3.05E-02	1.99E-01	8.65E-02	1.72E-02	0	2.63E-02	4.12E-05	0	6.20E-03	7.70E-04	**6.27E-01**
HLRW	kg	7.84E-09	6.15E-11	4.17E-09	3.14E-10	3.48E-11	0	7.86E-10	3.10E-13	0	5.34E-12	5.79E-12	**1.32E-08**
ILLRW	kg	1.63E-06	1.10E-08	7.03E-07	5.02E-08	6.22E-09	0	1.63E-07	5.25E-11	0	9.08E-10	9.81E-10	**2.56E-06**
CRU	kg	0	0	0	0	0	0	0	0	0	0	0	**0**
MR	kg	4.27E-04	0	0	0	3.05E-03	0	0	0	0	0	0	**3.48E-03**
MER	kg	0	0	0	0	0	0	0	0	0	0	0	**0**
EE	MJ	0	0	0	0	0	0	0	0	0	0	0	**0**
Carbon emissions and removals													
BCRP	kg CO_2	0	0	0	0	0	0	0	0	0	0	0	**0**
BCEP	kg CO_2	0	0	0	0	0	0	0	0	0	0	0	**0**
BCRK	kg CO_2	-4.45E-03	0	-5.60E-03	0	0	0	0	0	0	0	0	**-1.00E-02**
BCEK	kg CO_2	0	0	4.45E-03	0	0	0	5.60E-03	0	0	0	0	**1.00E-02**
CBCEW	kg CO_2	0	0	0	0	0	0	0	0	0	0	0	**0**
CCE	kg CO_2	0	0	0	0	0	0	0	0	0	0	0	**0**
CCR	kg CO_2	0	0	0	0	0	0	0	0	0	0	0	**0**
CWNR	kg CO_2	0	0	0	0	0	0	0	0	0	0	0	**0**

5.2.3.8. Sherwood, Alberta, Canada

Table 48. Resource use and waste flows for VOCOMP-30 per declared unit (1m^2) at Sherwood, Alberta, Canada

Parameters	Unit	Stage 1 - Product Stage			Stage 2 - Design & Construction Stage			Stage 3 - Use & Maintenance Stage			Stage 4 - End-of-Life Stage		Total
		1-1	1-2	1-3	2-1	2-2	2-3	3-1	3-2	3-3	4-1	4-2	
Resource use indicators													
RPR_E	MJ, NCV	1.07E-01	1.93E-03	5.27E-02	8.13E-05	2.83E-04	0	1.08E-02	3.00E-06	0	3.93E-05	5.60E-05	**1.73E-01**
RPR_M	MJ, NCV	0	0	0	0	0	0	0	0	0	0	0	**0**
RPR_{total}	MJ, NCV	1.07E-01	1.93E-03	5.27E-02	8.13E-05	2.83E-04	0	1.08E-02	3.00E-06	0	3.93E-05	5.60E-05	**1.73E-01**
$NRPR_E$	MJ, NCV	4.60E+00	1.26E+00	2.72E+00	5.31E-02	1.85E-01	0	4.63E-01	3.41E-04	0	2.18E-02	6.38E-03	**9.31E+00**
$NRPR_M$	MJ, NCV	1.82E+00	0	0	0	0	0	1.82E-01	0	0	0	0	**2.00E+00**
$NRPR_{total}$	MJ, NCV	6.42E+00	1.26E+00	2.72E+00	5.31E-02	1.85E-01	0	6.45E-01	3.41E-04	0	2.18E-02	6.38E-03	**1.13E+01**
ADP	MJ	0	4.11E+00	1.53E-01	2.18E+00	3.49E-01	1.74E-01	0	4.13E-01	3.17E-04	0	2.04E-02	**7.40E+00**
SM	kg	0	0	0	0	0	0	0	0	0	0	0	**0**
RSF	MJ, NCV	0	0	0	0	0	0	0	0	0	0	0	**0**
NRSF	MJ, NCV	0	0	0	0	0	0	0	0	0	0	0	**0**
RE	MJ, NCV	0	0	0	0	0	0	0	0	0	0	0	**0**
FW	m^3	4.34E-01	9.37E-03	2.16E-01	3.94E-04	1.37E-03	0	4.36E-02	1.99E-05	0	1.71E-04	3.71E-04	**7.05E-01**
Output flows and waste category indicators													
HWD	kg	2.35E-03	5.20E-06	7.67E-04	2.19E-07	7.62E-07	0	2.38E-04	4.52E-07	0	7.89E-07	8.45E-06	**3.37E-03**
NHWD	kg	2.60E-04	1.18E-04	9.10E-04	4.95E-06	1.72E-05	0	2.63E-05	4.12E-08	0	6.20E-06	7.70E-07	**1.34E-03**
HLRW	kg	3.76E-07	1.86E-09	1.99E-07	4.25E-09	2.12E-09	0	3.78E-08	1.59E-11	0	2.78E-10	2.98E-10	**6.21E-07**
ILLRW	kg	1.26E-06	3.65E-09	8.93E-07	8.32E-09	4.14E-09	0	1.26E-07	3.69E-11	0	6.36E-10	6.89E-10	**2.29E-06**
CRU	kg	0	0	0	0	0	0	0	0	0	0	0	**0**
MR	kg	4.27E-04	0	0	0	3.05E-03	0	0	0	0	0	0	**3.48E-03**
MER	kg	0	0	0	0	0	0	0	0	0	0	0	**0**
EE	MJ	0	0	0	0	0	0	0	0	0	0	0	**0**
Carbon emissions and removals													
BCRP	kg CO_2	0	0	0	0	0	0	0	0	0	0	0	**0**
BCEP	kg CO_2	0	0	0	0	0	0	0	0	0	0	0	**0**
BCRK	kg CO_2	-4.45E-03	0	-5.60E-03	0	0	0	0	0	0	0	0	**-1.00E-02**
BCEK	kg CO_2	0	0	4.45E-03	0	0	0	5.60E-03	0	0	0	0	**1.00E-02**
CBCEW	kg CO_2	0	0	0	0	0	0	0	0	0	0	0	**0**
CCE	kg CO_2	0	0	0	0	0	0	0	0	0	0	0	**0**
CCR	kg CO_2	0	0	0	0	0	0	0	0	0	0	0	**0**
CWNR	kg CO_2	0	0	0	0	0	0	0	0	0	0	0	**0**

5.2.4. MEL-PRIME

Table 49. Resource use and waste flows for MEL-PRIME per declared unit (1m^2) at Hampshire, Illinois

Parameters	Unit	Stage 1 - Product Stage			Stage 2 - Design & Construction Stage			Stage 3 - Use & Maintenance Stage			Stage 4 - End-of-Life Stage		Total
		1-1	1-2	1-3	2-1	2-2	2-3	3-1	3-2	3-3	4-1	4-2	
Resource use indicators													
RPR_E	MJ, NCV	6.09E-02	6.84E-05	1.07E+00	6.80E-05	3.74E-04	0	6.09E-03	0	0	2.01E-06	7.40E-05	**1.14E+00**
RPR_M	MJ, NCV	0	0	0	0	0	0	0	0	0	0	0	**0**
RPR_{total}	MJ, NCV	6.09E-02	6.84E-05	1.07E+00	6.80E-05	3.74E-04	0	6.09E-03	0	0	2.01E-06	7.40E-05	**1.14E+00**
$NRPR_E$	MJ, NCV	4.68E+00	4.47E-02	1.21E+00	4.44E-02	2.44E-01	0	4.68E-01	0	0	1.11E-03	8.42E-03	**6.70E+00**
$NRPR_M$	MJ, NCV	2.13E+00	0	0	0	0	0	2.13E-01	0	0	0	0	**2.34E+00**
$NRPR_{total}$	MJ, NCV	6.81E+00	4.47E-02	1.21E+00	4.44E-02	2.44E-01	0	6.81E-01	0	0	1.11E-03	8.42E-03	**9.04E+00**
ADP	MJ	0	4.27E+00	4.19E-02	1.07E+00	4.17E-02	2.29E-01	0	4.28E-01	0	0	1.04E-03	**6.09E+00**
SM	kg	0	0	0	0	0	0	0	0	0	0	0	**0**
RSF	MJ, NCV	0	0	0	0	0	0	0	0	0	0	0	**0**
NRSF	MJ, NCV	0	0	0	0	0	0	0	0	0	0	0	**0**
RE	MJ, NCV	0	0	0	0	0	0	0	0	0	0	0	**0**
FW	m^3	2.71E-01	3.32E-04	5.15E-02	3.29E-04	1.81E-03	0	2.72E-02	0	0	8.73E-06	4.91E-04	**3.53E-01**
Output flows and waste category indicators													
HWD	kg	3.04E-03	9.75E-06	5.30E-04	9.69E-06	5.33E-05	0	3.05E-04	0	0	4.27E-08	3.74E-06	**3.96E-03**
NHWD	kg	3.63E-02	3.86E-05	5.41E-03	3.84E-05	2.11E-04	0	1.05E-02	0	0	9.28E-07	1.71E-01	**2.24E-01**
HLRW	kg	2.98E-07	5.11E-10	4.72E-08	5.08E-10	2.79E-09	0	2.99E-08	0	0	1.42E-11	3.93E-10	**3.80E-07**
ILLRW	kg	7.58E-07	1.00E-09	4.77E-07	9.95E-10	5.47E-09	0	7.58E-08	0	0	3.25E-11	9.10E-10	**1.32E-06**
CRU	kg	0	0	0	0	0	0	0	0	0	0	0	**0**
MR	kg	8.05E-03	0	0	0	1.43E-02	0	0	0	0	0	0	**2.23E-02**
MER	kg	0	0	0	0	0	0	0	0	0	0	0	**0**
EE	MJ	0	0	0	0	0	0	0	0	0	0	0	**0**
Carbon emissions and removals													
BCRP	kg CO_2	0	0	0	0	0	0	0	0	0	0	0	**0**
BCEP	kg CO_2	0	0	0	0	0	0	0	0	0	0	0	**0**
BCRK	kg CO_2	-1.38E-03	0	0	0	0	0	0	0	0	0	0	**-1.38E-03**
BCEK	kg CO_2	0	0	1.38E-03	0	0	0	0	0	0	0	0	**1.38E-03**
CBCEW	kg CO_2	0	0	0	0	0	0	0	0	0	0	0	**0**
CCE	kg CO_2	0	0	0	0	0	0	0	0	0	0	0	**0**
CCR	kg CO_2	0	0	0	0	0	0	0	0	0	0	0	**0**
CWNR	kg CO_2	0	0	0	0	0	0	0	0	0	0	0	**0**

5.2.5. MEL-PRIME N.E.

Table 50. Resource use and waste flows for MEL-PRIME N.E. per declared unit (1m^2) at Hampshire, Illinois

Parameters	Unit	Stage 1 - Product Stage			Stage 2 - Design & Construction Stage			Stage 3 - Use & Maintenance Stage			Stage 4 - End-of-Life Stage		Total
		1-1	1-2	1-3	2-1	2-2	2-3	3-1	3-2	3-3	4-1	4-2	
Resource use indicators													
RPR_E	MJ, NCV	1.93E-01	9.96E-05	1.66E+00	1.89E-03	5.80E-04	0	1.93E-02	0	0	5.25E-06	1.15E-04	**1.88E+00**
RPR_M	MJ, NCV	0	0	0	0	0	0	0	0	0	0	0	**0**
RPR_{total}	MJ, NCV	1.93E-01	9.96E-05	1.66E+00	1.89E-03	5.80E-04	0	1.93E-02	0	0	5.25E-06	1.15E-04	**1.88E+00**
$NRPR_E$	MJ, NCV	1.48E+01	6.50E-02	2.07E+00	1.23E+00	3.79E-01	0	1.48E+00	0	0	2.92E-03	1.31E-02	**2.00E+01**
$NRPR_M$	MJ, NCV	4.27E+00	0	0	0	0	0	4.27E-01	0	0	0	0	**4.70E+00**
$NRPR_{total}$	MJ, NCV	1.90E+01	6.50E-02	2.07E+00	1.23E+00	3.79E-01	0	1.90E+00	0	0	2.92E-03	1.31E-02	**2.47E+01**
ADP	MJ	0	1.35E+01	6.11E-02	1.84E+00	1.16E+00	3.56E-01	0	1.35E+00	0	0	2.74E-03	**1.83E+01**
SM	kg	0	0	0	0	0	0	0	0	0	0	0	**0**
RSF	MJ, NCV	0	0	0	0	0	0	0	0	0	0	0	**0**
NRSF	MJ, NCV	0	0	0	0	0	0	0	0	0	0	0	**0**
RE	MJ, NCV	0	0	0	0	0	0	0	0	0	0	0	**0**
FW	m^3	8.39E-01	4.83E-04	8.25E-02	9.16E-03	2.81E-03	0	8.40E-02	0	0	2.29E-05	7.61E-04	**1.02E+00**
Output flows and waste category indicators													
HWD	kg	9.64E-03	1.42E-05	8.28E-04	2.70E-04	8.27E-05	0	9.64E-04	0	0	1.12E-07	5.81E-06	**1.18E-02**
NHWD	kg	1.08E-01	5.62E-05	8.61E-03	1.07E-03	3.27E-04	0	2.15E-02	0	0	2.43E-06	2.65E-01	**4.05E-01**
HLRW	kg	9.50E-07	7.44E-10	7.57E-08	1.41E-08	4.34E-09	0	9.50E-08	0	0	3.72E-11	6.10E-10	**1.14E-06**
ILLRW	kg	2.47E-06	1.46E-09	7.55E-07	2.77E-08	8.49E-09	0	2.47E-07	0	0	8.51E-11	1.41E-09	**3.51E-06**
CRU	kg	0	0	0	0	0	0	0	0	0	0	0	**0**
MR	kg	3.32E-02	0	0	0	2.48E-02	0	0	0	0	0	0	**5.80E-02**
MER	kg	0	0	0	0	0	0	0	0	0	0	0	**0**
EE	MJ	0	0	0	0	0	0	0	0	0	0	0	**0**
Carbon emissions and removals													
BCRP	kg CO_2	0	0	0	0	0	0	0	0	0	0	0	**0**
BCEP	kg CO_2	0	0	0	0	0	0	0	0	0	0	0	**0**
BCRK	kg CO_2	-2.13E-03	0	0	0	0	0	0	0	0	0	0	**-2.13E-03**
BCEK	kg CO_2	0	0	2.13E-03	0	0	0	0	0	0	0	0	**2.13E-03**
CBCEW	kg CO_2	0	0	0	0	0	0	0	0	0	0	0	**0**
CCE	kg CO_2	0	0	0	0	0	0	0	0	0	0	0	**0**
CCR	kg CO_2	0	0	0	0	0	0	0	0	0	0	0	**0**
CWNR	kg CO_2	0	0	0	0	0	0	0	0	0	0	0	**0**

5.2.6. MEL-PRIME W/B

Table 51. Resource use and waste flows for MEL-PRIME W/B per declared unit (1m^2) at Hampshire, Illinois

Parameters	Unit	Stage 1 - Product Stage			Stage 2 - Design & Construction Stage			Stage 3 - Use & Maintenance Stage			Stage 4 - End-of-Life Stage		Total
		1-1	1-2	1-3	2-1	2-2	2-3	3-1	3-2	3-3	4-1	4-2	
Resource use indicators													
RPR_E	MJ, NCV	3.13E-02	5.82E-05	1.48E+00	2.62E-03	6.26E-04	0	3.13E-03	0	0	4.16E-07	1.49E-04	**1.51E+00**
RPR_M	MJ, NCV	0	0	0	0	0	0	0	0	0	0	0	**0**
RPR_{total}	MJ, NCV	3.13E-02	5.82E-05	1.48E+00	2.62E-03	6.26E-04	0	3.13E-03	0	0	4.16E-07	1.49E-04	**1.51E+00**
$NRPR_E$	MJ, NCV	1.94E+00	3.80E-02	5.10E-01	1.71E+00	4.08E-01	0	1.95E-01	0	0	2.31E-04	1.69E-02	**4.82E+00**
$NRPR_M$	MJ, NCV	2.13E+00	0	0	0	0	0	2.13E-01	0	0	0	0	**2.34E+00**
$NRPR_{total}$	MJ, NCV	4.07E+00	3.80E-02	5.10E-01	1.71E+00	4.08E-01	0	4.08E-01	0	0	2.31E-04	1.69E-02	**7.16E+00**
ADP	MJ	0	1.79E+00	3.57E-02	3.97E-01	1.60E+00	3.83E-01	0	1.79E-01	0	0	2.16E-04	**4.38E+00**
SM	kg	0	0	0	0	0	0	0	0	0	0	0	**0**
RSF	MJ, NCV	0	0	0	0	0	0	0	0	0	0	0	**0**
NRSF	MJ, NCV	0	0	0	0	0	0	0	0	0	0	0	**0**
RE	MJ, NCV	0	0	0	0	0	0	0	0	0	0	0	**0**
FW	m^3	6.84E-02	2.81E-04	6.68E-02	1.27E-02	3.03E-03	0	6.87E-03	0	0	1.81E-06	9.86E-04	**1.59E-01**
Output flows and waste category indicators													
HWD	kg	5.40E-04	8.30E-06	7.66E-04	3.73E-04	8.92E-05	0	5.42E-05	0	0	8.85E-09	7.53E-06	**1.84E-03**
NHWD	kg	7.09E-02	3.28E-05	8.26E-03	1.48E-03	3.53E-04	0	1.86E-02	0	0	1.92E-07	3.44E-01	**4.44E-01**
HLRW	kg	6.15E-08	4.35E-10	7.36E-08	1.96E-08	4.67E-09	0	6.18E-09	0	0	2.94E-12	7.91E-10	**1.67E-07**
ILLRW	kg	1.56E-07	8.51E-10	7.91E-07	3.83E-08	9.15E-09	0	1.57E-08	0	0	6.73E-12	1.83E-09	**1.01E-06**
CRU	kg	0	0	0	0	0	0	0	0	0	0	0	**0**
MR	kg	2.49E-02	0	0	0	1.06E-03	0	0	0	0	0	0	**2.60E-02**
MER	kg	0	0	0	0	0	0	0	0	0	0	0	**0**
EE	MJ	0	0	0	0	0	0	0	0	0	0	0	**0**
Carbon emissions and removals													
BCRP	kg CO_2	0	0	0	0	0	0	0	0	0	0	0	**0**
BCEP	kg CO_2	0	0	0	0	0	0	0	0	0	0	0	**0**
BCRK	kg CO_2	-1.95E-03	0	0	0	0	0	0	0	0	0	0	**-1.95E-03**
BCEK	kg CO_2	0	0	1.95E-03	0	0	0	0	0	0	0	0	**1.95E-03**
CBCEW	kg CO_2	0	0	0	0	0	0	0	0	0	0	0	**0**
CCE	kg CO_2	0	0	0	0	0	0	0	0	0	0	0	**0**
CCR	kg CO_2	0	0	0	0	0	0	0	0	0	0	0	**0**
CWNR	kg CO_2	0	0	0	0	0	0	0	0	0	0	0	**0**

Significant data limitations currently exist within the LCI data used to generate waste metrics for Life Cycle Assessments and Environmental Product Declarations. The waste metrics were calculated in a way conformant with the requirements of ISO 21930:2017, but these values represent rough estimates and are for informational purposes only. As such, no decisions regarding actual cradle-gate waste performance between products should be derived from these reported values.

5.3 Life cycle impact assessment (LCIA)

It shall be reiterated at this point that the reported impact categories represent impact potentials; they are approximations of environmental impacts that could occur if the emitted molecules follow the underlying impact pathway and meet certain conditions in the receiving environment while doing so. In addition, the inventory only captures that fraction of the total environmental load that corresponds to the chosen declared unit (relative approach). LCIA results are therefore relative expressions only and do not predict actual impacts, the exceeding of thresholds, safety margins, or risks.

Life cycle impact assessment (LCIA) results are shown for the products. Unlike life cycle inventories, which only report sums for individual inventory flows, the LCIA includes a classification of individual emissions with regard to the impacts they are associated with and subsequently a characterization of the emissions by a factor expressing their respective contribution to the impact category indicator. The end result is a single metric for quantifying each potential impact, such as “Global Warming Potential”.

The impact assessment results are calculated using characterization factors published by the United States Environmental Protection Agency. The TRACI 2.1 (Tool for the Reduction and Assessment of Chemical and Other Environmental Impacts 2.1) methodology is the most widely applied impact assessment method for U.S. LCA studies. The SM2013 Methodology is also applied to come up with single score results for the sole purpose of representing total impacts per life cycle phase to explain where in the product life cycle greatest impacts are occurring and what is contributing to the impacts.

These six TRACI 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. All impact categories from TRACI are used to calculate single score millipoints using the SM2013 Methodology, but it should be noted that there are known limitations related to these impact categories due to their high degree of uncertainty.

It is important to note that the LCIA indicators for carcinogenics, non carcinogenics (CTUh), and ecotoxicity (CTUe) are subject to significant uncertainty. EN 15804 includes the following disclaimer: *"The results of this environmental impact indicator shall be used with care, as the uncertainties associated with these results are high, or there is limited experience with the indicator."*

5.3.1. VOCOMP-20

The tables in this section show the LCIA results and the percent contribution of each stage of the production of VOCOMP-20 across eight plants. The figures in this section show the contribution analysis of each impact category for VOCOMP-20.

The 1-1 raw material manufacturing stage contributes the most to the overall impact across all locations. Coating manufacturing (1-3) and transportation stages (1-2, 2-1, and 2-2) also have significant contributions, but to a lesser extent. End-of life management and emissions from drying show small but nonzero contributions, indicating some level of impact in these later stages.

Transportation impacts vary significantly by location**,** with Cartersville and Hampshire having lower impacts, suggesting differences in supply chain efficiency. Across all manufacturing plant locations, Benicia leads in multiple impact categories, particularly

coating manufacturing, and transportation. Cartersville and Hampshire show the lowest transportation impact, which may suggest that they have better logistics or are closer to supply sources.

The average SM2013 Methodology single figure millipoint (mPts) across all manufacturing plants of W. R. MEADOWS VOCOMP-20 score by life cycle phase for this product is presented below (Table 52). Across all 10 impact categories, the SM single-figure score indicates that raw materials acquisition accounts for around 51.04% of the total impacts, manufacturing for 15.72%, and transportation for 7.36%.

Table 52. SM2013 Methodology single-figure millipoint (mPts) average across all plants for VOCOMP-20

Impact category	Unit	Stage 1 - Product Stage			Stage 2 - Design & Construction			Stage 3 - Use & Maintenance			Stage 4 - End-of-Life		Total
		1-1	1-2	1-3	2-1	2-2	2-3	3-1	3-2	3-3	4-1	4-2	
SM Single Score	mPts	6.09E-03	1.18E-03	2.60E-03	8.36E-04	1.04E-03	0	6.18E-04	3.47E-04	0	4.53E-06	2.24E-04	1.29E-02
	percentage	47.10%	9.12%	20.07%	6.46%	8.02%	0%	4.78%	2.68%	0%	0.03%	1.73%	100%

5.3.1.1. Benicia, California

Table 53. Life cycle impact assessment results for VOCOMP-20 per declared unit (1 m^2) at the manufacturing location in Benicia, California

Impact category	Unit	Stage 1 - Product Stage			Stage 2 - Design & Construction			Stage 3 - Use & Maintenance			Stage 4 - End-of-Life		Total
		1-1	1-2	1-3	2-1	2-2	2-3	3-1	3-2	3-3	4-1	4-2	
GWP, $IPCC_{TOTAL}$	kg CO_2 eq	1.15E-01	1.80E-02	1.73E-01	2.05E-02	1.74E-02	0	1.92E-02	1.31E-04	0	4.88E-05	3.26E-03	**3.67E-01**
GWP, $IPCC_{BIOGENIC}$	kg CO_2 eq	-1.08E-03	0	-6.41E-03	0	0	0	7.49E-03	0	0	0	0	**0**
GWP, $IPCC_{FOSSIL}$	kg CO_2 eq	1.16E-01	1.80E-02	1.80E-01	2.05E-02	1.74E-02	0	1.17E-02	1.31E-04	0	4.88E-05	3.26E-03	**3.67E-01**
GWP, TRACI 2.1_{TOTAL}	kg CO_2 eq	1.12E-01	1.78E-02	1.69E-01	2.02E-02	1.72E-02	0	1.89E-02	1.16E-04	0	4.82E-05	2.88E-03	**3.58E-01**
GWP, TRACI $2.1_{BIOGENIC}$	kg CO_2 eq	-1.08E-03	0	-6.41E-03	0	0	0	7.49E-03	0	0	0	0	**0**
GWP, TRACI 2.1_{FOSSIL}	kg CO_2 eq	1.13E-01	1.78E-02	1.75E-01	2.02E-02	1.72E-02	0	1.14E-02	1.16E-04	0	4.82E-05	2.88E-03	**3.58E-01**
Ozone depletion	kg CFC-11 eq	1.61E-09	2.55E-10	4.65E-09	2.91E-10	2.47E-10	0	1.61E-10	3.96E-13	0	7.97E-13	9.85E-12	**7.22E-09**
Acidification	kg SO_2 eq	3.77E-04	4.39E-05	4.53E-04	5.00E-05	4.24E-05	0	3.78E-05	9.09E-08	0	2.35E-07	2.26E-06	**1.01E-03**
Eutrophication	kg N eq	5.29E-05	2.99E-06	3.18E-05	3.40E-06	2.88E-06	0	5.32E-06	2.39E-08	0	1.49E-08	5.96E-07	**1.00E-04**
Smog	kg O_3 eq	4.89E-03	1.13E-03	4.66E-03	1.28E-03	1.09E-03	0	4.91E-04	9.78E-03	0	7.23E-06	6.25E-05	**2.34E-02**
Respiratory effects	kg PM2.5 eq	5.87E-05	6.05E-06	4.40E-05	6.88E-06	5.84E-06	0	5.88E-06	1.33E-08	0	2.94E-08	3.31E-07	**1.28E-04**
Additional environmental information													
Carcinogenics	CTUh	5.46E-10	1.14E-11	2.24E-10	1.29E-11	1.10E-11	0	5.56E-11	1.00E-12	0	1.03E-14	2.50E-11	**8.87E-10**
Non carcinogenics	CTUh	6.41E-09	2.19E-09	4.44E-09	2.50E-09	2.12E-09	0	7.12E-10	7.07E-11	0	2.13E-12	1.76E-09	**2.02E-08**
Ecotoxicity	CTUe	4.90E-02	4.47E-02	1.88E-02	5.09E-02	4.32E-02	0	5.01E-03	1.08E-04	0	6.22E-06	2.70E-03	**2.14E-01**
Fossil fuel depletion	MJ surplus	2.77E-01	3.39E-02	4.12E-01	3.85E-02	3.27E-02	0	2.77E-02	4.38E-05	0	9.03E-05	1.09E-03	**8.23E-01**

Table 54. Life cycle impact assessment percentage contribution for VOCOMP-20 per declared unit (1 m^2) at the manufacturing location in Benicia, California

Impact category	Stage 1 - Product Stage			Stage 2 - Design & Construction			Stage 3 - Use & Maintenance			Stage 4 - End-of-Life		Total
	1-1	1-2	1-3	2-1	2-2	2-3	3-1	3-2	3-3	4-1	4-2	
GWP, $IPCC_{TOTAL}$	31.66%	4.90%	49.00%	5.58%	4.73%	0%	3.20%	0.04%	0%	0.01%	0.89%	100%
GWP, $TRACI_{TOTAL}$	31.30%	4.97%	47.15%	5.65%	4.79%	0%	5.29%	0.03%	0%	0.01%	0.81%	100%
Ozone depletion	22.26%	3.54%	64.38%	4.02%	3.41%	0%	2.23%	0.01%	0%	0.01%	0.14%	100%
Acidification	37.48%	4.36%	44.98%	4.96%	4.21%	0%	3.76%	0.01%	0%	0.02%	0.22%	100%
Eutrophication	52.97%	2.99%	31.81%	3.40%	2.88%	0%	5.32%	0.02%	0%	0.01%	0.60%	100%
Smog	20.90%	4.82%	19.93%	5.48%	4.65%	0%	2.10%	41.82%	0%	0.03%	0.27%	100%
Respiratory effects	45.96%	4.73%	34.45%	5.39%	4.57%	0%	4.61%	0.01%	0%	0.02%	0.26%	100%
Additional environmental information												
Carcinogenics	61.54%	1.28%	25.29%	1.46%	1.24%	0%	6.27%	0.11%	0%	0%	2.82%	100%
Non-carcinogenics	31.73%	10.86%	21.97%	12.36%	10.48%	0%	3.52%	0.35%	0%	0.01%	8.71%	100%
Ecotoxicity	34.21%	4.31%	9.29%	31.34%	23.78%	0%	2.76%	0.06%	0%	0%	1.48%	100%
Fossil fuel depletion	33.62%	4.12%	50.09%	4.68%	3.97%	0%	3.37%	0.01%	0%	0.01%	0.13%	100%

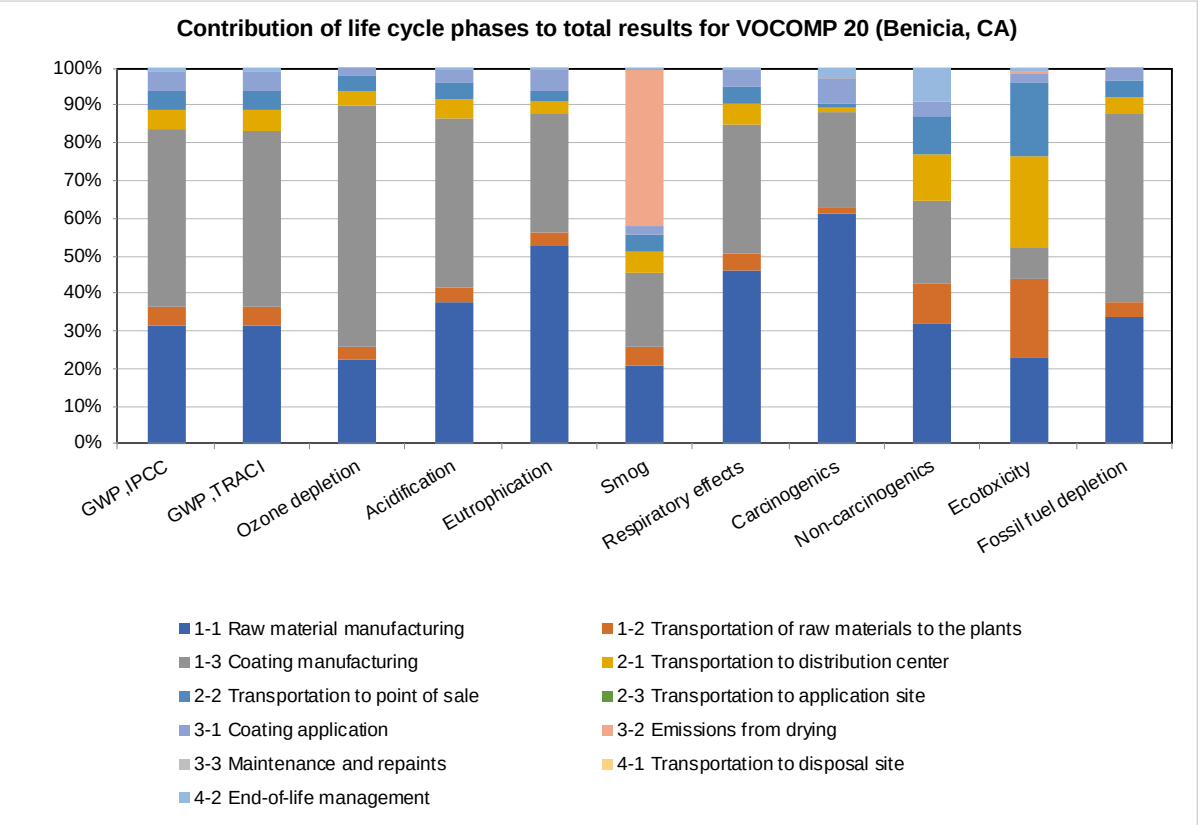

Figure 5. Contribution analysis of each impact category for VOCOMP-20 at Benicia, California

5.3.1.2. Cartersville, Georgia

Table 55. Life cycle impact assessment results for VOCOMP-20 per declared unit (1 m^2) at the manufacturing location in Cartersville, Georgia

Impact category	Unit	Stage 1 - Product Stage			Stage 2 - Design & Construction			Stage 3 - Use & Maintenance			Stage 4 - End-of-Life		Total
		1-1	1-2	1-3	2-1	2-2	2-3	3-1	3-2	3-3	4-1	4-2	
GWP, $IPCC_{TOTAL}$	kg CO_2 eq	1.15E-01	3.15E-03	5.50E-02	2.29E-02	1.74E-02	0	1.92E-02	1.31E-04	0	4.88E-05	3.26E-03	**2.36E-01**
GWP, $IPCC_{BIOGENIC}$	kg CO_2 eq	-1.08E-03	0	-6.41E-03	0	0	0	7.49E-03	0	0	0	0	**0**
GWP, $IPCC_{FOSSIL}$	kg CO_2 eq	1.16E-01	3.15E-03	6.14E-02	2.29E-02	1.74E-02	0	1.17E-02	1.31E-04	0	4.88E-05	3.26E-03	**2.36E-01**
GWP, TRACI 2.1_{TOTAL}	kg CO_2 eq	1.12E-01	3.11E-03	5.31E-02	2.26E-02	1.72E-02	0	1.89E-02	1.16E-04	0	4.82E-05	2.88E-03	**2.30E-01**
GWP, TRACI $2.1_{BIOGENIC}$	kg CO_2 eq	-1.08E-03	0	-6.41E-03	0	0	0	7.49E-03	0	0	0	0	**0**
GWP, TRACI 2.1_{FOSSIL}	kg CO_2 eq	1.13E-01	3.11E-03	5.95E-02	2.26E-02	1.72E-02	0	1.14E-02	1.16E-04	0	4.82E-05	2.88E-03	**2.30E-01**
Ozone depletion	kg CFC-11 eq	1.61E-09	4.47E-11	2.12E-09	3.25E-10	2.47E-10	0	1.61E-10	3.96E-13	0	7.97E-13	9.85E-12	**4.52E-09**
Acidification	kg SO_2 eq	3.77E-04	7.69E-06	1.83E-04	5.59E-05	4.24E-05	0	3.78E-05	9.09E-08	0	2.35E-07	2.26E-06	**7.07E-04**
Eutrophication	kg N eq	5.29E-05	5.22E-07	1.74E-05	3.80E-06	2.88E-06	0	5.32E-06	2.39E-08	0	1.49E-08	5.96E-07	**8.35E-05**
Smog	kg O_3 eq	4.89E-03	1.97E-04	2.44E-03	1.43E-03	1.09E-03	0	4.91E-04	9.78E-03	0	7.23E-06	6.25E-05	**2.04E-02**
Respiratory effects	kg PM2.5 eq	5.87E-05	1.06E-06	2.92E-05	7.69E-06	5.84E-06	0	5.88E-06	1.33E-08	0	2.94E-08	3.31E-07	**1.09E-04**
Additional environmental information													
Carcinogenics	CTUh	5.46E-10	1.99E-12	8.30E-11	1.45E-11	1.10E-11	0	5.56E-11	1.00E-12	0	1.03E-14	2.50E-11	**7.38E-10**
Non carcinogenics	CTUh	6.41E-09	3.84E-10	1.71E-09	2.79E-09	2.12E-09	0	7.12E-10	7.07E-11	0	2.13E-12	1.76E-09	**1.60E-08**
Ecotoxicity	CTUe	4.90E-02	7.83E-03	1.69E-02	5.69E-02	4.32E-02	0	5.01E-03	1.08E-04	0	6.22E-06	2.70E-03	**1.82E-01**
Fossil fuel depletion	MJ surplus	2.77E-01	5.93E-03	2.19E-01	4.31E-02	3.27E-02	0	2.77E-02	4.38E-05	0	9.03E-05	1.09E-03	**6.06E-01**

Table 56. Life cycle impact assessment percentage contribution for VOCOMP-20 per declared unit (1 m^2) at the manufacturing location in Cartersville, Georgia

Impact category	Stage 1 - Product Stage			Stage 2 - Design & Construction			Stage 3 - Use & Maintenance			Stage 4 - End-of-Life		Total
	1-1	1-2	1-3	2-1	2-2	2-3	3-1	3-2	3-3	4-1	4-2	
GWP, $IPCC_{TOTAL}$	48.73%	1.33%	23.29%	9.69%	7.35%	0%	8.15%	0.06%	0%	0.02%	1.38%	100%
GWP, $TRACI_{TOTAL}$	48.69%	1.35%	23.11%	9.83%	7.46%	0%	8.22%	0.05%	0%	0.02%	1.25%	100%
Ozone depletion	35.58%	0.99%	46.98%	7.19%	5.46%	0%	3.57%	0.01%	0%	0.02%	0.22%	100%
Acidification	53.37%	1.09%	25.93%	7.90%	5.99%	0%	5.35%	0.01%	0%	0.03%	0.32%	100%
Eutrophication	63.42%	0.63%	20.82%	4.55%	3.45%	0%	6.37%	0.03%	0%	0.02%	0.71%	100%
Smog	23.98%	0.97%	11.97%	7.03%	5.33%	0%	2.41%	47.97%	0%	0.04%	0.31%	100%
Respiratory effects	53.99%	0.97%	26.84%	7.08%	5.37%	0%	5.41%	0.01%	0%	0.03%	0.30%	100%
Additional environmental information												
Carcinogenics	73.97%	0.27%	11.26%	1.96%	1.49%	0%	7.53%	0.14%	0%	0%	3.39%	100%
Non-carcinogenics	40.16%	2.41%	10.73%	17.49%	13.27%	0%	4.46%	0.44%	0%	0.01%	11.03%	100%
Ecotoxicity	26.97%	4.31%	9.29%	31.34%	23.78%	0%	2.76%	0.06%	0%	0%	1.48%	100%
Fossil fuel depletion	45.62%	0.98%	36.13%	7.11%	5.39%	0%	4.57%	0.01%	0%	0.01%	0.18%	100%

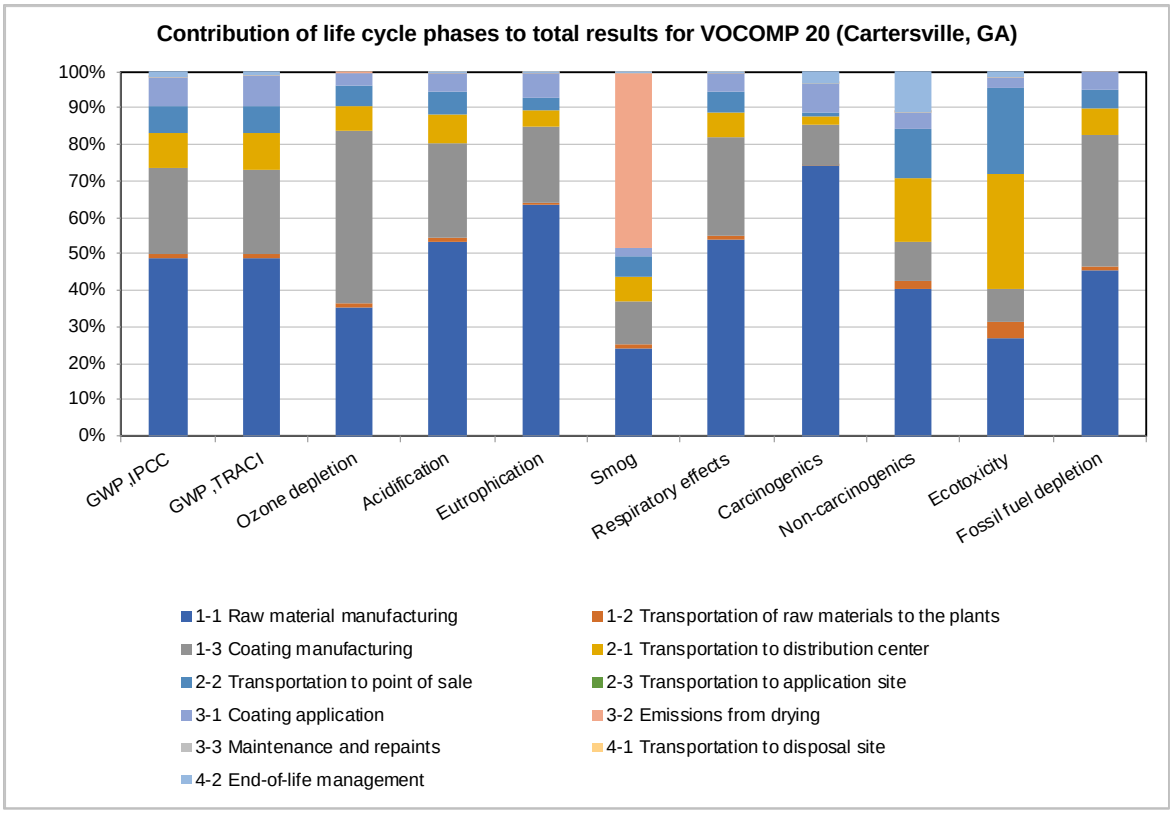

Figure 6. Contribution analysis of each impact category for VOCOMP-20 at Cartersville, Georgia

5.3.1.3. Fort Worth, Texas

Table 57. Life cycle impact assessment results for VOCOMP-20 per declared unit (1 m^2) at the manufacturing location in Fort Worth, Texas

Impact category	Unit	Stage 1 - Product Stage			Stage 2 - Design & Construction			Stage 3 - Use & Maintenance			Stage 4 - End-of-Life		Total
		1-1	1-2	1-3	2-1	2-2	2-3	3-1	3-2	3-3	4-1	4-2	
GWP, $IPCC_{TOTAL}$	kg CO_2 eq	1.15E-01	1.15E-02	1.77E-02	1.06E-02	1.74E-02	0	1.92E-02	1.31E-04	0	4.88E-05	3.26E-03	**1.95E-01**
GWP, $IPCC_{BIOGENIC}$	kg CO_2 eq	-1.08E-03	0	-6.41E-03	0	0	0	7.49E-03	0	0	0	0	**0**
GWP, $IPCC_{FOSSIL}$	kg CO_2 eq	1.16E-01	1.15E-02	2.41E-02	1.06E-02	1.74E-02	0	1.17E-02	1.31E-04	0	4.88E-05	3.26E-03	**1.95E-01**
GWP, TRACI 2.1_{TOTAL}	kg CO_2 eq	1.12E-01	1.14E-02	1.83E-02	1.05E-02	1.72E-02	0	1.89E-02	1.16E-04	0	4.82E-05	2.88E-03	**1.91E-01**
GWP, TRACI $2.1_{BIOGENIC}$	kg CO_2 eq	-1.08E-03	0	-6.41E-03	0	0	0	7.49E-03	0	0	0	0	**0**
GWP, TRACI 2.1_{FOSSIL}	kg CO_2 eq	1.13E-01	1.14E-02	2.47E-02	1.05E-02	1.72E-02	0	1.14E-02	1.16E-04	0	4.82E-05	2.88E-03	**1.91E-01**
Ozone depletion	kg CFC-11 eq	1.61E-09	1.64E-10	2.09E-10	1.51E-10	2.47E-10	0	1.61E-10	3.96E-13	0	7.97E-13	9.85E-12	**2.55E-09**
Acidification	kg SO_2 eq	3.77E-04	2.81E-05	7.65E-05	2.60E-05	4.24E-05	0	3.78E-05	9.09E-08	0	2.35E-07	2.26E-06	**5.91E-04**
Eutrophication	kg N eq	5.29E-05	1.91E-06	7.01E-06	1.77E-06	2.88E-06	0	5.32E-06	2.39E-08	0	1.49E-08	5.96E-07	**7.25E-05**
Smog	kg O_3 eq	4.89E-03	7.21E-04	1.17E-03	6.67E-04	1.09E-03	0	4.91E-04	9.78E-03	0	7.23E-06	6.25E-05	**1.89E-02**
Respiratory effects	kg PM2.5 eq	5.87E-05	3.87E-06	1.41E-05	3.58E-06	5.84E-06	0	5.88E-06	1.33E-08	0	2.94E-08	3.31E-07	**9.24E-05**
Additional environmental information													
Carcinogenics	CTUh	5.46E-10	7.27E-12	2.87E-10	6.73E-12	1.10E-11	0	5.56E-11	1.00E-12	0	1.03E-14	2.50E-11	**9.39E-10**
Non carcinogenics	CTUh	6.41E-09	1.41E-09	1.92E-09	1.30E-09	2.12E-09	0	7.12E-10	7.07E-11	0	2.13E-12	1.76E-09	**1.57E-08**
Ecotoxicity	CTUe	4.90E-02	2.86E-02	3.21E-02	2.65E-02	4.32E-02	0	5.01E-03	1.08E-04	0	6.22E-06	2.70E-03	**1.87E-01**
Fossil fuel depletion	MJ surplus	2.77E-01	2.17E-02	1.96E-02	2.01E-02	3.27E-02	0	2.77E-02	4.38E-05	0	9.03E-05	1.09E-03	**4.00E-01**

Table 58. Life cycle impact assessment percentage contribution for VOCOMP-20 per declared unit (1 m^2) at the manufacturing location in Fort Worth, Texas

Impact category	Stage 1 - Product Stage			Stage 2 - Design & Construction			Stage 3 - Use & Maintenance			Stage 4 - End-of-Life		Total
	1-1	1-2	1-3	2-1	2-2	2-3	3-1	3-2	3-3	4-1	4-2	
GWP, $IPCC_{TOTAL}$	59.01%	5.90%	9.09%	5.46%	8.90%	0%	9.87%	0.07%	0%	0.03%	1.67%	100%
GWP, $TRACI_{TOTAL}$	58.53%	5.95%	9.57%	5.50%	8.97%	0%	9.89%	0.06%	0%	0.03%	1.51%	100%
Ozone depletion	63.05%	6.41%	8.18%	5.93%	9.67%	0%	6.32%	0.02%	0%	0.03%	0.39%	100%
Acidification	63.88%	4.76%	12.95%	4.40%	7.17%	0%	6.40%	0.02%	0%	0.04%	0.38%	100%
Eutrophication	73.06%	2.64%	9.68%	2.44%	3.98%	0%	7.34%	0.03%	0%	0.02%	0.82%	100%
Smog	25.90%	3.82%	6.21%	3.53%	5.76%	0%	2.60%	51.81%	0%	0.04%	0.33%	100%
Fossil fuel depletion	69.24%	5.43%	4.89%	5.02%	8.18%	0%	6.93%	0.01%	0%	0.02%	0.27%	100%
Additional environmental information												
Respiratory effects	63.56%	4.19%	15.28%	3.88%	6.32%	0%	6.37%	0.01%	0%	0.03%	0.36%	100%
Carcinogenics	58.10%	0.77%	30.56%	0.72%	1.17%	0%	5.92%	0.11%	0%	0%	2.66%	100%
Non-carcinogenics	40.83%	8.95%	12.24%	8.28%	13.49%	0%	4.53%	0.45%	0%	0.01%	11.21%	100%
Ecotoxicity	26.17%	15.30%	17.13%	14.15%	23.07%	0%	2.67%	0.06%	0%	0%	1.44%	100%

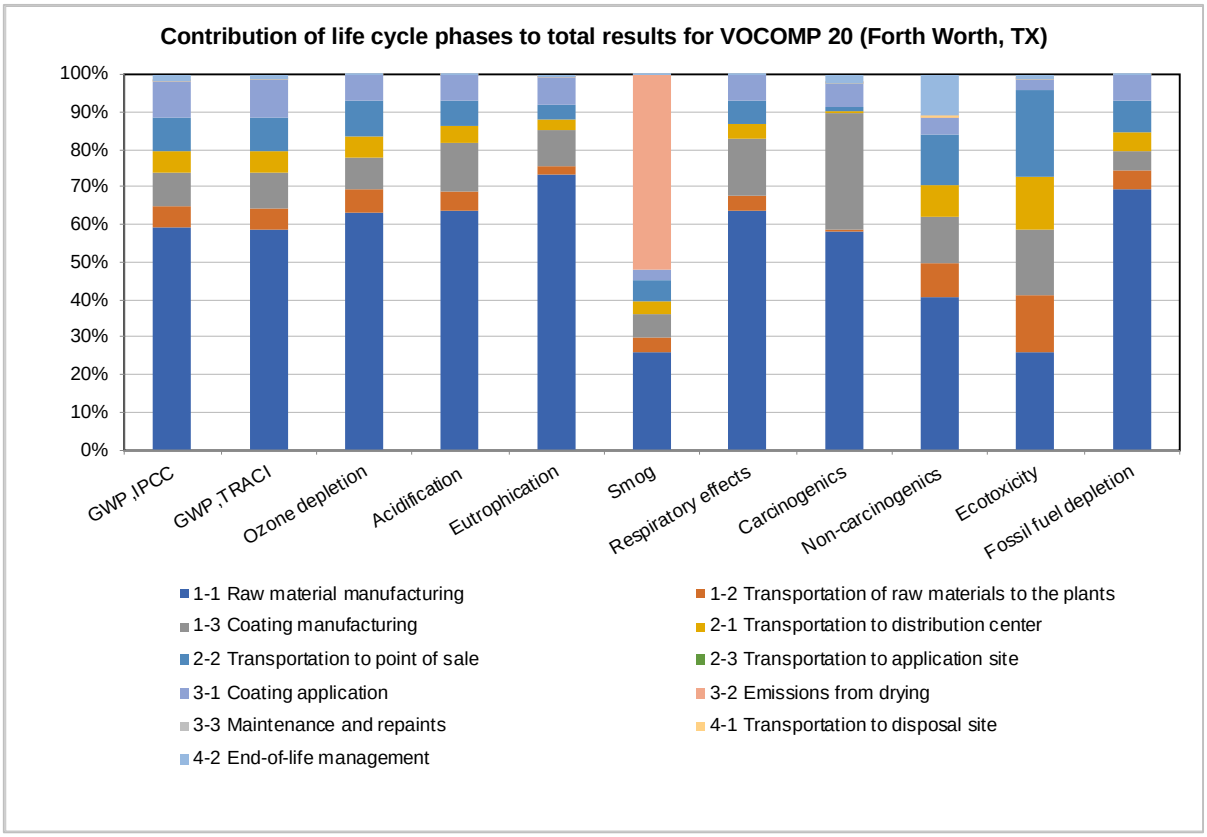

Figure 7. Contribution analysis of each impact category for VOCOMP-20 at Fort Worth, Texas

5.3.1.4. Goodyear, Arizona

Table 59. Life cycle impact assessment results for VOCOMP-20 per declared unit (1 m^2) at the manufacturing location in Goodyear, Arizona

Impact category	Unit	Stage 1 - Product Stage			Stage 2 - Design & Construction			Stage 3 - Use & Maintenance			Stage 4 - End-of-Life		Total
		1-1	1-2	1-3	2-1	2-2	2-3	3-1	3-2	3-3	4-1	4-2	
GWP, $IPCC_{TOTAL}$	kg CO_2 eq	1.15E-01	1.27E-02	2.99E-02	1.48E-02	1.74E-02	0	1.92E-02	1.31E-04	0	4.88E-05	3.26E-03	**2.12E-01**
GWP, $IPCC_{BIOGENIC}$	kg CO_2 eq	-1.08E-03	0	-6.41E-03	0	0	0	7.49E-03	0	0	0	0	**0**
GWP, $IPCC_{FOSSIL}$	kg CO_2 eq	1.16E-01	1.27E-02	3.63E-02	1.48E-02	1.74E-02	0	1.17E-02	1.31E-04	0	4.88E-05	3.26E-03	**2.12E-01**
GWP, $TRACI\ 2.1_{TOTAL}$	kg CO_2 eq	1.12E-01	1.25E-02	3.13E-02	1.46E-02	1.72E-02	0	1.89E-02	1.16E-04	0	4.82E-05	2.88E-03	**2.10E-01**
GWP, $TRACI\ 2.1_{BIOGENIC}$	kg CO_2 eq	-1.08E-03	0	-6.41E-03	0	0	0	7.49E-03	0	0	0	0	**0**
GWP, $TRACI\ 2.1_{FOSSIL}$	kg CO_2 eq	1.13E-01	1.25E-02	3.78E-02	1.46E-02	1.72E-02	0	1.14E-02	1.16E-04	0	4.82E-05	2.88E-03	**2.10E-01**
Ozone depletion	kg CFC-11 eq	1.61E-09	1.80E-10	9.70E-10	2.10E-10	2.47E-10	0	1.61E-10	3.96E-13	0	7.97E-13	9.85E-12	**3.39E-09**
Acidification	kg SO_2 eq	3.77E-04	3.10E-05	1.22E-04	3.61E-05	4.24E-05	0	3.78E-05	9.09E-08	0	2.35E-07	2.26E-06	**6.50E-04**
Eutrophication	kg N eq	5.29E-05	2.11E-06	1.33E-05	2.45E-06	2.88E-06	0	5.32E-06	2.39E-08	0	1.49E-08	5.96E-07	**7.97E-05**
Smog	kg O_3 eq	4.89E-03	7.96E-04	1.54E-03	9.26E-04	1.09E-03	0	4.91E-04	9.78E-03	0	7.23E-06	6.25E-05	**1.96E-02**
Respiratory effects	kg PM2.5 eq	5.87E-05	4.27E-06	1.82E-05	4.97E-06	5.84E-06	0	5.88E-06	1.33E-08	0	2.94E-08	3.31E-07	**9.82E-05**
Additional environmental information													
Carcinogenics	CTUh	5.46E-10	8.03E-12	3.13E-10	9.34E-12	1.10E-11	0	5.56E-11	1.00E-12	0	1.03E-14	2.50E-11	**9.68E-10**
Non carcinogenics	CTUh	6.41E-09	1.55E-09	1.92E-09	1.80E-09	2.12E-09	0	7.12E-10	7.07E-11	0	2.13E-12	1.76E-09	**1.64E-08**
Ecotoxicity	CTUe	4.90E-02	3.16E-02	3.65E-02	3.68E-02	4.32E-02	0	5.01E-03	1.08E-04	0	6.22E-06	2.70E-03	**2.05E-01**
Fossil fuel depletion	MJ surplus	2.77E-01	2.39E-02	4.60E-02	2.78E-02	3.27E-02	0	2.77E-02	4.38E-05	0	9.03E-05	1.09E-03	**4.36E-01**

Table 60. Life cycle impact assessment percentage contribution for VOCOMP-20 per declared unit (1 m^2) at the manufacturing location in Goodyear, Arizona

Impact category	Stage 1 - Product Stage			Stage 2 - Design & Construction			Stage 3 - Use & Maintenance			Stage 4 - End-of-Life		Total
	1-1	1-2	1-3	2-1	2-2	2-3	3-1	3-2	3-3	4-1	4-2	
GWP, $IPCC_{TOTAL}$	54.16%	5.98%	14.06%	6.96%	8.17%	0%	9.05%	0.06%	0%	0.02%	1.53%	100%
GWP, $TRACI_{TOTAL}$	53.42%	5.99%	14.96%	6.97%	8.18%	0%	9.02%	0.06%	0%	0.02%	1.38%	100%
Ozone depletion	47.47%	5.33%	28.63%	6.20%	7.28%	0%	4.76%	0.01%	0%	0.02%	0.29%	100%
Acidification	58.09%	4.77%	18.84%	5.56%	6.52%	0%	5.82%	0.01%	0%	0.04%	0.35%	100%
Eutrophication	66.47%	2.65%	16.71%	3.08%	3.62%	0%	6.68%	0.03%	0%	0.02%	0.75%	100%
Smog	24.97%	4.06%	7.87%	4.73%	5.55%	0%	2.51%	49.95%	0%	0.04%	0.32%	100%
Respiratory effects	59.77%	4.35%	18.50%	5.06%	5.94%	0%	5.99%	0.01%	0%	0.03%	0.34%	100%
Additional environmental information												
Carcinogenics	56.36%	0.83%	32.29%	0.97%	1.13%	0%	5.74%	0.10%	0%	0%	2.58%	100%
Non-carcinogenics	39.21%	9.48%	11.76%	11.03%	12.96%	0%	4.35%	0.43%	0%	0.01%	10.77%	100%
Ecotoxicity	23.91%	15.42%	17.83%	17.95%	21.07%	0%	2.44%	0.05%	0%	0%	1.32%	100%
Fossil fuel depletion	63.44%	5.49%	10.55%	6.39%	7.50%	0%	6.35%	0.01%	0%	0.02%	0.25%	100%

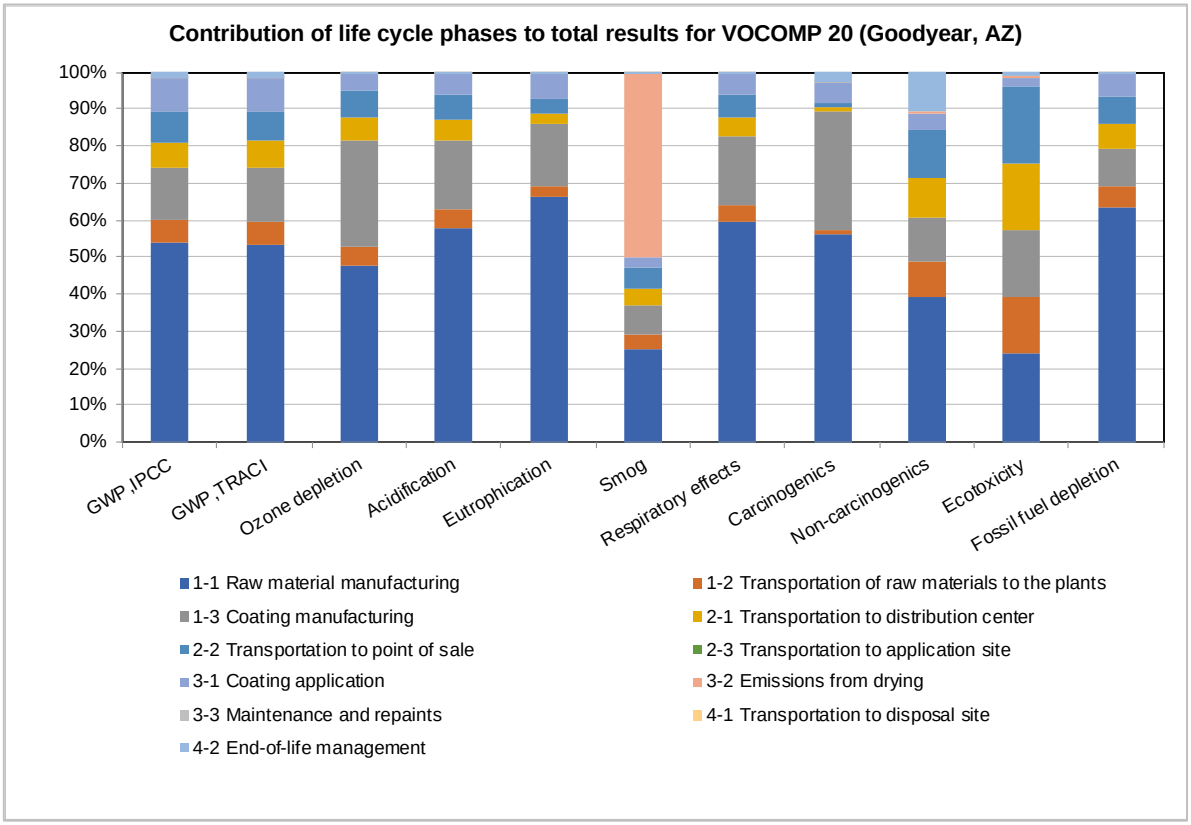

Figure 8. Contribution analysis of each impact category for VOCOMP-20 at Goodyear, Arizona

5.3.1.5. Hampshire, Illinois

Table 61. Life cycle impact assessment results for VOCOMP-20 per declared unit (1 m^2) at the manufacturing location in Hampshire, Illinois

Impact category	Unit	Stage 1 - Product Stage			Stage 2 - Design & Construction			Stage 3 - Use & Maintenance			Stage 4 - End-of-Life		Total
		1-1	1-2	1-3	2-1	2-2	2-3	3-1	3-2	3-3	4-1	4-2	
GWP, $IPCC_{TOTAL}$	kg CO_2 eq	1.15E-01	3.15E-03	2.72E-02	8.68E-03	1.74E-02	0	1.92E-02	1.31E-04	0	4.88E-05	3.26E-03	**1.94E-01**
GWP, $IPCC_{BIOGENIC}$	kg CO_2 eq	-1.08E-03	0	-6.41E-03	0	0	0	7.49E-03	0	0	0	0	**0**
GWP, $IPCC_{FOSSIL}$	kg CO_2 eq	1.16E-01	3.15E-03	3.36E-02	8.68E-03	1.74E-02	0	1.17E-02	1.31E-04	0	4.88E-05	3.26E-03	**1.94E-01**
GWP, TRACI 2.1_{TOTAL}	kg CO_2 eq	1.12E-01	3.11E-03	2.76E-02	8.58E-03	1.72E-02	0	1.89E-02	1.16E-04	0	4.82E-05	2.88E-03	**1.90E-01**
GWP, TRACI $2.1_{BIOGENIC}$	kg CO_2 eq	-1.08E-03	0	-6.41E-03	0	0	0	7.49E-03	0	0	0	0	**0**
GWP, TRACI 2.1_{FOSSIL}	kg CO_2 eq	1.13E-01	3.11E-03	3.40E-02	8.58E-03	1.72E-02	0	1.14E-02	1.16E-04	0	4.82E-05	2.88E-03	**1.90E-01**
Ozone depletion	kg CFC-11 eq	1.61E-09	4.47E-11	4.54E-10	1.23E-10	2.47E-10	0	1.61E-10	3.96E-13	0	7.97E-13	9.85E-12	**2.65E-09**
Acidification	kg SO_2 eq	3.77E-04	7.69E-06	1.06E-04	2.12E-05	4.24E-05	0	3.78E-05	9.09E-08	0	2.35E-07	2.26E-06	**5.96E-04**
Eutrophication	kg N eq	5.29E-05	5.22E-07	8.62E-06	1.44E-06	2.88E-06	0	5.32E-06	2.39E-08	0	1.49E-08	5.96E-07	**7.24E-05**
Smog	kg O_3 eq	4.89E-03	1.97E-04	1.46E-03	5.44E-04	1.09E-03	0	4.91E-04	9.78E-03	0	7.23E-06	6.25E-05	**1.85E-02**
Respiratory effects	kg PM2.5 eq	5.87E-05	1.06E-06	1.45E-05	2.92E-06	5.84E-06	0	5.88E-06	1.33E-08	0	2.94E-08	3.31E-07	**8.92E-05**
Additional environmental information													
Carcinogenics	CTUh	5.46E-10	1.99E-12	3.03E-10	5.48E-12	1.10E-11	0	5.56E-11	1.00E-12	0	1.03E-14	2.50E-11	**9.48E-10**
Non carcinogenics	CTUh	6.41E-09	3.84E-10	2.43E-09	1.06E-09	2.12E-09	0	7.12E-10	7.07E-11	0	2.13E-12	1.76E-09	**1.50E-08**
Ecotoxicity	CTUe	4.90E-02	7.83E-03	2.97E-02	2.16E-02	4.32E-02	0	5.01E-03	1.08E-04	0	6.22E-06	2.70E-03	**1.59E-01**
Fossil fuel depletion	MJ surplus	2.77E-01	5.93E-03	2.29E-02	1.63E-02	3.27E-02	0	2.77E-02	4.38E-05	0	9.03E-05	1.09E-03	**3.83E-01**

Table 62. Life cycle impact assessment percentage contribution for VOCOMP-20 per declared unit (1 m^2) at the manufacturing location in Hampshire, Illinois

Impact category	Stage 1 - Product Stage			Stage 2 - Design & Construction			Stage 3 - Use & Maintenance			Stage 4 - End-of-Life		Total
	1-1	1-2	1-3	2-1	2-2	2-3	3-1	3-2	3-3	4-1	4-2	
GWP, $IPCC_{TOTAL}$	59.27%	1.62%	14.02%	4.47%	8.94%	0%	9.91%	0.07%	0%	0.03%	1.68%	100%
GWP, $TRACI_{TOTAL}$	58.81%	1.63%	14.50%	4.51%	9.01%	0%	9.93%	0.06%	0%	0.03%	1.52%	100%
Ozone depletion	60.70%	1.69%	17.15%	4.65%	9.31%	0%	6.08%	0.01%	0%	0.03%	0.37%	100%
Acidification	63.37%	1.29%	17.88%	3.56%	7.12%	0%	6.35%	0.02%	0%	0.04%	0.38%	100%
Eutrophication	73.16%	0.72%	11.91%	1.99%	3.98%	0%	7.35%	0.03%	0%	0.02%	0.82%	100%
Smog	26.39%	1.06%	7.91%	2.94%	5.87%	0%	2.65%	52.80%	0%	0.04%	0.34%	100%
Respiratory effects	65.77%	1.19%	16.22%	3.27%	6.54%	0%	6.59%	0.01%	0%	0.03%	0.37%	100%
Additional environmental information												
Carcinogenics	57.54%	0.21%	31.92%	0.58%	1.16%	0%	5.86%	0.11%	0%	0%	2.64%	100%
Non-carcinogenics	42.88%	2.57%	16.27%	7.08%	14.17%	0%	4.76%	0.47%	0%	0.01%	11.78%	100%
Ecotoxicity	30.79%	4.92%	18.65%	13.57%	27.14%	0%	3.15%	0.07%	0%	0%	1.70%	100%
Fossil fuel depletion	72.15%	1.55%	5.97%	4.26%	8.53%	0%	7.23%	0.01%	0%	0.02%	0.28%	100%

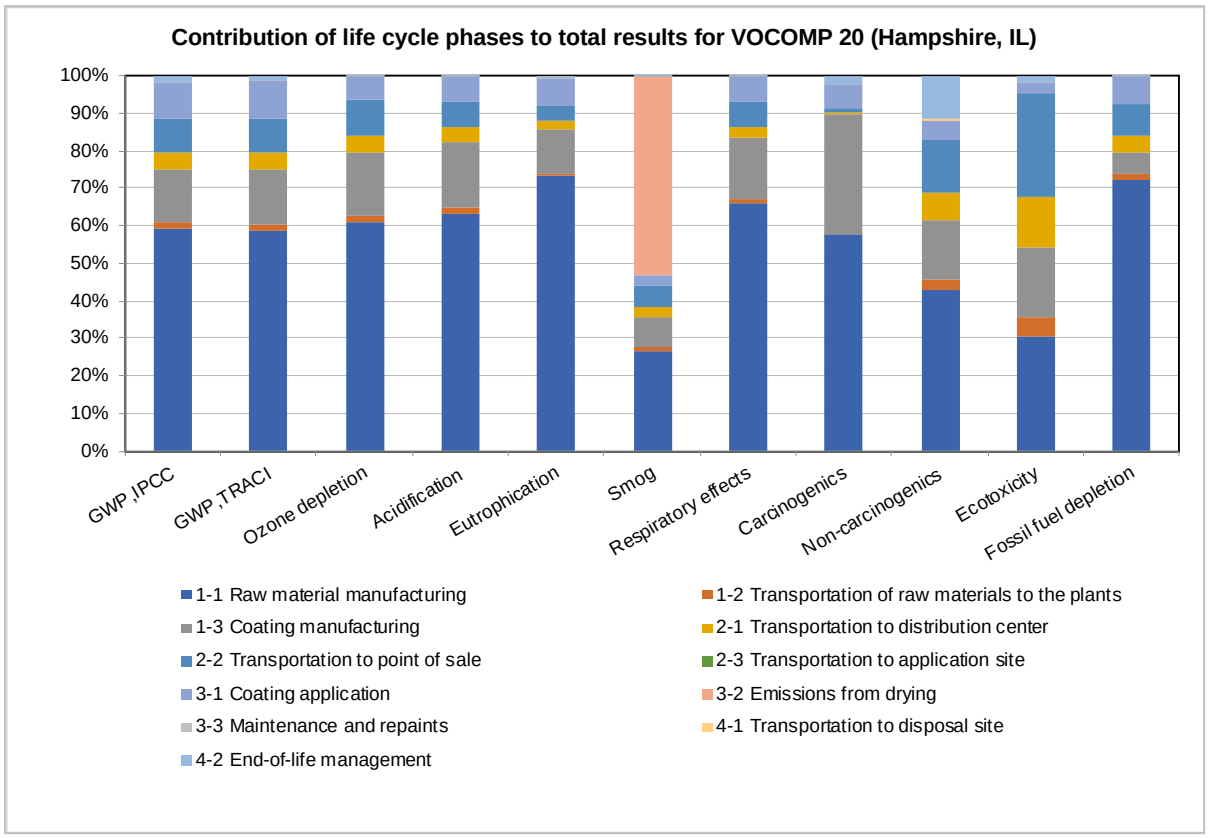

Figure 9. Contribution analysis of each impact category for VOCOMP-20 at Hampshire, Illinois

5.3.1.6. York, Pennsylvania

Table 63. Life cycle impact assessment results for VOCOMP-20 per declared unit (1 m^2) at the manufacturing location in York, Pennsylvania

Impact category	Unit	Stage 1 - Product Stage			Stage 2 - Design & Construction			Stage 3 - Use & Maintenance			Stage 4 - End-of-Life		Total
		1-1	1-2	1-3	2-1	2-2	2-3	3-1	3-2	3-3	4-1	4-2	
GWP, $IPCC_{TOTAL}$	kg CO_2 eq	1.15E-01	4.82E-02	1.36E-02	4.96E-03	1.74E-02	0	1.92E-02	1.31E-04	0	4.88E-05	3.26E-03	**2.22E-01**
GWP, $IPCC_{BIOGENIC}$	kg CO_2 eq	-1.08E-03	0	-6.41E-03	0	0	0	7.49E-03	0	0	0	0	**0**
GWP, $IPCC_{FOSSIL}$	kg CO_2 eq	1.16E-01	4.82E-02	2.00E-02	4.96E-03	1.74E-02	0	1.17E-02	1.31E-04	0	4.88E-05	3.26E-03	**2.22E-01**
GWP, TRACI 2.1_{TOTAL}	kg CO_2 eq	1.12E-01	4.76E-02	1.43E-02	4.90E-03	1.72E-02	0	1.89E-02	1.16E-04	0	4.82E-05	2.88E-03	**2.18E-01**
GWP, TRACI $2.1_{BIOGENIC}$	kg CO_2 eq	-1.08E-03	0	-6.41E-03	0	0	0	7.49E-03	0	0	0	0	**0**
GWP, TRACI 2.1_{FOSSIL}	kg CO_2 eq	1.13E-01	4.76E-02	2.08E-02	4.90E-03	1.72E-02	0	1.14E-02	1.16E-04	0	4.82E-05	2.88E-03	**2.18E-01**
Ozone depletion	kg CFC-11 eq	1.61E-09	6.85E-10	5.55E-10	7.04E-11	2.47E-10	0	1.61E-10	3.96E-13	0	7.97E-13	9.85E-12	**3.34E-09**
Acidification	kg SO_2 eq	3.77E-04	1.18E-04	8.99E-05	1.21E-05	4.24E-05	0	3.78E-05	9.09E-08	0	2.35E-07	2.26E-06	**6.80E-04**
Eutrophication	kg N eq	5.29E-05	8.00E-06	9.40E-06	8.23E-07	2.88E-06	0	5.32E-06	2.39E-08	0	1.49E-08	5.96E-07	**8.00E-05**
Smog	kg O_3 eq	4.89E-03	3.02E-03	1.20E-03	3.11E-04	1.09E-03	0	4.91E-04	9.78E-03	0	7.23E-06	6.25E-05	**2.09E-02**
Respiratory effects	kg PM2.5 eq	5.87E-05	1.62E-05	1.64E-05	1.67E-06	5.84E-06	0	5.88E-06	1.33E-08	0	2.94E-08	3.31E-07	**1.05E-04**
Additional environmental information													
Carcinogenics	CTUh	5.46E-10	3.05E-11	2.91E-10	3.13E-12	1.10E-11	0	5.56E-11	1.00E-12	0	1.03E-14	2.50E-11	**9.62E-10**
Non carcinogenics	CTUh	6.41E-09	5.88E-09	1.68E-09	6.05E-10	2.12E-09	0	7.12E-10	7.07E-11	0	2.13E-12	1.76E-09	**1.92E-08**
Ecotoxicity	CTUe	4.90E-02	1.20E-01	3.57E-02	1.23E-02	4.32E-02	0	5.01E-03	1.08E-04	0	6.22E-06	2.70E-03	**2.68E-01**
Fossil fuel depletion	MJ surplus	2.77E-01	9.08E-02	1.80E-02	9.34E-03	3.27E-02	0	2.77E-02	4.38E-05	0	9.03E-05	1.09E-03	**4.56E-01**

Table 64. Life cycle impact assessment percentage contribution for VOCOMP-20 per declared unit (1 m^2) at the manufacturing location in York, Pennsylvania

Impact category	Stage 1 - Product Stage			Stage 2 - Design & Construction			Stage 3 - Use & Maintenance			Stage 4 - End-of-Life		Total
	1-1	1-2	1-3	2-1	2-2	2-3	3-1	3-2	3-3	4-1	4-2	
GWP, $IPCC_{TOTAL}$	51.87%	21.73%	6.11%	2.24%	7.82%	0%	8.67%	0.06%	0%	0.02%	1.47%	100%
GWP, $TRACI_{TOTAL}$	51.37%	21.86%	6.58%	2.25%	7.87%	0%	8.68%	0.05%	0%	0.02%	1.32%	100%
Ozone depletion	48.18%	20.52%	16.64%	2.11%	7.39%	0%	4.83%	0.01%	0%	0.02%	0.30%	100%
Acidification	55.51%	17.31%	13.22%	1.78%	6.23%	0%	5.56%	0.01%	0%	0.03%	0.33%	100%
Eutrophication	66.18%	10.0%	11.75%	1.03%	3.60%	0%	6.65%	0.03%	0%	0.02%	0.74%	100%
Smog	23.45%	14.49%	5.76%	1.49%	5.22%	0%	2.36%	46.91%	0%	0.03%	0.30%	100%
Respiratory effects	55.86%	15.43%	15.62%	1.59%	5.55%	0%	5.60%	0.01%	0%	0.03%	0.31%	100%
Additional environmental information												
Carcinogenics	56.69%	3.17%	30.20%	0.33%	1.14%	0%	5.77%	0.10%	0%	0%	2.60%	100%
Non-carcinogenics	33.32%	30.58%	8.72%	3.15%	11.01%	0%	3.70%	0.37%	0%	0.01%	9.15%	100%
Ecotoxicity	18.28%	44.76%	13.32%	4.60%	16.12%	0%	1.87%	0.04%	0%	0%	1.01%	100%
Fossil fuel depletion	60.61%	19.89%	3.95%	2.05%	7.16%	0%	6.07%	0.01%	0%	0.02%	0.24%	100%

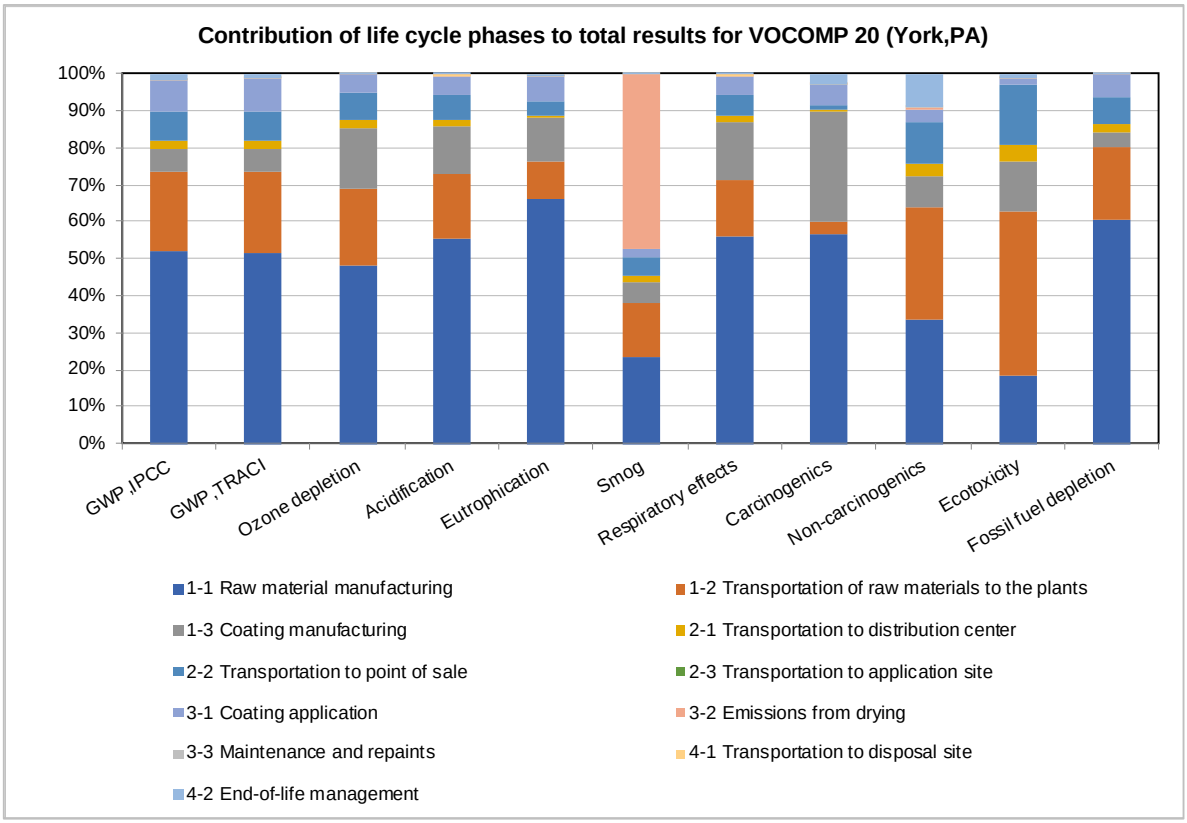

Figure 10. Contribution analysis of each impact category for VOCOMP-20 at York, Pennsylvania

5.3.1.7. Milton, Ontario, Canada

Table 65. Life cycle impact assessment results for VOCOMP-20 per declared unit (1 m^2) at the manufacturing location in Milton, Ontario, Canada

Impact category	Unit	Stage 1 - Product Stage			Stage 2 - Design & Construction			Stage 3 - Use & Maintenance			Stage 4 - End-of-Life		Total
		1-1	1-2	1-3	2-1	2-2	2-3	3-1	3-2	3-3	4-1	4-2	
GWP, $IPCC_{TOTAL}$	kg CO_2 eq	1.15E-01	1.27E-02	8.83E-03	2.53E-02	1.74E-02	0	1.92E-02	1.31E-04	0	4.88E-05	3.26E-03	**2.02E-01**
GWP, $IPCC_{BIOGENIC}$	kg CO_2 eq	-1.08E-03	0	-6.41E-03	0	0	0	7.49E-03	0	0	0	0	**0**
GWP, $IPCC_{FOSSIL}$	kg CO_2 eq	1.16E-01	1.27E-02	1.52E-02	2.53E-02	1.74E-02	0	1.17E-02	1.31E-04	0	4.88E-05	3.26E-03	**2.02E-01**
GWP, TRACI 2.1_{TOTAL}	kg CO_2 eq	1.12E-01	1.25E-02	9.63E-03	2.50E-02	1.72E-02	0	1.89E-02	1.16E-04	0	4.82E-05	2.88E-03	**1.98E-01**
GWP, TRACI $2.1_{BIOGENIC}$	kg CO_2 eq	-1.08E-03	0	-6.41E-03	0	0	0	7.49E-03	0	0	0	0	**0**
GWP, TRACI 2.1_{FOSSIL}	kg CO_2 eq	1.13E-01	1.25E-02	1.60E-02	2.50E-02	1.72E-02	0	1.14E-02	1.16E-04	0	4.82E-05	2.88E-03	**1.98E-01**
Ozone depletion	kg CFC-11 eq	1.61E-09	1.80E-10	4.48E-10	3.60E-10	2.47E-10	0	1.61E-10	3.96E-13	0	7.97E-13	9.85E-12	**3.01E-09**
Acidification	kg SO_2 eq	3.77E-04	3.10E-05	5.65E-05	6.18E-05	4.24E-05	0	3.78E-05	9.09E-08	0	2.35E-07	2.26E-06	**6.10E-04**
Eutrophication	kg N eq	5.29E-05	2.11E-06	6.15E-06	4.20E-06	2.88E-06	0	5.32E-06	2.39E-08	0	1.49E-08	5.96E-07	**7.42E-05**
Smog	kg O_3 eq	4.89E-03	7.96E-04	9.58E-04	1.59E-03	1.09E-03	0	4.91E-04	9.78E-03	0	7.23E-06	6.25E-05	**1.97E-02**
Respiratory effects	kg PM2.5 eq	5.87E-05	4.27E-06	1.39E-05	8.52E-06	5.84E-06	0	5.88E-06	1.33E-08	0	2.94E-08	3.31E-07	**9.75E-05**
Additional environmental information													
Carcinogenics	CTUh	5.46E-10	8.03E-12	2.74E-10	1.60E-11	1.10E-11	0	5.56E-11	1.00E-12	0	1.03E-14	2.50E-11	**9.36E-10**
Non carcinogenics	CTUh	6.41E-09	1.55E-09	1.54E-09	3.09E-09	2.12E-09	0	7.12E-10	7.07E-11	0	2.13E-12	1.76E-09	**1.73E-08**
Ecotoxicity	CTUe	4.90E-02	3.16E-02	3.37E-02	6.30E-02	4.32E-02	0	5.01E-03	1.08E-04	0	6.22E-06	2.70E-03	**2.28E-01**
Fossil fuel depletion	MJ surplus	2.77E-01	2.39E-02	1.29E-02	4.77E-02	3.27E-02	0	2.77E-02	4.38E-05	0	9.03E-05	1.09E-03	**4.23E-01**

Table 66. Life cycle impact assessment percentage contribution for VOCOMP-20 per declared unit (1 m^2) at the manufacturing location in Milton, Ontario, Canada

Impact category	Stage 1 - Product Stage			Stage 2 - Design & Construction			Stage 3 - Use & Maintenance			Stage 4 - End-of-Life		Total
	1-1	1-2	1-3	2-1	2-2	2-3	3-1	3-2	3-3	4-1	4-2	
GWP, $IPCC_{TOTAL}$	56.98%	6.29%	4.37%	12.54%	8.59%	0%	9.52%	0.06%	0%	0.02%	1.61%	100%
GWP, $TRACI_{TOTAL}$	56.47%	6.33%	4.86%	12.62%	8.65%	0%	9.54%	0.06%	0%	0.02%	1.45%	100%
Ozone depletion	53.33%	5.98%	14.87%	11.93%	8.18%	0%	5.35%	0.01%	0%	0.03%	0.33%	100%
Acidification	53.33%	5.98%	14.87%	11.93%	8.18%	0%	5.35%	0.01%	0%	0.03%	0.33%	100%
Eutrophication	61.91%	5.09%	9.28%	10.14%	6.95%	0%	6.21%	0.01%	0%	0.04%	0.37%	100%
Smog	71.31%	2.84%	8.29%	5.66%	3.88%	0%	7.16%	0.03%	0%	0.02%	0.80%	100%
Respiratory effects	60.20%	4.38%	14.29%	8.73%	5.99%	0%	6.03%	0.01%	0%	0.03%	0.34%	100%
Additional environmental information												
Carcinogenics	58.29%	0.86%	29.25%	1.71%	1.17%	0%	5.94%	0.11%	0%	0%	2.67%	100%
Non-carcinogenics	37.16%	8.98%	8.90%	17.92%	12.28%	0%	4.13%	0.41%	0%	0.01%	10.21%	100%
Ecotoxicity	21.46%	13.84%	14.77%	27.59%	18.91%	0%	2.19%	0.05%	0%	0%	1.18%	100%
Fossil fuel depletion	24.87%	4.05%	4.87%	8.07%	5.53%	0%	2.50%	49.75%	0%	0.04%	0.32%	100%

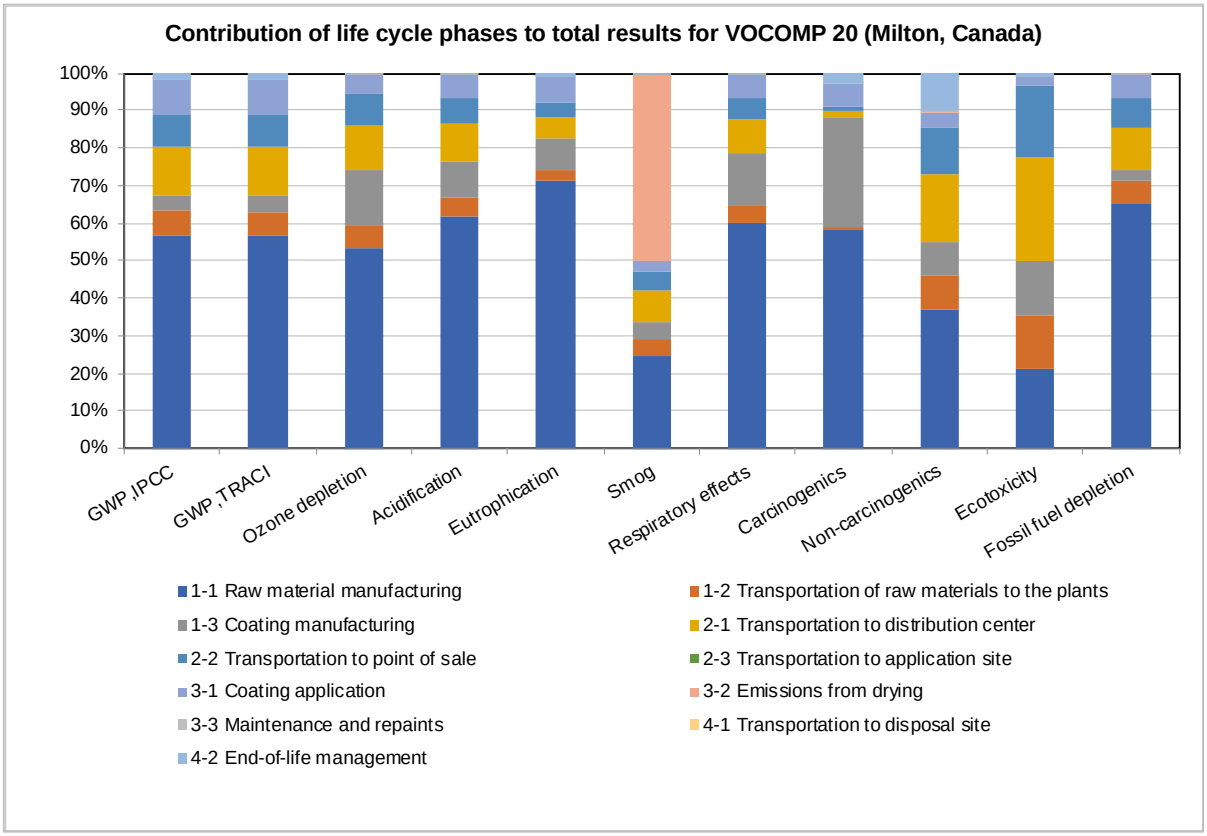

Figure 11. Contribution analysis of each impact category for VOCOMP-20 at Milton, Ontario, Canada

5.3.1.8. Sherwood, Alberta, Canada

Table 67. Life cycle impact assessment results for VOCOMP-20 per declared unit (1 m^2) at the manufacturing location in Sherwood, Alberta, Canada

Impact category	Unit	Stage 1 - Product Stage			Stage 2 - Design & Construction			Stage 3 - Use & Maintenance			Stage 4 - End-of-Life		Total
		1-1	1-2	1-3	2-1	2-2	2-3	3-1	3-2	3-3	4-1	4-2	
GWP, $IPCC_{TOTAL}$	kg CO_2 eq	1.15E-01	4.82E-02	4.61E-02	4.17E-03	1.74E-02	0	1.92E-02	1.31E-04	0	4.88E-05	3.26E-03	**2.54E-01**
GWP, $IPCC_{BIOGENIC}$	kg CO_2 eq	-1.08E-03	0	-6.41E-03	0	0	0	7.49E-03	0	0	0	0	**0**
GWP, $IPCC_{FOSSIL}$	kg CO_2 eq	1.16E-01	4.82E-02	5.25E-02	4.17E-03	1.74E-02	0	1.17E-02	1.31E-04	0	4.88E-05	3.26E-03	**2.54E-01**
GWP, $TRACI\ 2.1_{TOTAL}$	kg CO_2 eq	1.12E-01	4.79E-02	4.62E-02	4.12E-03	1.72E-02	0	1.89E-02	1.16E-04	0	5.19E-04	2.88E-03	**2.50E-01**
GWP, $TRACI\ 2.1_{BIOGENIC}$	kg CO_2 eq	-1.08E-03	0	-6.41E-03	0	0	0	7.49E-03	0	0	0	0	**0**
GWP, $TRACI\ 2.1_{FOSSIL}$	kg CO_2 eq	1.13E-01	4.79E-02	5.26E-02	4.12E-03	1.72E-02	0	1.14E-02	1.16E-04	0	5.19E-04	2.88E-03	**2.50E-01**
Ozone depletion	kg CFC-11 eq	1.61E-09	6.89E-10	6.71E-10	5.92E-11	2.47E-10	0	1.61E-10	3.96E-13	0	8.58E-12	9.85E-12	**3.45E-09**
Acidification	kg SO_2 eq	3.77E-04	1.18E-04	2.02E-04	1.02E-05	4.24E-05	0	3.78E-05	9.09E-08	0	2.53E-06	2.26E-06	**7.93E-04**
Eutrophication	kg N eq	5.29E-05	8.05E-06	1.92E-05	6.92E-07	2.88E-06	0	5.32E-06	2.39E-08	0	1.60E-07	5.96E-07	**8.99E-05**
Smog	kg O_3 eq	4.89E-03	3.04E-03	2.20E-03	2.61E-04	1.09E-03	0	4.91E-04	9.78E-03	0	7.79E-05	6.25E-05	**2.19E-02**
Respiratory effects	kg PM2.5 eq	5.87E-05	1.63E-05	2.23E-05	1.40E-06	5.84E-06	0	5.88E-06	1.33E-08	0	3.16E-07	3.31E-07	**1.11E-04**
Additional environmental information													
Carcinogenics	CTUh	5.46E-10	3.06E-11	3.35E-10	2.63E-12	1.10E-11	0	5.56E-11	1.00E-12	0	1.11E-13	2.50E-11	**1.01E-09**
Non carcinogenics	CTUh	6.41E-09	5.92E-09	2.57E-09	5.09E-10	2.12E-09	0	7.12E-10	7.07E-11	0	2.29E-11	1.76E-09	**2.01E-08**
Ecotoxicity	CTUe	4.90E-02	1.21E-01	3.62E-02	1.04E-02	4.32E-02	0	5.01E-03	1.08E-04	0	6.70E-05	2.70E-03	**2.67E-01**
Fossil fuel depletion	MJ surplus	2.77E-01	9.13E-02	5.77E-02	7.85E-03	3.27E-02	0	2.77E-02	4.38E-05	0	9.72E-04	1.09E-03	**4.96E-01**

Table 68. Life cycle impact assessment percentage contribution for VOCOMP-20 per declared unit (1 m^2) at the manufacturing location in Sherwood, Alberta, Canada

Impact category	Stage 1 - Product Stage			Stage 2 - Design & Construction			Stage 3 - Use & Maintenance			Stage 4 - End-of-Life		Total
	1-1	1-2	1-3	2-1	2-2	2-3	3-1	3-2	3-3	4-1	4-2	
GWP, $IPCC_{TOTAL}$	45.39%	19.01%	18.17%	1.64%	6.85%	0%	7.59%	0.05%	0%	0.02%	1.29%	100%
GWP, $TRACI_{TOTAL}$	44.82%	19.18%	18.51%	1.65%	6.87%	0%	7.57%	0.05%	0%	0.21%	1.15%	100%
Ozone depletion	46.56%	19.94%	19.43%	1.71%	7.14%	0%	4.67%	0.01%	0%	0.25%	0.29%	100%
Acidification	47.58%	14.93%	25.48%	1.28%	5.34%	0%	4.77%	0.01%	0%	0.32%	0.29%	100%
Eutrophication	58.91%	8.96%	21.37%	0.77%	3.21%	0%	5.92%	0.03%	0%	0.18%	0.66%	100%
Smog	22.34%	13.88%	10.05%	1.19%	4.97%	0%	2.25%	44.68%	0%	0.36%	0.29%	100%
Respiratory effects	52.84%	14.68%	20.08%	1.26%	5.25%	0%	5.30%	0.01%	0%	0.28%	0.30%	100%
Additional environmental information												
Carcinogenics	54.18%	3.04%	33.31%	0.26%	1.09%	0%	5.52%	0.10%	0%	0.01%	2.48%	100%
Non-carcinogenics	31.92%	29.46%	12.77%	2.53%	10.55%	0%	3.54%	0.35%	0%	0.11%	8.76%	100%
Ecotoxicity	18.33%	45.13%	13.56%	3.88%	16.15%	0%	1.87%	0.04%	0%	0.03%	1.01%	100%
Fossil fuel depletion	55.77%	18.41%	11.63%	1.58%	6.59%	0%	5.59%	0.01%	0%	0.20%	0.22%	100%

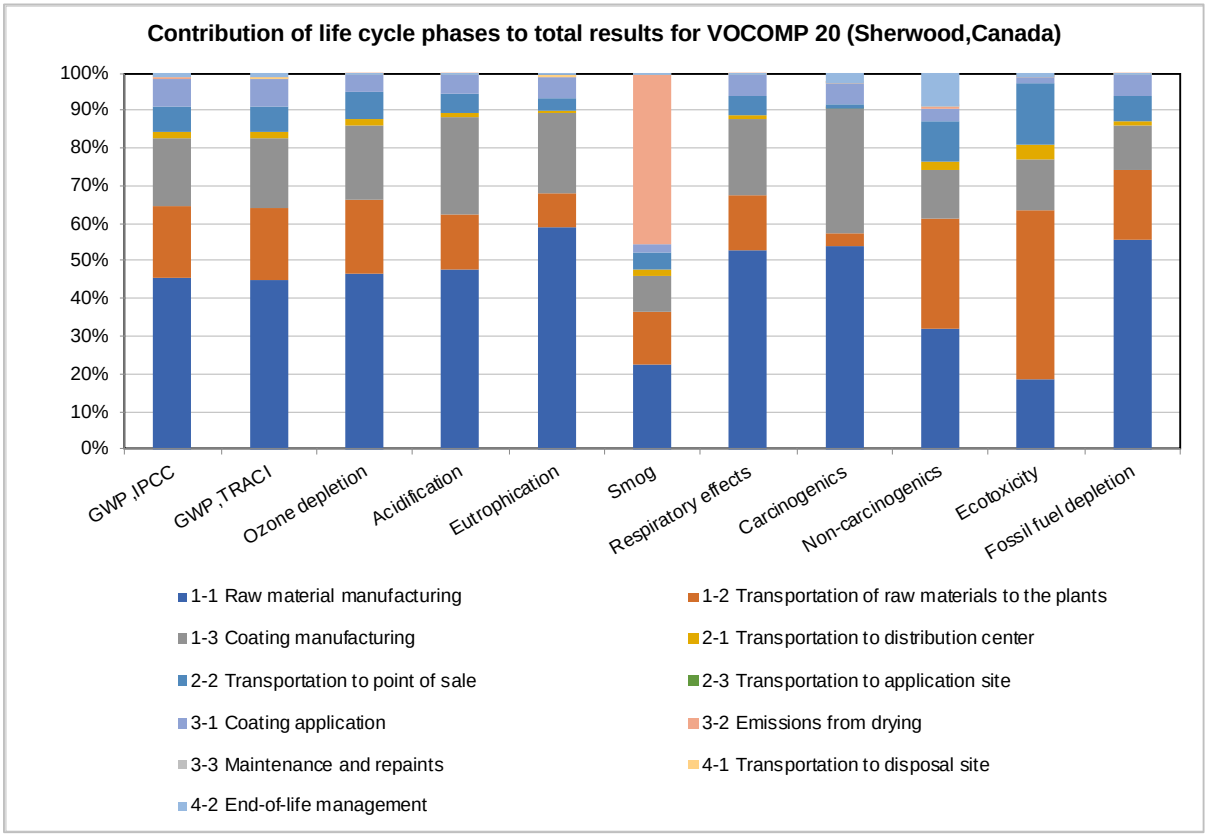

Figure 12. Contribution analysis of each impact category for VOCOMP-20 at Sherwood, Alberta, Canada

5.3.2. VOCOMP-25

The tables in this section show the LCIA results and the percent contribution of each stage of the production of VOCOMP-25 across eight plants. The figures in this section show the contribution analysis of each impact category for VOCOMP-25.

The largest impact contributions across all manufacturing locations come from raw material manufacturing (1-1), coating manufacturing (1-3), and transportation to distribution centers (2-1). Raw material manufacturing (1-1) consistently shows the highest values across multiple impact categories, including acidification, ecotoxicity, and eutrophication. Coating manufacturing (1-3) is another major contributor, particularly in carcinogenics and global warming potential (GWP). Transportation impacts (1-2, 2-1, 2-2) are significant in acidification and ecotoxicity, indicating that supply chain logistics are a key factor in overall environmental impact.

The average SM2013 Methodology single-figure millipoint (mPts) across all manufacturing plants of W. R. MEADOWS VOCOMP-25 score by life cycle phase for this product is presented below (Table 69). Across all 10 impact categories, the SM single-figure score indicates that raw materials acquisition accounts for around 65.06% of the total impacts, manufacturing for 5.45 %, and transportation for 17%.

Table 69. SM2013 Methodology single-figure millipoint (mPts) average across all plants for W. R. MEADOWS VOCOMP-25

Impact category	Unit	Stage 1 - Product Stage			Stage 2 - Design & Construction			Stage 3 - Use & Maintenance			Stage 4 - End-of-Life		Total
		1-1	1-2	1-3	2-1	2-2	2-3	3-1	3-2	3-3	4-1	4-2	
SM Single Score	mPts	9.54E-03	8.59E-04	9.27E-04	8.21E-04	7.79E-04	0	9.60E-04	6.92E-04	0	6.61E-05	1.68E-04	1.48E-02
	percentage	64.40%	5.80%	6.26%	5.54%	5.26%	0%	6.49%	4.67%	0%	0.45%	1.14%	100%

5.3.2.1. Benicia, California

Table 70. Life cycle impact assessment results for VOCOMP-25 per declared unit (1 m^2) at the manufacturing location in Benicia, California

Impact category	Unit	Stage 1 - Product Stage			Stage 2 - Design & Construction			Stage 3 - Use & Maintenance			Stage 4 - End-of-Life		Total
		1-1	1-2	1-3	2-1	2-2	2-3	3-1	3-2	3-3	4-1	4-2	
GWP, $IPCC_{TOTAL}$	kg CO_2 eq	1.79E-01	2.85E-02	9.98E-02	1.03E-02	1.30E-02	0	2.39E-02	1.31E-04	0	1.58E-03	2.45E-03	**3.58E-01**
GWP, $IPCC_{BIOGENIC}$	kg CO_2 eq	-3.77E-03	0	-1.83E-03	0	0	0	5.60E-03	0	0	0	0	**0**
GWP, $IPCC_{FOSSIL}$	kg CO_2 eq	1.82E-01	2.85E-02	1.02E-01	1.03E-02	1.30E-02	0	1.83E-02	1.31E-04	0	1.58E-03	2.45E-03	**3.58E-01**
GWP, TRACI 2.1_{TOTAL}	kg CO_2 eq	1.74E-01	2.82E-02	9.77E-02	1.02E-02	1.29E-02	0	2.34E-02	1.16E-04	0	1.56E-03	2.16E-03	**3.50E-01**
GWP, TRACI $2.1_{BIOGENIC}$	kg CO_2 eq	-3.77E-03	0	-1.83E-03	0	0	0	5.60E-03	0	0	0	0	**0**
GWP, TRACI 2.1_{FOSSIL}	kg CO_2 eq	1.77E-01	2.82E-02	9.95E-02	1.02E-02	1.29E-02	0	1.78E-02	1.16E-04	0	1.56E-03	2.16E-03	**3.50E-01**
Ozone depletion	kg CFC-11 eq	2.52E-09	4.05E-10	2.34E-09	1.47E-10	1.85E-10	0	2.52E-10	3.96E-13	0	2.58E-11	7.39E-12	**5.88E-09**
Acidification	kg SO_2 eq	5.88E-04	6.97E-05	2.41E-04	2.52E-05	3.18E-05	0	5.89E-05	9.09E-08	0	7.62E-06	1.70E-06	**1.02E-03**
Eutrophication	kg N eq	7.15E-05	4.74E-06	1.49E-05	1.72E-06	2.16E-06	0	7.17E-06	2.39E-08	0	4.83E-07	4.47E-07	**1.03E-04**
Smog	kg O_3 eq	7.64E-03	1.79E-03	2.18E-03	6.48E-04	8.16E-04	0	7.66E-04	1.98E-02	0	2.34E-04	4.69E-05	**3.39E-02**
Respiratory effects	kg PM2.5 eq	9.09E-05	9.60E-06	1.72E-05	3.48E-06	4.38E-06	0	9.10E-06	1.33E-08	0	9.53E-07	2.48E-07	**1.36E-04**
Additional environmental information													
Carcinogenics	CTUh	8.43E-10	1.80E-11	1.25E-10	6.53E-12	8.23E-12	0	8.50E-11	1.00E-12	0	3.34E-13	1.87E-11	**1.11E-09**
Non carcinogenics	CTUh	9.92E-09	3.48E-09	2.41E-09	1.26E-09	1.59E-09	0	1.04E-09	7.07E-11	0	6.89E-11	1.32E-09	**2.12E-08**
Ecotoxicity	CTUe	7.60E-02	7.10E-02	5.08E-03	2.57E-02	3.24E-02	0	7.68E-03	1.08E-04	0	2.02E-04	2.02E-03	**2.20E-01**
Fossil fuel depletion	MJ surplus	4.43E-01	5.37E-02	1.91E-01	1.95E-02	2.45E-02	0	4.43E-02	4.38E-05	0	2.93E-03	8.18E-04	**7.79E-01**

Table 71. Life cycle impact assessment percentage contribution for VOCOMP-25 per declared unit (1 m^2) at the manufacturing location in Benicia, California

Impact category	Stage 1 - Product Stage			Stage 2 - Design & Construction			Stage 3 - Use & Maintenance			Stage 4 - End-of-Life		Total
	1-1	1-2	1-3	2-1	2-2	2-3	3-1	3-2	3-3	4-1	4-2	
GWP, $IPCC_{TOTAL}$	49.83%	7.96%	27.85%	2.89%	3.64%	0%	6.68%	0.04%	0%	0.44%	0.68%	100%
GWP, $TRACI_{TOTAL}$	49.62%	8.06%	27.92%	2.92%	3.68%	0%	6.70%	0.03%	0%	0.45%	0.62%	100%
Ozone depletion	42.81%	6.89%	39.79%	2.50%	3.15%	0%	4.29%	0.01%	0%	0.44%	0.13%	100%
Acidification	57.45%	6.80%	23.50%	2.47%	3.11%	0%	5.75%	0.01%	0%	0.74%	0.17%	100%
Eutrophication	69.31%	4.59%	14.46%	1.66%	2.10%	0%	6.95%	0.02%	0%	0.47%	0.43%	100%
Smog	22.54%	5.27%	6.43%	1.91%	2.41%	0%	2.26%	58.34%	0%	0.69%	0.14%	100%
Respiratory effects	66.88%	7.06%	12.68%	2.56%	3.22%	0%	6.70%	0.01%	0%	0.70%	0.18%	100%
Additional environmental information												
Carcinogenics	76.20%	1.63%	11.33%	0.59%	0.74%	0%	7.69%	0.09%	0%	0.03%	1.70%	100%
Non-carcinogenics	46.87%	16.46%	11.37%	5.96%	7.51%	0%	4.94%	0.33%	0%	0.33%	6.24%	100%
Ecotoxicity	34.51%	32.24%	2.31%	11.68%	14.72%	0%	3.49%	0.05%	0%	0.09%	0.92%	100%
Fossil fuel depletion	56.82%	6.90%	24.47%	2.50%	3.15%	0%	5.69%	0.01%	0%	0.38%	0.11%	100%

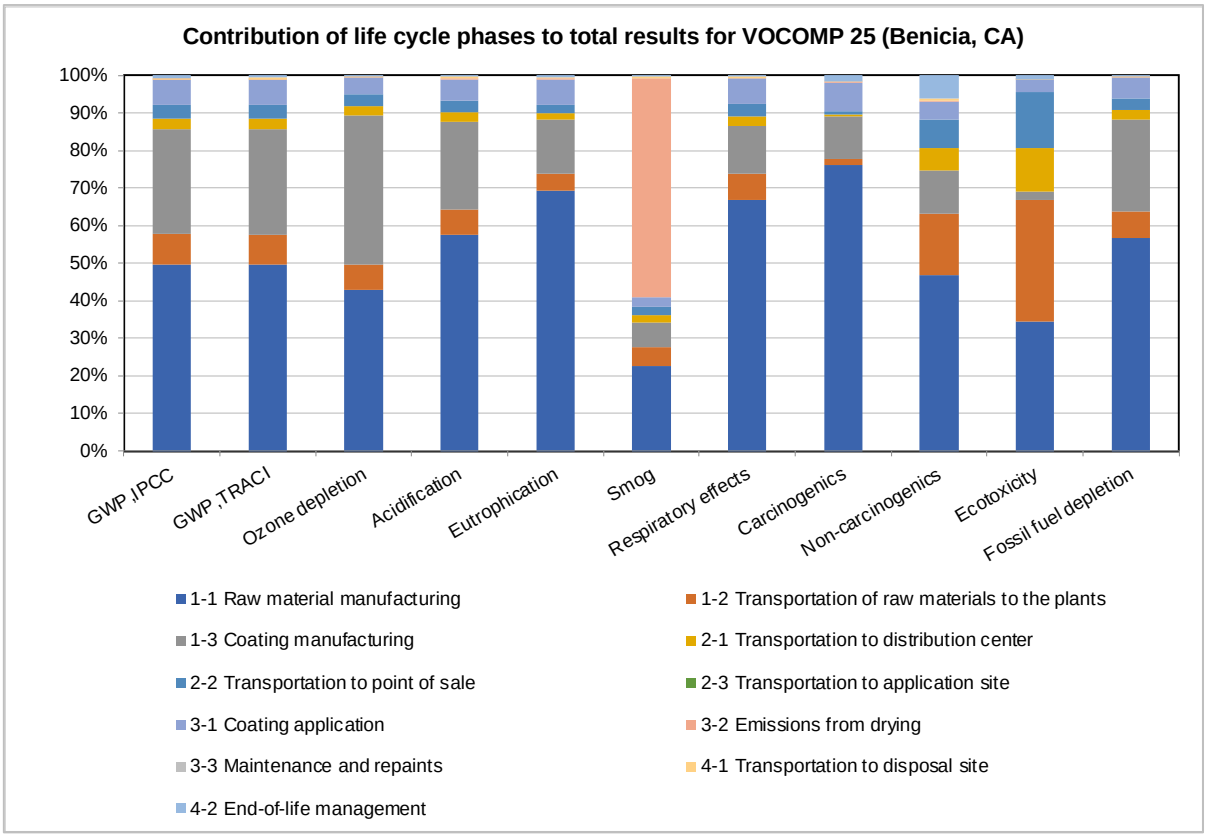

Figure 13. Contribution analysis of each impact category for VOCOMP-20 at Benicia, California

5.3.2.2. Cartersville, Georgia

Table 72. Life cycle impact assessment results for VOCOMP-25 per declared unit (1 m^2) at the manufacturing location in Cartersville, Georgia

Impact category	Unit	Stage 1 - Product Stage			Stage 2 - Design & Construction			Stage 3 - Use & Maintenance			Stage 4 - End-of-Life		Total
		1-1	1-2	1-3	2-1	2-2	2-3	3-1	3-2	3-3	4-1	4-2	
GWP, $IPCC_{TOTAL}$	kg CO_2 eq	1.79E-01	4.96E-03	6.21E-03	2.60E-03	1.30E-02	0	2.39E-02	1.31E-04	0	1.58E-03	2.45E-03	**2.33E-01**
GWP, $IPCC_{BIOGENIC}$	kg CO_2 eq	-3.77E-03	0	-1.83E-03	0	0	0	5.60E-03	0	0	0	0	**0**
GWP, $IPCC_{FOSSIL}$	kg CO_2 eq	1.82E-01	4.96E-03	8.04E-03	2.60E-03	1.30E-02	0	1.83E-02	1.31E-04	0	1.58E-03	2.45E-03	**2.33E-01**
GWP, TRACI 2.1_{TOTAL}	kg CO_2 eq	1.74E-01	4.90E-03	6.54E-03	2.57E-03	1.29E-02	0	2.34E-02	1.16E-04	0	1.56E-03	2.16E-03	**2.28E-01**
GWP, TRACI $2.1_{BIOGENIC}$	kg CO_2 eq	-3.77E-03	0	-1.83E-03	0	0	0	5.60E-03	0	0	0	0	**0**
GWP, TRACI 2.1_{FOSSIL}	kg CO_2 eq	1.77E-01	4.90E-03	8.37E-03	2.57E-03	1.29E-02	0	1.78E-02	1.16E-04	0	1.56E-03	2.16E-03	**2.28E-01**
Ozone depletion	kg CFC-11 eq	2.52E-09	7.05E-11	6.75E-11	3.70E-11	1.85E-10	0	2.52E-10	3.96E-13	0	2.58E-11	7.39E-12	**3.16E-09**
Acidification	kg SO_2 eq	5.88E-04	1.21E-05	1.72E-05	6.36E-06	3.18E-05	0	5.89E-05	9.09E-08	0	7.62E-06	1.70E-06	**7.24E-04**
Eutrophication	kg N eq	7.15E-05	8.24E-07	1.95E-06	4.32E-07	2.16E-06	0	7.17E-06	2.39E-08	0	4.83E-07	4.47E-07	**8.50E-05**
Smog	kg O_3 eq	7.64E-03	3.11E-04	2.44E-04	1.63E-04	8.16E-04	0	7.66E-04	1.98E-02	0	2.34E-04	4.69E-05	**3.00E-02**
Respiratory effects	kg PM2.5 eq	9.09E-05	1.67E-06	2.73E-06	8.76E-07	4.38E-06	0	9.10E-06	1.33E-08	0	9.53E-07	2.48E-07	**1.11E-04**
Additional environmental information													
Carcinogenics	CTUh	8.43E-10	3.14E-12	3.20E-11	1.65E-12	8.23E-12	0	8.50E-11	1.00E-12	0	3.34E-13	1.87E-11	**9.93E-10**
Non carcinogenics	CTUh	9.92E-09	6.06E-10	4.28E-10	3.18E-10	1.59E-09	0	1.04E-09	7.07E-11	0	6.89E-11	1.32E-09	**1.54E-08**
Ecotoxicity	CTUe	7.60E-02	1.23E-02	1.72E-03	6.48E-03	3.24E-02	0	7.68E-03	1.08E-04	0	2.02E-04	2.02E-03	**1.39E-01**
Fossil fuel depletion	MJ surplus	4.43E-01	9.35E-03	9.43E-03	4.91E-03	2.45E-02	0	4.43E-02	4.38E-05	0	2.93E-03	8.18E-04	**5.39E-01**

Table 73. Life cycle impact assessment percentage contribution for VOCOMP-25 per declared unit (1 m^2) at the manufacturing location in Cartersville, Georgia

Impact category	Stage 1 - Product Stage			Stage 2 - Design & Construction			Stage 3 - Use & Maintenance			Stage 4 - End-of-Life		Total
	1-1	1-2	1-3	2-1	2-2	2-3	3-1	3-2	3-3	4-1	4-2	
GWP, $IPCC_{TOTAL}$	76.48%	2.13%	2.66%	1.12%	5.58%	0%	10.25%	0.06%	0%	0.68%	1.05%	100%
GWP, $TRACI_{TOTAL}$	76.22%	2.15%	2.87%	1.13%	5.65%	0%	10.28%	0.05%	0%	0.69%	0.95%	100%
Ozone depletion	79.59%	2.23%	2.13%	1.17%	5.85%	0%	7.97%	0.01%	0%	0.82%	0.23%	100%
Acidification	81.24%	1.67%	2.38%	0.88%	4.39%	0%	8.13%	0.01%	0%	1.05%	0.23%	100%
Eutrophication	84.13%	0.97%	2.29%	0.51%	2.54%	0%	8.43%	0.03%	0%	0.57%	0.53%	100%
Smog	25.47%	1.04%	0.81%	0.54%	2.72%	0%	2.55%	65.92%	0%	0.78%	0.16%	100%
Respiratory effects	81.98%	1.51%	2.46%	0.79%	3.95%	0%	8.21%	0.01%	0%	0.86%	0.22%	100%
Additional environmental information												
Carcinogenics	84.88%	0.32%	3.22%	0.17%	0.83%	0%	8.56%	0.10%	0%	0.03%	1.89%	100%
Non-carcinogenics	64.55%	3.94%	2.79%	2.07%	10.35%	0%	6.80%	0.46%	0%	0.45%	8.59%	100%
Ecotoxicity	54.69%	8.88%	1.24%	4.66%	23.32%	0%	5.53%	0.08%	0%	0.15%	1.46%	100%
Fossil fuel depletion	82.13%	1.73%	1.75%	0.91%	4.55%	0%	8.22%	0.01%	0%	0.54%	0.15%	100%

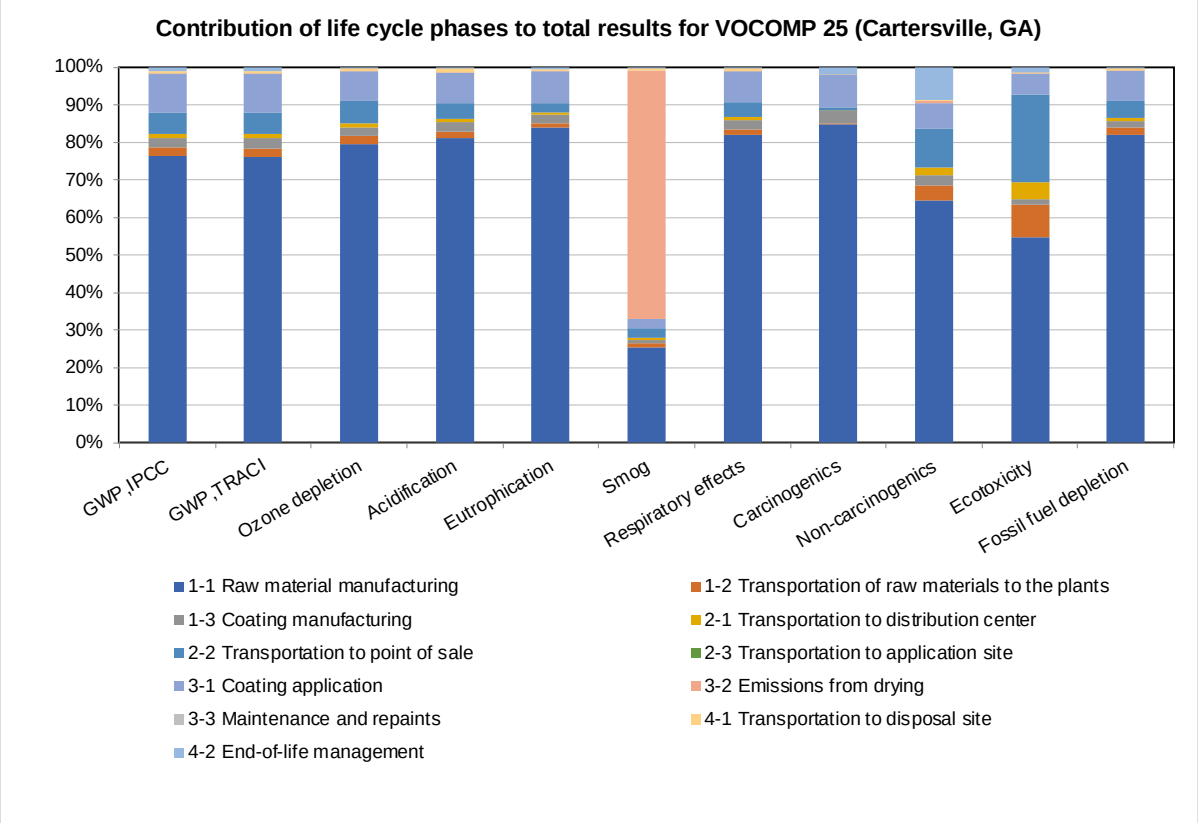

Figure 14. Contribution analysis of each impact category for VOCOMP-25 at Cartersville, Georgia

5.3.2.3. Fort Worth, Texas

Table 74. Life cycle impact assessment results for VOCOMP-25 per declared unit (1 m^2) at the manufacturing location in Fort Worth, Texas

Impact category	Unit	Stage 1 - Product Stage			Stage 2 - Design & Construction			Stage 3 - Use & Maintenance			Stage 4 - End-of-Life		Total
		1-1	1-2	1-3	2-1	2-2	2-3	3-1	3-2	3-3	4-1	4-2	
GWP, $IPCC_{TOTAL}$	kg CO_2 eq	1.79E-01	1.83E-02	7.35E-03	5.76E-03	1.30E-02	0	2.39E-02	1.31E-04	0	1.58E-03	2.45E-03	**2.51E-01**
GWP, $IPCC_{BIOGENIC}$	kg CO_2 eq	-3.77E-03	0	-1.83E-03	0	0	0	5.60E-03	0	0	0	0	**0**
GWP, $IPCC_{FOSSIL}$	kg CO_2 eq	1.82E-01	1.83E-02	9.18E-03	5.76E-03	1.30E-02	0	1.83E-02	1.31E-04	0	1.58E-03	2.45E-03	**2.51E-01**
GWP, TRACI 2.1_{TOTAL}	kg CO_2 eq	1.74E-01	1.81E-02	7.64E-03	5.70E-03	1.29E-02	0	2.34E-02	1.16E-04	0	1.56E-03	2.16E-03	**2.45E-01**
GWP, TRACI $2.1_{BIOGENIC}$	kg CO_2 eq	-3.77E-03	0	-1.83E-03	0	0	0	5.60E-03	0	0	0	0	**0**
GWP, TRACI 2.1_{FOSSIL}	kg CO_2 eq	1.77E-01	1.81E-02	9.46E-03	5.70E-03	1.29E-02	0	1.78E-02	1.16E-04	0	1.56E-03	2.16E-03	**2.45E-01**
Ozone depletion	kg CFC-11 eq	2.52E-09	2.60E-10	1.14E-10	8.19E-11	1.85E-10	0	2.52E-10	3.96E-13	0	2.58E-11	7.39E-12	**3.44E-09**
Acidification	kg SO_2 eq	5.88E-04	4.47E-05	2.33E-05	1.41E-05	3.18E-05	0	5.89E-05	9.09E-08	0	7.62E-06	1.70E-06	**7.71E-04**
Eutrophication	kg N eq	7.15E-05	3.04E-06	1.99E-06	9.57E-07	2.16E-06	0	7.17E-06	2.39E-08	0	4.83E-07	4.47E-07	**8.78E-05**
Smog	kg O_3 eq	7.64E-03	1.15E-03	2.85E-04	3.61E-04	8.16E-04	0	7.66E-04	1.98E-02	0	2.34E-04	4.69E-05	**3.11E-02**
Respiratory effects	kg PM2.5 eq	9.09E-05	6.16E-06	1.78E-06	1.94E-06	4.38E-06	0	9.10E-06	1.33E-08	0	9.53E-07	2.48E-07	**1.15E-04**
Additional environmental information													
Carcinogenics	CTUh	8.43E-10	1.16E-11	3.35E-11	3.64E-12	8.23E-12	0	8.50E-11	1.00E-12	0	3.34E-13	1.87E-11	**1.00E-09**
Non carcinogenics	CTUh	9.92E-09	2.23E-09	4.30E-10	7.04E-10	1.59E-09	0	1.04E-09	7.07E-11	0	6.89E-11	1.32E-09	**1.74E-08**
Ecotoxicity	CTUe	7.60E-02	4.55E-02	1.71E-03	1.43E-02	3.24E-02	0	7.68E-03	1.08E-04	0	2.02E-04	2.02E-03	**1.80E-01**
Fossil fuel depletion	MJ surplus	4.43E-01	3.45E-02	1.11E-02	1.09E-02	2.45E-02	0	4.43E-02	4.38E-05	0	2.93E-03	8.18E-04	**5.72E-01**

Table 75. Life cycle impact assessment percentage contribution for VOCOMP-25 per declared unit (1 m^2) at the manufacturing location in Fort Worth, Texas

Impact category	Stage 1 - Product Stage			Stage 2 - Design & Construction			Stage 3 - Use & Maintenance			Stage 4 - End-of-Life		Total
	1-1	1-2	1-3	2-1	2-2	2-3	3-1	3-2	3-3	4-1	4-2	
GWP, $IPCC_{TOTAL}$	71.11%	7.29%	2.93%	2.30%	5.19%	0%	9.53%	0.05%	0%	0.63%	0.97%	100%
GWP, $TRACI_{TOTAL}$	70.81%	7.38%	3.11%	2.32%	5.25%	0%	9.55%	0.05%	0%	0.64%	0.88%	100%
Ozone depletion	73.09%	7.55%	3.31%	2.38%	5.37%	0%	7.32%	0.01%	0%	0.75%	0.21%	100%
Acidification	76.36%	5.80%	3.02%	1.83%	4.13%	0%	7.64%	0.01%	0%	0.99%	0.22%	100%
Eutrophication	81.46%	3.46%	2.27%	1.09%	2.46%	0%	8.17%	0.03%	0%	0.55%	0.51%	100%
Smog	24.59%	3.69%	0.92%	1.16%	2.63%	0%	2.47%	63.64%	0%	0.75%	0.15%	100%
Respiratory effects	78.71%	5.33%	1.55%	1.68%	3.79%	0%	7.88%	0.01%	0%	0.83%	0.22%	100%
Additional environmental information												
Carcinogenics	83.88%	1.15%	3.33%	0.36%	0.82%	0%	8.46%	0.10%	0%	0.03%	1.87%	100%
Non-carcinogenics	57.06%	12.86%	2.47%	4.05%	9.15%	0%	6.01%	0.41%	0%	0.40%	7.60%	100%
Ecotoxicity	42.22%	25.30%	0.95%	7.97%	18.00%	0%	4.27%	0.06%	0%	0.11%	1.12%	100%
Fossil fuel depletion	77.42%	6.03%	1.95%	1.90%	4.29%	0%	7.75%	0.01%	0%	0.51%	0.14%	100%

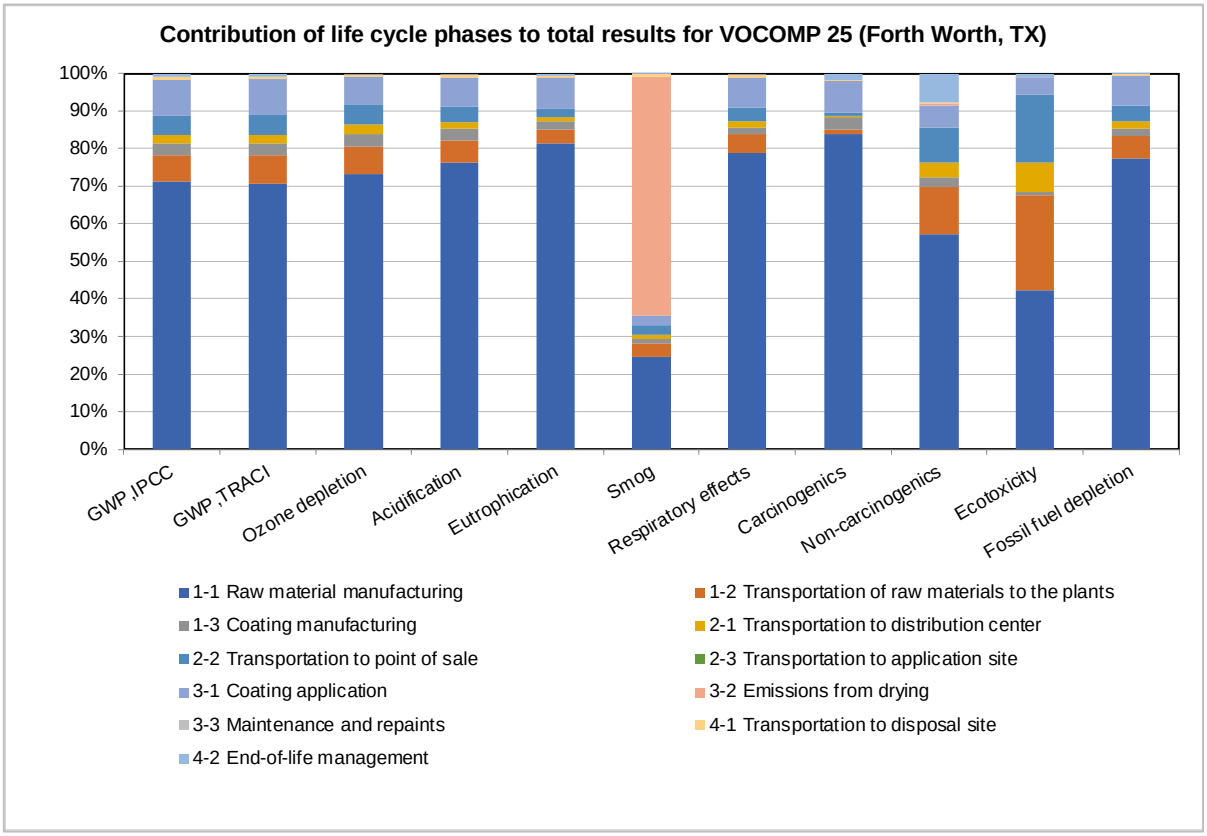

Figure 15. Contribution analysis of each impact category for VOCOMP-25 at Fort Worth, Texas

5.3.2.4. Goodyear, Arizona

Table 76. Life cycle impact assessment results for VOCOMP-25 per declared unit (1 m^2) at the manufacturing location in Goodyear, Arizona

Impact category	Unit	Stage 1 - Product Stage			Stage 2 - Design & Construction			Stage 3 - Use & Maintenance			Stage 4 - End-of-Life		Total
		1-1	1-2	1-3	2-1	2-2	2-3	3-1	3-2	3-3	4-1	4-2	
GWP, $IPCC_{TOTAL}$	kg CO_2 eq	1.79E-01	2.07E-02	2.31E-02	7.74E-03	1.30E-02	0	2.39E-02	1.31E-04	0	1.58E-03	2.45E-03	**2.71E-01**
GWP, $IPCC_{BIOGENIC}$	kg CO_2 eq	-3.77E-03	0	-1.83E-03	0	0	0	5.60E-03	0	0	0	0	**0**
GWP, $IPCC_{FOSSIL}$	kg CO_2 eq	1.82E-01	2.07E-02	2.49E-02	7.74E-03	1.30E-02	0	1.83E-02	1.31E-04	0	1.58E-03	2.45E-03	**2.71E-01**
GWP, TRACI 2.1_{TOTAL}	kg CO_2 eq	1.74E-01	2.05E-02	2.30E-02	7.65E-03	1.29E-02	0	2.34E-02	1.16E-04	0	1.56E-03	2.16E-03	**2.65E-01**
GWP, TRACI $2.1_{BIOGENIC}$	kg CO_2 eq	-3.77E-03	0	-1.83E-03	0	0	0	5.60E-03	0	0	0	0	**0**
GWP, TRACI 2.1_{FOSSIL}	kg CO_2 eq	1.77E-01	2.05E-02	2.48E-02	7.65E-03	1.29E-02	0	1.78E-02	1.16E-04	0	1.56E-03	2.16E-03	**2.65E-01**
Ozone depletion	kg CFC-11 eq	2.52E-09	2.95E-10	6.81E-10	1.10E-10	1.85E-10	0	2.52E-10	3.96E-13	0	2.58E-11	7.39E-12	**4.07E-09**
Acidification	kg SO_2 eq	5.88E-04	5.07E-05	6.79E-05	1.89E-05	3.18E-05	0	5.89E-05	9.09E-08	0	7.62E-06	1.70E-06	**8.26E-04**
Eutrophication	kg N eq	7.15E-05	3.44E-06	5.76E-06	1.28E-06	2.16E-06	0	7.17E-06	2.39E-08	0	4.83E-07	4.47E-07	**9.23E-05**
Smog	kg O_3 eq	7.64E-03	1.30E-03	7.00E-04	4.85E-04	8.16E-04	0	7.66E-04	1.98E-02	0	2.34E-04	4.69E-05	**3.18E-02**
Respiratory effects	kg PM2.5 eq	9.09E-05	6.98E-06	4.26E-06	2.60E-06	4.38E-06	0	9.10E-06	1.33E-08	0	9.53E-07	2.48E-07	**1.19E-04**
Additional environmental information													
Carcinogenics	CTUh	8.43E-10	1.31E-11	5.56E-11	4.89E-12	8.23E-12	0	8.50E-11	1.00E-12	0	3.34E-13	1.87E-11	**1.03E-09**
Non carcinogenics	CTUh	9.92E-09	2.53E-09	7.66E-10	9.45E-10	1.59E-09	0	1.04E-09	7.07E-11	0	6.89E-11	1.32E-09	**1.83E-08**
Ecotoxicity	CTUe	7.60E-02	5.16E-02	2.49E-03	1.92E-02	3.24E-02	0	7.68E-03	1.08E-04	0	2.02E-04	2.02E-03	**1.92E-01**
Fossil fuel depletion	MJ surplus	4.43E-01	3.91E-02	3.39E-02	1.46E-02	2.45E-02	0	4.43E-02	4.38E-05	0	2.93E-03	8.18E-04	**6.03E-01**

Table 77. Life cycle impact assessment percentage contribution for VOCOMP-25 per declared unit (1 m^2) at the manufacturing location in Goodyear, Arizona

Impact category	Stage 1 - Product Stage			Stage 2 - Design & Construction			Stage 3 - Use & Maintenance			Stage 4 - End-of-Life		Total
	1-1	1-2	1-3	2-1	2-2	2-3	3-1	3-2	3-3	4-1	4-2	
GWP, $IPCC_{TOTAL}$	65.83%	7.65%	8.50%	2.85%	4.80%	0%	8.82%	0.05%	0%	0.58%	0.90%	100%
GWP, $TRACI_{TOTAL}$	65.53%	7.74%	8.69%	2.89%	4.86%	0%	8.84%	0.04%	0%	0.59%	0.82%	100%
Ozone depletion	61.81%	7.23%	16.71%	2.70%	4.54%	0%	6.19%	0.01%	0%	0.63%	0.18%	100%
Acidification	71.23%	6.13%	8.22%	2.29%	3.85%	0%	7.13%	0.01%	0%	0.92%	0.21%	100%
Eutrophication	77.49%	3.73%	6.24%	1.39%	2.34%	0%	7.77%	0.03%	0%	0.52%	0.48%	100%
Smog	24.05%	4.09%	2.20%	1.53%	2.57%	0%	2.41%	62.26%	0%	0.74%	0.15%	100%
Respiratory effects	76.11%	5.84%	3.56%	2.18%	3.67%	0%	7.62%	0.01%	0%	0.80%	0.21%	100%
Additional environmental information												
Carcinogenics	81.85%	1.27%	5.40%	0.48%	0.80%	0%	8.26%	0.10%	0%	0.03%	1.82%	100%
Non-carcinogenics	54.33%	13.87%	4.20%	5.17%	8.71%	0%	5.72%	0.39%	0%	0.38%	7.23%	100%
Ecotoxicity	39.63%	26.91%	1.30%	10.04%	16.90%	0%	4.01%	0.06%	0%	0.11%	1.05%	100%
Fossil fuel depletion	73.43%	6.48%	5.63%	2.42%	4.07%	0%	7.35%	0.01%	0%	0.49%	0.14%	100%

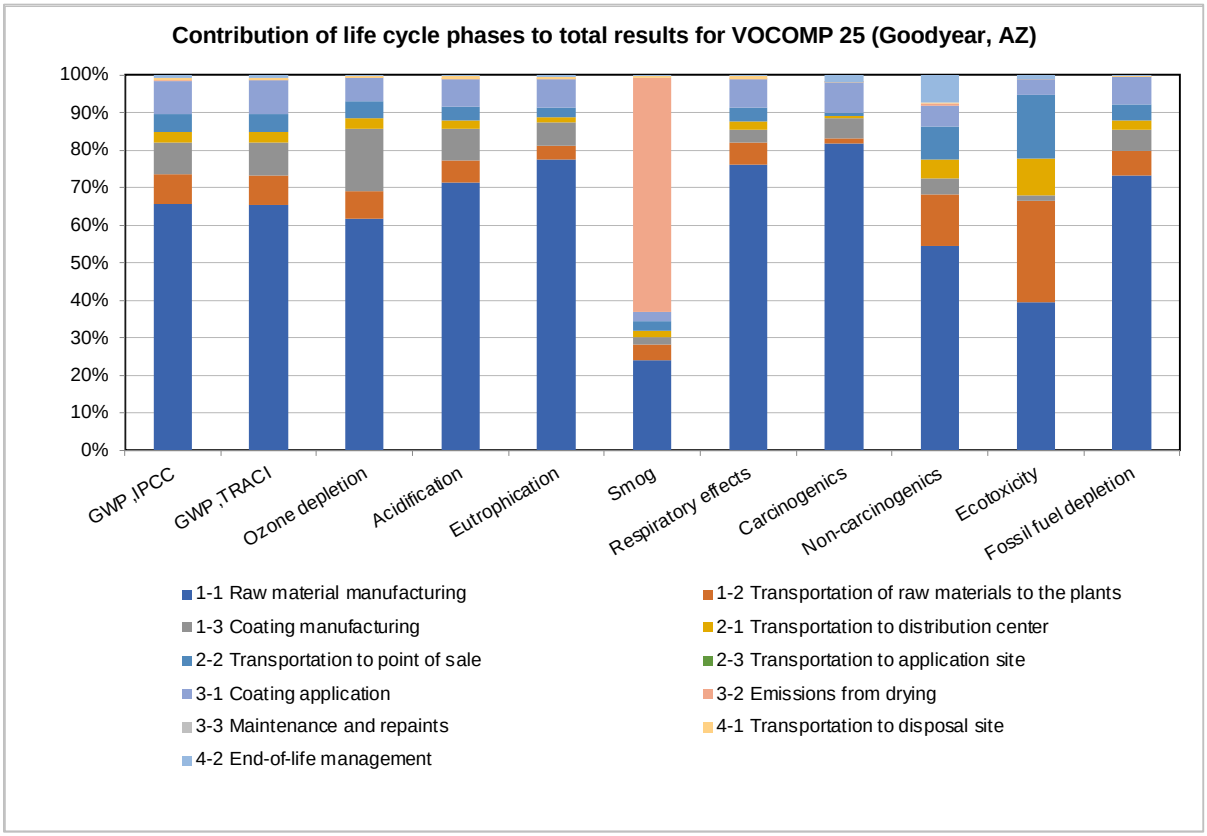

Figure 16. Contribution analysis of each impact category for **VOCOMP-25** at Goodyear, Arizona

5.3.2.5. Hampshire, Illinois

Table 78. Life cycle impact assessment results for VOCOMP-25 per declared unit (1 m^2) at the manufacturing location in Hampshire, Illinois

Impact category	Unit	Stage 1 - Product Stage			Stage 2 - Design & Construction			Stage 3 - Use & Maintenance			Stage 4 - End-of-Life		Total
		1-1	1-2	1-3	2-1	2-2	2-3	3-1	3-2	3-3	4-1	4-2	
GWP, $IPCC_{TOTAL}$	kg CO_2 eq	1.79E-01	4.96E-03	9.62E-03	8.34E-03	1.30E-02	0	2.39E-02	1.31E-04	0	1.58E-03	2.45E-03	**2.43E-01**
GWP, $IPCC_{BIOGENIC}$	kg CO_2 eq	-3.77E-03	0	-1.83E-03	0	0	0	5.60E-03	0	0	0	0	**0**
GWP, $IPCC_{FOSSIL}$	kg CO_2 eq	1.82E-01	4.96E-03	1.14E-02	8.34E-03	1.30E-02	0	1.83E-02	1.31E-04	0	1.58E-03	2.45E-03	**2.43E-01**
GWP, $TRACI\ 2.1_{TOTAL}$	kg CO_2 eq	1.74E-01	4.90E-03	9.89E-03	8.24E-03	1.29E-02	0	2.34E-02	1.16E-04	0	1.56E-03	2.16E-03	**2.37E-01**
GWP, $TRACI\ 2.1_{BIOGENIC}$	kg CO_2 eq	-3.77E-03	0	-1.83E-03	0	0	0	5.60E-03	0	0	0	0	**0**
GWP, $TRACI\ 2.1_{FOSSIL}$	kg CO_2 eq	1.77E-01	4.90E-03	1.17E-02	8.24E-03	1.29E-02	0	1.78E-02	1.16E-04	0	1.56E-03	2.16E-03	**2.37E-01**
Ozone depletion	kg CFC-11 eq	2.52E-09	7.05E-11	3.15E-10	1.18E-10	1.85E-10	0	2.52E-10	3.96E-13	0	2.58E-11	7.39E-12	**3.49E-09**
Acidification	kg SO_2 eq	5.88E-04	1.21E-05	3.87E-05	2.04E-05	3.18E-05	0	5.89E-05	9.09E-08	0	7.62E-06	1.70E-06	**7.60E-04**
Eutrophication	kg N eq	7.15E-05	8.24E-07	3.34E-06	1.38E-06	2.16E-06	0	7.17E-06	2.39E-08	0	4.83E-07	4.47E-07	**8.73E-05**
Smog	kg O_3 eq	7.64E-03	3.11E-04	4.05E-04	5.23E-04	8.16E-04	0	7.66E-04	1.98E-02	0	2.34E-04	4.69E-05	**3.05E-02**
Respiratory effects	kg PM2.5 eq	9.09E-05	1.67E-06	2.67E-06	2.80E-06	4.38E-06	0	9.10E-06	1.33E-08	0	9.53E-07	2.48E-07	**1.13E-04**
Additional environmental information													
Carcinogenics	CTUh	8.43E-10	3.14E-12	4.16E-11	5.27E-12	8.23E-12	0	8.50E-11	1.00E-12	0	3.34E-13	1.87E-11	**1.01E-09**
Non carcinogenics	CTUh	9.92E-09	6.06E-10	5.54E-10	1.02E-09	1.59E-09	0	1.04E-09	7.07E-11	0	6.89E-11	1.32E-09	**1.62E-08**
Ecotoxicity	CTUe	7.60E-02	1.23E-02	2.03E-03	2.07E-02	3.24E-02	0	7.68E-03	1.08E-04	0	2.02E-04	2.02E-03	**1.54E-01**
Fossil fuel depletion	MJ surplus	4.43E-01	9.35E-03	1.17E-02	1.57E-02	2.45E-02	0	4.43E-02	4.38E-05	0	2.93E-03	8.18E-04	**5.52E-01**

Table 79. Life cycle impact assessment percentage contribution for VOCOMP-25 per declared unit (1 m^2) at the manufacturing location in Hampshire, Illinois

Impact category	Stage 1 - Product Stage			Stage 2 - Design & Construction			Stage 3 - Use & Maintenance			Stage 4 - End-of-Life		Total
	1-1	1-2	1-3	2-1	2-2	2-3	3-1	3-2	3-3	4-1	4-2	
GWP, $IPCC_{TOTAL}$	73.60%	2.05%	3.96%	3.44%	5.37%	0%	9.86%	0.05%	0%	0.65%	1.01%	100%
GWP, $TRACI_{TOTAL}$	73.32%	2.07%	4.18%	3.48%	5.44%	0%	9.89%	0.05%	0%	0.66%	0.91%	100%
Ozone depletion	72.09%	2.02%	9.03%	3.39%	5.30%	0%	7.22%	0.01%	0%	0.74%	0.21%	100%
Acidification	77.45%	1.59%	5.10%	2.68%	4.19%	0%	7.75%	0.01%	0%	1.00%	0.22%	100%
Eutrophication	81.87%	0.94%	3.82%	1.59%	2.48%	0%	8.21%	0.03%	0%	0.55%	0.51%	100%
Smog	25.04%	1.02%	1.33%	1.71%	2.67%	0%	2.51%	64.80%	0%	0.77%	0.15%	100%
Respiratory effects	80.63%	1.48%	2.36%	2.49%	3.89%	0%	8.07%	0.01%	0%	0.85%	0.22%	100%
Additional environmental information												
Carcinogenics	83.77%	0.31%	4.13%	0.52%	0.82%	0%	8.45%	0.10%	0%	0.03%	1.86%	100%
Non-carcinogenics	61.26%	3.74%	3.42%	6.29%	9.82%	0%	6.45%	0.44%	0%	0.43%	8.16%	100%
Ecotoxicity	49.50%	8.04%	1.32%	13.51%	21.11%	0%	5.00%	0.07%	0%	0.13%	1.32%	100%
Fossil fuel depletion	80.19%	1.69%	2.11%	2.85%	4.45%	0%	8.03%	0.01%	0%	0.53%	0.15%	100%

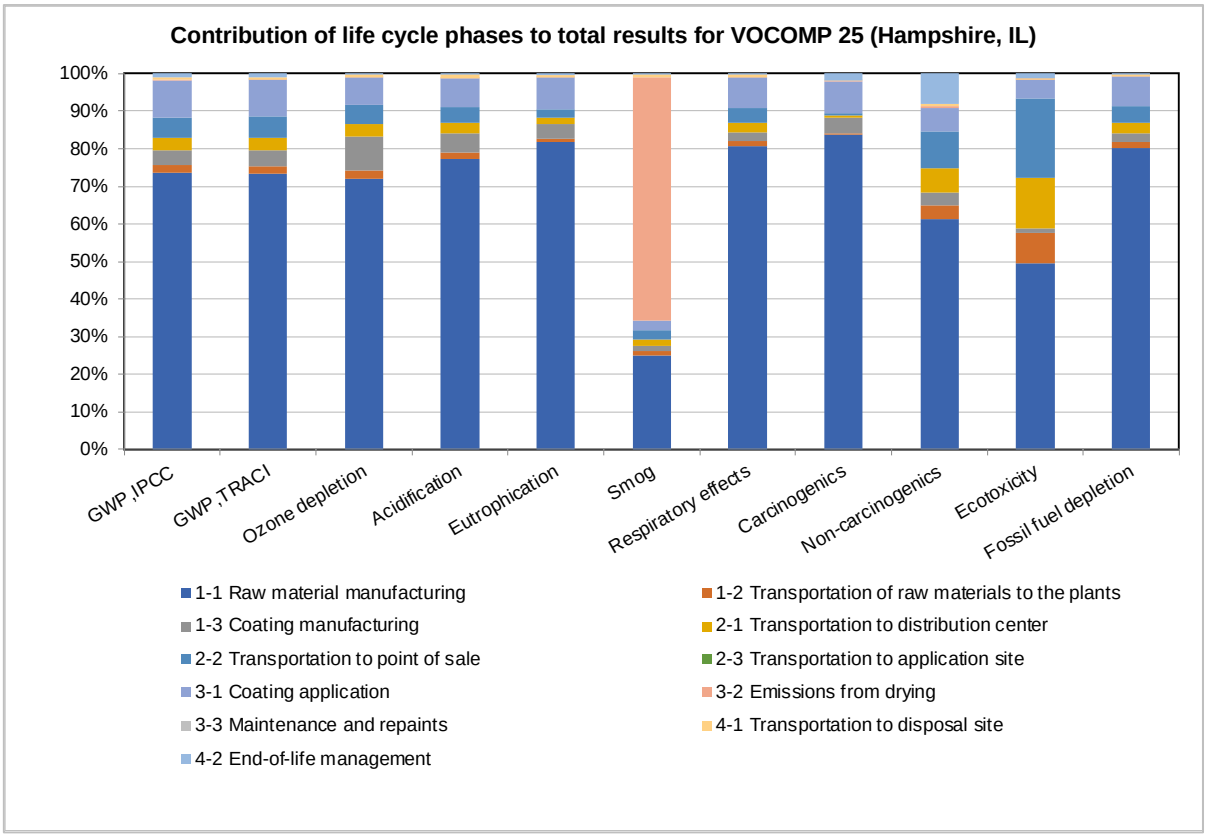

Figure 17. Contribution analysis of each impact category for **VOCOMP-25** at Hampshire, Illinois

5.3.2.6. York, Pennsylvania

Table 80. Life cycle impact assessment results for VOCOMP-25 per declared unit (1 m^2) at the manufacturing location in York, Pennsylvania

Impact category	Unit	Stage 1 - Product Stage			Stage 2 - Design & Construction			Stage 3 - Use & Maintenance			Stage 4 - End-of-Life		Total
		1-1	1-2	1-3	2-1	2-2	2-3	3-1	3-2	3-3	4-1	4-2	
GWP, $IPCC_{TOTAL}$	kg CO_2 eq	1.79E-01	1.02E-02	1.05E-02	3.83E-03	1.30E-02	0	2.39E-02	1.31E-04	0	1.58E-03	2.45E-03	**2.44E-01**
GWP, $IPCC_{BIOGENIC}$	kg CO_2 eq	-3.77E-03	0	-1.83E-03	0	0	0	5.60E-03	0	0	0	0	**0**
GWP, $IPCC_{FOSSIL}$	kg CO_2 eq	1.82E-01	1.02E-02	1.24E-02	3.83E-03	1.30E-02	0	1.83E-02	1.31E-04	0	1.58E-03	2.45E-03	**2.44E-01**
GWP, TRACI 2.1_{TOTAL}	kg CO_2 eq	1.74E-01	1.01E-02	1.08E-02	3.79E-03	1.29E-02	0	2.34E-02	1.16E-04	0	1.56E-03	2.16E-03	**2.38E-01**
GWP, TRACI $2.1_{BIOGENIC}$	kg CO_2 eq	-3.77E-03	0	-1.83E-03	0	0	0	5.60E-03	0	0	0	0	**0**
GWP, TRACI 2.1_{FOSSIL}	kg CO_2 eq	1.77E-01	1.01E-02	1.26E-02	3.79E-03	1.29E-02	0	1.78E-02	1.16E-04	0	1.56E-03	2.16E-03	**2.38E-01**
Ozone depletion	kg CFC-11 eq	2.52E-09	1.45E-10	3.63E-10	5.44E-11	1.85E-10	0	2.52E-10	3.96E-13	0	2.58E-11	7.39E-12	**3.55E-09**
Acidification	kg SO_2 eq	5.88E-04	2.50E-05	4.31E-05	9.36E-06	3.18E-05	0	5.89E-05	9.09E-08	0	7.62E-06	1.70E-06	**7.66E-04**
Eutrophication	kg N eq	7.15E-05	1.70E-06	3.71E-06	6.36E-07	2.16E-06	0	7.17E-06	2.39E-08	0	4.83E-07	4.47E-07	**8.78E-05**
Smog	kg O_3 eq	7.64E-03	6.42E-04	4.40E-04	2.40E-04	8.16E-04	0	7.66E-04	1.98E-02	0	2.34E-04	4.69E-05	**3.06E-02**
Respiratory effects	kg PM2.5 eq	9.09E-05	3.44E-06	2.91E-06	1.29E-06	4.38E-06	0	9.10E-06	1.33E-08	0	9.53E-07	2.48E-07	**1.13E-04**
Additional environmental information													
Carcinogenics	CTUh	8.43E-10	6.47E-12	4.38E-11	2.42E-12	8.23E-12	0	8.50E-11	1.00E-12	0	3.34E-13	1.87E-11	**1.01E-09**
Non carcinogenics	CTUh	9.92E-09	1.25E-09	5.87E-10	4.68E-10	1.59E-09	0	1.04E-09	7.07E-11	0	6.89E-11	1.32E-09	**1.63E-08**
Ecotoxicity	CTUe	7.60E-02	2.55E-02	2.11E-03	9.53E-03	3.24E-02	0	7.68E-03	1.08E-04	0	2.02E-04	2.02E-03	**1.56E-01**
Fossil fuel depletion	MJ surplus	4.43E-01	1.93E-02	1.25E-02	7.22E-03	2.45E-02	0	4.43E-02	4.38E-05	0	2.93E-03	8.18E-04	**5.54E-01**

Table 81. Life cycle impact assessment percentage contribution for VOCOMP-25 per declared unit (1 m^2) at the manufacturing location in York, Pennsylvania

Impact category	Stage 1 - Product Stage			Stage 2 - Design & Construction			Stage 3 - Use & Maintenance			Stage 4 - End-of-Life		Total
	1-1	1-2	1-3	2-1	2-2	2-3	3-1	3-2	3-3	4-1	4-2	
GWP, $IPCC_{TOTAL}$	73.10%	4.19%	4.31%	1.57%	5.33%	0%	9.80%	0.05%	0%	0.65%	1.00%	100%
GWP, $TRACI_{TOTAL}$	72.81%	4.25%	4.53%	1.59%	5.40%	0%	9.82%	0.05%	0%	0.65%	0.91%	100%
Ozone depletion	70.89%	4.10%	10.23%	1.53%	5.21%	0%	7.10%	0.01%	0%	0.73%	0.21%	100%
Acidification	76.81%	3.27%	5.63%	1.22%	4.15%	0%	7.69%	0.01%	0%	1.00%	0.22%	100%
Eutrophication	81.41%	1.94%	4.22%	0.72%	2.46%	0%	8.16%	0.03%	0%	0.55%	0.51%	100%
Smog	24.97%	2.10%	1.44%	0.78%	2.67%	0%	2.50%	64.62%	0%	0.77%	0.15%	100%
Respiratory effects	80.27%	3.04%	2.57%	1.14%	3.87%	0%	8.04%	0.01%	0%	0.84%	0.22%	100%
Additional environmental information												
Carcinogenics	83.54%	0.64%	4.34%	0.24%	0.82%	0%	8.43%	0.10%	0%	0.03%	1.86%	100%
Non-carcinogenics	60.78%	7.66%	3.60%	2.87%	9.74%	0%	6.40%	0.43%	0%	0.42%	8.09%	100%
Ecotoxicity	48.86%	16.38%	1.36%	6.13%	20.83%	0%	4.94%	0.07%	0%	0.13%	1.30%	100%
Fossil fuel depletion	79.86%	3.48%	2.25%	1.30%	4.43%	0%	7.99%	0.01%	0%	0.53%	0.15%	100%

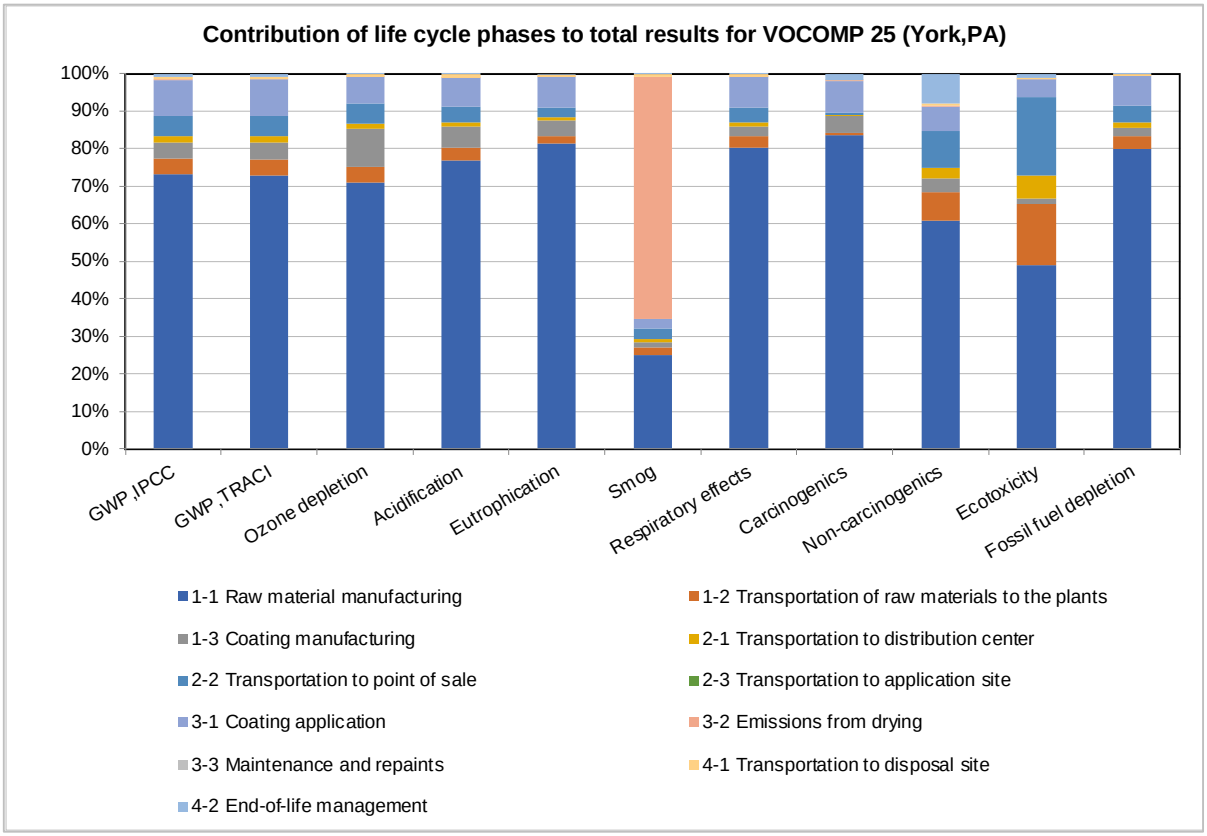

Figure 18. Contribution analysis of each impact category for VOCOMP-20 at York, Pennsylvania

5.3.2.7. Milton, Ontario, Canada

Table 82. Life cycle impact assessment results for VOCOMP-25 per declared unit (1 m^2) at the manufacturing location in Milton, Ontario, Canada

Impact category	Unit	Stage 1 - Product Stage			Stage 2 - Design & Construction			Stage 3 - Use & Maintenance			Stage 4 - End-of-Life		Total
		1-1	1-2	1-3	2-1	2-2	2-3	3-1	3-2	3-3	4-1	4-2	
GWP, $IPCC_{TOTAL}$	kg CO_2 eq	1.79E-01	2.07E-02	4.54E-03	8.84E-02	1.30E-02	0	2.39E-02	1.31E-04	0	1.58E-03	2.45E-03	**3.33E-01**
GWP, $IPCC_{BIOGENIC}$	kg CO_2 eq	-3.77E-03	0	-1.83E-03	0	0	0	5.60E-03	0	0	0	0	**0**
GWP, $IPCC_{FOSSIL}$	kg CO_2 eq	1.82E-01	2.07E-02	6.36E-03	8.84E-02	1.30E-02	0	1.83E-02	1.31E-04	0	1.58E-03	2.45E-03	**3.33E-01**
GWP, TRACI 2.1_{TOTAL}	kg CO_2 eq	1.74E-01	2.05E-02	4.88E-03	8.72E-02	1.29E-02	0	2.34E-02	1.16E-04	0	1.56E-03	2.16E-03	**3.26E-01**
GWP, TRACI $2.1_{BIOGENIC}$	kg CO_2 eq	-3.77E-03	0	-1.83E-03	0	0	0	5.60E-03	0	0	0	0	**0**
GWP, TRACI 2.1_{FOSSIL}	kg CO_2 eq	1.77E-01	2.05E-02	6.70E-03	8.72E-02	1.29E-02	0	1.78E-02	1.16E-04	0	1.56E-03	2.16E-03	**3.26E-01**
Ozone depletion	kg CFC-11 eq	2.52E-09	2.95E-10	4.59E-11	1.54E-09	1.85E-10	0	2.52E-10	3.96E-13	0	2.58E-11	7.39E-12	**4.87E-09**
Acidification	kg SO_2 eq	5.88E-04	5.07E-05	1.41E-05	1.87E-04	3.18E-05	0	5.89E-05	9.09E-08	0	7.62E-06	1.70E-06	**9.40E-04**
Eutrophication	kg N eq	7.15E-05	3.44E-06	1.25E-06	1.24E-05	2.16E-06	0	7.17E-06	2.39E-08	0	4.83E-07	4.47E-07	**9.89E-05**
Smog	kg O_3 eq	7.64E-03	1.30E-03	2.06E-04	4.45E-03	8.16E-04	0	7.66E-04	1.98E-02	0	2.34E-04	4.69E-05	**3.52E-02**
Respiratory effects	kg PM2.5 eq	9.09E-05	6.98E-06	1.27E-06	2.22E-05	4.38E-06	0	9.10E-06	1.33E-08	0	9.53E-07	2.48E-07	**1.36E-04**
Additional environmental information													
Carcinogenics	CTUh	8.43E-10	1.31E-11	2.92E-11	4.96E-11	8.23E-12	0	8.50E-11	1.00E-12	0	3.34E-13	1.87E-11	**1.05E-09**
Non carcinogenics	CTUh	9.92E-09	2.53E-09	3.66E-10	4.63E-09	1.59E-09	0	1.04E-09	7.07E-11	0	6.89E-11	1.32E-09	**2.15E-08**
Ecotoxicity	CTUe	7.60E-02	5.16E-02	1.57E-03	8.55E-02	3.24E-02	0	7.68E-03	1.08E-04	0	2.02E-04	2.02E-03	**2.57E-01**
Fossil fuel depletion	MJ surplus	4.43E-01	3.91E-02	7.16E-03	1.61E-01	2.45E-02	0	4.43E-02	4.38E-05	0	2.93E-03	8.18E-04	**7.23E-01**

Table 83. Life cycle impact assessment percentage contribution for VOCOMP-25 per declared unit (1 m^2) at the manufacturing location in Milton, Ontario, Canada

Impact category	Stage 1 - Product Stage			Stage 2 - Design & Construction			Stage 3 - Use & Maintenance			Stage 4 - End-of-Life		Total
	1-1	1-2	1-3	2-1	2-2	2-3	3-1	3-2	3-3	4-1	4-2	
GWP, $IPCC_{TOTAL}$	53.56%	6.22%	1.36%	26.52%	3.91%	0%	7.18%	0.04%	0%	0.47%	0.73%	100%
GWP, $TRACI_{TOTAL}$	53.20%	6.28%	1.49%	26.72%	3.94%	0%	7.18%	0.04%	0%	0.48%	0.66%	100%
Ozone depletion	51.66%	6.05%	0.94%	31.70%	3.80%	0%	5.17%	0.01%	0%	0.53%	0.15%	100%
Acidification	62.57%	5.39%	1.50%	19.90%	3.38%	0%	6.26%	0.01%	0%	0.81%	0.18%	100%
Eutrophication	72.32%	3.48%	1.27%	12.53%	2.19%	0%	7.25%	0.02%	0%	0.49%	0.45%	100%
Smog	21.69%	3.69%	0.59%	12.62%	2.32%	0%	2.17%	56.13%	0%	0.67%	0.13%	100%
Respiratory effects	66.83%	5.13%	0.94%	16.29%	3.22%	0%	6.69%	0.01%	0%	0.70%	0.18%	100%
Additional environmental information												
Carcinogenics	80.42%	1.25%	2.79%	4.73%	0.79%	0%	8.11%	0.10%	0%	0.03%	1.79%	100%
Non-carcinogenics	46.03%	11.75%	1.70%	21.51%	7.38%	0%	4.85%	0.33%	0%	0.32%	6.13%	100%
Ecotoxicity	29.56%	20.07%	0.61%	33.27%	12.60%	0%	2.99%	0.04%	0%	0.08%	0.79%	100%
Fossil fuel depletion	61.23%	5.40%	0.99%	22.33%	3.39%	0%	6.13%	0.01%	0%	0.40%	0.11%	100%

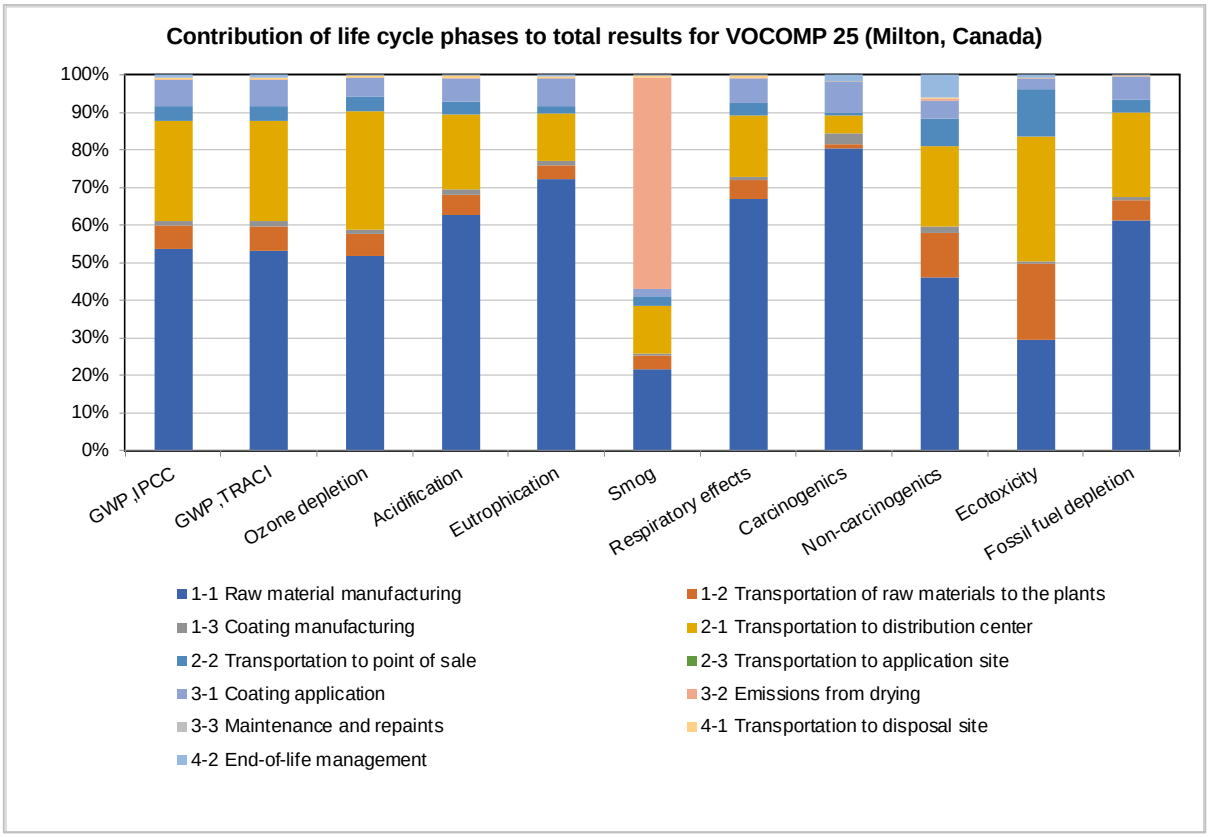

Figure 19. Contribution analysis of each impact category for VOCOMP-25 at Milton, Ontario, Canada

5.3.2.8. Sherwood, Alberta, Canada

Table 84. Life cycle impact assessment results for VOCOMP-25 per declared unit (1 m^2) at the manufacturing location in Sherwood, Alberta, Canada

Impact category	Unit	Stage 1 - Product Stage			Stage 2 - Design & Construction			Stage 3 - Use & Maintenance			Stage 4 - End-of-Life		Total
		1-1	1-2	1-3	2-1	2-2	2-3	3-1	3-2	3-3	4-1	4-2	
GWP, $IPCC_{TOTAL}$	kg CO_2 eq	1.79E-01	6.43E-03	3.58E-02	8.23E-03	1.30E-02	0	2.39E-02	1.31E-04	0	1.58E-03	2.45E-03	**2.70E-01**
GWP, $IPCC_{BIOGENIC}$	kg CO_2 eq	-3.77E-03	0	-1.83E-03	0	0	0	5.60E-03	0	0	0	0	**0**
GWP, $IPCC_{FOSSIL}$	kg CO_2 eq	1.82E-01	6.43E-03	3.76E-02	8.23E-03	1.30E-02	0	1.83E-02	1.31E-04	0	1.58E-03	2.45E-03	**2.70E-01**
GWP, TRACI 2.1_{TOTAL}	kg CO_2 eq	1.74E-01	6.36E-03	3.56E-02	8.13E-03	1.29E-02	0	2.34E-02	1.16E-04	0	1.56E-03	2.16E-03	**2.64E-01**
GWP, TRACI $2.1_{BIOGENIC}$	kg CO_2 eq	-3.77E-03	0	-1.83E-03	0	0	0	5.60E-03	0	0	0	0	**0**
GWP, TRACI 2.1_{FOSSIL}	kg CO_2 eq	1.77E-01	6.36E-03	3.74E-02	8.13E-03	1.29E-02	0	1.78E-02	1.16E-04	0	1.56E-03	2.16E-03	**2.64E-01**
Ozone depletion	kg CFC-11 eq	2.52E-09	9.14E-11	4.55E-10	1.17E-10	1.85E-10	0	2.52E-10	3.96E-13	0	2.58E-11	7.39E-12	**3.65E-09**
Acidification	kg SO_2 eq	5.88E-04	1.57E-05	1.30E-04	2.01E-05	3.18E-05	0	5.89E-05	9.09E-08	0	7.62E-06	1.70E-06	**8.55E-04**
Eutrophication	kg N eq	7.15E-05	1.07E-06	1.14E-05	1.37E-06	2.16E-06	0	7.17E-06	2.39E-08	0	4.83E-07	4.47E-07	**9.56E-05**
Smog	kg O_3 eq	7.64E-03	4.03E-04	1.23E-03	5.16E-04	8.16E-04	0	7.66E-04	1.98E-02	0	2.34E-04	4.69E-05	**3.14E-02**
Respiratory effects	kg PM2.5 eq	9.09E-05	2.16E-06	7.75E-06	2.77E-06	4.38E-06	0	9.10E-06	1.33E-08	0	9.53E-07	2.48E-07	**1.18E-04**
Additional environmental information													
Carcinogenics	CTUh	8.43E-10	4.06E-12	8.43E-11	5.20E-12	8.23E-12	0	8.50E-11	1.00E-12	0	3.34E-13	1.87E-11	**1.05E-09**
Non carcinogenics	CTUh	9.92E-09	7.85E-10	1.30E-09	1.00E-09	1.59E-09	0	1.04E-09	7.07E-11	0	6.89E-11	1.32E-09	**1.71E-08**
Ecotoxicity	CTUe	7.60E-02	1.60E-02	3.35E-03	2.05E-02	3.24E-02	0	7.68E-03	1.08E-04	0	2.02E-04	2.02E-03	**1.58E-01**
Fossil fuel depletion	MJ surplus	4.43E-01	1.21E-02	4.31E-02	1.55E-02	2.45E-02	0	4.43E-02	4.38E-05	0	2.93E-03	8.18E-04	**5.86E-01**

Table 85. Life cycle impact assessment percentage contribution for VOCOMP-25 per declared unit (1 m^2) at the manufacturing location in Sherwood, Alberta, Canada

Impact category	Stage 1 - Product Stage			Stage 2 - Design & Construction			Stage 3 - Use & Maintenance			Stage 4 - End-of-Life		Total
	1-1	1-2	1-3	2-1	2-2	2-3	3-1	3-2	3-3	4-1	4-2	
GWP, $IPCC_{TOTAL}$	66.10%	2.38%	13.25%	3.05%	4.82%	0%	8.86%	0.05%	0%	0.59%	0.91%	100%
GWP, $TRACI_{TOTAL}$	65.80%	2.41%	13.50%	3.08%	4.88%	0%	8.88%	0.04%	0%	0.59%	0.82%	100%
Ozone depletion	68.94%	2.50%	12.47%	3.20%	5.07%	0%	6.90%	0.01%	0%	0.71%	0.20%	100%
Acidification	68.85%	1.84%	15.24%	2.35%	3.72%	0%	6.89%	0.01%	0%	0.89%	0.20%	100%
Eutrophication	74.81%	1.12%	11.88%	1.43%	2.26%	0%	7.50%	0.03%	0%	0.51%	0.47%	100%
Smog	24.31%	1.28%	3.90%	1.64%	2.60%	0%	2.44%	62.93%	0%	0.75%	0.15%	100%
Respiratory effects	76.85%	1.83%	6.56%	2.34%	3.70%	0%	7.69%	0.01%	0%	0.81%	0.21%	100%
Additional environmental information												
Carcinogenics	80.29%	0.39%	8.03%	0.50%	0.78%	0%	8.10%	0.10%	0%	0.03%	1.79%	100%
Non-carcinogenics	58.00%	4.59%	7.60%	5.87%	9.30%	0%	6.11%	0.41%	0%	0.40%	7.72%	100%
Ecotoxicity	48.03%	10.11%	2.12%	12.93%	20.48%	0%	4.85%	0.07%	0%	0.13%	1.28%	100%
Fossil fuel depletion	75.54%	2.07%	7.36%	2.64%	4.19%	0%	7.56%	0.01%	0%	0.50%	0.14%	100%

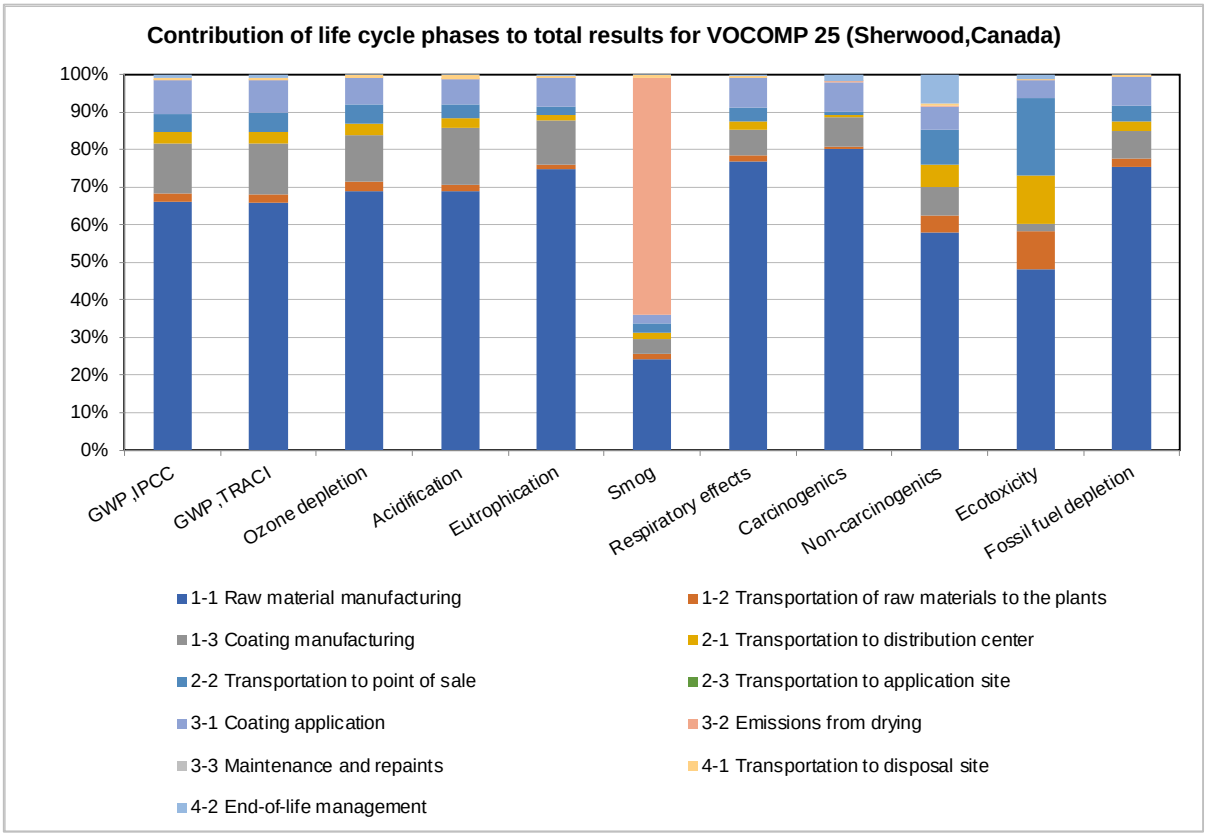

Figure 20. Contribution analysis of each impact category for VOCOMP-25 at Sherwood, Alberta, Canada

5.3.3. VOCOMP-30

The tables in this section show the LCIA results and the percent contribution of each stage of the production of VOCOMP-30 across eight plants. The figures in this section show the contribution analysis of each impact category for VOCOMP-25.

The 1-1 raw material manufacturing stage contributes the most to the overall impact across all locations. Coating manufacturing (1-3) and transportation stages (1-2, 2-1,

and 2-2) also have significant contributions, but to a lesser extent. End-of life management and emissions from drying show small but nonzero contributions, indicating some level of impact in these later stages.

Transportation impacts vary significantly by location**,** with Cartersville and Hampshire having lower impacts, suggesting differences in supply chain efficiency. Across all manufacturing plant locations, Benicia leads in multiple impact categories, particularly coating manufacturing, and transportation. Cartersville and Hampshire show the lowest transportation impact, which may suggest that they have better logistics or are closer to supply sources.

The average SM2013 Methodology single-figure millipoint (mPts) across all manufacturing plants of W. R. MEADOWS VOCOMP-30 score by life cycle phase for this product is presented below (Table 103). Across all 10 impact categories, the SM single-figure score indicates that raw materials acquisition accounts for around 52.6% of the total impacts, manufacturing for 19.7 %, and transportation for approximately 13%.

Table 86. SM2013 Methodology single-figure millipoint (mPts) average across all plants for W. R. MEADOWS VOCOMP-30

Impact category	Unit	Stage 1 - Product Stage			Stage 2 - Design & Construction			Stage 3 - Use & Maintenance			Stage 4 - End-of-Life		Total
		1-1	1-2	1-3	2-1	2-2	2-3	3-1	3-2	3-3	4-1	4-2	
SM Single Score	mPts	1.13E-02	5.31E-03	5.07E-03	2.24E-04	7.79E-04	0	1.20E-03	1.99E-03	0	6.63E-05	1.68E-04	2.62E-02
	percentage	43.36%	20.31%	19.37%	0.85%	2.98%	0%	4.60%	7.63%	0%	0.25%	0.64%	100%

5.3.3.1. Benicia, California

Table 87. Life cycle impact assessment results for VOCOMP-30 per declared unit (1 m^2) at the manufacturing location in Benicia, California

Impact category	Unit	Stage 1 - Product Stage			Stage 2 - Design & Construction			Stage 3 - Use & Maintenance			Stage 4 - End-of-Life		Total
		1-1	1-2	1-3	2-1	2-2	2-3	3-1	3-2	3-3	4-1	4-2	
GWP, $IPCC_{TOTAL}$	kg CO_2 eq	2.10E-01	3.29E-02	1.76E-01	8.45E-03	1.30E-02	0	2.81E-02	1.31E-04	0	1.59E-03	2.45E-03	**4.73E-01**
GWP, $IPCC_{BIOGENIC}$	kg CO_2 eq	-4.45E-03	0	-1.15E-03	0	0	0	5.60E-03	0	0	0	0	**0**
GWP, $IPCC_{FOSSIL}$	kg CO_2 eq	2.15E-01	3.29E-02	1.77E-01	8.45E-03	1.30E-02	0	2.25E-02	1.31E-04	0	1.59E-03	2.45E-03	**4.73E-01**
GWP, TRACI 2.1_{TOTAL}	kg CO_2 eq	2.05E-01	3.25E-02	1.72E-01	8.35E-03	1.29E-02	0	2.74E-02	1.16E-04	0	1.57E-03	2.16E-03	**4.61E-01**
GWP, TRACI $2.1_{BIOGENIC}$	kg CO_2 eq	-4.45E-03	0	-1.15E-03	0	0	0	5.60E-03	0	0	0	0	**0**
GWP, TRACI 2.1_{FOSSIL}	kg CO_2 eq	2.09E-01	3.25E-02	1.73E-01	8.35E-03	1.29E-02	0	2.18E-02	1.16E-04	0	1.57E-03	2.16E-03	**4.61E-01**
Ozone depletion	kg CFC-11 eq	9.45E-07	4.67E-10	4.94E-09	1.20E-10	1.85E-10	0	9.45E-08	3.96E-13	0	2.59E-11	7.39E-12	**1.05E-06**
Acidification	kg SO_2 eq	6.97E-04	8.02E-05	4.66E-04	2.06E-05	3.18E-05	0	7.04E-05	9.09E-08	0	7.65E-06	1.70E-06	**1.38E-03**
Eutrophication	kg N eq	8.91E-05	5.45E-06	3.64E-05	1.40E-06	2.16E-06	0	9.09E-06	2.39E-08	0	4.84E-07	4.47E-07	**1.45E-04**
Smog	kg O_3 eq	9.06E-03	2.06E-03	5.18E-03	5.30E-04	8.16E-04	0	9.25E-04	5.75E-02	0	2.35E-04	4.69E-05	**7.64E-02**
Respiratory effects	kg PM2.5 eq	1.08E-04	1.10E-05	5.33E-05	2.84E-06	4.38E-06	0	1.09E-05	1.33E-08	0	9.56E-07	2.48E-07	**1.92E-04**
Additional environmental information													
Carcinogenics	CTUh	9.81E-10	2.08E-11	2.28E-10	5.34E-12	8.23E-12	0	1.06E-10	1.00E-12	0	3.35E-13	1.87E-11	**1.37E-09**
Non carcinogenics	CTUh	1.14E-08	4.01E-09	4.52E-09	1.03E-09	1.59E-09	0	1.68E-09	7.07E-11	0	6.91E-11	1.32E-09	**2.57E-08**
Ecotoxicity	CTUe	8.98E-02	8.17E-02	2.59E-02	2.10E-02	3.24E-02	0	9.79E-03	1.08E-04	0	2.02E-04	2.02E-03	**2.63E-01**
Fossil fuel depletion	MJ surplus	5.18E-01	6.19E-02	4.59E-01	1.59E-02	2.45E-02	0	5.21E-02	4.38E-05	0	2.94E-03	8.18E-04	**1.14E+00**

Table 88. Life cycle impact assessment percentage contribution for VOCOMP-30 per declared unit (1 m^2) at the manufacturing location in Benicia, California

Impact category	Stage 1 - Product Stage			Stage 2 - Design & Construction			Stage 3 - Use & Maintenance			Stage 4 - End-of-Life		Total
	1-1	1-2	1-3	2-1	2-2	2-3	3-1	3-2	3-3	4-1	4-2	
GWP, $IPCC_{TOTAL}$	44.49%	6.95%	37.21%	1.79%	2.75%	0%	5.94%	0.03%	0%	0.34%	0.52%	100%
GWP, $TRACI_{TOTAL}$	44.38%	7.04%	37.20%	1.81%	2.79%	0%	5.94%	0.03%	0%	0.34%	0.47%	100%
Ozone depletion	90.41%	0.04%	0.47%	0.01%	0.02%	0%	9.04%	0%	0%	0%	0%	100%
Acidification	50.67%	5.83%	33.88%	1.50%	2.31%	0%	5.12%	0.01%	0%	0.56%	0.12%	100%
Eutrophication	61.64%	3.77%	25.17%	0.97%	1.50%	0%	6.29%	0.02%	0%	0.34%	0.31%	100%
Smog	11.87%	2.70%	6.79%	0.69%	1.07%	0%	1.21%	75.31%	0%	0.31%	0.06%	100%
Respiratory effects	56.40%	5.76%	27.76%	1.48%	2.28%	0%	5.69%	0.01%	0%	0.50%	0.13%	100%
Additional environmental information												
Carcinogenics	71.66%	1.52%	16.64%	0.39%	0.60%	0%	7.72%	0.07%	0%	0.02%	1.37%	100%
Non-carcinogenics	44.46%	15.59%	17.58%	4.01%	6.18%	0%	6.51%	0.27%	0%	0.27%	5.13%	100%
Ecotoxicity	34.15%	31.08%	9.84%	8.00%	12.32%	0%	3.72%	0.04%	0%	0.08%	0.77%	100%
Fossil fuel depletion	45.64%	5.45%	40.42%	1.40%	2.16%	0%	4.59%	0%	0%	0.26%	0.07%	100%

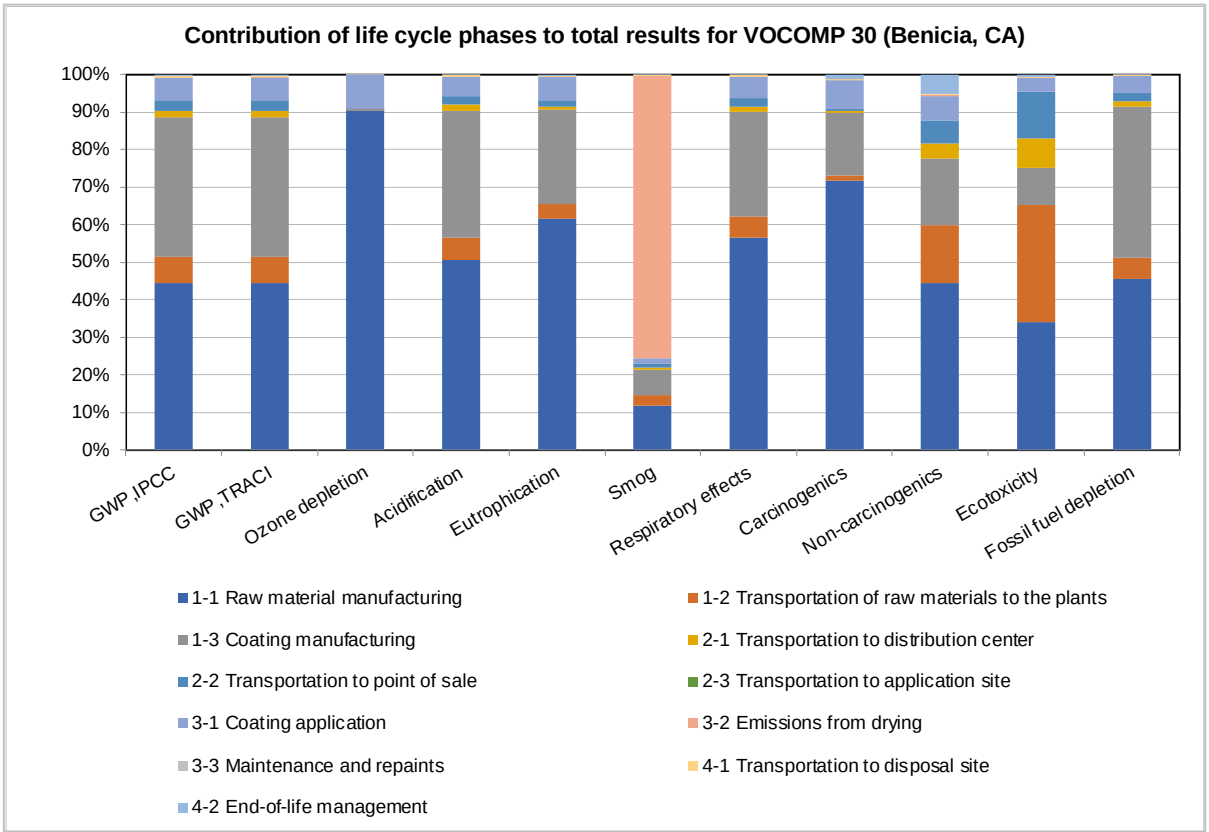

Figure 21. Contribution analysis of each impact category for VOCOMP-30 at Benicia, California

5.3.3.2. Cartersville, Georgia

Table 89. Life cycle impact assessment results for VOCOMP-30 per declared unit (1 m^2) at the manufacturing location in Cartersville, Georgia

Impact category	Unit	Stage 1 - Product Stage			Stage 2 - Design & Construction			Stage 3 - Use & Maintenance			Stage 4 - End-of-Life		Total
		1-1	1-2	1-3	2-1	2-2	2-3	3-1	3-2	3-3	4-1	4-2	
GWP, $IPCC_{TOTAL}$	kg CO_2 eq	2.10E-01	5.70E-03	8.25E-02	1.05E-02	1.30E-02	0	2.81E-02	1.31E-04	0	1.59E-03	2.45E-03	**3.54E-01**
GWP, $IPCC_{BIOGENIC}$	kg CO_2 eq	-4.45E-03	0	-1.15E-03	0	0	0	5.60E-03	0	0	0	0	**0**
GWP, $IPCC_{FOSSIL}$	kg CO_2 eq	2.15E-01	5.70E-03	8.36E-02	1.05E-02	1.30E-02	0	2.25E-02	1.31E-04	0	1.59E-03	2.45E-03	**3.54E-01**
GWP, TRACI 2.1_{TOTAL}	kg CO_2 eq	2.05E-01	5.63E-03	8.05E-02	1.03E-02	1.29E-02	0	2.74E-02	1.16E-04	0	1.57E-03	2.16E-03	**3.45E-01**
GWP, TRACI $2.1_{BIOGENIC}$	kg CO_2 eq	-4.45E-03	0	-1.15E-03	0	0	0	5.60E-03	0	0	0	0	**0**
GWP, TRACI 2.1_{FOSSIL}	kg CO_2 eq	2.09E-01	5.63E-03	8.17E-02	1.03E-02	1.29E-02	0	2.18E-02	1.16E-04	0	1.57E-03	2.16E-03	**3.45E-01**
Ozone depletion	kg CFC-11 eq	9.45E-07	8.09E-11	2.71E-09	1.49E-10	1.85E-10	0	9.45E-08	3.96E-13	0	2.59E-11	7.39E-12	**1.04E-06**
Acidification	kg SO_2 eq	6.97E-04	1.39E-05	2.46E-04	2.55E-05	3.18E-05	0	7.04E-05	9.09E-08	0	7.65E-06	1.70E-06	**1.09E-03**
Eutrophication	kg N eq	8.91E-05	9.46E-07	2.32E-05	1.74E-06	2.16E-06	0	9.09E-06	2.39E-08	0	4.84E-07	4.47E-07	**1.27E-04**
Smog	kg O_3 eq	9.06E-03	3.57E-04	3.26E-03	6.55E-04	8.16E-04	0	9.25E-04	5.75E-02	0	2.35E-04	4.69E-05	**7.29E-02**
Respiratory effects	kg PM2.5 eq	1.08E-04	1.92E-06	3.77E-05	3.52E-06	4.38E-06	0	1.09E-05	1.33E-08	0	9.56E-07	2.48E-07	**1.68E-04**
Additional environmental information													
Carcinogenics	CTUh	9.81E-10	3.60E-12	1.35E-10	6.61E-12	8.23E-12	0	1.06E-10	1.00E-12	0	3.35E-13	1.87E-11	**1.26E-09**
Non carcinogenics	CTUh	1.14E-08	6.95E-10	2.55E-09	1.28E-09	1.59E-09	0	1.68E-09	7.07E-11	0	6.91E-11	1.32E-09	**2.07E-08**
Ecotoxicity	CTUe	8.98E-02	1.42E-02	2.25E-02	2.60E-02	3.24E-02	0	9.79E-03	1.08E-04	0	2.02E-04	2.02E-03	**1.97E-01**
Fossil fuel depletion	MJ surplus	5.18E-01	1.07E-02	2.78E-01	1.97E-02	2.45E-02	0	5.21E-02	4.38E-05	0	2.94E-03	8.18E-04	**9.07E-01**

Table 90. Life cycle impact assessment percentage contribution for VOCOMP-30 per declared unit (1 m^2) at the manufacturing location in Cartersville, Georgia

Impact category	Stage 1 - Product Stage			Stage 2 - Design & Construction			Stage 3 - Use & Maintenance			Stage 4 - End-of-Life		Total
	1-1	1-2	1-3	2-1	2-2	2-3	3-1	3-2	3-3	4-1	4-2	
GWP, $IPCC_{TOTAL}$	59.38%	1.61%	23.29%	2.95%	3.68%	0%	7.92%	0.04%	0%	0.45%	0.69%	100%
GWP, $TRACI_{TOTAL}$	59.28%	1.63%	23.33%	2.99%	3.73%	0%	7.93%	0.03%	0%	0.45%	0.63%	100%
Ozone depletion	90.63%	0.01%	0.26%	0.01%	0.02%	0%	9.06%	0%	0%	0%	0%	100%
Acidification	63.74%	1.27%	22.44%	2.33%	2.91%	0%	6.44%	0.01%	0%	0.70%	0.16%	100%
Eutrophication	70.03%	0.74%	18.26%	1.37%	1.70%	0%	7.14%	0.02%	0%	0.38%	0.35%	100%
Smog	12.44%	0.49%	4.48%	0.90%	1.12%	0%	1.27%	78.92%	0%	0.32%	0.06%	100%
Respiratory effects	64.47%	1.14%	22.45%	2.09%	2.61%	0%	6.51%	0.01%	0%	0.57%	0.15%	100%
Additional environmental information												
Carcinogenics	77.87%	0.29%	10.69%	0.52%	0.65%	0%	8.39%	0.08%	0%	0.03%	1.49%	100%
Non-carcinogenics	55.31%	3.36%	12.31%	6.17%	7.69%	0%	8.10%	0.34%	0%	0.33%	6.38%	100%
Ecotoxicity	45.58%	7.19%	11.41%	13.21%	16.45%	0%	4.97%	0.05%	0%	0.10%	1.03%	100%
Fossil fuel depletion	57.14%	1.18%	30.63%	2.17%	2.71%	0%	5.75%	0%	0%	0.32%	0.09%	100%

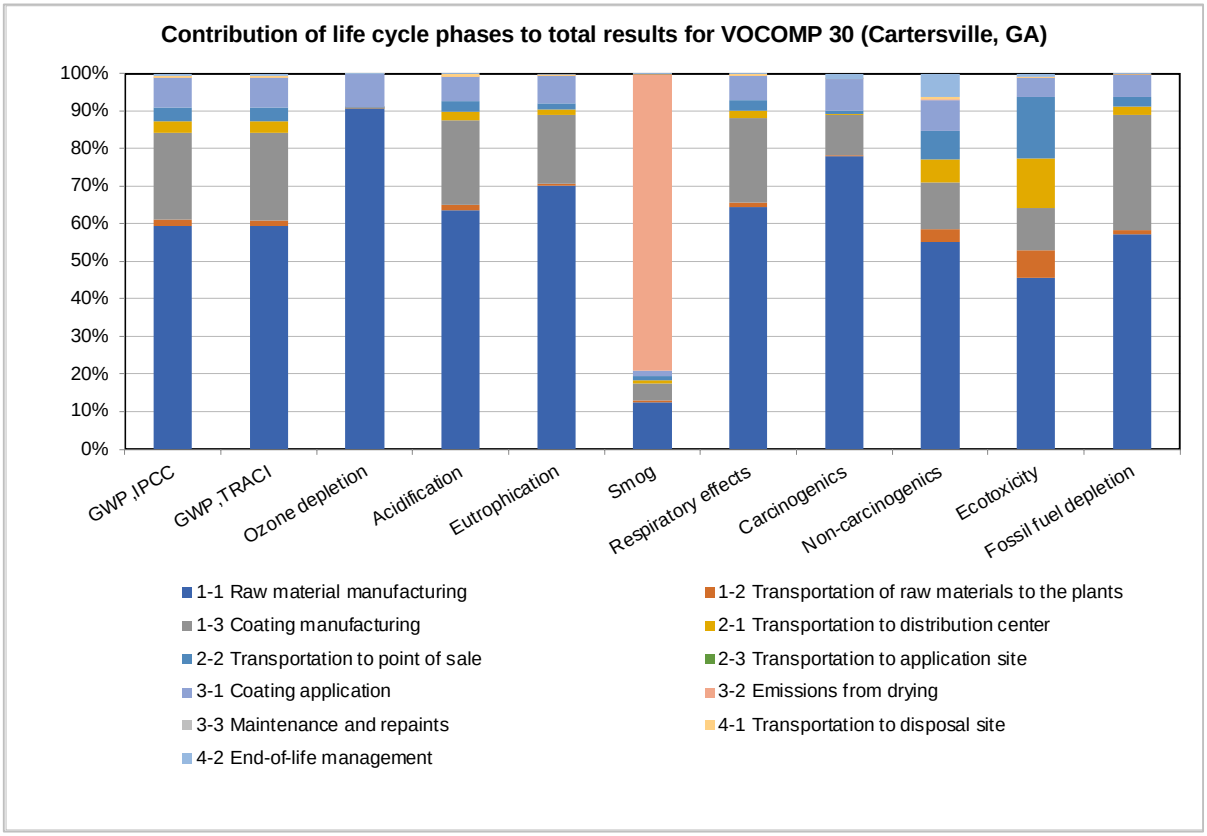

Figure 22. Contribution analysis of each impact category for VOCOMP-30 at Cartersville, Georgia

5.3.3.3. Fort Worth, Texas

Table 91. Life cycle impact assessment results for VOCOMP-30 per declared unit (1 m^2) at the manufacturing location in Fort Worth, Texas

Impact category	Unit	Stage 1 - Product Stage			Stage 2 - Design & Construction			Stage 3 - Use & Maintenance			Stage 4 - End-of-Life		Total
		1-1	1-2	1-3	2-1	2-2	2-3	3-1	3-2	3-3	4-1	4-2	
GWP, $IPCC_{TOTAL}$	kg CO_2 eq	2.10E-01	2.08E-02	8.31E-02	1.55E-03	1.30E-02	0	2.81E-02	1.31E-04	0	1.59E-03	2.45E-03	**3.61E-01**
GWP, $IPCC_{BIOGENIC}$	kg CO_2 eq	-4.45E-03	0	-1.15E-03	0	0	0	5.60E-03	0	0	0	0	**0**
GWP, $IPCC_{FOSSIL}$	kg CO_2 eq	2.15E-01	2.08E-02	8.43E-02	1.55E-03	1.30E-02	0	2.25E-02	1.31E-04	0	1.59E-03	2.45E-03	**3.61E-01**
GWP, TRACI 2.1_{TOTAL}	kg CO_2 eq	2.05E-01	2.05E-02	8.11E-02	1.53E-03	1.29E-02	0	2.74E-02	1.16E-04	0	1.57E-03	2.16E-03	**3.52E-01**
GWP, TRACI $2.1_{BIOGENIC}$	kg CO_2 eq	-4.45E-03	0	-1.15E-03	0	0	0	5.60E-03	0	0	0	0	**0**
GWP, TRACI 2.1_{FOSSIL}	kg CO_2 eq	2.09E-01	2.05E-02	8.23E-02	1.53E-03	1.29E-02	0	2.18E-02	1.16E-04	0	1.57E-03	2.16E-03	**3.52E-01**
Ozone depletion	kg CFC-11 eq	9.45E-07	2.95E-10	2.70E-09	2.20E-11	1.85E-10	0	9.45E-08	3.96E-13	0	2.59E-11	7.39E-12	**1.04E-06**
Acidification	kg SO_2 eq	6.97E-04	5.07E-05	2.48E-04	3.78E-06	3.18E-05	0	7.04E-05	9.09E-08	0	7.65E-06	1.70E-06	**1.11E-03**
Eutrophication	kg N eq	8.91E-05	3.45E-06	2.34E-05	2.57E-07	2.16E-06	0	9.09E-06	2.39E-08	0	4.84E-07	4.47E-07	**1.28E-04**
Smog	kg O_3 eq	9.06E-03	1.30E-03	3.28E-03	9.69E-05	8.16E-04	0	9.25E-04	5.75E-02	0	2.35E-04	4.69E-05	**7.33E-02**
Respiratory effects	kg PM2.5 eq	1.08E-04	6.98E-06	3.78E-05	5.20E-07	4.38E-06	0	1.09E-05	1.33E-08	0	9.56E-07	2.48E-07	**1.70E-04**
Additional environmental information													
Carcinogenics	CTUh	9.81E-10	1.31E-11	1.35E-10	9.78E-13	8.23E-12	0	1.06E-10	1.00E-12	0	3.35E-13	1.87E-11	**1.26E-09**
Non carcinogenics	CTUh	1.14E-08	2.53E-09	2.54E-09	1.89E-10	1.59E-09	0	1.68E-09	7.07E-11	0	6.91E-11	1.32E-09	**2.14E-08**
Ecotoxicity	CTUe	8.98E-02	5.17E-02	2.25E-02	3.85E-03	3.24E-02	0	9.79E-03	1.08E-04	0	2.02E-04	2.02E-03	**2.12E-01**
Fossil fuel depletion	MJ surplus	5.18E-01	3.91E-02	2.79E-01	2.91E-03	2.45E-02	0	5.21E-02	4.38E-05	0	2.94E-03	8.18E-04	**9.19E-01**

Table 92. Life cycle impact assessment percentage contribution for VOCOMP-30 per declared unit (1 m^2) at the manufacturing location in Fort Worth, Texas

Impact category	Stage 1 - Product Stage			Stage 2 - Design & Construction			Stage 3 - Use & Maintenance			Stage 4 - End-of-Life		Total
	1-1	1-2	1-3	2-1	2-2	2-3	3-1	3-2	3-3	4-1	4-2	
GWP, $IPCC_{TOTAL}$	58.27%	5.75%	23.02%	0.43%	3.61%	0%	7.77%	0.04%	0%	0.44%	0.68%	100%
GWP, $TRACI_{TOTAL}$	58.15%	5.83%	23.05%	0.43%	3.66%	0%	7.78%	0.03%	0%	0.45%	0.61%	100%
Ozone depletion	90.63%	0.03%	0.26%	0%	0.02%	0%	9.06%	0%	0%	0%	0%	100%
Acidification	62.75%	4.56%	22.30%	0.34%	2.86%	0%	6.34%	0.01%	0%	0.69%	0.15%	100%
Eutrophication	69.39%	2.69%	18.22%	0.20%	1.68%	0%	7.08%	0.02%	0%	0.38%	0.35%	100%
Smog	12.37%	1.78%	4.47%	0.13%	1.11%	0%	1.26%	78.49%	0%	0.32%	0.06%	100%
Respiratory effects	63.66%	4.11%	22.21%	0.31%	2.58%	0%	6.42%	0.01%	0%	0.56%	0.15%	100%
Additional environmental information												
Carcinogenics	77.57%	1.04%	10.72%	0.08%	0.65%	0%	8.35%	0.08%	0%	0.03%	1.48%	100%
Non-carcinogenics	53.38%	11.83%	11.85%	0.88%	7.42%	0%	7.82%	0.33%	0%	0.32%	6.16%	100%
Ecotoxicity	42.29%	24.33%	10.59%	1.81%	15.26%	0%	4.61%	0.05%	0%	0.10%	0.95%	100%
Fossil fuel depletion	56.36%	4.25%	30.31%	0.32%	2.67%	0%	5.67%	0%	0%	0.32%	0.09%	100%

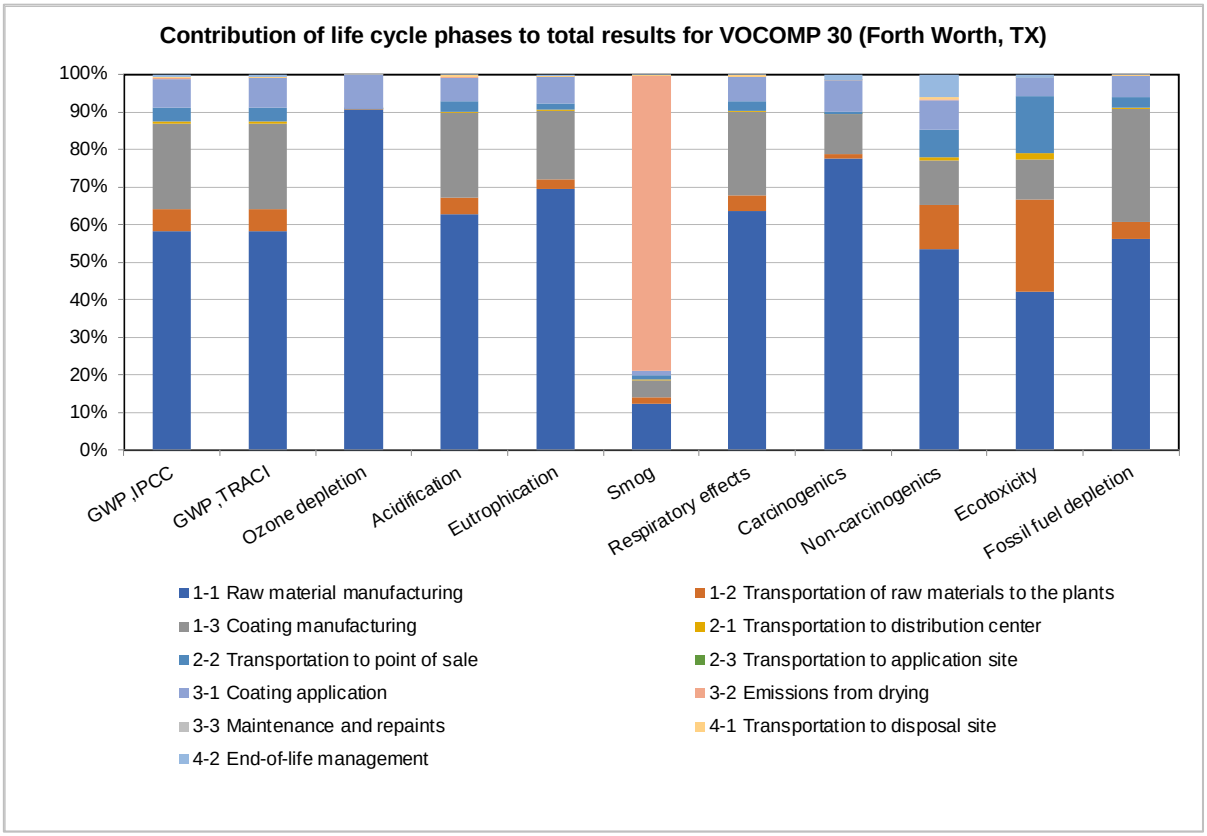

Figure 23. Contribution analysis of each impact category for VOCOMP-30 at Fort Worth, Texas

5.3.3.4. Goodyear, Arizona

Table 93. Life cycle impact assessment results for VOCOMP-30 per declared unit (1 m^2) at the manufacturing location in Goodyear, Arizona

Impact category	Unit	Stage 1 - Product Stage			Stage 2 - Design & Construction			Stage 3 - Use & Maintenance			Stage 4 - End-of-Life		Total
		1-1	1-2	1-3	2-1	2-2	2-3	3-1	3-2	3-3	4-1	4-2	
GWP, $IPCC_{TOTAL}$	kg CO_2 eq	2.10E-01	2.30E-02	9.84E-02	9.31E-03	1.30E-02	0	2.81E-02	1.31E-04	0	1.59E-03	2.45E-03	**3.86E-01**
GWP, $IPCC_{BIOGENIC}$	kg CO_2 eq	-4.45E-03	0	-1.15E-03	0	0	0	5.60E-03	0	0	0	0	**0**
GWP, $IPCC_{FOSSIL}$	kg CO_2 eq	2.15E-01	2.30E-02	9.96E-02	9.31E-03	1.30E-02	0	2.25E-02	1.31E-04	0	1.59E-03	2.45E-03	**3.86E-01**
GWP, TRACI 2.1_{TOTAL}	kg CO_2 eq	2.05E-01	2.28E-02	9.61E-02	9.20E-03	1.29E-02	0	2.74E-02	1.16E-04	0	1.57E-03	2.16E-03	**3.77E-01**
GWP, TRACI $2.1_{BIOGENIC}$	kg CO_2 eq	-4.45E-03	0	-1.15E-03	0	0	0	5.60E-03	0	0	0	0	**0**
GWP, TRACI 2.1_{FOSSIL}	kg CO_2 eq	2.09E-01	2.28E-02	9.73E-02	9.20E-03	1.29E-02	0	2.18E-02	1.16E-04	0	1.57E-03	2.16E-03	**3.77E-01**
Ozone depletion	kg CFC-11 eq	9.45E-07	3.27E-10	3.26E-09	1.32E-10	1.85E-10	0	9.45E-08	3.96E-13	0	2.59E-11	7.39E-12	**1.04E-06**
Acidification	kg SO_2 eq	6.97E-04	5.63E-05	2.92E-04	2.27E-05	3.18E-05	0	7.04E-05	9.09E-08	0	7.65E-06	1.70E-06	**1.18E-03**
Eutrophication	kg N eq	8.91E-05	3.83E-06	2.71E-05	1.55E-06	2.16E-06	0	9.09E-06	2.39E-08	0	4.84E-07	4.47E-07	**1.34E-04**
Smog	kg O_3 eq	9.06E-03	1.44E-03	3.69E-03	5.83E-04	8.16E-04	0	9.25E-04	5.75E-02	0	2.35E-04	4.69E-05	**7.43E-02**
Respiratory effects	kg PM2.5 eq	1.08E-04	7.75E-06	4.02E-05	3.13E-06	4.38E-06	0	1.09E-05	1.33E-08	0	9.56E-07	2.48E-07	**1.76E-04**
Additional environmental information													
Carcinogenics	CTUh	9.81E-10	1.46E-11	1.57E-10	5.88E-12	8.23E-12	0	1.06E-10	1.00E-12	0	3.35E-13	1.87E-11	**1.29E-09**
Non carcinogenics	CTUh	1.14E-08	2.81E-09	2.87E-09	1.14E-09	1.59E-09	0	1.68E-09	7.07E-11	0	6.91E-11	1.32E-09	**2.30E-08**
Ecotoxicity	CTUe	8.98E-02	5.73E-02	2.33E-02	2.32E-02	3.24E-02	0	9.79E-03	1.08E-04	0	2.02E-04	2.02E-03	**2.38E-01**
Fossil fuel depletion	MJ surplus	5.18E-01	4.34E-02	3.01E-01	1.75E-02	2.45E-02	0	5.21E-02	4.38E-05	0	2.94E-03	8.18E-04	**9.61E-01**

Table 94. Life cycle impact assessment percentage contribution for VOCOMP-30 per declared unit (1 m^2) at the manufacturing location in Goodyear, Arizona

Impact category	Stage 1 - Product Stage			Stage 2 - Design & Construction			Stage 3 - Use & Maintenance			Stage 4 - End-of-Life		Total
	1-1	1-2	1-3	2-1	2-2	2-3	3-1	3-2	3-3	4-1	4-2	
GWP, $IPCC_{TOTAL}$	54.44%	5.96%	25.47%	2.41%	3.37%	0%	7.26%	0.03%	0%	0.41%	0.63%	100%
GWP, $TRACI_{TOTAL}$	54.30%	6.04%	25.51%	2.44%	3.42%	0%	7.27%	0.03%	0%	0.42%	0.57%	100%
Ozone depletion	90.57%	0.03%	0.31%	0.01%	0.02%	0%	9.06%	0%	0%	0%	0%	100%
Acidification	59.11%	4.77%	24.73%	1.93%	2.70%	0%	5.97%	0.01%	0%	0.65%	0.14%	100%
Eutrophication	66.60%	2.86%	20.26%	1.16%	1.62%	0%	6.79%	0.02%	0%	0.36%	0.33%	100%
Smog	12.20%	1.94%	4.96%	0.79%	1.10%	0%	1.25%	77.39%	0%	0.32%	0.06%	100%
Respiratory effects	61.56%	4.41%	22.86%	1.78%	2.49%	0%	6.21%	0.01%	0%	0.54%	0.14%	100%
Additional environmental information												
Carcinogenics	75.88%	1.13%	12.17%	0.46%	0.64%	0%	8.17%	0.08%	0%	0.03%	1.45%	100%
Non-carcinogenics	49.77%	12.24%	12.49%	4.94%	6.92%	0%	7.29%	0.31%	0%	0.30%	5.75%	100%
Ecotoxicity	37.72%	24.08%	9.77%	9.73%	13.61%	0%	4.11%	0.05%	0%	0.09%	0.85%	100%
Fossil fuel depletion	53.94%	4.52%	31.34%	1.83%	2.55%	0%	5.43%	0%	0%	0.31%	0.09%	100%

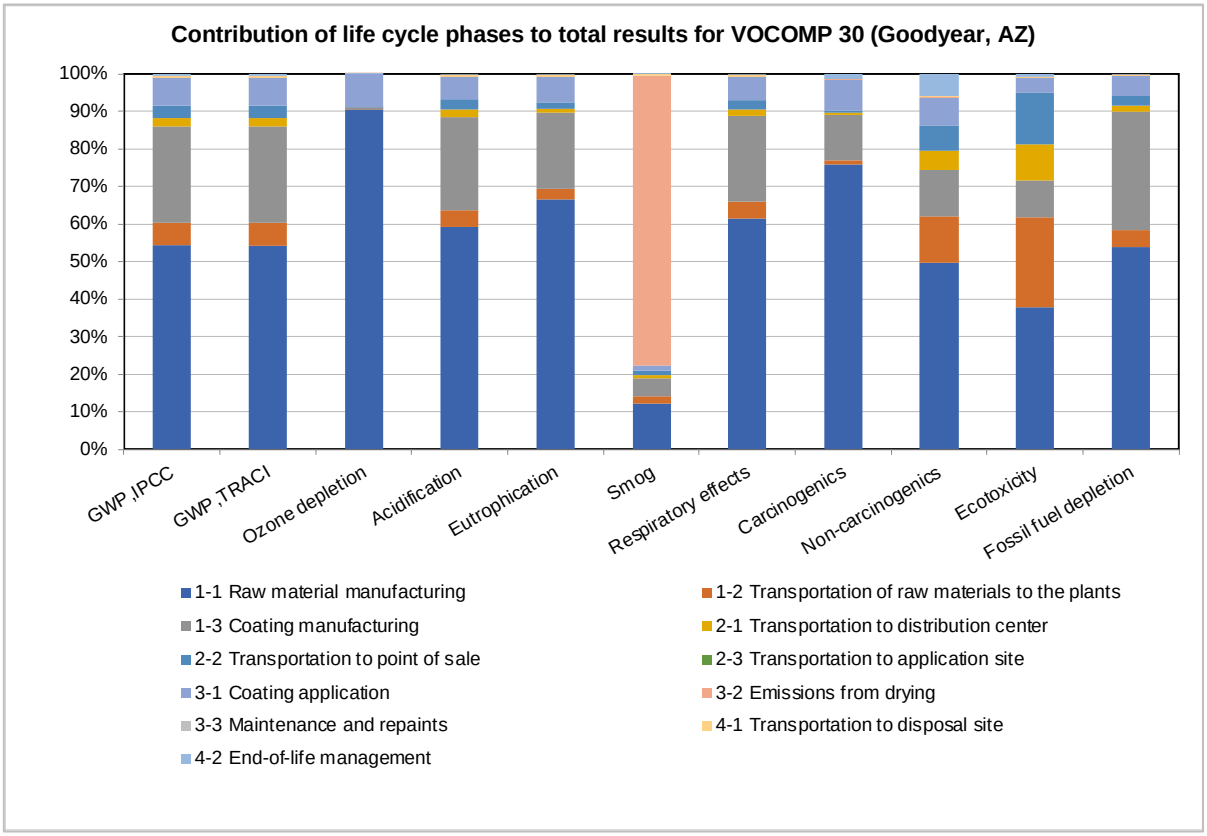

Figure 24. Contribution analysis of each impact category for VOCOMP-30 at Goodyear, Arizona

5.3.3.5. Hampshire, Illinois

Table 95. Life cycle impact assessment results for VOCOMP-30 per declared unit (1 m^2) at the manufacturing location in Hampshire, Illinois

Impact category	Unit	Stage 1 - Product Stage			Stage 2 - Design & Construction			Stage 3 - Use & Maintenance			Stage 4 - End-of-Life		Total
		1-1	1-2	1-3	2-1	2-2	2-3	3-1	3-2	3-3	4-1	4-2	
GWP, $IPCC_{TOTAL}$	kg CO_2 eq	2.10E-01	5.70E-03	8.53E-02	6.54E-03	1.30E-02	0	2.81E-02	1.31E-04	0	1.59E-03	2.45E-03	**3.53E-01**
GWP, $IPCC_{BIOGENIC}$	kg CO_2 eq	-4.45E-03	0	-1.15E-03	0	0	0	5.60E-03	0	0	0	0	**0**
GWP, $IPCC_{FOSSIL}$	kg CO_2 eq	2.15E-01	5.70E-03	8.65E-02	6.54E-03	1.30E-02	0	2.25E-02	1.31E-04	0	1.59E-03	2.45E-03	**3.53E-01**
GWP, TRACI 2.1_{TOTAL}	kg CO_2 eq	2.05E-01	5.63E-03	8.33E-02	6.46E-03	1.29E-02	0	2.74E-02	1.16E-04	0	1.57E-03	2.16E-03	**3.44E-01**
GWP, TRACI $2.1_{BIOGENIC}$	kg CO_2 eq	-4.45E-03	0	-1.15E-03	0	0	0	5.60E-03	0	0	0	0	**0**
GWP, TRACI 2.1_{FOSSIL}	kg CO_2 eq	2.09E-01	5.63E-03	8.45E-02	6.46E-03	1.29E-02	0	2.18E-02	1.16E-04	0	1.57E-03	2.16E-03	**3.44E-01**
Ozone depletion	kg CFC-11 eq	9.45E-07	8.09E-11	2.90E-09	9.29E-11	1.85E-10	0	9.45E-08	3.96E-13	0	2.59E-11	7.39E-12	**1.04E-06**
Acidification	kg SO_2 eq	6.97E-04	1.39E-05	2.63E-04	1.60E-05	3.18E-05	0	7.04E-05	9.09E-08	0	7.65E-06	1.70E-06	**1.10E-03**
Eutrophication	kg N eq	8.91E-05	9.46E-07	2.47E-05	1.09E-06	2.16E-06	0	9.09E-06	2.39E-08	0	4.84E-07	4.47E-07	**1.28E-04**
Smog	kg O_3 eq	9.06E-03	3.57E-04	3.40E-03	4.10E-04	8.16E-04	0	9.25E-04	5.75E-02	0	2.35E-04	4.69E-05	**7.27E-02**
Respiratory effects	kg PM2.5 eq	1.08E-04	1.92E-06	3.86E-05	2.20E-06	4.38E-06	0	1.09E-05	1.33E-08	0	9.56E-07	2.48E-07	**1.68E-04**
Additional environmental information													
Carcinogenics	CTUh	9.81E-10	3.60E-12	1.43E-10	4.13E-12	8.23E-12	0	1.06E-10	1.00E-12	0	3.35E-13	1.87E-11	**1.27E-09**
Non carcinogenics	CTUh	1.14E-08	6.95E-10	2.66E-09	7.98E-10	1.59E-09	0	1.68E-09	7.07E-11	0	6.91E-11	1.32E-09	**2.03E-08**
Ecotoxicity	CTUe	8.98E-02	1.42E-02	2.28E-02	1.63E-02	3.24E-02	0	9.79E-03	1.08E-04	0	2.02E-04	2.02E-03	**1.88E-01**
Fossil fuel depletion	MJ surplus	5.18E-01	1.07E-02	2.79E-01	1.23E-02	2.45E-02	0	5.21E-02	4.38E-05	0	2.94E-03	8.18E-04	**9.01E-01**

Table 96. Life cycle impact assessment percentage contribution for VOCOMP-30 per declared unit (1 m^2) at the manufacturing location in Hampshire, Illinois

Impact category	Stage 1 - Product Stage			Stage 2 - Design & Construction			Stage 3 - Use & Maintenance			Stage 4 - End-of-Life		Total
	1-1	1-2	1-3	2-1	2-2	2-3	3-1	3-2	3-3	4-1	4-2	
GWP, $IPCC_{TOTAL}$	59.57%	1.61%	24.16%	1.85%	3.69%	0%	7.95%	0.04%	0%	0.45%	0.69%	100%
GWP, $TRACI_{TOTAL}$	59.46%	1.64%	24.21%	1.88%	3.74%	0%	7.96%	0.03%	0%	0.46%	0.63%	100%
Ozone depletion	90.62%	0.01%	0.28%	0.01%	0.02%	0%	9.06%	0%	0%	0%	0%	100%
Acidification	63.28%	1.26%	23.87%	1.45%	2.89%	0%	6.39%	0.01%	0%	0.69%	0.15%	100%
Eutrophication	69.58%	0.74%	19.30%	0.85%	1.69%	0%	7.10%	0.02%	0%	0.38%	0.35%	100%
Smog	12.46%	0.49%	4.67%	0.56%	1.12%	0%	1.27%	79.04%	0%	0.32%	0.06%	100%
Respiratory effects	64.62%	1.14%	23.06%	1.31%	2.61%	0%	6.52%	0.01%	0%	0.57%	0.15%	100%
Additional environmental information												
Carcinogenics	77.47%	0.28%	11.34%	0.33%	0.65%	0%	8.34%	0.08%	0%	0.03%	1.48%	100%
Non-carcinogenics	56.30%	3.42%	13.09%	3.93%	7.82%	0%	8.25%	0.35%	0%	0.34%	6.50%	100%
Ecotoxicity	47.88%	7.56%	12.16%	8.67%	17.27%	0%	5.22%	0.06%	0%	0.11%	1.08%	100%
Fossil fuel depletion	57.52%	1.19%	30.99%	1.37%	2.72%	0%	5.79%	0%	0%	0.33%	0.09%	100%

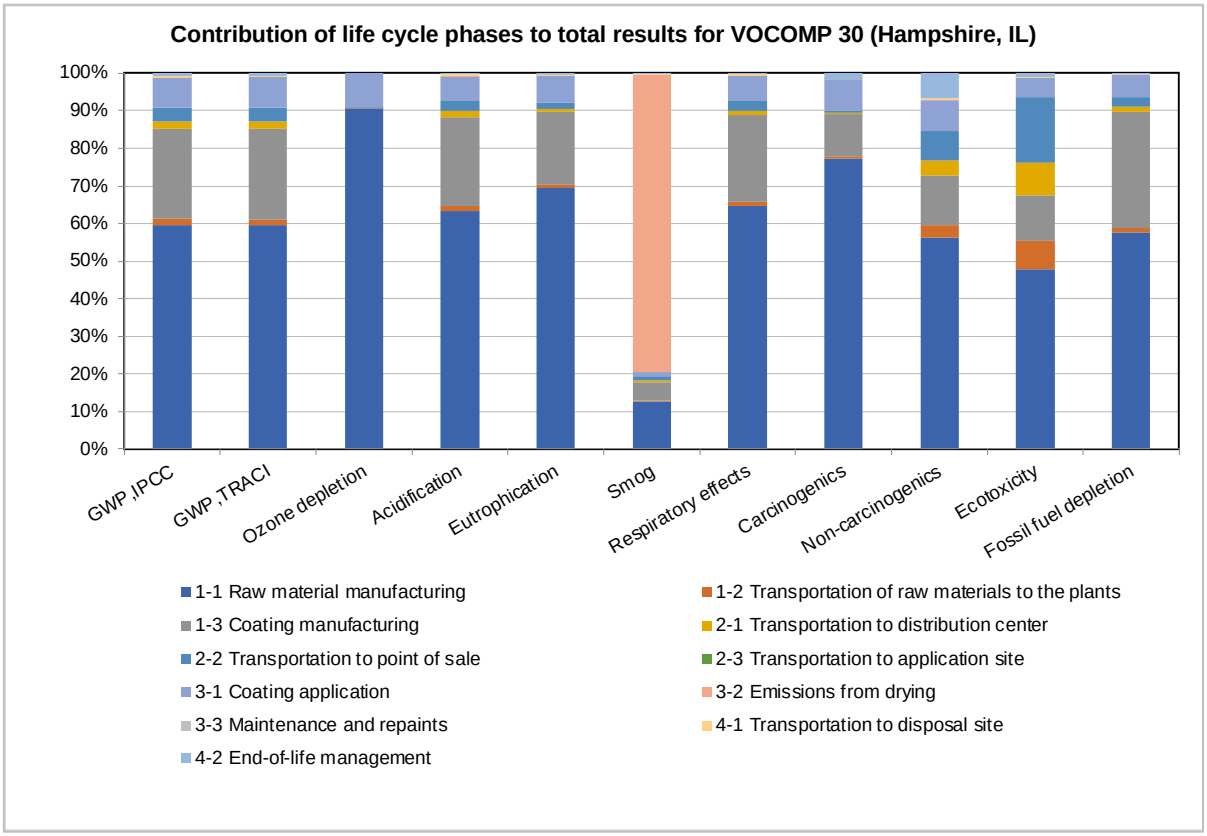

Figure 25. Contribution analysis of each impact category for VOCOMP-**30** at Hampshire, Illinois

5.3.3.6. York, Pennsylvania

Table 97. Life cycle impact assessment results for VOCOMP-30 per declared unit (1 m^2) at the manufacturing location in York, Pennsylvania

Impact category	Unit	Stage 1 - Product Stage			Stage 2 - Design & Construction			Stage 3 - Use & Maintenance			Stage 4 - End-of-Life		Total
		1-1	1-2	1-3	2-1	2-2	2-3	3-1	3-2	3-3	4-1	4-2	
GWP, $IPCC_{TOTAL}$	kg CO_2 eq	2.10E-01	1.15E-02	8.62E-02	2.62E-02	1.30E-02	0	2.81E-02	1.31E-04	0	1.59E-03	2.45E-03	**3.79E-01**
GWP, $IPCC_{BIOGENIC}$	kg CO_2 eq	-4.45E-03	0	-1.15E-03	0	0	0	5.60E-03	0	0	0	0	**0**
GWP, $IPCC_{FOSSIL}$	kg CO_2 eq	2.15E-01	1.15E-02	8.73E-02	2.62E-02	1.30E-02	0	2.25E-02	1.31E-04	0	1.59E-03	2.45E-03	**3.79E-01**
GWP, TRACI 2.1_{TOTAL}	kg CO_2 eq	2.05E-01	1.13E-02	8.42E-02	2.59E-02	1.29E-02	0	2.74E-02	1.16E-04	0	1.57E-03	2.16E-03	**3.70E-01**
GWP, TRACI $2.1_{BIOGENIC}$	kg CO_2 eq	-4.45E-03	0	-1.15E-03	0	0	0	5.60E-03	0	0	0	0	**0**
GWP, TRACI 2.1_{FOSSIL}	kg CO_2 eq	2.09E-01	1.13E-02	8.53E-02	2.59E-02	1.29E-02	0	2.18E-02	1.16E-04	0	1.57E-03	2.16E-03	**3.70E-01**
Ozone depletion	kg CFC-11 eq	9.45E-07	1.63E-10	2.95E-09	3.72E-10	1.85E-10	0	9.45E-08	3.96E-13	0	2.59E-11	7.39E-12	**1.04E-06**
Acidification	kg SO_2 eq	6.97E-04	2.80E-05	2.67E-04	6.39E-05	3.18E-05	0	7.04E-05	9.09E-08	0	7.65E-06	1.70E-06	**1.17E-03**
Eutrophication	kg N eq	8.91E-05	1.90E-06	2.51E-05	4.34E-06	2.16E-06	0	9.09E-06	2.39E-08	0	4.84E-07	4.47E-07	**1.33E-04**
Smog	kg O_3 eq	9.06E-03	7.19E-04	3.43E-03	1.64E-03	8.16E-04	0	9.25E-04	5.75E-02	0	2.35E-04	4.69E-05	**7.44E-02**
Respiratory effects	kg PM2.5 eq	1.08E-04	3.86E-06	3.89E-05	8.80E-06	4.38E-06	0	1.09E-05	1.33E-08	0	9.56E-07	2.48E-07	**1.76E-04**
Additional environmental information													
Carcinogenics	CTUh	9.81E-10	7.25E-12	1.46E-10	1.65E-11	8.23E-12	0	1.06E-10	1.00E-12	0	3.35E-13	1.87E-11	**1.28E-09**
Non carcinogenics	CTUh	1.14E-08	1.40E-09	2.69E-09	3.19E-09	1.59E-09	0	1.68E-09	7.07E-11	0	6.91E-11	1.32E-09	**2.35E-08**
Ecotoxicity	CTUe	8.98E-02	2.85E-02	2.29E-02	6.51E-02	3.24E-02	0	9.79E-03	1.08E-04	0	2.02E-04	2.02E-03	**2.51E-01**
Fossil fuel depletion	MJ surplus	5.18E-01	2.16E-02	2.80E-01	4.93E-02	2.45E-02	0	5.21E-02	4.38E-05	0	2.94E-03	8.18E-04	**9.50E-01**

Table 98. Life cycle impact assessment percentage contribution for VOCOMP-30 per declared unit (1 m^2) at the manufacturing location in York, Pennsylvania

Impact category	Stage 1 - Product Stage			Stage 2 - Design & Construction			Stage 3 - Use & Maintenance			Stage 4 - End-of-Life		Total
	1-1	1-2	1-3	2-1	2-2	2-3	3-1	3-2	3-3	4-1	4-2	
GWP, $IPCC_{TOTAL}$	55.44%	3.02%	22.72%	6.90%	3.43%	0%	7.40%	0.03%	0%	0.42%	0.64%	100%
GWP, $TRACI_{TOTAL}$	55.29%	3.06%	22.75%	6.99%	3.48%	0%	7.40%	0.03%	0%	0.42%	0.58%	100%
Ozone depletion	90.59%	0.02%	0.28%	0.04%	0.02%	0%	9.06%	0%	0%	0%	0%	100%
Acidification	59.69%	2.40%	22.89%	5.47%	2.72%	0%	6.03%	0.01%	0%	0.65%	0.15%	100%
Eutrophication	67.17%	1.44%	18.91%	3.28%	1.63%	0%	6.85%	0.02%	0%	0.37%	0.34%	100%
Smog	12.18%	0.97%	4.61%	2.21%	1.10%	0%	1.24%	77.31%	0%	0.32%	0.06%	100%
Respiratory effects	61.40%	2.19%	22.05%	4.99%	2.48%	0%	6.20%	0.01%	0%	0.54%	0.14%	100%
Additional environmental information												
Carcinogenics	76.38%	0.56%	11.34%	1.29%	0.64%	0%	8.23%	0.08%	0%	0.03%	1.46%	100%
Non-carcinogenics	48.77%	5.97%	11.48%	13.62%	6.78%	0%	7.15%	0.30%	0%	0.29%	5.63%	100%
Ecotoxicity	35.80%	11.38%	9.12%	25.95%	12.92%	0%	3.90%	0.04%	0%	0.08%	0.81%	100%
Fossil fuel depletion	54.57%	2.28%	29.49%	5.19%	2.58%	0%	5.49%	0%	0%	0.31%	0.09%	100%

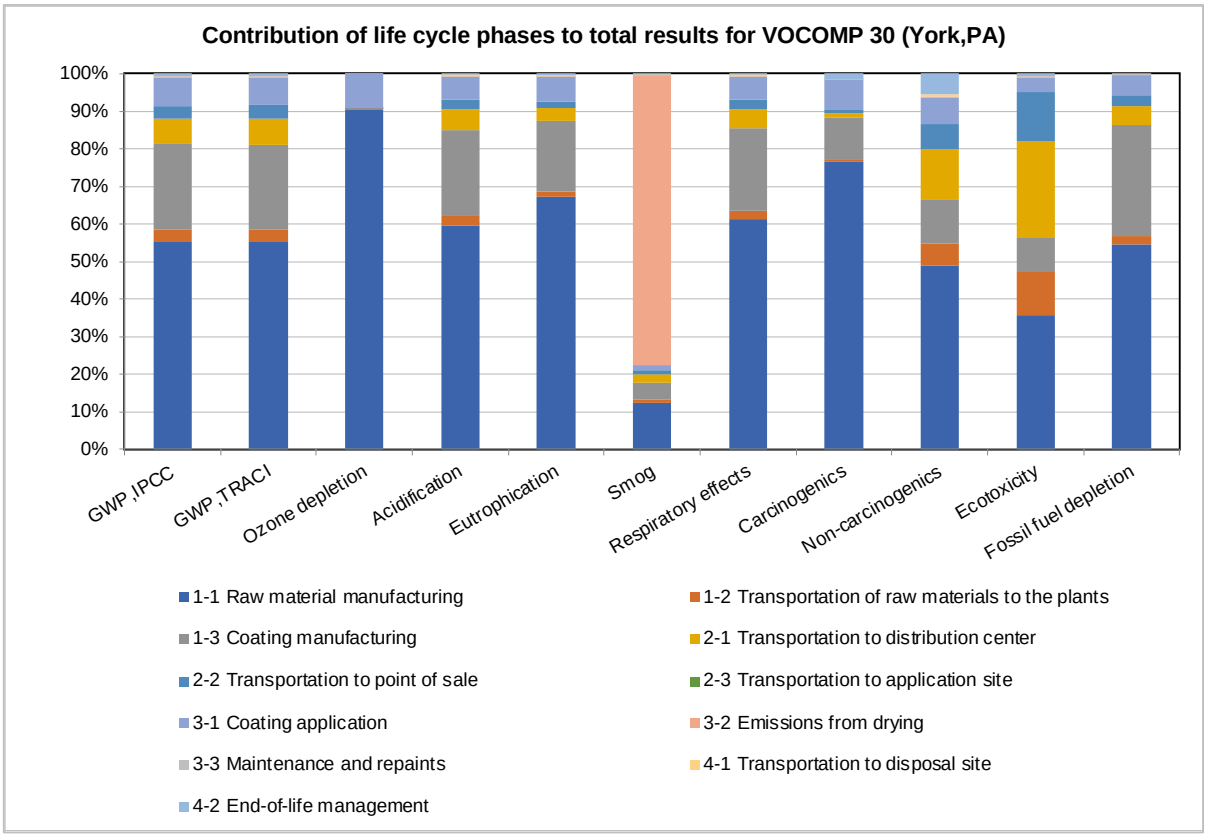

Figure 26. Contribution analysis of each impact category for VOCOMP-**30** at York, Pennsylvania

5.3.3.7. Milton, Ontario, Canada

Table 99. Life cycle impact assessment results for VOCOMP-30 per declared unit (1 m^2) at the manufacturing location in Milton, Ontario, Canada

Impact category	Unit	Stage 1 - Product Stage			Stage 2 - Design & Construction			Stage 3 - Use & Maintenance			Stage 4 - End-of-Life		Total
		1-1	1-2	1-3	2-1	2-2	2-3	3-1	3-2	3-3	4-1	4-2	
GWP, $IPCC_{TOTAL}$	kg CO_2 eq	2.10E-01	2.30E-02	8.03E-02	5.44E-02	1.30E-02	0	2.81E-02	1.31E-04	0	1.59E-03	2.45E-03	**4.13E-01**
GWP, $IPCC_{BIOGENIC}$	kg CO_2 eq	-4.45E-03	0	-1.15E-03	0	0	0	5.60E-03	0	0	0	0	**0**
GWP, $IPCC_{FOSSIL}$	kg CO_2 eq	2.15E-01	2.30E-02	8.15E-02	5.44E-02	1.30E-02	0	2.25E-02	1.31E-04	0	1.59E-03	2.45E-03	**4.13E-01**
GWP, TRACI 2.1_{TOTAL}	kg CO_2 eq	2.05E-01	2.28E-02	7.84E-02	5.37E-02	1.29E-02	0	2.74E-02	1.16E-04	0	1.57E-03	2.16E-03	**4.04E-01**
GWP, TRACI $2.1_{BIOGENIC}$	kg CO_2 eq	-4.45E-03	0	-1.15E-03	0	0	0	5.60E-03	0	0	0	0	**0**
GWP, TRACI 2.1_{FOSSIL}	kg CO_2 eq	2.09E-01	2.28E-02	7.95E-02	5.37E-02	1.29E-02	0	2.18E-02	1.16E-04	0	1.57E-03	2.16E-03	**4.04E-01**
Ozone depletion	kg CFC-11 eq	9.45E-07	3.27E-10	2.64E-09	9.83E-10	1.85E-10	0	9.45E-08	3.96E-13	0	2.59E-11	7.39E-12	**1.04E-06**
Acidification	kg SO_2 eq	6.97E-04	5.63E-05	2.39E-04	1.12E-04	3.18E-05	0	7.04E-05	9.09E-08	0	7.65E-06	1.70E-06	**1.22E-03**
Eutrophication	kg N eq	8.91E-05	3.83E-06	2.27E-05	7.37E-06	2.16E-06	0	9.09E-06	2.39E-08	0	4.84E-07	4.47E-07	**1.35E-04**
Smog	kg O_3 eq	9.06E-03	1.44E-03	3.20E-03	2.62E-03	8.16E-04	0	9.25E-04	5.75E-02	0	2.35E-04	4.69E-05	**7.58E-02**
Respiratory effects	kg PM2.5 eq	1.08E-04	7.75E-06	3.73E-05	1.28E-05	4.38E-06	0	1.09E-05	1.33E-08	0	9.56E-07	2.48E-07	**1.83E-04**
Additional environmental information													
Carcinogenics	CTUh	9.81E-10	1.46E-11	1.31E-10	2.98E-11	8.23E-12	0	1.06E-10	1.00E-12	0	3.35E-13	1.87E-11	**1.29E-09**
Non carcinogenics	CTUh	1.14E-08	2.81E-09	2.47E-09	2.18E-09	1.59E-09	0	1.68E-09	7.07E-11	0	6.91E-11	1.32E-09	**2.36E-08**
Ecotoxicity	CTUe	8.98E-02	5.73E-02	2.23E-02	3.80E-02	3.24E-02	0	9.79E-03	1.08E-04	0	2.02E-04	2.02E-03	**2.52E-01**
Fossil fuel depletion	MJ surplus	5.18E-01	4.34E-02	2.75E-01	9.88E-02	2.45E-02	0	5.21E-02	4.38E-05	0	2.94E-03	8.18E-04	**1.02E+00**

Table 100. Life cycle impact assessment percentage contribution for VOCOMP-30 per declared unit (1 m^2) at the manufacturing location in Milton, Ontario, Canada

Impact category	Stage 1 - Product Stage			Stage 2 - Design & Construction			Stage 3 - Use & Maintenance			Stage 4 - End-of-Life		Total
	1-1	1-2	1-3	2-1	2-2	2-3	3-1	3-2	3-3	4-1	4-2	
GWP, $IPCC_{TOTAL}$	50.89%	5.57%	19.42%	13.17%	3.15%	0%	6.79%	0.03%	0%	0.38%	0.59%	100%
GWP, $TRACI_{TOTAL}$	50.71%	5.64%	19.42%	13.30%	3.19%	0%	6.78%	0.03%	0%	0.39%	0.54%	100%
Ozone depletion	90.55%	0.03%	0.25%	0.09%	0.02%	0%	9.05%	0%	0%	0%	0%	100%
Acidification	57.34%	4.63%	19.63%	9.21%	2.62%	0%	5.79%	0.01%	0%	0.63%	0.14%	100%
Eutrophication	65.92%	2.83%	16.76%	5.46%	1.60%	0%	6.72%	0.02%	0%	0.36%	0.33%	100%
Smog	11.95%	1.90%	4.22%	3.45%	1.08%	0%	1.22%	75.81%	0%	0.31%	0.06%	100%
Respiratory effects	59.29%	4.24%	20.41%	7.01%	2.40%	0%	5.98%	0.01%	0%	0.52%	0.14%	100%
Additional environmental information												
Carcinogenics	76.00%	1.13%	10.17%	2.31%	0.64%	0%	8.19%	0.08%	0%	0.03%	1.45%	100%
Non-carcinogenics	48.40%	11.90%	10.47%	9.22%	6.73%	0%	7.09%	0.30%	0%	0.29%	5.59%	100%
Ecotoxicity	35.64%	22.75%	8.87%	15.07%	12.86%	0%	3.89%	0.04%	0%	0.08%	0.80%	100%
Fossil fuel depletion	51.02%	4.27%	27.05%	9.73%	2.42%	0%	5.13%	0%	0%	0.29%	0.08%	100%

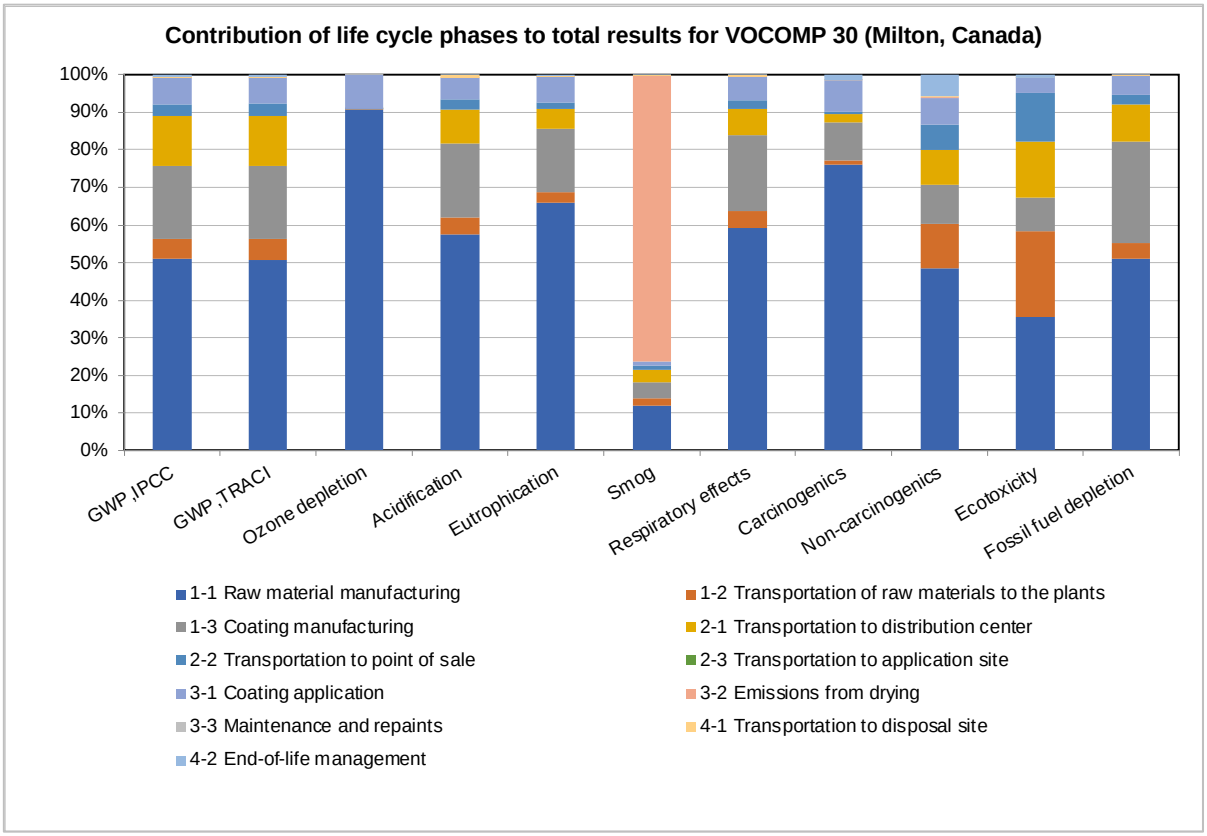

Figure 27. Contribution analysis of each impact category for VOCOMP-**30** at Milton, Ontario, Canada

5.3.3.8. Sherwood, Alberta, Canada

Table 101. Life cycle impact assessment results for VOCOMP-30 per declared unit (1 m^2) at the manufacturing location in Sherwood, Alberta, Canada

Impact category	Unit	Stage 1 - Product Stage			Stage 2 - Design & Construction			Stage 3 - Use & Maintenance			Stage 4 - End-of-Life		Total
		1-1	1-2	1-3	2-1	2-2	2-3	3-1	3-2	3-3	4-1	4-2	
GWP, $IPCC_{TOTAL}$	kg CO_2 eq	2.10E-01	8.89E-02	1.11E-01	3.74E-03	1.30E-02	0	2.81E-02	1.31E-04	0	1.59E-03	2.45E-03	**4.59E-01**
GWP, $IPCC_{BIOGENIC}$	kg CO_2 eq	-4.45E-03	0	-1.15E-03	0	0	0	5.60E-03	0	0	0	0	**0**
GWP, $IPCC_{FOSSIL}$	kg CO_2 eq	2.15E-01	8.89E-02	1.12E-01	3.74E-03	1.30E-02	0	2.25E-02	1.31E-04	0	1.59E-03	2.45E-03	**4.59E-01**
GWP, TRACI 2.1_{TOTAL}	kg CO_2 eq	2.05E-01	8.79E-02	1.08E-01	3.70E-03	1.29E-02	0	2.74E-02	1.16E-04	0	1.57E-03	2.16E-03	**4.49E-01**
GWP, TRACI $2.1_{BIOGENIC}$	kg CO_2 eq	-4.45E-03	0	-1.15E-03	0	0	0	5.60E-03	0	0	0	0	**0**
GWP, TRACI 2.1_{FOSSIL}	kg CO_2 eq	2.09E-01	8.79E-02	1.10E-01	3.70E-03	1.29E-02	0	2.18E-02	1.16E-04	0	1.57E-03	2.16E-03	**4.49E-01**
Ozone depletion	kg CFC-11 eq	9.45E-07	1.26E-09	3.04E-09	5.31E-11	1.85E-10	0	9.45E-08	3.96E-13	0	2.59E-11	7.39E-12	**1.04E-06**
Acidification	kg SO_2 eq	6.97E-04	2.17E-04	3.53E-04	9.13E-06	3.18E-05	0	7.04E-05	9.09E-08	0	7.65E-06	1.70E-06	**1.39E-03**
Eutrophication	kg N eq	8.91E-05	1.48E-05	3.26E-05	6.21E-07	2.16E-06	0	9.09E-06	2.39E-08	0	4.84E-07	4.47E-07	**1.49E-04**
Smog	kg O_3 eq	9.06E-03	5.57E-03	4.20E-03	2.34E-04	8.16E-04	0	9.25E-04	5.75E-02	0	2.35E-04	4.69E-05	**7.86E-02**
Respiratory effects	kg PM2.5 eq	1.08E-04	2.99E-05	4.36E-05	1.26E-06	4.38E-06	0	1.09E-05	1.33E-08	0	9.56E-07	2.48E-07	**2.00E-04**
Additional environmental information													
Carcinogenics	CTUh	9.81E-10	5.62E-11	1.85E-10	2.36E-12	8.23E-12	0	1.06E-10	1.00E-12	0	3.35E-13	1.87E-11	**1.36E-09**
Non carcinogenics	CTUh	1.14E-08	1.09E-08	3.39E-09	4.57E-10	1.59E-09	0	1.68E-09	7.07E-11	0	6.91E-11	1.32E-09	**3.09E-08**
Ecotoxicity	CTUe	8.98E-02	2.21E-01	2.41E-02	9.30E-03	3.24E-02	0	9.79E-03	1.08E-04	0	2.02E-04	2.02E-03	**3.89E-01**
Fossil fuel depletion	MJ surplus	5.18E-01	1.67E-01	3.10E-01	7.05E-03	2.45E-02	0	5.21E-02	4.38E-05	0	2.94E-03	8.18E-04	**1.08E+00**

Table 102. Life cycle impact assessment percentage contribution for VOCOMP-30 per declared unit (1 m^2) at the manufacturing location in Sherwood, Alberta, Canada

Impact category	Stage 1 - Product Stage			Stage 2 - Design & Construction			Stage 3 - Use & Maintenance			Stage 4 - End-of-Life		Total
	1-1	1-2	1-3	2-1	2-2	2-3	3-1	3-2	3-3	4-1	4-2	
GWP, $IPCC_{TOTAL}$	45.81%	19.36%	24.16%	0.81%	2.84%	0%	6.11%	0.03%	0%	0.35%	0.53%	100%
GWP, $TRACI_{TOTAL}$	45.60%	19.58%	24.18%	0.82%	2.87%	0%	6.10%	0.03%	0%	0.35%	0.48%	100%
Ozone depletion	90.51%	0.12%	0.29%	0.01%	0.02%	0%	9.05%	0%	0%	0%	0%	100%
Acidification	50.23%	15.64%	25.43%	0.66%	2.29%	0%	5.07%	0.01%	0%	0.55%	0.12%	100%
Eutrophication	59.68%	9.89%	21.84%	0.42%	1.45%	0%	6.09%	0.02%	0%	0.32%	0.30%	100%
Smog	11.53%	7.09%	5.35%	0.30%	1.04%	0%	1.18%	73.16%	0%	0.30%	0.06%	100%
Respiratory effects	54.24%	14.98%	21.87%	0.63%	2.19%	0%	5.47%	0.01%	0%	0.48%	0.12%	100%
Additional environmental information												
Carcinogenics	72.18%	4.14%	13.65%	0.17%	0.61%	0%	7.77%	0.07%	0%	0.02%	1.38%	100%
Non-carcinogenics	37.06%	35.16%	10.99%	1.48%	5.15%	0%	5.43%	0.23%	0%	0.22%	4.28%	100%
Ecotoxicity	23.09%	56.87%	6.20%	2.39%	8.33%	0%	2.52%	0.03%	0%	0.05%	0.52%	100%
Fossil fuel depletion	47.83%	15.46%	28.63%	0.65%	2.26%	0%	4.81%	0%	0%	0.27%	0.08%	100%

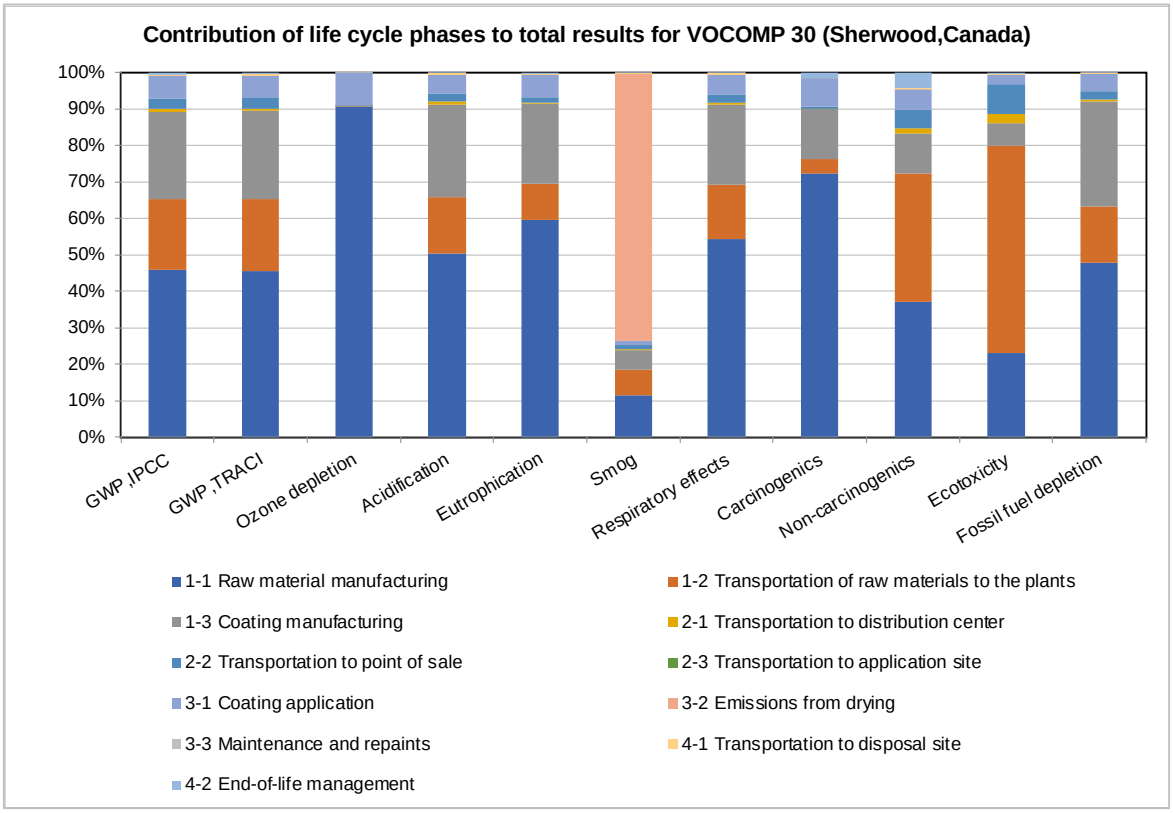

Figure 28. Contribution analysis of each impact category for VOCOMP-30 at Sherwood, Alberta, Canada

5.3.4. MEL-PRIME

The tables in this section show the LCIA results and the percent contribution of each stage of the production of MEL-PRIME. The figures in this section show the contribution analysis of each impact category for MEL-PRIME.

For MEL-PRIME, the most significant impact comes from raw material manufacturing (1-1), contributing the highest values to global warming potential (GWP), acidification, and fossil fuel depletion. Coating manufacturing (1-3) is another major contributor, particularly in GWP (fossil) and smog formation due to energy-intensive processes. Transportation stages (1-2, 2-1, 2-2) add to acidification and ecotoxicity, though their overall contributions remain lower than manufacturing. End-of-life impacts (4-1, 4-2) are minor, meaning most emissions occur upstream. The total GWP for MEL-PRIME is 0.312 kg CO2-eq, with coating manufacturing and raw material processing being the dominant contributors.

The average SM2013 Methodology single-figure millipoint (mPts) across all manufacturing plants of W. R. MEADOWS MEL-PRIME score by life cycle phase for this product is presented below (Table 86). Across all 10 impact categories, the SM single-figure score indicates that raw materials acquisition accounts for around 37.85% of the total impacts, manufacturing for 18.41 %, and transportation for 4.47%.

Table 103. SM2013 Methodology single-figure millipoint (mPts) average across all plants for W. R. MEADOWS MEL-PRIME

Impact category	Unit	Stage 1 - Product Stage			Stage 2 - Design & Construction			Stage 3 - Use & Maintenance			Stage 4 - End-of-Life		Total
		1-1	1-2	1-3	2-1	2-2	2-3	3-1	3-2	3-3	4-1	4-2	
SM Single Score	mPts	8.70E-03	1.88E-04	4.23E-03	1.87E-04	1.03E-03	0	8.79E-04	7.55E-03	0	3.39E-06	2.22E-04	2.30E-02
	percentage	37.85%	0.82%	18.41%	0.81%	4.47%	0%	3.82%	32.83%	0%	0.01%	0.97%	100%

Table 104. Life cycle impact assessment results for MEL-PRIME per declared unit (1 m^2) at the manufacturing location in Hampshire, Illinois

Impact category	Unit	Stage 1 - Product Stage			Stage 2 - Design & Construction			Stage 3 - Use & Maintenance			Stage 4 - End-of-Life		Total
		1-1	1-2	1-3	2-1	2-2	2-3	3-1	3-2	3-3	4-1	4-2	
GWP, $IPCC_{TOTAL}$	kg CO_2 eq	1.69E-01	3.15E-03	9.87E-02	3.13E-03	1.72E-02	0	1.72E-02	0	0	8.11E-05	3.23E-03	**3.12E-01**
GWP, $IPCC_{BIOGENIC}$	kg CO_2 eq	-1.38E-03	0	1.38E-03	0	0	0	0	0	0	0	0	**0**
GWP, $IPCC_{FOSSIL}$	kg CO_2 eq	1.70E-01	3.15E-03	9.73E-02	3.13E-03	1.72E-02	0	1.72E-02	0	0	8.11E-05	3.23E-03	**3.12E-01**
GWP, TRACI 2.1_{TOTAL}	kg CO_2 eq	1.64E-01	3.11E-03	9.81E-02	3.09E-03	1.70E-02	0	1.66E-02	0	0	8.01E-05	2.86E-03	**3.05E-01**
GWP, TRACI $2.1_{BIOGENIC}$	kg CO_2 eq	-1.38E-03	0	1.38E-03	0	0	0	0	0	0	0	0	**0**
GWP, TRACI 2.1_{FOSSIL}	kg CO_2 eq	1.69E-01	3.15E-03	9.87E-02	3.13E-03	1.72E-02	0	1.72E-02	0	0	8.11E-05	3.23E-03	**3.12E-01**
Ozone depletion	kg CFC-11 eq	3.95E-07	4.47E-11	4.79E-10	4.44E-11	2.44E-10	0	3.95E-08	0	0	1.32E-12	9.76E-12	**4.35E-07**
Acidification	kg SO_2 eq	5.66E-04	7.68E-06	2.55E-04	7.64E-06	4.20E-05	0	5.67E-05	0	0	3.91E-07	2.24E-06	**9.38E-04**
Eutrophication	kg N eq	4.24E-05	5.22E-07	1.84E-05	5.19E-07	2.86E-06	0	4.26E-06	0	0	2.48E-08	5.90E-07	**6.96E-05**
Smog	kg O_3 eq	6.91E-03	1.97E-04	4.00E-03	1.96E-04	1.08E-03	0	6.94E-04	2.19E-01	0	1.20E-05	6.19E-05	**2.32E-01**
Respiratory effects	kg PM2.5 eq	7.27E-05	1.06E-06	3.30E-05	1.05E-06	5.79E-06	0	7.28E-06	0	0	4.89E-08	3.28E-07	**1.21E-04**
Additional environmental information													
Carcinogenics	CTUh	4.01E-10	1.99E-12	5.99E-10	1.98E-12	1.09E-11	0	4.11E-11	0	0	1.71E-14	2.48E-11	**1.08E-09**
Non carcinogenics	CTUh	6.28E-09	3.84E-10	7.34E-09	3.82E-10	2.10E-09	0	6.98E-10	0	0	3.53E-12	1.74E-09	**1.89E-08**
Ecotoxicity	CTUe	4.60E-02	7.83E-03	4.99E-02	7.78E-03	4.28E-02	0	4.71E-03	0	0	1.03E-05	2.67E-03	**1.62E-01**
Fossil fuel depletion	MJ surplus	5.52E-01	5.93E-03	6.50E-02	5.89E-03	3.24E-02	0	5.53E-02	0	0	1.50E-04	1.08E-03	**7.18E-01**

Table 105. Life cycle impact assessment percentage contribution for MEL-PRIME per declared unit (1 m^2) at the manufacturing location in Hampshire, Illinois

Impact category	Stage 1 - Product Stage			Stage 2 - Design & Construction			Stage 3 - Use & Maintenance			Stage 4 - End-of-Life		Total
	1-1	1-2	1-3	2-1	2-2	2-3	3-1	3-2	3-3	4-1	4-2	
GWP, $IPCC_{TOTAL}$	50.54%	1.01%	35.35%	1.00%	5.52%	0%	5.51%	0%	0%	0.03%	1.04%	100%
GWP, $TRACI_{TOTAL}$	50%	1.02%	35.96%	1.01%	5.58%	0%	5.46%	0%	0%	0.03%	0.94%	100%
Ozone depletion	90.74%	0.01%	0.11%	0.01%	0.06%	0%	9.07%	0%	0%	0%	0%	100%
Acidification	60.34%	0.82%	27.22%	0.81%	4.48%	0%	6.04%	0%	0%	0.04%	0.24%	100%
Eutrophication	60.94%	0.75%	26.45%	0.75%	4.10%	0%	6.13%	0%	0%	0.04%	0.85%	100%
Smog	2.98%	0.09%	1.73%	0.08%	0.47%	0%	0.30%	94.32%	0%	0.01%	0.03%	100%
Respiratory effects	59.97%	0.87%	27.21%	0.87%	4.77%	0%	6.01%	0%	0%	0.04%	0.27%	100%
Additional environmental information												
Carcinogenics	37.11%	0.18%	55.42%	0.18%	1.01%	0%	3.80%	0%	0%	0%	2.29%	100%
Non-carcinogenics	33.17%	2.03%	38.78%	2.02%	11.09%	0%	3.69%	0%	0%	0.02%	9.21%	100%
Ecotoxicity	28.47%	4.84%	30.86%	4.81%	26.46%	0%	2.91%	0%	0%	0.01%	1.65%	100%
Fossil fuel depletion	76.92%	0.83%	9.05%	0.82%	4.51%	0%	7.70%	0%	0%	0.02%	0.15%	100%

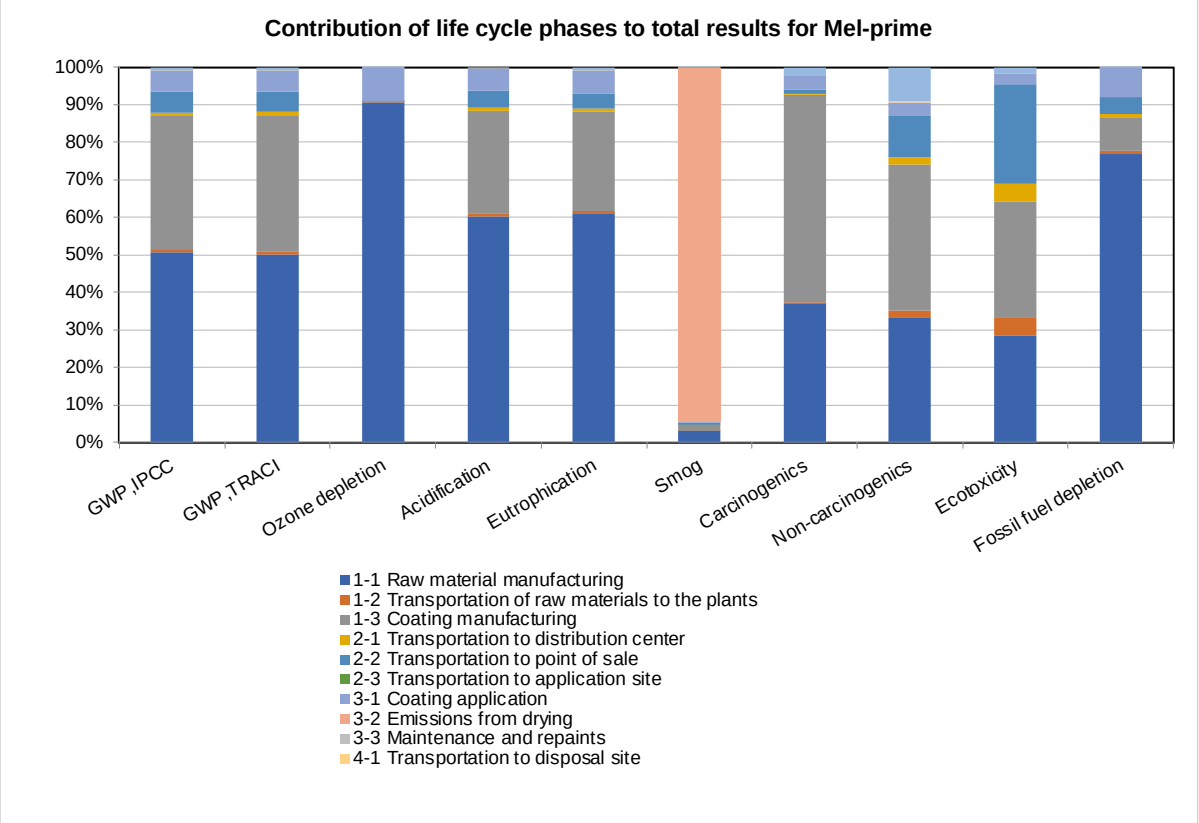

Figure 29. Contribution analysis of each impact category for MEL-PRIME at Hampshire, Illinois

5.3.5. MEL-PRIME N.E.

The tables in this section show the LCIA results and the percent contribution of each stage of the production of MEL-PRIME N.E. across eight plants. The figures in this section show the contribution analysis of each impact category for MEL-PRIME N.E.

For MEL-PRIME N.E., the environmental impact is primarily driven by raw material manufacturing and coating processes, which account for the highest contributions to global warming potential (GWP), acidification, and fossil fuel depletion. The production of raw materials contributes significantly to carbon emissions and resource consumption, making it the most critical stage in the life cycle. Coating manufacturing also plays a major role, particularly in GWP (fossil), due to the energy-intensive nature of the process. Transportation-related impacts are present but relatively minor, mainly affecting acidification and ecotoxicity. End-of-life emissions are negligible, which indicates that most environmental burdens occur in the earlier production stages.

The average SM2013 Methodology single-figure millipoint (mPts) across all manufacturing plants of W. R. MEADOWS MEL-PRIME N.E. score by life cycle phase for this product is presented below (Table 103). Across all 10 impact categories, the SM single-figure score indicates that raw materials acquisition accounts for around 54.6% of the total impacts, manufacturing for 14.6 %, and transportation for 10.6%.

Table 106. SM2013 Methodology single-figure millipoint (mPts) average across all plants for W. R. MEADOWS MEL-PRIME N.E.

Impact category	Unit	Stage 1 - Product Stage			Stage 2 - Design & Construction			Stage 3 - Use & Maintenance			Stage 4 - End-of-Life		Total
		1-1	1-2	1-3	2-1	2-2	2-3	3-1	3-2	3-3	4-1	4-2	
SM Single Score	mPts	2.68E-02	2.74E-04	7.19E-03	5.20E-03	1.60E-03	0	2.70E-03	4.96E-03	0	8.87E-06	3.45E-04	4.91E-02
	percentage	54.64%	0.56%	14.65%	10.59%	3.25%	0%	5.49%	10.11%	0%	0.02%	0.70%	100%

Table 107. Life cycle impact assessment results for MEL-PRIME N.E. per declared unit (1 m^2) at the manufacturing location in Hampshire, Illinois

Impact category	Unit	Stage 1 - Product Stage			Stage 2 - Design & Construction			Stage 3 - Use & Maintenance			Stage 4 - End-of-Life		Total
		1-1	1-2	1-3	2-1	2-2	2-3	3-1	3-2	3-3	4-1	4-2	
GWP, $IPCC_{TOTAL}$	kg CO_2 eq	4.90E-01	4.58E-03	1.70E-01	8.70E-02	2.67E-02	0	4.94E-02	0	0	2.12E-04	5.01E-03	**8.32E-01**
GWP, $IPCC_{BIOGENIC}$	kg CO_2 eq	-2.13E-03	0	2.13E-03	0	0	0	0	0	0	0	0	**0**
GWP, $IPCC_{FOSSIL}$	kg CO_2 eq	4.92E-01	4.58E-03	1.67E-01	8.70E-02	2.67E-02	0	4.94E-02	0	0	2.12E-04	5.01E-03	**8.32E-01**
GWP, $TRACI\ 2.1_{TOTAL}$	kg CO_2 eq	4.73E-01	4.53E-03	1.68E-01	8.59E-02	2.64E-02	0	4.77E-02	0	0	2.10E-04	4.43E-03	**8.11E-01**
GWP, $TRACI\ 2.1_{BIOGENIC}$	kg CO_2 eq	-2.13E-03	0	2.13E-03	0	0	0	0	0	0	0	0	**0**
GWP, $TRACI\ 2.1_{FOSSIL}$	kg CO_2 eq	4.75E-01	4.53E-03	1.66E-01	8.59E-02	2.64E-02	0	4.77E-02	0	0	2.10E-04	4.43E-03	**8.11E-01**
Ozone depletion	kg CFC-11 eq	1.43E-06	6.51E-11	8.56E-10	1.24E-09	3.79E-10	0	1.43E-07	0	0	3.47E-12	1.51E-11	**1.57E-06**
Acidification	kg SO_2 eq	1.66E-03	1.12E-05	4.35E-04	2.12E-04	6.52E-05	0	1.66E-04	0	0	1.02E-06	3.48E-06	**2.56E-03**
Eutrophication	kg N eq	2.29E-04	7.61E-07	3.05E-05	1.44E-05	4.43E-06	0	2.29E-05	0	0	6.48E-08	9.15E-07	**3.03E-04**
Smog	kg O_3 eq	2.09E-02	2.87E-04	6.88E-03	5.45E-03	1.67E-03	0	2.10E-03	1.44E-01	0	3.15E-05	9.61E-05	**1.81E-01**
Respiratory effects	kg PM2.5 eq	2.19E-04	1.54E-06	5.43E-05	2.92E-05	8.97E-06	0	2.19E-05	0	0	1.28E-07	5.09E-07	**3.35E-04**
Additional environmental information													
Carcinogenics	CTUh	1.13E-09	2.90E-12	1.02E-09	5.50E-11	1.69E-11	0	1.14E-10	0	0	4.48E-14	3.84E-11	**2.38E-09**
Non carcinogenics	CTUh	1.77E-08	5.59E-10	1.25E-08	1.06E-08	3.26E-09	0	1.88E-09	0	0	9.25E-12	2.71E-09	**4.92E-08**
Ecotoxicity	CTUe	1.41E-01	1.14E-02	8.21E-02	2.16E-01	6.64E-02	0	1.43E-02	0	0	2.71E-05	4.14E-03	**5.36E-01**
Fossil fuel depletion	MJ surplus	1.77E+00	8.63E-03	1.10E-01	1.64E-01	5.03E-02	0	1.78E-01	0	0	3.93E-04	1.68E-03	**2.29E+00**

Table 108. Life cycle impact assessment percentage contribution for MEL-PRIME N.E. per declared unit (1 m^2) at the manufacturing location in Hampshire, Illinois

Impact category	Stage 1 - Product Stage			Stage 2 - Design & Construction			Stage 3 - Use & Maintenance			Stage 4 - End-of-Life		Total
	1-1	1-2	1-3	2-1	2-2	2-3	3-1	3-2	3-3	4-1	4-2	
GWP, $IPCC_{TOTAL}$	57.58%	0.55%	21.65%	10.45%	3.21%	0%	5.94%	0%	0%	0.03%	0.60%	100%
GWP, $TRACI_{TOTAL}$	57.03%	0.56%	22.10%	10.60%	3.25%	0%	5.88%	0%	0%	0.03%	0.55%	100%
Ozone depletion	90.76%	0%	0.05%	0.08%	0.02%	0%	9.08%	0%	0%	0%	0%	100%
Acidification	65.01%	0.44%	17.01%	8.31%	2.55%	0%	6.51%	0%	0%	0.04%	0.14%	100%
Eutrophication	75.55%	0.25%	10.08%	4.77%	1.46%	0%	7.57%	0%	0%	0.02%	0.30%	100%
Smog	11.56%	0.16%	3.80%	3.01%	0.92%	0%	1.16%	79.32%	0%	0.02%	0.05%	100%
Respiratory effects	65.23%	0.46%	16.19%	8.72%	2.68%	0%	6.53%	0%	0%	0.04%	0.15%	100%
Additional environmental information												
Carcinogenics	47.53%	0.12%	42.89%	2.31%	0.71%	0%	4.82%	0%	0%	0%	1.62%	100%
Non-carcinogenics	35.99%	1.14%	25.32%	21.59%	6.62%	0%	3.82%	0%	0%	0.02%	5.50%	100%
Ecotoxicity	26.39%	2.13%	15.32%	40.35%	12.38%	0%	2.67%	0%	0%	0.01%	0.77%	100%
Fossil fuel depletion	77.60%	0.38%	4.81%	7.16%	2.20%	0%	7.76%	0%	0%	0.02%	0.07%	100%

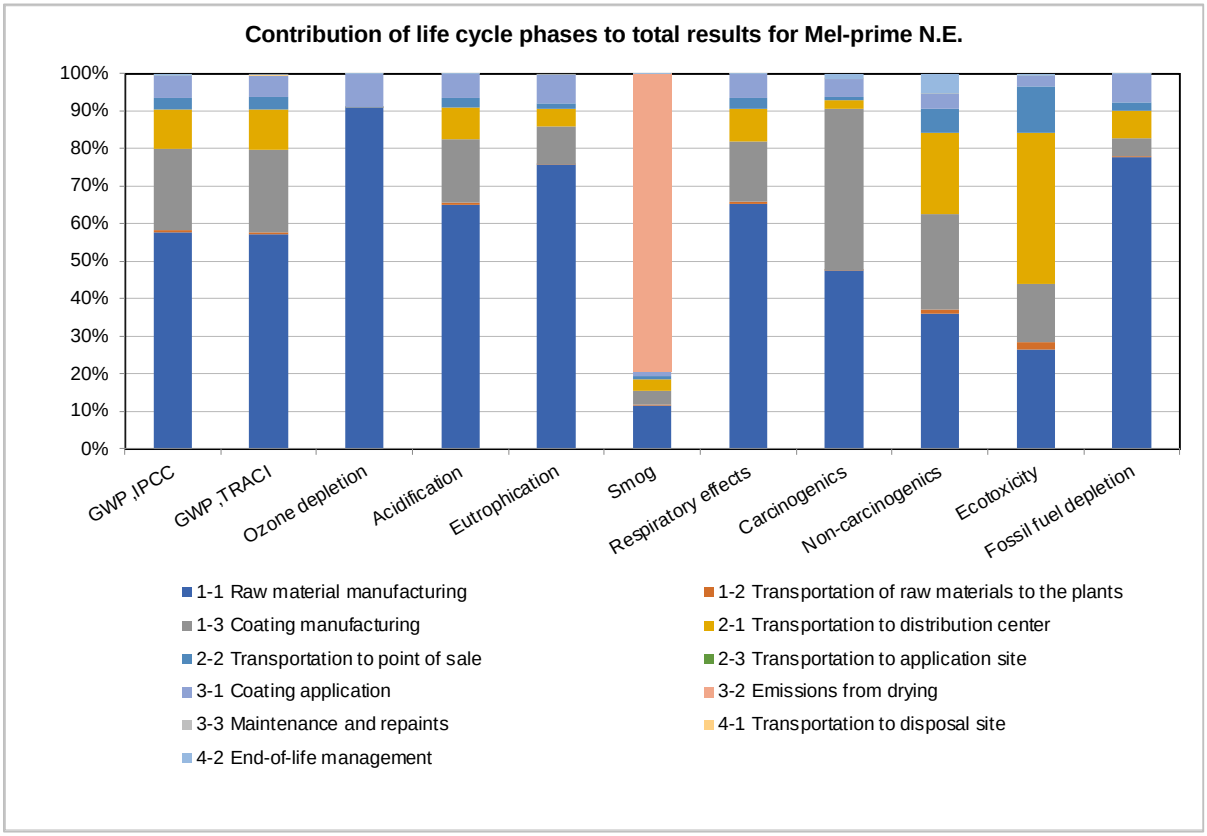

Figure 30. Contribution analysis of each impact category for MEL-PRIME N.E. per declared unit (1 m^2) at the manufacturing location in Hampshire, Illinois

5.3.6. MEL-PRIME W/B

The tables in this section show the LCIA results and the percent contribution of each stage of the production of MEL-PRIME W/B across eight plants. The figures in this section show the contribution analysis of each impact category for MEL-PRIME W/B.

For MEL-PRIME W/B, coating application (3-1) is the dominant contributor to environmental impact and shows a slightly higher share compared to other formulations. This suggests that the water-based composition may contain lower raw material environmental impact and may require different processing methods that influence emissions due to allocation method. While GWP and acidification remain significant concerns, fossil fuel depletion is slightly lower than in other versions, indicating potential reductions in fossil-based inputs. Transportation and end-of-life stages contribute minimally to the overall footprint.

The average SM2013 Methodology single-figure millipoint (mPts) across all manufacturing plants of W. R. MEADOWS MEL-PRIME W/B score by life cycle phase for this product is presented below (Table 52). Across all 10 impact categories, the SM single-figure score indicates that raw materials acquisition accounts for around 24.7% of the total impacts, manufacturing for 14.2 %, and transportation for 44.2%.

Table 109. SM2013 Methodology single-figure millipoint (mPts) average across all plants for W. R. MEADOWS MEL-PRIME W/B

Impact category	Unit	Stage 1 - Product Stage			Stage 2 - Design & Construction			Stage 3 - Use & Maintenance			Stage 4 - End-of-Life		Total
		1-1	1-2	1-3	2-1	2-2	2-3	3-1	3-2	3-3	4-1	4-2	
SM Single Score	mPts	4.04E-03	1.60E-04	2.32E-03	7.19E-03	1.72E-03	0	4.19E-04	0	0	7.02E-07	4.47E-04	1.63E-02
	percentage	24.78%	0.98%	14.21%	44.15%	10.55%	0%	2.57%	0%	0%	0%	2.74%	100%

Table 110. Life cycle impact assessment results for MEL-PRIME W/B per declared unit (1 m^2) at the manufacturing location in Hampshire, Illinois

Impact category	Unit	Stage 1 - Product Stage			Stage 2 - Design & Construction			Stage 3 - Use & Maintenance			Stage 4 - End-of-Life		Total
		1-1	1-2	1-3	2-1	2-2	2-3	3-1	3-2	3-3	4-1	4-2	
GWP, $IPCC_{TOTAL}$	kg CO_2 eq	8.08E-02	2.68E-03	3.25E-02	1.20E-01	2.88E-02	0	8.49E-03	0	0	1.68E-05	6.50E-03	**2.80E-01**
GWP, $IPCC_{BIOGENIC}$	kg CO_2 eq	-1.95E-03	0	1.95E-03	0	0	0	0	0	0	0	0	**0**
GWP, $IPCC_{FOSSIL}$	kg CO_2 eq	8.28E-02	2.68E-03	3.06E-02	1.20E-01	2.88E-02	0	8.49E-03	0	0	1.68E-05	6.50E-03	**2.80E-01**
GWP, TRACI 2.1_{TOTAL}	kg CO_2 eq	7.90E-02	2.65E-03	3.28E-02	1.19E-01	2.84E-02	0	8.29E-03	0	0	1.66E-05	5.75E-03	**2.76E-01**
GWP, TRACI $2.1_{BIOGENIC}$	kg CO_2 eq	-1.95E-03	0	1.95E-03	0	0	0	0	0	0	0	0	**0**
GWP, TRACI 2.1_{FOSSIL}	kg CO_2 eq	8.10E-02	2.65E-03	3.09E-02	1.19E-01	2.84E-02	0	8.29E-03	0	0	1.66E-05	5.75E-03	**2.76E-01**
Ozone depletion	kg CFC-11 eq	1.58E-09	3.80E-11	7.65E-10	1.71E-09	4.09E-10	0	1.59E-10	0	0	2.74E-13	1.96E-11	**4.68E-09**
Acidification	kg SO_2 eq	2.30E-04	6.54E-06	1.50E-04	2.94E-04	7.03E-05	0	2.32E-05	0	0	8.10E-08	4.51E-06	**7.79E-04**
Eutrophication	kg N eq	1.66E-05	4.44E-07	1.86E-05	2.00E-05	4.78E-06	0	1.70E-06	0	0	5.13E-09	1.19E-06	**6.33E-05**
Smog	kg O_3 eq	3.02E-03	1.68E-04	2.43E-03	7.54E-03	1.80E-03	0	3.07E-04	0	0	2.49E-06	1.25E-04	**1.54E-02**
Respiratory effects	kg PM2.5 eq	2.52E-05	9.00E-07	3.38E-05	4.05E-05	9.67E-06	0	2.54E-06	0	0	1.01E-08	6.59E-07	**1.13E-04**
Additional environmental information													
Carcinogenics	CTUh	3.14E-10	1.69E-12	3.39E-10	7.61E-11	1.82E-11	0	3.30E-11	0	0	3.55E-15	4.98E-11	**8.31E-10**
Non carcinogenics	CTUh	3.89E-09	3.27E-10	3.43E-09	1.47E-08	3.51E-09	0	5.06E-10	0	0	7.32E-13	3.51E-09	**2.99E-08**
Ecotoxicity	CTUe	2.68E-02	6.66E-03	5.10E-02	2.99E-01	7.16E-02	0	2.86E-03	0	0	2.14E-06	5.37E-03	**4.64E-01**
Fossil fuel depletion	MJ surplus	2.12E-01	5.04E-03	4.14E-02	2.27E-01	5.42E-02	0	2.13E-02	0	0	3.11E-05	2.17E-03	**5.63E-01**

Table 111. Life cycle impact assessment percentage contribution for MEL-PRIME W/B per declared unit (1 m^2) at the manufacturing location in Hampshire, Illinois

Impact category	Stage 1 - Product Stage			Stage 2 - Design & Construction			Stage 3 - Use & Maintenance			Stage 4 - End-of-Life		Total
	1-1	1-2	1-3	2-1	2-2	2-3	3-1	3-2	3-3	4-1	4-2	
GWP, $IPCC_{TOTAL}$	28.84%	0.96%	11.62%	42.96%	10.27%	0%	3.03%	0%	0%	0.01%	2.32%	100%
GWP, $TRACI_{TOTAL}$	28.65%	0.96%	11.89%	43.11%	10.30%	0%	3.00%	0%	0%	0.01%	2.08%	100%
Ozone depletion	33.79%	0.81%	16.33%	36.52%	8.73%	0%	3.39%	0%	0%	0.01%	0.42%	100%
Acidification	29.57%	0.84%	19.25%	37.75%	9.02%	0%	2.98%	0%	0%	0.01%	0.58%	100%
Eutrophication	26.22%	0.70%	29.37%	31.59%	7.55%	0%	2.68%	0%	0%	0.01%	1.88%	100%
Smog	19.63%	1.09%	15.77%	48.98%	11.71%	0%	1.99%	0%	0%	0.02%	0.81%	100%
Respiratory effects	22.26%	0.79%	29.81%	35.75%	8.54%	0%	2.25%	0%	0%	0.01%	0.58%	100%
Additional environmental information												
Carcinogenics	37.74%	0.20%	40.74%	9.15%	2.19%	0%	3.97%	0%	0%	0%	5.99%	100%
Non-carcinogenics	13.02%	1.09%	11.48%	49.20%	11.76%	0%	1.69%	0%	0%	0%	11.75%	100%
Ecotoxicity	5.78%	1.44%	11.00%	64.58%	15.43%	0%	0.62%	0%	0%	0%	1.16%	100%
Fossil fuel depletion	37.72%	0.90%	7.35%	40.24%	9.62%	0%	3.78%	0%	0%	0.01%	0.39%	100%

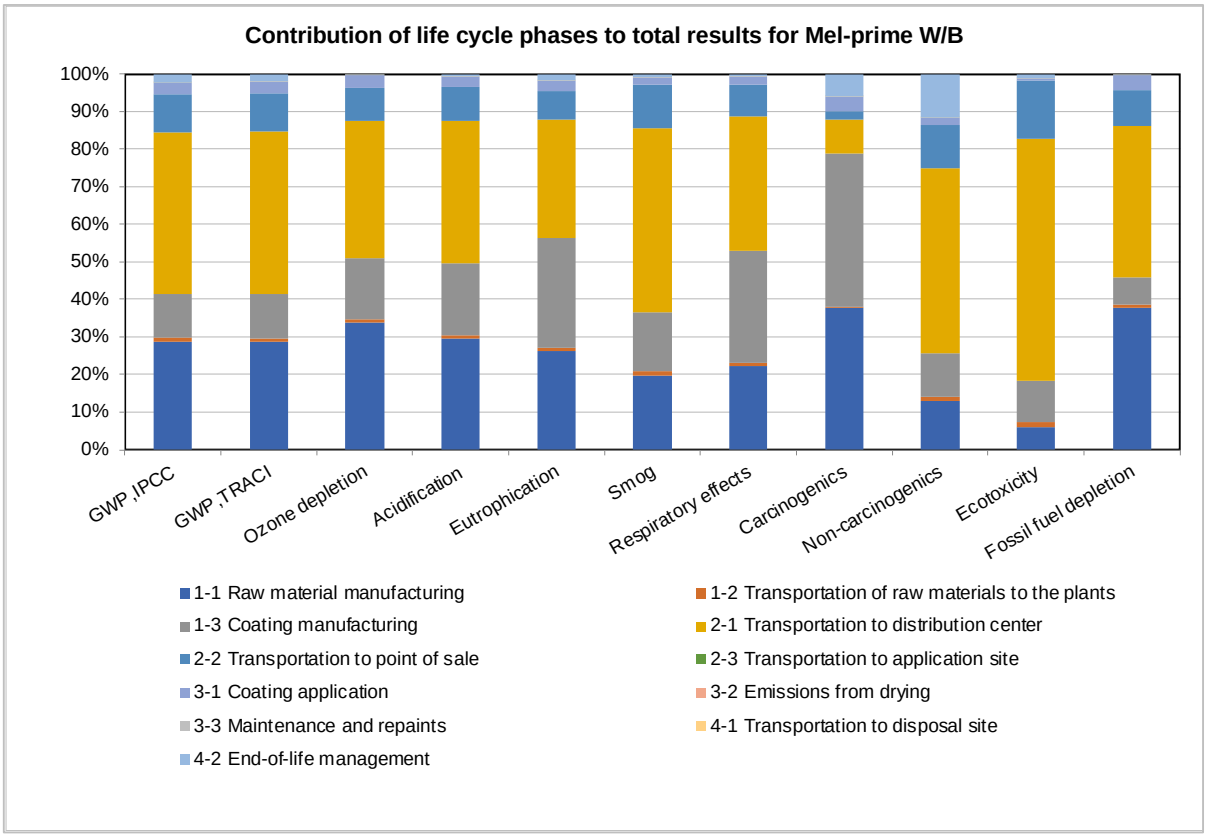

Figure 31. Contribution analysis of each impact category for MEL-PRIME W/B per declared unit (1 m^2) at the manufacturing location in Hampshire, Illinois

5.3.7. $GWP_{TRACI\ 2.1}$ Summary

Total Global Warming Potential (GWP) results (kg CO_2 eq) using TRACI 2.1 methodology, per functional unit (kg/m2), for each product type (VOCOMP-20, VOCOMP-25, VOCOMP-30, MEL-PRIME, MEL-PRIME N.E., and MEL-PRIME W/B) across eight manufacturing locations.

Table 112. Total Global Warming Potential (GWP) results (kg CO_2 eq) using TRACI 2.1 methodology, per functional unit (kg/m^2), for each product type (VOCOMP-20, VOCOMP-25, VOCOMP-30, MEL-PRIME, MEL-PRIME N.E., and MEL-PRIME W/B) across eight manufacturing locations.

Manufacturing location	VOCOMP-20	VOCOMP-25	VOCOMP-30	MEL-PRIME	MEL-PRIME N.E	MEL-PRIME W/B
Benicia, CA	3.58E-01	3.50E-01	4.61E-01	-	-	-
Cartersville, GA	2.30E-01	2.28E-01	3.45E-01	-	-	-
Fort Worth, TX	1.91E-01	2.45E-01	3.52E-01	-	-	-
Goodyear, AZ	2.10E-01	2.65E-01	3.77E-01	-	-	-
Hampshire, IL	1.90E-01	2.37E-01	3.44E-01	3.05E-01	8.11E-01	2.76E-01
York, PA	2.18E-01	2.38E-01	3.70E-01	-	-	-
Milton, Ontario, Canada	1.98E-01	3.26E-01	4.04E-01	-	-	-
Sherwood Park, Alberta, Canada	2.50E-01	2.64E-01	4.49E-01	-	-	-

5.3.8. Sensitivity Analysis

Sensitivity analyses were conducted to assess the robustness of total Global Warming Potential (GWP) results, focusing on raw materials that contribute significantly to overall emissions and exhibit higher uncertainty in background data. GWP was selected as the key indicator due to W.R. MEADOWS' interest in understanding the CO_2 equivalent emissions associated with its products. For each selected product,

the mass of a key raw material was adjusted by ±20% to evaluate the impact on life cycle results. These materials were chosen based on their relatively high contribution to GWP and lower data representativeness. As shown in Table 21, such changes resulted in a ±2.5–7% variation in total life cycle impacts, suggesting that while material assumptions do influence results, the overall conclusions remain stable. For MEL-PRIME W/B, a water-based adhesive with inherently lower environmental impacts, the primary contribution to GWP comes from metal packaging, which accounts for the 2.5% variation in total GWP if reduced.

Table 113. Sensitivity analysis results showing the impact of ±20% changes in key raw material mass on total life cycle Global Warming Potential (kg CO_2 eq) for each product.

Product name	Raw material studied	Base average life cycle impacts (kgCO2-eq)	After 20% decrease in mass (kgCO2-eq)	After 20% increase in mass (kgCO2-eq)	Range of change in total life cycle impacts
VOCOMP-20	Polymer	2.31E-01	2.19E-01	2.42E-01	+/-5%
VOCOMP-25	Polymer	2.69E-01	2.51E-01	2.87E-01	+/-7%
VOCOMP-30	Polymer	3.88E-01	3.67E-01	4.09E-01	+/-5%
MEL-PRIME	Solvent	3.05E-01	2.96E-01	3.14E-01	+/-3%
MEL-PRIME N.E.	Solvent	8.11E-01	7.74E-01	8.48E-01	+/-5%
MEL-PRIME W/B	Packaging	2.76E-01	2.69E-01	2.78E-01	+/-2.5%

5.4 Overview of relevant findings

This study evaluated a range of inventory and environmental indicators for W.R. MEADOWS products.

Across all three water-based concrete curing compounds (VOCOMP-20, VOCOMP-25, and VOCOMP-30), raw material manufacturing (1-1) consistently emerges as the largest contributor to environmental impact, particularly in acidification, ecotoxicity, and eutrophication. Coating manufacturing (1-3) stands out as another dominant impact driver to fossil fuel depletion, global warming potential (GWP), and carcinogenics. Transportation stages (1-2, 2-1, 2-2) also contribute to acidification and ecotoxicity. While end-of-life impacts (4-1, 4-2) are minimal, indicating that most emissions occur upstream during raw material extraction, production, and distribution. The findings align with the expected energy demand required to transform raw materials into final products.

The MEL-PRIME product line follows a similar impact pattern, with raw material manufacturing (1-1) and coating processes (1-3, 3-1) being the primary contributors. The most significant environmental impact categories include GWP, acidification, and fossil fuel depletion, all driven by energy use in material production and coating application. Among the MEL-PRIME formulations, MEL-PRIME N.E. shows a higher reliance on fossil-based materials, resulting in a larger fossil fuel depletion footprint. In contrast, MEL-PRIME W/B exhibits slightly lower fossil fuel depletion but has a higher impact from coating application, likely due to differences in formulation and processing requirements. Transportation and end-of-life stages contribute minimally to overall emissions, reinforcing that the most impactful life cycle stages occur during production

5.5 Conclusions and recommendations

The goal of this study was to conduct a cradle-to-gate LCA on the products so as to develop Transparency Reports [EPDs]™. The creation of these Transparency Reports [EPDs]™ will allow consumers in the building and construction industry to make better informed decisions about the environmental impacts associated with the products they choose.

Overall, the study found that environmental performance is primarily driven by the raw material supply phase, which accounts for the majority total impacts across seven out of ten TRACI 2.1 categories. The manufacturing stage and or transportation stage dominates the rest of results for most products.

VOCOMP-20, VOCOMP-25 and VOCOMP-30 will benefit from sourcing lower-impact ingredients an or increasing recycled content. Coating manufacturing processes may also benefit efficiency improvements, including lower-energy production methods and alternative formulations to reduce fossil fuel use. Logistics improvements, such as shorter transport distances and lower-emission transportation, could further lower acidification and ecotoxicity impacts.

MEL-PRIME N.E. has high fossil fuel depletion, suggesting a need for reduced reliance on petroleum-based materials. Energy efficiency improvements and lower-carbon energy sources could help mitigate GWP and fossil fuel depletion. Since raw material acquisition and manufacturing are the largest contributors, W. R. MEADOWS can focus its efforts on its supply chain. Regular LCA updates will support continuous improvements and align with sustainability goals. It is recommended that W. R. MEADOWS considers designs for its products that use an increased amount of recycled packaging, and into designs which use less material overall to fulfill the same functions. Partnering with suppliers who use sustainable materials, renewable energy, or energy-efficient manufacturing methods may also help further reduce impacts.

Additionally, regular updates to this LCA and the associated Transparency Reports [EPDs]™ would enable high-quality year-over-year comparisons and serve as the basis for a potential optimized EPD, which is assigned a higher credit value under the Materials and Resources category in LEED and would help those looking to increase the performance of their building projects. A post-study review may provide opportunities for improving the data collection process in future years and for continuing to align with the W. R. MEADOWS goals for sustainability.

6 REFERENCES

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ACRONYMS

BOM	Bill of materials
IGU	Insulating glass unit
ISO	International Standardization Organization
LCA	Life cycle assessment
LCI	Life cycle inventory
LCIA	Life cycle impact analysis
MND	Module Not Declared
PCR	Product Category Rule document
TR	Transparency Report [EPD]™

GLOSSARY

For the purposes of this report, the terms and definitions given in ISO 14020, ISO 14025, the ISO 14040 series, and ISO 21930 apply. The most important ones are included here:

Allocation	Partitioning the input or output flows of a process or a product system between the product system under study and one or more other product systems
Close loop & open loop	A closed-loop allocation procedure applies to closed-loop product systems. It also applies to open-loop product systems where no changes occur in the inherent properties of the recycled material. In such cases, the need for allocation is avoided since the use of secondary material displaces the use of virgin (primary) materials. An open-loop allocation procedure applies to open-loop product systems where the material is recycled into other product systems and the material undergoes a change to its inherent properties.
Cradle to grave	Addresses the environmental aspects and potential environmental impacts (e.g., use of resources and environmental consequences of releases) throughout a product's life cycle from raw material acquisition until the end of life
Cradle to gate	Addresses the environmental aspects and potential environmental impacts (e.g. use of resources and environmental consequences of releases) throughout a product's life cycle from raw material acquisition until the end of the production process (“gate of the factory”). It may also include transportation until use phase
Declared unit	Quantity of a product for use as a reference unit in an EPD based on one or more information modules
Functional unit	Quantified performance of a product system for use as a reference unit
Life cycle	Consecutive and interlinked stages of a product system, from raw material acquisition or generation from natural resources to final disposal
Life cycle assessment - LCA	Compilation and evaluation of the inputs, outputs and the potential environmental impacts of a product system throughout its life cycle
Life cycle impact assessment - LCIA	Phase of life cycle assessment aimed at understanding and evaluating the magnitude and significance of the potential environmental impacts for a product system throughout the life cycle of the product
Life cycle inventory - LCI	phase of life cycle assessment involving the compilation and quantification of inputs and outputs for a product throughout its life cycle
Life cycle interpretation	Phase of life cycle assessment in which the findings of either the inventory analysis or the impact assessment, or both, are evaluated in relation to the defined goal and scope in order to reach conclusions and recommendations

APPENDIX

- SM_WRM_Concrete Curing and Adhesive_inventory_data.zip
- SM_WRM_Concrete Curing and Adhesive_primary data collection.zip
- SM_WRM_Concrete Curing and Adhesive_LCIA_results.zip