

Value Chain Map Assessment Addendum



THE **ADHESIVE** AND **SEALANT** COUNCIL

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ASC Sustainability Committee

ASC would like to thank the following ASC member companies that have contributed time, expertise and guidance on this important Adhesive & Sealant Sustainability Value Chain Map Assessment.

CONTRIBUTING COMPANIES



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Introduction

The Adhesive and Sealant Council (ASC) is non-profit trade association which represents North American manufacturers, suppliers, and distributors of adhesive and sealants. The ASC has three strategic priorities including (1) Advocacy, (2) End User Engagement, and (3) Sustainability. In 2021, the ASC's board approved their 2021–2024 Strategic Plan which includes a focus on sustainability.

The Strategic Plan includes three key priorities for which the ASC would like to progress, including: (1) advancing the circular economy, (2) reducing environmental impact in operations and supply chain, and (3) making a positive impact for the ASC's employees and communities.

In 2023, the ASC commissioned Sustainable Solutions Corporation (SSC) to create an addendum to the 2022 ASC Value Chain Map Assessment. The purpose of this addendum is to provide a detailed analysis of ASC's value chain in relation to stewardship and circularity, focusing on three key industries: building and construction, transportation, and packaging. The scope of the addendum includes an evaluation of key movements in regulation and legislation; a review of emerging trends in circularity and end-of-life solutions; and a case study of Scope 3 within the building and construction industry, as pertaining to ASC members.

The information used to complete this report was derived from available sustainability reporting throughout the industry, independent research, and interviews conducted with product end users and industry contacts.

Legislation and Regulation Review

End users of adhesives and sealants prioritize staying ahead of impending regulations. To assist ASC members in understanding the drivers within the packaging, transportation, and building and construction end markets, SSC reviewed legislation and regulations relevant to adhesives and sealants.

Extended Producer Responsibility Policy

Extended Producer Responsibility (EPR) is an environmental policy approach that holds producers responsible for the entire life cycle of their products and packaging, from raw material extraction to the final disposal.¹ By requiring producers to manage end-of-life disposal, EPR programs incentivize designing products and packaging for reusability and recyclability, as illustrated by the Product Stewardship Institute in Figure 1.

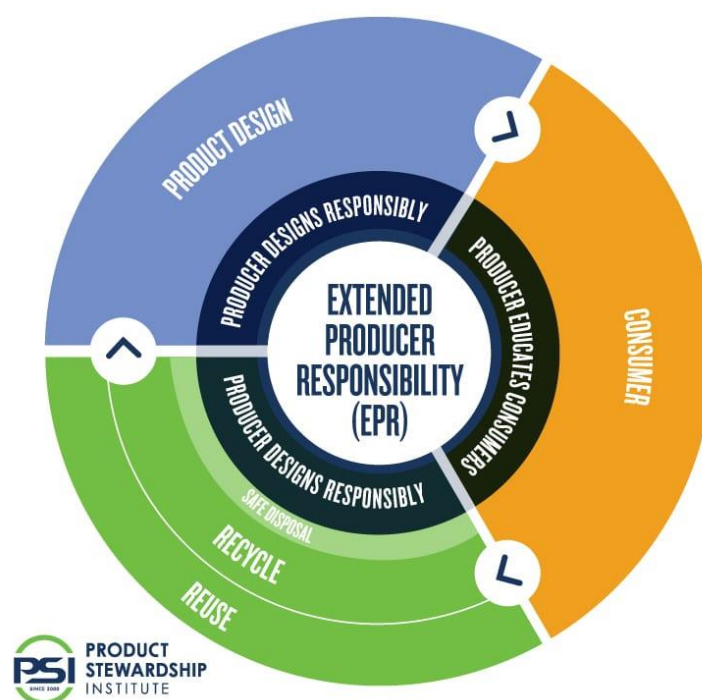


Figure 1 – Extended Producer Responsibility from Product Design to End-of-Life Disposal²

Manufacturers of adhesives for use in packaging should be aware of progression in EPR legislation in North America as final product manufacturers will be required to comply.

Packaging EPR Legislation in the United States

As of 2023, four U.S. states have implemented EPR laws for packaging: California, Oregon, Colorado, and Maine.³ Maryland, which passed legislation in 2023 to establish a producer responsibility organization (PRO) and to create an advisory council for future packaging EPR rulings, is anticipated to be the fifth

¹ *Extended Producer Responsibility (EPR)*. CalRecycle. <https://calrecycle.ca.gov/epr/>

² *What is extended producer responsibility (EPR)?* Product Stewardship Institute. <https://productstewardship.us/what-is-epr/>

³ *EPR laws in the United States*. Product Stewardship Institute. <https://productstewardship.us/epr-laws-map/#:~:text=EPR%20laws%20in%20the%20United,land%20and%20265%20million%20people.>

state to pass packaging EPR legislation.⁴ Several more states have EPR legislation proposed. While federal EPR policy for packaging is unlikely, the trend of EPR packaging legislation is expected to continue across U.S. states.

The drivers behind EPR legislation differ between states, and so producers may see differences in how fees are distributed across different state programs. States will work with PROs to determine how to implement eco-modulated fees to incentivize changes in packaging design. By implementing eco-modulated fees, PROs can allocate financial responsibility to producers based on the environmental impact of the product, allowing for discounts for environmentally preferred attributes and penalties for detrimental attributes.⁵

As California's goal is to move the state towards zero waste by making 100% of single-use packaging recyclable or compostable by 2032, the PRO could set higher fees for producers not assisting to meet this goal. In Oregon, where the driver of EPR legislation is the overall reduction of environmental impact, the Oregon Environmental Quality Commission is investigating following a life cycle assessment approach to measure impact, using ISO 21930 as the foundation. The Oregon PROs would then benefit from proposing an approach to eco-modulation that reflects these rulings.

As of 2023, California and Oregon are in the process of selecting PROs, with Maine anticipated to select a stewardship organization in 2026. Colorado appointed the Circular Action Alliance as its PRO; Circular Action Alliance was also appointed to the advisory council for Maryland.⁶ Determinations for fee eco-modulation strategies are not anticipated earlier than 2025.

To assist manufacturers within the packaging end market, ASC members should remain aware of how their products can impact environmental attributes evaluated by PROs. Adhesives and sealants can prevent assembled products comprised of different materials from being disassembled, therefore preventing recycling. Interviews with end users and EPR legislators indicated that the recycling of packaging is currently not inhibited by the presence of minor contamination, such as adhesives and sealants; however, as these programs mature and the volume of materials increases, EPR programs may require action from ASC members to determine solutions for disassembling incompatible components.

EPR Legislation for Sealants in the United States

Within the United States, 11 states and the District of Columbia have enacted EPR legislation for paints and coatings, with the most recent legislation, the Illinois Paint Stewardship Act, going into effect on January 1, 2024.⁷ Figure 2 from the Product Stewardship Institute maps the U.S. states with established paint stewardship laws. The EPR programs are managed through a stewardship organization, PaintCare, which operates in all 11 states and the District of Columbia. Sealants are covered under this legislation under the definition of "architectural paint," which specifies "interior and exterior architectural coatings,

⁴ *Environment - Statewide Recycling Needs Assessment and Producer Responsibility for Packaging Materials*. Maryland General Assembly. <https://mgaleg.maryland.gov/mgaweb/Legislation/Details/sb0222>

⁵ Lifset, R., et al. *Restoring the incentives for eco-design in extended producer responsibility: The challenges for eco-modulation*. Waste Management (August 2023).

<https://www.sciencedirect.com/science/article/abs/pii/S0956053X2300380X?via%3Dihub>

⁶ *About Us*. Circular Action Alliance. <https://circularactionalliance.org/>

⁷ *State Paint EPR Laws*. Product Stewardship Institute. <https://productstewardship.us/products/paint/>

sold in a container of five gallons or less.⁸ This definition excludes adhesives and aerosols. Further information on which products are covered under PaintCare’s stewardship program is available on its website.⁹ ASC members within the value chain for applicable products should remain aware of manufacturer responsibilities under the PaintCare stewardship program.

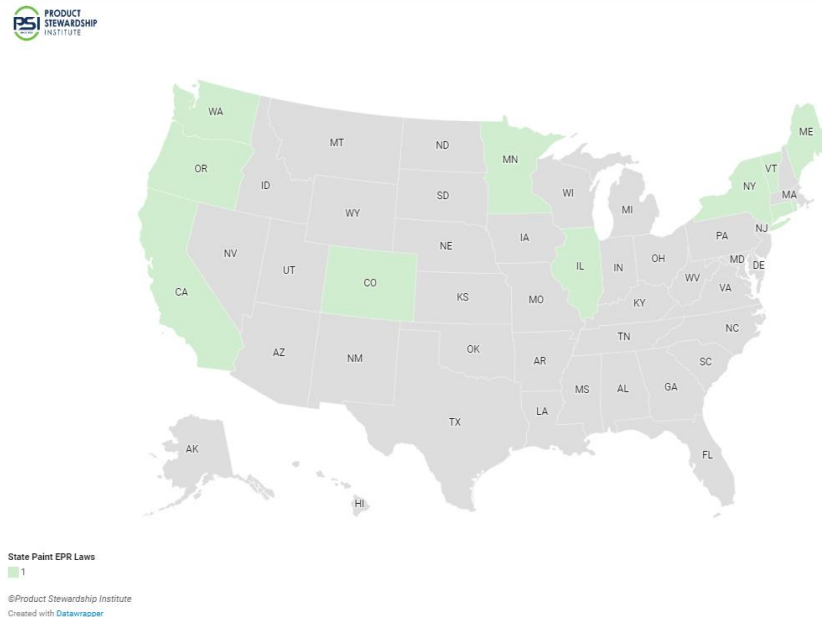


Figure 2 – U.S. States with Paint EPR Laws⁷

Embodied Carbon

Embodied carbon represents the greenhouse gases emitted from the raw material extraction and manufacturing of a product or building. Embodied carbon is a key component of a product’s total carbon footprint, as illustrated in Figure 3. As the U.S. seeks to address the emissions contributed from the building and construction industry, governments on the federal, state, and local level are implementing policy to encourage low-carbon design.

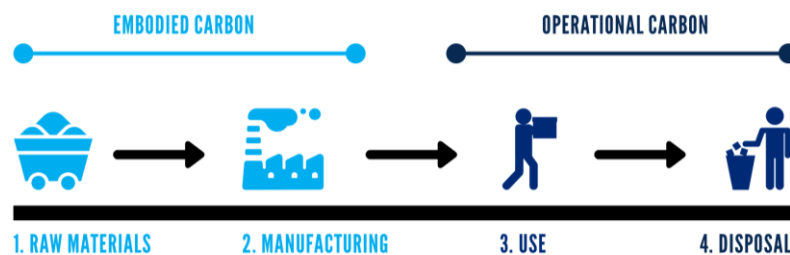


Figure 3 – The Carbon Cycle for Products¹⁰

⁸ RCW 70A.515.020. Washington State Legislature. <https://app.leg.wa.gov/RCW/default.aspx?cite=70A.515.020>

⁹ Products We Accept. PaintCare. <https://www.paintcare.org/products/>

¹⁰ Everything You Need to Know About Embodied Carbon. SSC. <https://www.sustainablesolutionscorporation.com/resources>

To understand which materials are high in embodied carbon, end users within the building and construction end market look for environmental product declarations (EPDs), which report the product's environmental impact over its life cycle.

EPDs are independently verified documents developed in accordance with the International Organization for Standardization Standard 14025 following industry specifications. To create an EPD, an organization must complete a life cycle assessment (LCA) of a product following the instructions established for the product category, known as the Product Category Rules. An LCA that is “cradle-to-grave” examines a product from its raw materials to end-of-life disposal. “Cradle-to-gate” LCAs measure the total impact of manufacturing a product, from raw material extraction to exiting the factory gate.

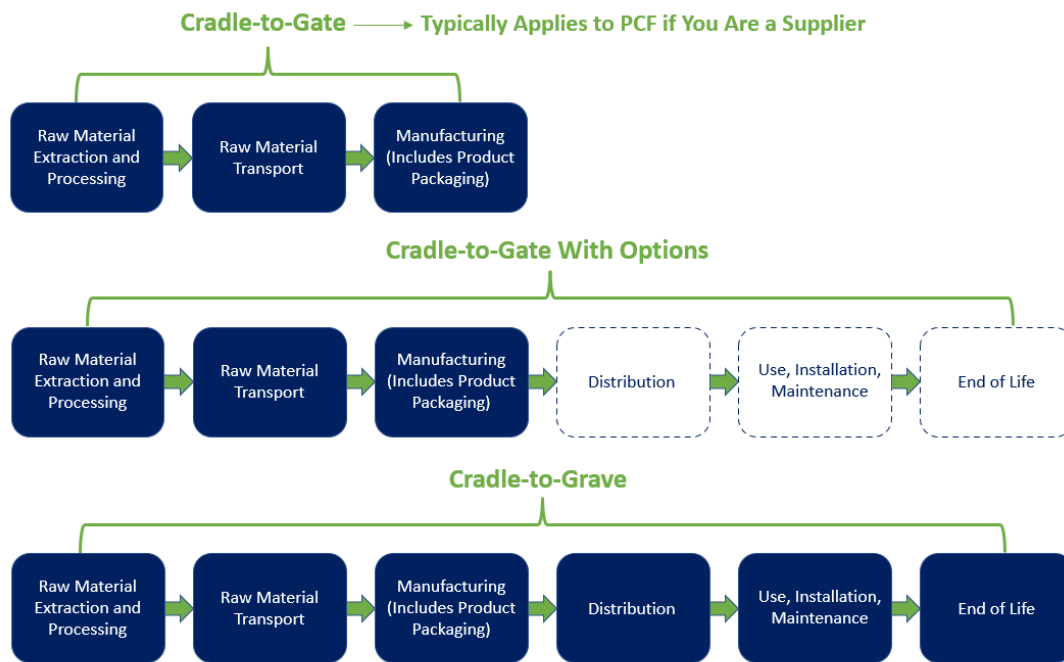


Figure 4 – System Boundaries for LCA¹¹

EPDs are beneficial for companies to communicate the environmental impacts of their products to potential end users. Members upstream should be aware of the data requirements for LCA and EPD creation; as product manufacturers seek to create EPDs, they will require data from throughout their supply chain.

Embodied Carbon Policy in the United States

A common form of embodied carbon policies are procurement policies, which prioritize or require the purchase of low-carbon materials for building projects. The first example of Buy Clean legislation was passed by California in 2017 and established a maximum global warming potential limit for the steel, flat

¹¹ Educational Series: Achieve Your Decarbonization Goals With LCA And PCF. Part 1: How To Conduct An LCA Or PCF To Optimize Decarbonization Of Products And Operations. SSC.

<https://www.sustainablesolutionscorporation.com/resources-how-to-conduct-an-lca-or-pcf-to-optimize-decarbonization>

glass, and mineral wool board insulation purchased for use in public works projects.¹² Since then, several states, such as Washington, New York, and New Jersey, have passed procurement policies addressing embodied carbon. In March of 2023, the federal government launched the Federal-State Buy Clean Partnership which supports the procurement of lower-carbon infrastructure materials in state-funded projects within thirteen states.¹³

Figure 5 from the Carbon Leadership Forum maps embodied carbon policy in the U.S. and surrounding countries.¹⁴

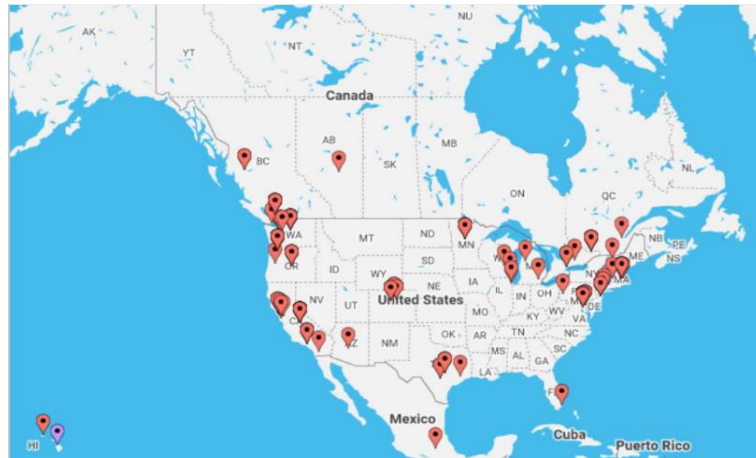


Figure 5 – Embodied Carbon Policy in North America (Red Indicates Passed/Active, Purple Indicates Did Not Pass)¹⁴

While currently no global warming potential limits are set for adhesives and sealants, there is a possibility that they will be established within the next five years. Additionally, the design community is pushing for greater transparency with material embodied carbon emissions by specifying materials with EPDs.

The New Buildings Institute (NBI) developed a comprehensive overlay to incorporate embodied carbon amendments into the International Building Code; while adhesives and sealants are not specified, products such as interior finishes, which may incorporate adhesives or sealants, are specified.¹⁵

Inflation Reduction Act (2022)

The Inflation Reduction Act (IRA) has invested \$350 million through IRA Section 60116 and Section 60112 to support efforts to measure and lower embodied carbon and greenhouse gas emissions associated with the full life cycle of construction materials.

¹² *What is a Buy Clean Policy?* Carbon Leadership Forum. <https://carbonleadershipforum.org/what-is-a-buy-clean-policy/>

¹³ *Federal Buy Clean Initiative.* Office of the Federal Chief Sustainability Officer. <https://www.sustainability.gov/buyclean/#:~:text=In%20March%202023%2C%20the%20Biden,welcomed%20Minnesota%20into%20the%20partnership.>

¹⁴ *Embodied Carbon Policy Toolkit.* Carbon Leadership Forum. [Embodied Carbon Policy Toolkit - Carbon Leadership Forum](#)

¹⁵ *Embodied Carbon Building Code.* NBI (August 2023). [Embodied Carbon Building Code: An overlay of model code language for limiting the climate impact of building products \(newbuildings.org\)](#)

IRA Section 60116 Low-Embodied Carbon Labeling for Construction Materials provides funding to the Environmental Protection Agency (EPA) to identify and label construction materials with substantially lower embodied greenhouse gas emissions. EPA defines “substantially lower” embodied carbon construction materials as within the best performing 20% compared to similar materials; if these materials are unavailable, then materials must be better than the estimated industry average to qualify.¹⁶ With this initiative, EPA aims to simplify the process for procuring low embodied carbon materials, to facilitate access to data for whole building life cycle assessment, and to allow consideration of additional low embodied carbon materials.

In September of 2023, EPA launched a grant program in support of IRA Section 60112 Environmental Product Declaration Assistance to provide funding for businesses within the building and construction industry to develop and verify Environmental Product Declarations.¹⁷ EPA anticipates awarding up to \$100 million across up to 40 grants and cooperative agreements. The application deadline to apply for is January 16, 2024.

Indirect Contributions of Adhesives and Sealants

An important consideration for adhesives and sealants is how they can indirectly impact the embodied and operational carbon of a product. For example, within the transportation end market, adhesives and sealants comprise a small percentage of the total product mass; and as such, have very little direct influence on the embodied carbon from the material alone. However, to use innovative and lightweight materials that cannot be welded, manufacturers turn to adhesives. As such, adhesives can facilitate lower embodied carbon design. Within the building and construction end market, sealants are an important component of the building envelope. Effective sealants can reduce the energy demand of a building, therefore reducing its operational carbon footprint. Understanding how adhesives and sealants can contribute indirectly to lowering the carbon footprint of a product can help end users meet their sustainability goals.

Contaminants of Concern

As policymakers develop regulations to reflect current research, end users aim to phase out certain compounds in anticipation of these regulations. This section provides an overview of regulatory action towards contaminants of concern of key interest to ASC members and end users of adhesives and sealants.

There exists a need to involve technical experts, such as those within the ASC, in the conversations surrounding contaminants of concern. To contribute to the current understanding of compounds necessary to adhesives and sealants, ASC members can develop educational materials for legislators where alternatives are not feasible. ASC members whose products incorporate contaminants of concern should work with stakeholders to determine potential alternatives or exemptions ahead of anticipated regulations.

¹⁶ McCabe, J. *Interim Determination*. EPA (December 22, 2022). <https://www.epa.gov/inflation-reduction-act/inflation-reduction-act-programs-fight-climate-change-reducing-embodied>

¹⁷ *Grant Program: Reducing Embodied Greenhouse Gas Emissions for Construction Materials and Products*. EPA. <https://www.epa.gov/greenerproducts/grant-program-reducing-embodied-greenhouse-gas-emissions-construction-materials-and>

Volatile Organic Compounds

Volatile organic compounds (VOCs) are found in industrial solvents, fuels, and consumer products and are a concern for both outdoor and indoor air quality. Outdoors, VOCs react with oxygen containing molecules to form ozone and smog. In indoor environments, VOCs can accumulate in high concentrations due to the everyday use and storage of VOC-containing materials.

The South Coast Air Quality Management District (SCAQMD) first set Rule 1168 in 1989 to reduce VOC emissions from adhesive and sealant applications.¹⁸ The rule was last amended in October 2017. To demonstrate compliance, end users within the building and construction industry pursuing green building certifications can request VOC emissions and VOC content testing certifications. The SCAQMD publishes a list of products compliant with Rule 1168 on its website.¹⁹ Products are categorized as “Compliant” by meeting Rule 1168 or “Super Compliant” by having a VOC content less than 25 grams per liter or 20% of the future VOC limit for the category. The list was last updated in July 2020.

The California Air Resources Board (CARB) aims to reduce VOC emissions from consumer products including aerosol adhesives and automotive specialty products through its Consumer Products Regulatory Program. The program has previously enacted prohibitions on compounds with high global warming potential in several categories, including aerosol adhesive, to prevent manufacturers from substituting VOC with high global warming potential compounds that were otherwise exempt.²⁰ More information on methods of compliance is available on the Consumer Products Program website.²⁰

In September of 2022, CARB approved the 2022 State Strategy for the State Implementation Plan which, to meet federal ozone standards, proposes measures to reduce VOC emissions from consumer products by 20 tons per day statewide by 2037.²¹ To accomplish this, CARB staff will work with stakeholders to expand manufacturer compliance options, evaluate market-based approaches, and review existing exemptions in order to achieve the maximum feasible reductions. The proposed implementation schedule is 2028–2038. As CARB seeks information on how to meet its targets, ASC members with end users in the transportation or consumer products end markets should be aware of how they can contribute to the conversation.

Green building standards, such as Leadership in Energy and Environmental Design (LEED), are drivers within the building and construction end market for low-VOC products. Within LEED v4.1 Building Design and Construction, projects can achieve points towards certification if the adhesives and sealants meet the following criteria:

- 75% of adhesives and sealants must be tested according to California Department of Public Health (CDPH) Standard Method v1.2-2017 and comply with the maximum allowable concentrations. For a product to qualify, the manufacturer must test every three years.

¹⁸ *Rule 1168 – Adhesive and Sealant Applications*. SCAQMD. <https://www.aqmd.gov/home/rules-compliance/compliance/vocs/adhesive-and-sealants>

¹⁹ *Rule 1168 Compliant Products*. SCAQMD. <https://www.aqmd.gov/home/rules-compliance/compliance/vocs/adhesive-and-sealants/rule-1168-compliant-products>

²⁰ *Consumer Product Program | About*. CARB. <https://ww2.arb.ca.gov/our-work/programs/consumer-products-program/about>

²¹ *Proposed 2022 State Strategy for the State Implementation Plan*. CARB (August 12, 2022). https://ww2.arb.ca.gov/sites/default/files/2022-11/Proposed_2022_State_SIP_Strategy.pdf

- 100% of adhesives and sealants must meet the standards of SCAQMD Rule 1168, amended 2017.²²

The WELL Building Standard has similar requirements to achieve the VOC Reduction feature, also specifying that adhesives and sealants must meet applicable national VOC content regulations or conduct testing in accordance with listed ASTM or ISO standards.²³ More information on the CDPH Standard Method for the Testing and Evaluation of Volatile Organic Chemical Emissions from Indoor Sources, including the maximum allowable concentrations and product declaration guidelines, are available online.²⁴

TCE

Trichloroethylene (TCE) is a VOC used in adhesives and sealants. In January of 2023, EPA released a final revised risk assessment for TCE that found that TCE presents an unreasonable risk of injury to human health.²⁵ Following this assessment, in October of 2023, EPA proposed a risk management rule for TCE that bans the manufacture, import, processing, and distribution of TCE for all consumer use, including for adhesives and sealants.²⁶ The rule also proposes a complete ban on TCE for all industrial and commercial uses. The use of TCE within adhesives and sealants does not qualify for an exemption from this ruling.

EPA estimates the Final Rule for TCE will be published in 2024, with the prohibition for most uses to then be in full effect 12 months after the date of the final rule (2025).

PFAS

Per- and polyfluoroalkyl substances (PFAS) are a group of synthetic chemicals characterized by their composition and unique properties. The durability, resistance to water, and heat resistance of PFAS make them difficult chemicals to replace in adhesives and sealants without compromising product efficacy. Their widespread use and persistence in the environment have led to significant concern over the vast human exposure to PFAS, which research has determined may lead to adverse health impacts.

At the federal level, EPA is taking action to limit the use of PFAS in manufacturing and to set standards for contamination. In 2022, EPA proposed a rule that would regulate two PFAS, PFOA and PFOS, as hazardous substances under the Comprehensive Environmental Response, Compensation, and Liability Act. Future hazardous substance designations of additional PFAS are a strong possibility. For new PFAS,

²² LEED v4 BD+C: New Construction IEQ Credit: Low Emitting Materials. U.S. Green Building Council. <https://www.usgbc.org/credits/new-construction-core-and-shell-schools-new-construction-retail-new-construction-data-38?view=language&return=/credits/New%20Construction/v4.1>

²³ WELL Air Feature 04: VOC Reduction. International WELL Building Institute. <https://standard.wellcertified.com/air/voc-reduction>

²⁴ Smith, K., Dooley, D., and Brown Jr., E. *Standard Method for the Testing and Evaluation of Volatile Organic Chemical Emissions from Indoor Sources Using Environmental Chambers. Version 1.2*. CDPH (January 2017). https://www.cdph.ca.gov/programs/ccdphp/deodc/ehlb/iaq/cdph%20document%20library/cdph-iaq_standardmethod_v1_2_2017_ada.pdf

²⁵ *Risk Evaluation for Trichloroethylene (TCE)*. EPA. <https://www.epa.gov/assessing-and-managing-chemicals-under-tsca/risk-evaluation-trichloroethylene-tce-0>

²⁶ *Risk Management for Trichloroethylene (TCE)*. EPA. <https://www.epa.gov/assessing-and-managing-chemicals-under-tsca/risk-management-trichloroethylene-tce>

EPA released a framework in June of 2023 under the Toxic Substances Control Act to conduct extensive evaluations to ensure that PFAS pose no harm to human health and the environment.

In October of 2023, EPA published a final rule under the Toxic Substances Control Act to require all manufacturers and importers of PFAS and PFAS-containing products to report information on uses, production volumes, disposal, exposure, and hazards. Any entities that have manufactured or imported PFAS in any year since 2011 have 18 to 24 months following publication to report this data.²⁷

Many states are taking legislative and regulatory action ahead of federal regulation to restrict the use of PFAS in products. Figure 6 from Safer States maps PFAS policy within U.S. states. In 2021, Maine became the first state to ban nonessential uses of PFAS from all products and began banning new sale of PFAS products in 2023.²⁸

Examples of policies within other states include:

- Establishing stringent maximum contamination limits to restrict PFAS levels in drinking water.
- Setting a gross revenue tax on entities manufacturing and selling products including PFAS.
- Prohibition of use of products, including seals and coatings, containing PFAS.

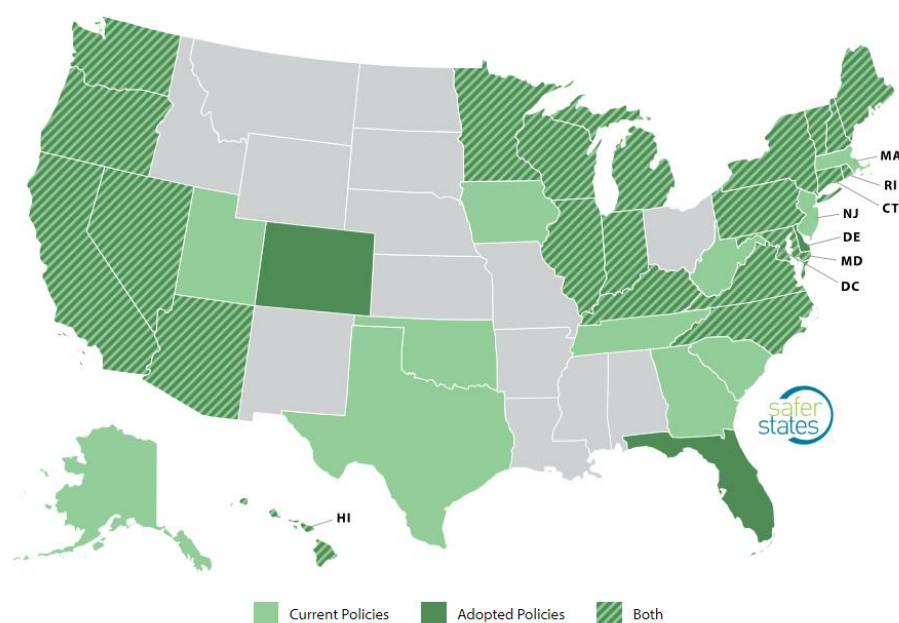


Figure 6 – U.S. States with Policies Restricting PFAS²⁹

Nine states have sued manufacturers of PFAS chemicals for threatening public health and the environment.²⁸

²⁷ TSCA Section 8(a)(7) Reporting and Recordkeeping Requirements for Perfluoroalkyl and Polyfluoroalkyl substances. EPA. <https://www.epa.gov/assessing-and-managing-chemicals-under-tsca/tsca-section-8a7-reporting-and-recordkeeping>

²⁸ Per- and Polyfluoroalkyl Substances (PFAS) | State Legislation and Federal Action. NCSL (March 23, 2023). <https://www.ncsl.org/environment-and-natural-resources/per-and-polyfluoroalkyl-substances>

²⁹ PFAS. Safer States. <https://www.saferstates.com/toxic-chemicals/pfas/>

Phthalates

Phthalates are used in adhesives and sealants for their function as plasticizers and are prevalent across all three end markets considered in this addendum. Certain phthalates are chemicals of concern due to their widespread presence in the environment, numerous pathways of human exposure, and potential to harm human health.

At the federal level, certain phthalates are regulated by the Consumer Product Safety Commission for use in children's products and by the Food and Drug Association for use in cosmetics and food contact applications.^{30,31} In July of 2023, EPA added diisononyl phthalate to the list of chemicals subject to the Toxics Release Inventory in order to increase public awareness of the use of diisononyl phthalate and releases to the environment.³² Separately, seven phthalates are currently undergoing risk evaluations under the Toxic Substances Control Act.³³

In April of 2023, the Washington Department of Ecology and the Washington Department of Health published a draft action plan to reduce sources of phthalates and eliminate exposure pathways. Recommendations included:

- Leveraging existing resources to contribute to state standards for material health considerations, with the intention of using phthalate-free materials in building and construction projects in Washington when reasonable to do so.
- Incorporating preferred purchasing guidance, which includes materials that do not contain phthalates, into statewide contracts.
- Gathering further information to understand the presence of phthalates in the recycling stream from products and packaging.³⁴

Resources for End Users

The ASC is dedicated to providing the industry with the best and clearest information possible on existing and developing guidelines, while also recognizing that different and at times contradictory guidelines exist. This report does not endorse the use of any of the presented guidelines and methodologies.

In interviews, end users within the building and construction end market expressed that they refer to initiatives such as the Healthy Building Network (HBN) HomeFree, which publishes product guidance for

³⁰ *Phthalates Business Guidance & Small Entity Compliance Guide*. Consumer Product Safety Commission.

<https://www.cpsc.gov/Business--Manufacturing/Business-Education/Business-Guidance/Phthalates-Information>

³¹ *Phthalates in Food Packaging and Food Contact Applications*. FDA. <https://www.fda.gov/food/food-ingredients-packaging/phthalates-food-packaging-and-food-contact-applications>

³² *EPA Requires Toxics Release Inventory Reporting on DINP*. EPA (July 12, 2023). <https://www.epa.gov/chemicals-under-tsca/epa-requires-toxics-release-inventory-reporting-dinp>

³³ *Ongoing and Completed Chemical Risk Evaluations under TSCA*. EPA. <https://www.epa.gov/assessing-and-managing-chemicals-under-tsca/ongoing-and-completed-chemical-risk-evaluations-under>

³⁴ *Draft Phthalates Action Plan*. Washington State Department of Ecology (April 25, 2023). <https://apps.ecology.wa.gov/publications/documents/2304025.pdf>

consumers to select products safer for occupants and workers.³⁵ A comprehensive list of HBN's guidance, including for flooring adhesives, is available on its website.³⁵

The International Living Future Institute's Living Building Challenge Framework Red List is a comprehensive list of chemicals determined to have a serious risk to human health.³⁶ In an interview, an end user within the building and construction end market noted that they are undergoing efforts to find alternatives for red list ingredients such as PFAS due to the pressure from the design community.

Additional resources for end users within the building and construction end market include EPA's Recommendations of Specifications, Standards and Ecolabels³⁷.

Transparency and Disclosure

Product transparency and disclosure refers to the verified reporting of material ingredients, raw material sourcing, and environmental impact associated with a manufactured product. As end users look to further their sustainability goals, transparency and disclosure documentation is a key part. These documents are increasingly required by end users to quantify and understand the total impact on the environment and human health from use of the product.

Within the building and construction end market, EPA recommends products meet disclosure standards set based on product type. These recommendations are requirements for use in federal projects which must adhere to the Sustainable Acquisition Policy (Subpart 23.1) of the Federal Acquisition Regulation.³⁸ For adhesives, EPA recommends the following certifications:

- Cradle to Cradle Certified
- SCS Indoor Advantage Gold
- GREENGUARD
- Ecologo/UL 2762 Sustainability Standard for Adhesives
- CRI Green Label Plus Program³⁹



Figure 7 – Labels of Certifications Recommended by the EPA for Adhesives

³⁵ Sealant Product Guidance. HBN. <https://healthybuilding.net/products/10-sealants>

³⁶ About the Red List. International Living Future Institute. <https://living-future.org/red-list/>

³⁷ Recommendations of Specifications, Standards, and Ecolabels for Federal Purchasing. EPA. <https://www.epa.gov/greenerproducts/recommendations-specifications-standards-and-ecolabels-federal-purchasing>

³⁸ Subpart 23.1 - Sustainable Acquisition Policy. FAR. <https://www.acquisition.gov/far/subpart-23.1>

³⁹ Sustainable Marketplace: Greener Products and Services | Adhesives. EPA. <https://www.epa.gov/greenerproducts/adhesives>

Drivers for Disclosure Documentation

While no federal or state regulation within the U.S. directly requires transparency documentation for human health, developing material ingredient reports can assist organizations in demonstrating compliance with regulations restricting chemicals of concern. To create this documentation, end users will require material ingredient information such as bills of materials from upstream suppliers.

A primary driver for transparency and material reporting within the building and construction end market are the green building rating systems like Leadership in Energy and Environmental Design (LEED), the Living Building Challenge (LBC), and the WELL building standard, which incorporate transparency requirements within the certifications. Green building rating systems are incorporated into building code across the U.S. as cities such as Washington, D.C., San Francisco, Philadelphia, and Chicago require municipal buildings to meet LEED certification requirements. Additional municipalities offer incentives, such as expedited review, tax credits, or grants, for projects achieving green building certifications.

Projects pursuing green building certifications can require several kinds of transparency documentation, including:

- Product-Specific Environmental Product Declarations (EPDs)
- Material ingredient reports such as Health Product Declarations (HPDs) or Declare labels
- Recycled content certifications
- Volatile Organic Compound (VOC) emissions testing and content certifications

Product manufacturers can create and market certifications for their products to become more competitive in the building and construction end market. Members upstream should be aware of the data requirements for transparency documentation as they require data from throughout the supply chain.

Construction and Demolition Waste Management

Within U.S. policy, several states and municipal building codes require projects to meet diversion targets. California Senate Bill 1374 (2002) requires construction projects to recycle and/or salvage a minimum of 65% of non-hazardous construction and demolition waste.⁴⁰ The International Green Construction Code, which U.S. cities such as Dallas, Texas follow, establishes a minimum of 50% of nonhazardous construction waste material should be diverted from landfill.⁴¹

To comply with construction and demolition waste regulation, end users will be driven to select materials that will not impact the recyclability of building materials recovered from demolition. Adhesives and sealants can prevent assembled products comprised of different materials from being disassembled, therefore preventing recycling. As such, ASC members should continue to further efforts to determine solutions for disassembling components incompatible with recycling.

⁴⁰ *Senate Bill 1374 (2002)*. CalRecycle.

<https://calrecycle.ca.gov/LGCentral/Library/CandDModel/Instruction/SB1374/>

⁴¹ *2018 International Green Construction Code*. ICC. <https://codes.iccsafe.org/content/IGCC2018P3/chapter-9-materials-and-resources>

Green Building Rating Systems

Additional drivers for construction and demolition waste diversion include green building rating systems like LEED, WELL, and BREEAM (Building Research Establishment Environmental Assessment Method), which incorporate C&D waste management within certification. LEED v4 Building Design and Construction certification offers points for projects achieving greater than 50% diversion of construction and demolition waste diversion. The LEED v5 beta rating system for Building Operations and Maintenance: Existing Buildings, released in September of 2023, offers points for recycling hard-to-recover and high-embodied carbon products during remodeling and renovation. This includes one point for recovery of non-contaminated carpet.⁴²



Figure 8 – Green Building System Logos

Trends in the European Union

The European Green Deal is a set of proposals adopted by the European Commission aligned with the goal of “transforming the European Union into a modern, resource-efficient, and competitive economy.”⁴³ To forward its aim of being the first climate-neutral continent, the European Commission established the target of zero net greenhouse gas emissions by 2050 with a 55% reduction by 2030.

The U.S. has made attempts at policy similar to the European Green Deal, such as the Green New Deal proposed in March of 2019 and later reintroduced in April of 2021. In addition, several jurisdictions and organizations have launched their own climate policies, including the City of Boston, American University, and the Red Nation.

To prepare for future green deal legislation within in the U.S., ASC member companies can benefit from understanding current European Green Deal compliance requirements. The following sections examine European Union directives as pertaining to the key legislation of interest to this addendum.

FEICA, the Association of the European Adhesive and Sealant Industry, further evaluates the impact of European legislation on the adhesive and sealant industry. More information is available on FEICA’s website.⁴⁴

⁴² LEED v5 Building Operations + Maintenance: Existing Buildings Beta Version. USGBC (September 25, 2023). https://www.usgbc.org/sites/default/files/2023-09/LEED-v5-OM-Existing-Buildings-beta-version_1.pdf

⁴³ The European Green Deal. European Commission. https://commission.europa.eu/strategy-and-policy/priorities-2019-2024/european-green-deal_en

⁴⁴ FEICA. <https://www.feica.eu/>

Packaging and Packaging Waste Directive

Packaging and paper EPR policy in the U.S. follows the trend established by Europe, where packaging EPR policies have been present since the early 1990s. The European Union (EU) Packaging and Packaging Waste Directive requires that all EU Member States establish EPR schemes for packaging by 2024.⁴⁵ While Member States can determine how to implement the EPR policy, all EPR programs need to comply with requirements under the Waste Framework Directive and incentivize designing for packaging reuse or high-quality recycling while minimizing environmental impact.⁴⁶ Countries such as France and Germany have active packaging EPR programs.

In November of 2022, the European Commission proposed to replace the Packaging and Packaging Waste Directive with a regulation that addresses the differences in regulatory approaches across Member States.⁴⁷ Key measures of the initiative include harmonized labelling of packaging and waste bins, minimum percentages of recycled content for plastic packaging, and establishing criteria for design for recycling.

Waste Framework Directive

As explored previously, the U.S. does not have an overall construction and demolition (C&D) waste diversion target. In Europe, the European Commission's Waste Framework Directive set a 70% C&D waste recovery target for projects.⁴⁸

Green Claims Directive

The European Commission proposed the Green Claims Directive in March of 2023 to regulate sustainable product marketing by placing requirements on the verification and communication of environmental claims.⁴⁹ Under the directive, all green claims must be substantiated with evidence meeting established requirements. The proposed directive will require greater transparency for environmental claims, making documents such as EPDs valuable to companies marketing green claims internationally.

⁴⁵ *Packaging waste*. European Commission. https://environment.ec.europa.eu/topics/waste-and-recycling/packaging-waste_en#background

⁴⁶ *Proposal for a REGULATION OF THE EUROPEAN PARLIAMENT AND OF THE COUNCIL on packaging and packaging waste, amending Regulation (EU) 2019/1020 and Directive (EU) 2019/904, and repealing Directive 94/62/EC*. EUR-Lex. <https://eur-lex.europa.eu/legal-content/EN/TXT/?uri=LEGISSUM:l21207>

⁴⁷ *Proposal for a regulation on packaging and packaging waste*. EUR-Lex. <https://eur-lex.europa.eu/legal-content/EN/TXT/?uri=CELEX%3A52022PC0677>

⁴⁸ *Waste Framework Directive*. European Commission. https://environment.ec.europa.eu/topics/waste-and-recycling/waste-framework-directive_en

⁴⁹ *Green Claims Directive*. European Commission (March 22, 2023). <https://eur-lex.europa.eu/legal-content/EN/TXT/?uri=COM%3A2023%3A0166%3AFIN>

Circularity and End-of-Life Solutions

In alignment with the ASC Strategic Priorities, SSC reviewed current information regarding innovative technologies within circularity.

Disassembling Incompatible Components

End users are increasingly interested in the ability of adhesives to debond or degrade to facilitate circularity. While product durability is still the priority, for end users to comply with developing regulations and achieve their sustainability goals, materials must be able to be separated without the remaining adhesive impacting reusability or recyclability. Manufacturers are challenged to develop alternatives that are both economically feasible and comparable to current products.

One approach is to design adhesives that debond from material in response to an external stimulus. One challenge is that it must be unlikely that the product would encounter the debonding stimulus during its lifetime.⁵⁰ Thermal and light-induced debonding are the most widely researched debonding stimuli but are also likely to be encountered during the life cycle of the product.⁵¹ Other debonding stimuli currently researched, such as magnetic or electrical debonding, each have their own applications and limitations of use. Researchers predict that for debondable adhesives to be practical and economically feasible, successful debondable adhesives will most likely be modifications of current formulations incorporating small quantities of additives.⁵¹

Biobased adhesives are also considered for their potential to biodegrade.⁵² Research into biobased adhesives includes for use in packaging, driven by the industry's desire to lessen its end-of-life impact and to reduce the volatile organic emissions from processing.⁵³ Current challenges for the use of biobased materials include poor resistance to water and low stability.

Advanced Recycling

Advanced recycling, also known as chemical or feedstock recycling, is the chemical process that converts plastic polymers into basic components to be repolymerized into virgin plastics. If implemented widely, advanced recycling would allow for a larger capture of plastics for remanufacture into products, diverting more plastics from landfill.

A current challenge the industry faces that impedes implementing advanced recycling broadly is the insufficient scale of infrastructure. For advanced recycling to be economically viable, the system requires a significant source of waste plastics; collection of these plastics may require competition with municipally operated facilities.⁵⁴ Additionally, the current scale of systems is insufficient to meet the

⁵⁰2022 Adhesive and Sealant Sustainability Summit. Adhesion Society.

⁵¹ Mulcahy, K. et al. *Debondable adhesives and their use in recycling*. Green Chem (November 22, 2021). <https://pubs.rsc.org/en/content/articlehtml/2022/gc/d1gc03306a>

⁵² Sierra-Romero, A., Novakovic, K., and Geoghegan, M. *Adhesive Interfaces towards a Zero-Waste Industry*. Langmuir (December 20, 2022).

⁵³ Vrabic-Brodnjak, U. *Bio-Based Adhesives Formulated from Tannic Acid, Chitosan, and Shellac for Packaging Materials*. Polymers (March 4, 2023). <https://www.mdpi.com/2073-4360/15/5/1302>

⁵⁴ Li, B., Ma, Y., and Li, H. *A new journey of plastics: Towards a circular and low carbon future*. Giant (August 2022). <https://www.sciencedirect.com/science/article/pii/S2666542522000261>

capacity required. Lastly, the complex composition of plastics, including variability with feedstock and additional impurities, can require multiple stages of regeneration and increase cost.

Broadly, advanced recycling processes can handle small levels of contamination such as adhesives.⁵⁵ Due to the emerging nature of advanced recycling technology, guidance on how suppliers can create products suited to circular solutions is not yet widely available. To understand specific requirements, ASC members must collaborate with partners within the value chain.

Legislation Regarding Advanced Recycling

24 states within the U.S. have passed legislation classifying advanced recycling processes as manufacturing rather than waste management, providing operators with greater certainty on how the processes will be regulated, and lessening the regulatory burden in some states. Utah, Kansas, and Indiana passed legislation in 2023, with bill supporters stating interest in the growing technology and its ability to increase the circularity of plastic products.⁵⁶

Concurrently, additional states are moving to restrict advanced recycling due to the environmental impact from facility operation. States such as Massachusetts and Rhode Island proposed legislation in 2023 to prohibit new combustion facilities from being built within their states. Additionally, Maine proposed a bill that would subject advanced recycling to solid waste regulation, citing concerns over weaker environmental regulations that manufacturing would be subject to as a reason.⁵⁷

⁵⁵ *Making Circularity A Reality: Ideas for What Brands Can Do Today*. Sustainable Brands (September 12, 2023). <https://library.sustainablebrands.com/view/making-circularity-a-reality-ideas-for-what-brands-can-do-today-1>

⁵⁶ *Indiana Lawmakers Overwhelmingly Pass Advanced Recycling Legislation to Boost Economy, Help End Plastic Waste*. ACC (April 20, 2023). <https://www.americanchemistry.com/chemistry-in-america/news-trends/press-release/2023/indiana-lawmakers-overwhelmingly-pass-advanced-recycling-legislation-to-boost-economy-help-end-plastic-waste>

⁵⁷ Sarah Nichols. *LD 1600*. NRCM (May 8, 2023). <https://www.nrcm.org/testimony/ld-1660-advanced-recycling-facilities-subject-solid-waste-regulation/>

Scope 3 Within the Building and Construction End Market

Scope 3 emissions are the greenhouse gas emissions produced from all assets not owned or controlled directly by the reporting organization, outside of the emissions in Scope 2, and are a result of the interactions throughout the value chain.⁵⁸ According to the World Resources Institute and the World Business Council for Sustainable Development, Scope 3 emissions can represent the largest source of emissions for companies; as such, quantifying and tracking Scope 3 emissions can lead to the greatest opportunities for greenhouse gas emissions reduction.⁵⁹ Examples of activities throughout a company's value chain that produce Scope 3 emissions are provided in Figure 9.

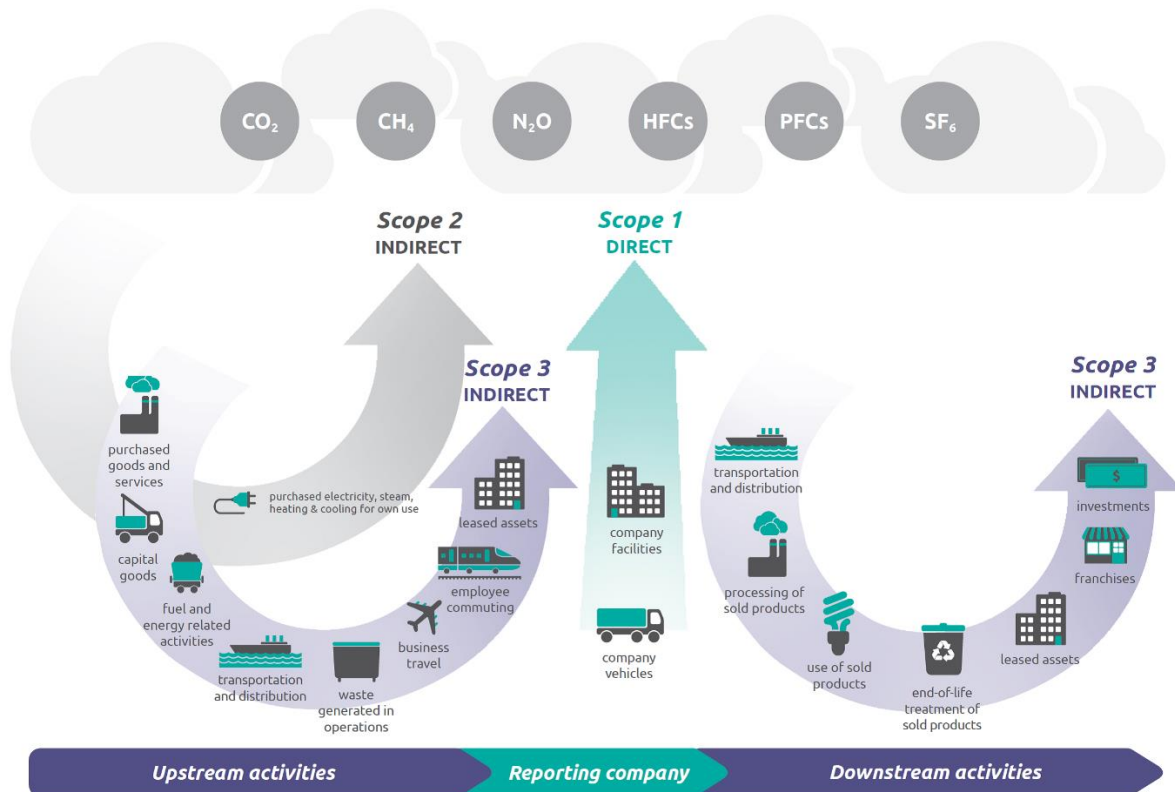


Figure 9 – Overview of Scope 1, Scope 2, and Scope 3 Emission Activities⁵⁹

⁵⁸ *Scope 3 Inventory Guidance*. EPA.

https://ghgprotocol.org/sites/default/files/ghgp/standards_supporting/Diagram%20of%20scopes%20and%20emissions%20across%20the%20value%20chain.pdf

⁵⁹ *Greenhouse Gas Protocol Corporate Value Chain (Scope 3) Standard*. WRI and WBCSD.

https://ghgprotocol.org/sites/default/files/ghgp/standards_supporting/Diagram%20of%20scopes%20and%20emissions%20across%20the%20value%20chain.pdf

Scope 3 emissions contribute to the majority of emissions produced within the building and construction industry. As illustrated in Figure 10, Scope 3 accounts for 92% of the total emissions within the construction sector.⁶⁰ As businesses seek to minimize the carbon emissions produced within the built environment, more are turning to Scope 3 reporting.

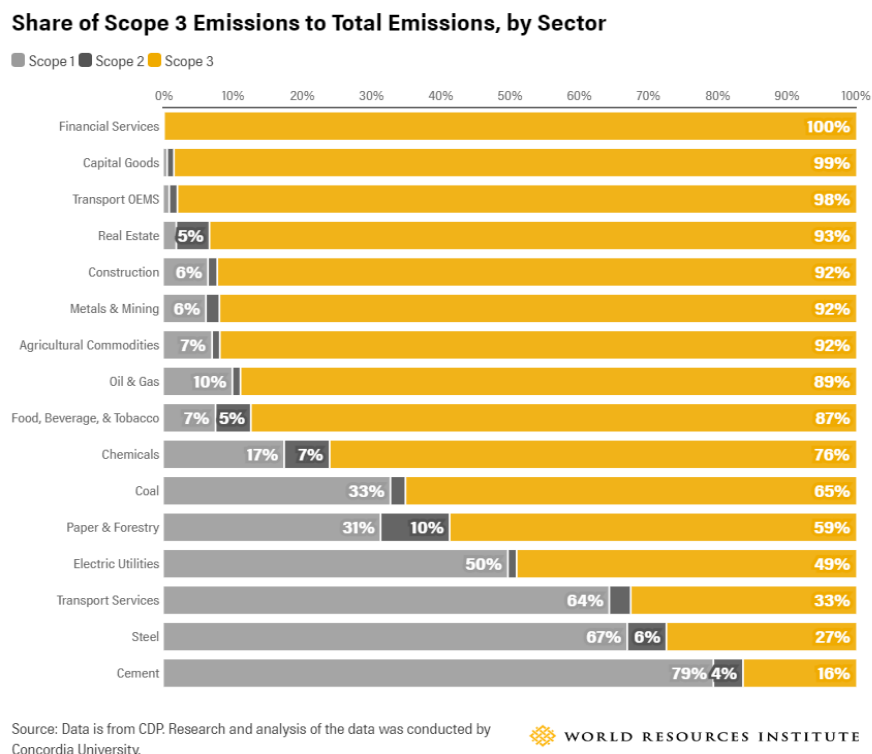


Figure 10 – Share of Scope 3 Emissions to Total Emissions, by Sector⁶⁰

Drivers of Scope 3 Reporting

Greenhouse gas emissions reductions are an increasingly common goal among manufacturers, and governing bodies are beginning to require greenhouse gas emissions reporting. In October of 2023, California passed Senate Bill 253 and Senate Bill 261 to require companies conducting business in California to evaluate their climate impact. Senate Bill 253 dictates that companies with revenues higher than \$1 billion must disclose their Scope 1 and 2 emissions by 2026 and Scope 3 emissions by 2027. Senate Bill 261 requires that all companies with revenues higher than \$500 million to prepare and publicly share a report by 2026 summarizing publicly available climate-related financial risk reports and an analysis of systemic and sector-wide climate-related financial risks facing the state. Companies that are not compliant will be subject to penalty fees.

As climate regulation progresses across the U.S., ASC members should be aware of their own reporting obligations. Additionally, as Scope 3 reporting requires collaboration from across the value chain, members should prepare for their own emissions data to be requested by others.

⁶⁰ Hadziosmanovic, M., Rahimi, K., and Bhatia, P. *Trends Show Companies Are Ready for Scope 3 Reporting with US Climate Disclosure Rule*. World Resources Institute (June 24, 2022). <https://www.wri.org/update/trends-show-companies-are-ready-scope-3-reporting-us-climate-disclosure-rule>

Available Guidance

The Greenhouse Gas Protocol is the primary industry method for greenhouse gas emissions accounting. The *Corporate Value Chain (Scope 3) Accounting and Reporting Standard* and the *Technical Guidance for Calculating Scope 3 Emissions* provide necessary background and framework to any organization approaching Scope 3 emissions reporting.⁵⁹

To examine Scope 3 from across the value chain and provide strategies to reduce emissions, the Science Based Targets Initiative, Navigant, and the Gold Standard published *Value Change in the Value Chain: Best Practices in Scope 3 Greenhouse Gas Management*.⁶¹ This guidance supplements the information provided in the Greenhouse Gas Protocol by and summarizes best practices for supplier engagement.

These documents are publicly available and free to download at the organizations' websites.

Case Study

This section of the addendum will examine the process of completing a Scope 3 analysis from an end user within the building and construction industry. The steps for completing a Scope 3 analysis are illustrated in Figure 11.

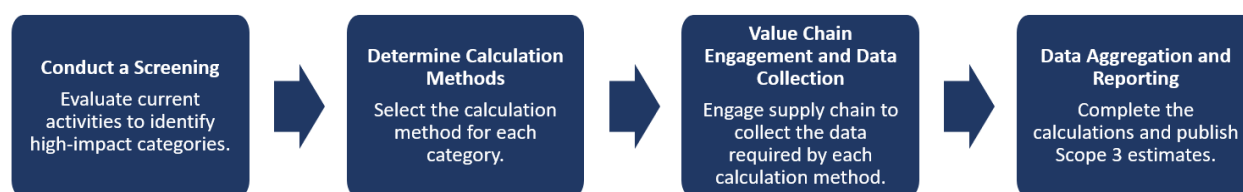


Figure 11 – Overview of Scope 3 Analysis

Conducting a Screening

The first step in estimating a company's Scope 3 emissions is to determine which activities have the most significant impact and are most relevant to the company's operations and goals. The Greenhouse Gas Protocol classifies Scope 3 emissions into fifteen categories, as visualized in Figure 9. Not every category will be relevant to each company. To best determine where to focus data collection efforts, companies should evaluate each category against the criteria listed in Figure 12.

⁶¹ *Value Change in the Value Chain: Best Practices in Scope 3 Greenhouse Gas Management*. Science Based Targets Initiative, Navigant, and the Gold Standard (November 2018). https://sciencebasedtargets.org/resources/files/SBT_Value_Chain_Report-1.pdf

Criteria	Description of activities
Size	They contribute significantly to the company's total anticipated scope 3 emissions
Influence	There are potential emissions reductions that could be undertaken or influenced by the company
Risk	They contribute to the company's risk exposure (e.g., climate change related risks such as financial, regulatory, supply chain, product and technology, compliance/litigation, and reputational risks)
Stakeholders	They are deemed critical by key stakeholders (e.g., customers, suppliers, investors or civil society)
Outsourcing	They are outsourced activities previously performed in-house or activities outsourced by the reporting company that are typically performed in-house by other companies in the reporting company's sector
Sector guidance	They have been identified as significant by sector-specific guidance
Spending or revenue analysis	They are areas that require a high level of spending or generate a high level of revenue (and are sometimes correlated with high GHG emissions)
Other	They meet any additional criteria developed by the company or industry sector

Source: Adapted from table 6.1 from the *Scope 3 Standard*

Figure 12 – Screening Process Criteria for Identifying Relevant Scope 3 Categories⁶²

To evaluate against criteria such as size, for which a company may not have readily available data, companies can turn to industry average emissions factors. When using size as a criterion, a company's screening would involve doing initial high-level calculations to determine the highest impact categories within Scope 3.

According to data from the Carbon Disclosure Project (CDP), within the construction industry, the use of sold products, purchased goods and services, and upstream transportation and distribution were the top three Scope 3 categories by percent of total greenhouse gas emissions. The figure is further broken down in Figure 13.

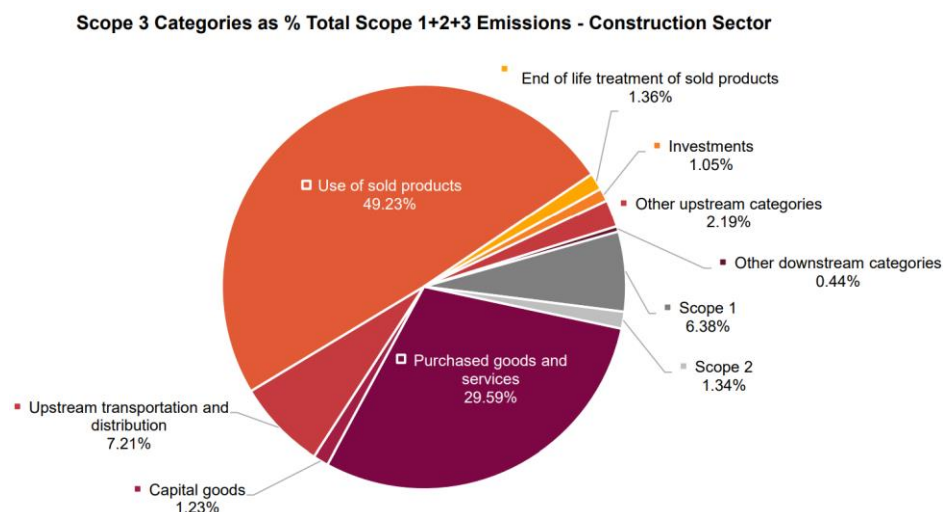


Figure 13 – Scope 3 Categories by Total Percentage of Emissions⁶³

⁶² *Technical Guidance for Calculating Scope 3 Emissions*. Greenhouse Gas Protocol.

https://ghgprotocol.org/sites/default/files/standards/Scope3_Calculation_Guidance_0.pdf

⁶³ *CDP Technical Note: Relevance of Scope 3 Categories by Sector*. CDP (January 25, 2023). https://cdn.cdp.net/cdp-production/cms/guidance_docs/pdfs/000/003/504/original/CDP-technical-note-scope-3-relevance-by-sector.pdf

Conducting a Screening: Example

For demonstrating best practices in climate action and strategy, Saint-Gobain earned a score of A from CDP, a disclosure system for environmental reporting.⁶⁴ Saint-Gobain has a science-based target set to reduce its Scope 3 emissions in 2030 by 16% compared to its 2017 baseline.⁶⁵ In its 2022 CDP questionnaire response, Saint-Gobain reported its Scope 3 emissions for fourteen out of the fifteen categories.⁶⁶ It is implementing a complete system of monitoring of the following categories:

- Category 1: Purchased goods and services
- Category 3: Fuel- and energy-related activities not included in Scope 1 or Scope 2
- Category 4: Upstream transportation and distribution
- Category 9: Downstream transportation and distribution

Impacts from categories such as capital goods, upstream leased assets, downstream leased assets, franchises, and investments were considered marginal compared to other categories.

Determining Calculation Method

After the company has identified its high-impact categories, it can determine the type of calculation required for each. Companies should prioritize using higher-specificity calculation methods for high-impact categories to produce higher-quality estimates. The general calculation methods are spend-based, average-data, hybrid, and supplier-specific.

The spend-based and average-data methods have the lowest level of specificity. Both methods use average industry emission factors for a specified unit.

The hybrid method uses allocated primary emissions data from suppliers. The hybrid data utilizes a combination of supplier-specific data and average data where supplier-specific data is insufficient.

The supplier-specific method has the highest level of specificity and requires data from suppliers. To gather data for this method, companies can request product lifecycle greenhouse gas emissions data from each relevant value chain partner.

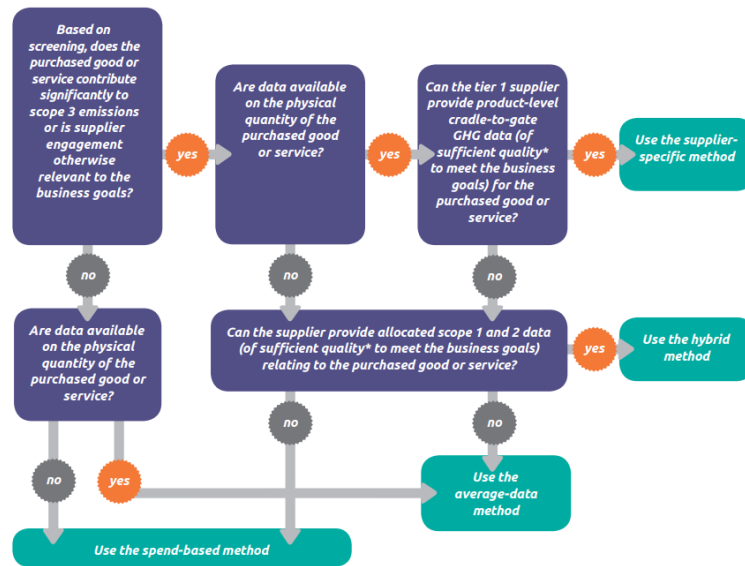
⁶⁴ *The A List 2022*. CDP. <https://www.cdp.net/en/companies/companies-scores>

⁶⁵ *Climate Change*. Saint-Gobain. <https://www.saint-gobain.com/en/corporate-responsibility/our-pillars/climate-change>

⁶⁶ *Saint-Gobain CDP Climate Change Questionnaire 2022 29 July 2022*. CDP (July 29, 2022). <https://www.saint-gobain.com/sites/saint-gobain.com/files/media/document/CDP%20Climate%20Change%202022.pdf>

Determining Calculation Method: Example

Figure 14, from the Greenhouse Gas Protocol Scope 3 Technical Guidance, illustrates the process of selecting a calculation method for Category 1: Purchased goods and services.



Note * Companies should collect data of sufficient quality to ensure that the inventory:

- most appropriately reflects the GHG emissions of the company
- supports the company's business goals for conducting a GHG inventory
- serves the decision-making needs of users, both internal and external to the company.

For more information on how to determine whether data is of sufficient quality, see section 7.3 of the *Scope 3 Standard*
 Source: World Resources Institute

Figure 14 – Calculation Method Decision Tree for Category 1: Purchased Goods and Services⁶²

Value Chain Engagement and Data Collection

After selecting the calculation method for each category, the reporting company can then evaluate the data requirements to identify potential gaps. Gathering supplier-specific data requires significant engagement throughout the value chain. *Value Change in the Value Chain: Best Practices in Scope 3 Greenhouse Gas Management* presents strategies for supplier engagement according to the supplier engagement framework presented in Figure 15.



Figure 15 – Supplier Engagement Framework⁶¹

Currently, many manufacturers are engaging with suppliers manually to retrieve emissions data, but retrieving and maintaining current information is difficult and time intensive. The industry will see a shift towards online platforms such as Together for Sustainability and Manufacturer 2030 to streamline the process.

Data Aggregation and Reporting

The next step in completing a Scope 3 analysis is to complete the requisite calculations. The company completes the calculations for each identified relevant category using the selected calculation method. The data can then be aggregated and validated. It is important for companies to document any assumptions made or limitations encountered throughout this process.

A company can then publish its Scope 3 emissions estimates in a sustainability report, on its website, or through a reporting framework. Requests from members in a company's supply chain may request its Scope 3 emissions data directly, or through reporting frameworks like CDP's Supply Chain Program.

As regulations such as California's Senate Bill 253 and Senate Bill 261 institute formalized reporting, many large companies are facing a heavy burden to meet requirements. Upstream members of the value chain can support customers conducting Scope 3 inventories by quantifying their own emissions to provide product-specific emissions data.

Five-Year Outlook

This report provides an overview of sustainability market drivers impacting users of adhesives and sealants within the building and construction, transportation, and packaging end markets. SSC has identified the following as important drivers will impact the North American adhesive and sealant industry over the next five years:

- Scope 3 reporting legislation, Buy Clean procurement policies, and the growing push for embodied carbon information require companies throughout the value chain to collaborate and quantify their greenhouse gas emissions.
- End users are referring to published lists, such as those created by the U.S. Environmental Protection Agency, the South Coast Air Quality Management District, and various non-governmental organizations to determine what attributes are environmentally preferable for adhesives and sealants. ASC members should be aware of the lists discussed in this report.
- There exists a need to involve technical experts, such as those within the ASC, in the conversations surrounding contaminants of concern such as PFAS and phthalates. ASC members whose products incorporate contaminants of concern should work with stakeholders to determine potential alternatives or exemptions ahead of anticipated regulations. To contribute to current understanding of compounds necessary to adhesives and sealants, ASC members can develop educational materials for legislators where alternatives are not feasible.

The following conclusions are summarized by end market.

Building and Construction

- Green building standards such as Leadership in Energy and Environmental Design (LEED) and the Living Building Challenge (LBC) are large drivers within the building and construction market. To meet these certification requirements, product manufacturers are facing a growing push for material ingredient reporting and environmental transparency documentation.

Transportation

- In order to utilize innovative materials and remain competitive, automotive manufacturers are switching to adhesives rather than welding to avoid compromising the material integrity. An end user within the automotive industry expressed that this switch is driving interest in the ability of adhesives to debond for reuse or recycling.

Packaging

- Recyclability and reusability requirements are drivers for further research into disassembling incompatible components.
- Environmental Producer Responsibility (EPR) policy is growing traction in the United States as four states develop EPR programs and yet more propose EPR legislation. To assist end product manufacturers, ASC members should be aware of the recyclability and environmental attribute requirements to comply with packaging EPR programs.

Conclusion

By understanding trends in legislation and circularity, and the growing push for Scope 3, ASC members have the tools necessary to develop their sustainability strategies to meet the sustainability needs throughout the value chain.

To leverage the information provided in this report, ASC members can work to educate end users. Methods of education include engaging with departments such as procurement; training sales members to be aware of what sustainability drivers exist for customers; participating in industry conferences; and hosting informative webinars.

Interviews with end users indicated that they are not yet investigating the ability of adhesives and sealants to impact their sustainability goals, and so by forwarding the priorities of its Strategic Plan, the ASC remains ahead of the market.

For more information on adhesive and sealant sustainability, please contact the Adhesive and Sealant Council: <https://www.ascouncil.org/>.



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