SELVOL™

2025
Selvol Life Cycle Analysis

An analysis of the environmental impacts of our business

SEKISUI

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POLYVINYL ALCOHOL

Selvol High Performance Polyvinyl Alcohol

Polyvinyl alcohol is a water soluble, non hazardous, non-toxic, and biodegradable polymer. Because it is water soluble, polyvinyl alcohol also reduces the need for organic solvents and it is a key ingredient in many green technologies.

Selvol polyvinyl alcohol has many applications that advance sustainability lifestyles for the world's population. It is a key ingredient in laminated glass for interlayer films. These films are designed to add sound and heat insulation to automotive glass, keeping automobiles lightweight and cooling efficient, reducing automobile CO_2 emissions. If installed on 10 million vehicles, this interlayer film could reduce CO_2 emissions by as much as 600,000 tons!

Polyvinyl alcohol can also play a key role in the sustainable packaging industry through water-soluble unit dosing, providing an easy to use, standardized dosing solution.

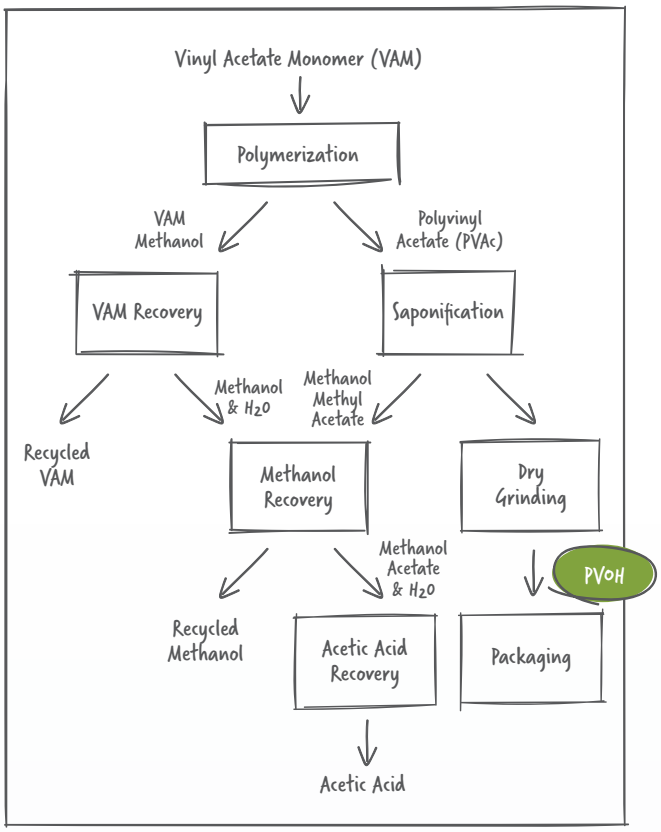
It is also used in agricultural applications to make farming more efficient while leaving the delicate, growing ecosystem untouched.

Selvol Life Cycle Analysis

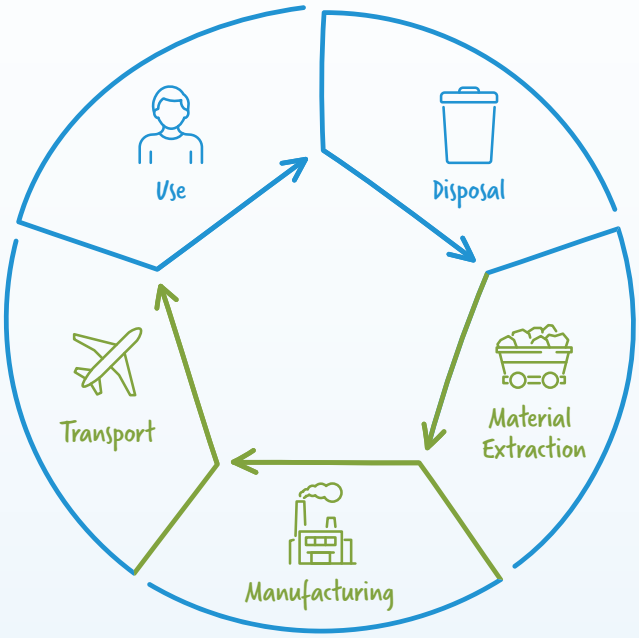
Sekisui Specialty Chemicals (SSC) is strongly committed to preserving a global environment in which future generations can prosper. SSC has three ISO 9001 and ISO 14001 certified manufacturing facilities located in the US and Spain, and a robust supply chain network that delivers our polymers to customers around the world. Because our operations span the planet, we take environmental responsibility very seriously. Our goal is to contribute to the survival of the planet by minimizing our impact on natural capital (i.e. soil, air, water, mineral, flora, fauna, etc), and implementing measures to combat rising greenhouse-gas emissions and overconsumption of resources. To better understand our impact on the global environment, we were one of the first in our industry to commission a Life Cycle Analysis (LCA) study in 2012. We conducted our last LCA in 2023 and plan to continue a regular cadence of analysis to document our progress towards our 2030 goal of 50% CO2 reduction.

Here at SSC, an LCA is not a one-time process. In accordance with the spirit of Kaizen (continual improvement), regular LCA assessments will allow SSC to track our environmental effects over time and continually improve our sustainability practices. This LCA helps identify opportunities for resource efficiency, waste reduction, and energy savings, leading to cost savings as well as environmental benefits. SSC is continually looking to optimize our supply chains, reduce risks, and enhance overall sustainability.

Figure 1: Our Manufacturing Process



Cradle to Grave Versus Cradle to Gate



What is an LCA?

Life Cycle Assessment is a method of systematically assessing the environmental burdens associated with a product, process or activity over the whole of its life cycle. The international standard for life cycle assessment, ISO 14040, states that:

"LCA addresses the environmental aspects and potential environmental impacts (e.g. use of resources and the environmental consequences of releases) throughout a product's life cycle**" (ISO, 2006b).

The assessment compiles relevant energy, material, and environmental inputs to operation and evaluates the potential environmental impacts associated with the total operation.

The results of the assessment are presented in "cradle to gate" format. They include the impacts of extraction and transportation of raw materials, production and transport of fuels, production and transport of packaging to our facilities, production of products ready for shipment to customers, and by-products.

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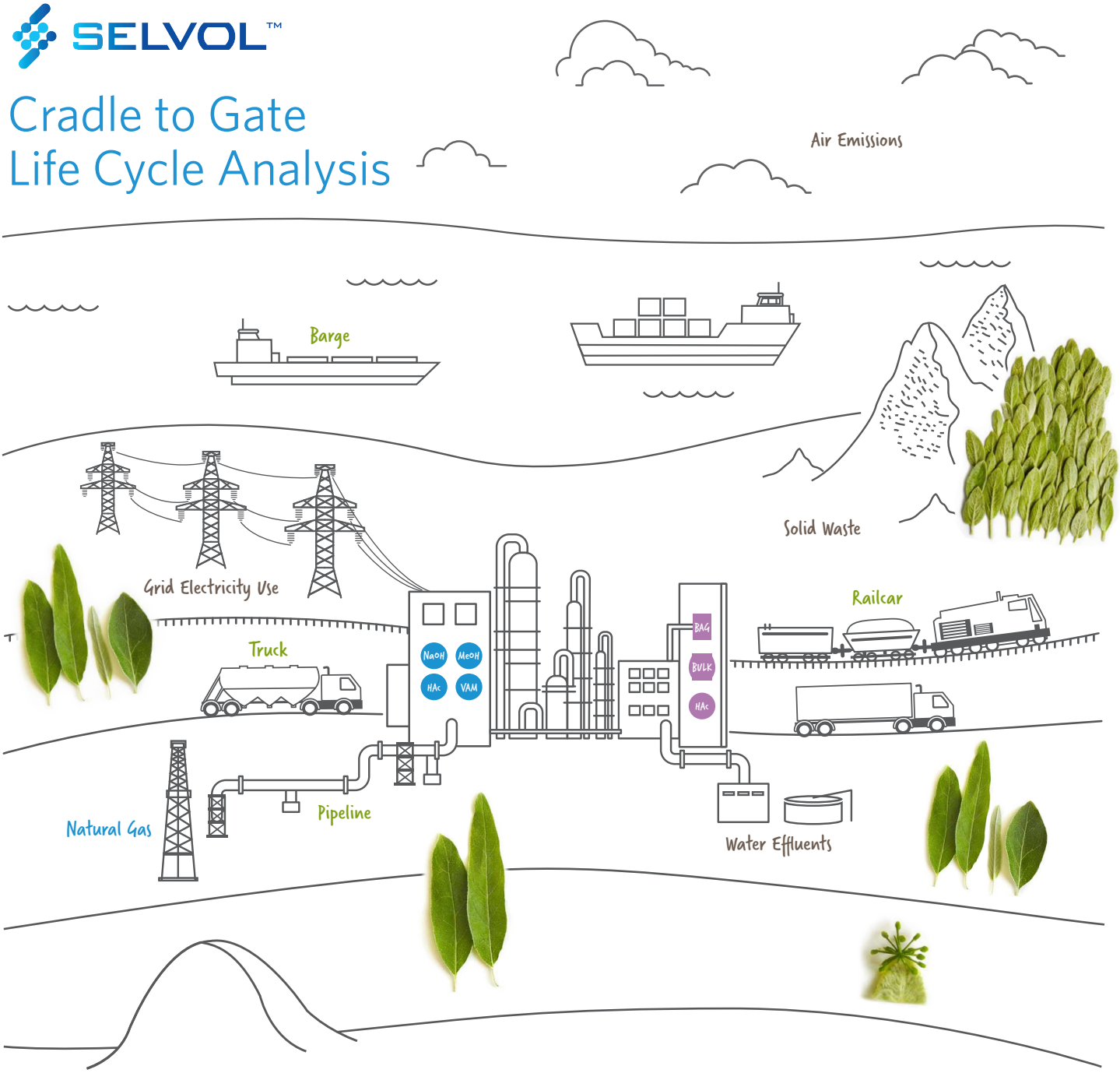
Cradle to Gate Life Cycle Analysis



KEY: Transportation Raw Materials Environmental Impacts Process outputs

1) Inputs*

The cradle to gate analysis begins with an assessment of raw materials, energy, and transportation inputs to the process. These include electricity, fuel, vinyl acetate monomer (VAM), methanol, and acetic acid as a by-product.†

2) Process

The Process of producing Selvol polyvinyl alcohol actually varies from plant to plant depending on plant capabilities. The results presented here are the average of all three plants. Our manufacturing process includes VAM polymerization, PVAc saponification, acetic acid recovery and recycling steps.

3) Results

The cradle to gate LCA analysis ends with finished bags and bulk containers of Selvol sitting at our front door waiting for shipment to customers. The impacts of our processes on terrestrial acidification, water deprivation potential, and carbon emissions are detailed in "The Results" section.

**The cradle to gate analysis includes the use of primary data provided by SSC and secondary data from the Ecoinvent database V3.11.*

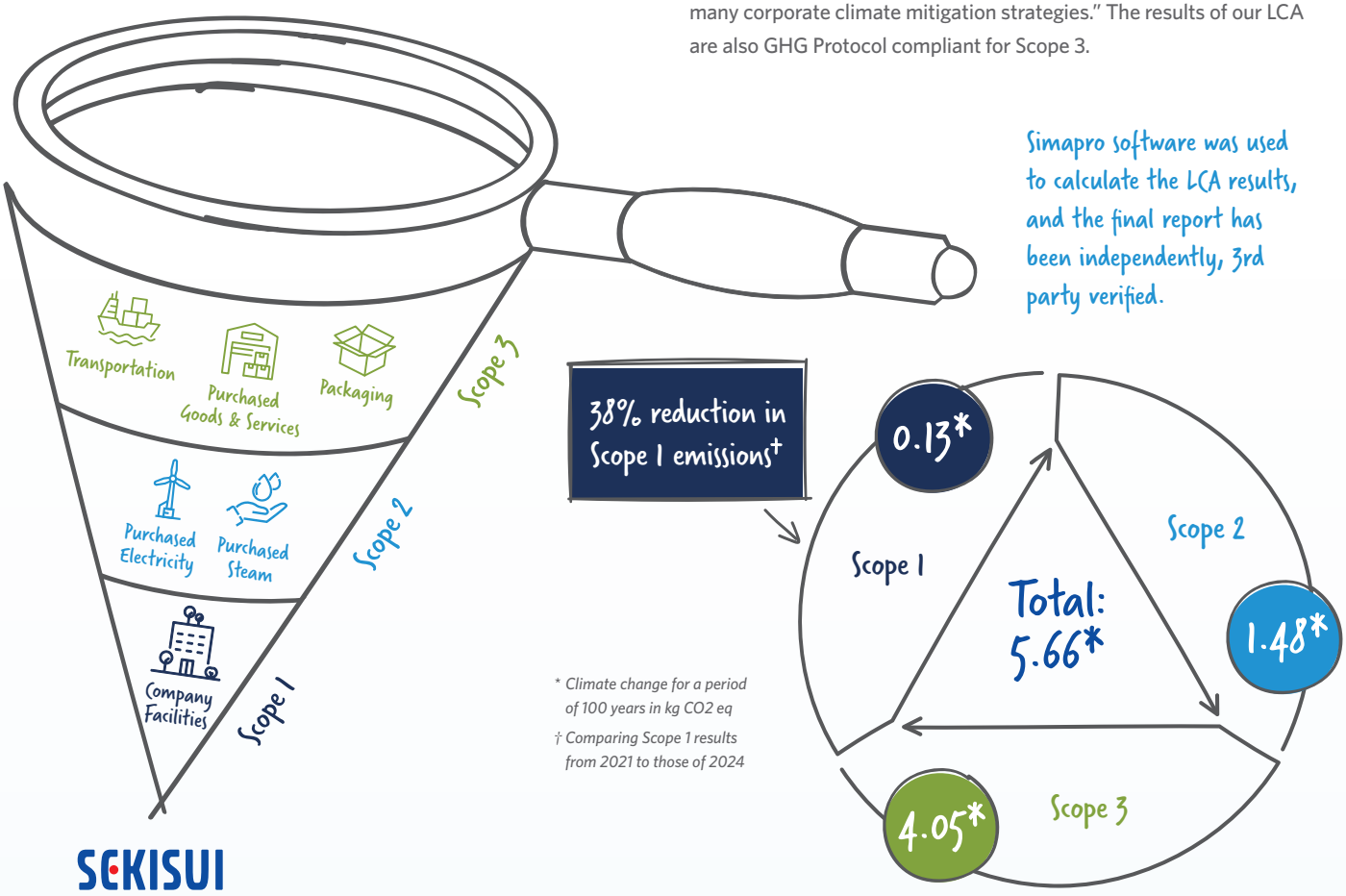
† By-products are materials of value that are produced as a residual of, or incidental to, the production process.

Note: The use and end-of-life phase have not been calculated in this study, since both are part of another life cycle corresponding to the consumer of this product.

Data Discovery and Verification

The LCA was performed in accordance with ISO 14040 and ISO 14044. The first step in the LCA process was to calculate the energy and raw material inputs and air emissions, water effluents, and solid waste outputs based on polymer production. This LCA was calculated in 2025 with data from 2024, and represents data collected from all three SSC manufacturing plants.

The report is also aligned with the PCF (Product Carbon Footprint Guideline for the Chemical Industry) guideline created by TfS (Together for Sustainability V3.0) initiative. As per PCF guideline, "a major share of the industry's greenhouse gas (GHG) emissions arises from the upstream value chain (scope 3). Increasing data transparency and accuracy on the product-level is a key element to drive emission reductions along the value chain and is a strategic cornerstone of many corporate climate mitigation strategies." The results of our LCA are also GHG Protocol compliant for Scope 3.



Simapro software was used to calculate the LCA results, and the final report has been independently, 3rd party verified.

38% reduction in Scope 1 emissions†

* *Climate change for a period of 100 years in kg CO2 eq*

† *Comparing Scope 1 results from 2021 to those of 2024*

The Results

We look forward to sharing the results with our customers to help them achieve their sustainability goals for future products. The results of the analysis included the following topics:

- Stratospheric ozone depletion (kg CFC-11 eq.)
- Ozone formation, human health (kg NOx eq)
- Fine particulate matter formation (kg PM2.5 eq)
- Ozone formation, terrestrial ecosystems (kg NOx eq)
- Terrestrial acidification (kg SO2 eq)
- Freshwater eutrophication (kg P eq)
- Marine eutrophication (kg N eq)
- Water consumption (m3)

For more information about specific data for the calculated impact categories, please contact your local Sekisui representative.

All provided results in this flyer are based on 1 kg of Selvol PVOH production, the average of all three plants, including the impact of by-products. Please see the By-Product Allocated Addendum for results separated between PVOH and its by-products.

About Sekisui Chemical Company

A new frontier, a new lifestyle. Sekisui Chemical Group is a multibillion dollar, global company that delivers a wide range of products and services to enrich people's lives. Sekisui has been striving to 'produce a better world with creative technologies' since its formation in 1947. The company is comprised of core businesses and technologies in housing, social infrastructure, and chemical solutions. Minimizing environmental impact and maximizing the environmental benefit of products and solutions are core values of Sekisui's Corporate Social Responsibility philosophy.

Innovation for the Earth

Climate Water CDP A List 2025

Forests CDP A List 2025

Sekisui was recognized as "A List" for Climate Change and Water Security for the third consecutive year by CDP, a global environmental non-profit organization. In addition, Sekisui Chemical was also recognized as "A- List" for Forests for the second consecutive year.

SUSTAINABLE DEVELOPMENT GOALS

As a part of our 'Vision 2030' medium-term management plan, Sekisui Chemical Group has committed to supporting the UN's Sustainable Development Goals. We are proud to say our activities support at least 8 of the 17 goals.

Sekisui Chemical was selected as one of the Top 10% companies of S&P Global Sustainability Yearbook 2025. This is the 15th consecutive year, since 2011, that Sekisui Chemical has been selected.

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