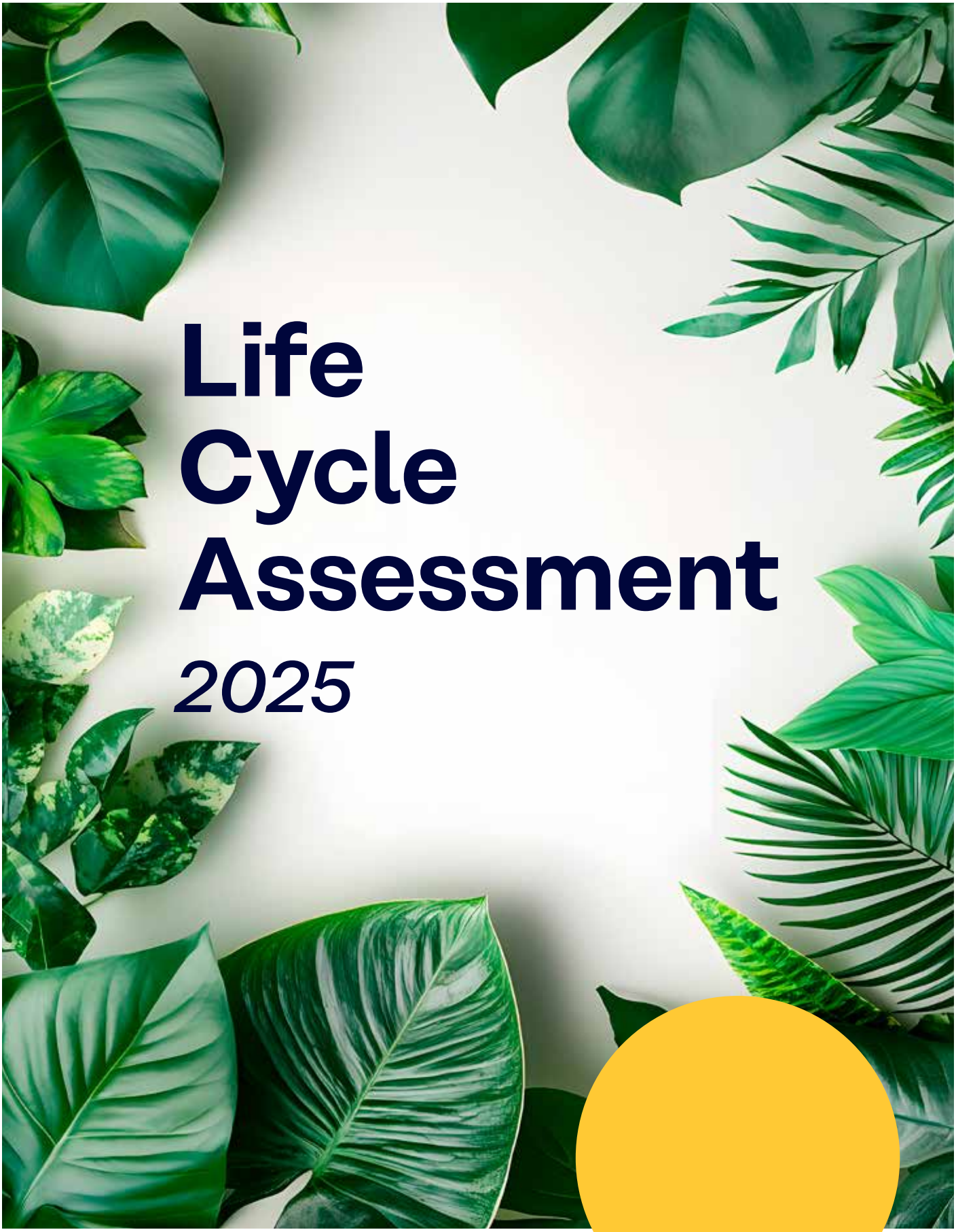


Life Cycle Assessment

2025

kuraray

Kuraray Poval™

Kuraray Poval™

All about our Polyvinyl Alcohol (PVOH) Life Cycle Assessment



1

What is a LCA?
The European Committee for Standardization defines life cycle assessment as a method for quantifying environmental impacts based on an inventory of environmental factors of a product, process, or activity from raw material extraction to final disposal.

2

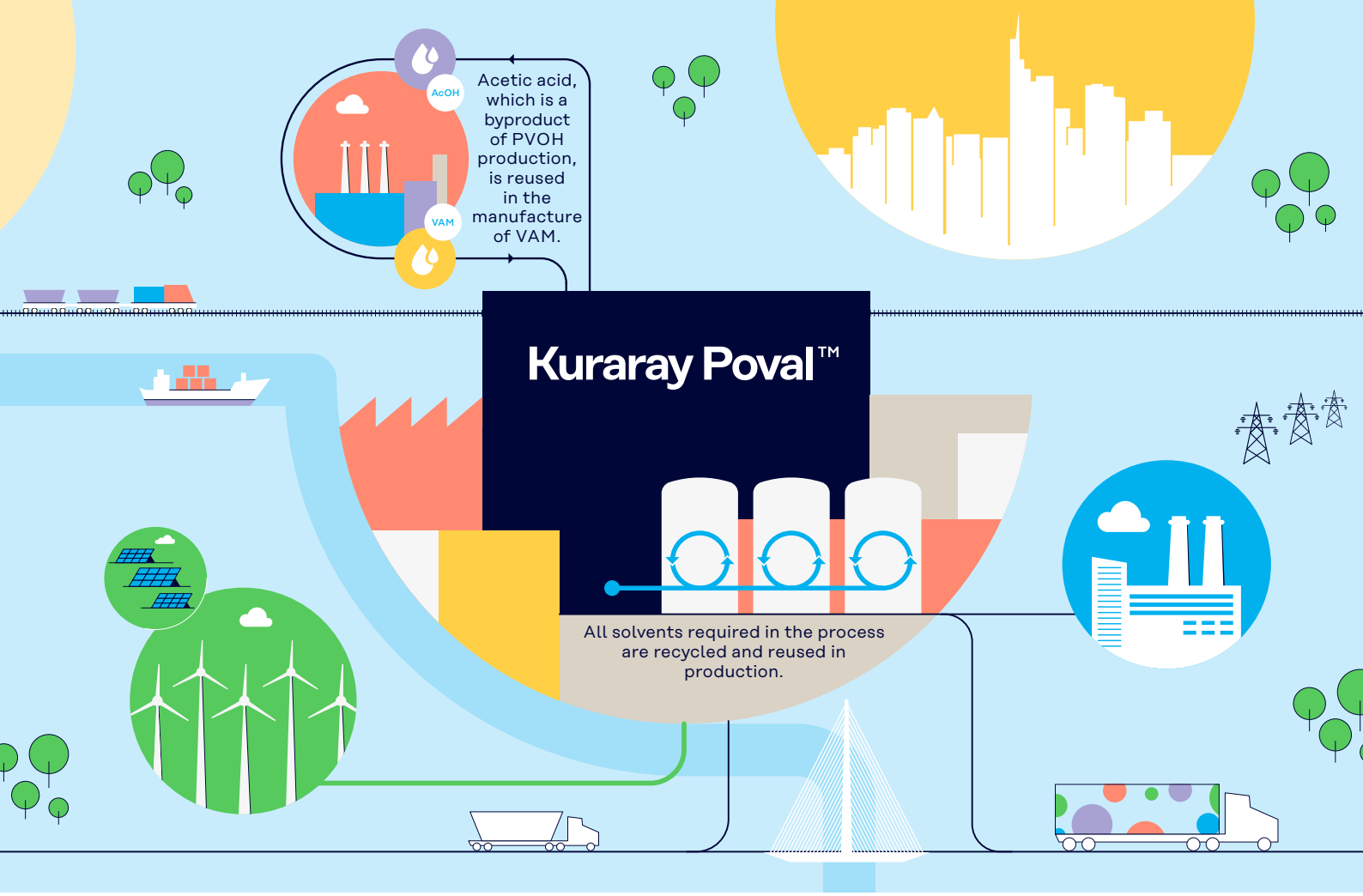
What is a CO_2 Footprint?
A carbon footprint is the amount of greenhouse gases – primarily carbon dioxide – released into the atmosphere by particular human activities. It is measured as tons of CO_2 emitted per year / per ton / per m^2 of product. This figure can be supplemented by tons of CO_2 -equivalent gases, including methane, nitrous oxide, and other greenhouse gases.

3

Cradle-to-gate
From raw material extraction to the factory gate. Since PVOH is used in numerous applications, a cradle-to-gate analysis was performed. This includes all production steps, from the manufacture of raw materials and chemical precursors to energy production and consumption, transport, and processing.

4

Why do we have an LCA?
We are aware that we come from an industry that is responsible for a certain proportion of greenhouse gases. As a company, we take responsibility for this and have always been improving our efficiency in all areas of our production. Considering this, we believe that providing the LCA calculation could be valuable for our customers and partners. Moreover, we aim to further contribute to enhancing the sustainability of our product across its wide range of applications.



For people and the planet – to achieve what no one else can.

Life Cycle Assessment: Data & Scope

- Reference standards/guidelines: ISO 14040, ISO 14044, ISO 14067
- Reference period: 2025
- System boundary: Scope 1, Scope 2, and Scope 3 (Categories 1, 3, 4, and 5, cradle-to-gate)
- Calculation software: LCA for Experts (GaBi), provided by Sphera Solutions GmbH
- Database: Managed LCA Content (MLC), version 2026.1, provided by Sphera Solutions GmbH
- Impact Assessment Methodology: IPCC AR6 GWP 100
- Verification method: Internal verification by responsible department of LCA

Note:

a. A cut off rule was applied for some minor raw materials within the range of 2% or less of the total input weight to the process subject to the calculation.
b. Mass allocation of all Greenhouse Gas (GHG) emissions of the plant was applied to the main product and a co-product.
c. The data provided before July 31, 2026, was calculated using a different version of the database. We have confirmed that the differences in Product Carbon Footprint (PCF) values from the previous year are more significantly influenced by the database updates than by our production conditions.

Disclaimer: The above PCF calculation values are based on the amount of activity and GHG emissions factors available at the time of calculation. These are not guaranteed values. The PCF calculation values are subject to revision in a timely manner due to improvements or changes in manufacturing processes, updates to GHG emission factors, and revisions to related laws, regulations, guidelines, or the issuance of new regulations. It does not allow for comparisons with the PCF of other companies' products.

Climate Change

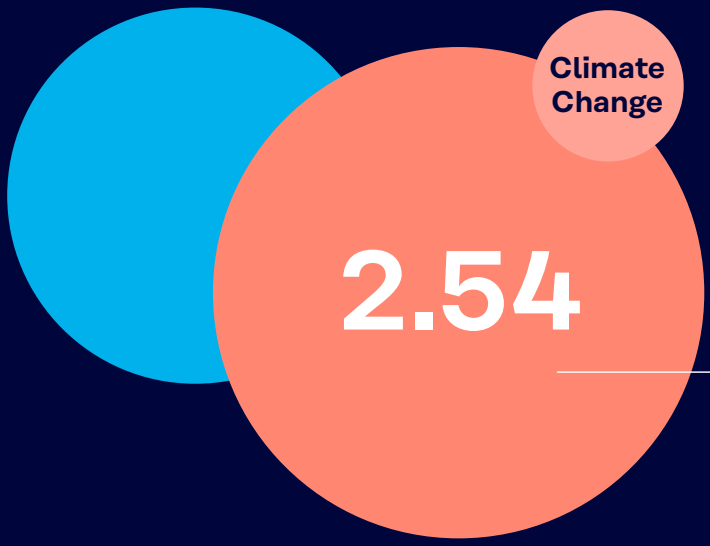
Greenhouse Gas emissions, such as CO_2 and methane contribute to the enhanced greenhouse effect by increasing the absorption of radiation emitted by the Earth. This intensification of the natural greenhouse effect may lead to adverse impacts on ecosystem health, human well-being and material welfare.

Kuraray Poval™

CO_2 Footprint

Sustainability means transparency!

LCA Results: KURARAY POVAL™ produced in Frankfurt a.M., Germany



The Climate Change impact for a period of 100 years is 2.54kg CO_2-eq per kg KURARAY POVAL™

The smaller our footprint, the better for yours!

KURARAY POVAL™ can contribute to the sustainability of your product as it is inherently biodegradable in aqueous solution form. Please note that the biodegradability of PVOH is associated with a renewed CO_2 emission of 2 kg CO_2 per kg PVOH, regardless of which PVOH it is.

Our Sustainability Activities

Improving Energy Efficiency

We have continuously worked to increase our efficiency and reduce our energy consumption. A major investment in 2012 and 2013 contributed to energy savings of 20% in our production process. This resulted in a 6% reduction in our carbon footprint. Our production has been ISO 50001 certified for many years. A few years ago, these measures were cost-driven, but today we are also driving energy-saving projects in awareness of our environmental and social responsibility.

Our Past & Present

In addition to transparency, we believe that dialogue is also an important component of sustainable development. We aim to share our experience and knowledge in the field of energy efficiency and become more sustainable and environmentally friendly together with other companies in the region. Since early 2020, we have been a member of the 3rd Rhine-Main Energy Efficiency Network. In recognition of our efforts to use energy resources more efficiently, we have been awarded the AGEEN seal of approval.

... now looking to our future!

Our Sustainability Taskforce is continuously working to reduce energy consumption and improve our sustainability performance. It is important to note that the largest part of our carbon footprint comes from our raw material vinyl acetate. We take responsibility for our share by consistently pursuing optimization and innovation. Sustainability must be viewed holistically. That´s why we are a member of the Process4Sustainability initiative at our production site in Frankfurt-Höchst. It is a cooperative effort with other local companies and the site operator Infraserv to work on green solutions to make our industry fit for the future.

Process4 Sustainability

HESSEN Hessisches Ministerium für Wirtschaft, Energie, Verkehr, Wohnen und ländlichen Raum

RENEWABLE CARBON INITIATIVE CO_2 Member

Certificate Holder ISCC International Sustainability & Carbon Certification

4ever green

Adding value to your products – worldwide

KURARAY POVAL™, EXCEVAL™, ELVANOL™, and MOWIFLEX™ are the trademarks for polyvinyl alcohol (PVOH) resins made by Kuraray. Their key characteristics — outstanding film-forming properties and high binding strength — add real value to your products. Our polymers are water-soluble, highly reactive, crosslinkable and foamable. They have high pigment binding capacity, protective colloid characteristics and thickening effects. The physical and chemical properties of KURARAY POVAL™ make it ideal for a wide variety of applications, ranging from adhesives through paper and ceramics to packaging films. Many of our polymers are food contact-approved and thus suitable for food applications.

Kuraray produces its wide range of KURARAY POVAL™ grades in Japan, Singapore, Germany and the United States. Kuraray's global production and service network make us your partner of choice for innovative high-quality PVOH resins.



Kuraray Poval™

PLEASE CONTACT US

poval.kuraray.com

kuraray

HEADQUARTERS

Kuraray Co., Ltd.
Tokiwabashi Tower
2-6-4, Otemachi
Chiyoda-ku
Tokyo, Japan 100-0004

Kuraray America, Inc.
3700 Bay Area Blvd.,
Suite 680 Houston, TX77058
United States of America

Kuraray Asia Pacific Pte., Ltd.
1 North Buona Vista Link
#12-10/11, Elementum
Singapore 139691

Kuraray Europe GmbH
Philipp-Reis-Str. 4
65795 Hattersheim am Main,
Germany

Kuraray Shanghai Co., Ltd.
Unit 2207, 2 Grand Gateway
3 Hongqiao Road, Xuhui District, Shanghai
200030, China

DISCLAIMER
KURARAY POVAL™, EXCEVAL™, ELVANOL™, and MOWIFLEX™ are the trademarks or registered trademarks of Kuraray or its affiliated companies. The information, recommendations, and details in this document are provided based on sufficient consideration to the best of Kuraray's knowledge. However, they are not intended to guarantee any characteristics beyond the product specifications. Customers should verify the suitability of our products for their intended use and compliance with relevant laws and regulations. Neither Kuraray nor any of its affiliated companies makes any warranty or responsibility for any errors, inaccuracies, or omissions in this document.

10_2026