

Polyvinylbutyral (PVB): a boost in the recycling of laminated glass?

PVB-recycling: the vision of a PVB-producer

Sunrise workshop at Ecomondo, Italy, 2024 November

kuraray **Trosifol[®]** **SentryGlas[®]**

Main Kuraray products

Vinyl Acetate Derivatives	 <p>PVA Resins</p>	 <p>PVA film (Optical-Use)</p>	 <p>PVA film (Water-Soluble)</p>	 <p>EVOH Resins</p>	 <p>Plantic™</p>	 <p>PVB resin / film: Mowital*, Trosifol* PVB & SentryGlas® ionoplast</p>	<p>★ World No.1 Market Share or Only 1 Product</p>
Isoprene Chemicals	 <p>Isoprene chemicals</p>	 <p>SEPTON™ Thermoplastic Elastomer</p>	 <p>Liquid Rubber</p>	 <p>GENESTAR™ Heat-resistant polyamide</p>	 <p>KURARITY™ Acrylic Thermoplastic Elastomer</p>		
Fibers and Textiles	 <p>KURALON™ PVA Fibers</p>	 <p>VECTRAN® Polyarylate Fiber</p>	 <p>KURAFLEX non-woven fabrics</p>	 <p>Polyester Fibers</p>	 <p>Fastening Hook-and-loop fastner</p>		
Function Materials / others	 <p>Methacryl Resins</p>	 <p>CLARINO™ Manmade leather</p>	 <p>Dental Materials</p>	 <p>Activated carbon</p>	 <p>Environmental</p>		

Kuraray's Advanced Interlayer Solutions Division (AIS)

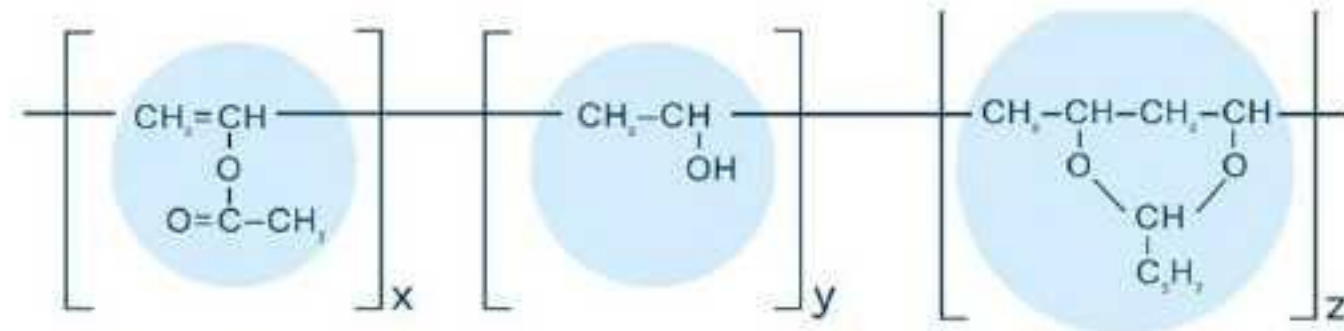
YOUR PREFERRED PARTNER FOR LAMINATED SAFETY GLASS

- 7 Manufacturing sites
- 2 R&D Labs
- 18 Sales Offices

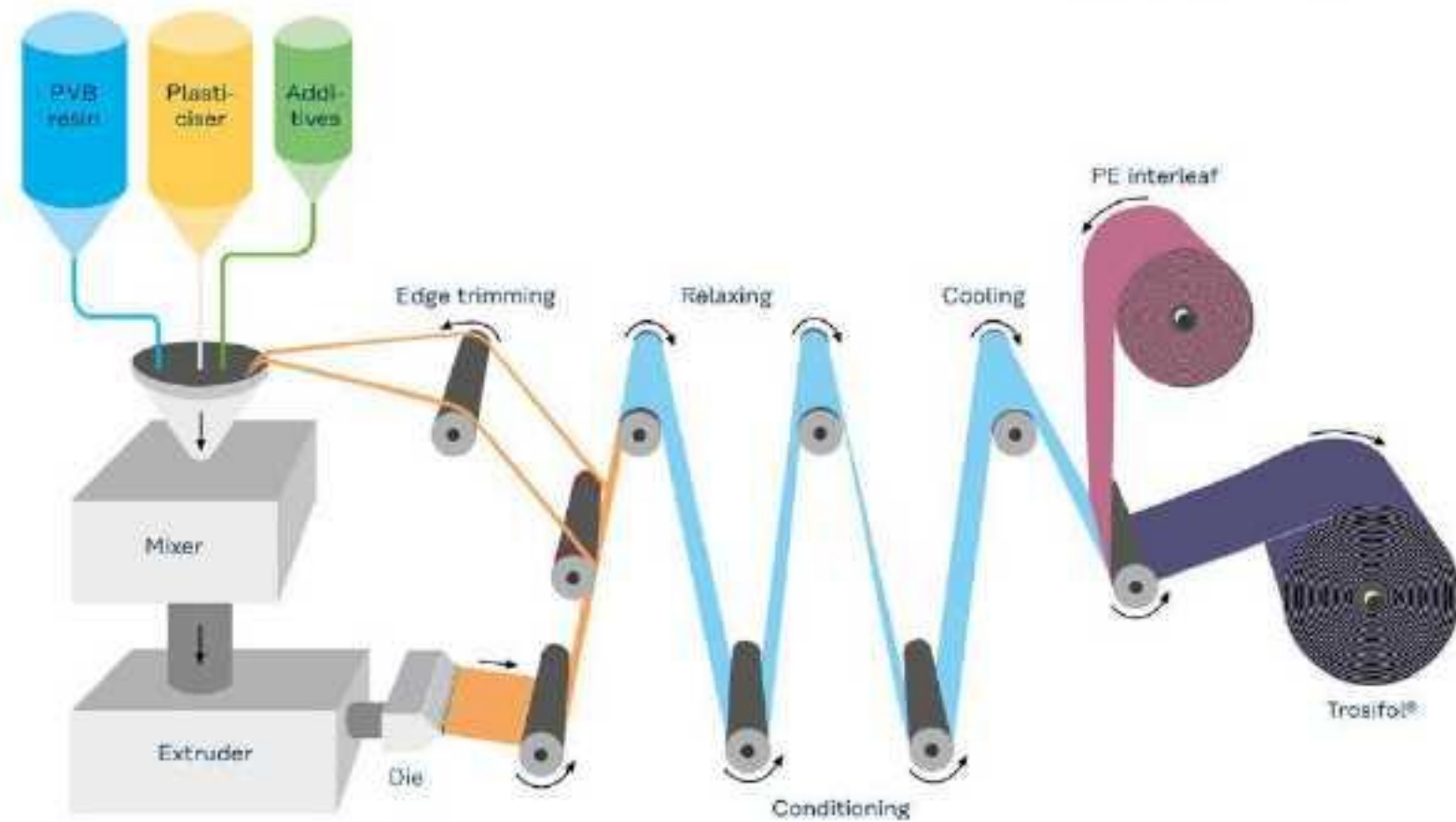


Trosifol® General information

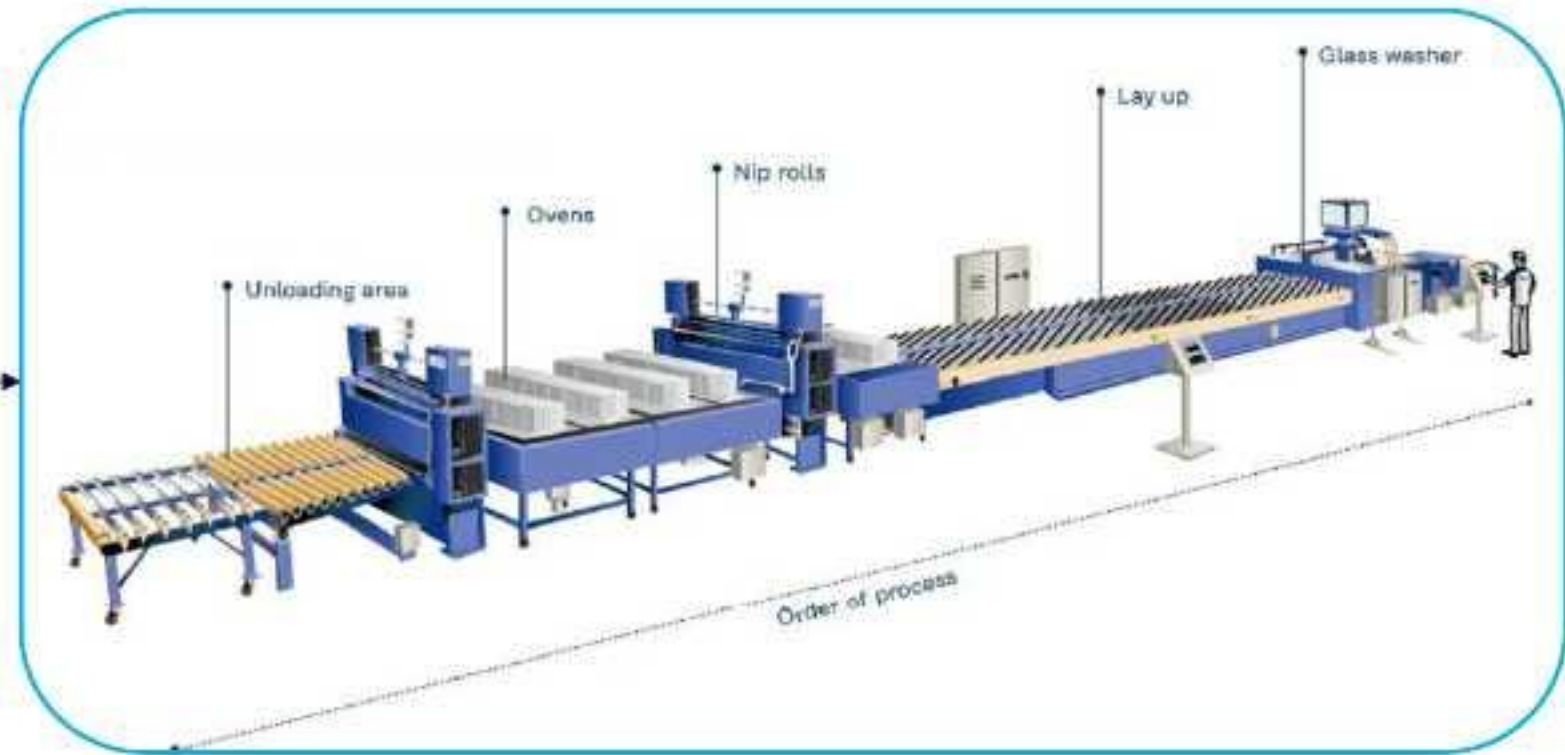
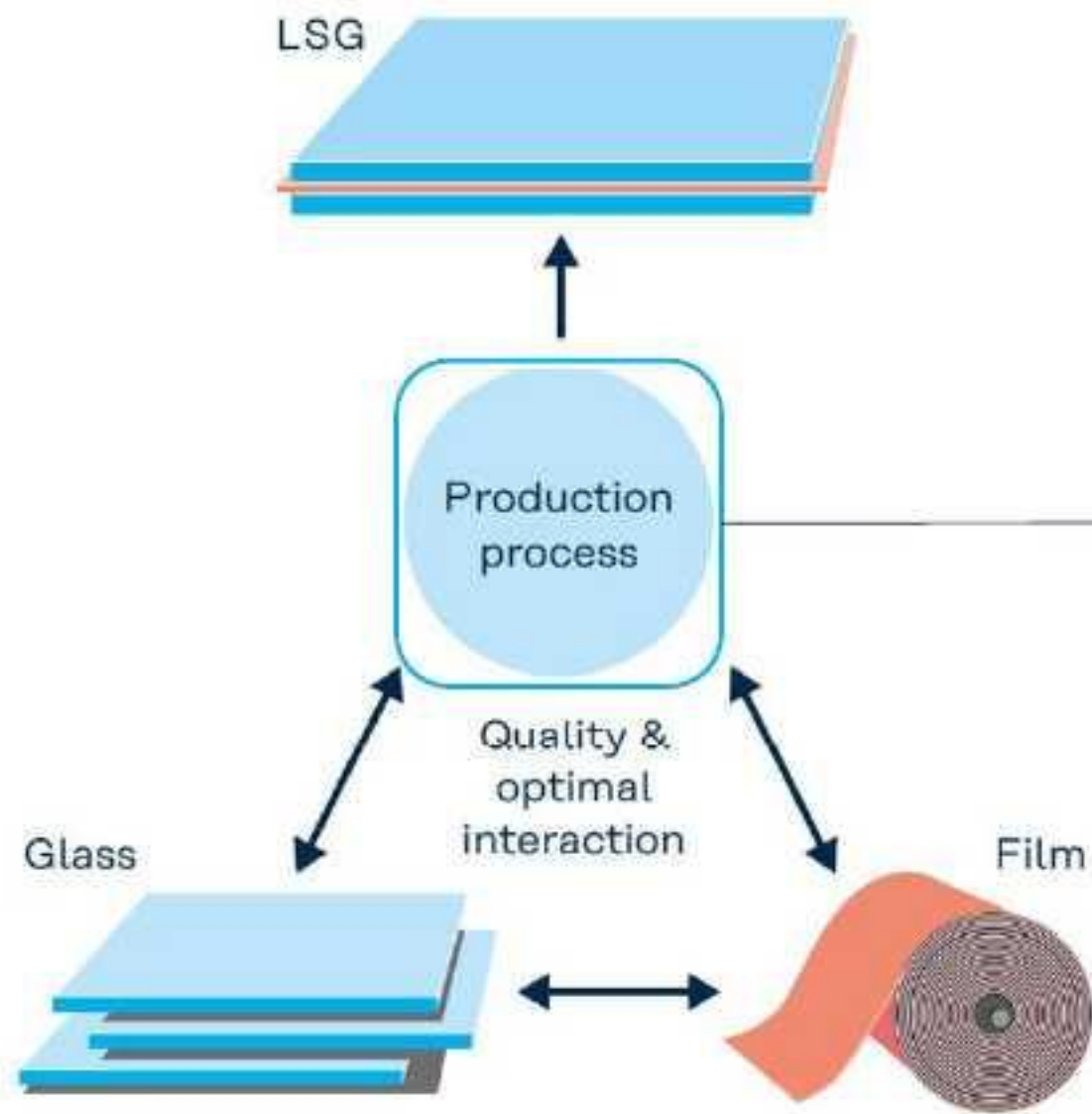
Polyvinylbutyral (PVB):



Trosifol® PVB film production:



Trosifol® The laminating process



AIS product portfolio to fit glazing needs Trosifol® PVB film applications

Facade & Curtain Walls



Balustrades & Railings



Acoustic Glazing



Roof & Overhead Glazing



Glass Fins



Screens & Louvers



Floors, Stairs & Bridges



Windows & Doors



Automotive glazing



Sustainable glazing

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Trosifol®

SentryGlas®

November 29, 2024

Advanced Interlayer Solution Division

Sustainability as an opportunity

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Trosifol™ SentryGlas®

Our commitment


Environmental protection and safety have top priority for our company.

We strive for a lasting improvement in environmental protection.

We develop products and technologies that help improve the environment.

We will always conduct business in a free, fair and transparent manner.





Our mission

We are committed to developing new fields of business using pioneering technology that improves the environment and enhances the quality of life through the world.

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

Kuraray sustainability long-term vision in facts (scope 1+2)



Advanced Interlayer Solutions

Sustainability long-term vision in facts (scope 1+2)



Scope 1

direct emissions

Covers all direct GHG emissions from your companies' activities

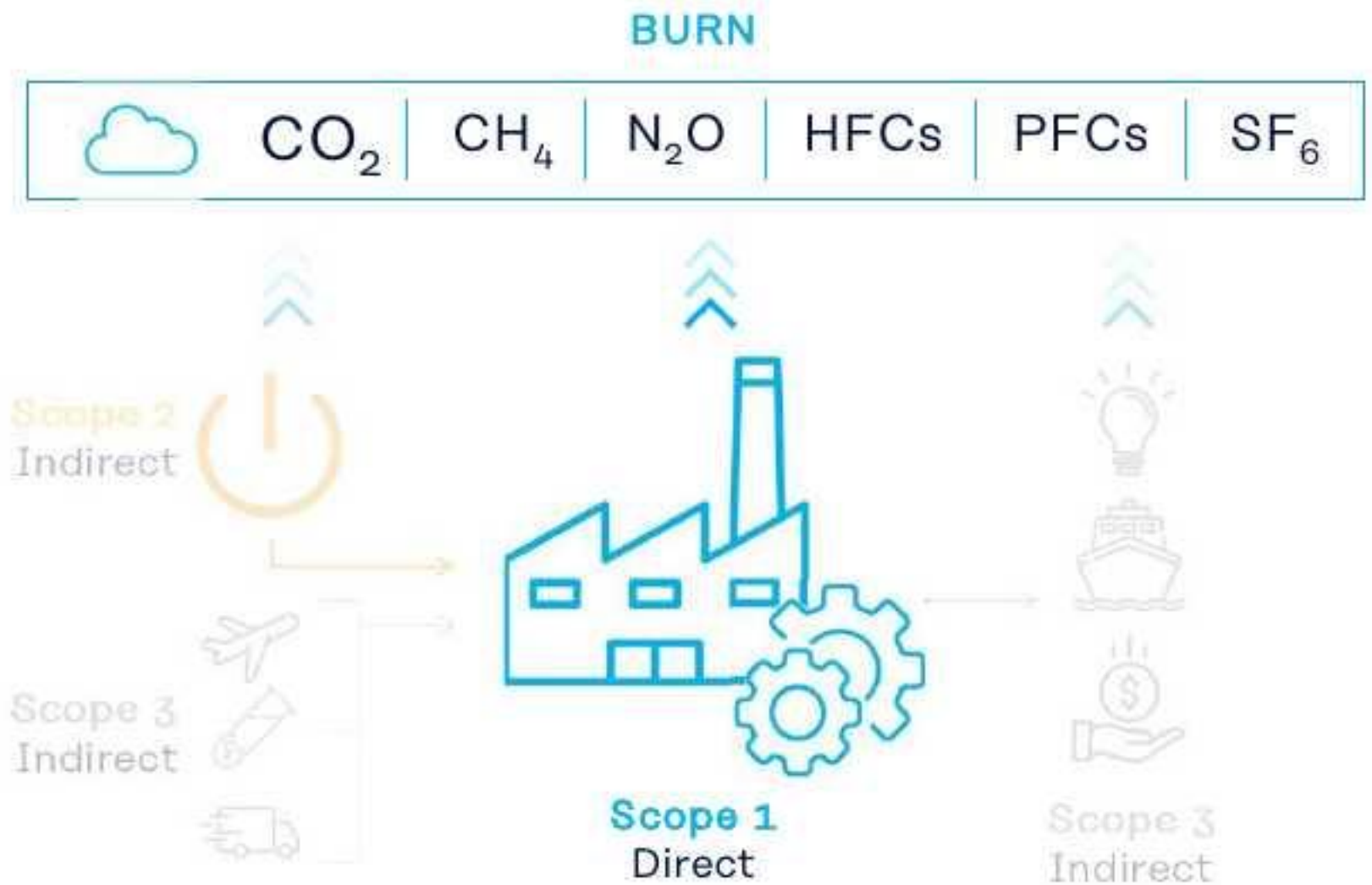
- Primary energy consumed in your facility

Company car fuel consumption

Diesel generator

Heating (gas burning)

Direct emission from process by chemical reaction (cement production)



Scope 2

indirect emissions

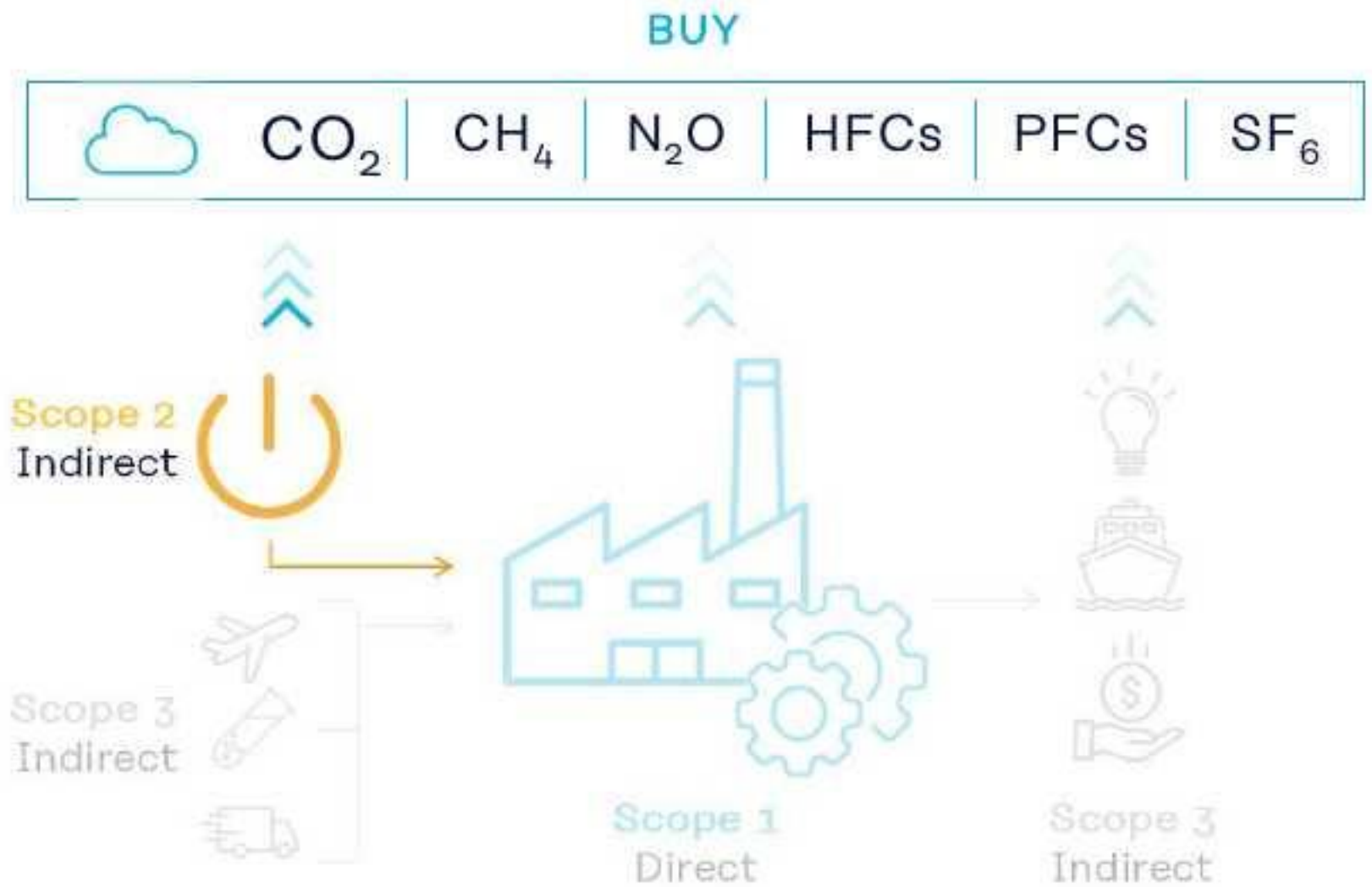
Indirect emissions resulting from the production of energy purchased by a company

Electricity

District heating

Steam

Cooling energy



Scope 3

indirect emissions

Indirect emissions resulting from up-
downstream company activities

Upstream:

Goods and products for production
(raw materials, packaging)

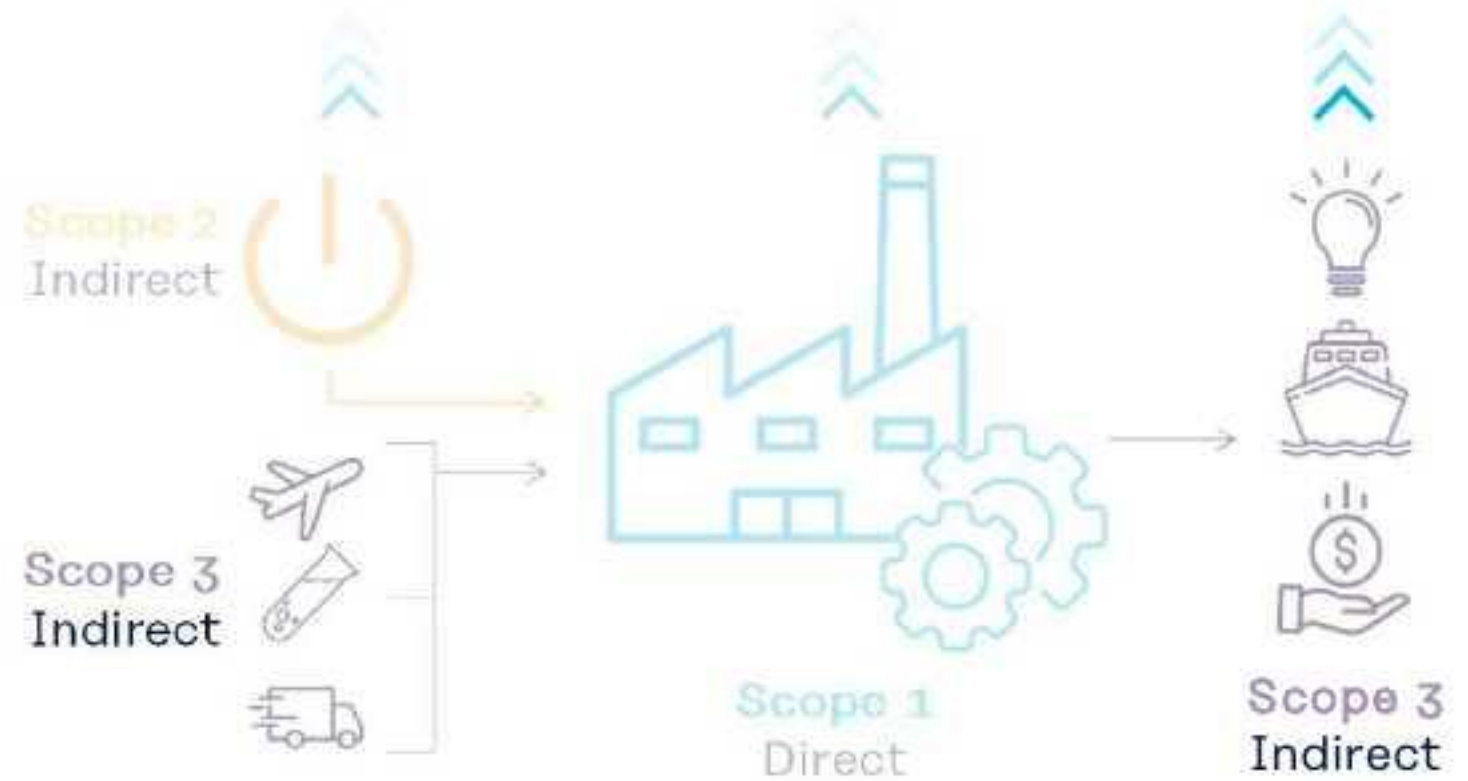
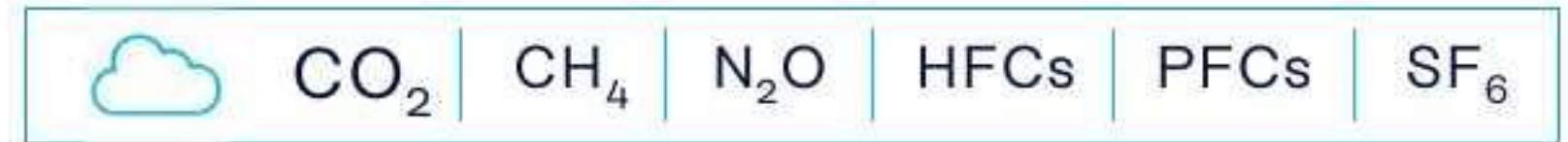
Logistics

Downstream:

Use and end of life of products

Logistics

BEYOND



Sustainability Targets

Advanced Interlayer Solutions

75%
reduction
by 2030

carbon
neutral
by 2050

Sustainability – Current Interlayer products are already contributing to Social and Natural Environment

Improving the Natural environment



Solution of Plastic waste



Affordable and Clean Energy

Natural Environment contributing products

Trosifol® R3 and SentryGlas® Interlayer Film

PVB interlayer for Building integrated PV (BIPV)

Improving the living environment



Good Health and Well being



Sustainable Cities and communities

Social Environment contributing products

Safety Glass in Cars (Acoustic PVB, SentryGlas®, CPET®) and Trosifol® CamViera® For ADAS*

Hurricane resistant glazing

*advanced Driver Assist System

Green House Gas (GHG) emission Scope 1+2 targets

121kt CO₂
(2019)



EMEA
US
Korea



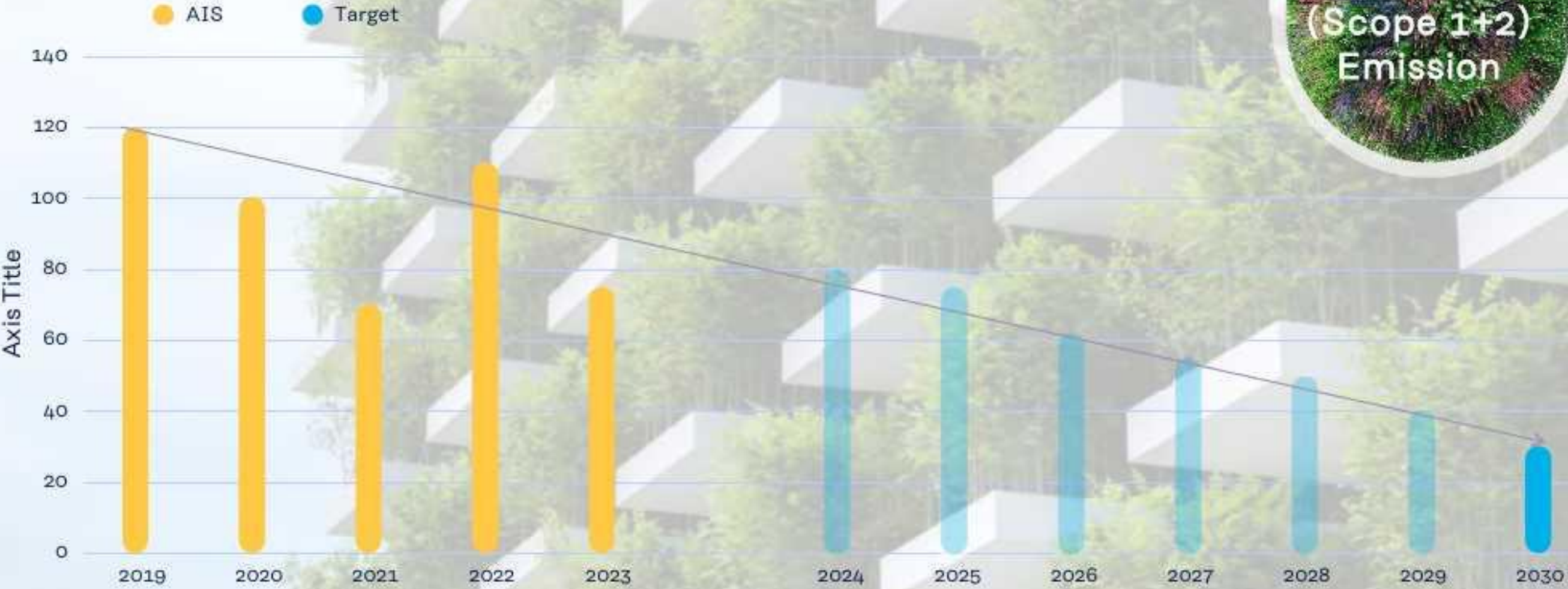
30kt CO₂
(2030)



EMEA
US
Korea

Reduction by
75%, 90kt by
2030

AIS Scope 1+2 status update



Looking into the future



The role of chemical recycling in a Circular Economy

Different loops are necessary for a successful transition towards circularity



Mass balancing (traceability through ISCC+ certification)



Mass balance is general name for several methods of tracking the input of sustainable materials in production and to gradually shift away from virgin fossil to renewable/recycled raw material. All methods rely on the same basic principle of separating renewable and fossil materials in bookkeeping while mixing them in production.

Non mass balance will require dedicated assets and chemical industry is heavily integrated and utilizes intensive assets. Therefore mass balance is the enabler for sustainable products.

The role of mechanical recycling in a Circular Economy

Different loops are necessary for a successful transition towards circularity



The role of mechanical recycling in a Circular Economy

Where are we?

Where are we:

- LSG is recycled by glass recyclers around Europe
- Target is mainly to recover glass
- PVB is considered as waste
- Only 9% of post-consumer PVB waste is recycled



What can we do:

- Pre-sorting of acoustic, clear, and tinted PVB films
- Different waste streams for each PVB film
- Clean environment for dismantling of LSG

Quality for re-PVB*

- Ash content [wt. %]: max 0.5
- Light transmittance [%]: > 87
- Color: transparent

*Measured in a laminate of glass/PVB/glass with a PVB film with a thickness of 0.76mm and 2mm clear float glass (not low iron glass)

Sustainability Story Trosifol® R3 Clear Class B



Sustainability Story Trosifol® R3 Clear Class A





We can't
create the future
alone.

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November 29, 2024

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Thank you!



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