



SOLVAY Specialty Polymers Life Solutions

Empowering Sustainability
Ambitions with no Compromise
on Performance

September 2023

SUSTAINABILITY



The Solvay Team



Ricardo Calumby

Global Marketing Manager Sustainability
& Construction
Solvay Specialty Polymers

A seasoned Materials Engineer and polymers science expert, Ricardo holds an MBA in Business Management, fortifying his extensive 23-year journey across diverse sectors. From aerospace and automotive to consumer goods and packaging, his expertise in business development and marketing has consistently delivered value. Currently, Ricardo champions as the Global Marketing Manager for the Consumer Market at Solvay, melding technical prowess with strategic vision. Join him as he delves deep into sustainability ambitions, blending his vast experience with Solvay's forward-thinking approach.



Philippe Brasseur

Senior Technical Development Engineer
Consumer
Solvay Specialty Polymers

With a foundational degree in Mechanical Engineering, Philippe embarked on his journey at Solvay Automotive in 1995, starting as a CAD designer and swiftly rising to the role of Project Manager. Transitioning in 2001, he took the helm as the head of Specialty Polymers technical support. Over the years, Philippe's multifaceted experience has spanned across sectors ranging from Automotive to Aerospace. In recent times, his expertise has been channeled with an intensified focus on the Healthcare and Consumer markets. Dive into the session with Philippe, a Senior Technical Development Engineer, as he leverages his expansive knowledge in the field.

2030 Solvay One Planet goals

10 ambitious objectives to reduce our global impact

2030 Target
 2022 Progress vs 2018

Climate

Fight against climate crisis



Align Greenhouse Gas Emissions with Paris Agreement & SBTi^{*}
Reach Carbon Neutrality / Scope 1 & Scope 2 by 2040 excl. soda ash, by 2050 incl. soda ash



Reduce by 31%**
10.3 Mt CO₂ 1eq. / Reduced-15% structural

Phase out coal



Exit 5 coal plants
28 PJ/Reduce -15% / 4 plants

Phase out coal



Reduce by 30%
-5%/Reduced / -28% since 2018

Resources

Embed circular business



Increase sustainable Solutions % of Group sales



Achieve 65%
55% / ↑ +5%

Increase circular economy % of Group sales



More than double / 10%
9% since 2018

Reduce Non-Recoverable Industrial waste



Reduce by 30%
56 Kt / Reduce -36% since 2018

Reduce Intake of Freshwater



Reduce by 25%
330 Mm³

Better Life

Improve quality of life



Safety RIIR KPI Reportable Injury and Illness rate



Aim for zero
0.34

Inclusion & Diversity % of women in middle/senior management



Achieve 50% by 2030
26.5% Diversity / ↑ 2.8 pp Inclusion / high participation
Global Employee Share Program

Equity



Publication of gender pay gap in April 2022 and corrective measures in place for 951 people



* SBTi: Science Based Targets initiative
** scope 1&2

1) Biodiversity - year on year



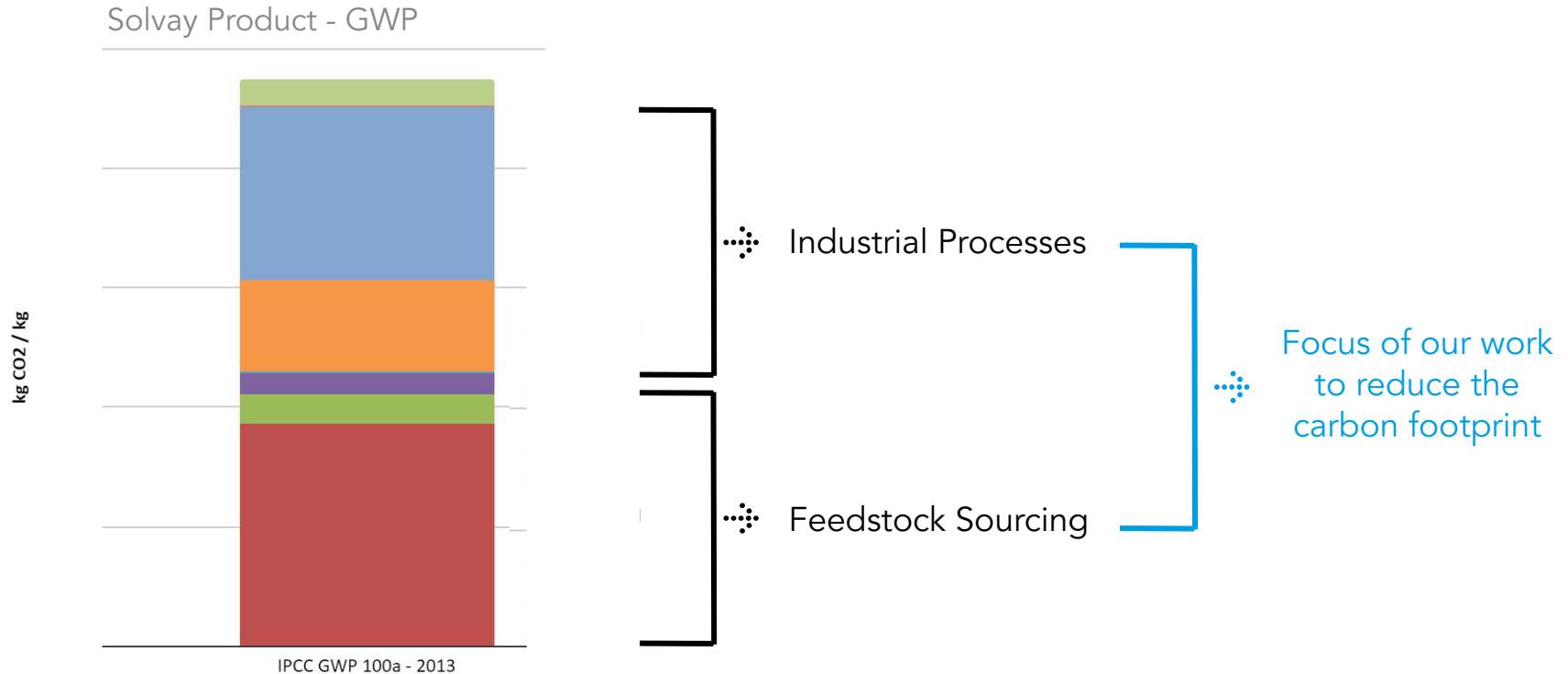
Life Solutions



Focus on Climate & Resources

When looking at the carbon footprint of our products, we observe that

The two main carbon emitters are the raw materials (scope 3) and the industrial processes (scope 1 & 2)





GBU Materials Sustainability Roadmap builds on 2 key levers Renewable Energy and Circular Solutions



CLIMATE

We actively drive transition to renewable energy

→ We aim to be carbon neutral Scope 1, 2 by 2040



RESOURCES

We increase circularity with renewable and circular solutions

- Launch Kalix® in 2013, Amodel® Bios in 2021 and Omnix® ReCycle in 2022
- Launch Mass Balance product portfolio from 2023 (Udel®, Radel®, Ryton®, Amodel®)
- Reach at least 6% of total revenues with circular economy solutions by 2026



Solvay Materials targets Carbon Neutrality by 2040

CO₂ Scope 1, 2 carbon neutral by 2040

- Process energy efficiency
- Solar and wind electricity
- Biogas
- Electric boilers

By 2024, all our compounding facilities will be carbon neutral thanks to transition to renewable electricity.



Wind and biomass
India



Solvay Solar Facilities
United States



Solvay Solar Facilities
France

Solvay Materials Ambition

CO₂ Scope 3 upstream initiatives

- Mass balance bio/circular attributed content
- Bio/recycled based materials
- Engage our suppliers
 - Sustainable procurement & sourcing initiatives launched to collect primary data and open the discussion



POLL QUESTION

What attribute is more relevant to your Application/Market?

- A. Recycled / Bio content %
- B. GWP / Carbon footprint reduction



Life Solutions



RESOURCES

We are on the journey to design more sustainable high performance polymers

without compromising on performance

We are working on 5 different solutions to lower our customers value chain carbon footprint and enable circularity:



Bio-Based
resins



Recycled
resins



Mass balanced
resins



Bio-based
& recycled fillers



Enabling circularity



Life Solutions



RESOURCES

We are happy to introduce our ECHO Portfolio

ECHOing Your Sustainability Ambitions

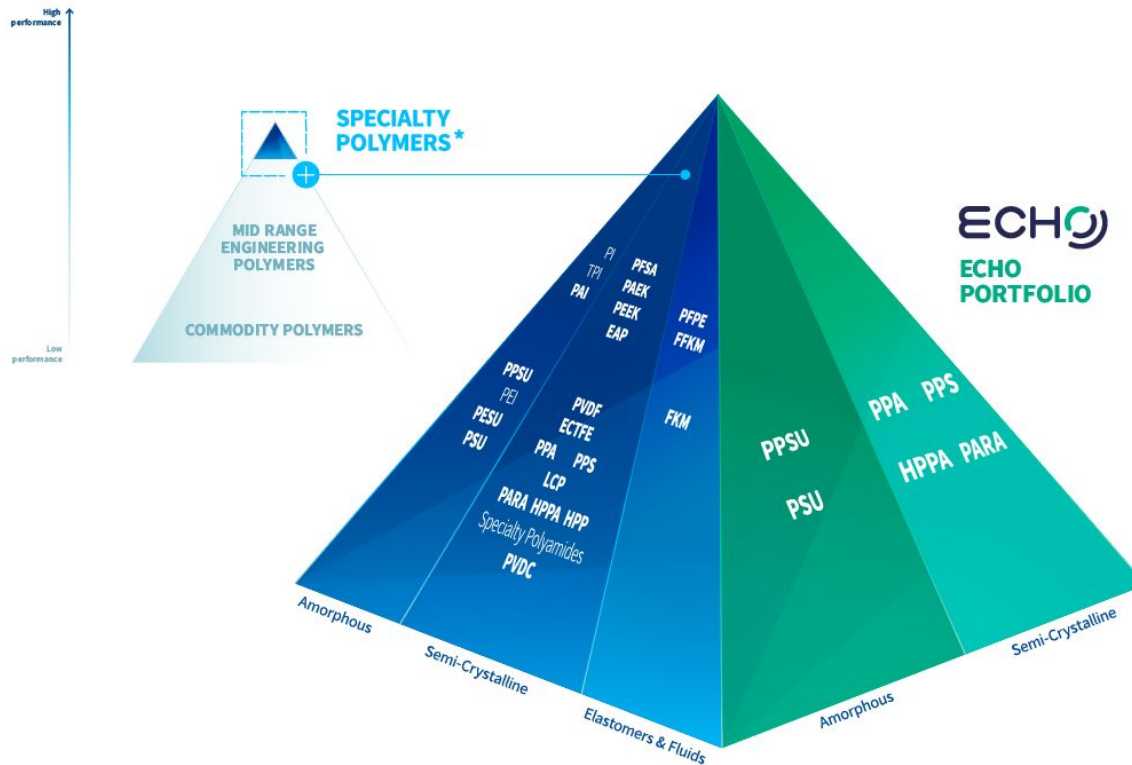


More sustainability,
same performance.

- ❖ Sustainable grades with biobased and/or recycled content
- ❖ A lower carbon footprint than standard grades
- ❖ No compromise on performance

Meet our ECHO Portfolio

More Sustainability, same performance



Bio-Based resins



Integrating 2nd generation of feedstock (non-food competing) in our polymers

Meet our Bio-based grades!

In our portfolio

Commercially available

Kalix® 2xxx Series

62% bio-based HPPA structural material combining rigidity, aesthetics and low moisture pick up

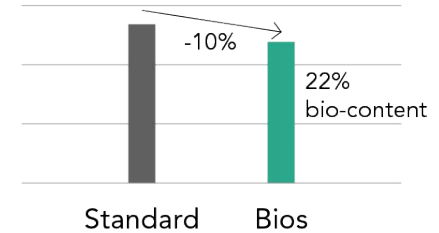


Amodel® PPA Bios

Best-in-class 22% bio-based PPA; available in structural, electrification and flame retardant grades



Amodel GWP kg CO₂ eq/kg



Partnership with Origin Materials to develop decarbonized grades



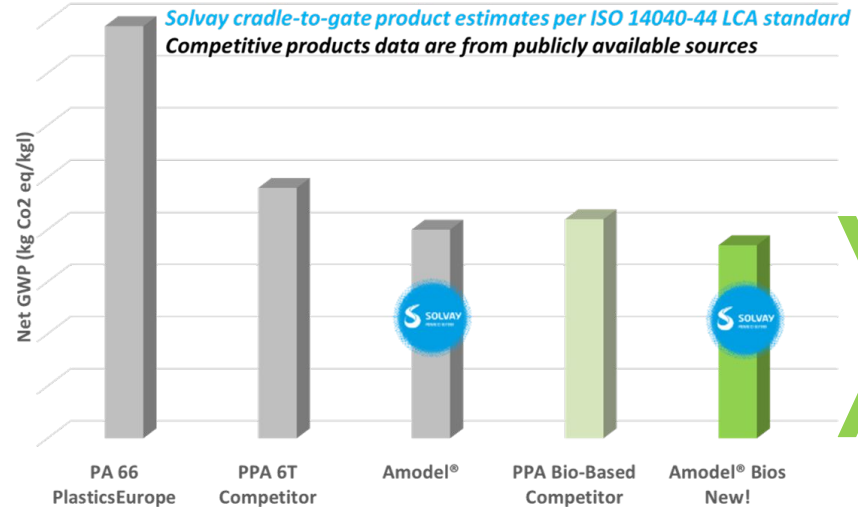


Bio-Based resins



Meet our Bio-based grades!

- Partially **Bio-sourced** (Lower GWP than 6T PPA)
- Bio-based resin from **non-food competing feedstock**
- Resin produced with **100% Renewable Electricity**
- **Highest T_g** (135°C) among Bio-based PPA
- **Lower Moisture absorption** than 6T PPA
- High **elongation & weldline strength**
- **Excellent surface finish** and colorability
- Dimensional Stability & **Chemical resistance**



Lowest GWP among PPAs

Integrating 2nd generation of feedstock (non-food competing) in our polymers



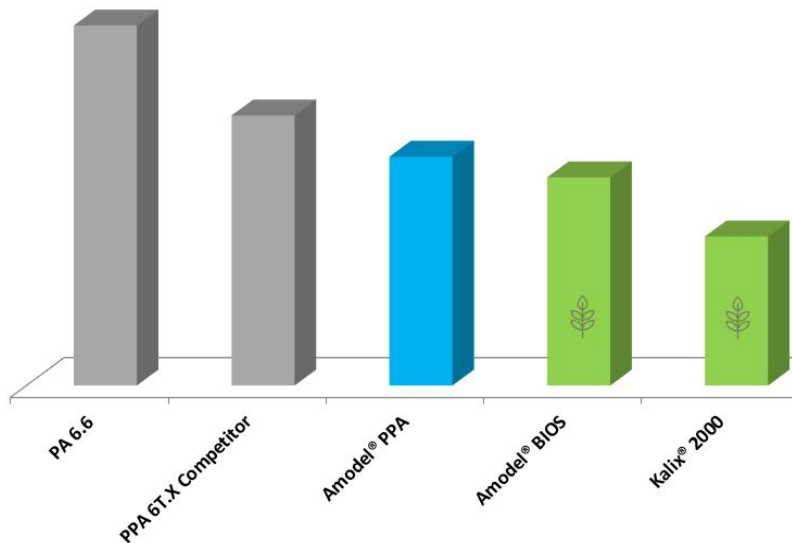
Bio-Based resins



Integrating 2nd generation of feedstock (non-food competing) in our polymers

Meet our Bio-based grades!

Net GWP (kg CO₂ eq/kg)



Kalix® 2xxx Series

HPPA variant - the structural material with optimal combination of:

- strength,
- rigidity,
- aesthetics,
- low moisture pick up,
- bio-based content (made from castor bean oil)
- produced from 100% renewable electricity.

* Calculated based on average of all product grades values



Recycled resins

from PIR and PCR



Meet our Recycled ECHO grades!

Omnix[®] HPPA ECHO RP

with >33% recycled content*, consisting of 70% of recycled based resin, for demanding aesthetic requirements.



Xencor[™] HPPA ECHO

with >33% recycled content*, consisting of 70% of recycled based resin, for demanding aesthetic requirements for applications requiring long fibers technology



Integrating recycled monomers & polymers in our formulations, without compromising on performance

*Note: Recycled content is based on recycled resins derived from a combination of PCR/PIR waste materials sourced from various waste streams including building & construction, fishing industry, textile industry sectors, and post-industrial.



Recycled resins

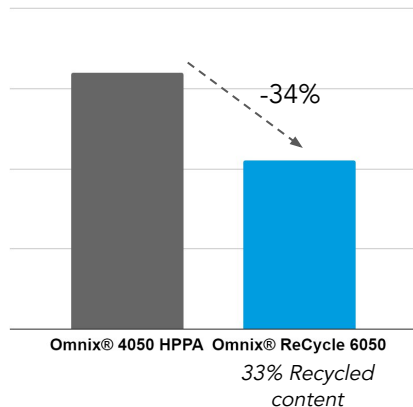
from PIR and PCR



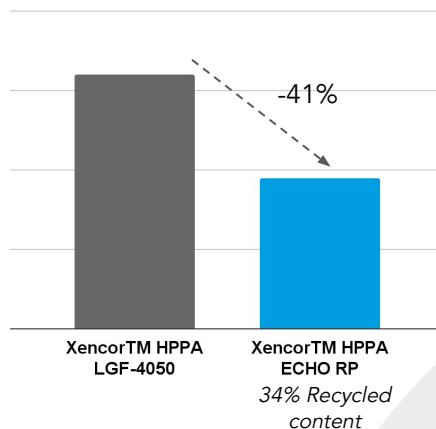
Integrating recycled monomers & polymers in our formulations, without compromising on performance

Meet our Recycled ECHO grades!

Omnix GWP kg CO₂ eq/kg



Xencor GWP kg CO₂ eq/kg



Our recycled resins derived from a combination of PCR/PIR waste materials sourced from various waste streams including building & construction, fishing industry, textile industry sectors, and post-industrial.





Recycled resins

from PIR and PCR



Integrating recycled monomers & polymers in our formulations, without compromising on performance

Meet our Recycled ECHO grades!

Omnix® HPPA

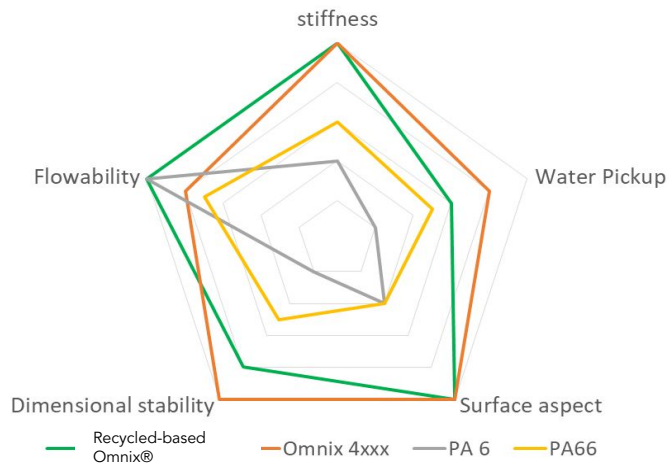
Recycled-based
Omnix® HPPA



Best of PA 6 and 6.6 plus...

- Better mechanical properties
- Lower water absorption
 - Better dimensional stability
 - Better retention of mechanical properties
- More aesthetic surface appearance

GWP (kg CO₂ eq/kg)



Recycled resins

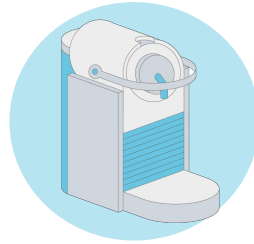
from PIR and PCR



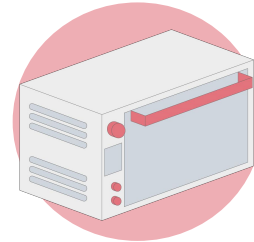
Key benefits compared to PA6 and PA6.6

- Better mechanical properties
- Lower water absorption
- Better dimensional stability
- Better retention of mechanical properties
- More aesthetic surface appearance
- Lower GWP
- Recycled resin content up to 70%

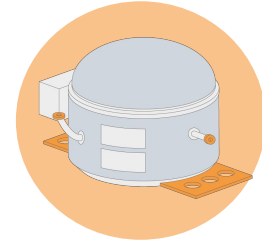
Where Recycled-based Omnix® can bring value and competitive advantage



Coffee makers
(Both Drip & Single serve types)



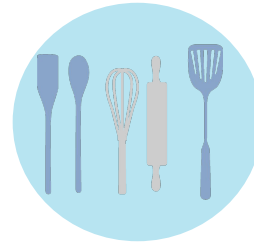
Microwaves



Compressors
(refrigerators)



Ovens & Air Fryers



Kitchen Utensils



Food processors & slow cookers



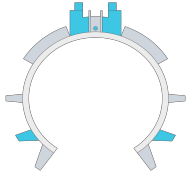
Recycled
resins

from PIR and PCR



Recycled-based Omnix® for Capsule Coffee Machines

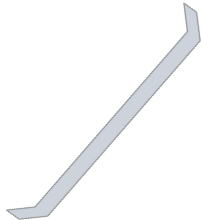
Support Frame



Recycled-based Omnix®:

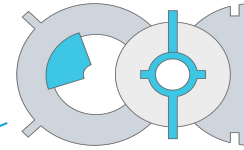
- High stiffness
- Easy to mold
- Lower moisture absorption vs standard PA
- Low GWP

Front Exterior Part



Recycled-based Omnix®:

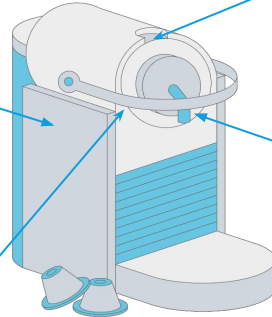
- Excellent surface quality
- High flowability
- High stiffness
- Low GWP



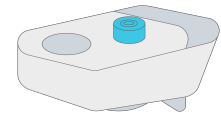
Gear Box

Recycled-based Omnix®:

- High stiffness
- High dimensional stability
- Outperforming standard PA
- Low GWP



Capsule holder



Recycled-based Omnix®:

- Excellent surface quality
- Easy to mold
- Outperforming standard PA
- Low GWP



Recycled
resins

from PIR and PCR



Recycled-based Omnix® for Kitchen Robots & Food Processors

Solvay Value Proposition

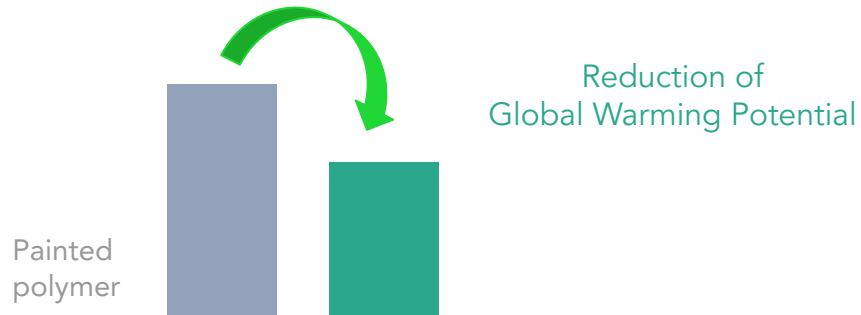
New recycled-based Omnix® offers a unique combination of performances:

- high stiffness (50% Glass Fibre)
- colorability and surface appearance (no painting)
- meeting cost & sustainability targets

Kitchen robot chassis

Replacing

- Aluminium dies cast
- Painting on plastic





Mass Balance Resins

from plastic waste and biomass













Meet our Mass Balanced ECHO grades!

In our portfolio:

Soon available

High-performance polymers with bio-based and/or circular attributed content using mass balance:

- Udel® PSU ECHO   
- Radel® PPSU ECHO    
- Ryton® PPS ECHO  
- Amodel® PPA ECHO  

Certified with ISCC-PLUS

Certified for compliance with



Leveraging the mass-balance approach to offer circular grades



The mass balance approach is commonly used in the chemical industry to track and allocate the blended chemicals

Value Chain



Bio-Based Feedstock

From non food competing feedstock



Recycled feedstock & fibers

Post consumer recycling (PCR)
Post industrial recycling (PIR)



Fossil-based feedstock

Natural gas / Crude Oil

Refinery Steam Crackers



We adopt a pragmatic and sustainable approach and rely on existing infrastructure

Chemicals & polymers



We formulate high performance solutions



Allocation



We allocate the renewable share to selected products using the **Mass Balance Approach**

Certification scheme



Final product



Bio-based & Recycled

Fossil-based





Life Solutions

Life Solutions Mass Balance value proposal

Solvay Mass Balance solution is now available to support your challenges towards sustainability:

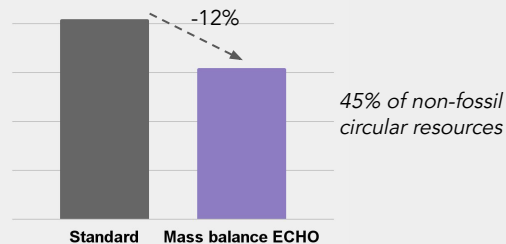
- + A sustainable drop-in solution : **same quality as standard** references (no re-qualification, no homologation, no sample needed)
- + **Lower carbon footprint** (see graphs)
- + Enhanced circularity: **substitution of fossil resources with sustainably and responsibly sourced alternative raw materials**, allocated using mass balance chain of custody
- + Easy implementation to reach your sustainability targets: no investments needed in storage or production, incentivizing the scale up of downstream recycling operations while leveraging existing upstream assets
- + Traceability and transparency: **certification per ISCC-PLUS**, international recognized certification system

Note:

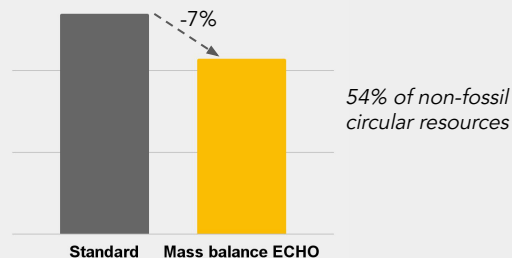
Non fossil bio-based and/or circular attributed content is allocated using mass balance approach
Non fossil resources = not derived from or characteristic of fossils or fossil fuels



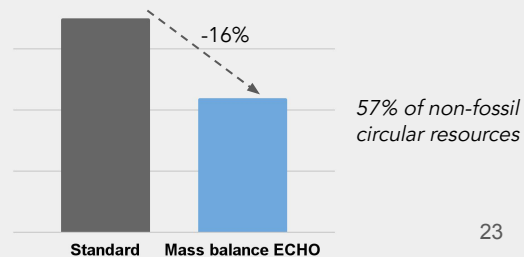
PSU (polymers) GWP kg CO₂ eq/kg



PPSU (polymers) GWP kg CO₂ eq/kg



PPS (compounds) GWP kg CO₂ eq/kg



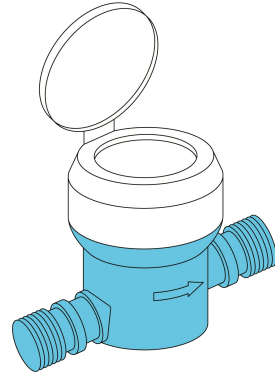


Construction - Plumbing

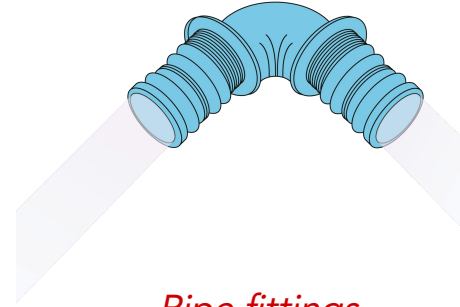
Application examples where our Mass Balance ECHO resins can be successfully applied without compromise on performance

Mass Balance Resins

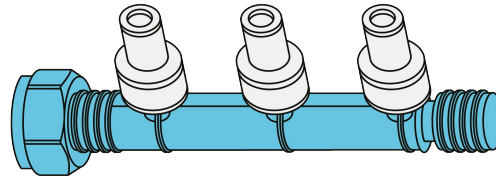
from plastic waste and biomass



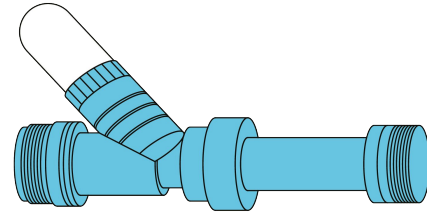
Water meters



Pipe fittings



Manifolds



Balancing Valves

Leveraging the mass-balance approach to offer circular grades



Partnership on Baby Bottles

SOLVAY and HEGEN partner to bring the first baby bottle made with recycled allocated content to the market

The circular, non-fossil feedstock content of the **Duradex™ PPSU** grade is third-party mass balance certified, meeting the end customers' expectations for more sustainable products.



Mass Balance Resins

from plastic waste and biomass



Leveraging the mass-balance approach to offer circular grades





Bio-based
& recycled fillers



Meet our Bio- & Recycled-based Fillers!

In our portfolio
Commercially available

Recycled carbon fibers

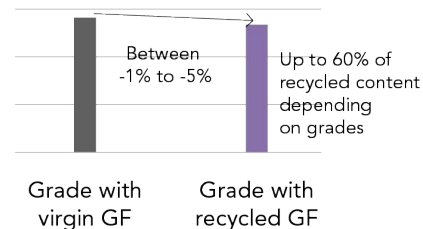
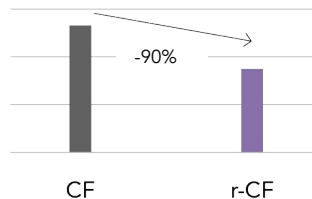
& soon available

Recycled glass fibers

On selected key reinforced grades including

- Amodel[®] PPA
- Ryton[®] PPS
- Ixef[®] PARA
- Omnix[®] HPPA

GWP kg CO₂ eq/kg



Offering recycled & biobased glass fibers & carbon fibers



Partnership with Trillium on bio-based acrylonitrile for carbon fiber





Enabling
circularity



Meet our Circular projects!



Partnership with **Veolia** to recover the **rare metals** in EV cars
end-of-life batteries

Chemical recycling



Partnership with Ostium Group to recycle **Solvay Ixef® PARA**
in **end-of-life orthopedic surgery instruments**

Mechanical recycling



Partnership with MCAM Mitsubishi Chemical Advanced Materials to
recycle **Solvay Udel® PSU** in **end-of-life medical components**

Mechanical recycling



Partnership with Carbios to depolymerize PET/PVDC
barrier **packaging** films and recover **PET**

Chemical recycling

We are looking for partners to enable circularity!

Closing the loop on our
products at their
end-of-life

Questions?

Key Takeaways



We are working on 5 different solutions to lower our customers carbon footprint and enable circularity without compromising on performance

Join us on this journey, and let's collaborate to go further on Sustainability



Bio-Based
resins



Recycled
resins



Mass balanced
resins



Bio-based
& recycled fillers



Enabling circularity