

SMASH PACKAGING

2021 Annual Update



Dear Customers, Colleagues, Partners and Stakeholders,

From life-saving therapies, diagnostics and preventative solutions to more sustainable offerings and breakthrough technologies – **together, we impact life and health with science.** Moreover, we further our impact as a **sustainability multiplier** for our customers and collaborators by helping them achieve their own sustainability goals.

As our customers drive scientific progress for their communities, they need our products to arrive quickly, efficiently and safely. Our packaging must meet their requirements for sterile environments, temperature control conditions and protect our products as they traverse the world.

We also know that sustainable packaging remains vital to our customers. That means we need to maintain high-quality and high-performance packaging even as we work to reduce its environmental impact.

We tackle these challenges through the **SMASH Packaging Plan**, which is founded upon three pillars:

- **Optimize resources** by reducing the amount of packaging,
- **Design for circular economy** to maximize recyclability and reduce waste, and
- **More sustainable materials** to achieve zero-deforestation and increase plastic sustainability in packaging

Now in its fourth year, this program takes a holistic approach to the entire life cycle of our products and packaging. It addresses increasing sustainability requirements and helps reduce the environmental impact of scientific research and development globally.

With bold, methodical, needle-moving actions, we can and will continue delivering breakthrough solutions for our customers – creating a more sustainable tomorrow, together.



Matthias Heinzl

Member of the Executive Board of Merck KGaA, Darmstadt, Germany
CEO of its Life Science business



The SMASH Packaging Plan is part of our approach to a more responsible business. Let us know how we're doing and stay informed on our progress at sigmaaldrich.com/greener

SMASH PACKAGING PLAN

The SMASH Packaging Plan is our four-year approach to drive improvement in the sustainability of our packaging to match our life science leading product sustainability framework. We are setting new standards and goals to SHRINK, SECURE, SWITCH, and SAVE packaging while still meeting the required performances requirements and transit safety regulations.

PILLAR	OPTIMIZE RESOURCES	MORE SUSTAINABLE MATERIALS	DESIGN FOR CIRCULAR ECONOMY	
GOAL	Shrink Reduce amount of packaging 	Secure Achieve zero deforestation 	Switch Improve plastic sustainability 	Save Maximize recycling 
2022 TARGETS	<ul style="list-style-type: none">• New product packaging aligned with our standards for weight and volume• 20 key improvement projects for existing packaging• 20% reduction of air space in distribution boxes	<ul style="list-style-type: none">• New product packaging aligned with our zero deforestation standards• 90% of existing packaging aligned with our zero deforestation standards• 100% of packaging from deforestation-risk countries certified sustainably sourced	<ul style="list-style-type: none">• New product packaging aligned with our plastic sustainability standards• 20 improvement projects to replace existing plastic packaging by more sustainable solutions• 20% reduction of expanded polystyrene (EPS) use	<ul style="list-style-type: none">• New product packaging aligned with our standards for recyclability• 100% of fiber-based packaging not compatible with recycling, replaced• 100% of products with packaging recycling / disposal guidance

OPTIMIZE RESOURCES

Goal 1: Shrink

REDUCE AMOUNT OF PACKAGING

What does it mean?

We will reduce the size and weight of the packaging we use to pack and safely ship our products



2022 TARGETS

New product packaging aligned with our standards for weight and volume

- Optimize packaging weight and volume
- Investigate reusable or bulk packaging solutions
- Avoid requirement of specific distribution packaging

Actions we'll take include:

- Implement new sustainability standards and guidelines during new product packaging design
- Provide training and support to development teams
- Assess and ensure alignment of sustainability characteristics of new product packaging

20 key improvement projects for existing packaging including:

- Elimination of unnecessary packaging components
- Substitution of materials with lighter ones
- Optimization of internal packaging
- Development of bulk packaging solutions

Actions we'll take include:

- Identify and prioritize key opportunities for improvement
- Develop clear action plans for improvement with internal and external stakeholders
- Share best practice case studies to repeat and improve

20% reduction of air space in distribution boxes

- Adjustment of box sizes to better suit common orders
- Optimization of computerized pack-out configuration system
- New processes and training to minimize unused airspace in boxes

Actions we'll take include:

- Identify and prioritize key opportunities for improvement
- Develop clear action plans for improvement with internal and external stakeholders
- Share best practice case studies to repeat and improve

MORE SUSTAINABLE MATERIALS

Goal 2: Secure

ACHIEVE ZERO DEFORESTATION

What does it mean?

We will ensure that the wood and fiber-based packaging materials that we use to pack and ship our products do not contribute to deforestation. We will focus on demonstrating responsible sourcing and increasing recycled content



2022 TARGETS

New product packaging aligned with our zero deforestation standards

- Use of certified wood and fiber-based packaging materials
- Demonstration of responsible sourcing
- Maximization of recycled content

Actions we'll take include:

- Implement new sustainability standards and guidelines during new product packaging design
- Provide training and support to development teams
- Assess and ensure alignment of sustainability characteristics of new product packaging

90% of existing packaging aligned with our zero deforestation standards

- Use of certified wood and fiber-based packaging materials
- Demonstration of responsible sourcing
- Maximization of recycled content

Actions we'll take include:

- Survey our supply chain to identify sources and characteristics of wood and fiber-based packaging
- Collaborate with our vendors to demonstrate and increase responsible sourcing
- Identify and prioritize key opportunities for increasing recycled content of existing packaging

100% of wood fibers from deforestation-risk countries certified sustainably sourced

- Materials are certified (FSC, PEFC or SFI) with chain of custody

Actions we'll take include:

- Survey our supply chain to identify sources and characteristics of wood and fiber-based packaging
- Develop plan to ensure that all the wood and fiber-based packaging materials coming from deforestation-risk countries are certified sustainably sourced with chain of custody

MORE SUSTAINABLE MATERIALS

Goal 3: Switch

IMPROVE PLASTIC SUSTAINABILITY

What does it mean?

We will improve sustainability of the plastic materials used in packaging applications, including increase use of materials with lower environmental impacts and reduce materials of concern



2022 TARGETS

New product packaging aligned with our plastic sustainability standards

- Use of alternative plastics with lower impacts
- Use of recycled content
- Use of renewable content
- No use of materials of concern

Actions we'll take include:

- Implement new sustainability standards and guidelines during new product packaging design
- Provide training and support to development teams
- Assess and ensure alignment of sustainability characteristics of new product packaging

20 improvement projects to replace existing plastic packaging by more sustainable solutions including:

- Replacement of plastics with ones with lower impacts
- Replacement of conventional plastic by material produced from renewable materials
- Introduction of recycled content

Actions we'll take include:

- Identify and prioritize key opportunities for improvement of plastic packaging
- Develop clear action plans for improvement with internal and external stakeholders
- Share best practice case studies to repeat and improve

20% reduction of expanded polystyrene (EPS) use

- Replacement of EPS used in secondary and distribution packaging in non-reusable applications
- Minimize introduction of new packaging made of EPS

Actions we'll take include:

- Define process to measure and track use of EPS
- Identify and prioritize key opportunities for replacement of EPS
- Develop clear action plans for replacement of EPS packaging items with internal and external stakeholders

DESIGN FOR CIRCULAR ECONOMY

Goal 4: Save

MAXIMIZE RECYCLING

What does it mean?

We will reduce the amount of non-recyclable materials we use, reduce packaging techniques that make it difficult to recycle and improve packaging labelling and education



2022 TARGETS

New product packaging aligned with our standards for recyclability

- Avoid use of any material or treatments that interfere with recycling of fiber-based materials
- Avoid use of multi-layer plastic or any plastic type that is incompatible with recycling

Actions we'll take include:

- Implement new sustainability standards and guidelines during new product packaging design
- Provide training and support to development teams
- Assess and ensure alignment of sustainability characteristics of new product packaging

Replace 100% of fiber-based packaging not compatible with recycling

- Replacement of any specific treatments that interfere with recycling
- Replacement of multi-layer packaging materials
- Replacement of hot-melt adhesives

Actions we'll take include:

- Identify fiber-based packaging items not compatible with recycling
- Develop plan for replacement with internal and external stakeholders

100% of products with packaging recycling / disposal guidance

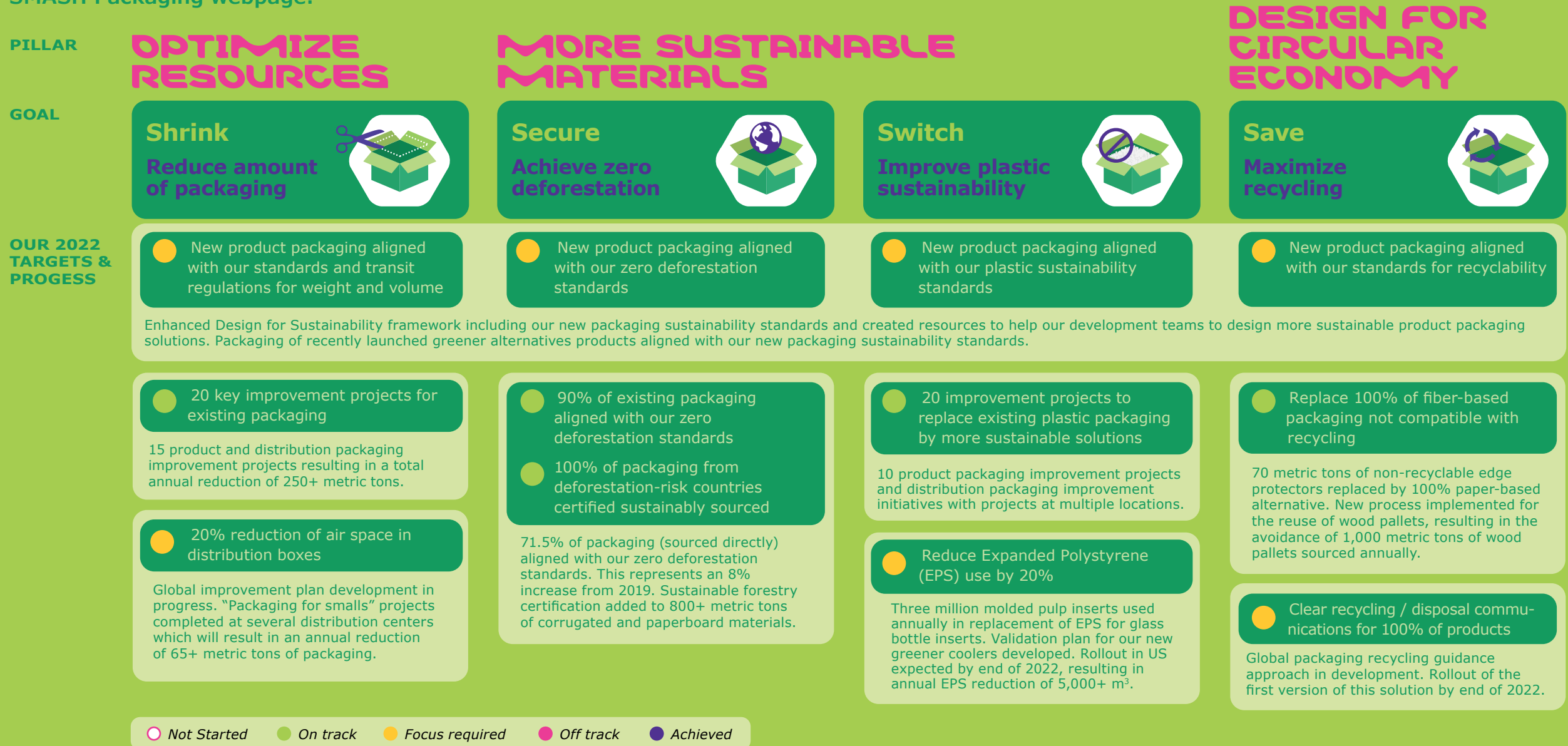
- Provide recycling / disposal guidance for any primary, secondary and distribution packaging received by our customers

Actions we'll take include:

- Develop reference document with recycling / disposal guidance for all our packaging material types
- Develop plan to communicate effectively packaging recycling / disposal guidance to customers

2021 RESULTS DASHBOARD

Our four-year SMASH Packaging Plan is our approach to drive improvement in the sustainability of our packaging. Below are the top-level measurements by which we track our progress toward our 2022 targets. See more details on our SMASH Packaging webpage.



○ Not Started
● On track
● Focus required
● Off track
● Achieved

www.sigmaaldrich.com/smash

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