

Lightweight, Aesthetics, Connectivity, Circular Economy:
Innovative solutions for the New Mobility

Smart Plastics 2022

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WE ARE IN AN ERA OF CHANGE

CHANGE IS AN OPPORTUNITY FOR PLASTIC

Innovative solutions for the New Mobility

- ❑ Aesthetic **Front Panel** with focus on branding and connectivity with Clearmelt technology
- ❑ Lightweight composite for **Door and Tailgate structure**
- ❑ Micro Mobility with **Bicycle Frame** produced in injection moulding
- ❑ **Circular economy** injection machine solutions for broad adoption of post-consumer resin

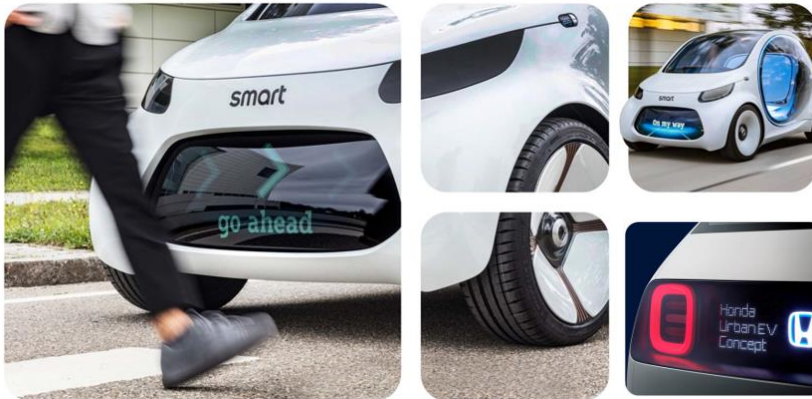
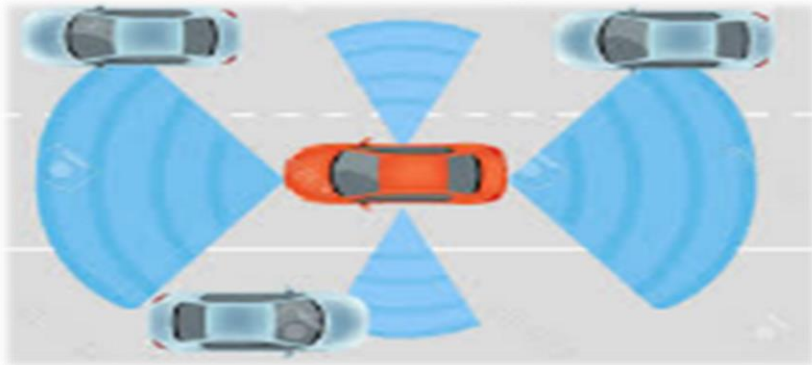
Aesthetic Front Panel

With ENGEL Clearmelt



Front Panel

Mega Trend



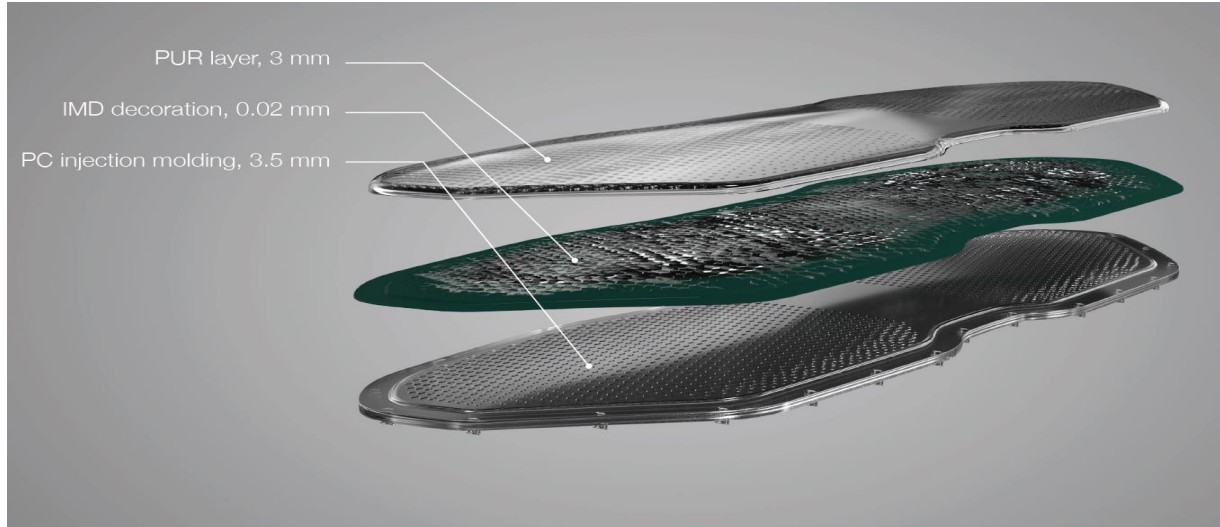
Project Motivation

1. DESIGN FREEDOM & FUNCTION INTEGRATION
→ Unique styling ,3D effects, high gloss with depth
2. LIDAR TRANSPARENT
→ high near infrared transparency
3. RADAR TRANSPARENT
→ Excellent higher frequencies Transparency
4. IMPACT PERFORMANCES
→ Solution to fulfill the pedestrian Impact requirements
5. SURFACE
→ Self-healing, UV protection, high chem. resistance
6. LIGHT TRANSPARANCY
→ Wide range of colors and transmission levels
7. PROCESSING
→ one step Process



Front Panel project

Concept



Project Motivation

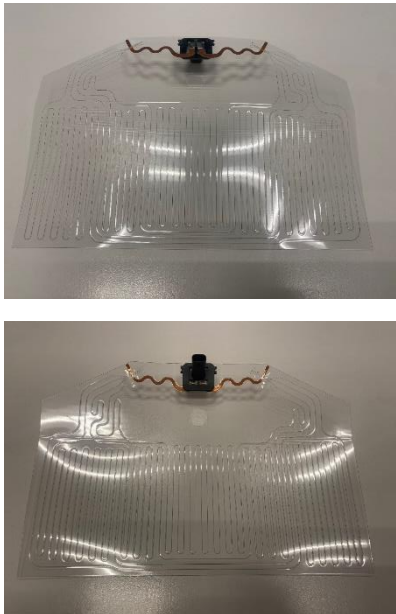
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Front Panel BMW iX

Production workflow

Heating film

- PC film
- integrated connector



[Source: BMW]

Injection moulding & coating

- Film insert moulding
- PC injection compression moulding
- PUR overmoulding



[Source: BMW & ENGEL]

Final decoration after moulding

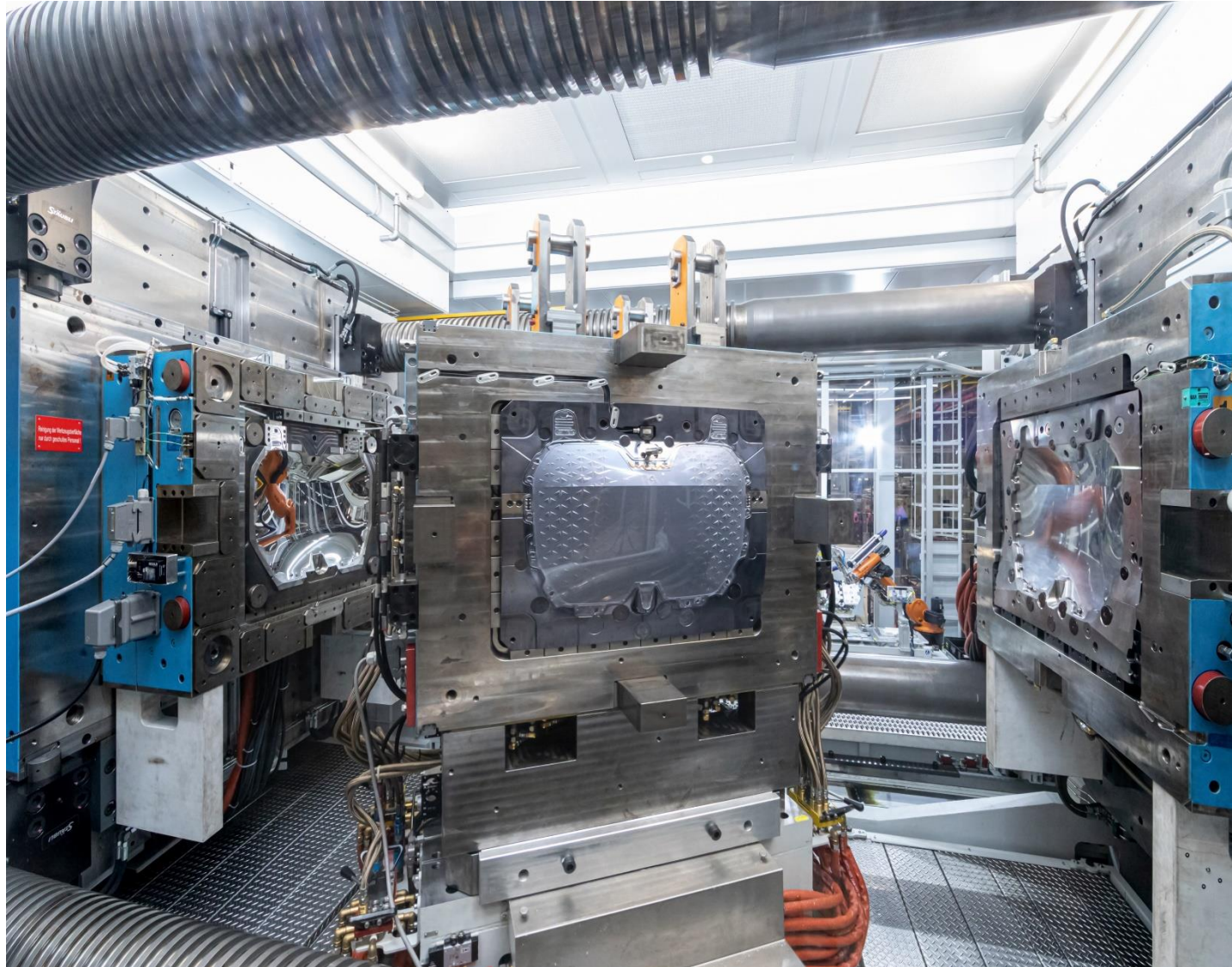
- lasering
- PVD coating
- clear coating.....



[Source: ENGEL]

Front Panel BMW iX

Removal of moulded part and placement of foil - turning mould



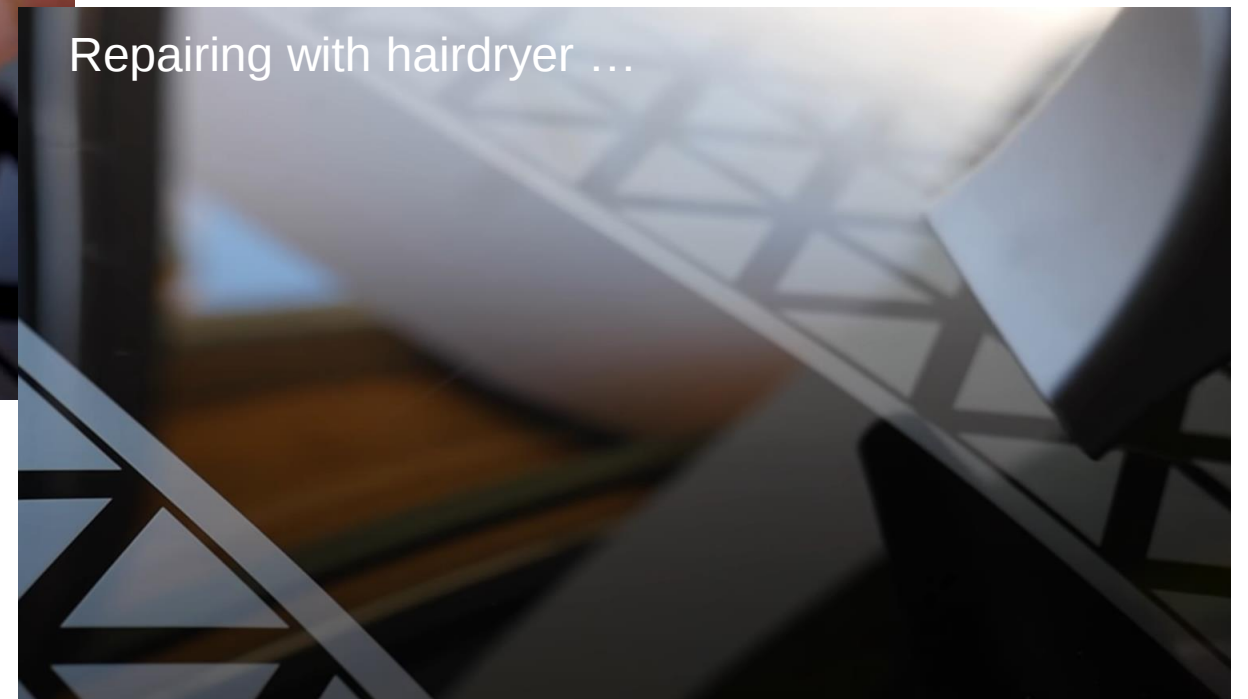
Front Panel BMW iX PUR Overmoulding

SOP 2021



[BMW iX FULL REVIEW xDrive 50 AWD - world's best big EV SUV? - YouTube](#)

Scratching and repairing of the PUR-surface



Lightweight composite Door Structure

With ENGEL Organomelt



Lightweight composite Door Structure

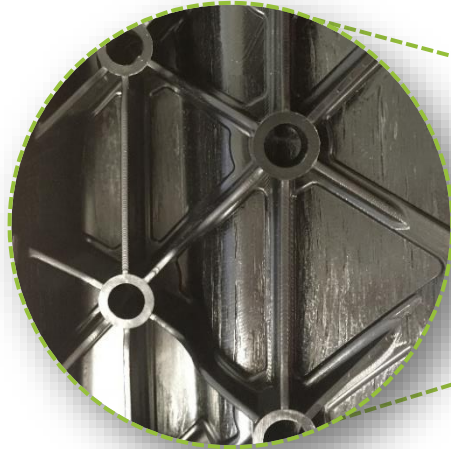


- KingFa PP/GF Cross-Ply 2,5 mm
- KingFa PP/GF Cross-Ply 0,6 mm
- KingFa PP/GF Cross-Ply 1,0 mm
- KingFa PP/LGF 35 Compound

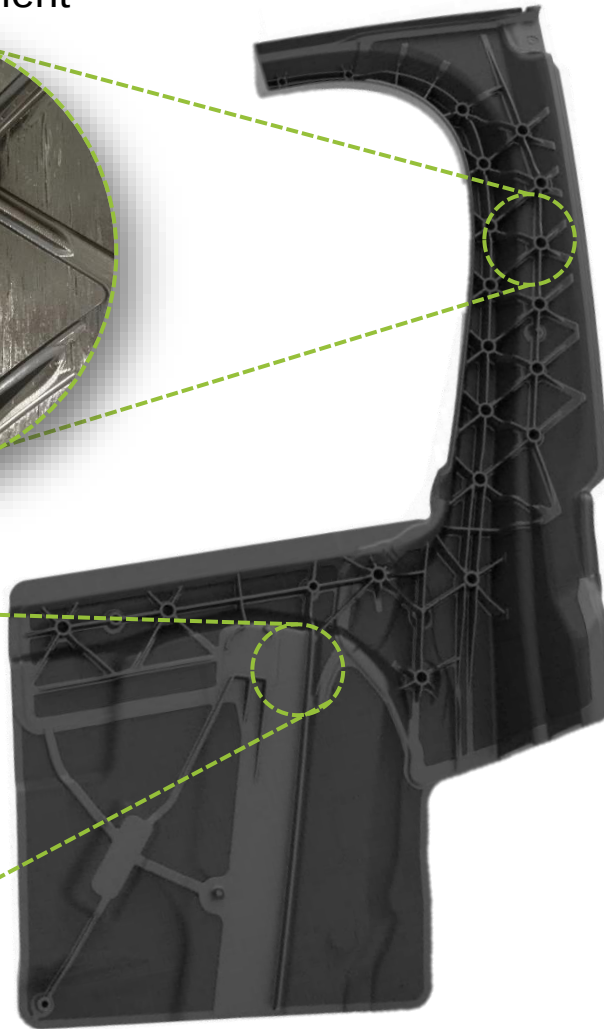
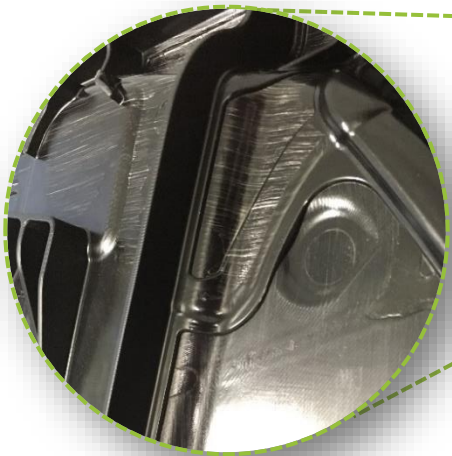


Lightweight composite Door Structure

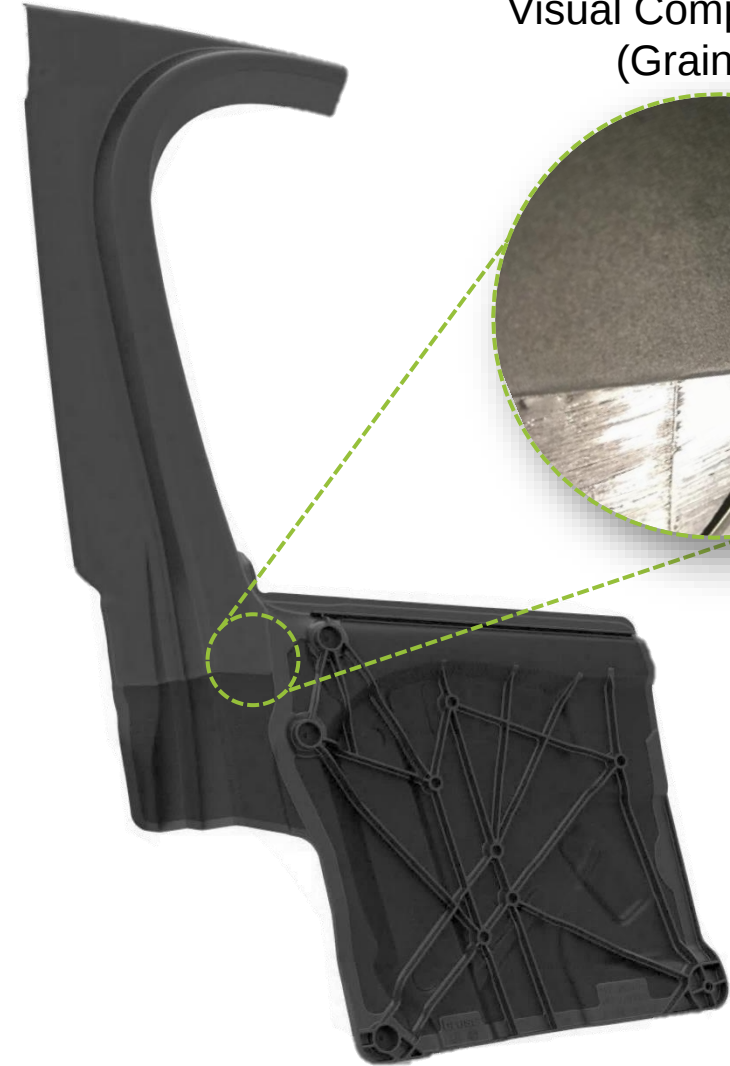
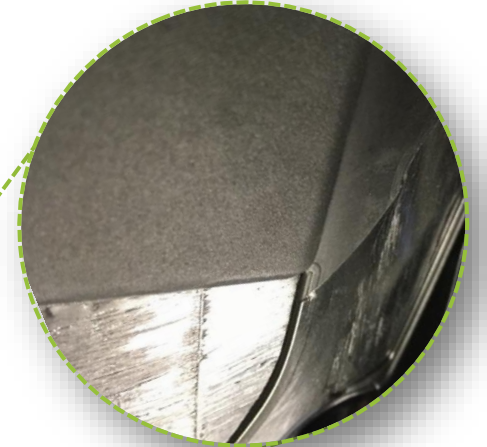
Structural component



Functional Component

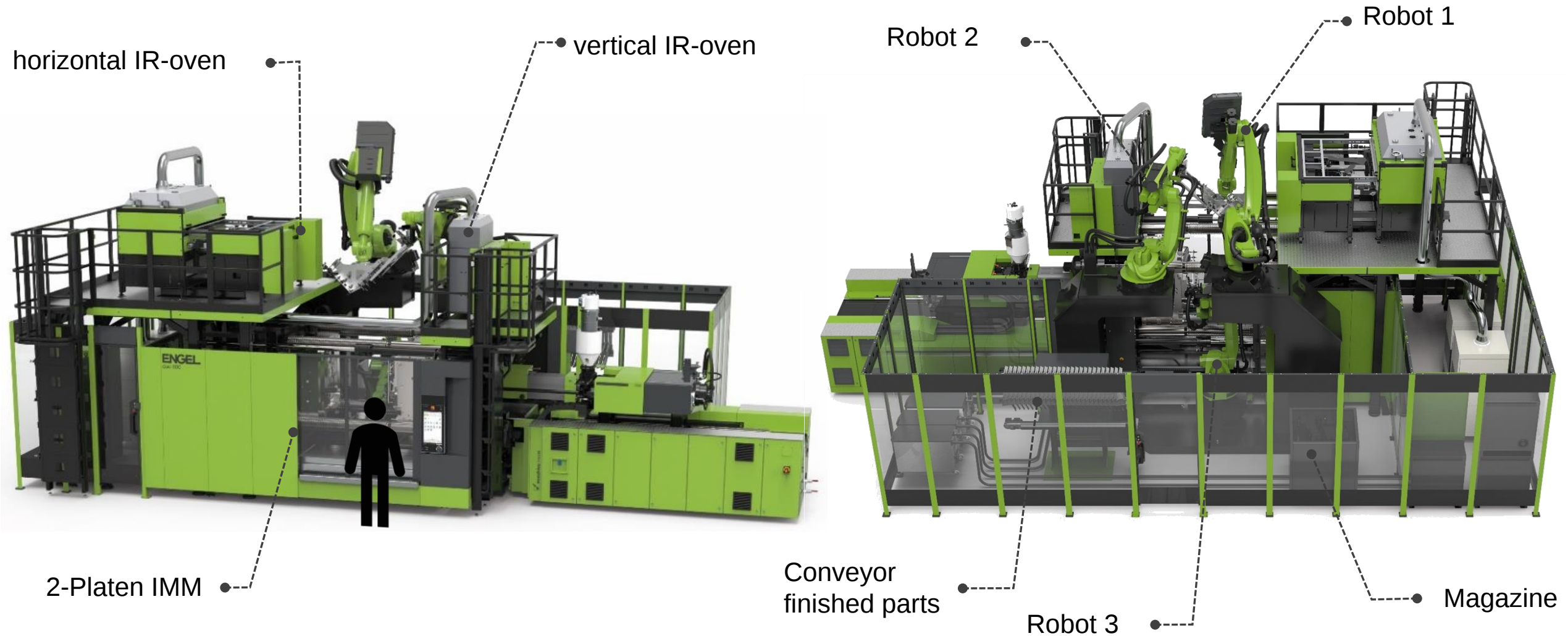


Visual Component
(Grain)



Lightweight composite Door Structure

Customized production cells: Brose Frame Module (K'19)





[Source: SABIC]

Micro Mobility Bicycle Frame

With ENGEL Watermelt



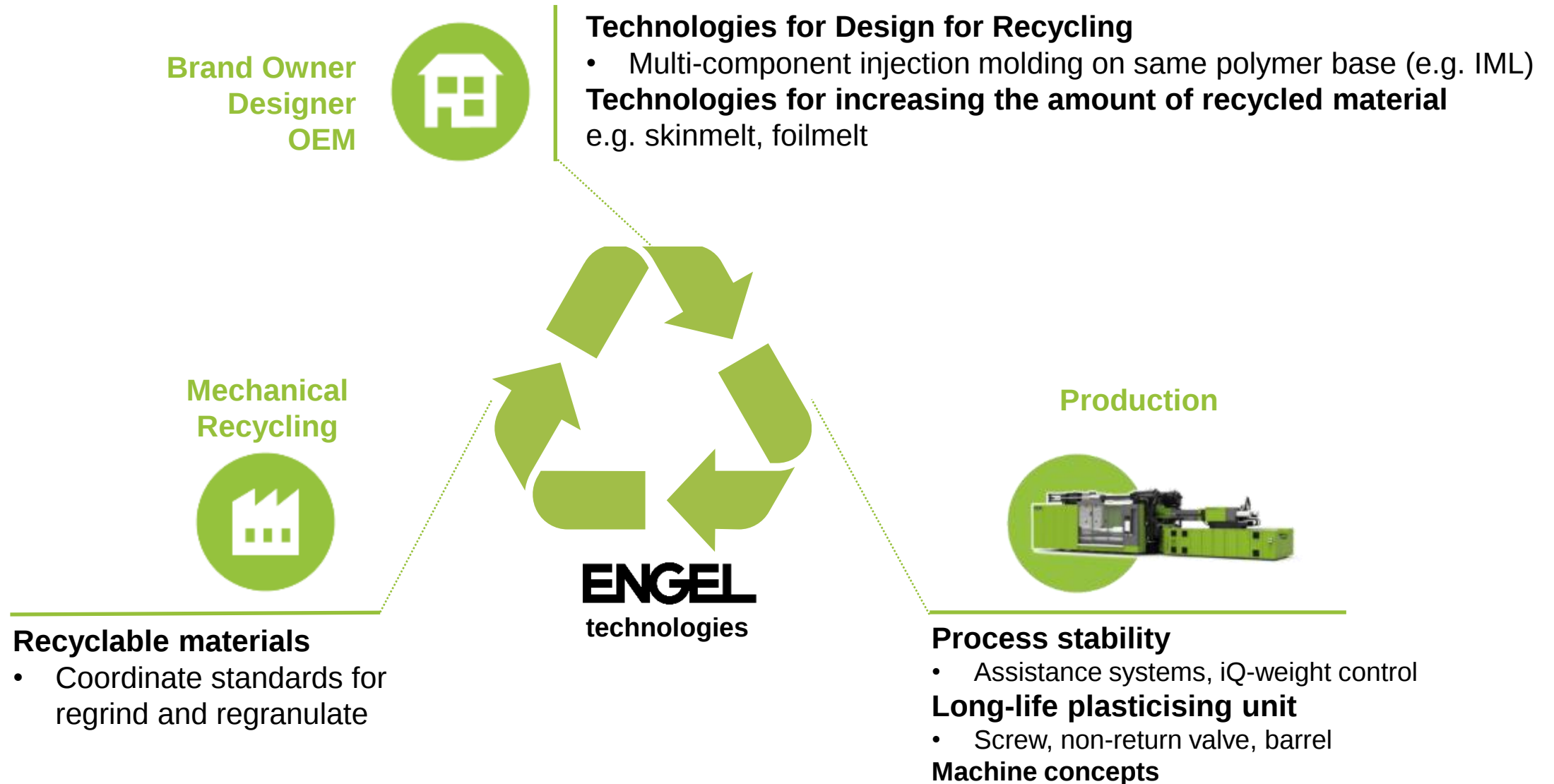
first injection molded bike frame with fluid injection technology

ENGEL Circular Economy



What activities can we perform?

ENGEL Solutions for Recycling



Smart Machine

Use more recyclates thanks to higher process stability

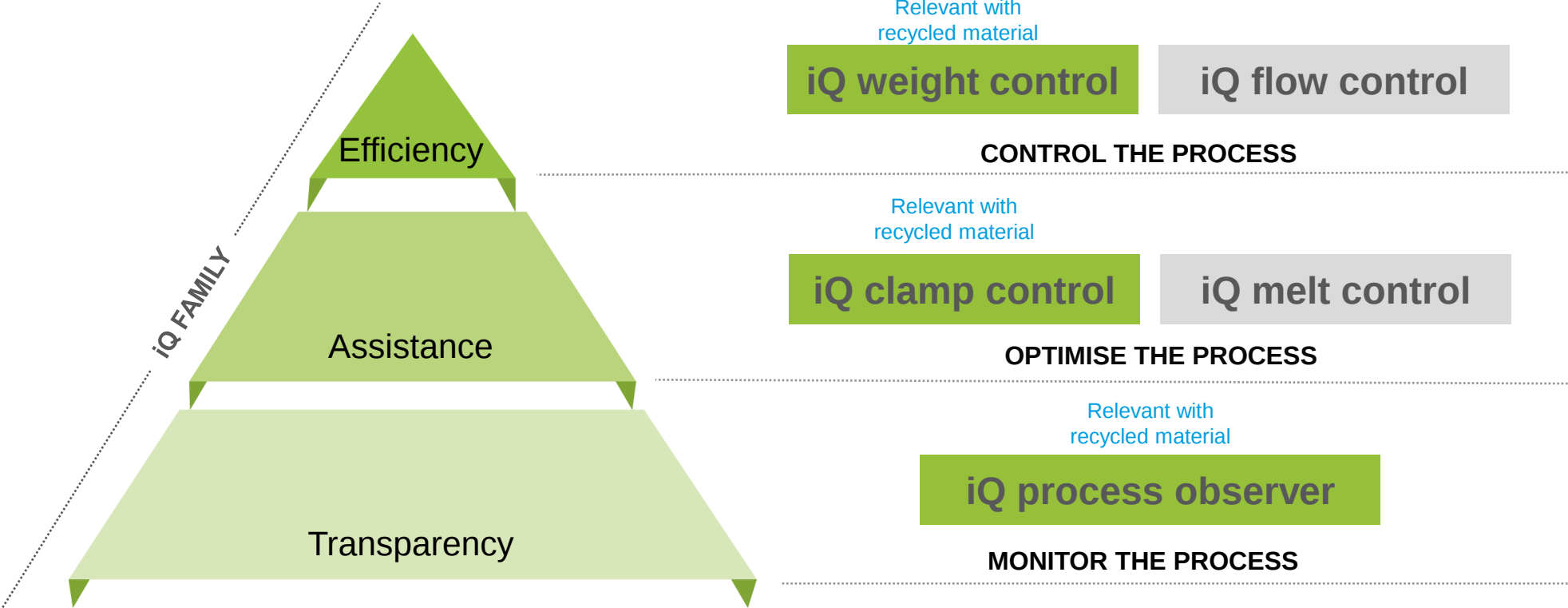
Digitalization as an important component for the Circular Economy

Recyclates are naturally subject to greater batch fluctuations than virgin materials. Our digital solutions from the ENGEL inject 4.0 programme can help to significantly reduce influences on the process automatically



Smart Machine

more stability, better quality



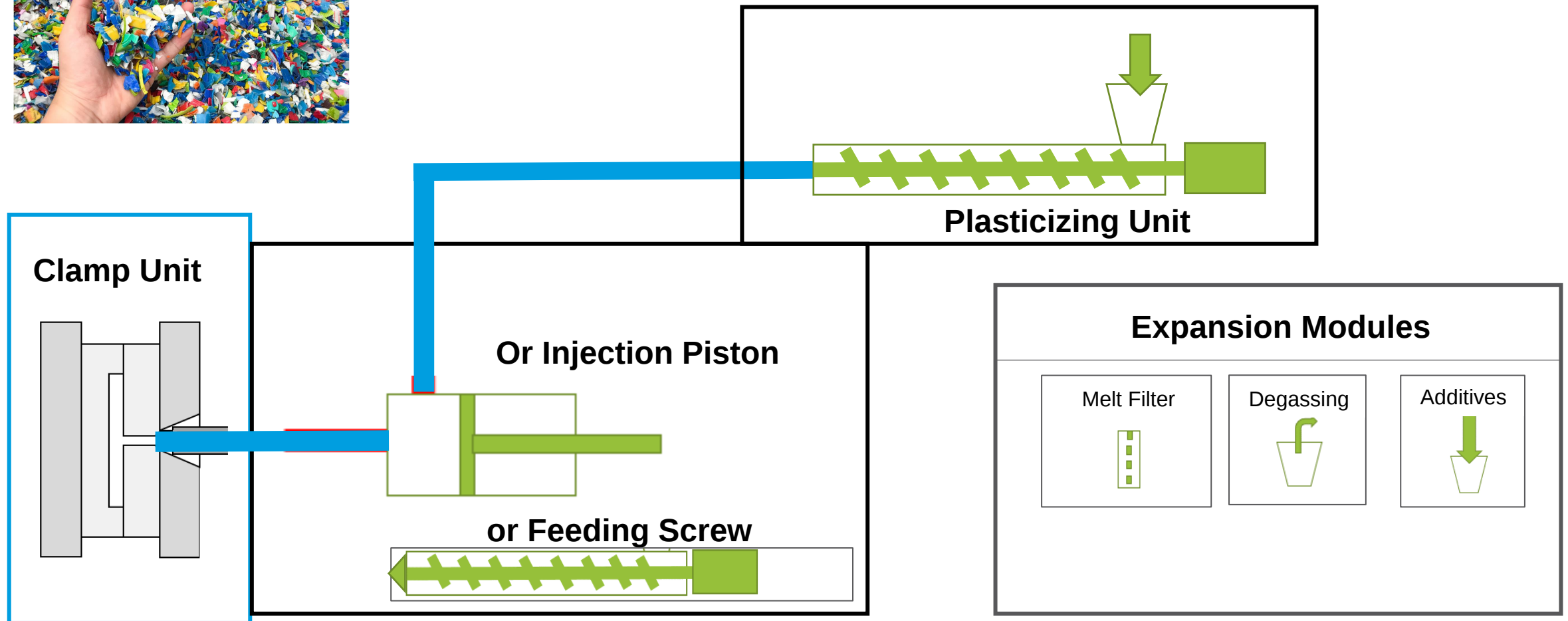
Injection moulding machines for recycling purpose

ENGEL two Stage Process



ENGEL Circular Economy

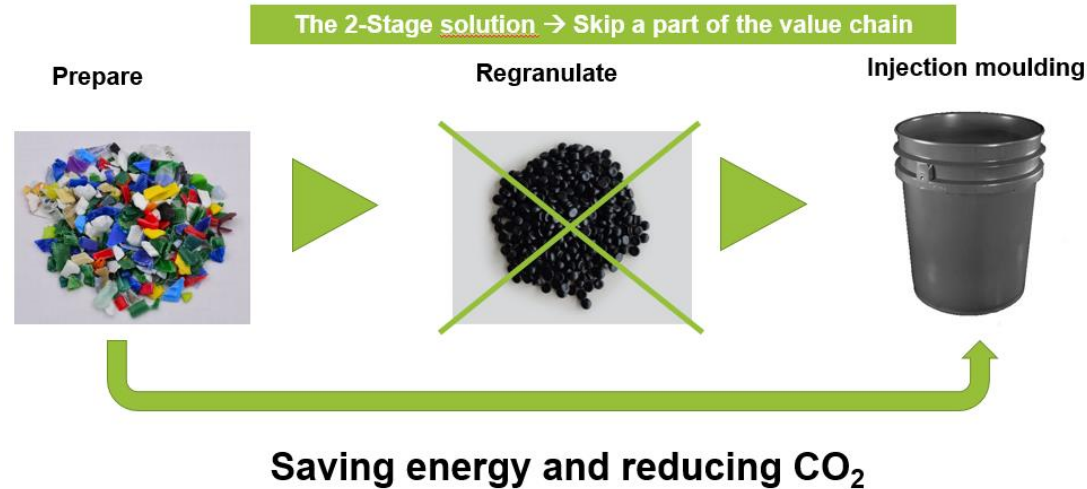
2-stage process in circular economy



ENGEL Circular Economy

Two Stage Process

High recycling quality directly from plastic flakes



Based on a legacy ENGEL duo injection moulding machine, the production cell for processing plastic flakes has a modular design. The production cell at the K show features a high-performance melt filter by ETTLINGER and a degassing unit.

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Further innovations at



Hall 15 | Booth C58

Thank You!