



Robotics and Circular Economy



White Paper der LV „Industrieroboter“

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Figure 1: Source: Apple (2018)

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Graz, April 2024



Basics of Circular Economy

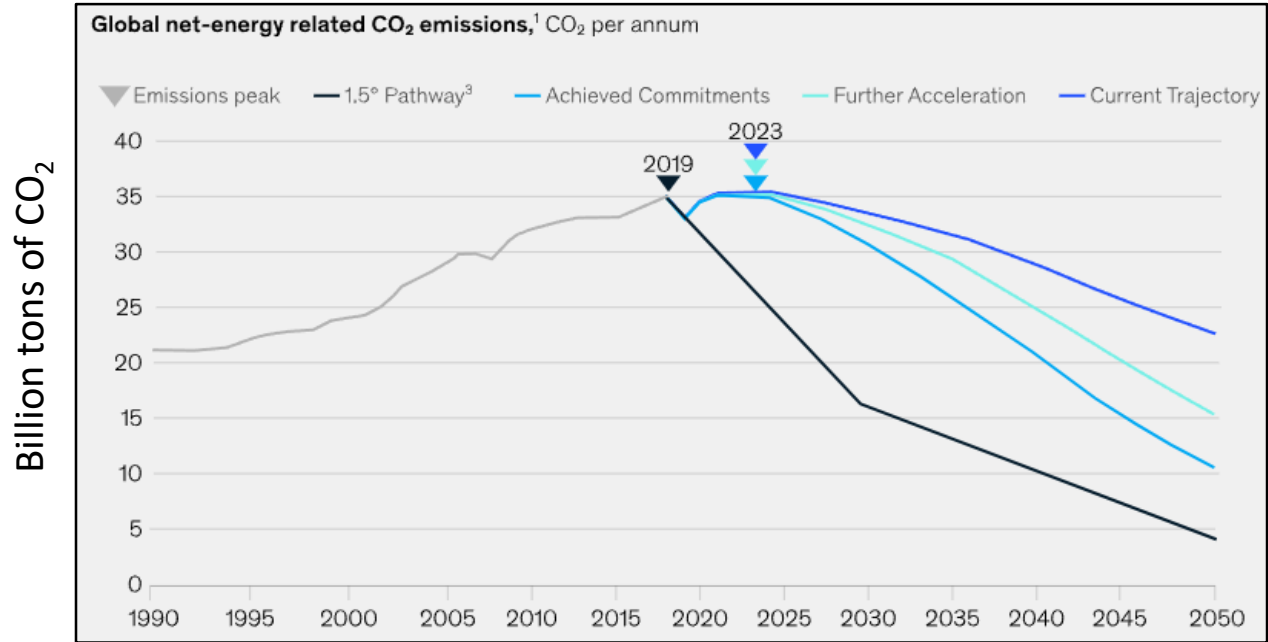


Circular economy model, Quelle: European Parliament (2023)



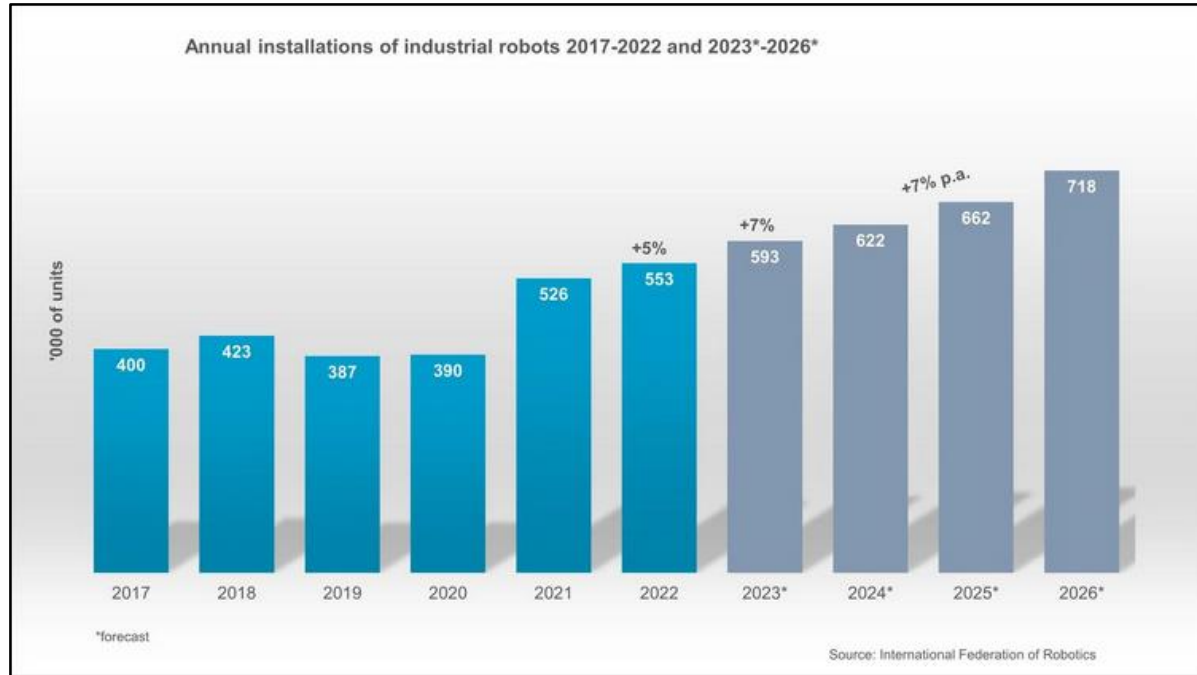
Circular Economy and the SDGs, Source: Cork University Business School (2021)

Statistics



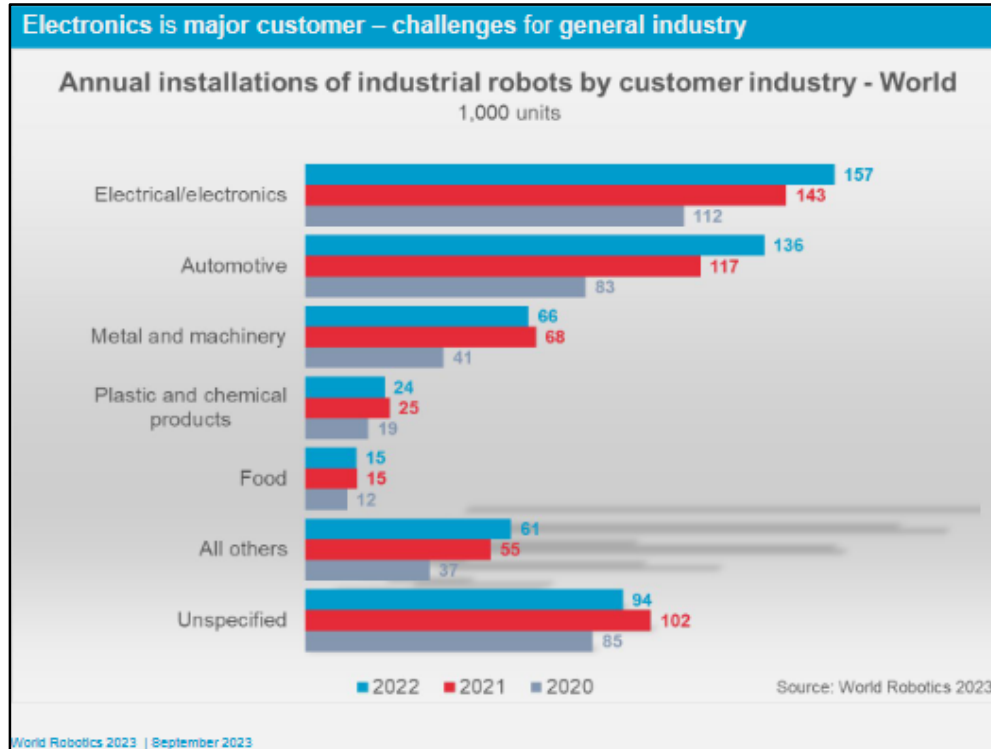
Global Emissions of GHG with future trajectories, Source: United Nations Environment Programme (2015)

Statistics



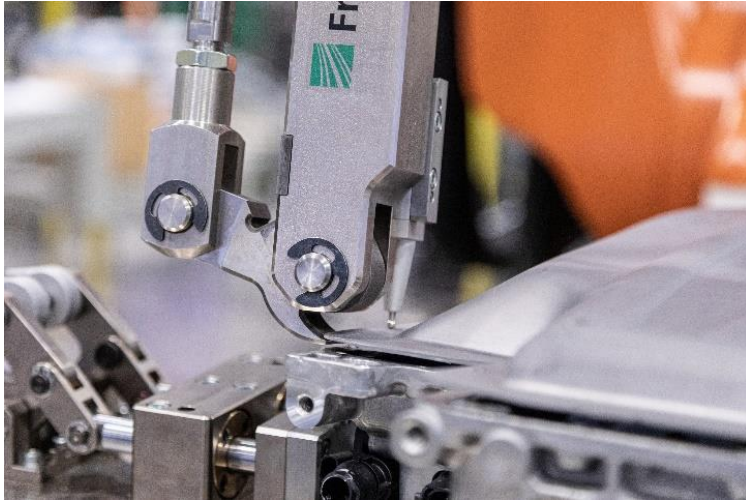
Annual installations of industrial robots 2017-2022 and 2023-2026, Source: IFR (2023)

Statistics

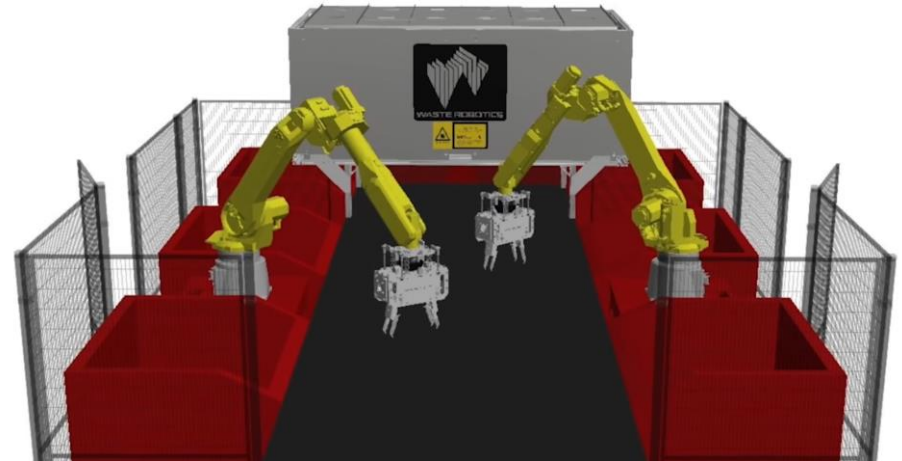


Annual installations of industrial robots by customer industry, Source: IFR (2023)

Automotive Industry

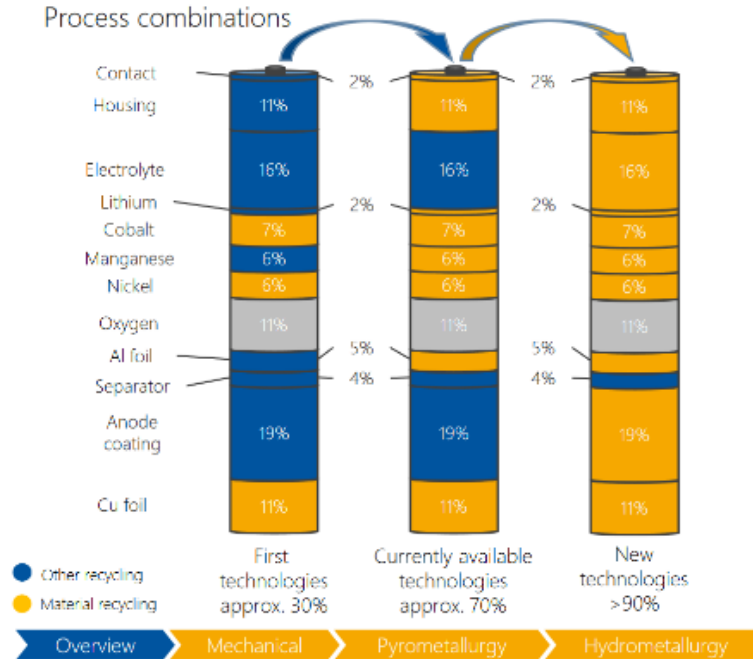


Flexible tool for separating glued joints,
Source: Fraunhofer IPA (2023)



Recycling line for separating waste by material, Source: FANUC (2019)

Battery Production



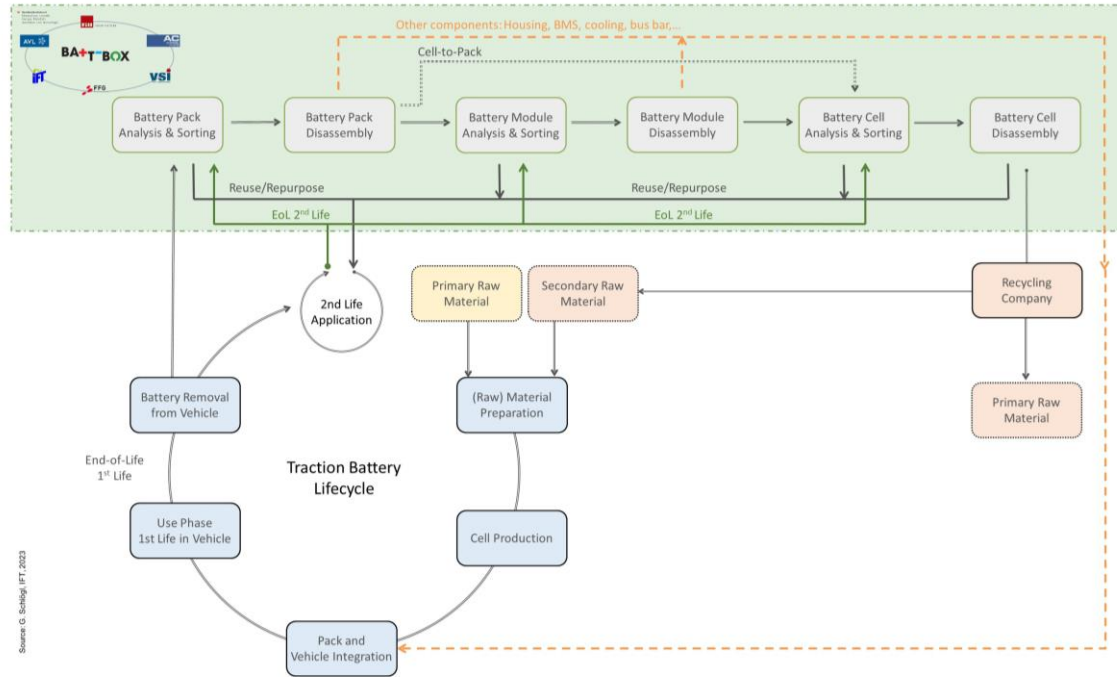
Process combinations in battery recycling,

Source: Michaelis/Rahimzei/Brückner/Rottnick (2021)

Battery Production



BATTBOX: Recycling of Traction Batteries: Processes for a Circular Battery Ecosystem

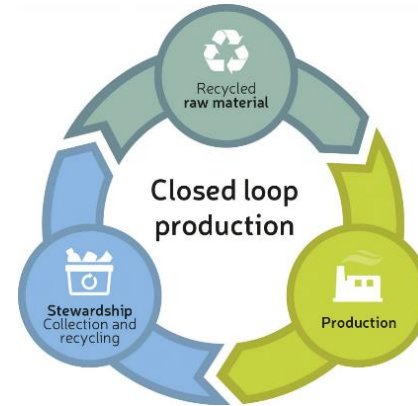


Non Electronic Consumer Industry

- Combination of Systems with high sorting accuracy and high sorting capacity
- Use of robots to identify waste types is only a help for humans sorting their own waste
- Reduction of the detection and sorting effort of the robot to ease the integration of robots



Steinert UniSort Unibot Sortierroboter,
Source: Steinert (2023)



Electronics



Apple's recycling robot "Daisy", Source: Apple (2018)

Food and Agriculture



Autonomous and electric compost turner, Source: Futurezone (2023)

Food and Agriculture



Examples for the use of Robotics in agriculture and the food industry Source: Redmond Ramin Shamshiri (2018) and P. K. Paul (2020)

Urban Mining



DXR Demolition Robots, Source: Husquvarna (2021)

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