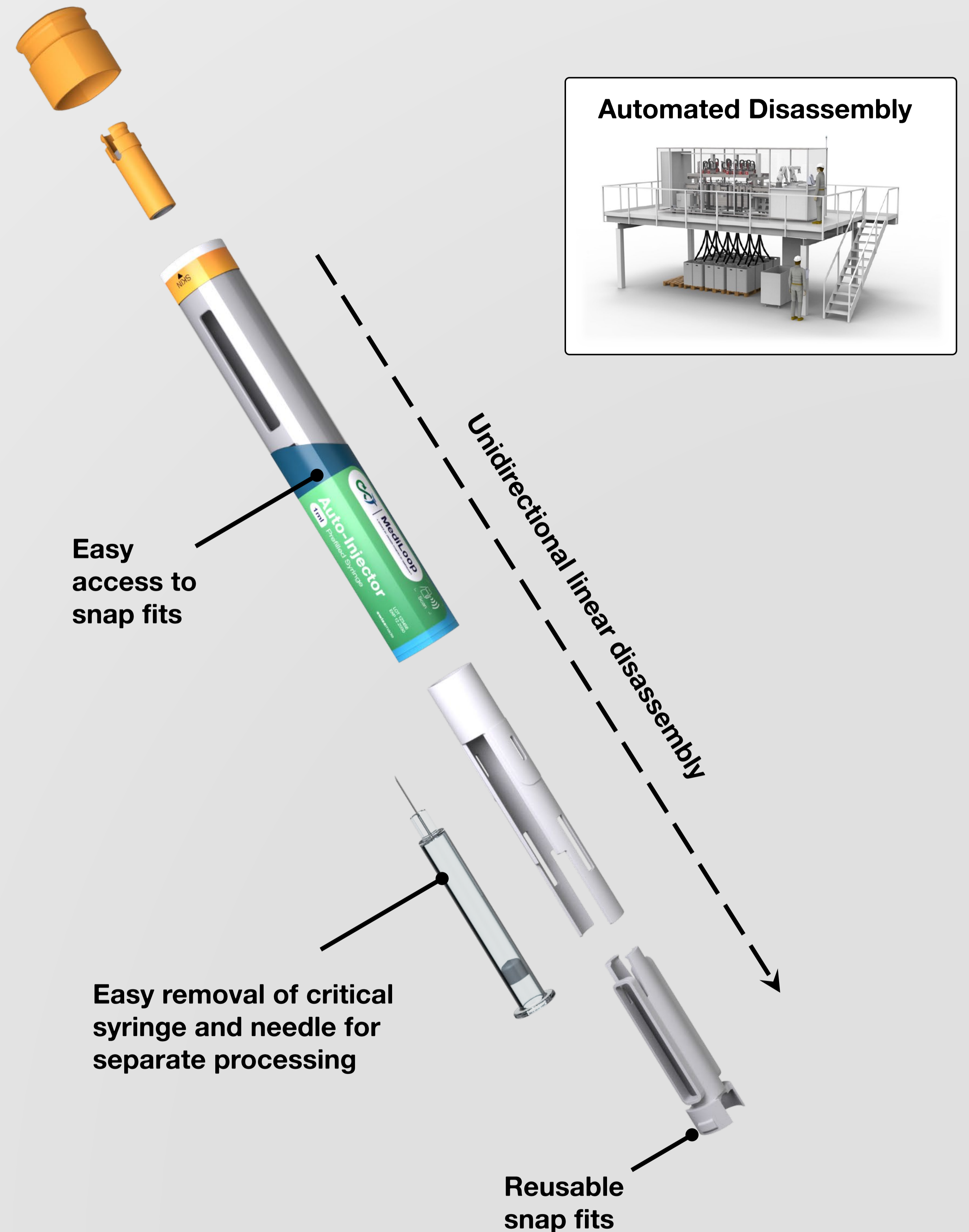
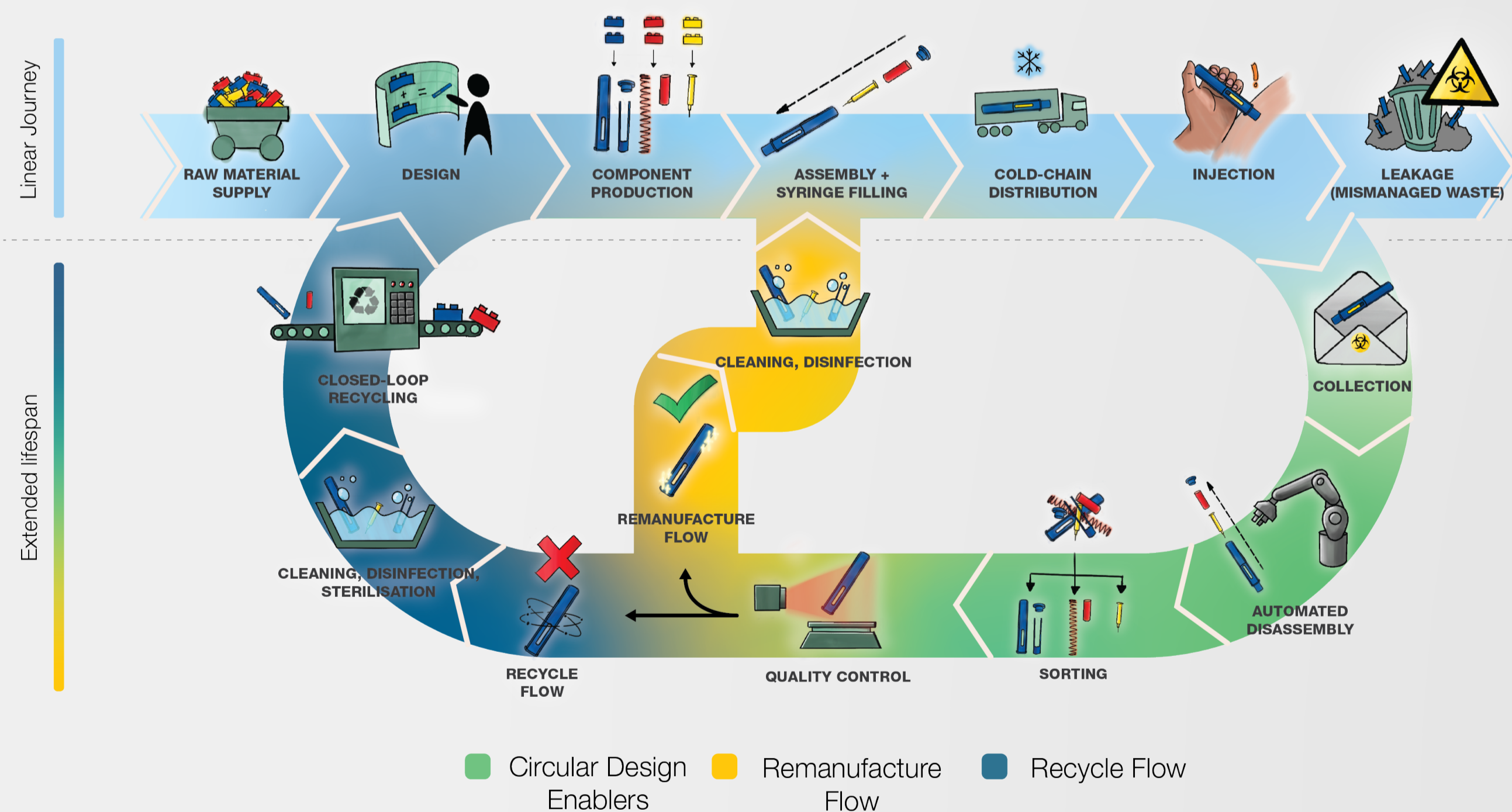


# Towards Circular Self-injectors

This project explored the **redesign of auto-injectors** to integrate **circular economy (CE) principles**, focusing on the existing Ypsomate auto-injector. Assigned by pharmaceutical company Johnson & Johnson (J&J), who have shown interest in developing **circular systems for self-injectors**, this study aims to **make CE design principles tangible** for J&J. Key research questions addressed included **identifying barriers and opportunities for CE** in disposable self-injectors and applying potential circular strategies to redesign the Ypsomate

The project followed a **creative problem-solving** approach involving **literature research, expert interviews, co-creation** and a **field visit** to J&J's innovation development site where a **self-injector disassembly robot** is being built. Findings highlighted industry trends focusing on **patient safety and usability** as well as several sustainability developments. However, **end-of-life design considerations remain underexplored**. The study identified major barriers to CE integration, such as the challenge of **combining safety with reuse strategies** due to the **low value and high hygiene criticality** of auto-injectors.

The most promising opportunity was found in the safe, cost-effective separation of hygiene-critical from non-critical components, reducing reprocessing requirements. An in-depth product analysis of the Ypsomate identified relevant circular strategies: **Design for Recycling, Disassembly, Component Reuse, and Extended Life**. A redesign concept, the **MediLoop** was developed and prototyped to **demonstrate the feasibility** of significantly improving CE strategies for **end-of-life recovery**.



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Towards Circular Self-Injectors: Designing an auto-injector for automated non-destructive disassembly  
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Integrated Product Design

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