

Sustainable Design for Forceps' Lifecycle

Goal

Enhance the **sustainability** of the Boston Scientific biopsy forceps product line by rethinking its **design, materials, manufacturing processes, and disposal processes** to minimize **environmental impact** while maintaining **product value**.

What is an Endoscopy?

An endoscopy is a medical procedure during which the interior of the digestive tract is examined. For this procedure, a long, flexible tube with a light and a camera, called an endoscope, is used. This endoscope is inserted into an opening in the body, and video is used for visual examination.

What are Forceps?

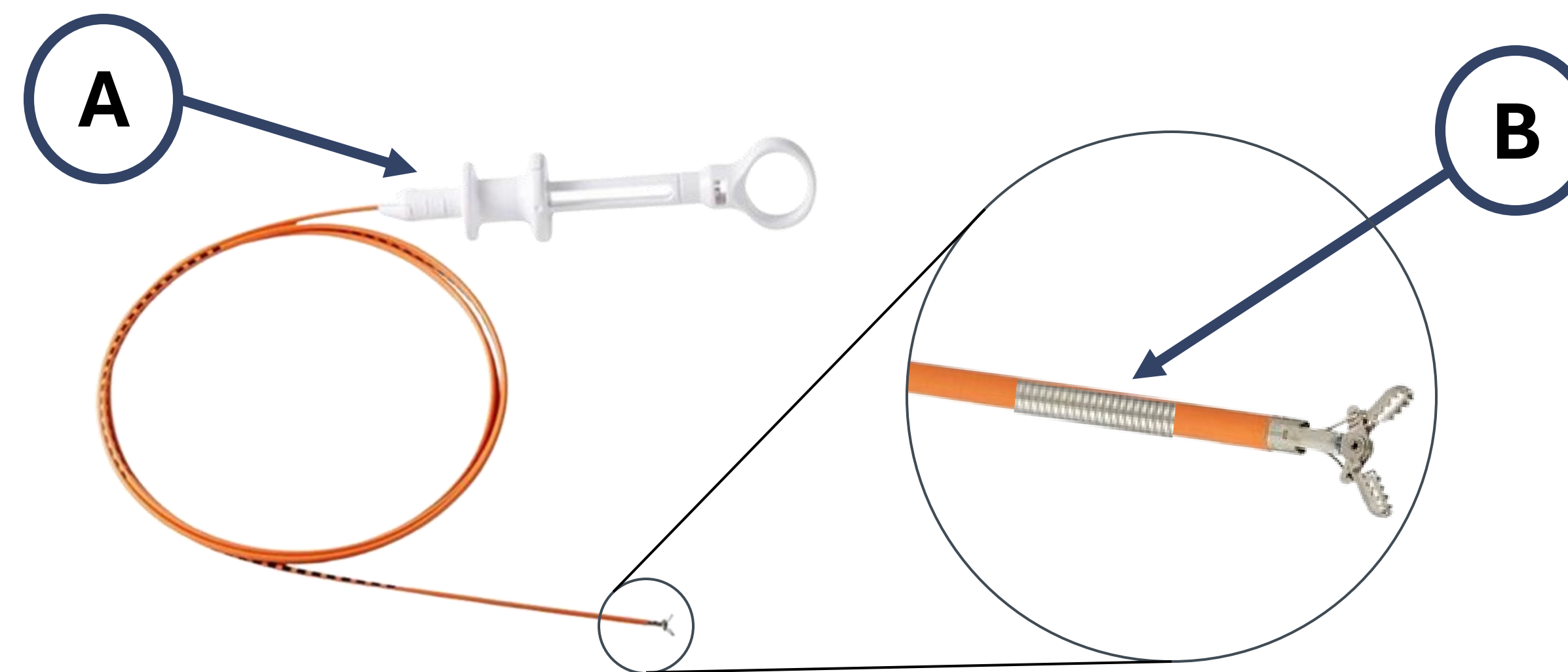
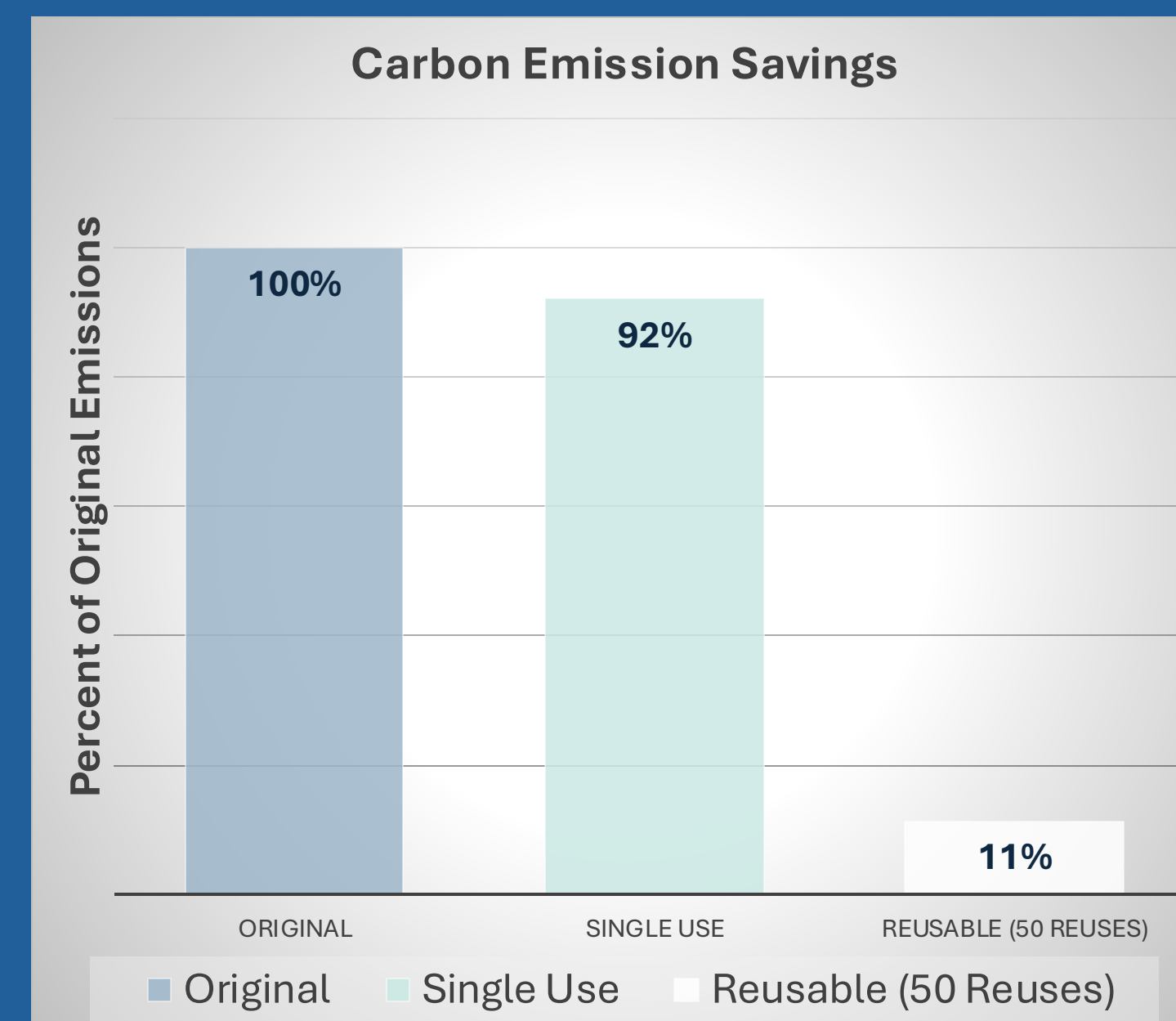
Forceps are tools used in endoscopic procedures to manipulate tissue samples and remove foreign objects. They are long probes with actuatable jaws which are fed through endoscopes.

We developed **three novel components** for the biopsy forceps line that can **improve** Boston Scientific products and push them towards their company goal of **carbon neutrality** by 2050.

Results

One single use design with a projected 8% decrease in CO₂ emissions.

Two reusable designs with a projected 89% decrease in CO₂ emissions if reused 50 times before disposal.



Process

1) Life Cycle Analysis

In order to provide a basis for our redesigns, we broke down and analyzed a set of existing forceps to determine the carbon emissions from its creation, transportation, and incineration

2) Where is the most benefit? :

Based on our LCA, we determined a few areas that could greatly affect sustainability with redesign.

- Packaging, internal wires, coil, radial jaw, and handle

3) Two Areas of Focus:

After development on several areas of interest, we settled on two areas of design which had the most impact on sustainability

- Ⓐ Handle
- Ⓑ Coil

4) Three Final Products:

Our work concluded with three product designs, one for single use and two that are reusable

