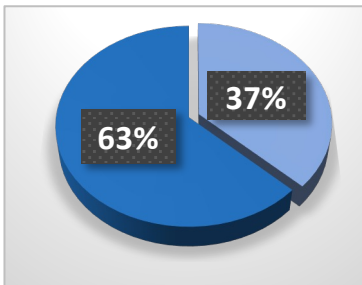
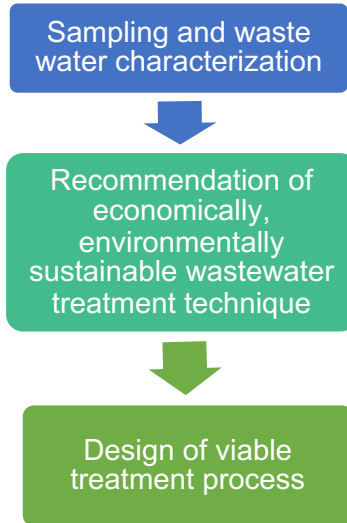


## Introduction

- Insulin production; fermentation, recovery and purification
- Effluent purified water production makes up 37% of total water input in IM1 production process.
- Processes involved ion exchange, reverse osmosis and electrodeionization



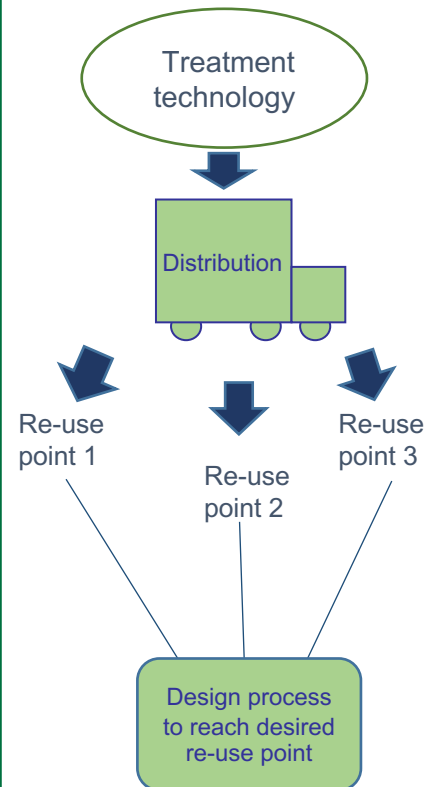
## Methods



- Waste water sampling and characterization
- ICP-OES analysis (ionic composition of sample)
- Hach-lange water testing analysis (TOC and COD measurements)

## Outcome

- Low ionic and organic composition



## Perspectives

- Helix lab, a bridge between education and industry
- First hand industrial experience
- Real life problem solving
- Exposure and career kick-start