



Biomass Reactor Capstone Project

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Motivation

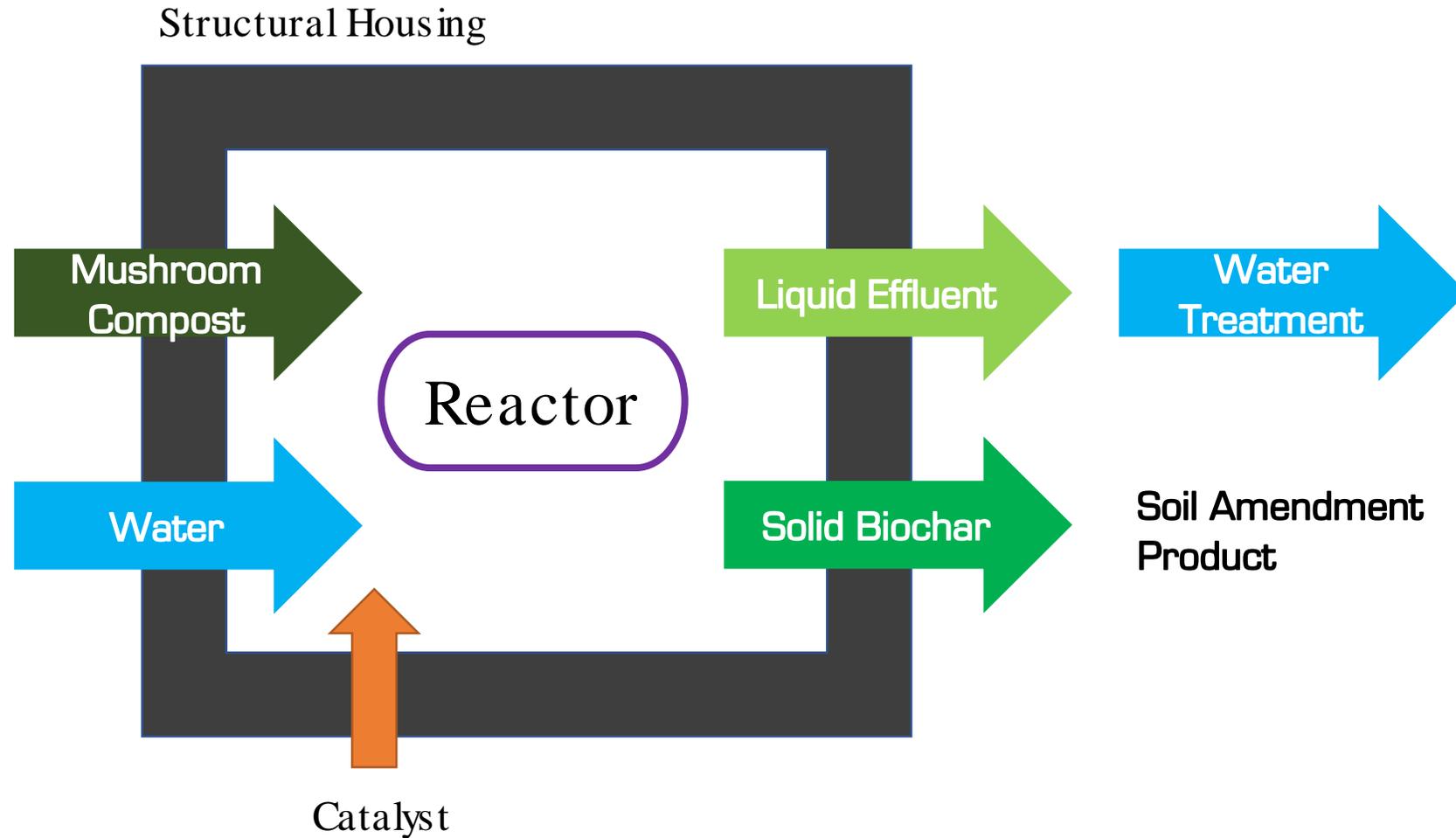


- Large Mushroom farming industry in BC
 - Limited by amount of mushroom waste
- Designed a process that reduces the time required for safe disposal
 - Produce soil amendment product

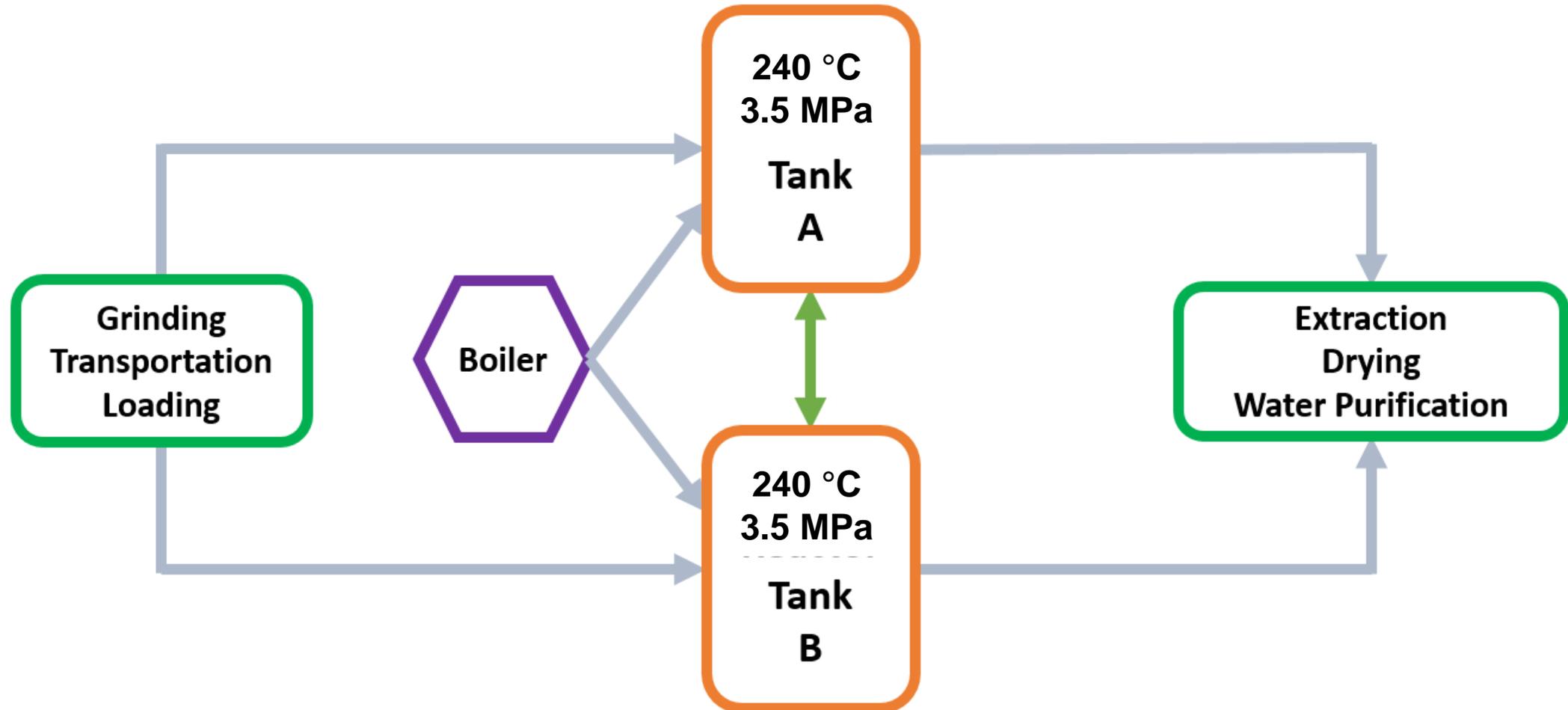




The Process

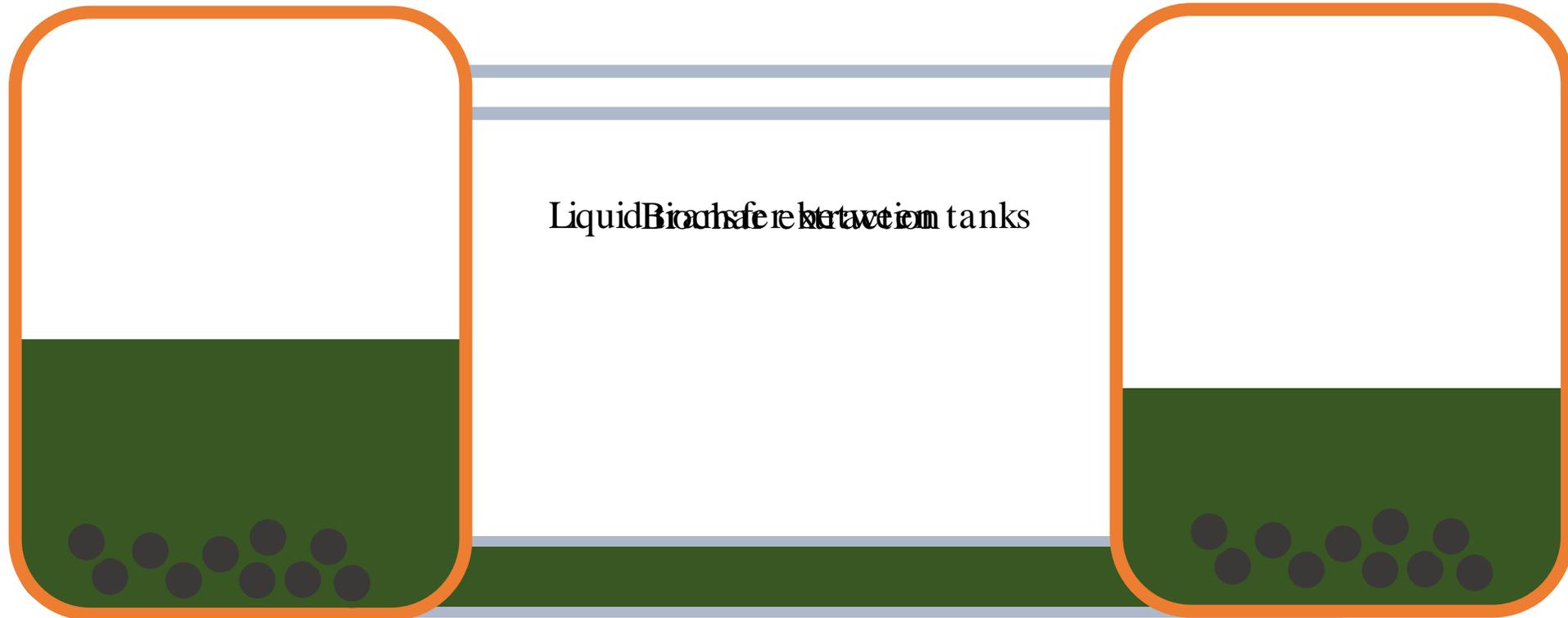


The Reactor System





Transfer Method



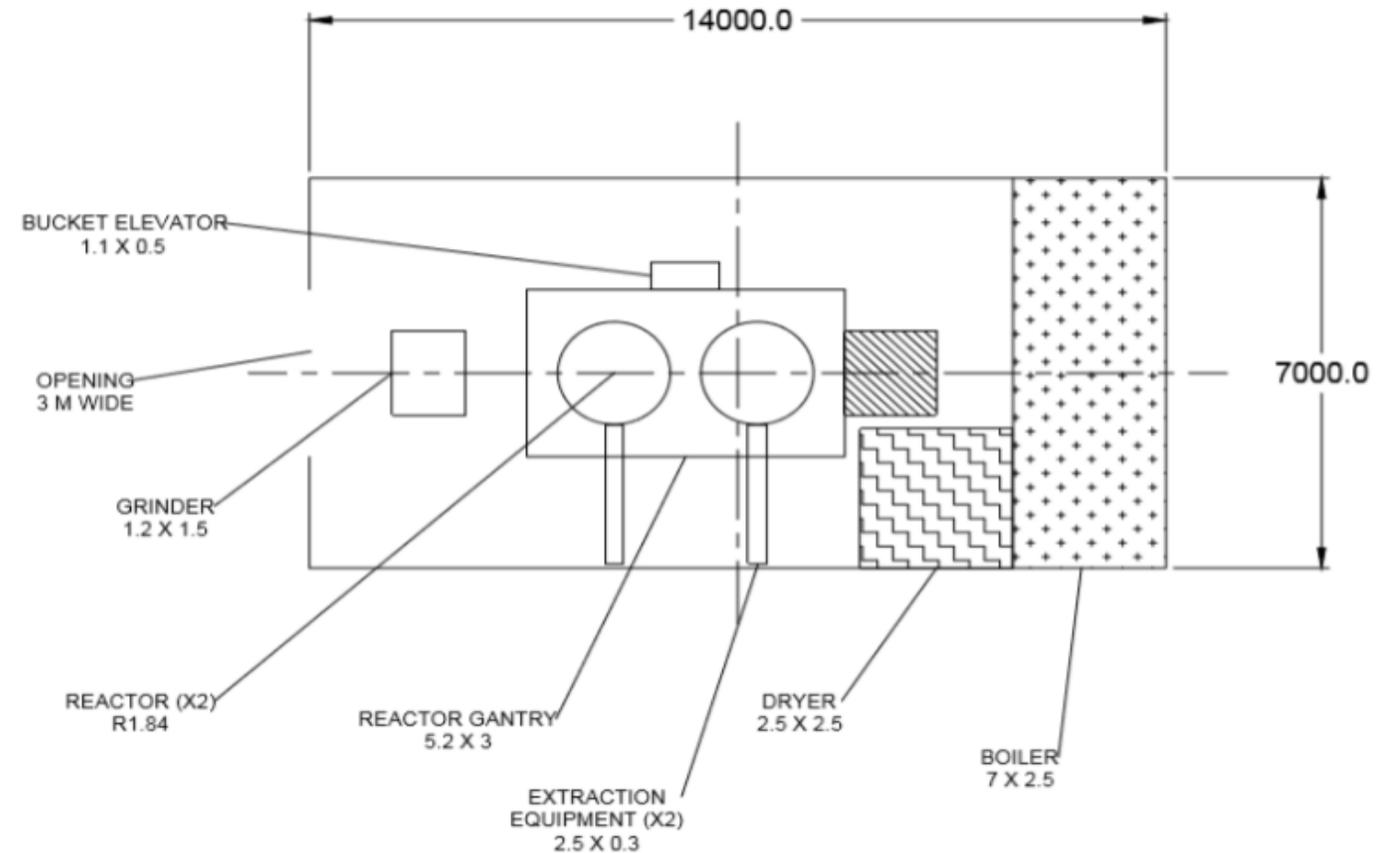
Reactor Pressure Vessel

- Designed from scratch using ASME Codes
- 4000 L capacity
- SA-240-316L Stainless Steel
- 2.5 m height, 1.8 m diameter
- Multiple Openings for Steam and Biomass Movement
- Reactor Dimensions and Shape
 - Minimize Surface Area
 - Minimize Material Cost
 - Limited Space Constraints

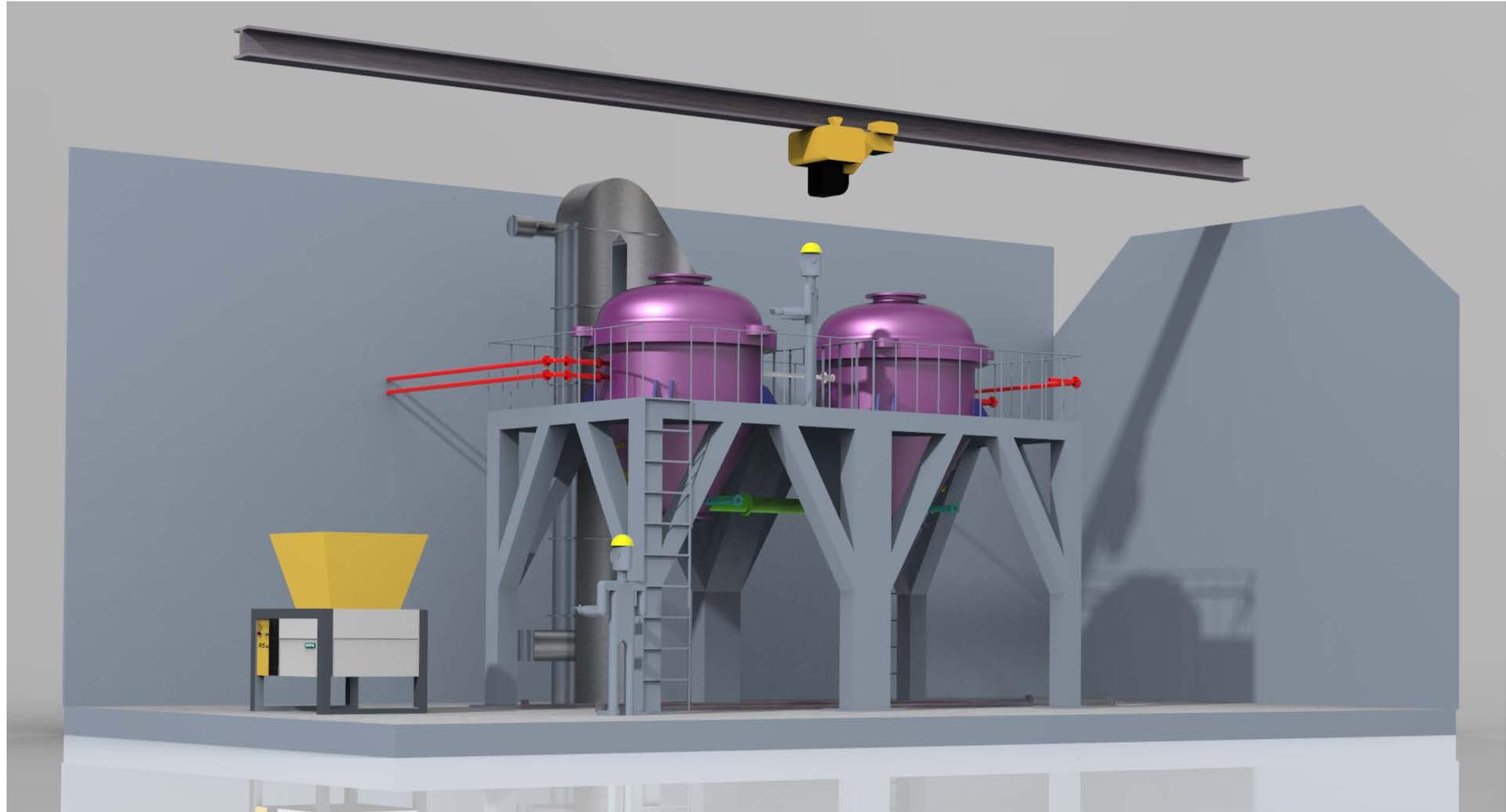


Components

- Problem Solving:
 - Grinding, mixing,
 - feeding into reactor
 - Extracting from reactor and drying
- Design Work:
 - Pressure Vessel Design
 - Fluid Transfer Design
 - Valves and Piping
- Analysis:
 - Energy Balance
- Testing:
 - Build Team
 - Systems Control

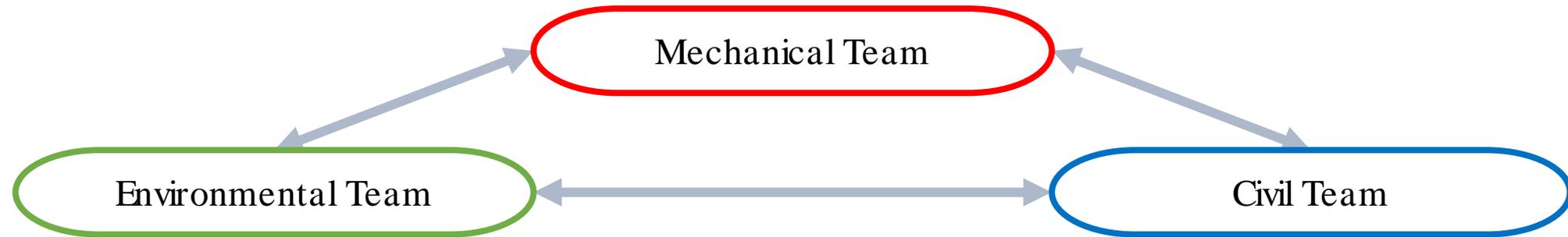


Visualization





Interdisciplinary Project



- Working with engineering students from other disciplines
- Chance to gain technical knowledge of other fields
- Great preparation for the real world!



YOUR Work



- Improving Efficiency
 - Turbines
 - Heat Exchangers
- Specializing for other applications
 - Biofuel Production
 - Replacement for coal

