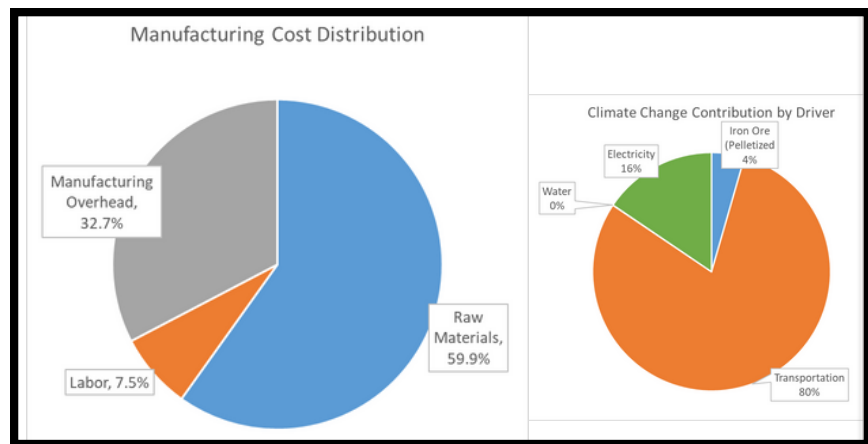
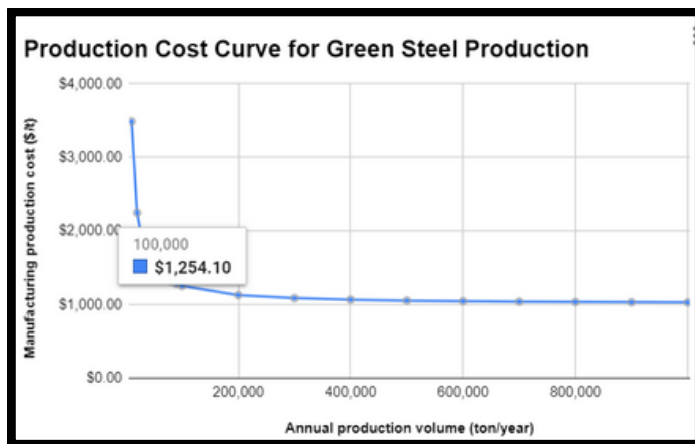
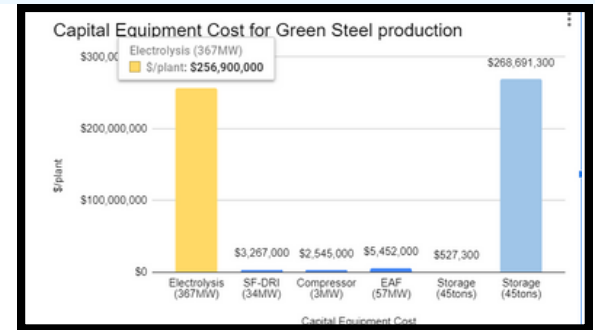
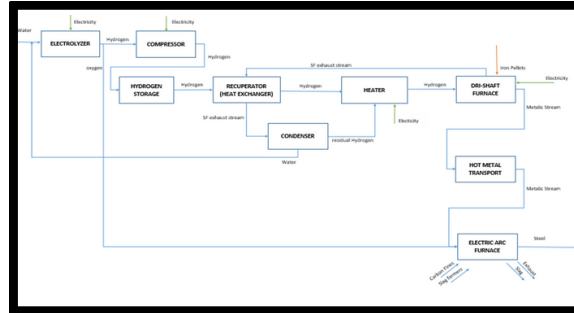
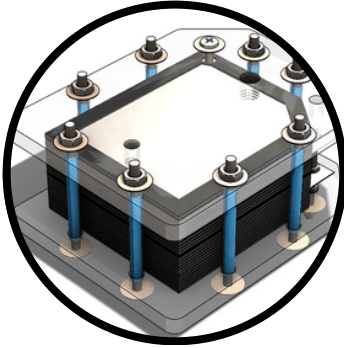


TECHNO-ECONOMIC ANALYSIS AND LIFE CYCLE ASSESSMENT ON GREEN STEEL PRODUCTION



What?

- Conducted research on **green steel production**, addressing the urgent need for sustainable practices to minimize carbon emissions in the steel industry.

How?

- Used **techno-economic analysis** (TEA) and **life cycle assessment** (LCA) methodologies.
- Gathered Inventory, equipment, and Process flow data from **15+** literature sources and used **SimaPro and Excel** for data management and analysis..
- Developed a comprehensive process flow, sized equipment, and constructed an exhaustive inventory.
- After identifying that electrolysis constitutes **48%** of the capital cost, I Designed a model electrolyser model for further investigation of the electrolysis process to find ways to minimize its costs. .

Results

- Total manufacturing cost for green steel exceeds the global average at **\$1254/ton**, while conventional steel was **\$737/ton** in 2020
- Green steel production emits only **0.6 tons of CO2 per ton**, a substantial improvement over the **2.1 tons** emitted in the Blast furnace pathway.
- Emphasized the need for future research to focus on reducing electrolysis costs, recognizing its dominant role in the capital cost structure.