For our second design project, our group was tasked by ArcelorMittal to design a product, process, or combination of the two that the company could implement to improve its environmental sustainability. Collaborating as a group, we created a needs hierarchy (pictured below in our presentation slide) that we based this process on and held against when selecting aspects of our process. The idea behind our specific design project was the fact that ArcelorMittal, among a notable amount of other companies, uses a large number of metal pallets for transporting and storing materials. However, ArcelorMittal has also studied the life of metal pallets and has come to the conclusion that 70% of metal pallets are simply used once and then discarded as trash. Our process for recycling these metal pallets will significantly reduce the amount of waste requiring proper removal and allows the material to be reused to help make some of the products ArcelorMittal will already have to make. Using our design process, we were able to narrow down options for our process and decided upon our final process, which is detailed below.

![Project Goals](image1)

**Why Do This?**

According to ArcelorMittal, ~70% of all metal is used just once, then discarded. The remaining 30% is recycled, but after 5 cycles only 0.25% remains in circulation, and has minimum footprint due to furnace efficiency.

![Improved Process for Recycling Metal Pallets](image2)

**Step 1:** Recycling services pick up used metal pallets from companies

**Step 2:** Processing company picks up pallets from recycling company

**Step 3:** Metal pallets are melted down using an electric heated furnace (85% of melting performance)

**Step 4:** Once metal is melted, put into box mold

**Step 5:** Easy store of molds in warehouse

**Step 6:** Remold only as needed to minimize excess

**Basis: Consumer Needs Hierarchy**

1. Small footprint
2. Low carbon footprint
3. Low waste output
4. Cost Effective
5. Comparable to other methods
6. Lower initial cost
7. Efficient
8. Easy to implement
9. Not going to lose money
10. Sustainable

**Implementation**

Extremely fast, immediately after acquiring the furnace. Often cost effective because companies can downsize warehouses and acreage.

![ArcelorMittal](image3)

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