Deliverables

The goals and motivation behind our design resides behind the needs to rid ArcelorMittal of their excess wooden pallets in an ecological manner. Our method would allow for the materials to be recycled and sold rather than the current method of mass disposal into landfills. The design involves a large industrial shredder that would break apart the wooden pallets and other additional waste lumber in addition to a large electromagnet to separate the nails and staples from the remaining materials. This method of recycling requires electricity and skilled workers to operate the machinery as well as the maintenance that the equipment would require to continue with operation.

Our selected design would meet the requirements of ArcelorMittal by shifting the model from cradle to grave, to cradle to cradle. By recycling the waste lumber that is no longer needed, the materials are put back into production and kept out of our landfills; reducing ArcelorMittal’s ecological footprint. To demonstrate our design, we will be creating a SolidWorks model that will show the basic, but conceptual aspects of the shredder, conveyor belt, and electromagnet. There will possibly be an animation to detail each step of the process if time permits.

The user will interact with the product by inserting the waste lumber and wood pallets into the shredder. The machine will also take care of separating the metal from the wood shredding. The stakeholders will see the profit to be made when selling the woodchips as there is a constant demand for these materials in production. Additionally, there would also need to be interactions with other systems in the removal of the waste wood and metal in the system we propose. With a one-time purchase for the shredder, the profits made from recycling and selling the scraps will eventually pay for the initial costs for the entire system and its integration.
ArcelorMittal would be able to sell the scrap metal to yards as well as the wood for the production of pressboard or mulch for yards, playgrounds, and parks.

After discussing our design with another team, we proposed that we should take action by limiting the emissions and the risk factors for the equipment operators. In addition, we would like to research finding alternative energy for the shredder to use other than the electric. Possible routes include nature gas generators or solar power to further limit the ecological footprint of ArcelorMittal.