

STEEL



Photo courtesy of 2013 team

Important Facts

- **Use:** Frame the perimeter to make the house moveable, roof supports and posts, wall supports
- **Key structural benefits:** Weather-resistant, high strength per weight, uniform composition, moveable via crane

Solar Decathlon 2013

All steel will come from SOS Steel, whose close proximity to SCU will reduce transportation energy costs. SOS Steel is part of many LEED projects since their steel meets LEED standards for post-consumer recycled content. They obtain their steel from Brown-Strauss Steel in Colorado after that company purchases steel from mills around the world. This makes it difficult to know about the labor conditions that went into producing the steel. However, most of their suppliers are very open about the recycled content of their steel, which averages 95% for most structural applications and 30% for other applications.

Ethical Issues Raised

Steel is initially produced by heating iron ore and treating it to remove excess carbon while incorporating other additives. The smelting process uses a tremendous amount of electricity and releases carbon dioxide and other pollutants into the air, often in poorer communities where the plants are located. Steel has a high energy cost because there are so many steps from mining, extracting, processing, finishing, and transporting the final product. Iron ore mining is a labor-intensive project with little payoff since the market price of steel is relatively low. In many cases, this leads to exploitation of labor. The high up-front cost to begin a steel production venture has concentrated steel resources into the hands of a powerful few, perpetuating wealth and resource inequality.

However, not all is bad in the world of steel. According to a 2008 EPA report, the steel industry has made the biggest strides out of nine targeted manufacturing industries in improving environmental practices. Steel has a long lifetime and does not require large quantities to provide adequate structural support. It provides a solid thermal seal that can cut down on energy losses. Most importantly, it is readily recycled, with nearly 100% of structural steel ultimately reclaimed for re-use.

For the specific demands of this project, steel is the most practical option. The house needs to be moveable in order to transport it to Southern California, and a steel-based frame facilitates that task. It is also hard to find a superior support material that can withstand weather conditions and years of wear. Steel has a proven track record of reliability in the construction industry with few associated risks.

It is important to uphold rigorous standards for our sponsors, making sure they make an extra effort to use recycled steel and obtain their new steel from ethical sources. Recycling has become standard, so most companies will use recycled steel regardless of their concern for the environment. There is still work that could be done to minimize steel's environmental impact and create more stringent labor standards to minimize exploitation. This must start with individual companies holding their suppliers accountable.