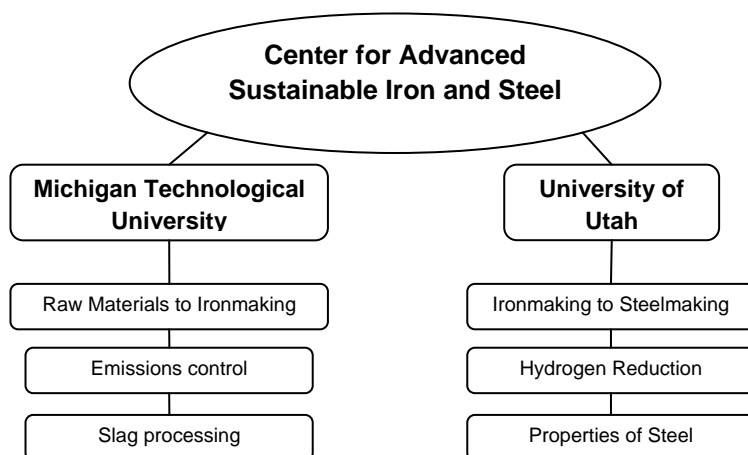


Mission of Center: The Center is being formed to conduct research important to industry that falls in any of the following areas of iron and steel production: Ironmaking, steelmaking, slag management, and feed preparation (grinding, separation, pelletization). It will promote fundamental industry-sponsored research that is needed to make iron and steel production sustainable, and to provide opportunities for education of the critically-needed students to work in this area. The team assembled for this Center believes that the common perception of the iron and steel industry as being “mature” technologies, with little room for improvement, is incorrect. The overwhelming need to develop an alternative to the use of fossil fuels will force the industry to find novel approaches for producing the 130 million tons of iron and steel consumed in the U.S. annually.

The issues with sustainability cannot simply be addressed with minor tinkering with current processes. Fundamental new science and technology derived from basic research is needed to create new approaches for metal production. The proposed Center will foster a research and technology base that will promote synergy between academic and industrial interests, leading to a new generation of sustainable, economical iron and steelmaking technologies.

The new Center will include an Industrial Advisory Board that will provide regular oversight and consultations to work with the Center participants to define the research agenda, ensuring that it focuses on shared research interests, needs, and opportunities. All intellectual property will be shared equally among the Center members. Industry members of the Center will provide the primary financial resource for the Center’s activities, and will have substantial interaction with the two university members. The extensive graduate and undergraduate student involvement will ensure that students have the opportunity to work with industrial personnel, and will produce students that are knowledgeable in industrially relevant research.



Membership:

Three levels of membership are available: Full members, Associate members, and Affiliate members. The advantages and benefits to be gained by all members include:

1. Process improvements and any other technology transfer that will flow from any site-specific studies
2. Access to a very broad range of research outcomes
3. Receipt of technical summary reports on the findings of all research programs within the Center, regardless of the level of sponsorship
4. Royalty-free access to, and use of, any optimization tools developed by the Center
5. Involvement in discussions with other sponsors on technical problems, and the sharing of relevant information and solutions
6. Involvement in a multi-disciplined research program with multi-national sponsorship base and multi-national research collaboration
7. Development and maintenance of a critical mass of research infrastructure in iron and steel production, with access to experienced research staff for *ad hoc* advice and assistance in a range of technical areas
8. A source of well qualified and trained students for the industries workforce
9. Discounts on commercialized products of research
10. Extremely high leverage of each sponsors' research funding investment
11. Further education and training.

In addition, Full members will be able to nominate their sites as research sites for evaluation and validation of some of the research outcomes. This gives the opportunity to have a concurrent program of research undertaken on a specific issue related to the operation. Full members are also able to access the project team for a detailed presentation/seminar arranged for their company representatives on two occasions during the life of the project. This level of sponsorship is the most expensive, but also clearly the most effectual in terms of getting the maximum interaction and involvement from the research team.

Associate members will have one membership on the Center's Industrial Advisory Board, which will direct the research projects of the Center. Associate members will also have access to all published technical papers and reports.

Affiliate membership is intended to recruit individual members, small business members, and to attract new industry sponsors who are not financially able to commit to a Full or Associate membership. Affiliate members may attend research conferences and will have access to technical papers; however, they will not have a vote on the Industrial Advisory Board. Individuals and Small Businesses may remain affiliate members indefinitely, larger industrial partners will be asked to commit to Full or Associate membership after an introductory period of no more than two years as Affiliate members.

The costs of the membership levels are initially expected to be \$50,000/year for Full members, \$25,000/year for Associate members, and \$5,000 for Affiliate members. Membership fees are expected to increase at approximately 3% per year.

1. Relevant Research Projects Completed in the Past

- 1.1 Single-Step Ironmaking from Ore to Improve Energy Efficiency
- 1.2 Verification of Steelmaking Slag Iron Content, Recycle and Reuse of Steel Slags
- 1.3 Prevention of Self-Heating of Swarf
- 1.4 Ultrasonic Removal of Mill Scale from Continuous Strip
- 1.5 Chemistry and Physics of Taconite Agglomeration
- 1.6 Production of Inorganic Pellet Binders from Coal Fly Ash
- 1.7 Novel Binders and Methods for Agglomeration of Ore
- 1.8 Temperature and Viscosity Effects in Mineral Comminution Circuits
- 1.9 Optimization of Comminution Circuit Throughput and Product Size Distribution by Simulation and Control
- 1.10 Bacterial Extraction of Phosphorus from Iron Ore

2. Examples of Proposed Research Projects for the Center

- 2.1 Metal/Slag Separation in Iron Nugget Production
- 2.2 Advanced Furnace Modeling
- 2.3 Capture and sequestration of CO₂ from Iron and Steelmaking
- 2.4 High-Efficiency Removal of Mercury from Plant Emissions
- 2.5 Effects of Binder Type on Pellet Breakdown and Dust Production
- 2.6 Review of Iron Ore Pellet Binders, With Emphasis on Organic Binders
- 2.7 Flowsheet Development for Low-Grade Ores
- 2.8 Evaluation of Surface Chemistry throughout Processing Plant, and Determination of Effects on Plant Performance
- 2.9 Review of Technology for Online Moisture Analysis
- 2.10 Effects of Carbonate Minerals on Filtration Rates