

# HARNESSING THE POWER OF SMART MANUFACTURING

CESMII (Clean Energy Smart Manufacturing Innovation Institute), a Manufacturing USA® institute, accelerates smart manufacturing adoption through advanced technologies and intelligence to improve decision making, sustainability, productivity and energy efficiency.

Manufacturing USA, a public-private partnership with 14 manufacturing institutes across the nation, connects companies, academic institutes, non-profits, and local, state, and federal entities to solve industry-relevant advanced manufacturing challenges in new technology areas with the goals of enhancing industrial competitiveness and economic growth and strengthening national security.



## Technology Focus Area

**Smart manufacturing optimizes business, technology, infrastructure, and workforce practices using engineered systems that integrate information technology with operational technologies.** With smart manufacturing, manufacturers have the right information and tools to make better, real-time decisions. Smart manufacturing integrates previously siloed manufacturing processes using advanced sensors, controls, platforms, and modeling technologies to help U.S. manufacturers of all sizes. Bringing together information and operations will create, among other things, dynamic plant configurations and readiness; flexible product component and material configuration; just-in-case optimized inventory and management; adjustable ordering to reduce premium shipments; and customizable order options for customers.

## Approach to Innovation and Collaboration

CESMII brings together dozens of partners in industry, government, and academia to focus on innovations that advance U.S. manufacturing competitiveness. This is done through programs such as:



Test beds, application projects, services, and training enabled by the **Smart Manufacturing Platform and Marketplace infrastructure**



Developing the nation's first **open platform and marketplace** for secure, real-time data analytics, industrial applications, and manufacturing solutions



**Collaboration Space:** a secure smart factory to demonstrate smart manufacturing technologies across the enterprise to validate productivity and profitability



**Workforce development** including online courses, training for IT and manufacturing professionals, student courses, and smart manufacturing concepts in regional training

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Los Angeles, CA  
888-720-8096  
cesmii.org

# COLLABORATIVE PROJECT EXAMPLES

“Smart manufacturing makes it possible for companies to reduce their energy use and save money on their energy bills by optimizing their manufacturing processes. In fact, increased investments in Smart Manufacturing could save American manufacturers \$15 billion in annual electricity cost savings by 2035.”

– Ethan Rogers, Program Director, American Council for an Energy-Efficient Economy



## **ENERGY REDUCTIONS IN CONTINUOUS STEEL CASTING:**

ArcelorMittal leads partners on this project to target zero-defect slabs in the continuous casting process by adopting smart manufacturing technologies and reducing overall energy intensity in existing state-of-the-industry operations.

**FACTORY 4.0 EDUCATIONAL TOOLKIT:** Penn State leads the development of a small-scale process simulator of machinery and software with smart manufacturing components for educational purposes. The system will develop communication and data storage architecture, optimize machine-learning algorithms, and develop educational modules and interfaces.



## **SMART MANUFACTURING WORKFORCE DEVELOPMENT MODEL PROGRAM:**

El Camino Community College leads the development and imbedded a smart manufacturing workforce model that leverages existing education and workforce training systems. This program is designed so that any curriculum, training component, or business development tool can be easily adopted and customized by organizations nationwide.

**ENERGY-EFFICIENT CEMENT MANUFACTURING:** University of Louisville leads the incorporation of smart manufacturing technologies and processes—modern monitoring, simulation and control systems - that will allow lower energy use through lowering firing temperature and times to reduce cost and environmental impacts in the cement making industry.

“We’re eager to share Savigent Technology and our passion for smart manufacturing with the CESMII network. These projects and initiatives will validate and increase productivity, energy efficiency and overall profitability, significantly improving the capabilities of participating U.S. manufacturing companies and their supply chain.”

– Mark Besser, Vice President of Customer Success, Savigent Software