

**RCN - Sustainable Manufacturing
Advances in Research and Technology:
Project and Progress Review**



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**Workshop on Sustainable Manufacturing
Omni William Penn Hotel, Pittsburgh, PA
October 31, 2012**

RCN-SEES Sustainable Manufacturing Project

- **NSF Award (No.1140000) to CACHE (~\$722k, 01/01/2012 – 12/31/2016)**

- **Project Team:**

PI: Yinlun Huang (Wayne State U.)

Co-PIs: Thomas Edgar (U. Texas), Mahmoud El-Halwagi (Texas A&M U.), Cliff Davidson (Syracuse U.), Mario Eden (Auburn U.)

Other Steering Committee Members: Luke Achenie (Virginia Tech.), David Allen (U. Texas), Burton English (U. Tennessee), David Fasenfest (Wayne State U.), Ignacio Grossmann (Carnegie Mellon U.), Karen High (Oklahoma State U.), Ibrahim Jawahir (U. Kentucky), Christos Maravelias (U. Wisconsin), Kim Ogden (U. Arizona), Mary Rezac (Kansas State U.), Farhang Shadman (U. Arizona)

Loss of U.S. Leadership in Manufacturing

Source: Report to the President on Capturing Domestic Competitive Advantage in Advanced Manufacturing, - by Executive Office of the President, President's Council of Advisors on Science and Technology, July 2012

- **Loss of low-wage jobs in low-tech industries, and our status relative to low-wage nations**
- **Lagging behind in innovation relative to high-wage nations such as Germany and Japan**
- **Leadership relinquished in some medium- and high-tech industries**
- **Loss of significant elements of the R&D activities linked to manufacturing to other nations**
- **Loss of ability to compete in the manufacturing of many products that were invented and innovated in the U.S.**

Project Objective



- **To bridge the gap between the academic knowledge discovery and industrial technology innovation for sustainable manufacturing**
- **To foster interactions that create new research directions or advance manufacturing sustainability.**

Project Tasks

1. To conduct comprehensive and in-depth **review of the frontier research and technological development** for sustainable manufacturing
2. To define the **roadmap** towards manufacturing sustainability and identify the bottlenecks in a number of focused research areas via several workshops
3. To **coordinate the research** through sharing knowledge, resources, software, and results
4. To establish **partnerships with industrial groups** to expedite technology introduction
5. To conduct **education and outreach** to a wide range of stakeholders

Project Collaborators

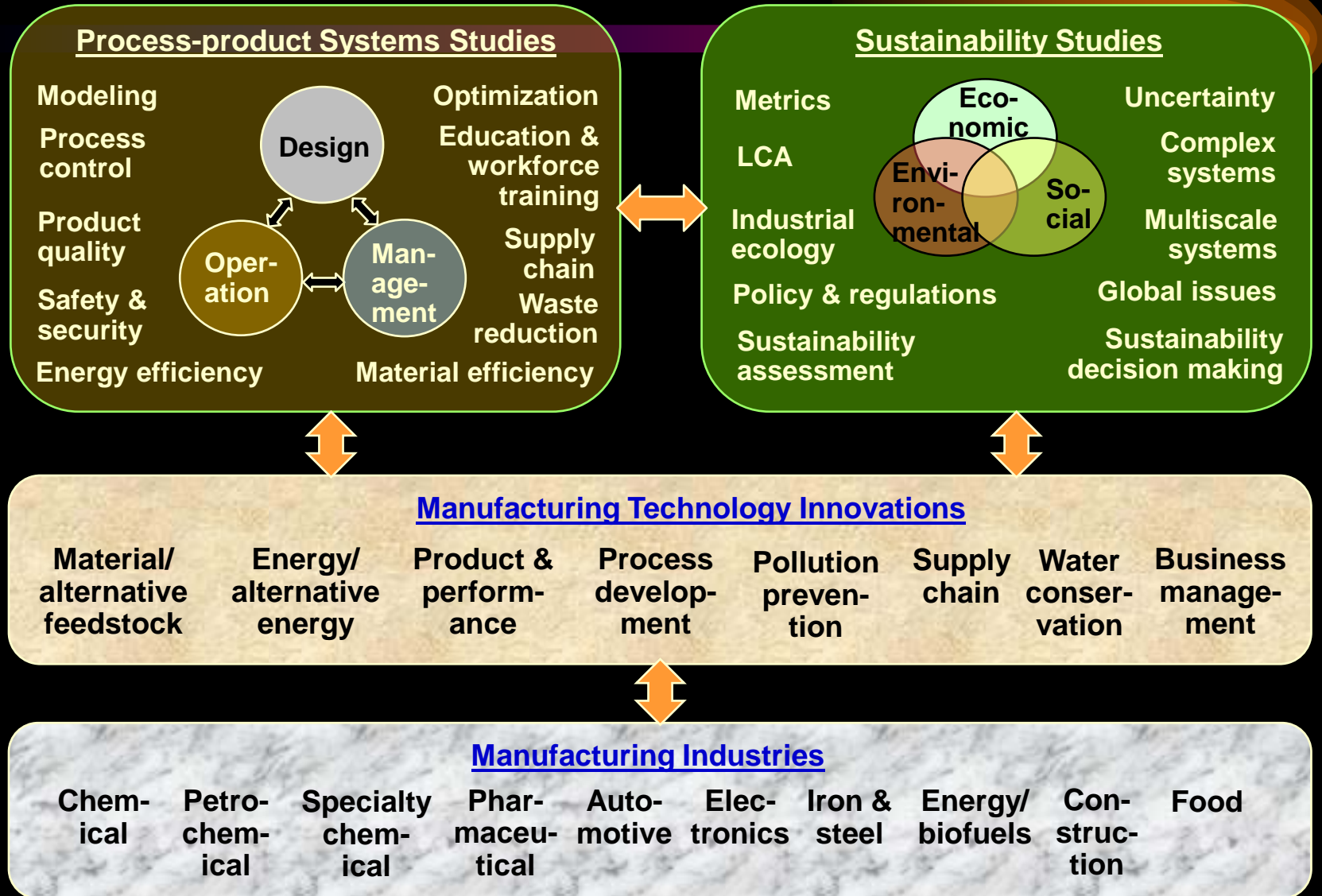


- **AICHE - Institute for Sustainability (IfS)**
- **CACHE Corporation**
- **Center for Advanced Process Decision-Making (CAPD), Carnegie Mellon U.**
- **Center for Sustainable Engineering, Syracuse U.**
- **Institute for Sustainable Manufacturing (ISM), U. of Kentucky**
- **National Alliance for Advanced Biofuels and Bioproducts (NAABB)**
- **National Center for Manufacturing Sciences (NCMS)**
- **National Council for Advanced Manufacturing (NACFAM)**
- **NSF ISRC Engineering Center for Environmentally Benign Semiconductor Manufacturing, U. of Arizona**
- **Smart Manufacturing Leadership Coalition (SMLC)**
- **Texas-Wisconsin-California Control Consortium (TWCCC), Austin, TX**

Project Foreign Collaborators

- **B. Bakshi, TERI U., India** (now returned to OSU)
- **R. Gani, Technical U. of Denmark, Denmark**
- **E. Hertwich, Norwegian U. of Sci. & Tech., Norway**
- **S. Hu, Tsinghua U., China**
- **Q. Jin, Waseda U., Japan**
- **I. Karimi, Nat'l U. of Singapore, Singapore**
- **Y. Qian, South China U. of Tech., China**
- **G. Wozny, Berlin U. of Technology, Germany**

Coordinated Research and Education on Sustainable Manufacturing



Sustainability and Process/Product Systems Research and Education Coordination



Core Areas

- I – Methodological studies on engineering sustainability**
- II – Studies on sustainable design and integration**
- III – Research on sustainable operation, system management, and cyber-infrastructure**
- IV – Energy and alternative energy research**

Project Progress ...

- **Executive committee: monthly meetings for activity planning**
- **Steering committee meeting in Dallas, TX, on May 2: Research and education coordination approach**
- **Educational activity planning: RFP to all ChE chairs on Sept. 26**
- **Planning for roadmap workshop in summer 2013**
- **Website development / coordination with CSE at Syracuse**
- **Outreach efforts: with NIST, NCMS, industries, institutions**
- **Initial stage of industrial advisory board creation**
- **Workshop in Pitts**

<http://www.research.che.utexas.edu/susman/index.html>

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SMART

SUSTAINABLE MANUFACTURING ADVANCES IN RESEARCH AND TECHNOLOGY

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Quick Links

- Center for Sustainable Engineering (Syracuse)
- Center for Advanced Process Decision-Making (Carnegie-Mellon)
- Texas-Wisconsin-California Control Consortium
- CACHE Corporation
- Smart Manufacturing Leadership Coalition
- AICHE Institute for Sustainability
- National Council for Advanced Manufacturing (NACFAM)

