# Education and Software Coordination Plan in Sustainable Manufacturing

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# Major Activities

1. Develop Sustainable Manufacturing Case Studies (four per year)
2. Integrate these Case Studies and other modules into the Electronic Library of the Center for Sustainable Engineering
3. Benchmark the status of current education in Sustainable Manufacturing in U.S. engineering programs
4. Conduct Workshops for faculty on Sustainable Manufacturing to enhance the sustainability content of manufacturing and design courses

# 1. Develop Sustainable Manufacturing Case Studies

- What is a “Case Study”?
  - Interactive, graphically oriented
  - Contains supporting material and simulations
  - Can help instructor and students learn about some aspect of sustainable manufacturing design
- Request for Proposals has been distributed, due November 15, 2012

# 1. Develop Sustainable Manufacturing Case Studies (continued)

**Those submitting proposals should:**

- **Clearly state the main idea of the study**
- **Give specifications of simulation underlying the case study: choice of simulation models, ranges of user-adjustable parameters, values of fixed parameters, etc.**
- **Prepare each component of the case study**
- **Provide documentation of trial runs using the simulation**
- **Provide a shorter version of the case study for outreach to K-12 and to industry**

# 2. Develop Modules for the Electronic Library of the Center for Sustainable Engineering

- Intended to provide high quality education materials accessible on the web at no cost
- Case Studies are one type of module; also many other types of modules such as those emphasizing principles, reviews of broad areas, standards, etc.
- All modules are sent out for peer review
- Modules that pass review are posted
- Once posted, modules are indexed by topic, keywords, author, title, grade level, discipline of engineering, etc.

# 3. Benchmark Current Status of Education in Sustainable Manufacturing in the U.S.

- Degree programs
- Courses
- Topic areas covered within each course
- Case studies used in class
- Educational materials: textbooks, journal papers, conference papers, software, etc.
- Other educational activities: seminars, projects, field trips, laboratories

# Proposed Survey Questions to Benchmark the Status of SM Education in the U.S.

- What degree programs (BS, MS, PhD) exist at your school that include required courses in SM?
- What minors or certificate programs exist in SM?
- In approximately what year did each of these programs begin?
- How many students have successfully completed each of these programs since the beginning?
- What courses include at least some material on SM? What educational materials are used in each?
- What other educational activities in SM exist at your school?

# 4. Workshops on Sustainable Manufacturing for Faculty

- 1-3 day workshops to enhance sustainability in engineering design/manufacturing courses
- Sessions on principles of sustainable manufacturing, examples of case studies, educational materials, using and submitting SM modules to the Electronic Library
- Some workshops will be associated with national conferences (AIChE, ASEE), others will be free-standing
- Workshops will also encourage a network of SM educators and researchers

# Summary:
# Four Education Activities

1. Sustainable Manufacturing Case Studies
2. Modules for the Electronic Library of the Center for Sustainable Engineering
3. Benchmark study of current education in Sustainable Manufacturing in U.S.
4. Faculty Workshops on Sustainable Manufacturing to enhance the sustainability content of manufacturing and design courses