Enhancing Industrial Sustainability by Improving Resource Efficiency

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INDUSTRIAL ASSESSMENT CENTER BACKGROUND

- Sponsored by U.S. Department of Energy (DOE)
  - Began during 1970’s “Energy Crisis”
  - 24 Centers at universities throughout the U.S.
  - 20 no-cost assessments per year for mid-sized manufacturers.

- Goals
  - Help industry be more resource-efficient and competitive
  - Train new engineers in industrial best practices
  - Develop new, innovative solutions for energy and resource efficiency

RESOURCES UTILIZED TO ACCOMPLISH THE GOAL

- Rutgers System
  - Identify and classify Resource efficiency Assessment Recommendations.
- UD-IAC Audits
  - Resource Efficiency ARs from Audits
- EPA Report, Equipment Literature
  - Collected data on new technologies and methodology to improve resource and energy efficiency.

INTEGRATED RESOURCES PLUS PRINCIPLES MATRIX

- IRPM provides a roadmap to increase industrial resource efficiency and provides comprehensive, and repeatable method for identifying resource efficiency opportunities.

RESOURCES SAVINGS PRIORITY AND ITS ANALOGY

- These principles are prioritized according to the magnitude of resource saving opportunity.
- Moreover, the magnitude of resource saving opportunity is also proportional to the energy saving, pollution reduction, and cost saving potential.

RESOURCE EFFICIENCY GUIDEBOOK GOAL

- Create a comprehensive excel-based tool which help industry to improve manufacturing resource efficiency by the following:
  - Pollution Prevention
  - Resource minimization
  - Cost Minimization
  - Reduce Life Cycle Minimization

WHY THESE RESOURCE CATEGORIES?

- Practically all industrial processes use some combination of the following six resources: raw materials, water, chemical agents, equipment, process scraps, and packaging.
- Efficient use of these resources results in cost savings and reduced pollution.

RESOURCE EFFICIENCY GUIDEBOOK FLOW

- The main purpose of the tool is offer setting a systematic strategy and tool set for effective resource management.
- To offer a comprehensive and systematic way of improving manufacturing resource efficiency.

WATER RESOURCE PAGE AND BEST-PRACTICE PAGE

- The water resource page, includes example recommendations such as install pH sensor, use skimmer to prevent tramp oil.
- Water best practices page, which includes best practices such fix leaks and counter-flow rinsing.

STRAINED LCA

- Life Cycle Assessment (LCA) provides a holistic view of industrial energy consumption, resource consumption, and environmental emissions.
- The streamlined LCA will perform a tailored life cycle assessment with fixed system boundary, industry specific life cycle inventory (LCI) data, and geographically specific emission data.

WHY REG IS IMPORTANT TO THE WORLD?

- Environmental
  - Reduce need for more landfills
  - Reduces pollution and carbon footprint
- Social
  - Improve company reputation
  - Attracts more contracts and customers
- Financial
  - Increases revenue by recycling
  - Increases profitability
- Others
  - Yes, cleaner environment to live

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