

ASME Sustainable Products & Processes Strategic Planning Workshop Results

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PERSI Session at Ecobuild
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Washington, D.C.**

Strategic Planning Workshop Objectives



- **Help address challenges in areas of**
 - Sustainable Manufacturing, Energy & Water
- **Explore potential ASME roles in addressing these challenges**
 - By developing ASME value-added sustainable products & services
- **Identify high-impact partnership opportunities**
- **Enable a dynamic exchange of ideas**
- **Identify project implementation “next steps”**



ASME

At a Glance



- **Focused on the technical, educational and research issues of the engineering technology community**
- **127,000 members**
 - **15% outside U.S.**
- **141 countries**
- **37 technical divisions plus 5 institutes**
 - **IGTI (Gas Turbine)**
 - **IPTI (Petroleum)**
- **Digital library with 21 journals, more than 100 conference proceedings, and ASME Press e-books**
- **500 standards, used in more than 100 countries**
- **Strategically focused, market driven, forward looking**

Codes & Standards

- **ASME develops universally applicable codes, standards, conformity assessment programs, and related products and services**
- **125th anniversary of first ASME standard celebrated in 2009**
 - **first Performance Test Code (1884)**



ASME / AUTODESK SUSTAINABLE DESIGN TREND SURVEY

- **Second annual comprehensive survey of ASME members**
 - **Gauging opinions of ASME members on matters of general sustainability and sustainable technologies.**
- **Members also given opportunity to comment on the sustainability process in manufacturing.**

ASME / AUTODESK SUSTAINABLE DESIGN TREND SURVEY

- **63% expected their companies would have an increasing involvement with green or sustainable design specifications over the next year.**
- **Regulatory requirements, rising energy costs and client demand are the three most likely factors to influence the use green design practices and procedures.**

ASME / AUTODESK SUSTAINABLE DESIGN TREND SURVEY

- **Members were asked to respond to the question of how their organizations balance priorities that may impact the use of sustainable methods**
- **24% - Invest if doing so wouldn't affect throughput or cost**
- **27% - Investment on existing products only if it would improve throughput or cost**
- **34% - Sustainable practices only considered on new products if they save money**

Energy and Water are ... Inextricably linked



Water for Energy

and

Energy for Water

Energy and power production requires water:

- Thermoelectric cooling
- Hydropower
- Energy minerals extraction / mining
- Fuel Production (fossil fuels, H₂, biofuels/ethanol)
- Emission controls



Water production, processing, distribution, and end-use requires energy:

- Pumping
- Conveyance and Transport
- Treatment
- Use conditioning
- Surface and Ground water

ENERGY and WATER
ENERGY and WATER



ASME Water Management Technology Roadmap

- **\$6.7 billion industry in the United States alone in 2002 (U.S. Census Bureau)**
- **7% of ASME members and their companies have a direct involvement in water industries**
- **25% of ASME members are dependent on water availability, quantity, quality, cost and processing to deliver their primary products and services**

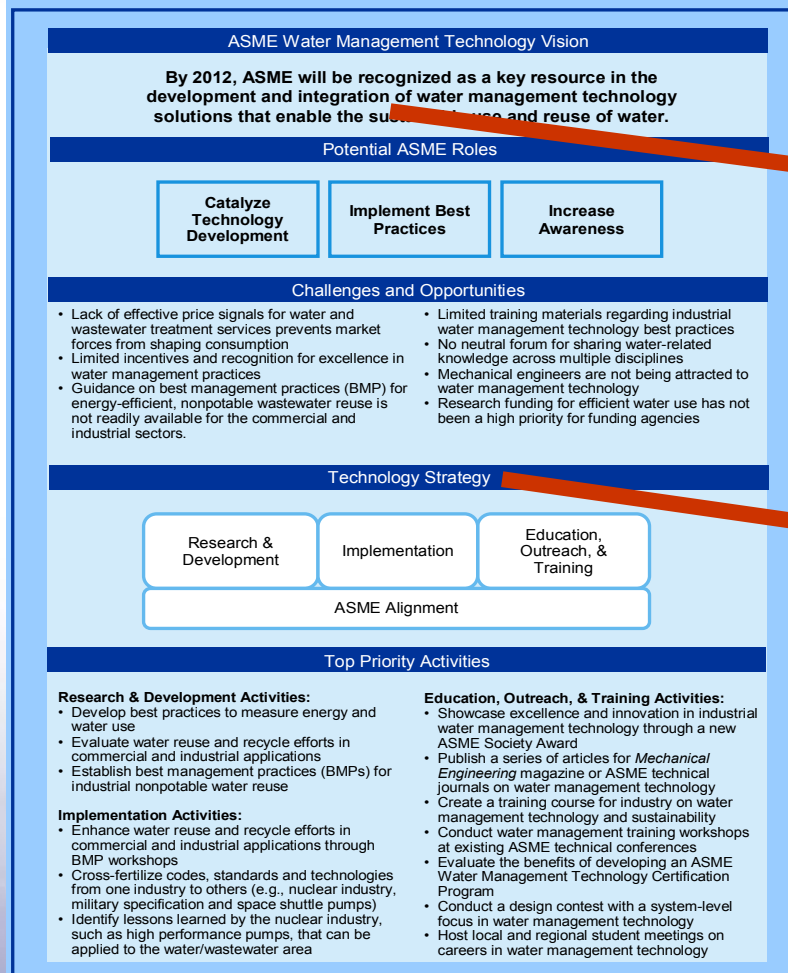
ASME Water Management Technology Vision and Strategy

Vision

By 2012, ASME will be recognized as a key resource in the development and integration of water management solutions that enable sustainable use and re-use of water.

Technology Strategy

- Research & Development
- Implementation
- Education, Outreach & Training
- ASME Alignment





Top Water Management Issues

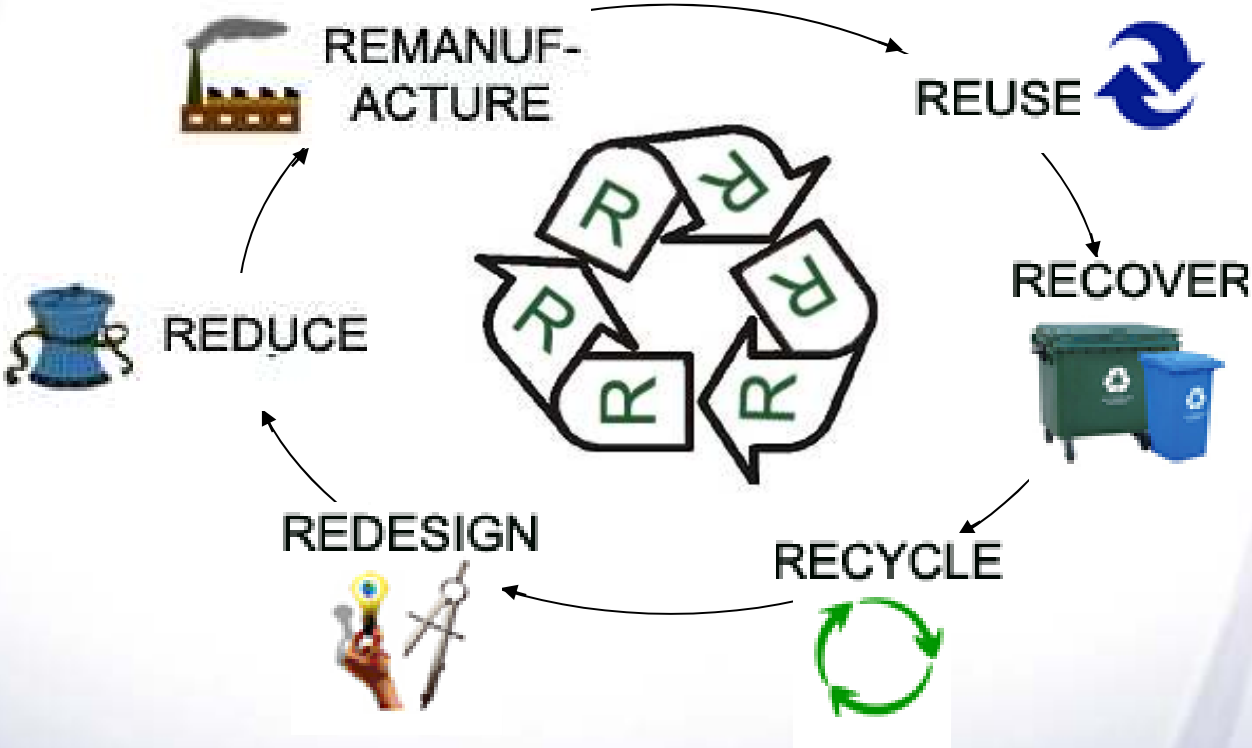
- **Technology**
 - Slow adoption of new technologies
 - Inadequacy of current technologies
- **Economics**
 - Add the value of water to everything
 - Relationship of water availability and economic development
- **Water Supply**
 - Sustainability and water re-use
 - Water footprint of goods and services
- **Policy** — Energy-Water Nexus DOE Study
 - Energy for water vs. water for energy
- **Leadership**
 - Lack of standards
 - No Department of Water

U.S. Manufacturing Sector

- **Manufactured goods represent 69 percent of U.S. exports** ¹
- **Industrial manufacturing processes used more than 15.6 trillion Btu in 2006** ²
- **Each year, approximately 7.6 billion tons of industrial solid waste are generated and disposed of at American industrial facilities** ³

1. A Framework for Revitalizing American Manufacturing, Executive Office of the President, December 2009.
2. Energy Information Administration, www.eia.doe.gov/emeu/mecs/
3. Environmental Protection Agency, www.epa.gov/epawaste/nonhaz/industrial/guide/pdf/intro.pdf

The Six Rs



ASME CRTD Sustainable Products and Processes Workshop

- **June 17, 2010 in Washington, DC**
- **Participants:**
 - **Richard Alloo**
 - **John F. Elter, Ph.D.**
 - **Shaw C. Feng, Ph.D.**
 - **I.S. Jawahir, Ph.D.**
 - **Norma Johnston**
 - **Sridhar Kota**
 - **Sarah Krasley**
 - **John R. Lloyd, Ph.D.**
 - **Michael F. Molnar, PE, FASME**
 - **Walter Roy**
 - **Michael Sanio**
 - **Darlene Schuster**
 - **K. Daniel SeEVERS**
 - **Subhas K. Sikdar, Ph.D.**
 - **Steve Sikrica**
 - **E. Timothy Smith**
 - **John W. Sutherland, Ph.D.**
 - **Michael Tinkelman, Ph.D.**
 - **Kenneth Wetzel, Jr.**
 - **Richard N. Wright, Ph.D.**

Priority Areas and Activities

Type of Activity	Priority Area			
	Product Design for Sustainability	Sustainable Manufacturing Processes	Systems Approach to Water Management	Crosscutting
Sustainability Standards and Methodologies				
Conferences, Seminars, and Meetings				
Education (Engineers and Consumers)				
Research and Products				

Product Design for Sustainability

- **Create a sustainable product rating system including a national standard and testing procedures to assess conformity**
- **Develop methodologies and technologies for verification of performance with respects to sustainability metrics**
- **Create an online toolkit for sustainable product design regarding water, energy, and materials**

Sustainable Manufacturing Processes

- **Define the critical factors that determine the sustainability of manufacturing processes**
- **Develop a standard that could brand sustainable manufacturing and that addresses all utilities (e.g., energy, water, steam, etc.), including metrics, verification, and branding**
- **Educate manufacturing plant engineers on how to conduct an energy audit and on best practices for all utilities**
- **Conduct a remanufacturing survey measuring market size; new technologies; and how much energy, cost, and CO₂ is saved**

Systems Approach to Water Management

- **Develop a research consensus document for water reuse in industrial operations**
- **Link the flow of gray water from wastewater treatment plants to steam-electric power plants and link the flow of gray water to its use in manufacturing facilities in general**
- **Develop lifecycle analysis methodologies for assessing water use and develop a water-content metric for products and processes**

Crosscutting

- **Conduct an annual, premier conference focusing on product design for sustainability, sustainable manufacturing processes, and a systems approach to water management**
- **Develop a way to measure and express risk to the environment from products with varying degrees of sustainability**
- **Gather, publicize, and map tools and techniques for measuring sustainability**
- **Improve the visibility of ASME's current sustainability efforts**

ASME Sustainability Related Conferences

- **ASME International Mechanical Engineering Congress & Exposition 2010**
 - **Two technical sessions on Sustainable Products and Processes (examples of papers)**
 - **Innovation Is the Key to Sustaining Sustainability**
 - **A Case Study in "Total Beauty" Design: an Experience through Sustainable Product Design**
 - **Electrical Properties Of Recycled Plastic Nanocomposites Produced By Injection Molding**

ASME Sustainability Related Conferences

- **2010 4th Int'l Conference on Energy Sustainability**
 - **Phoenix**
 - **Tracks included:**
 - **Exergy Applications: Sustainability, Renewable Energy**
 - **Sustainable Cities and Communities**
 - **Low/Zero Energy Buildings**
 - **Water Desalination & Distillation Systems**
 - **Biofuels**

ASME Sustainability Related Conferences

- **2011 Energy Sustainability Conference & Fuel Cell Conference – August 7-10, 2011**
 - **Washington DC**
 - **Tracks to include:**
 - **Sustainable Cities and Communities; Transportation**

Questions?



ASME

SETTING THE STANDARD
