

Sustainability Strategy & Management Systems

Presented at the
Manufacturing Matters! Conference
April 20, 2010

Presented by:
John B. Tweddale, PG, CHMM
BT Squared, Inc.



5 Questions for this Workshop:

- What is **Sustainable Manufacturing**?
- Why Should I Care?
- Who Sets the Standards or Provides Guidance?
- How Can I Get Started?
- What Are the Keys to Success?

What you will Take Away:

You will:

1
Have a Broad Understanding of
Sustainability

2
Hear **Lessons Learned**
from other Workshop Attendees

3
Identify Possible **Next Steps**
to take at Your Facility

What is Sustainable Manufacturing?

The general principle of sustainable manufacturing is to reduce the intensity of –

- *materials use,*
- *energy consumption,*
- *emissions, and*
- *the creation of unwanted by-products*

while maintaining, or improving, the value of products to society and to organizations.

Source: Organization for Economic Co-Operation and Development (OECD),
November 2, 2009

Sustainable Manufacturing Concepts

- Proactive/Strategic vs. Reactive
- Voluntary Instead of Regulatory-Driven
- Triple Bottom Line
- Transparency
- Systemic Continuous Improvement (SCI)
- Corporate Social Responsibility (CSR)
- Extension of Quality Systems, Environmental Management, etc.
- Eco-efficiency

Sustainable Manufacturing **Data**

The International Perspective

- Biggest issues are climate change (profit) and human rights (people)
- Energy efficiency is the primary way to address climate change
- Stakeholder demands are increasing

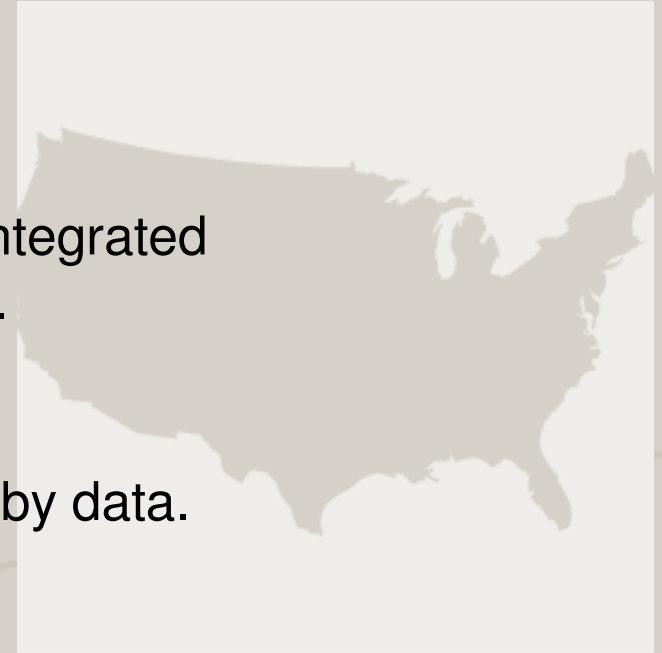


Source: BSR/GlobeScan State of Sustainable Business Poll conducted in October 2009, among a sample of 274 corporate responsibility professionals from 15 countries who attended the BSR Conference in 2009.

Sustainable Manufacturing **Data**

The U.S. Perspective, Part 1

- Sustainability needs to be integrated with strategy to be effective.
- Decisions should be driven by data.
- Customer demands will continue to increase, e.g., Walmart and OEMs .



Source: miscellaneous 2009-2010 articles in Industry Week, Business Week, The Wall Street Journal, The Economist, Forbes, etc.

Sustainable Manufacturing Data

The U.S. Perspective, Part 2

- Only 13% had effective systems to measure progress.
- Very low % of staff dedicated to sustainable process or product improvements.
- Awareness is growing, but not fast enough to meet demands from customers, OEMs, etc.



Source: Next Generation Manufacturing (NGM) 2009 Survey of 2,500 manufacturers in 18 states, with sustainability as one of six NGM Success Attributes.

Sustainable Manufacturing **Data**

The Wisconsin Perspective

- Energy efficiency, sustainability metrics, and carbon footprint are biggest action areas
- Driving forces = cost reduction, improved efficiency, and corporate/brand image
- Barriers = cost, perceived lack of ROI, lack of staff



Source: Wisconsin Sustainable Business Council Survey of large companies in 2009. Of 85 “sustainability champions” contacted, 39 replied, mostly manufacturers.

Stakeholders in Sustainable Manufacturing



Shareholders/
Investors



Customers/OEMs



Senior
Management/
Corporate



Regulatory
Agencies



Trade
Organizations



Suppliers



Community/
Municipality



Employees

* These groups may have separate information and communication needs, and diverse goals.

Drivers for Sustainable Manufacturing

People (social)

- Employer of choice
- Employee health & safety
- Training
- Community concerns
- Justice/human rights

Profit (economic)

- Processes (Lean)
- Packaging
- Transportation
- Energy efficiency
- Useful by-products
- Business acquisition

Planet (environmental)

- Emissions/GHGs
- Residuals/waste
- Water use
- Land use
- Renewable energy
- Materials use, esp. toxics
- Risk management/planning
- Disaster recovery

What Sustainability is **Not**:



Global warming/climate change



Tree hugging



Short-term thinking



Greenwashing

Why Should I Care?



*Adapt or Be Left Behind

"Why should I care about future generations? What have they ever done for me?" - Groucho Marx

Who Sets the Standards or Provides Guidance?

International Organizations



Federal Government



National Organizations



State/Local



BT SQUARED

Navigating the Standards: The Condensed Version

A patchwork of competing and confusing standards that are *Technically Challenging* and require *Time to Learn and Implement*

- Corporate sustainability reports cannot be easily compared
- Guidance often geared toward public reporting
- Research shows that SMMs are in the early stages

OECD – focused on facility-level sustainable manufacturing



How Can I Get Started?

Systematic (Ideal Approach) vs. Ad Hoc Projects?

1. Choose a multi-disciplinary team

Finance	Engineering
EHS	Production
Maintenance	Product Design
Human Resources	Distribution
Purchasing/ Procurement	Public/Community Representation

Getting Started: Focus on Your Goals

2. Determine Specific Stakeholders and Drivers
3. Agree on (Narrow) Focus



Getting Started: Identifying your Processes

4. Divide facility into distinct production processes
 - Define inputs and outputs to each process



* Overhead is one “process”

- 1) Management/Office
- 2) Maintenance
- 3) Comfort Heating & Cooling/HVAC
- 4) Quality Control, Research & Development, etc.

* Ideally, one product output per process, otherwise allocation needed

Getting Started: Back to the Big Picture

Where Are We Going?

5. Establish a vision – overall direction and big-picture goal
6. Establish sustainability objectives to meet vision



Where Are We Now?

7. Identify appropriate metrics and measure current position

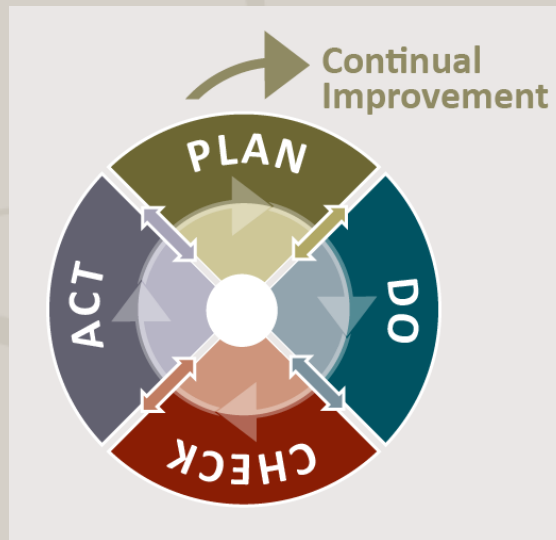


Take Action

8. Perform gap analysis
 - A. Lack of sector-specific performance data
 - B. Possible role for industry associations

Getting Started:

9. Plan – Do – Check – Act (SCI/Deming) Cycle
 - A. Develop a strategy
 - B. Prepare an action plan/design
 - C. Implement change
 - D. Monitor and review (measurement and verification)
 - E. Discuss lessons learned and start again



What are the Keys to Success?

LEADERSHIP

- **Dedicated management buy-in**
- **Internal champions**
- **Incentives to participate and implement**

ENVIRONMENT

- **Time, resources, and information**
- **Belief in Long-Term Business Case**
- **Adaptability / Willingness to Change**

STRUCTURE

- **Financial framework – ROI, simple payback, etc.**
- **Capital – Internal, External, plus grants/incentives**
- **Internal/External Communications – Confidentiality, Training, PR**

Further Reading

- “Mid-Course Correction: Toward a Sustainable Enterprise: The Interface Model,” by Ray Anderson, 2002
- “Sustainable Development in the Process Industries: Cases and Impact,” edited by J. Harmsen and Joseph B. Powell, 2010
- “Green to Gold: How Smart Companies Use Environmental Strategy to Innovate, Create Value, and Build Competitive Advantage,” by Daniel Esty and Andrew Winston, 2009
- “Sustainable Value: How the World's Leading Companies Are Doing Well by Doing Good,” by Chris Laszlo, 2008
- “The Truth About Green Business,” by Gil Friend, 2009
- Greening Your Business: The Hands-On Guide to Creating a Successful and Sustainable Business,” by Daniel Sitarz, 2008

Thank You.

Questions?

John B. Tweddale, PG, CHMM
jtweddale@btsquared.com
608.216.7320



Smart, Simple Solutions.