



Internal challenges in adopting sustainable chemistry within a firm

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“Sustainability”

“..development that meets the needs of the present without compromising the ability of future generations to meet their own needs”

	<u>Traditional</u>	<u>Sustainable</u>
Environmental	pollution sources	<i>ecosystem health</i>
Social	community affairs	<i>global</i>
Economic	company P&L	<i>societal</i>

Huh? **“Triple Bottom Line”**

Valuing Intangibles

Going sustainable may bring financial returns, but major reasons are soft:

- Reputation
 - Customers, shareholders, community, agencies, managers, workers, NGOs respect company
 - Translates to loyalty and some forgiveness
 - Social Responsibility and Ethics
 - Personal and societal behavior expectations
 - Legal obligations
- More than just PR*

In-House Expertise

- Bias toward narrow expertise
- Assumptions that green means
 - more expensive
 - poorer performance
- Green chemistry/engineering unfamiliar
 - Fear of change
 - New training/education needed



Old dogs.....

Corporate Cultures

Barriers	Sustainability
“if it ain’t broke...”	Change is good/innovation
Chain of command	Quality/6 Sigma
“Not my job...” [EHS or PR]	Empowerment
Projects	Pervasive shared goals
Business unit/Fence-line	Systems thinking
Silos	Cross-functional teams
Business unit quarterly \$ objectives	Corporate sustainability objectives
Short term	Long term

ROI Expectations

- Dollar return %
- Time for return
- Competition for funds within firm
 - Corporate environmental goals may conflict with ROI for individual plants or businesses
- Green processes often require capital and time to learn
- Pressures to downsize EHS staff

Marketing Uncertainties

More Old Dogs....

- Complicated message
 - what is sustainable?
 - specific attributes vs puffery
- Greenwashing accusations
- Will suppliers give misleading info?
- Customers say they will buy...
 - but will they? Will they pay more?

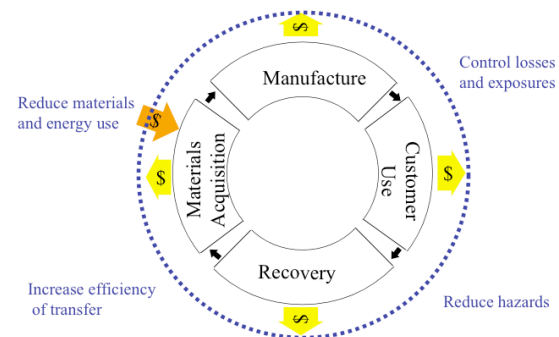


Metrics

- Environmental emission metrics understood
 - Quantifiable units www.epa.gov/lean
 - Understandable technical challenges
 - Pollution reduction is logical – to a point
 - Zero pollution violates 2nd law
- Softer sustainability goals more difficult to quantify
 - Arbitrary (scorecards, more “programs”)
 - Fad of the day (it’s “organic”)
 - Media driven opinion surveys
- Global concerns/Short term vs long
 - miniscule company contribution

Life Cycle Thinking

Life Cycle Management



EHS Strategies, Inc. 12/12/06

Ⓢ Risks = costs from control failures in workplace/environment

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