

# Sustainability: What Are the Benefits to Our Business?



J.C. (Jack)  
Gustashaw, P.E.

Sr. Vice President  
Middough Inc.



**39TH**

ECC CONFERENCE

**Redefining Our Industry**

Solutions through Collaboration, Innovation and Organization

# Sustainability: What Are the Benefits to Our Business?

J.C. (Jack) Gustashaw, P.E.

Middough Inc.

Sr. Vice President

Business Development

- Responsible for the Business Development and Marketing activities for eight business units nationwide.
- During his 34 years in the engineering / construction business, he has had the opportunity to work in many different industries including process, pharmaceutical, consumer, manufacturing, commercial and institutional.
- BS Degree in Agricultural Engineering; MS Degree in Mechanical Engineering; University of Florida.



# Sustainability: What Are the Benefits to Our Business?

## SPM<sup>2</sup>

Sustainable Process Methods at Middough

A Systematic Approach to  
Sustainability

***middough***

*An integrated  
full-service  
Architectural,  
Engineering and  
Management firm  
with offices  
nationwide.*



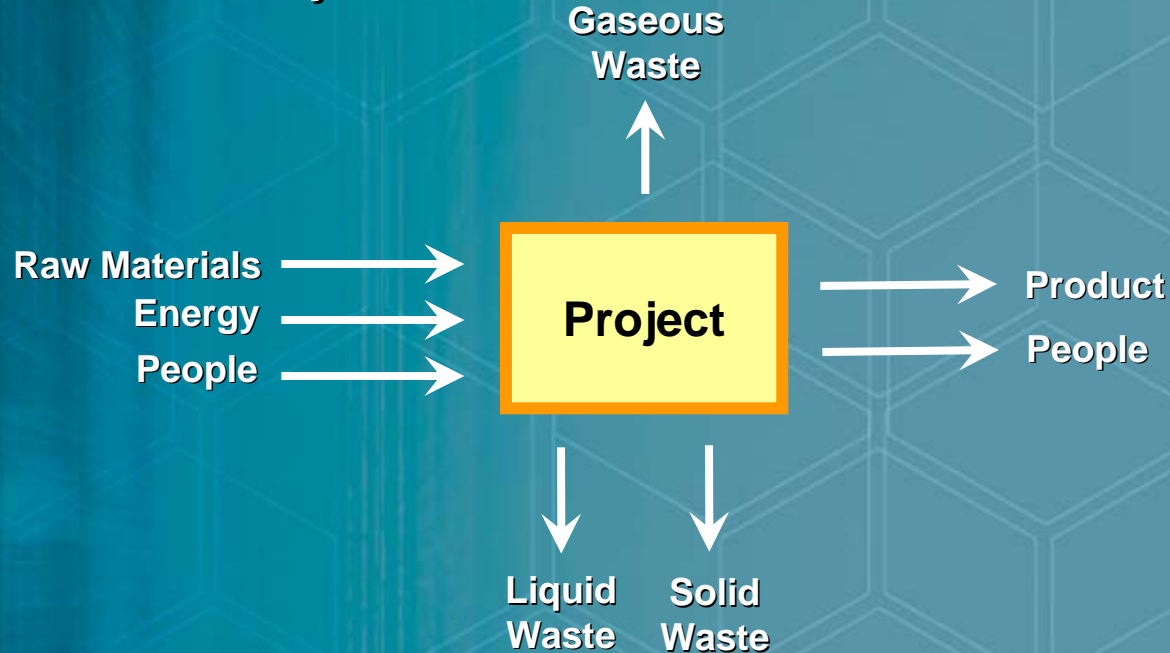
**Redefining Our Industry**

**39TH ENGINEERING AND CONSTRUCTION CONTRACTING CONFERENCE**



# Sustainability: What Are the Benefits to Our Business?

## SPM<sup>2</sup> at the Project Level



### Environmental Opportunities

- Quantitative (Energy/Mass Balance)
- Qualitative (Life Cycle Analysis)
- Assimilative/Regenerative

### Social Opportunities

- Safety
- Staff Efficiency
- Turnover Rate

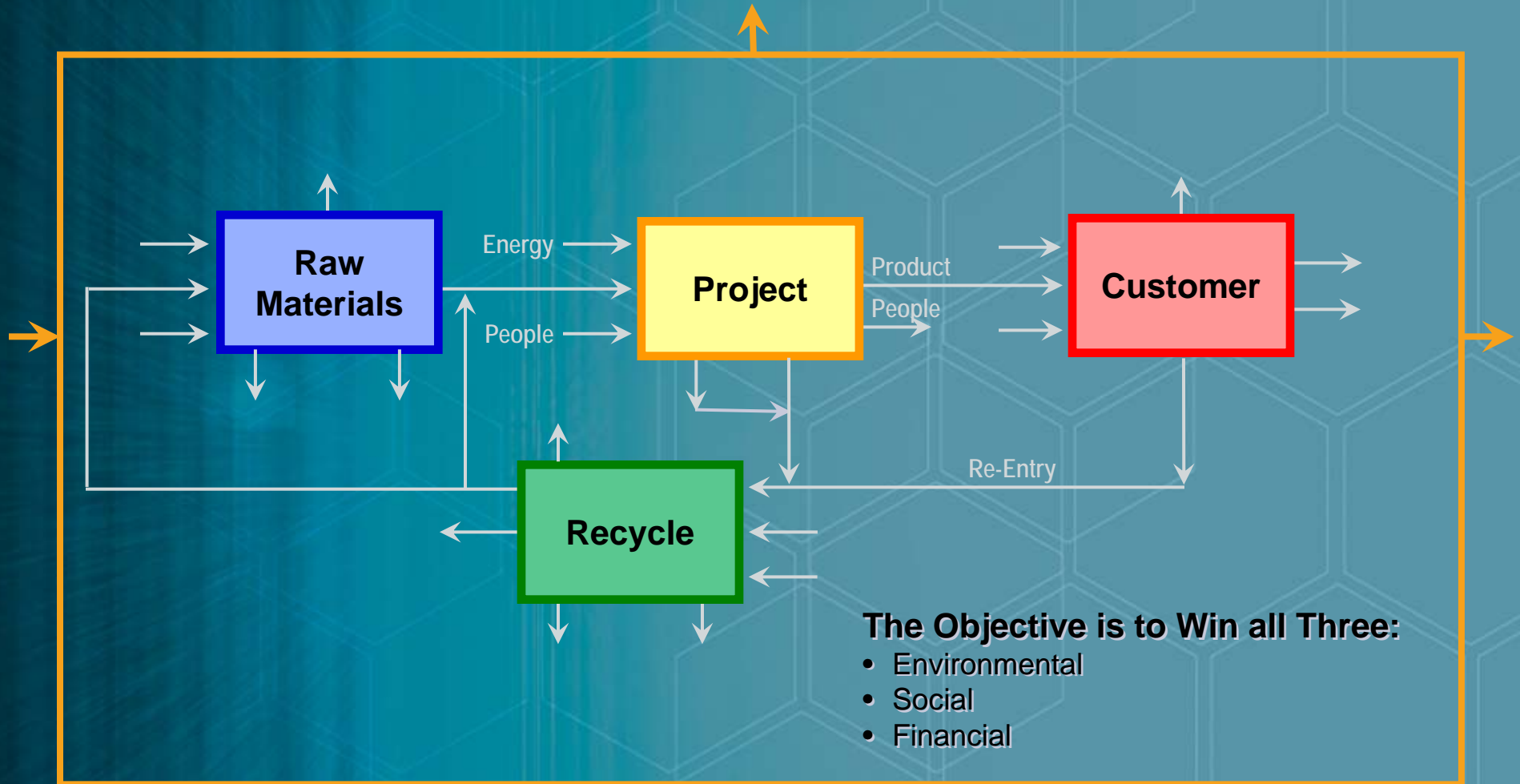
### Financial Opportunities

- Direct Costs
- Indirect Costs
- Future Costs
- Intangible Costs



# Sustainability: What Are the Benefits to Our Business?

## SPM<sup>2</sup> at the Macro Level (Big Picture)



# Sustainability Roadmap Developed By Industry for Industry



D. S. Schuster, PhD

Director  
Institute for Sustainability  
Center for Sustainable  
Technology Practices



39TH

ECC CONFERENCE

## Redefining Our Industry

Solutions through Collaboration, Innovation and Organization



# Potential for Improvement SD Roadmap Summary Table

- 155 Key Sustainability Questions
- Where to ask them during process and product development
- Who should be included in the “answers?”

Microsoft Excel - Summary Table Completed.xls

File Edit View Insert Format Tools Data Window Help

Type a question for help

C3 Assessment

A	B	C	D	E
1	CSTP SD Roadmap - Summary Table			
2	Revised July 17, 2007			
3				
4	<b>Sustainability Considerations</b>	<b>Assessment</b>	<b>Rating</b> ■ Serious Concerns ■ Some Concerns ■ Good	<b>Assessed by</b>
14	<ul style="list-style-type: none"> <li>What policies and processes are in place to assure sustainable performance of the supply chain (e.g. EMS requirements)?</li> </ul>	Gov. and private regulations on sustainable agriculture practices	Green	Certification & Services n.d., Code o
15	<ul style="list-style-type: none"> <li>What tools are available to evaluate the sustainability performance of the supply chain?</li> </ul>	Few formal tools, Net Energy Balance gives good, comprehensive evaluation, GREET model measures air/GHG emissions	Yellow	Pimentel (2003), Ethanol: Energy W
16	<b>Supply Chain &amp; Product Stewardship</b>			
17	<ul style="list-style-type: none"> <li>Which supply chain partners are aware of and interested in sustainability and what are their sustainability standards and needs?</li> </ul>	Oil/automotive companies who dictate end use of product may not support sustainability, Process otherwise sustainable in many aspects	Yellow	Brower (2007)
18	<ul style="list-style-type: none"> <li>Which potential supply chain partners are positioned to support a sustainable technology initiative/product/process?</li> </ul>	BP energy company has invested millions in biofuel research, Some oil companies oppose ethanol	Yellow	Energy Efficiency and (2006)
19	<ul style="list-style-type: none"> <li>What opportunities exist for industrial symbiosis and shared information?</li> </ul>	Process/Product more at a development stage, Much symbiosis among supply chain and by product use	Green	Neuhauser et al (1999)
20	<b>Stakeholder Engagement</b>			
21	<ul style="list-style-type: none"> <li>Who are the key SD stakeholders (internal &amp; external, along the supply chain) and how does the company communicate with them (e.g. employees, shareholders, NGOs, governments)?</li> </ul>	Government organizations, private farmers, etc., The breadth of the operation may limit communication possibilities	Yellow	
22	<ul style="list-style-type: none"> <li>Does the company participate in external SD organizations/coalitions/initiatives that can provide guidance or input?</li> </ul>	CSTP	Green	About the WBCSD n.d, Strengtheni
23	<ul style="list-style-type: none"> <li>What are the sustainability standards of your business partners?</li> </ul>	Oil/automotive companies are key partners	Red	
24	<b>Resource Usage: energy, land, water</b>			
25	<b>Energy Use</b>			
26	<ul style="list-style-type: none"> <li>How energy intensive is the feedstock? Which feedstock materials are the most energy intensive and are there energy-efficient alternatives?</li> </ul>	High NEB reflects low energy intensity, Small use of fertilizers and almost non-existent use of pesticide/herbicide	Green	Positive Impacts n.d.
27	<ul style="list-style-type: none"> <li>Can the feedstock be produced using renewable energy?</li> </ul>	Biodiesel for farm equipment, but no good alternative for fertilizer	Yellow	
28	<ul style="list-style-type: none"> <li>Can any byproducts be used as energy?</li> </ul>	Lignin, ground and burned to produce electricity	Green	Brower (2007)

Ready

9:03 AM Start Presentation Microsoft PowerPoint - [...] User werem logged in - ... Microsoft Excel - Sum...



**39TH**  
ECC CONFERENCE

**Redefining Our Industry**  
Solutions through Collaboration, Innovation and Organization



# Sustainable Development (SD) Roadmap

- The Roadmap

- Categories concerning a new product and/or process sustainability
  - Developed by the Center of Sustainable Technology Practices (CSTP) team of the American Institute of Chemical Engineers
  - Team members include:
  - Continued testing is taking place



**39TH**  
ECC CONFERENCE

**Redefining Our Industry**  
Solutions through Collaboration, Innovation and Organization





# SD Considerations

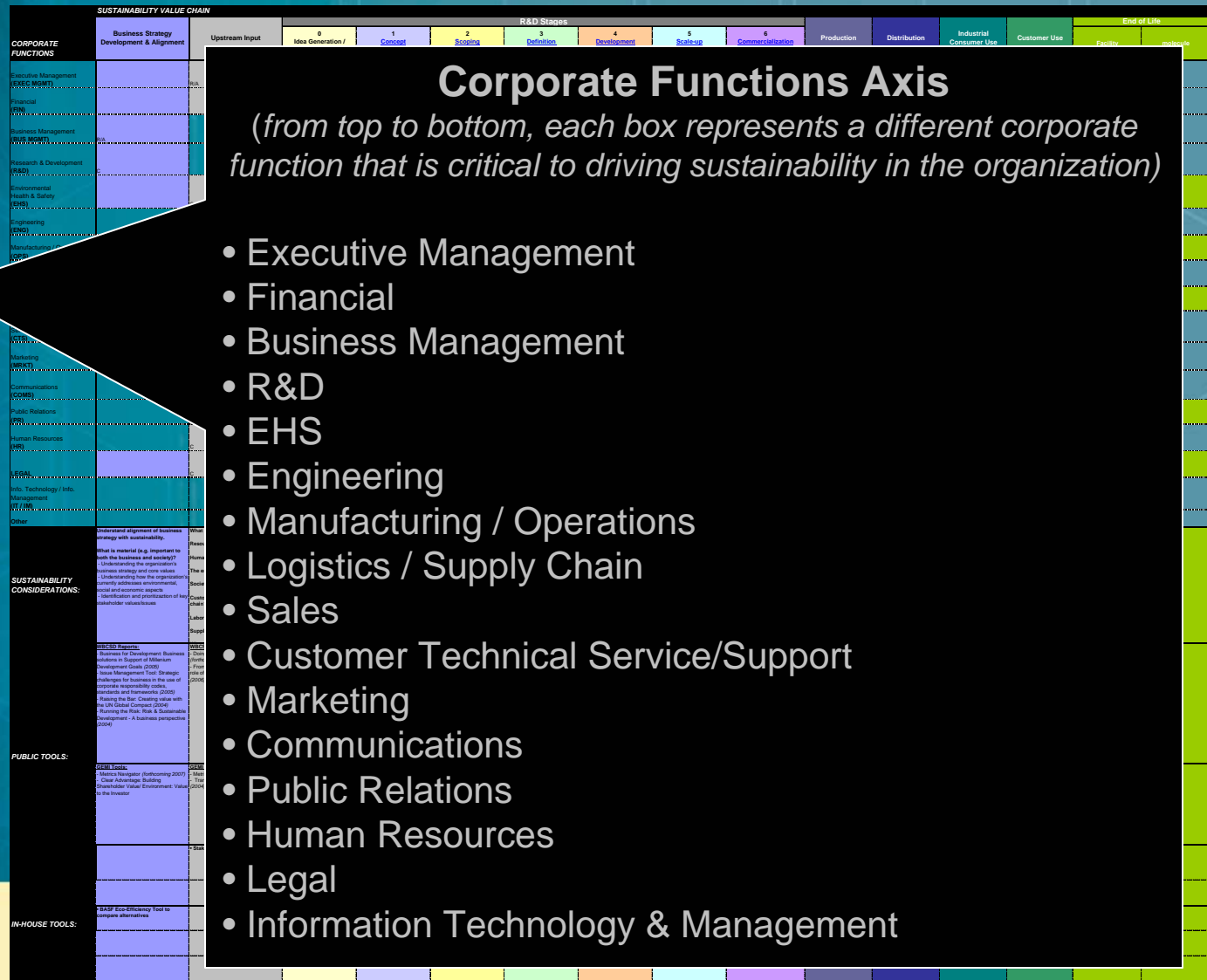
Environmental	Resource Use	Energy use, material intensity, water use, land use
	Environmental Impact	GHG emissions, air emissions, solid waste, (pollutant effects)
Social	Health & Safety	Toxic reduction, hazards, process safety
	Societal Impact	Workers' well-being, local community impacts/QOL, global societal impacts/contributions
Econ.	Economic Impact	Financials along value-chain (corporate, customers, ...)
Business Perspective	Management	Internal process, value-chain partnership, stakeholder engagement
	Business Strategy	SD alignment with biz strategy & core value, core competencies, market & regulatory drivers

**defining our industry**  
 through Collaboration, Innovation and Organization



# Elements of the SD Roadmap

Value Chain Stages →



Corporate Functions

Sustainability considerations

Tools & Resources

**Corporate Functions Axis**  
*(from top to bottom, each box represents a different corporate function that is critical to driving sustainability in the organization)*

- Executive Management
- Financial
- Business Management
- R&D
- EHS
- Engineering
- Manufacturing / Operations
- Logistics / Supply Chain
- Sales
- Customer Technical Service/Support
- Marketing
- Communications
- Public Relations
- Human Resources
- Legal
- Information Technology & Management



# Upstream Input

## 18. Would customer/stakeholder concerns affect the future use of the feedstock?

- Willow-based ethanol industrial scale is very dependent on interest from investors, customers and potential farmers.
  - Willow feedstock initially would be grown almost exclusively on land being leased to the producers via private land owners and farmers. (Pioneering Energy Crops..., 2000)
  - Cooperation and the future of the feedstock are contingent on the confidence of landowners in the market for willow ethanol.



**39TH**  
ECC CONFERENCE

**Redefining Our Industry**  
Solutions through Collaboration, Innovation and Organization





# Sustainability Index: Benchmark for Industry

Calvin B. Cobb

President

Chair, AIChE Institute for  
Sustainability



**39TH**

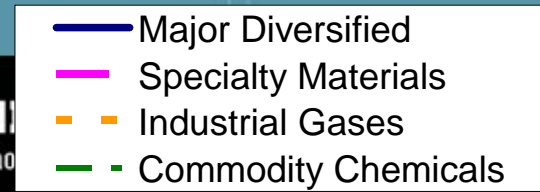
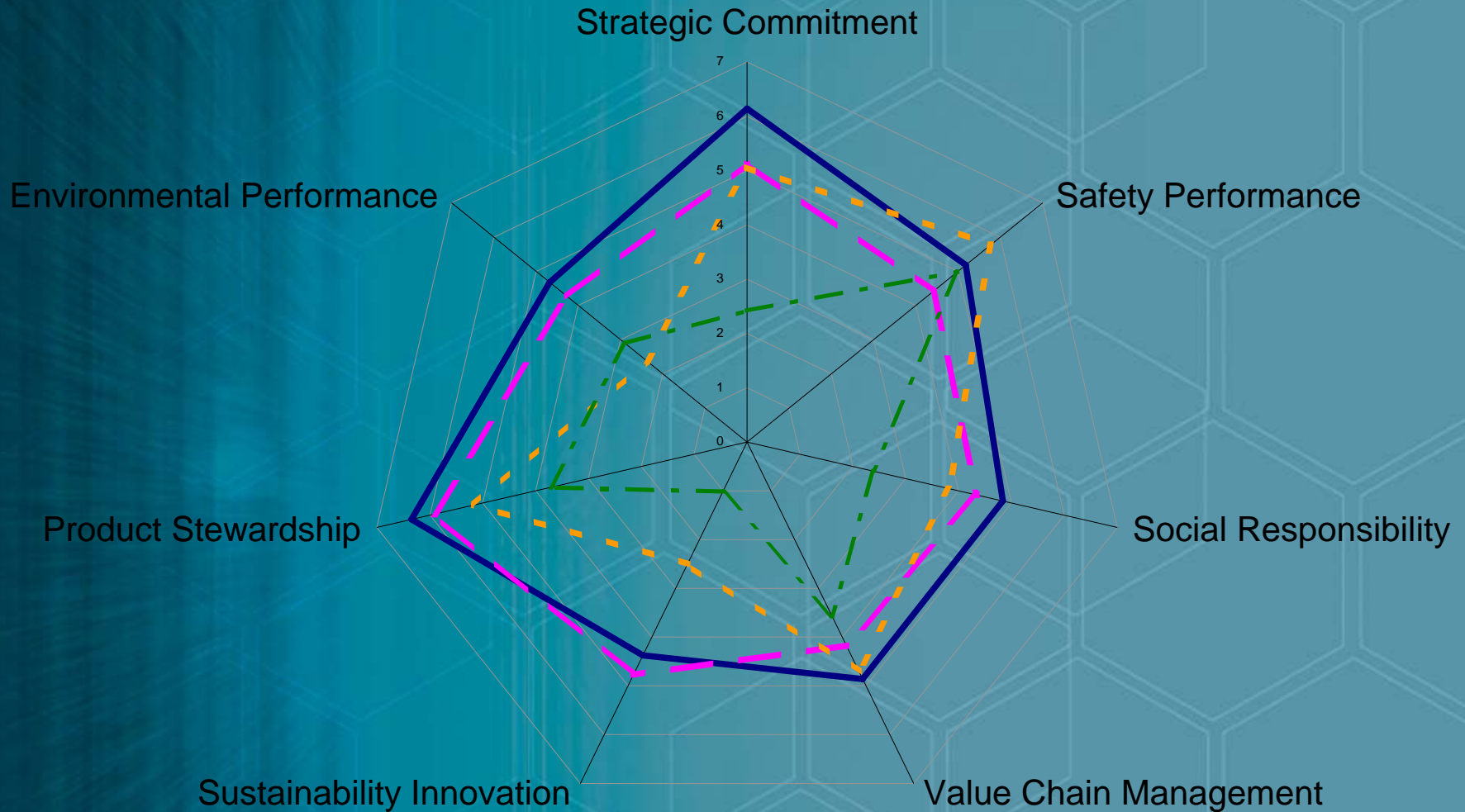
ECC CONFERENCE

**Redefining Our Industry**

Solutions through Collaboration, Innovation and Organization

# AIChE Sustainability Index for the Chemical Industry

September 2007



**39TH**  
ECC CONFERENCE

**Redefining Our**  
Solutions through Collaboration, Innovation

# AIChE Sustainability Index for the Chemical Industry

September 2007



**39TH**  
ECC CONFERENCE

**Redefining**  
Solutions through Colla

— Net Revenue > \$10 Billion USD  
- - Net Revenue < \$10 Billion USD