Sustainability: What Are the Benefits to Our Business?

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

Sr. Vice President
Middough Inc.

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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?

SPM²

Sustainable Process Methods at Middough

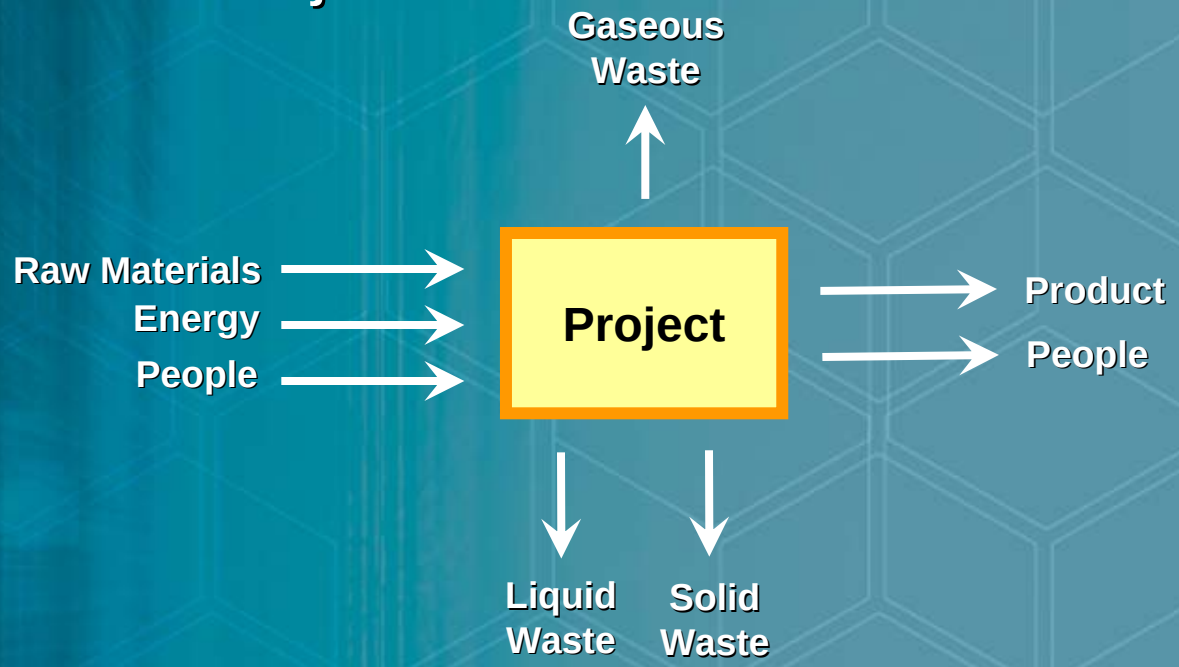
A Systematic Approach to Sustainability

middough

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

Sustainability: What Are the Benefits to Our Business?

SPM² 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

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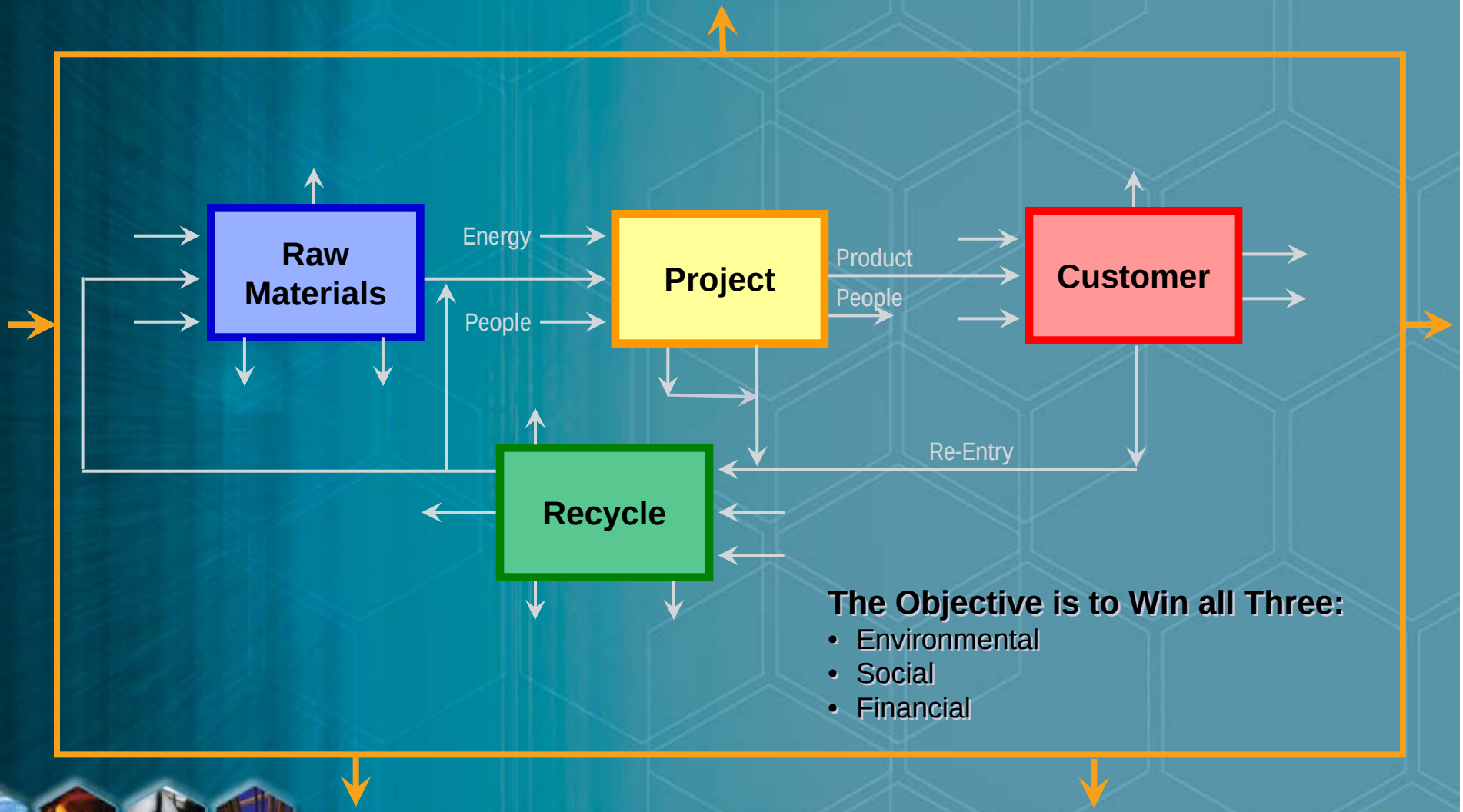
SPM² at the Macro Level (Big Picture)



The Objective is to Win all Three:

- Environmental
- Social
- Financial

Sustainability Roadmap Developed By Industry for Industry

D. S. Schuster, PhD

Director
Institute for Sustainability
Center for Sustainable
Technology Practices

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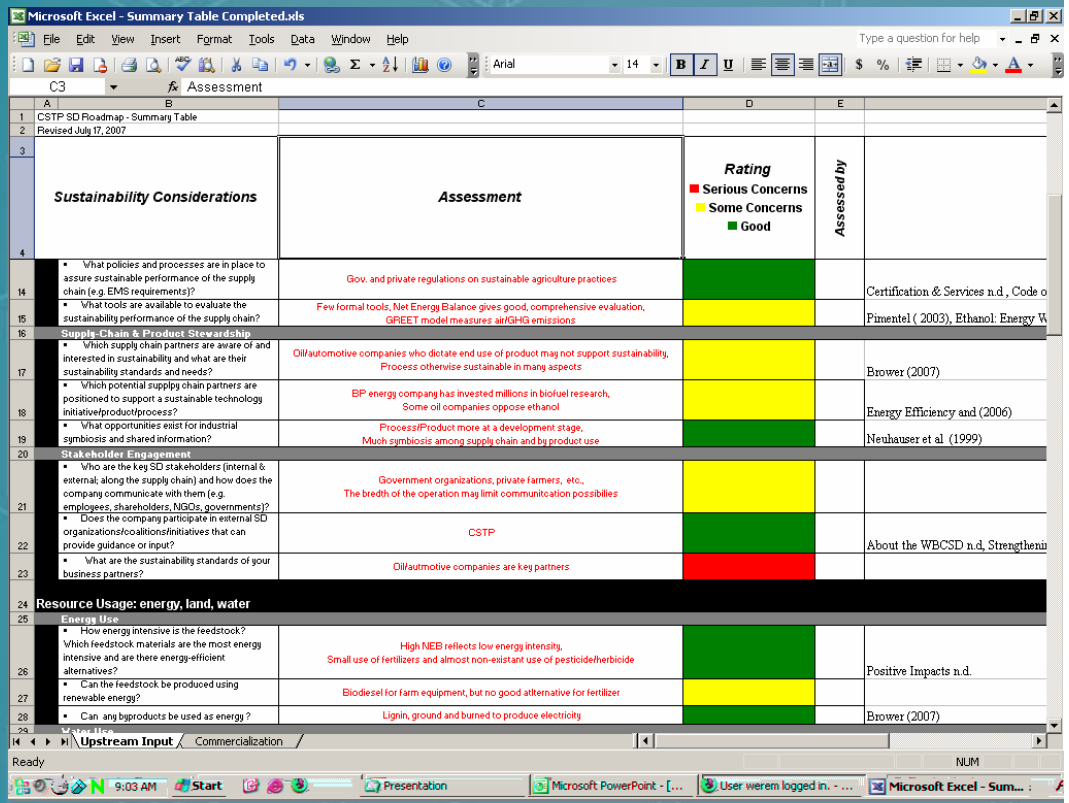
Solutions through Collaboration, Innovation and Organization

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?”



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

SD Considerations

Environmental	Resource Use	Energy use, material intensity, water use, land use
Environmental	Environmental Impact	GHG emissions, air emissions, solid waste, (pollutant effects)
Social	Health & Safety	Toxic reduction, hazards, process safety
Social	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 Perspective	Business Strategy	SD alignment with biz strategy & core value, core competencies, market & regulatory drivers

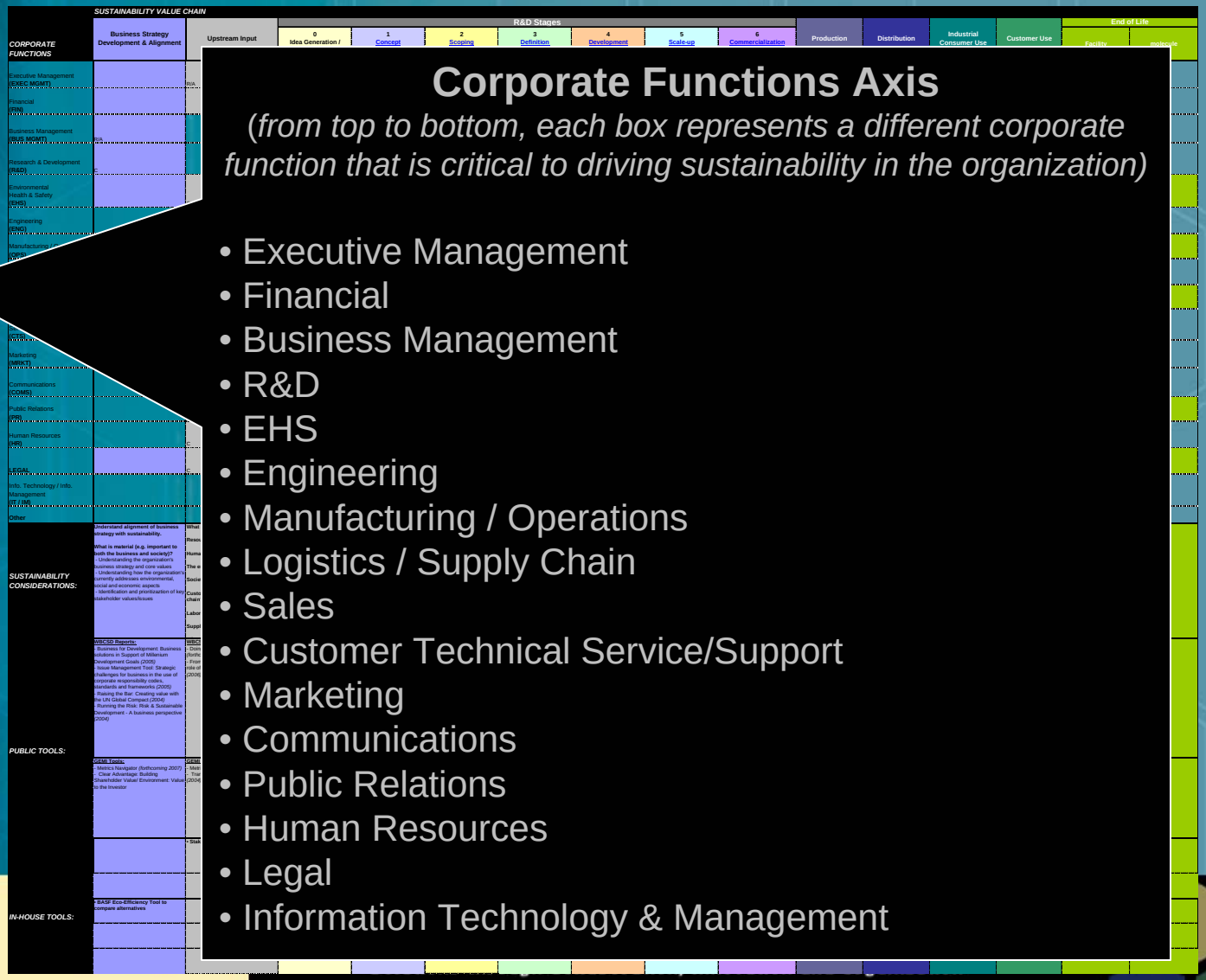
Elements of the SD Roadmap

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?

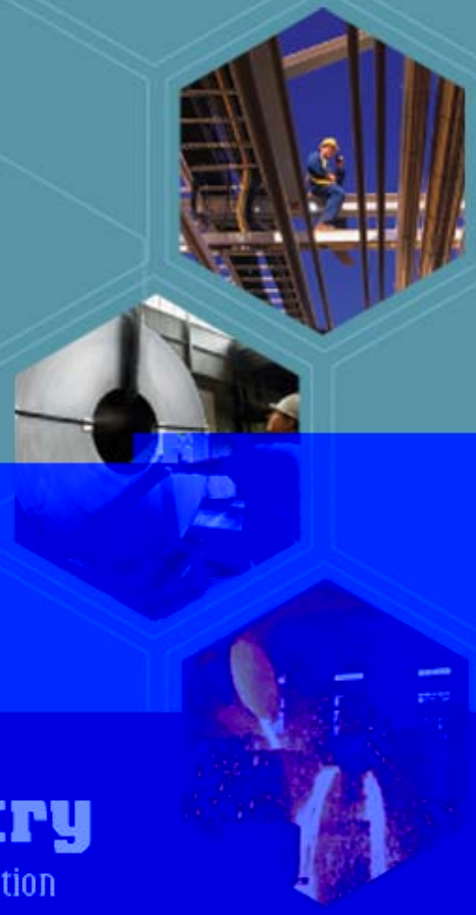
- **Willow-based ethanol industrial scale is very dependent on interest from investors, customers and potential farmers.**
  - Willow feedstock initially would be grown almost exclusively on land being leased to the producers via private land owners and farmers. (Pioneering Energy Crops..., 2000)
  -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

Sustainability Index: Benchmark for Industry

Calvin B. Cobb

President

Chair, AIChE Institute for Sustainability



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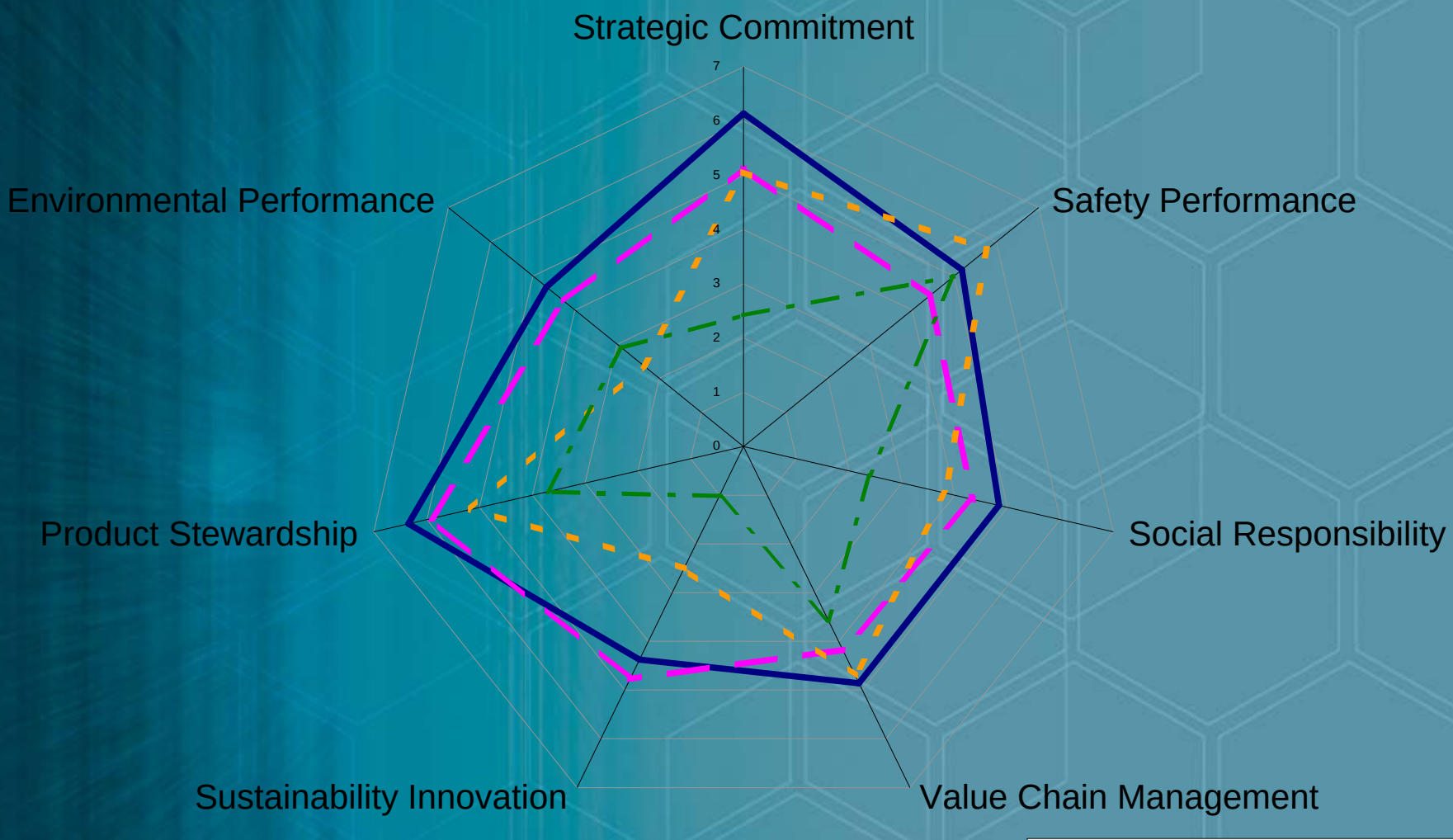
AIChE Sustainability Index for the Chemical Industry

September 2007



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