



Open Innovation at Eastman Chemical Company

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Eastman Chemical Company

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Eastman **At-A-Glance**

- A global manufacturer of chemicals, plastics and fibers
- Leading producer of differentiated coatings adhesives, and specialty plastics products
- World's largest manufacturer of PET polymers for packaging
- Leading supplier of cellulose acetate fibers
- 2006 sales revenue of \$7.5B with ca \$ 167 M R&D Budget
- Corporate headquarters in Kingsport, Tennessee



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Our history

Highlights:

- In 1920 George Eastman acquires wood distillation plant in Kingsport, TN
- Expands manufacturing production to include new products such as:
 - *Acetate yarn and acetate tow*
 - *Acetic anhydride*
 - *Cellulosic plastics*
 - *Polyethylene terephthalate (PET) polymers*
- Becomes first to operate a commercial coal gasification facility in U.S. in 1983
- Wins Malcolm Baldrige National Quality Award in 1993
- Spins from Kodak in 1994; becomes independent, publicly traded company on the NYSE
- Posts record sales of \$7.5B in 2006



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We have a **broad, global** presence

Global Manufacturing Locations



Structure and Technology

Two Business Groups

■ Polymers

- Performance Polymers
- Specialty Plastics

■ Chemicals and Fibers

- Coatings, Adhesives, Specialty Polymers and Inks
- Fibers
- Performance Chemicals and Intermediates

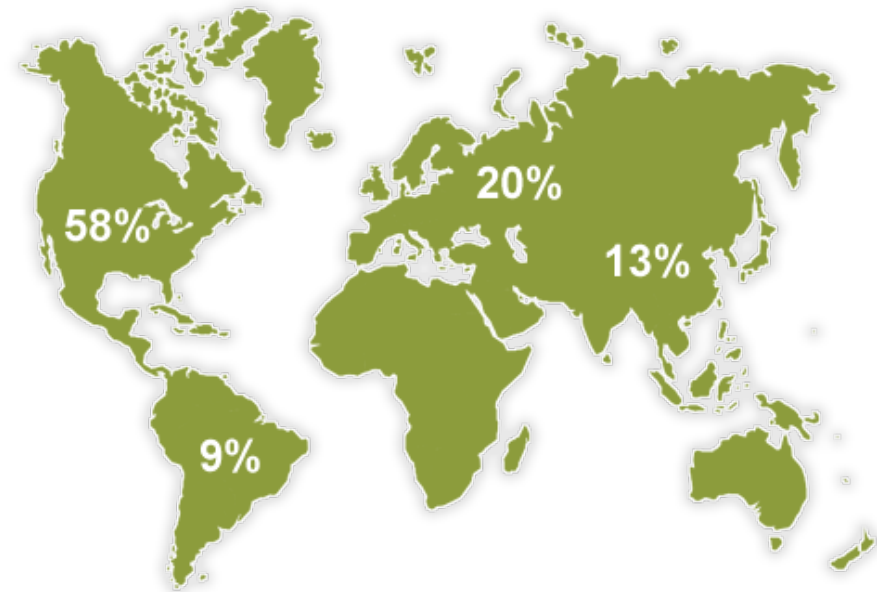


We serve diverse markets and sell our products in all regions of the world

2005 Sales Revenue by Markets

	Packaging 44%
	Tobacco 11%
	Transportation 8%
	Building & Construction 7%
	Consumables 7%
	Health/Wellness 6%
	Durables 5%
	Graphic Imaging 4%
	Agriculture 3%
	Distributed Resources 3%
	Electronics 2%

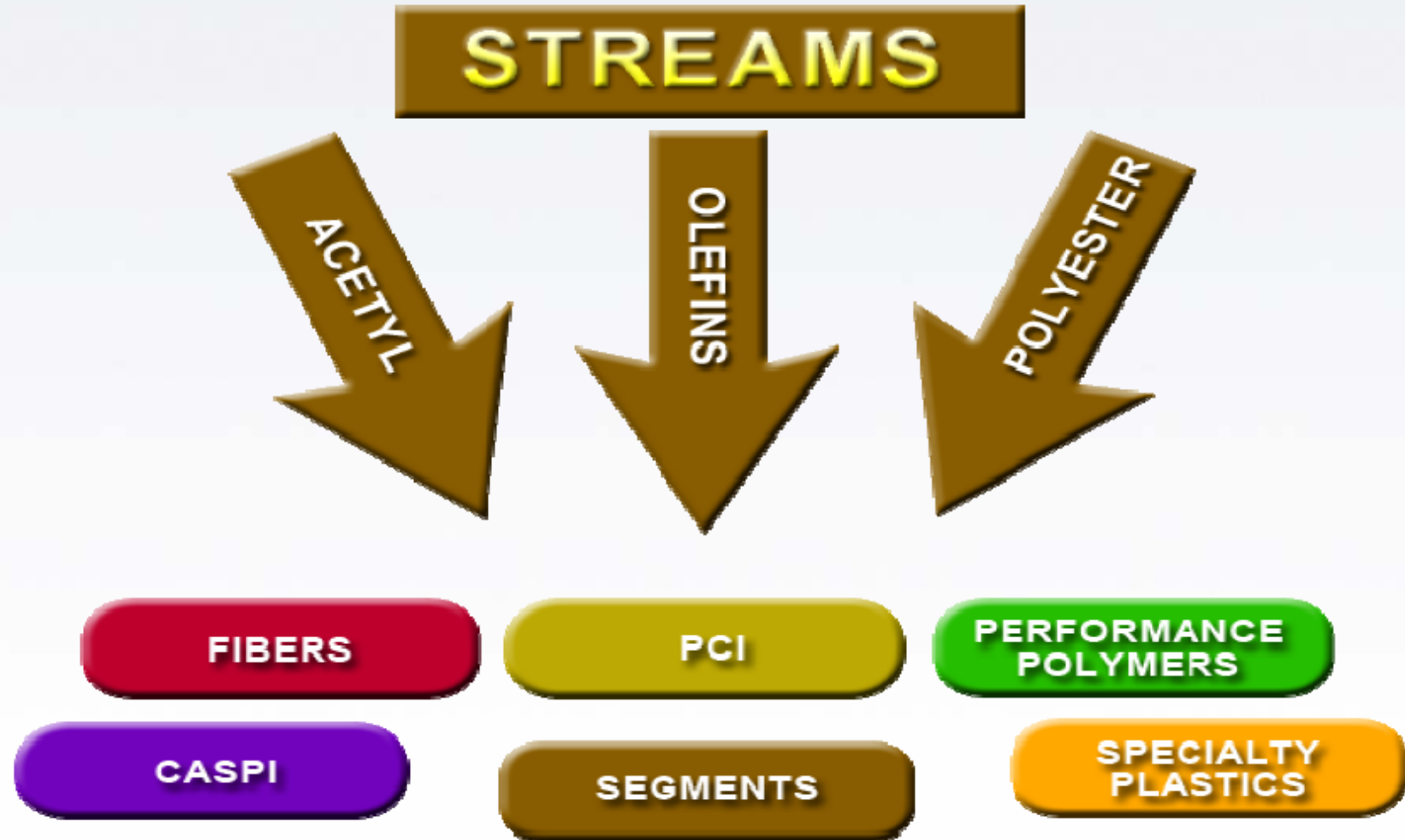
2005 Sales Revenue by Region



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Eastman Chemical Company

At-A-Glance



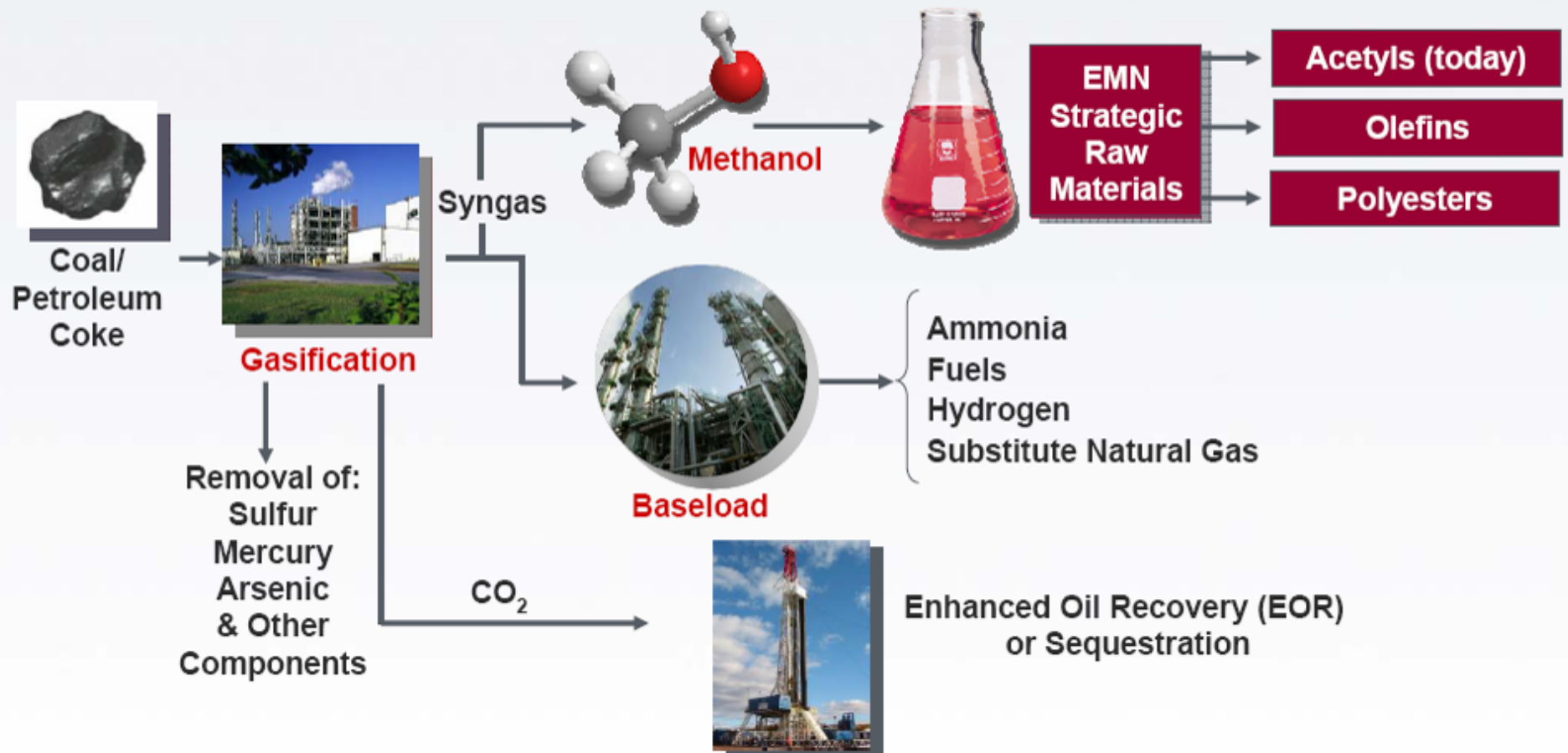


Eastman Strategy at a glance

- Develop and grow using strength in Polyester, Acetyl and Olefins platforms
- Increase level of raw materials based on coal and other non-traditional feedstocks

Eastman's Strategy for Gasification

Leverage expertise to create value



Every aspect of this chain has open innovation opportunities

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Areas for Open Innovation

- Customer-Supplier Interactions
 - ✓ External Research
- University Relations
 - ✓ Venture Investing
 - ✓ Market Facing Activities



Eastman External Research

- Early to Mid 1990's
 - Expenditures in excess of \$ 10 M
 - ~10 people in centralized external technology function
 - Significant funding obtained from DOE and NIST-ATP
- Late 1990's early 2000
 - Major reductions made as part of cost-cutting
 - External activities run via individual research groups, rather than via centralized function → little coordination or institutional learning
 - Significant activities in venture investing, particularly in Information Technology
- Today
 - Expenditures ~ half mid 90's level.
 - Reinstating centralized function with one experienced employee
 - Focus on strategic and platform needs
 - Continuing to work some external programs via individual research groups



Current External Technology Model:

The Hoffmann-La Roche Model: The “WFGM” Paradigm

Want

What external resources do we need to succeed in our mission?

Find

What mechanisms will we use to find these resources?

Get

What processes will we use to plan, structure and negotiate an agreement to access the resources?

Manage

What tools, metrics and management techniques will we use to implement the relationship?



Translation of the “WFGM” Model to an External Innovation Function

Want

What external resources do we need to succeed in our mission?

Development of Technologies Sought List

Sources: Platform needs, industry trends, and Business Organization generated needs

Identification and monitoring of Emerging and Pacing Technologies

From Technology Maps and Gap Analysis

Market Needs and Trends Analysis

Tie to Market Teams and Future Trends



Translation of the “WFGM” Model to an External Innovation Function

Find

What mechanisms will we use to find these resources?

Technology Scouting

Analysis of implications of future technologies on key products and strategies

External Networks

Link to external groups such as IRI, CCR & selected consultants

Intermediaries such as Nine Sigma, Innocentive etc

Relationships with Key Institutes

Establish ties to key institutes in all key geographies

Current External Technology Model:

The Hoffmann-La Roche Model: The “WFGM” Paradigm



How We Go About It...

- Technologies Sought
 - Internal process to identify and refine
 - External documents and presentations for sharing outside of Eastman
- Problem Statements
 - Brief description of specific problems
 - Used to further discussion and invite proposals with selected institutes
 - Usually shared under NDA
 - Process helps both with internal buy-in and external gauging of interest



Score-Card for External Technology Function

Original Proposal:

- Responsibilities of lead person to re-start centralized external technology group.

Responsibilities include:

- 👍 Development of Technologies Sought List
- 👍 Consolidation of current external activities
- 👍 Establish technology scouting activities
- 👍 Establish linkages with legal
- 👍 Participate in key external networks (IRI, CCR, AUTM etc)
- 👎 Establish contacts for external funding when appropriate
- 👉 Teach others on establishing and managing external partnerships



Current experience in open innovation

- Much longer cycle time than originally expected
 - Portfolio approach important to manage overall process
- Internal barriers persist, but progress can be made
- Significant opportunities exist in emerging areas, but process is difficult, slow and rules very different
- Experienced individuals in identifying, establishing and managing open innovation partnerships are essential and rare
- 'Single point of contact' in organizations (legal, technology) helps process efficiency
- It's a big, open world...easy to take on too much



Areas for Open Innovation

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Venture Investing

- Developing Business group formed in '90's, mission included finding totally new businesses
- Venture investing significant part of activities



Venture Investing – Cont.

■ Early Days

- Heavy focus on I/T and e-business
- Two companies spun from investments
- Both failed

■ Later Days

- Activities more focused on businesses and focus areas of developing business
- Limited success in investments, but better market and technical connect

Venture Investing Case Study

■ Avantium B.V. – Eastman Partnership

- High Throughput Experimentation Firm
- Strategic investment made in 2001 at mezzanine level
- Number of projects in catalysis and automation done with firm
- Value in ongoing relationship and results of work



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Venture Investing Case Study

- Konarka – Eastman
- Company focused on flexible photo voltaic technology
- Potential for plastics and certain chemical materials
- Investment made (2002), but overlap and synergy never realized → no specific projects



Venture Investing – Bottom Line

- Start-up companies must focus on survival
- Investment by corporation not likely to influence direction *in absence of mutually compelling business case*
- If there is a compelling business case non-financial resources (people, knowledge, technology) may be more valuable to both parties
- Work continues with small companies in areas of strategic interest, VC investment is not needed or sought with those firms

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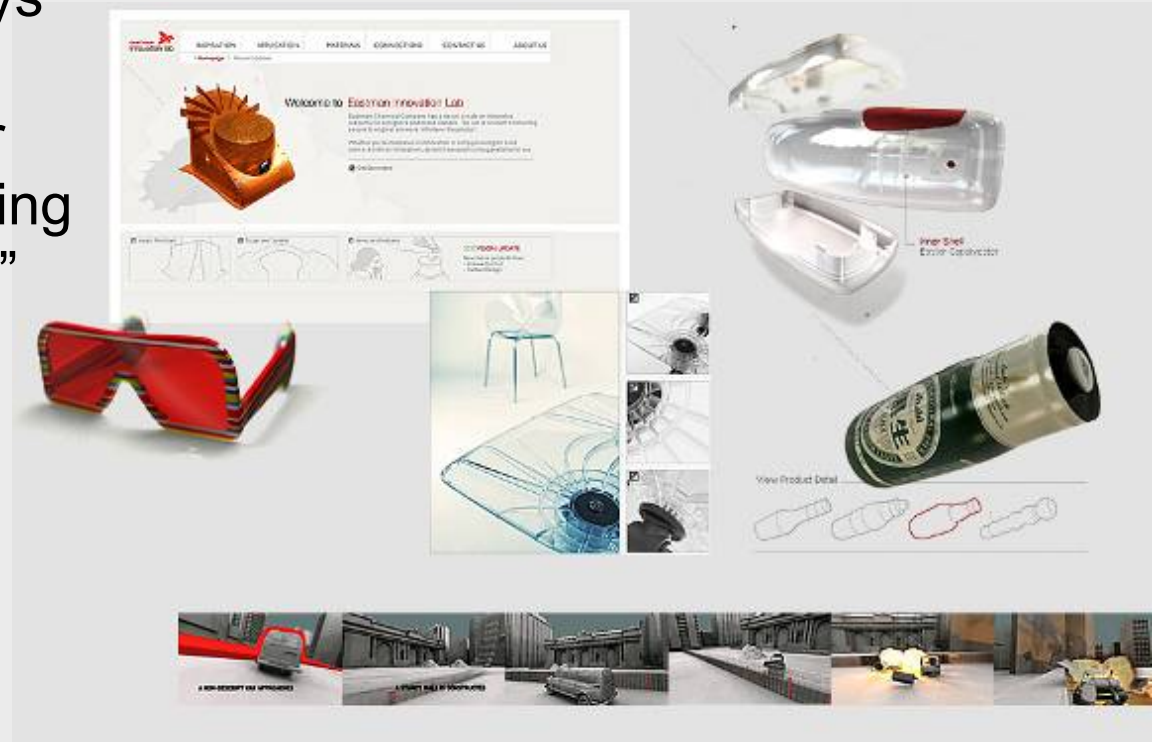


- Animation slide showing design work done with specialty plastics (removed due to size)



“The **Eastman Innovation Lab** brings a visitor into a world that clearly conveys credibility and expertise. Their products speak for themselves while providing constant demonstration.”

Peter Arnell
IDSA juror
Chief Creative Officer
Arnell Group



material difference™
THE ADVANCE OF DESIGN THROUGH MATERIALS

EASTMAN
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- Eastman – George Zima, Harish Davey, Shaowo Liang, Bill Heise, Eastman Management (Greg O Nelson, Greg W Nelson and Ron Lindsay)
- "The Usual Suspects" –John Tao (Air Products), Randy Guschl (DuPont), Susan Butts (Dow) , Gene Slowinski (Rutgers), IRI –ETDN Members



backup



Key Findings – Best Practices in External Technology Management

- Development of 'hot list' of needed technologies based on objective process
- Setting of strategic boundaries and objectives
- Use of peer review to assess projects within predefined boundaries and rigorous gating
- Management involvement and rewards for use of external technology
- Contract templates and standards for more rapid program completion
- Centralized External Technology function becoming increasingly more common, but not universal.

Source: IRI Sourcing External Innovation Subcommittee



Topology For External Innovation*

(a hypothesis)

- Level 1 – Cost and Supply Chain Management
- Level 2 – Strategic Partnering
- Level 3 – Extended External Networks
- Level N – Integrated External Innovation

* For a similar approach to Intellectual Capital Management see Harrison et al. *Edison in the Boardroom*



Translation of the “WFGM” Model to an External Innovation Function

Get

What processes will we use to plan, structure and negotiate an agreement to access the resources?

Establishment of Partnerships and Research Contracts

- Proposal evaluation and peer review
- Contract Standards and Measures (Dow Model)
- Contract Templates and Model Agreements
- Processes for transactions and execution

Management of External Projects

- Establishment of Milestones and Go/no-go Criteria
- Establishment of objectives
- Stakeholder buy-in

Grant Identification and Procurement

- Link to key agencies
- Government relations tie-ins



Translation of the “WFGM” Model to an External Innovation Function

Manage

What tools, metrics and management techniques will we use to implement the relationship?

Management of Projects

- Progress vs. milestones and objectives
- Gate and Go/no-go decisions
- Stakeholder Reporting
- Management of financial obligations and other contract terms
- Grant Management

Capture of Learnings

- Partner evaluation and feedback
- Capability assessment
- Lessons learned for future contracts and management systems
- Technology and Information Transfer
- Secure patent and other IP

Types of External Programs By Horizon

