
Health and Environment An Outward-looking Program

MMT®: A Case Study
Ethyl Corporation



Protecting, Promoting and Enhancing Your Core Business

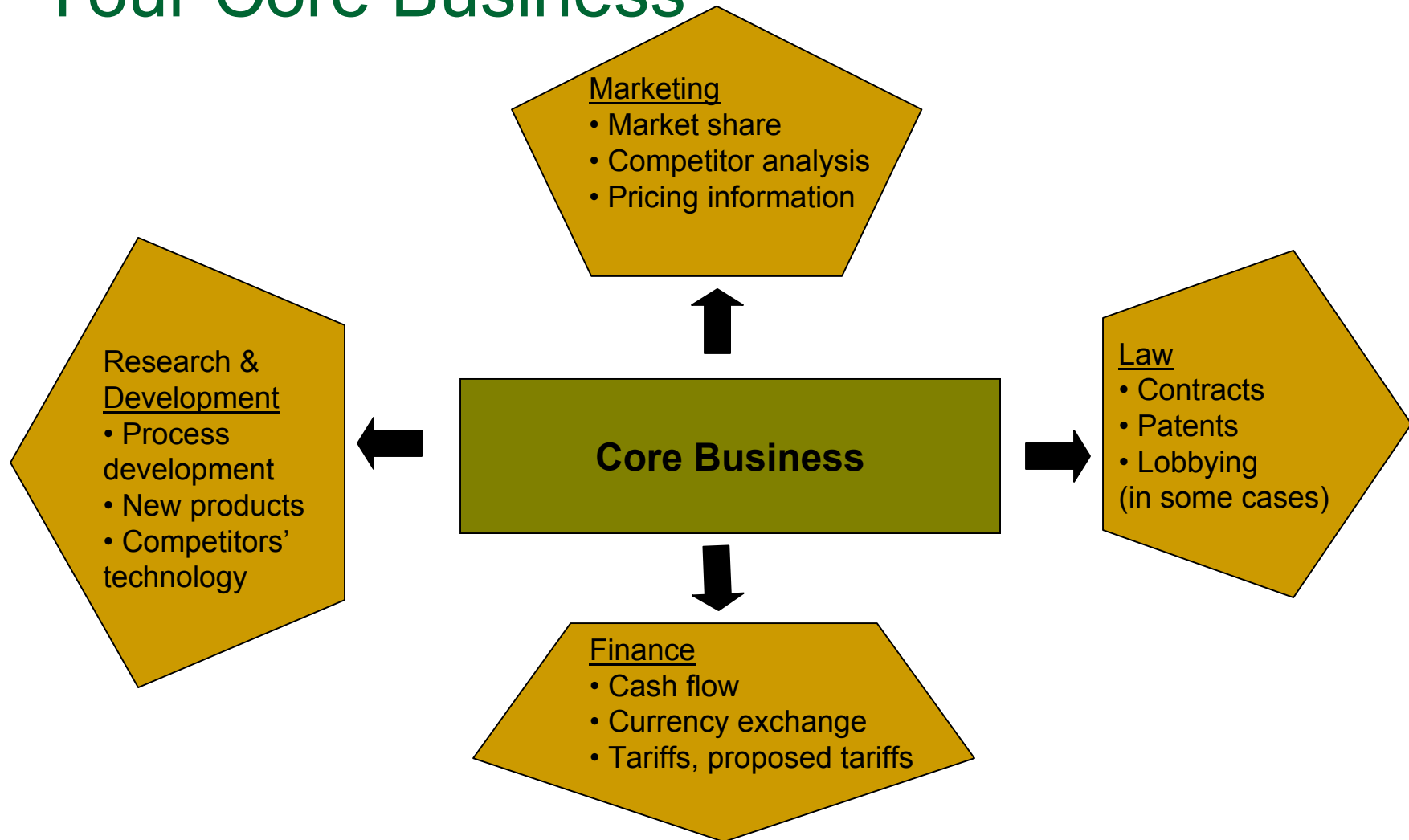


Figure 2

Protecting, Promoting and Enhancing Your Core Business

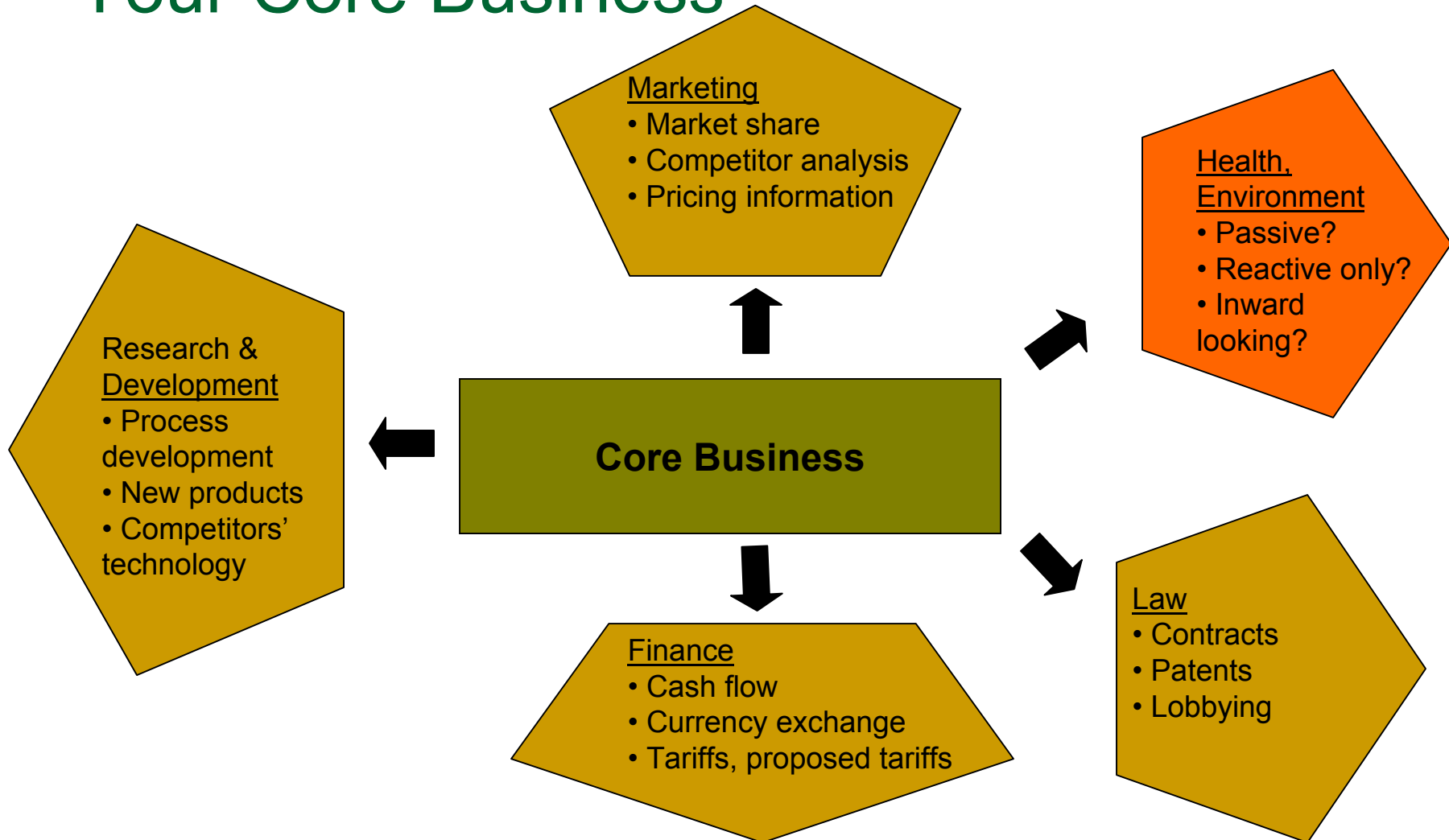


Figure 3

Ethyl Corporation Business Profile

- *Since 1921, Ethyl Corporation has provided additive chemistry solutions to enhance the performance of petroleum products. Our products and services provide the chemistry that makes fuels burn cleaner, engines run smoother and machines last longer.*
- Core businesses – fuel and lubricant additives
- Headquartered in Richmond, Virginia, USA with operations worldwide
- 2003 sales -- \$756 million; operating profit \$86 million
- ~1,600 employees

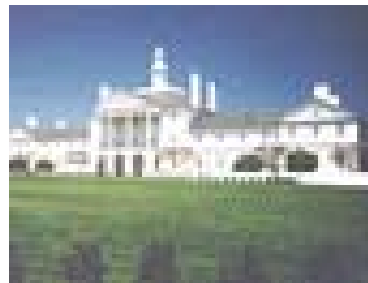


Figure 4



MMT[®] Facts

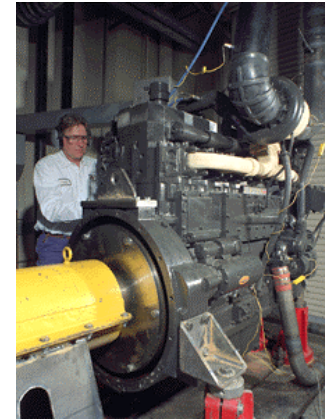
- Methylcyclopentadienyl manganese tricarbonyl -- a manganese-based additive
- Not a new product – developed in the late 1950's
- MMT[®] -- a key fuel additive used in gasoline, diesel, and fuel oil
- A gasoline additive that boosts octane, saves crude oil, and reduces automotive NOx emissions



Figure 5

MMT[®] Market & Regulatory Highlights

- Beginning late 1950's
 - Expanding usage
 - Used in both leaded and unleaded gasoline
- 1977
 - Broad usage, prompting U.S. EPA to mandate that certification fuel must contain MMT[®]
- 1978
 - Use of MMT[®] in unleaded gasoline suspended pending approval under Section 211(f) of the Clean Air Act



MMT[®] Market & Regulatory Highlights

■ 1978-94

- ❑ Millions of miles of fleet and emission testing
- ❑ Approval granted in 1994
- ❑ MMT[®] currently approved for use in unleaded gasoline in the U.S.
- ❑ Used in over 25 countries
- ❑ Health and environmental issues gained higher profile during this period



MMT[®] Health & Environment Aspects: U.S. EPA's Concerns

- “... a reasonable basis exists for concern regarding potential health risks, especially for sensitive subpopulations...” [U.S. EPA, MMT Risk Assessment, 1994]
- “Until research and information needs are met, a high degree of uncertainty will attend any judgment of the potential risks to public health associated with MMT.” [U.S. EPA, MMT Risk Assessment, 1994]

Ethyl's MMT[®]/Mn Health & Environment Research Program

- Inward-looking, reactive position – tell us what testing will be imposed and we'll do it – this path was not taken
- Agreed to engage the scientific issues and cooperate with the U.S. EPA to address health and environment concerns
- Resulting test program was a mixture of required and voluntarily undertaken studies
 - Required and voluntary studies form a complete program that addresses the issues of concern

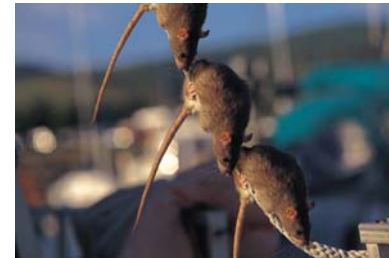
Ethyl's MMT[®]/Mn Health & Environment Research Program Voluntary Studies

- A series of 14-day Mn inhalation studies in rats
- Study of direct nasal uptake of Mn
- A Mn personal exposure study in Toronto, Canada
- Automobile tailpipe emission characterization studies



Ethyl's MMT[®]/Mn Health & Environment Research Program Required Studies

- Age and gender study: 90-day Mn inhalation study in rats
- Developmental effects study: 90-day Mn inhalation study in rats
- Species differences study: 90-day Mn inhalation study in monkeys
- Additional automobile emission studies



Benefits Of Cooperatively Entering A Health and Environment Testing Program

- Good science
 - Relevant scientific issues under investigation, not generic issues covered by standard test programs
- Product stewardship – Good Will
 - Engaging science with the regulators and scientists instead of fostering a perception as being opposed to science and against regulators
- Time/money
 - Product remains on market and supports testing program
- Scientific infrastructure
 - Ability to respond to issues as they arise
- Positioning for a favorable regulatory outcome
 - Because that's what the science indicates

Inward- V. Outward-looking Health & Environmental Program

- Health and environment is an integral part of today's business activities and there is no indication that will change
- An outward-looking program engaged in good science is an important component of a sound business plan

Health and Environment An Outward-looking Program

MMT®: A Case Study

Ethyl Corporation

Thank you for your attention.

