



## **Robert Eller Associates, Inc.**

CONSULTANTS TO THE PLASTICS AND RUBBER INDUSTRIES

# **OVERVIEW OF THE AUTO INTERIORS MARKET AND HOW TO REMAIN COMPETITIVE**

### **PRESENTED BY:**

**Bob Eller, President**  
**Robert Eller Associates, Inc.**  
**Phone: 001 330 670 9566**  
**[bobeller@prodigy.net](mailto:bobeller@prodigy.net)**  
**[www.robertellerassoc.com](http://www.robertellerassoc.com)**

### **PREPARED FOR:**

**PLASTICS IN AUTOMOTIVE  
INTERIORS, III**  
**PRAGUE, CZECH REPUBLIC**

**JANUARY 26, 2006**

Bob/mydox/paper/prague supply chain.ppt

# **OUTLINE**

- **CURRENT STATE OF THE AUTO INDUSTRY**
- **INDUSTRY STRUCTURE SHIFTS**
- **MANUFACTURING SHIFTS TO LOW COST REGIONS**
- **IMPLICATIONS OF THE IMPLODING SUPPLY CHAIN**
- **ADDING VALUE/ADAPTING TO SUPPLY CHAIN SHIFTS VIA:**
  - NEW PLASTICS MATERIALS TECHNOLOGIES**
  - FABRICATION TECHNOLOGY SHIFTS**

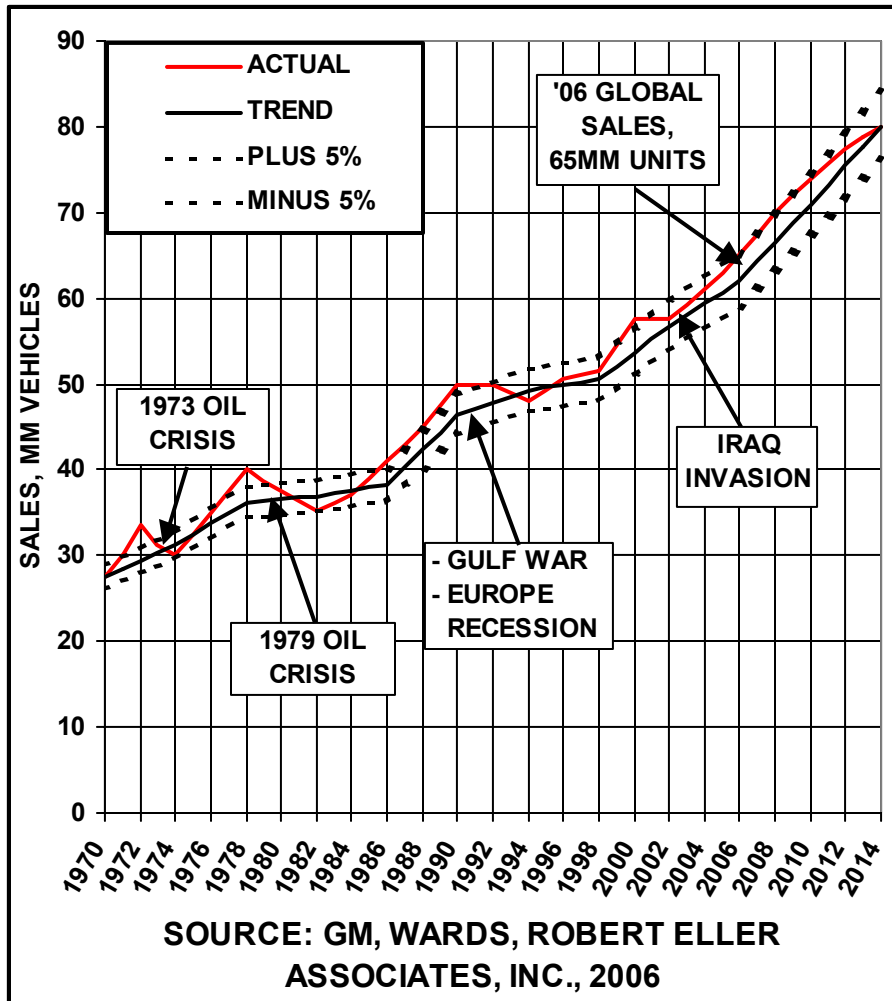
# **OPERATING HYPOTHESES**

- **THE SUPPLY CHAIN WILL BE RESHAPED**
- **VEHICLE PRICE DECLINES CONTINUE**
- **“HIGH” N.A. FUEL PRICES CONTINUE**
- **NET TECHNICAL INFLOW TO U.S. CONTINUES**
- **MATERIALS/PROCESS TECHNOLOGY IS A PATH TO ADDING VALUE**
- **FLEET COMPOSITION ADAPTS TO ECONOMIC PRESSURES**
- **MANUFACTURING SHIFT TO ASIA**
- **GLOBAL QUALITY STANDARDIZATION**

# **CURRENT/FUTURE STATE OF THE AUTO INDUSTRY**

- **GLOBAL PRODUCTION DEMAND GROWTH APPROX. 3%/YR. THROUGH 2012**
- **GLOBAL DEMAND HISTORY +/- 5% OFF TREND LINE SINCE 1970**
- **GLOBAL OVERCAPACITY**
- **STAGNANT U.S./EUROPE DEMAND**
- **REGIONAL DEMAND GROWTH SHIFT TO ASIA PACIFIC**
- **MINI/SMALL CAR (B SEGMENT) SHARE GAIN GLOBAL/U.S.**
- **GROWTH OF DOMESTIC ASIA PACIFIC OEMs**
- **SHARE LOSS BY U.S./EUROPEAN DOMESTIC OEMs**

# GLOBAL LIGHT VEHICLE PRODUCTION TREND LINE



- 2011 GLOBAL SALES COULD REACH 75MM UNITS
- GLOBAL AAG = 3%/YR.
- ASIA PACIFIC GROWTH 5-6%/YR.?
- WESTERN GROWTH STAGNANT OR DECLINE
- GLOBAL FLEET SHIFT TOWARD SMALLER CARS
- VARIATIONS HAVE BEEN IN +/- 5% BAND SINCE 1970

# **ROLE OF ECONOMIC PRESSURES**

- **HIGH LABOR COSTS (N.A./EUROPE)**
- **SHIFTS TOWARD MATERIALS AND TECHNOLOGIES CAPABLE OF MEETING REDUCED COST TARGETS**
- **SUV PROFITABILITY LOSS IN N. AMERICA:**
  - **RENEWED WEIGHT SAVE INCENTIVE**
  - **PRESSURE FOR SMALLER VEHICLES**

# **INTERIOR SUPPLY CHAIN**

- **SEVERE PROFITABILITY SQUEEZE:**
  - **HIGH RAW MATERIAL PRICES**
  - **LIMITED PRICING POWER**
  - **EUROPE/U.S./JAPAN  
TECHNOLOGY/INDUSTRY STRUCTURE  
CONVERGENCE**
- **ABOUT 85% OUTSOURCED (WILL NOT CHANGE)**
- **N. AMERICAN SPINOFFS (DELPHI, VISTEON),  
SOME OTHERS IN FINANCIAL DIFFICULTIES**
- **PRIVATE EQUITY GROUPS ENTERING**
- **FURTHER CONSOLID'N/GLOBALIZ'N LIKELY**
- **PREVIOUS RECORD SUGGESTS THAT BIG  
DOESN'T NECESSARILY LEAD TO PROFIT**

# **INTERIORS**

- **ABOUT 20% OF GLOBAL VEHICLE VALUE ADD**
- **REVENUE GROWTH POTENTIAL LIMITED**
- **AVERAGE VALUE ABOUT 2000 EURO/VEHICLE (WILL DECLINE-SMALL VEHICLE SHARE GAIN, UTILITY INTERIORS)**
- **ELECTRICAL/ELECTRONIC SYSTEMS LARGEST REVENUE GROWTH POT'L.**

**(CONT'D.)**



# INTERIORS (CONT'D.)

| MODULE TYPE  | GLOBAL VALUE (2004) |             | NOTE                                                                  |
|--------------|---------------------|-------------|-----------------------------------------------------------------------|
|              | BN EURO             | SHARE %     |                                                                       |
| INTERIOR     | 130                 | 19%         | HIGHLY OUTSOURCED (85%)<br>STATIC REVENUE GROWTH (<1%/YR.)            |
| E/E SYSTEMS  | 145                 | 21%         | HIGHLY OUTSOURCED (85%)<br>STEEP REVENUE GROWTH (7%/YR. THROUGH 2010) |
| OTHER (a)    | 405                 | 60%         | SOME MODULES WILL GROW REVENUE                                        |
| <b>TOTAL</b> | <b>680</b>          | <b>100%</b> |                                                                       |

**NOTE:**

**(a) INCLUDES ENGINE, POWERTRAIN, CHASSIS, EXTERIOR, BODY IN WHITE**

**SOURCE: ROBERT ELLER ASSOCIATES, INC., 2006**

# **AN INEFFICIENT INTERIOR SUPPLY CHAIN WILL:**

- **SEE INTENSIFIED GLOBAL COMPETITION FURTHER CONSOLIDATE**
- **FLATTEN**
- **FURTHER GLOBALIZE**
- **INCREASE ASIA PRESENCE (AND FACE PARALLEL SUPPLY CHAIN)**
- **ACCELERATE EUROPE/N. AMERICA CONVERGENCE**
- **SEEK TECHNOLOGY SOLUTIONS TO PROFIT SQUEEZE**

# POLYMER TECHNOLOGY, INFORMATION TECHNOLOGY MACROECONOMIC INFLUENCES ON AUTOPLASTIC INTERIORS

## AUTOPLASTICS SUPPLY CHAIN:

- |                                                                                                                        |  |                                                                                                                                                |
|------------------------------------------------------------------------------------------------------------------------|--|------------------------------------------------------------------------------------------------------------------------------------------------|
| <ul style="list-style-type: none"> <li>-RESIN</li> <li>-COMP'DG.</li> <li>-FABRICATION</li> <li>-TECHNOLOGY</li> </ul> |  | <ul style="list-style-type: none"> <li>-BROADENED PRODUCT ENVELOPE</li> <li>-LOWER SYSTEMS COSTS</li> <li>-INDUSTRY STRUCTURE SHIFT</li> </ul> |
|------------------------------------------------------------------------------------------------------------------------|--|------------------------------------------------------------------------------------------------------------------------------------------------|

## END USER MARKET, MACROECONOMIC TRENDS:

- MFG. SHIFT TO LOWER COST COUNTRIES (ASIA, E.E., ETC.)
- ENTRY OF NEW COUNTRIES INTO GLOBAL MKT. ECONOMY
- ENLARGEMENT OF GLOBAL CONSUMER CLASS (3-->6BN)
- EMERGENCE OF NEW WORKER CLASS (+1.5BN)
- SLOWED POPULATION GROWTH IN WEST
- RELATIVELY STAGNANT/SLOWED GROWTH IN WESTERN ECONOMY
- SEVERE DOWNWARD OEM PRICE PRESSURES
- DEMAND SHIFT TO NEWLY INDUSTRIALIZED COUNTRIES
- DEMAND DRIVEN RAW MAT'L. PRICE INCREASES

## RUBBER SECTOR:

- SLOW INNOVATION IN POLYMER TECHNOLOGY
- SLOW INNOVATION IN FABRICATION TECHNOLOGY
- VERY LIMITED INVESTMENT
- LOW R/D LEVELS



## GLOBAL MARKET STRUCTURE/MACROECONOMIC CHANGES:

- GLOBAL HORIZONTAL COLLABORATION REPLACING VERTICAL CHAIN OF COMMAND & MKT. STRUCTURE
- SUPPLY CHAIN RESTRUCTURE
- GLOBAL PERF. STANDARDS
- MFG. BASE SHIFT (EASTWARD)
- EMERGENCE OF NEW, LOCALLY CONTROLLED OEM MFG.
- SHIFT IN ROLE OF SALES/MKTG.
- CONT'D. OEM GLOBAL MKT. CONSOLIDATION?(b)
- OUTWARD FLOW OF PROFITS FROM NEWLY INDUSTRIALIZED COUNTRIES TOWARD WESTERN INVESTMENT
- INCREASED TERRORISM
- SUPPLY CHAIN MANIPULATION BY MAJOR GLOBAL OEMs

## AUTOPLASTIC EFFECTS

- SHARP INCREASE IN RUBBER MKT. PENETRATION BY TPEs
- DEMAND SHIFT EASTWARD
- SLOW GROWTH OF WESTERN MARKETS
- TREND TOWARD HIGHER VALUE POs IN WESTERN MARKETS
- SUPPLY CHAIN CONSOLIDATION
- INDUSTRY STRUCTURE SHIFT
- EMERGENCE OF NEW, LOCALLY CONTROLLED RESIN AND PO COMPOUND PRODUCERS(a)
- NET GLOBAL PO DEMAND INCREASE
- SHIFT TOWARD NEW PO TECHNOLOGIES

NOTES: (a)A NEW PARALLEL SUPPLY CHAIN CHALLENGING THE POSITION OF ESTABLISHED WESTERN AUTOPLASTIC SUPPLIERS  
(b)PARTIALLY OFFSET BY EMERGENCE OF NEW, LOCAL COMPETITION IN NEWLY INDUSTRIALIZED REGIONS

SOURCE: ROBERT ELLER ASSOCIATES, INC., 2006

# **AUTO MANUFACTURING SHIFTS TO LOW COST REGIONS**

## **THE CHINA EFFECT:**

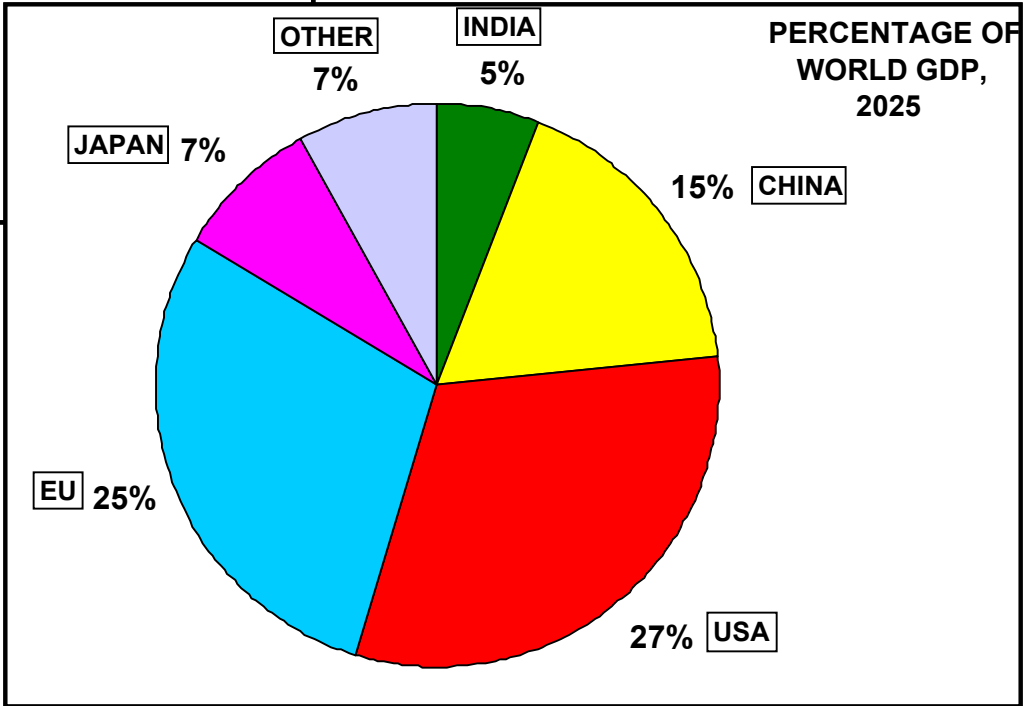
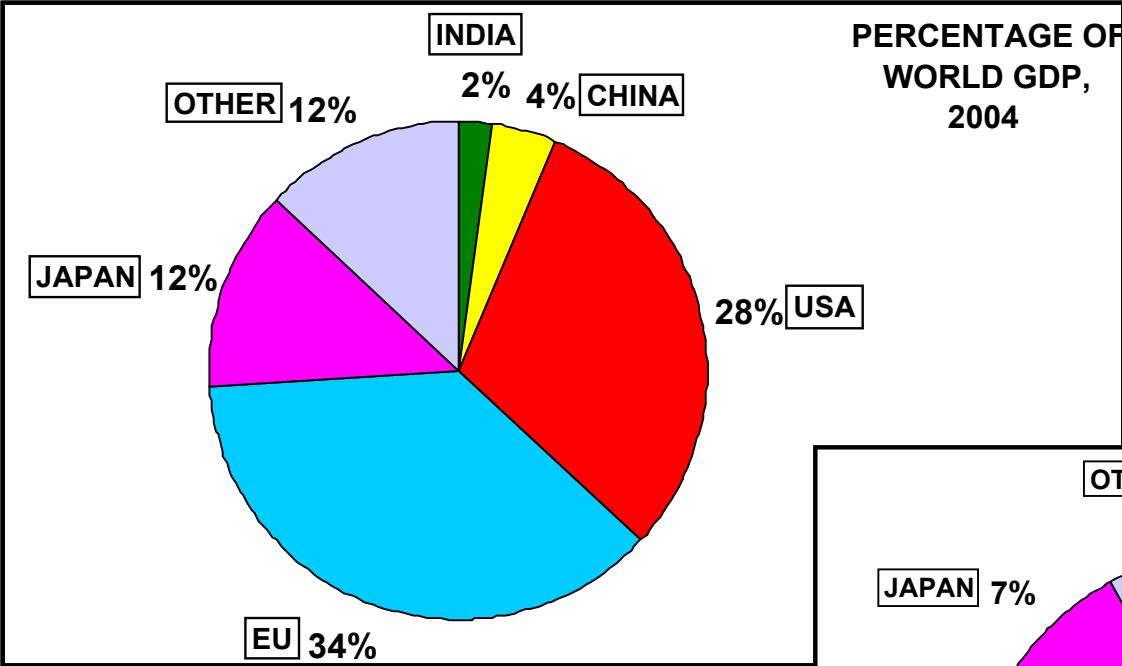
- **MAJOR SHARE GAIN (2X FROM 2005-2010)**
- **GROWTH OF SMALL CAR PRODUCTION**
  - **INEXPENSIVE PEOPLE CARRIERS (SMALL VANS, BUSES) FOR EXPORT TO EMERGING DOMESTIC MARKETS**
  - **SYRIA CURRENTLY MAJOR EXPORT TARGET**
  - **\$5,000 TARGET PRICE**
- **RESIN SUPPLIER, CMPD'R., TIER 1 SHIFT STARTED**

# **GROWTH OF AUTO MANUFACTURING SHIFTS TO LOW COST REGIONS(CONT'D.)**

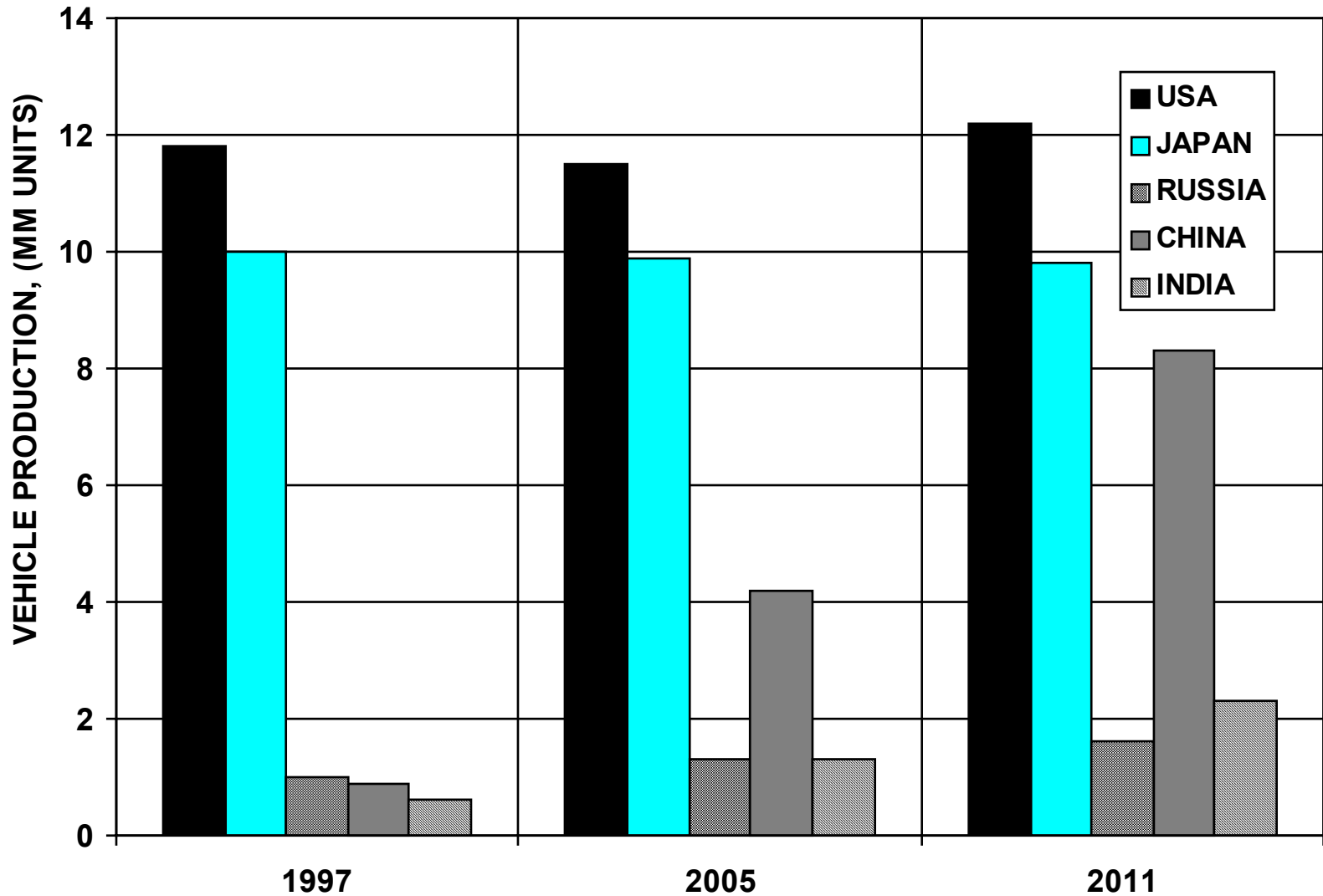
## **THE CHINA EFFECT:**

- **CHINA POWER GAIN IN MIDDLE EAST**
- **GEELY/CHERY IN U.S./EUROPE? IN 2008**
- **DOWNTURN OF CHINA DOMESTIC MKT.  
WILL STIMULATE EXPORT**
- **KITS WILL HAVE SIGNIFICANT SHARE**
- **WULING (GM), CHANG'AN (FORD JV) ARE  
SMALL CAR LEADERS**
- **GOVERNMENT ROLE**

# SHIFT IN GEOGRAPHIC DISTRIBUTION OF GLOBAL GDP, 2004-2025

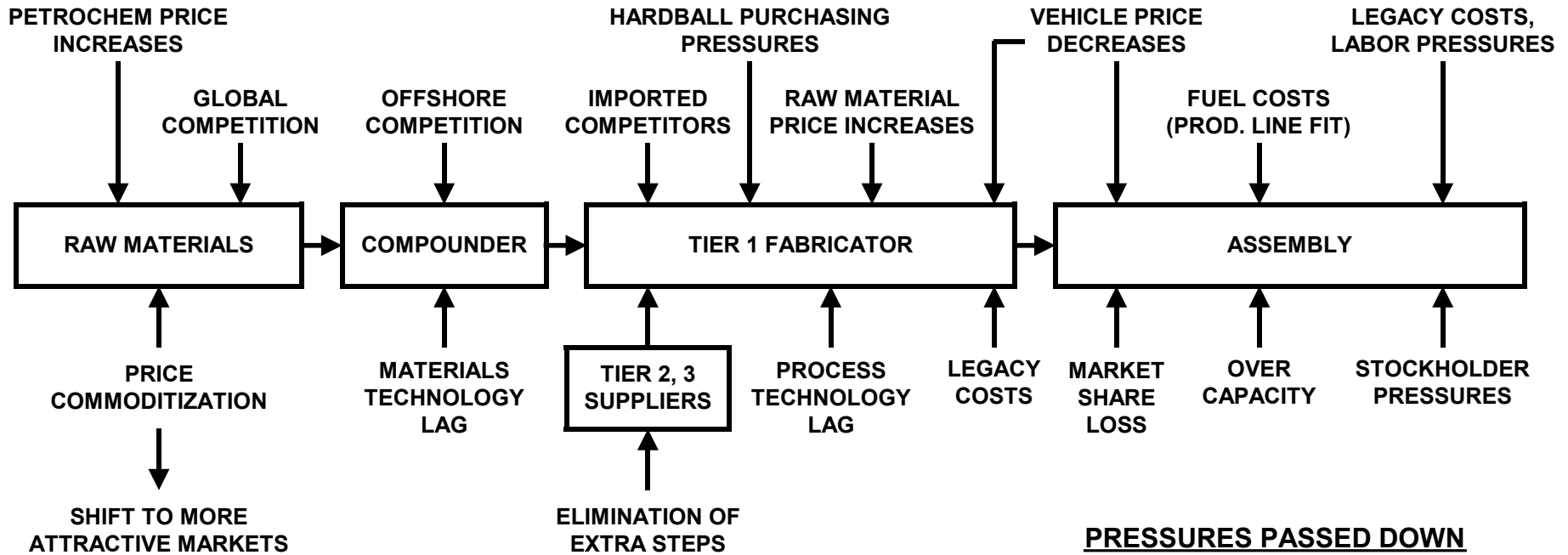


# LIGHT VEHICLE PRODUCTION SHIFT, 1997-2011



SOURCE: ROBERT ELLER ASSOCIATES, INC., 2006

# AUTOPLASTIC SUPPLY CHAIN IMPLOSION



## PRESSURES PASSED DOWN THE SUPPLY CHAIN:

- ← PRICING PRESSURES
- ← SUPPLY CHAIN "MANAGEMENT"
- ← DEMAND SLOWDOWN
- ← REVISED SPECIFICATIONS
- ← GLOBALIZATION PRESSURES

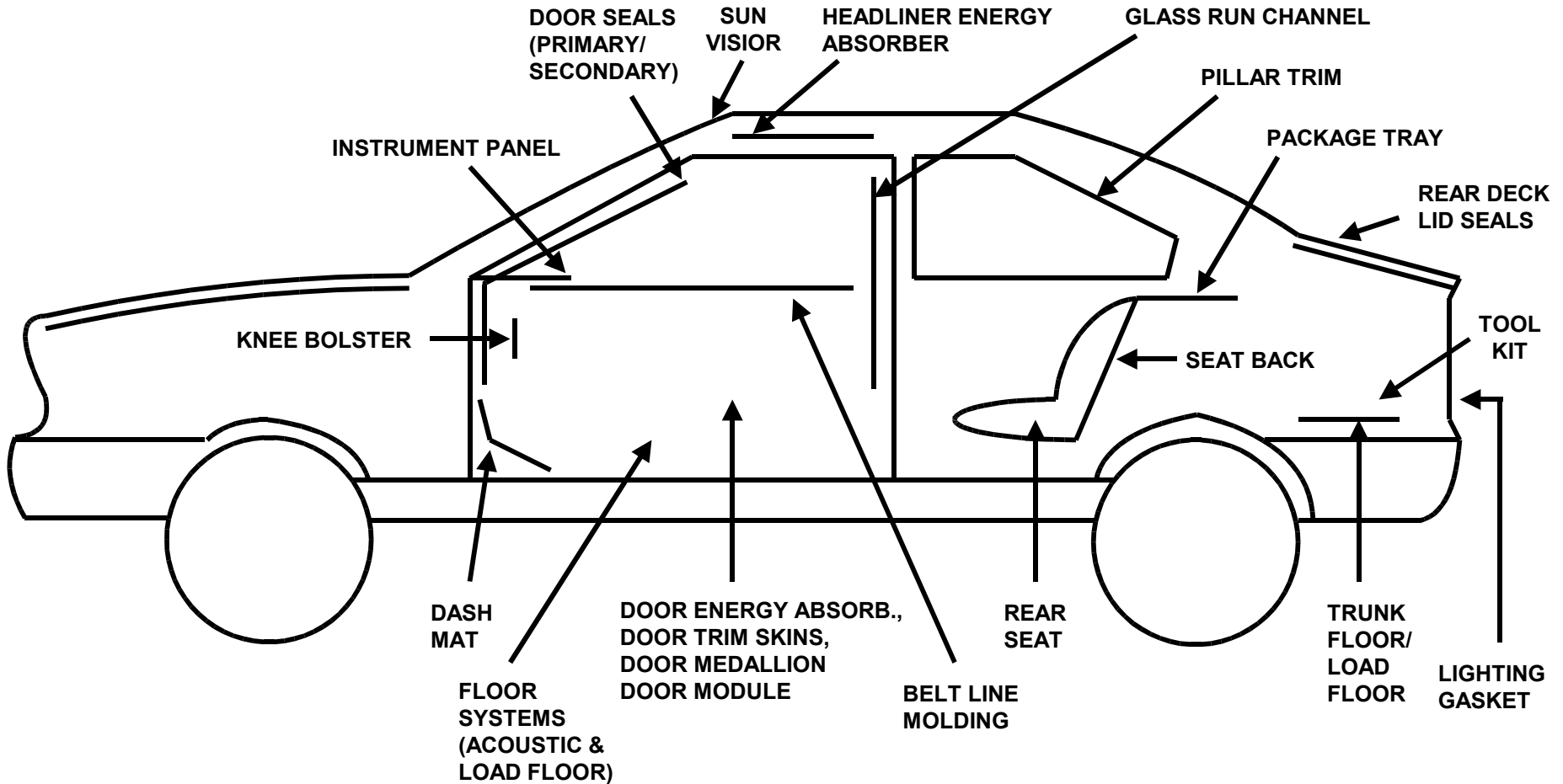
## ELIMINATE/REDUCE THE INEFFICIENCIES:

- MULTIPLE STEPS
- EXCESSIVE LOGISTICS
- SCRAP GENERATION
- INEFFICIENT PROCESS TECHNOLOGIES
- SALES/MARKETING COSTS
- EXCESS LABOR COSTS
- OVER-GLOBALIZATION?

**SOURCE: ROBERT ELLER ASSOCIATES, INC., 2006**



# AUTOMOTIVE INTERIOR APPLICATIONS



SOURCE: ROBERT ELLER ASSOCIATES, INC., SOFT TRIM MULTICLIENT STUDY

# VALUE CREATION VIA MATERIALS

- **IMPROVED REACTOR-TPOs**
- **POLYOLEFIN SUBSTITUTION FOR ETPs**
- **COATINGS ELIMINATION**
  - **IMPROVED MOLDED-IN COLOR**
  - **IMPROVED SCRATCH/MAR RESISTANCE**
- **ADVANCED TECHNOLOGY NONWOVENS**
- **PLASTOMER/HMS-PP COMBINATIONS**
- **FOAM QUALITY IMPROVEMENT**
- **SKIN/FOAM COMBINATIONS**
- **EPP & EPP/PS BEAD FOAMS**
  - **SEATING**
  - **TEXTILE/FOAM COMBINATIONS**
- **MONO MATERIALS CONSTRUCTION**

# **INCREASED PLASTOMER ROLE**

- **LONG CHAIN BRANCHING:**
  - **POOR MAN'S CROSSLINKING**
  - **SKINS/THERMOFORMED APPLICATIONS**
- **TPO BUMPER FASCIA(EPDM SUBSTITUTE)**
- **HIGH PROPYLENE PLASTOMER GRADES:**
  - **HIGH ELASTICITY TPO APPLICATIONS**
  - **COATED FABRICS?**
  - **FOAMS?**

# **VALUE CREATION VIA FABRICATION TECHNOLOGIES**

- **2-SHOT MOLDING**
- **RIGID/FLEXIBLE COMBINATIONS**
- **DIRECT COMPOUNDING**
- **COPROCESSING**
  - **CO-BLOW**
  - **CO-INJECTION**
  - **CO-EXTRUSION**
  - **PROFILE EXTRUSION**
- **ON-BOARD FUNCTIONS (ACOUSTIC,  
ENERGY ABSORPTION)**

# SOME INTERIOR COMPETITIONS

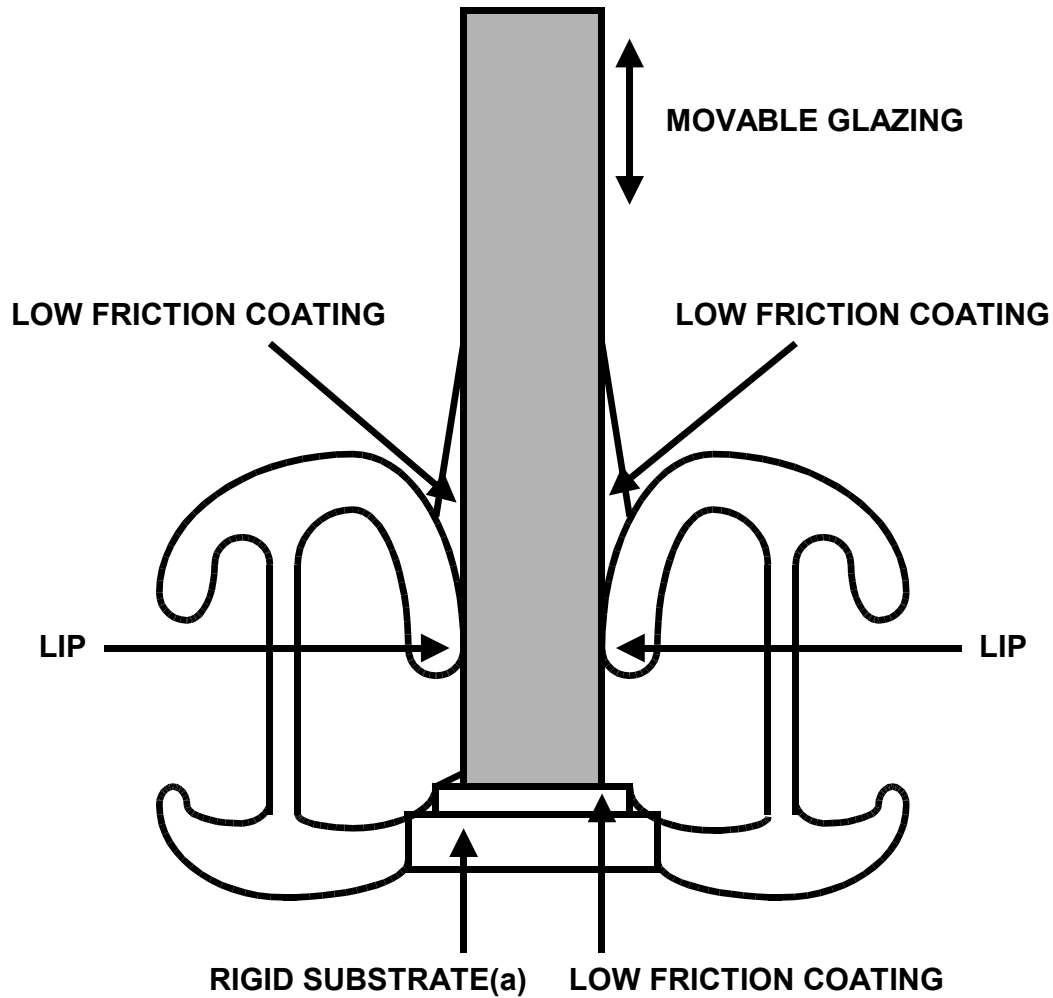
| MODULE                           | COMPETITORS                                                                       |
|----------------------------------|-----------------------------------------------------------------------------------|
| <b>FLOOR,<br/>HEADLINER</b>      | <b>-FOAM VS. FIBER<br/>-LT. WT. COMPOSITES VS. FOAM<br/>-PET VS. PP NONWOVENS</b> |
| <b>HEADLINER “A”<br/>SURFACE</b> | <b>-NONWOVENS VS. KNITS</b>                                                       |
| <b>HEADLINER<br/>SUBSTRATE</b>   | <b>-PU FOAM VS. NW, PO FOAM<br/>-PU FOAM VS. LT. WT. COMPOSITES</b>               |
| <b>SKIN</b>                      | <b>-THERMOFORM VS. 2-SHOT<br/>-SLUSH VS. SPRAY<br/>-PLASTOMERS VS TPVs</b>        |
| <b>ACOUSTICS</b>                 | <b>-FOAM VS. FIBER</b>                                                            |
| <b>ENERGY MGT.</b>               | <b>-FOAM VS. R-TPO<br/>-R-TPO VS. C-TPO</b>                                       |

(CONT'D.)

# SOME INTERIOR COMPETITIONS

| <b>MODULE</b>             | <b>COMPETITORS</b>                                                                               |
|---------------------------|--------------------------------------------------------------------------------------------------|
| <b>AIRBAG DOORS</b>       | <b>-SEBS VS. TPO<br/>-r-TPO VS. SEBS, c-TPO<br/>-SINGLE VS. 2-SHOT</b>                           |
| <b>TRIM</b>               | <b>-PAINT VS. IN-MOLD DECORATION<br/>-PAINT VS. MOLDED-IN COLOR</b>                              |
| <b>DOOR TRIM</b>          | <b>-INJECTION VS. THERMOFORM<br/>-WOOD FIBER FILLED VS. TALC</b>                                 |
| <b>SEATING</b>            | <b>-LEATHER VS. TEXTILE<br/>-LEATHER VS. LUX. COATED FABRICS<br/>-EPP BEAD FOAMS VS PU FOAMS</b> |
| <b>BODY/GLAZING SEALS</b> | <b>-TPV VS EPDM<br/>-ENTRY OF CROSSLINKED SEBS</b>                                               |
| <b>COATED FABRIC</b>      | <b>NO OLEFINIC SUCCESS VS. PVC YET</b>                                                           |

# TYPICAL GLASS RUN CHANNEL CROSS-SECTION



**NOTE:**  
(a) USUALLY FILLED PP



**Body Seal Example:**Rear tailgate seal

**Model:** Jeep Cherokee

**Manufacturer:** Major Body Seal Tier 1

**Material Type:** EPDM Compound

**Note:** Foamed (sponge)/Solid (dense) Combination



# RUBBER SUBSTITUTION STATUS

| <b>APPLICATION</b>                    | <b>STATUS</b>                                                                       |
|---------------------------------------|-------------------------------------------------------------------------------------|
| <b>BODY/ GLAZING SEALS</b>            | <b>- STARTED</b>                                                                    |
| <b>HOSE</b>                           | <b>- NO SIGNIFICANT PENETRATION YET</b>                                             |
| <b>BELTS</b>                          | <b>- UNLIKELY PENETRATION</b>                                                       |
| <b>BOOTS/ BELLOWS/<br/>DUCTING</b>    | <b>- SUBSTANTIAL PENETRATION<br/>- SHIFT TO HIGHER PERFORMANCE TPE<sub>s</sub>?</b> |
| <b>GROMMETS, BUMPERS,<br/>GASKETS</b> | <b>- STARTED</b>                                                                    |



**Manufacturer:** Valeo

**TPV Type:** TPV

**Manufacturer Location:** Europe

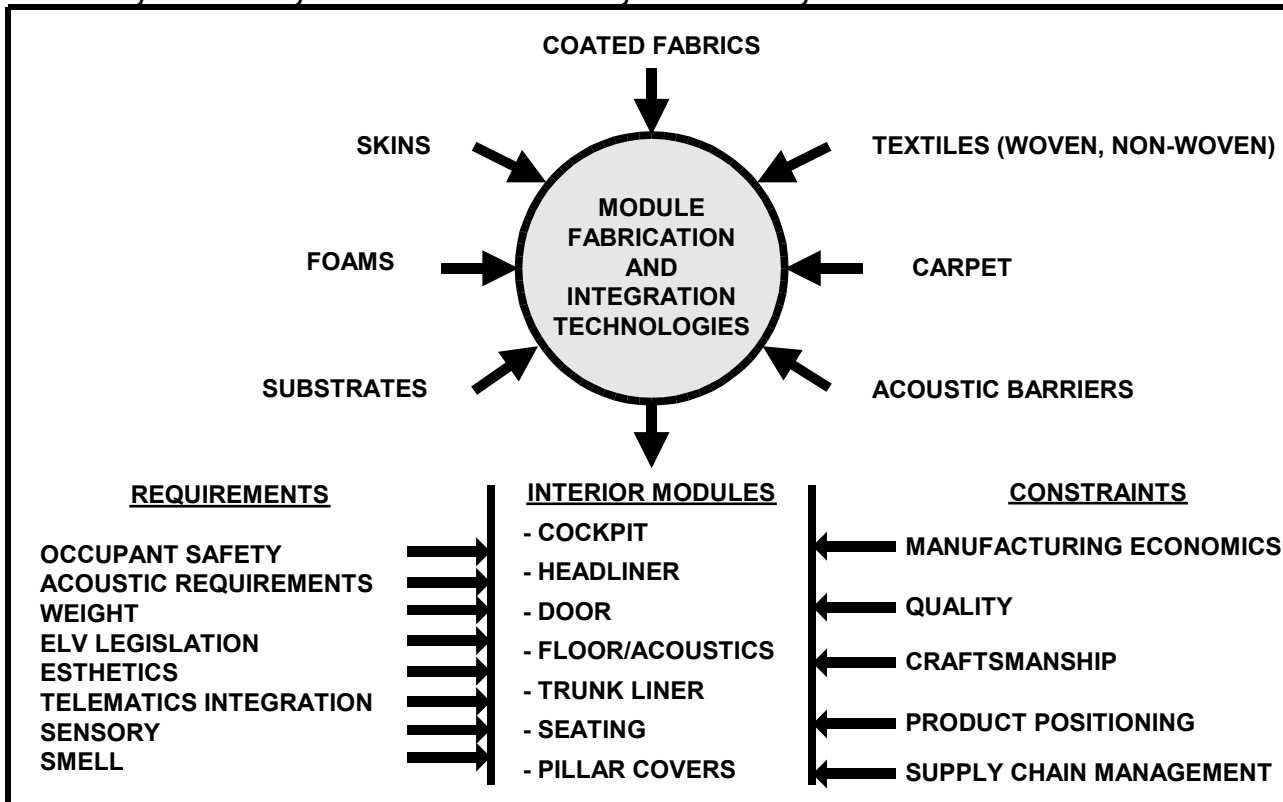
**Note:** Example of boots/bellows and EPDM replacement.

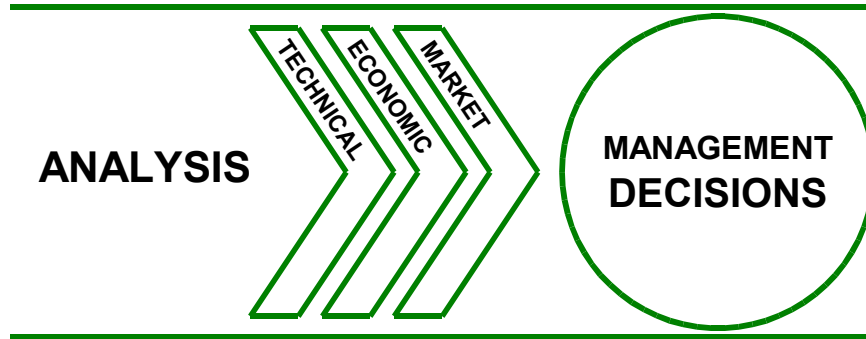
# HOW TO CAPTURE VALUE

- **TARGET SYSTEMS COST SAVINGS**
- **TAKE FROM E/E, EXTERIORS**
- **SHORTEN THE SUPPLY CHAIN**
- **LOWER COST MATERIALS**
  - **REACTOR-TPOs**
  - **PLASTOMER/HMS PP COMBINATIONS**
  - **NONWOVENS**
- **FABRICATION TECHNOLOGIES**
  - **2-SHOT MOLDING/LOW PRESSURE MOLDING**
  - **MONOMATERIALS CONSTRUCTIONS**
  - **ON-BOARD FUNCTIONS (ACOUSTIC, ENERGY ABSORPTION)**
  - **CO-PROCESSING**

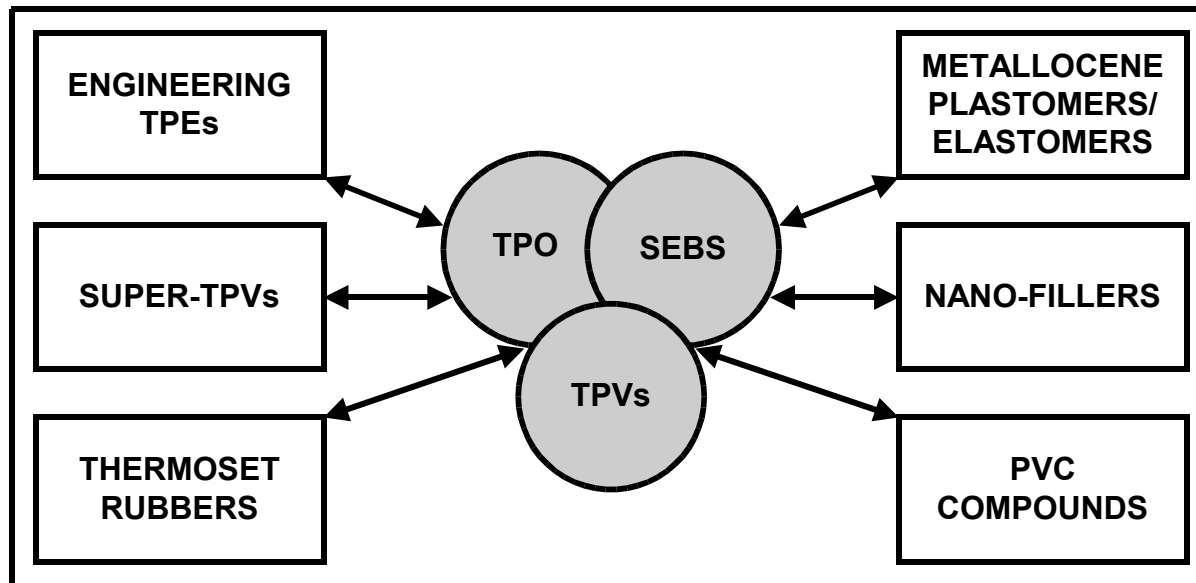


## Automotive Interior Soft Trim: Skins, Foams, Coated Fabrics, Textiles, and Acoustic Barriers





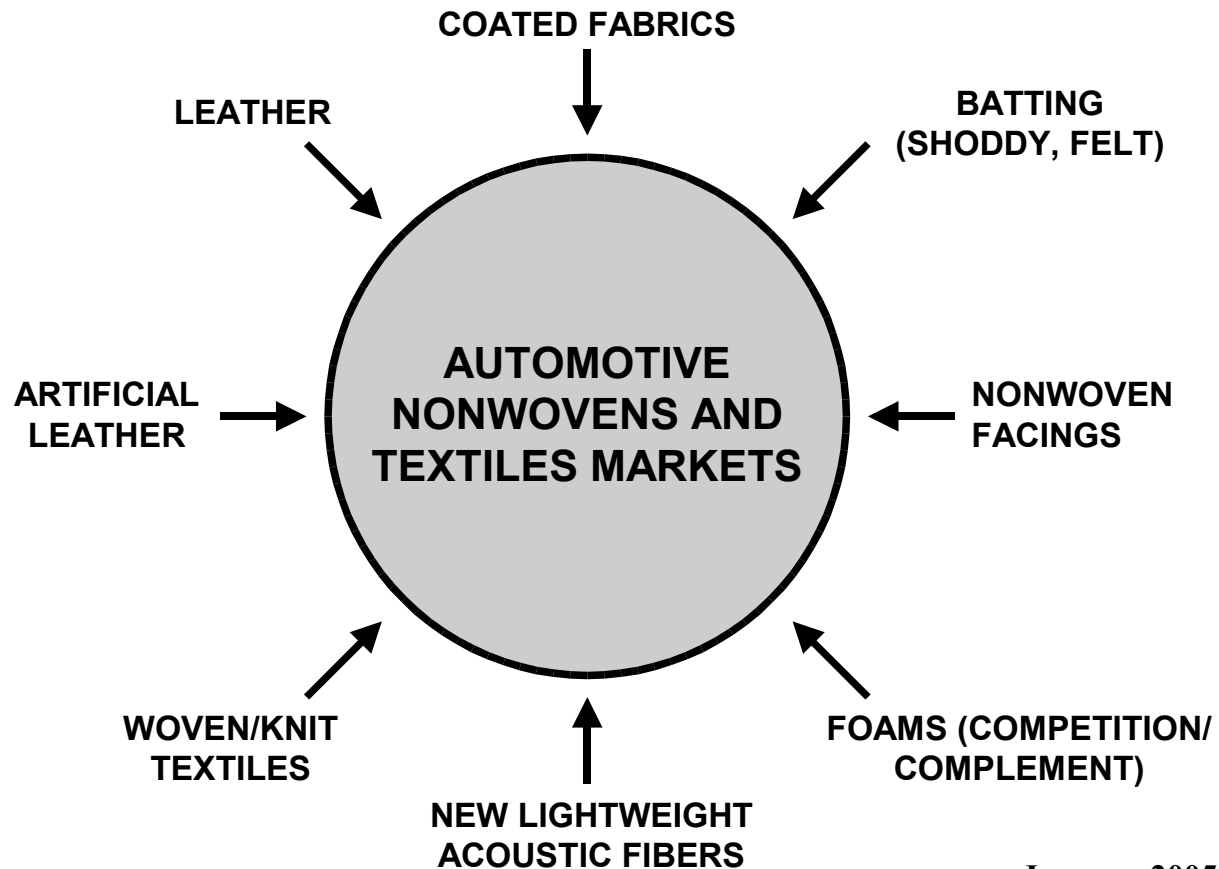
## Specialty Thermoplastic Elastomers . . . Markets, Economics, Technology, Intermaterials Competition



*A Europe/U.S./Japan Multiclient Industry Analysis*

# Opportunities for Advanced Technology Nonwovens for Automotive Surface and Construction Applications in N. America and Europe

## A Multiclient Study



January 2005



# **Robert Eller Associates, Inc.**

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