

SRI CONSULTING

# Chemical Industry Trends

## Impact on CMS

CMS Forum - San Francisco, CA  
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SRI Consulting*

# Introduction

## **SRI Consulting**

- 55+ years of chemical business research
- Once known as Stanford Research Institute
- Now division of Access Intelligence

## **Safe & Sustainable Chemical Series**

- New series of reports on important opportunities and threats to industry
- Bioproducts, safe materials, new energy



A Division of Access Intelligence, LLC

# Items to Cover

- Sustainability — Just what does this mean?
- What is the status of the global chemical industry?
- What are some recent trends?
- What can we expect to see coming?
- Threats or opportunities to CMS?

# What Constitutes Sustainability?

- Difficult question
- Different parties value different attributes
- Everyone wants it
- Stake holders demand it
- Three major areas of concern

# Elements of Sustainability



# Economic Sustainability

- It has to be
  - No value, no survival
  - Laws may help
- Bottom line value
  - Supplier → end-users
  - Entire value chain in total

# Environmental Sustainability

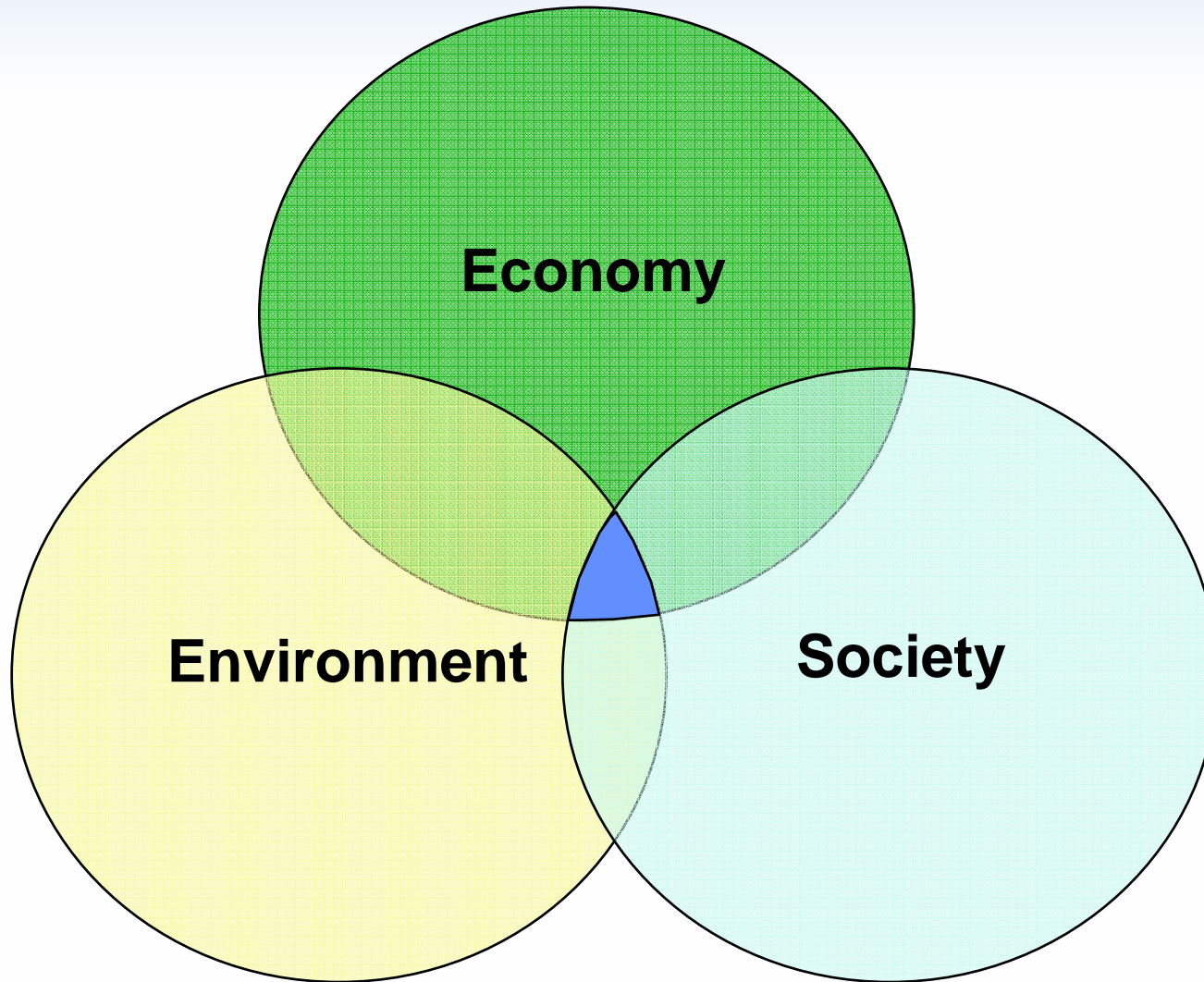
- Products and services renewable over time
- Safety along value chain
- Minimize toxicity
- Minimize GHG footprint

# Sustainable in Society

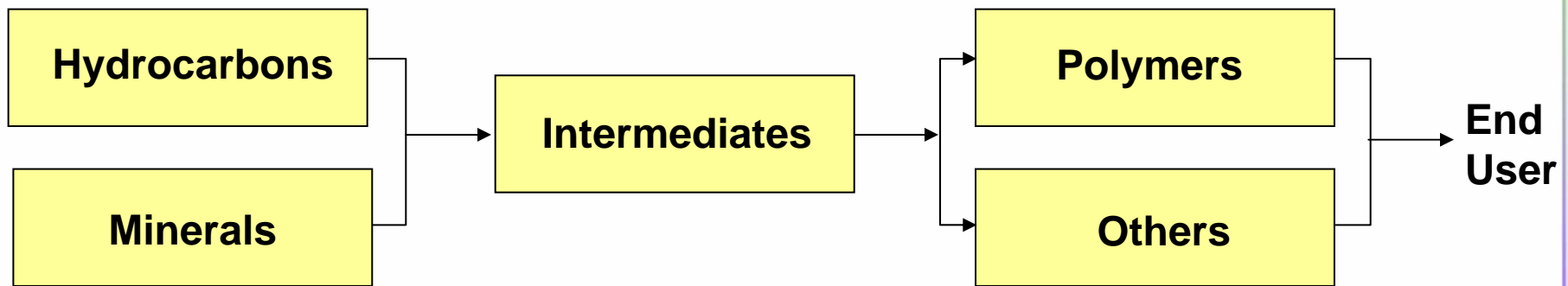
- Complex issue
  - Employment vs. economy
  - Self sufficiency
  - Integration into economy
  - Alternate use of capital
  - Educational issues
  - Infrastructure changes
  - N.I.M.B.Y.



# So When Is a System Sustainable?



# The Chemical Industry Today



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**Commodity**  
**Specialty**  
**Fine Chemicals**

# End Uses

Fine Chemicals  
Plastics/Resins  
Specialty – Functional  
Specialty – Market Focus  
Fertilizers  
Fibers  
Coatings  
Solvents  
Elastomers  
Other

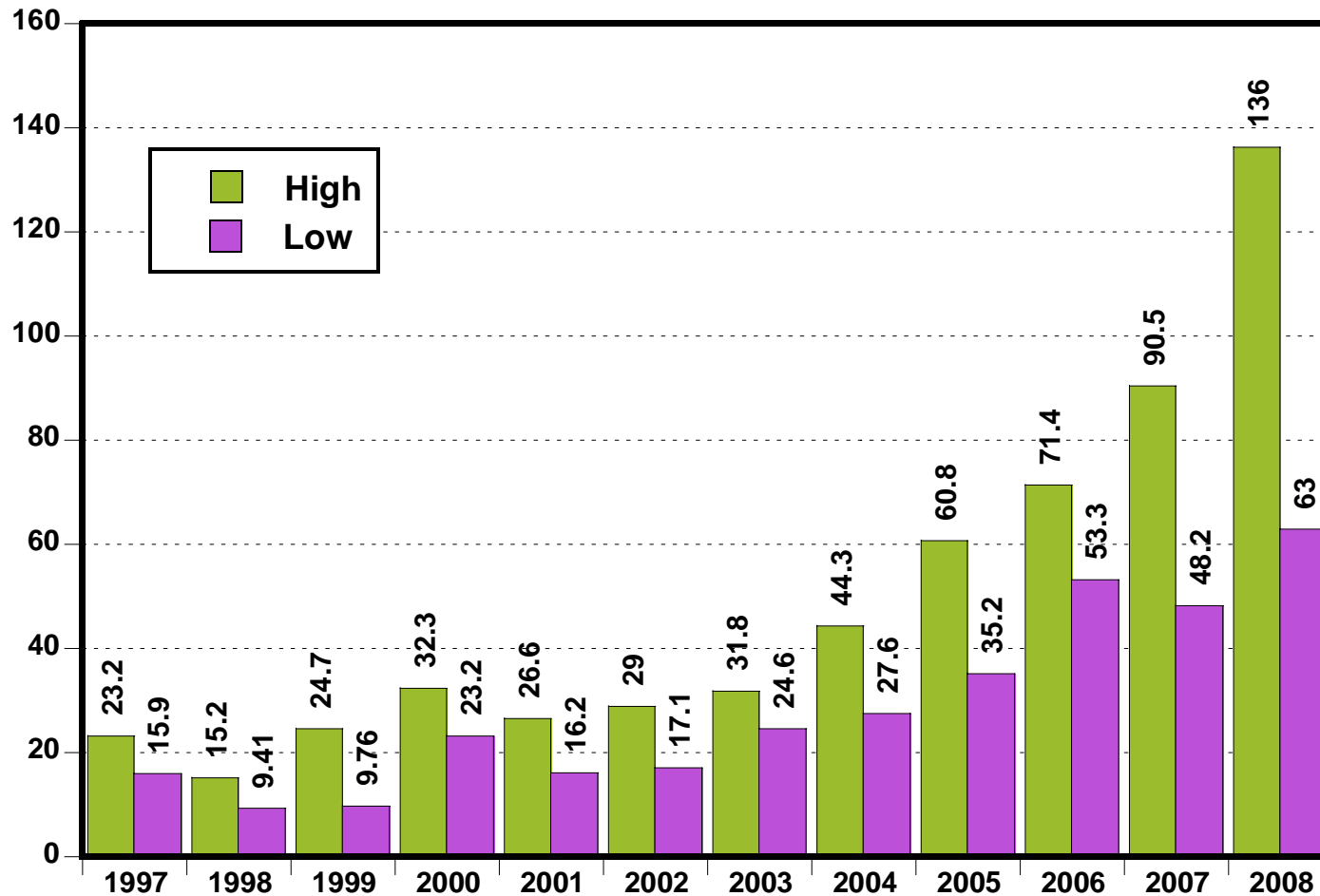
\$2 Trillion Globally  
(or more)

# Some Trends

- Energy uncertainty
- Biotechnology thrusts
- Regulations galore
- Nanotechnology
- Changing order

# Historical Oil Prices

Dollars per  
Barrel



Note: Based on weighted average, weekly, all-country, fob, exported value.

Source: EIA.

# Biotechnology

- Red — Pharma
- White — Industrial
- Green — Agriculture

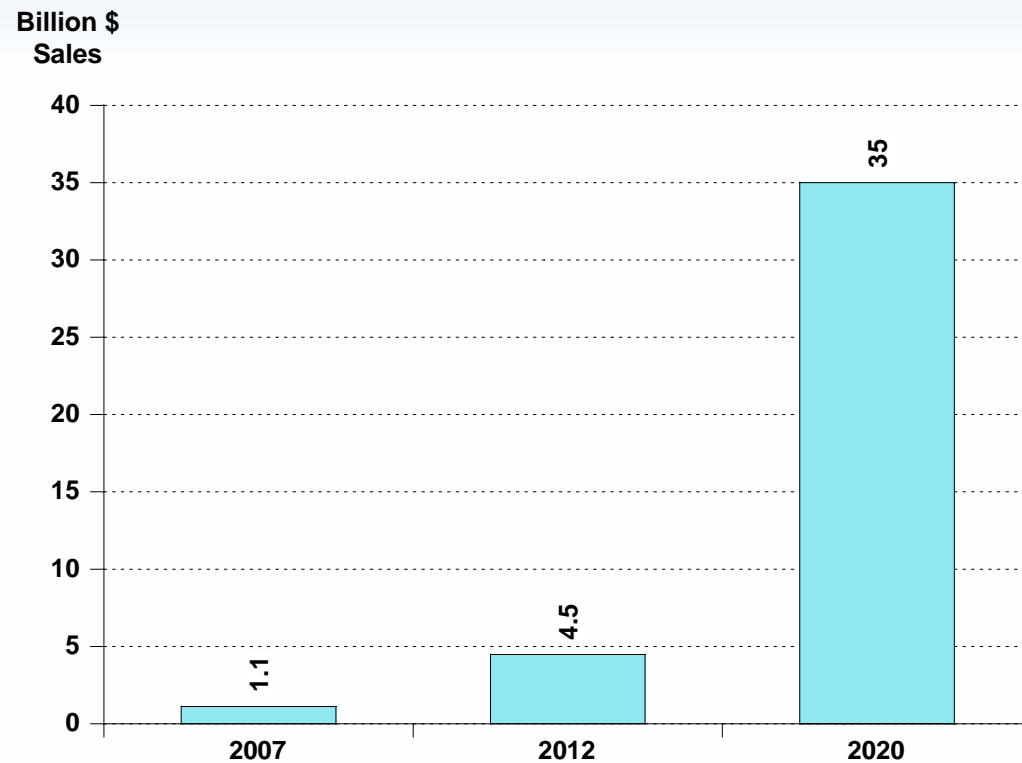
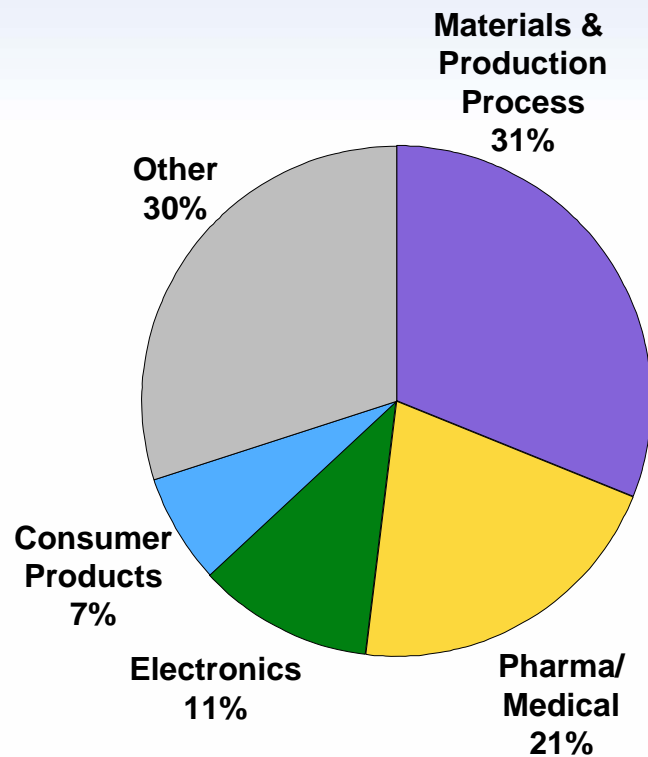
# Biotechnology Focus

- Early focus – agriculture and pharma
  - Size of market
  - Profit potential
- New interest in industrial
  - “Green” focus
  - Energy situation

# Nanotechnology

- Big interest several years ago
- Industry that is hard to define
  - Materials
  - Processes
- Many types of products
  - Nanotubes
  - Nanofibers
  - Fullerenes
  - Organoclays

# Nanotech Applications and Growth



Source: Freedonia.

# M&A Activity

## Some Major Transactions 2008

- Dow buys Rohm & Haas
- Ashland buys Hercules
- Vestar buys Unilever N.A. Detergent business
- BASF buys CIBA
- Tata buys General Chemical Industrial Products
- Incitec Pivot buys Dyno Nobel
- Jordan Company buys Haas TCM

# What's Coming?

- Less regulation (ha ha)
- Green & sustainable
  - New energy sources
  - Biomass conversion
  - Recycling
- Petroleums of the future
  - Water
  - Various elements

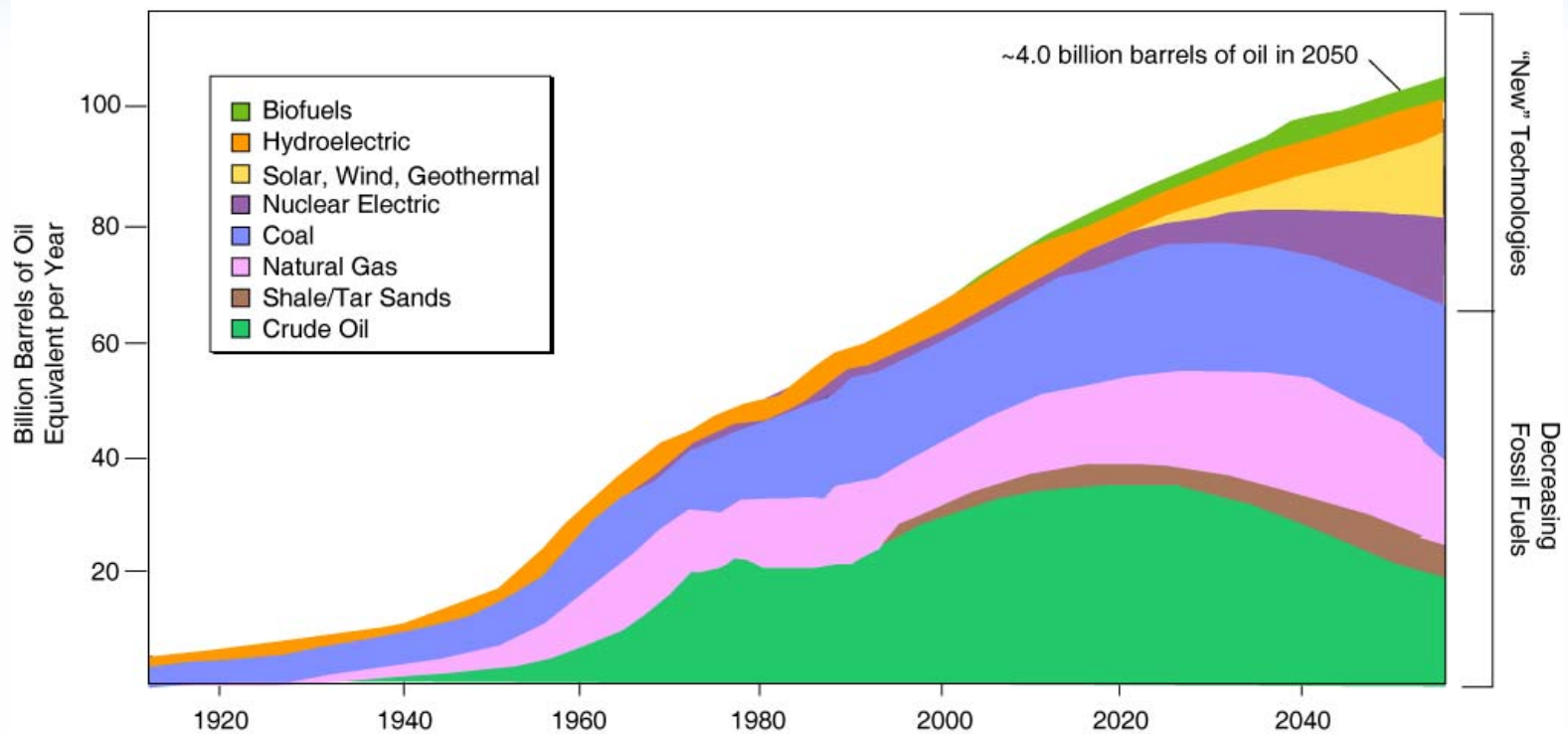
# Regulations

- The big ones
  - Registration, authorization and evaluation of chemicals
    - REACH
  - Restriction of hazardous substances – electrical/electronic equipment
    - RoHS
  - Waste electrical and electronic equipment
    - WEEE

# New Energy Sources

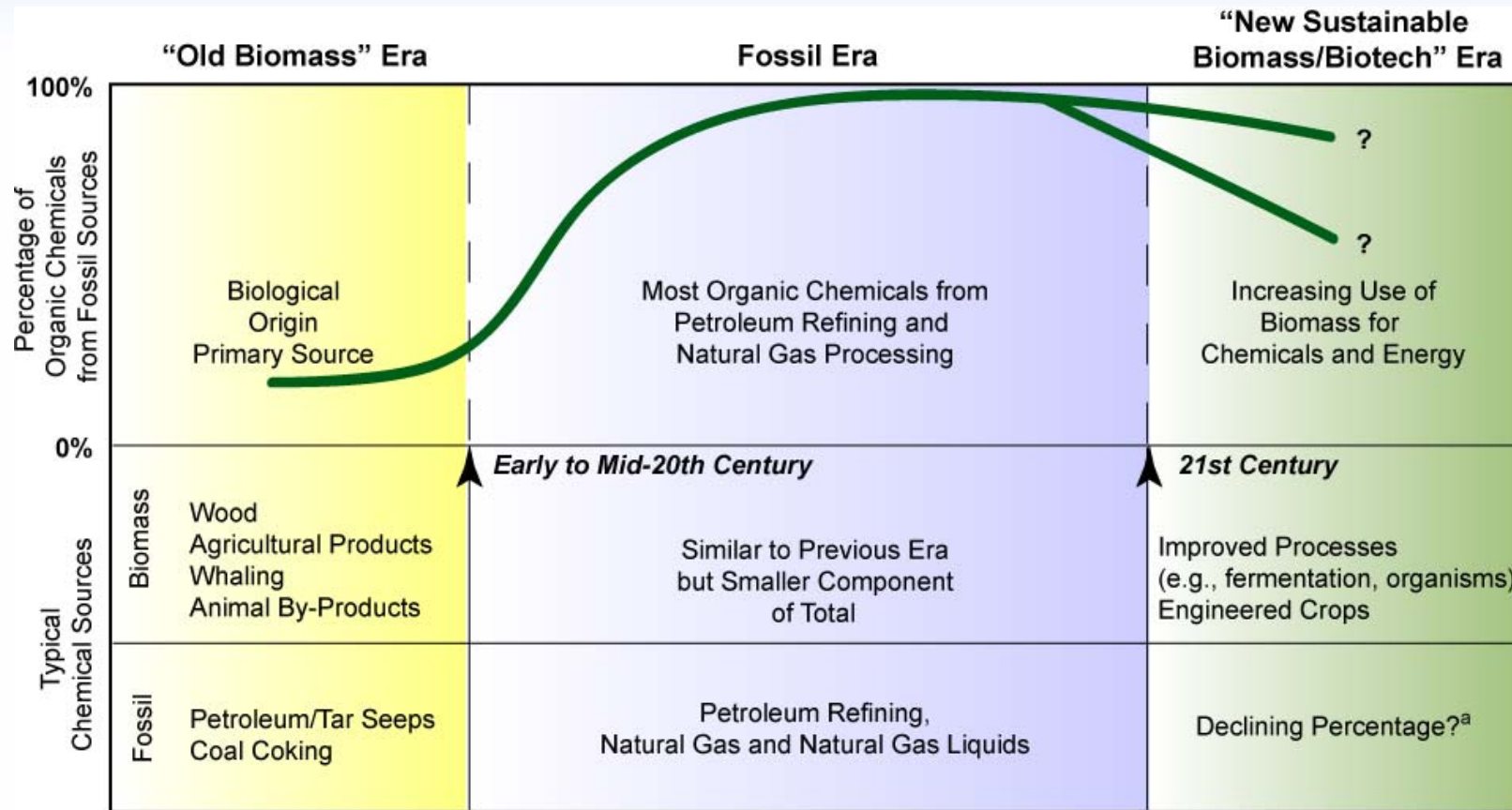
- Solar
- Wind
- Biofuels
- Rejuvenation
  - Nuclear

# World Energy Demand – Long-Term Energy Sources



Sources: Lynn Orr, *Changing the World's Energy Systems*, Stanford University Global Climate & Energy Project (after John Edwards, American Association of Petroleum Geologists); SRI Consulting.

# The Future



a. The question remains: with more energy being obtained from renewable (e.g., wind, solar) and resurgent (e.g., nuclear) sources, will this free up high-quality fossil sources for chemicals?

Source: SRI Consulting.

# Chemicals from Biomass

- Forestry
- Natural Products
- Fermentation
- Food/Agriculture Products
- By-Product of Biofuels
- Thermochemical Products



# Recycling

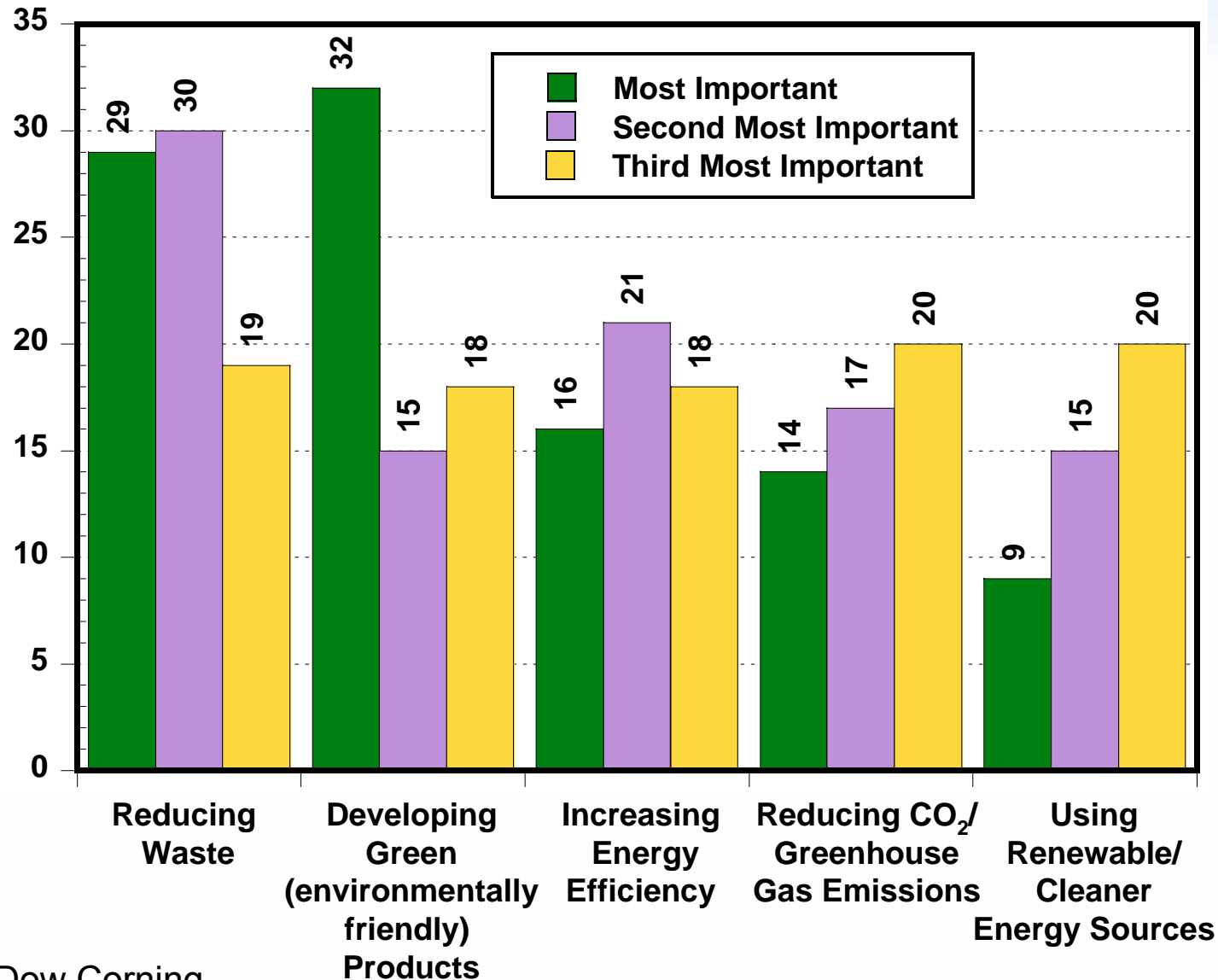
- Plastics
- Solvents
- MSW
- Reuse vs recycle
- Electronics
- Other

# CMS Impact

- Green initiatives
- New materials in market
- New service opportunities
- Global changes
- Information value increasing

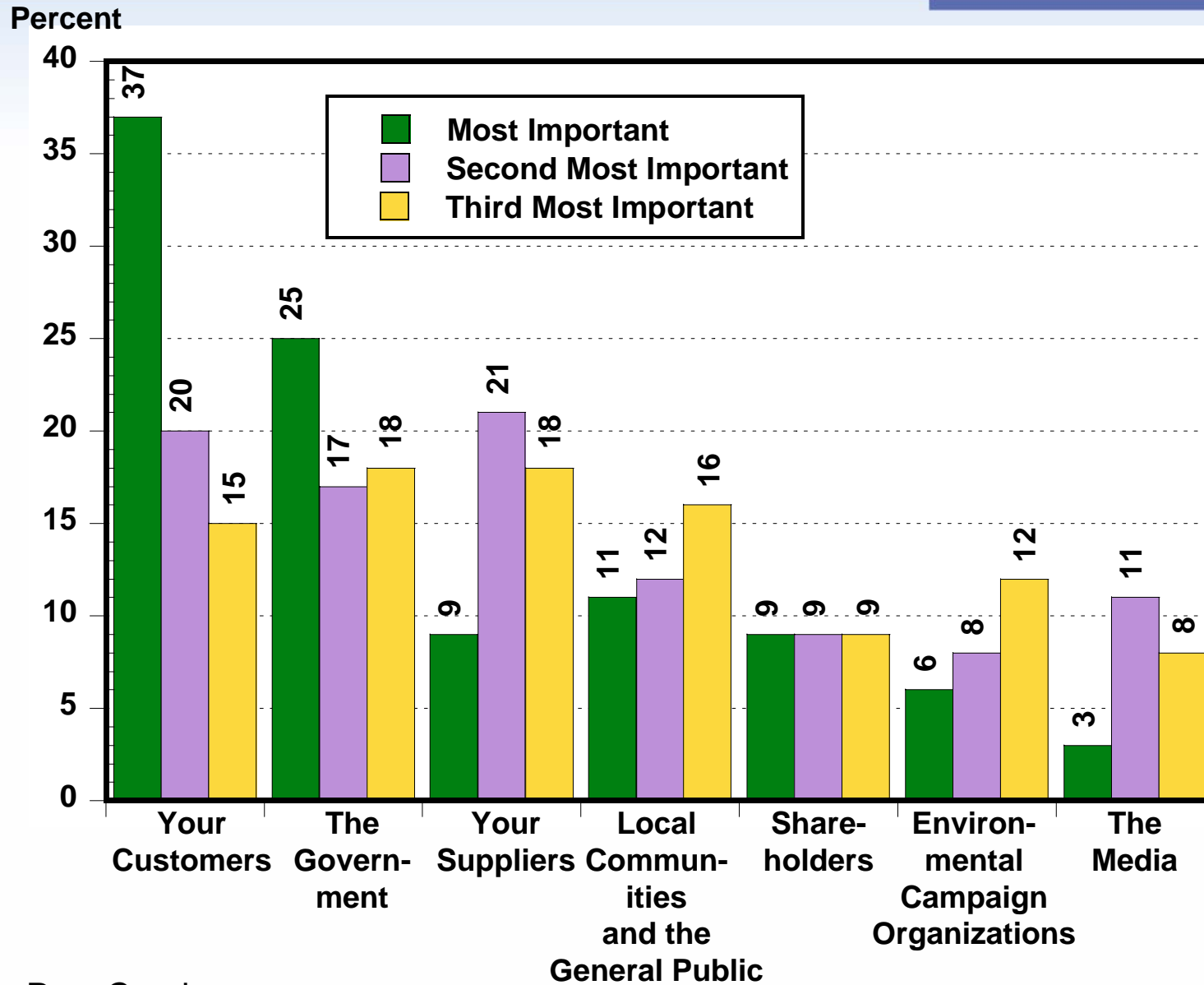
# Dow Corning Study on Green

Percent



Source: Dow Corning.

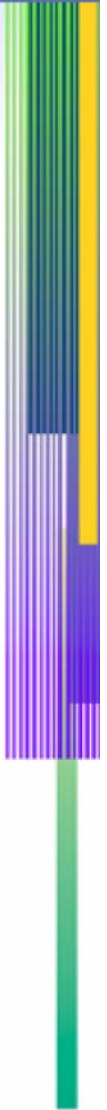
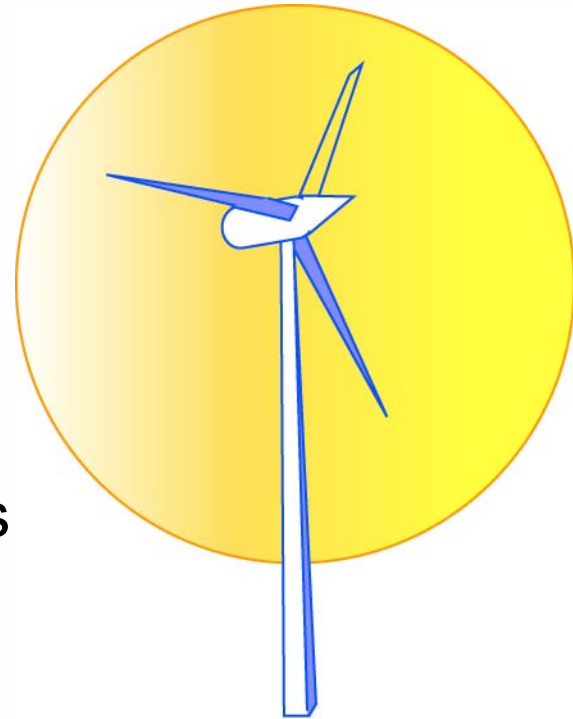
# Where is Impetus?



Source: Dow Corning.

# New Opportunities in Energy

- Solar
  - Non-photo voltaic
  - Heat transfer media
- Wind
  - Lubricants/functional fluids



# Biomass → Chemicals

- Renewable/sustainable/locally produced
- CO<sub>2</sub> reduction
- Cost advantage
- Alleviate waste or by-products
- Less toxic
- Might be biodegradable
- Market/political advantages
- CMS providers can bring solutions to many issues



# The Plastic Car



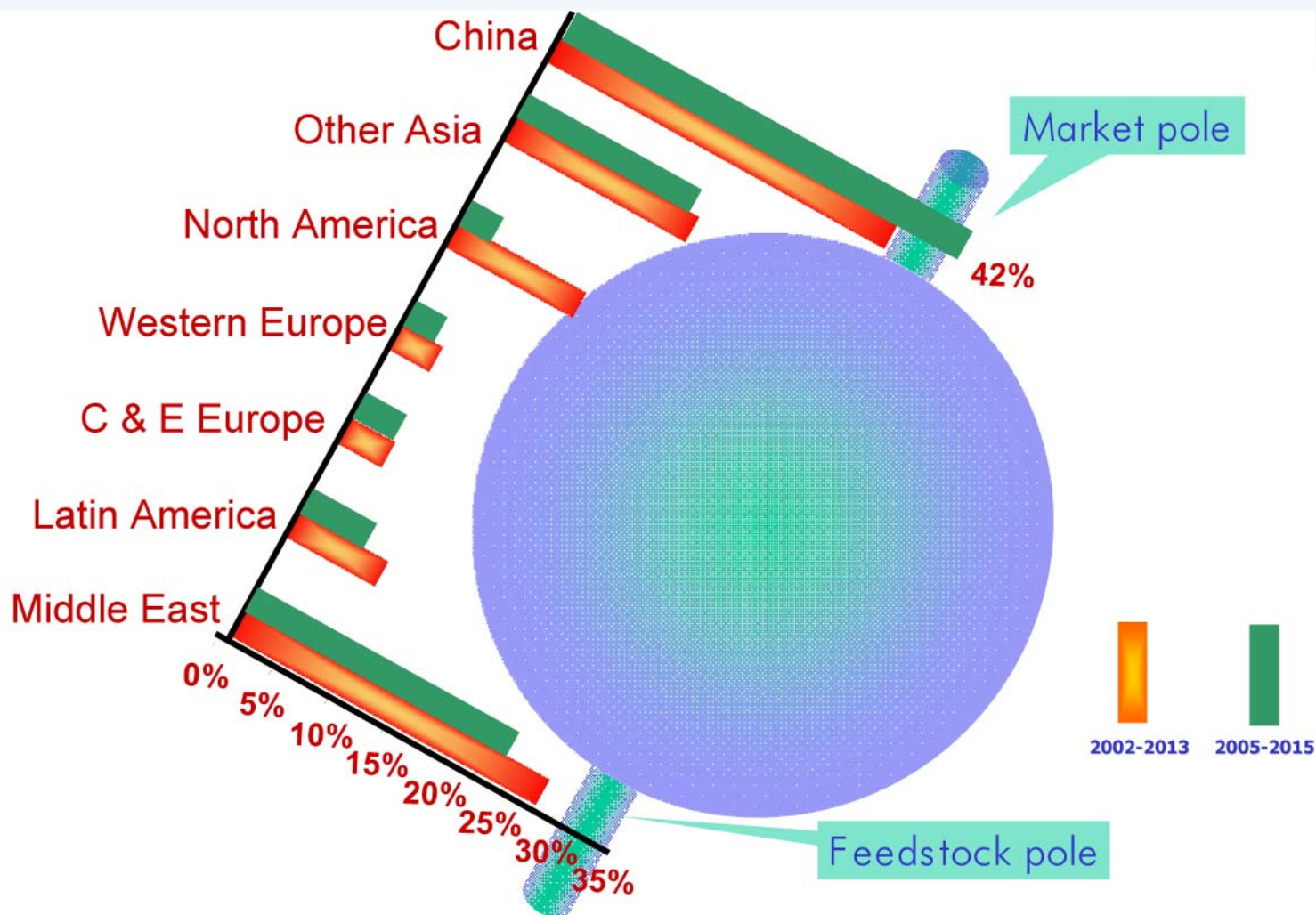
# Serve the Entire Lifecycle

- Synthesis and production
  - Minimize waste
  - Use renewable/recyclable
  - Less GHG
  - Less toxic
- Optimize transport and packaging
  - Less material and energy
  - Less hazards
- Efficiency in use
  - Renewable/recyclable
  - Minimize
- Reuse/recycle/dispose
  - Value from waste



# Changing Global Markets

## Petrochemical Investment



# Information Value Increases

- Regulations
- Green opportunities
- GHG status
- New materials
- Future trends

# SRI Consulting Programs

- Process Economics Program
  - Process economic analysis of 100's of processes
    - Examples: Chemicals from Agricultural Waste, Methanol to Olefins
- Chemical Economics Handbook
  - Market analysis of hundreds of chemicals
    - Examples: Acrylic Surface Coatings, Zeolites
- Specialty Chemical Update Program
  - Strategic analysis of specialty product groups
    - Examples: Electronic Chemicals: Semiconductors, Silicon and IC Process Chemicals, Plastic Additives
- Safe & Sustainable Chemicals
  - Analysis of evolving chemical development – “oven”
    - Examples: Global Solvents Report: The Green Impact, Chemicals from Biomass



Thank You

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