

# **Impact of Shale on Downstream Demand and the Manufacturing Renaissance**

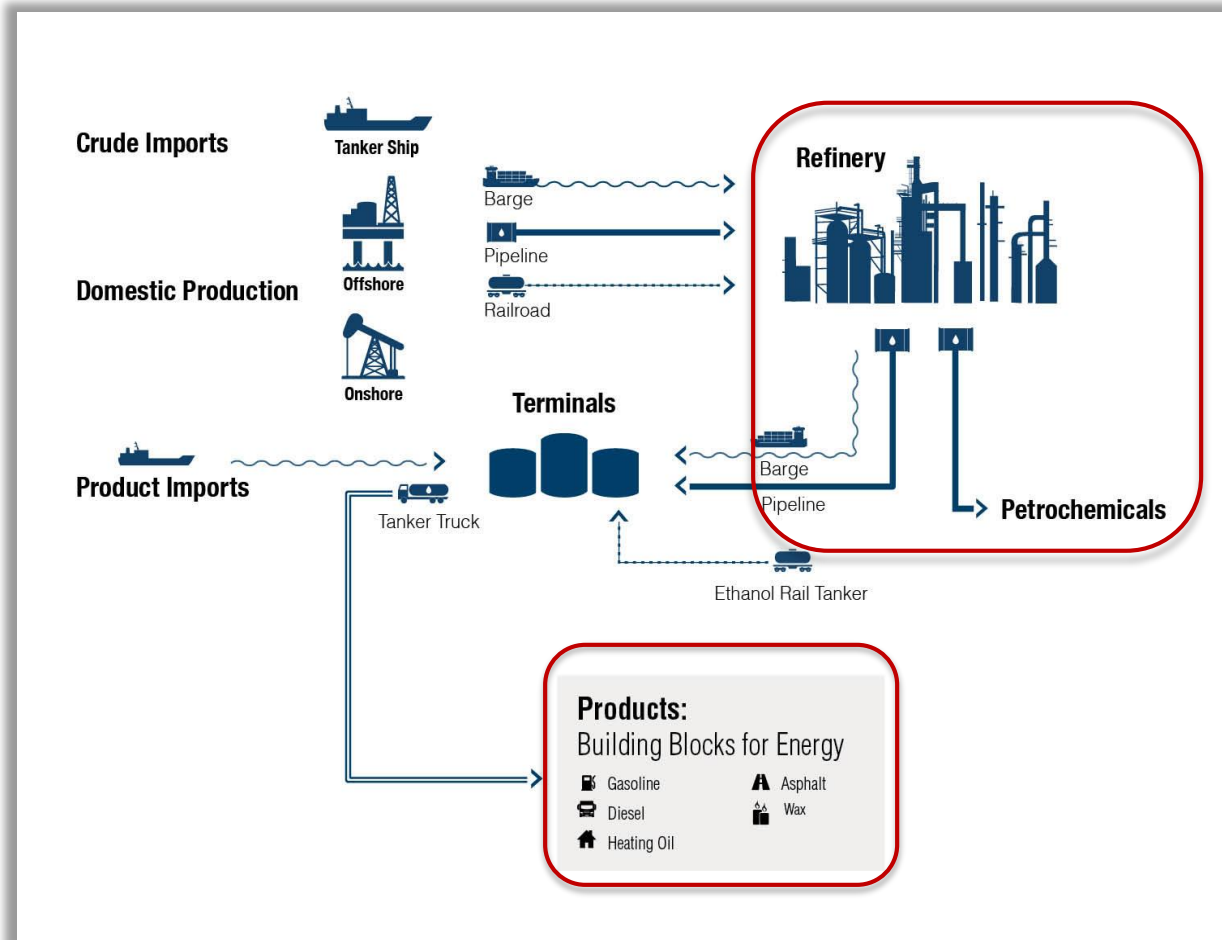
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# Who We Are

- Founded in 1902
- Represent over 95% of U.S. refining capacity and petrochemical manufacturing
- More than 400 member companies
  - Refineries
  - Petrochem manufacturers
  - Service providers

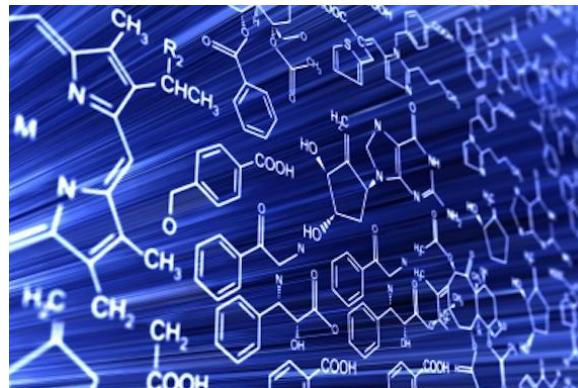
# What We Do

- AFPM represents members in the “downstream” section of the supply chain



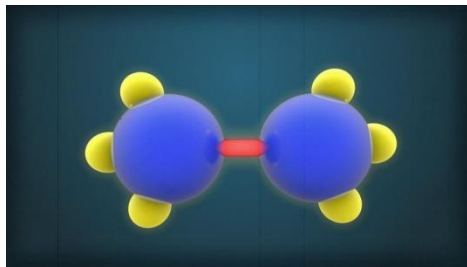
# What are Petrochemicals?

- Set of very specific chemical compounds
- Generally speaking a petrochemical is a chemical derived from oil or natural gas
  - Vast majority of petrochemicals are derived from oil or natural gas
  - U.S. mostly uses nat gas

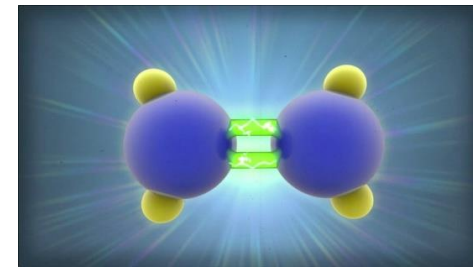


# Petrochemicals 101

- Base petrochemicals
  - Ethylene
  - Propylene
  - Butadiene
  - Benzene
  - Toluene
  - Xylene
- Let's focus on ethylene

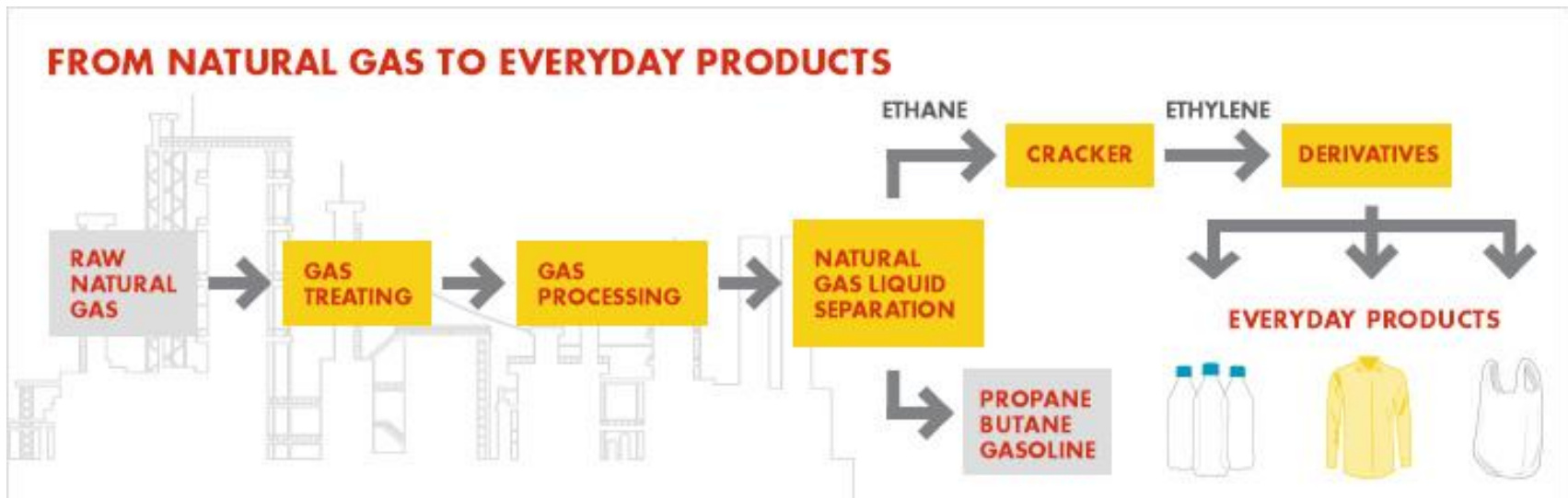


Ethane



Ethylene

# How to Make a Petrochemical – Ethylene Example



Graphic courtesy of Shell Chemical

# Where are Petrochemicals Used?

- Housing and construction
- Medical applications
- Vehicles
- Electronics
- Packaging
- Military
- Clothing
- Much, much more



# Impact of Shale Revolution

- U.S. chemical industry is the largest industrial consumer of nat gas
- New economics = U.S. competitive advantage
  - 2008 – nat gas was selling for ~\$12.50/MM Btus
  - Today – less than \$3/MM Btus
- Dramatic reversal – U.S. now one of the most affordable for chemical production





# Impact on U.S. Chemical Industry

- 238 projects announced
- \$145B in new capital investment
- 383,000 direct and indirect jobs by 2023
- More than half of the investment is by firms based outside the U.S.



# American Shale & Manufacturing Partnership



- Multi-stakeholder initiative
- Focused on shale development and its impact on the supply chain for U.S. manufacturing
- 14 members
  - Academia
  - Associations
  - Non-governmental organizations
  - Unions

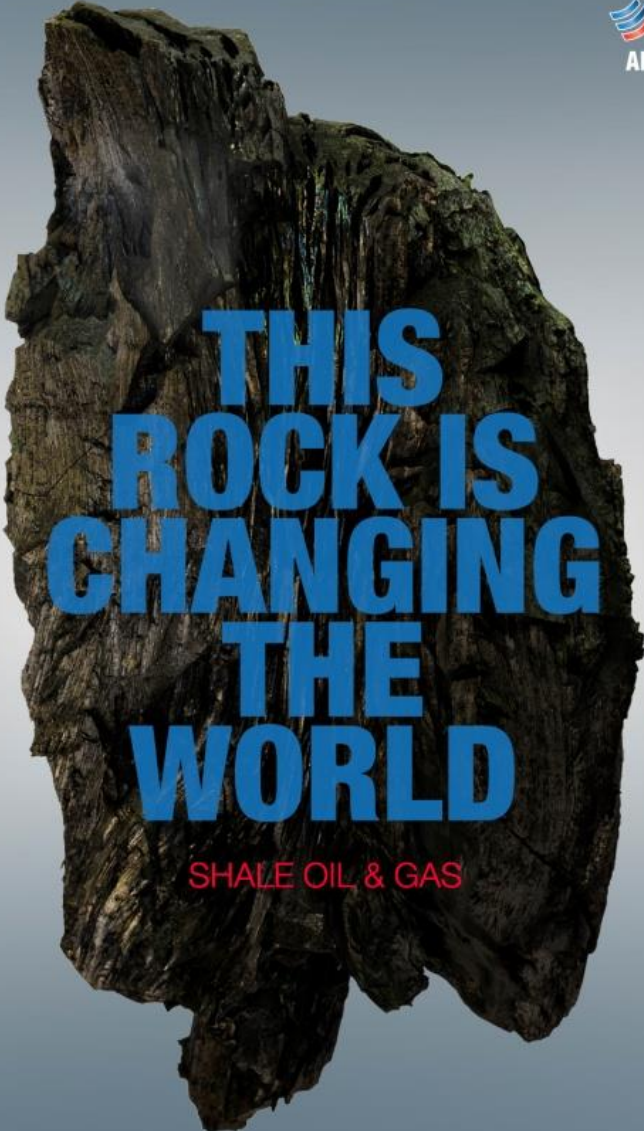
# Manufacturing Renaissance Series

- January 2013 – launched series at Carnegie Mellon University
- Events held in PA, OH, TX, LA and CO
- Over 425 participants
- What needs to be done to further advance American manufacturing?

# Final Report

- “Ideas to Empower America’s Emerging Shale-Based Manufacturing Renaissance”
- Focused on 5 core areas:
  - Workforce development
  - Environment
  - Infrastructure
  - Research and innovation
  - Federal and state policies





**THIS  
ROCK IS  
CHANGING  
THE  
WORLD**

SHALE OIL & GAS



**AFPM**

American  
Fuel & Petrochemical  
Manufacturers