



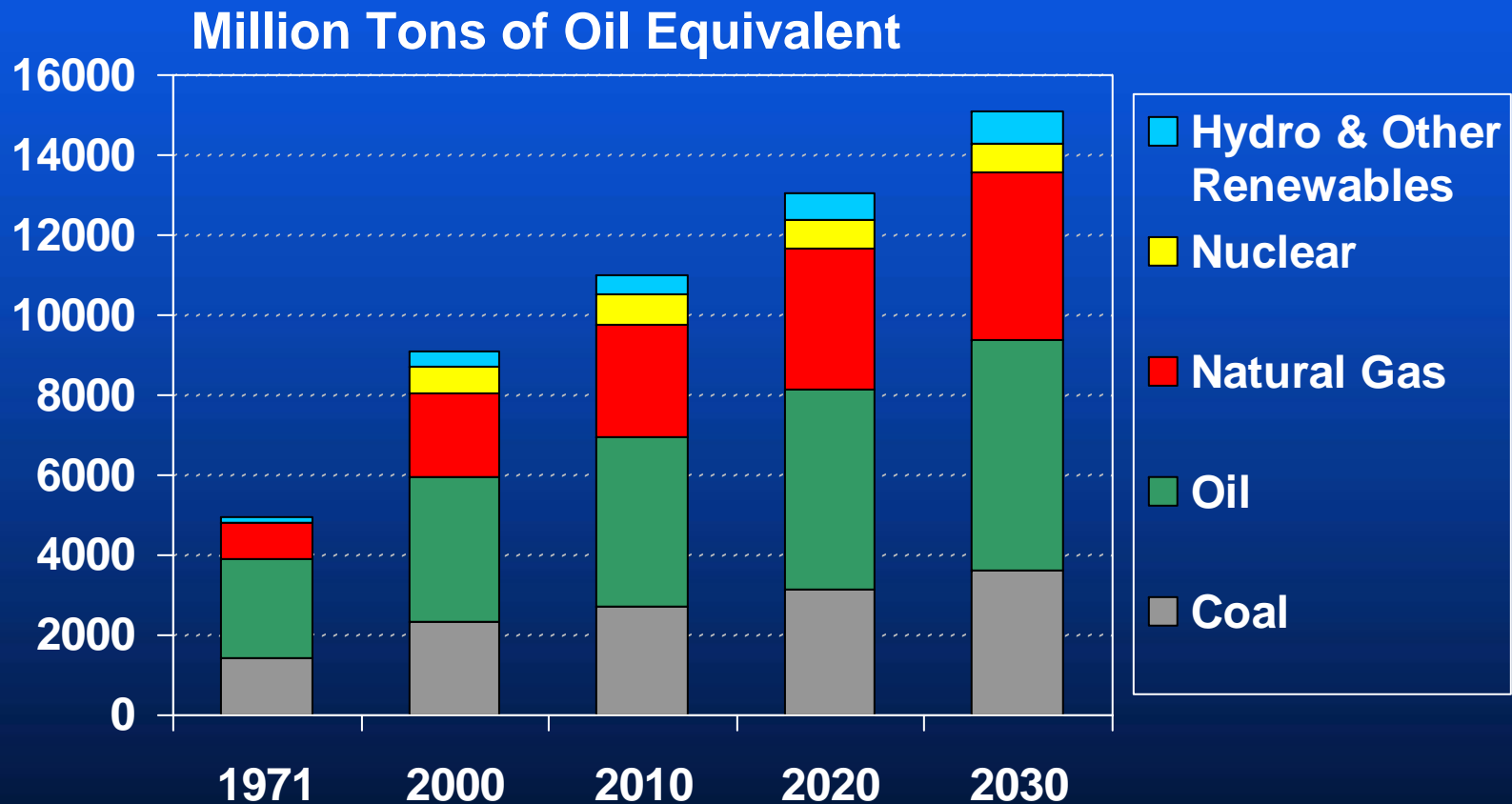
## **Fuel and Refining Trends**

**Presentation at Louisiana State University**

Fred Stiers  
General Manager, Lake Charles Refinery

October 22, 2004

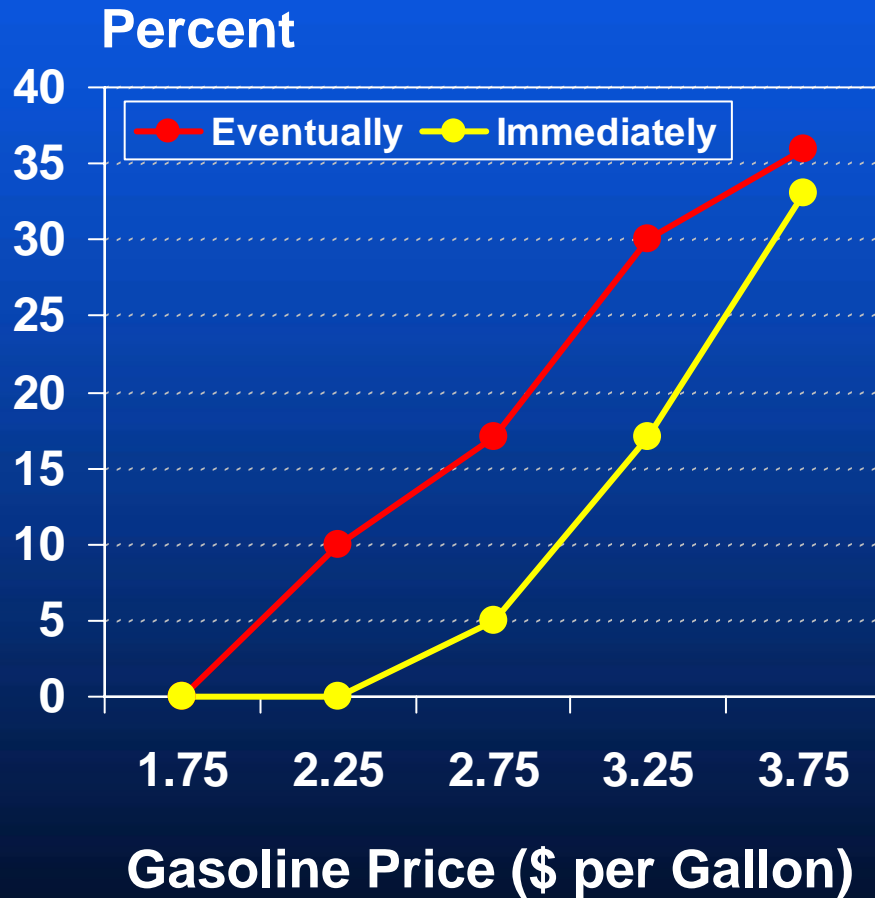
# World Energy Demand Outlook



Source: International Energy Agency,  
"World Energy Outlook"

# U.S. Price Threshold for Change

## Survey by CNW Marketing Research

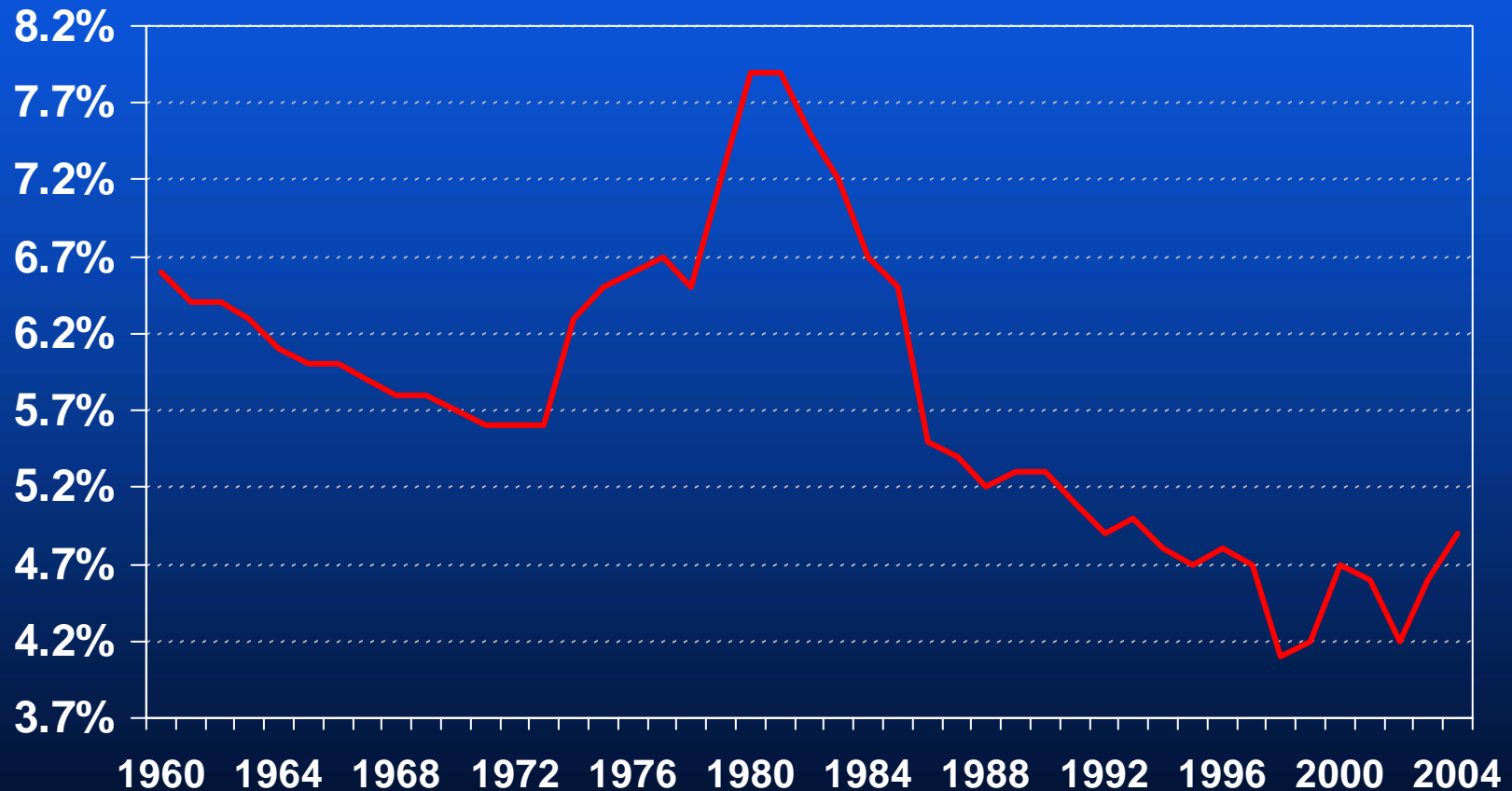


Survey measures the percent of new car owners who would buy a new, more fuel-efficient car immediately or eventually based on the price of gasoline.

Survey of 3,981 car owners nationwide, assuming price remains for 6 months



# U.S. Consumer Spending on Energy as a Percentage of Disposable Income



Source: U.S. Department of Commerce, Bureau of Economic Analysis



# Auto Trends

## Hybrid Electric

Toyota Prius  
M.T. Car of the Year



MSRP: \$20,510  
Hybrid System Mfg. Cost:  
\$2500-3500  
55 mpg avg city/highway  
45 mpg actual?

## Diesel Car

European Automakers  
Ramping Up



VW Passat diesel  
(return after 8 years)

NOX concerns for  
U.S.

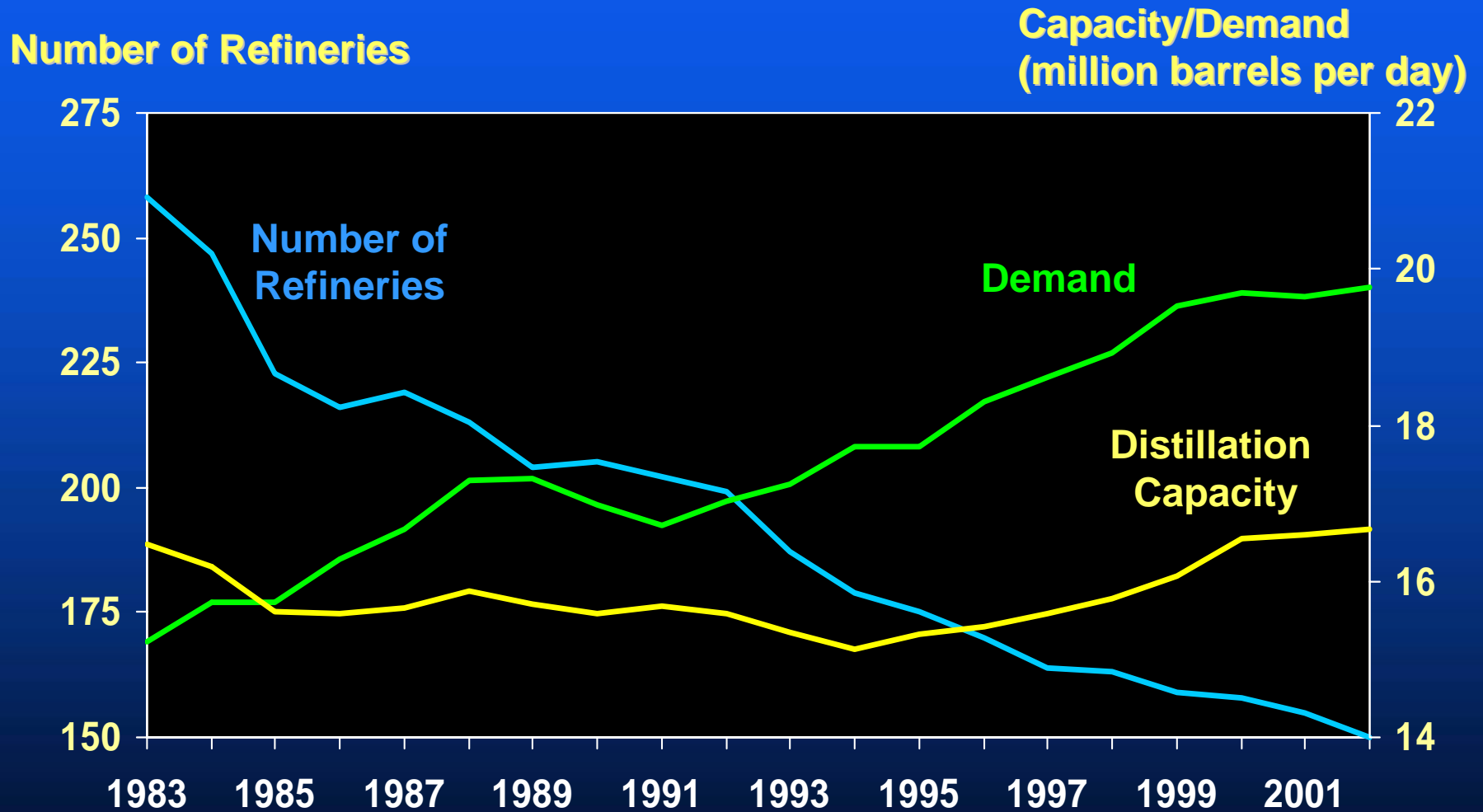
## Fuel Cell Vehicles

Many Challenges to  
Overcome



- Safety
- Inadequate nat gas as H2 source
- Cost too high by a factor of 10

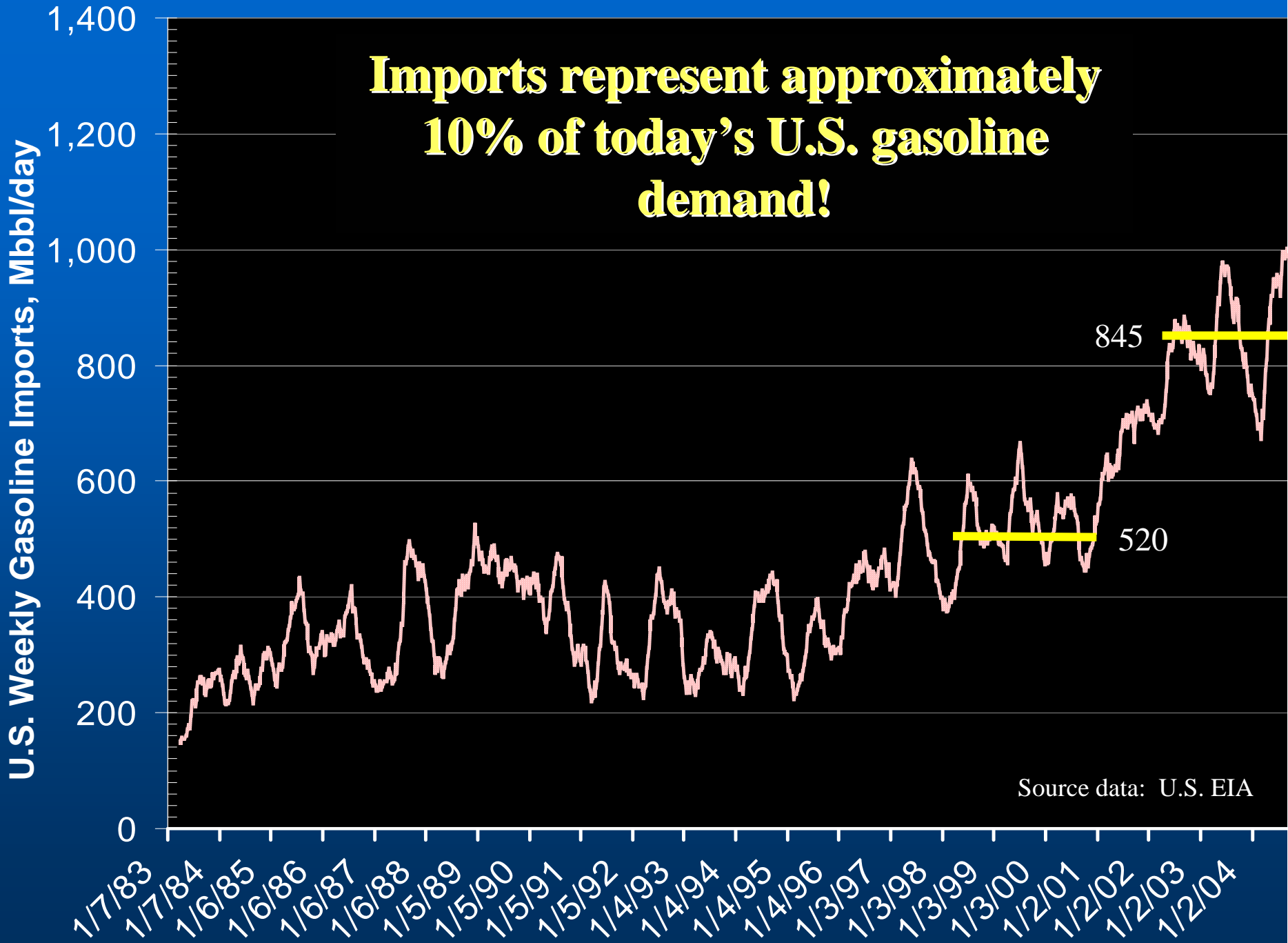
# U.S. Refining Capacity



Source: U.S. DOE, API, P&G

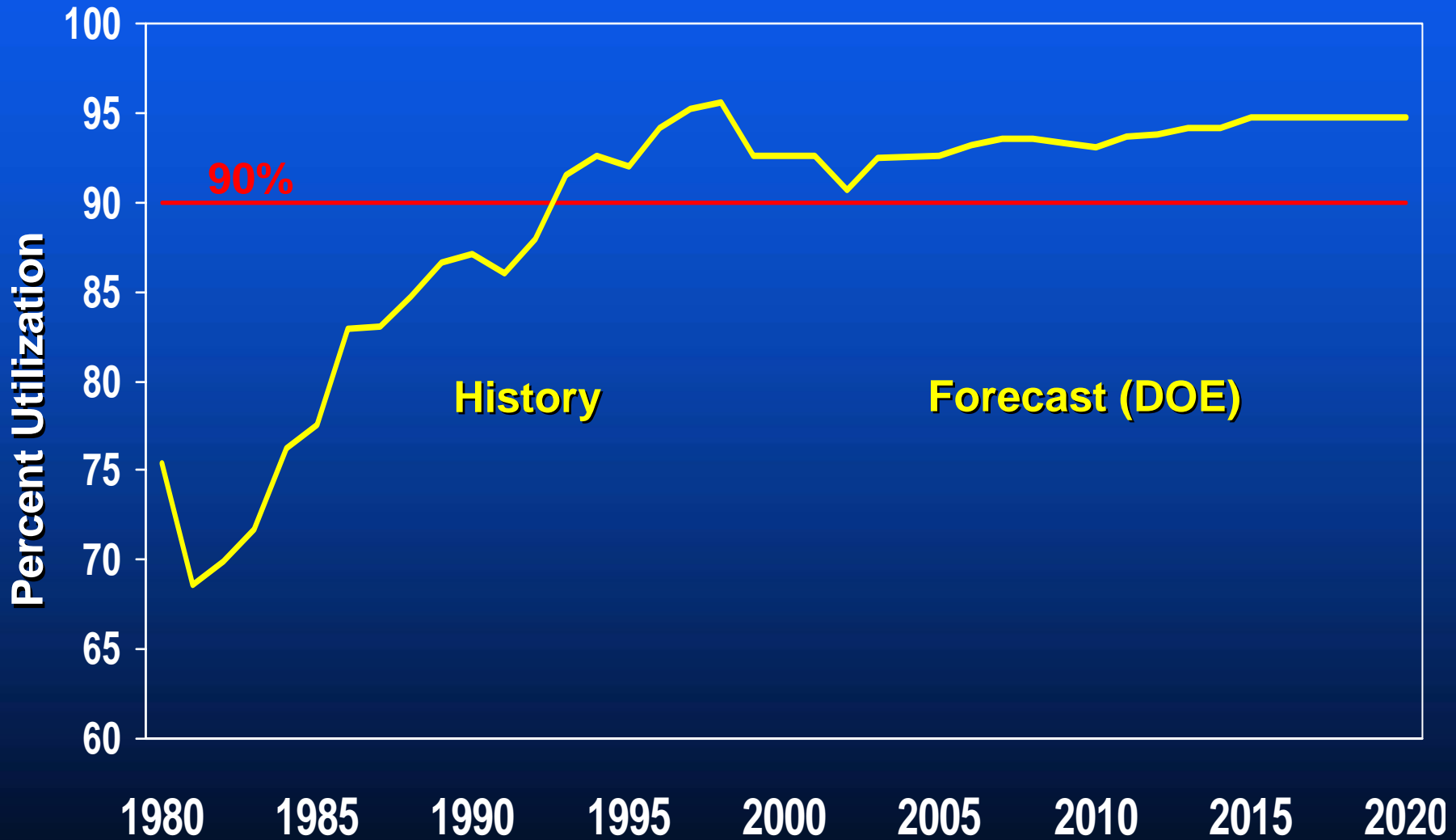


**Imports represent approximately 10% of today's U.S. gasoline demand!**



Source data: U.S. EIA

# U.S. Refinery Capacity Utilization



*Gross input to refineries / operable capacity*

Source: U.S. Department of Energy



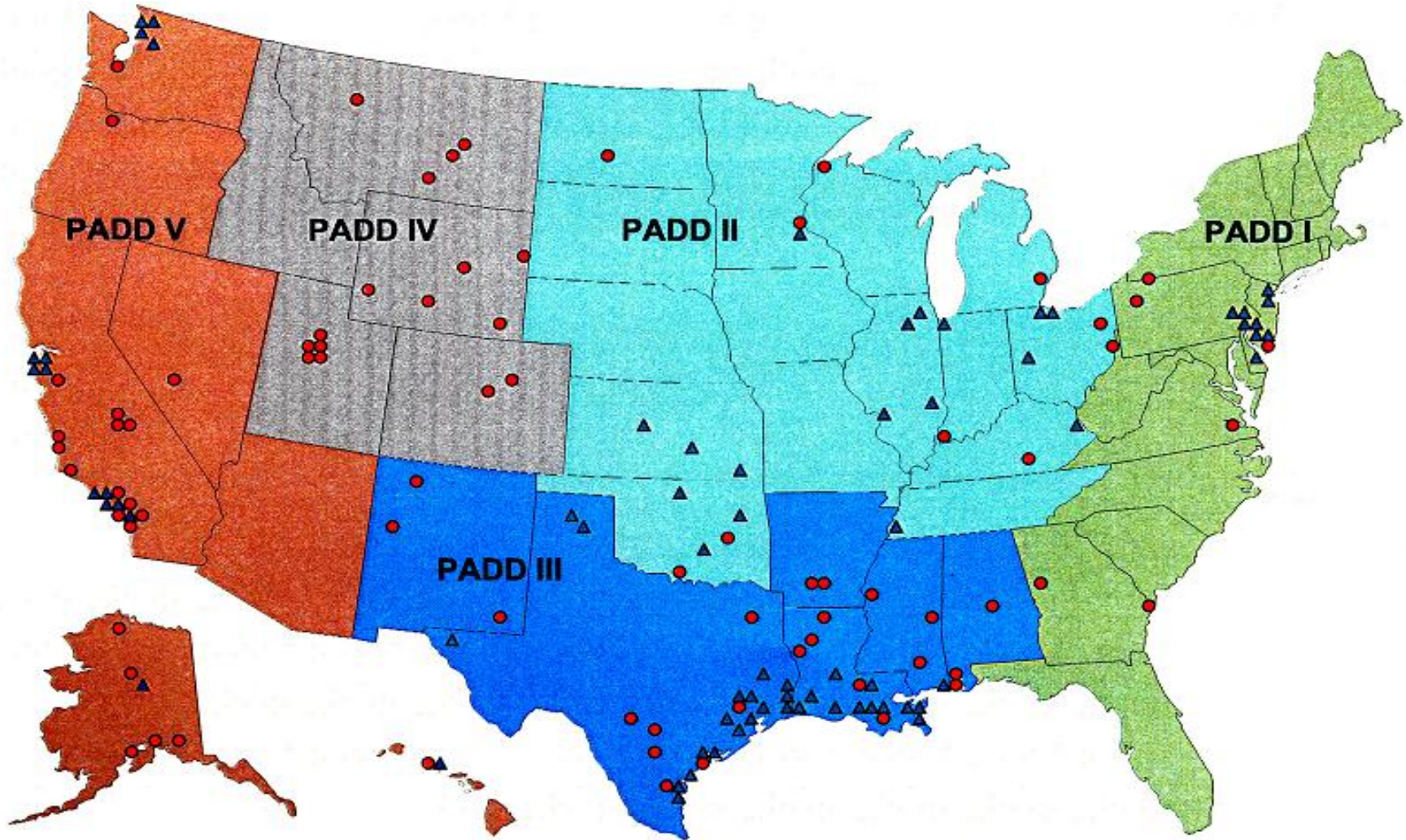
# U.S. Refining Trends

- **Capital money for US refining has been spent to meet changing fuel specification rather than build additional capacity (estimated \$20 Billion)**
  - **LSG and ULSD**
  - **the 2% RFG oxygen mandate**
  - **Local/regional boutique fuels**



# U.S. Refining Trends

- **Capital money for US refining has been spent to meet changing fuel specification rather than build additional capacity (estimated \$20 Billion)**
  - LSG and ULSD
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- **Public demand continues to increase; however, so does “not in my backyard” resistance to refinery and infrastructure expansions**
  - Permitting difficulties
  - Litigation from upsets and environmental issues



# Locations of U.S. Refineries 2004

- ▲ Large: Over 75,000 B/D
- Small: Under 75,000 B/D



# U.S. Refining Concerns

- **Capital money for US refining has been spent to meet changing fuel specification rather than build additional capacity (estimated \$20 Billion)**
  - LSG and ULSD
  - the 2% RFG oxygen mandate
  - Local/regional boutique fuels
- **Public demand continues to increase; however, so does “not in my backyard” resistance to refinery and infrastructure expansions**
  - Permitting difficulties
  - Litigation from upsets and environmental issues
- **Investment in refining capacity post Clean Fuels will require a sustained trend of strong return on capital employed.**

**Thanks for the opportunity !**

