RISING FUEL PRICES AND THE OIL MARKET

MICHAEL C. LYNCH LYNCH@ENERGYSEER.COM

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LESSONS FROM 49 YEARS OF ANALYSIS

- LOTS OF DISINFORMATION ABOUT OIL
- TENDENCY TO CONFUSE SHORT-TERM, TRANSIENT EVENTS AND LONG-TERM TRENDS
- TENDENCY TO BELIEVE OIL PRICES MUST RISE OVER THE LONG-TERM
- PESSIMISM ABOUT SUPPLY COMMON
- DIFFERENTIATING BETWEEN WHAT CAN BE DONE AND WHAT WILL BE DONE

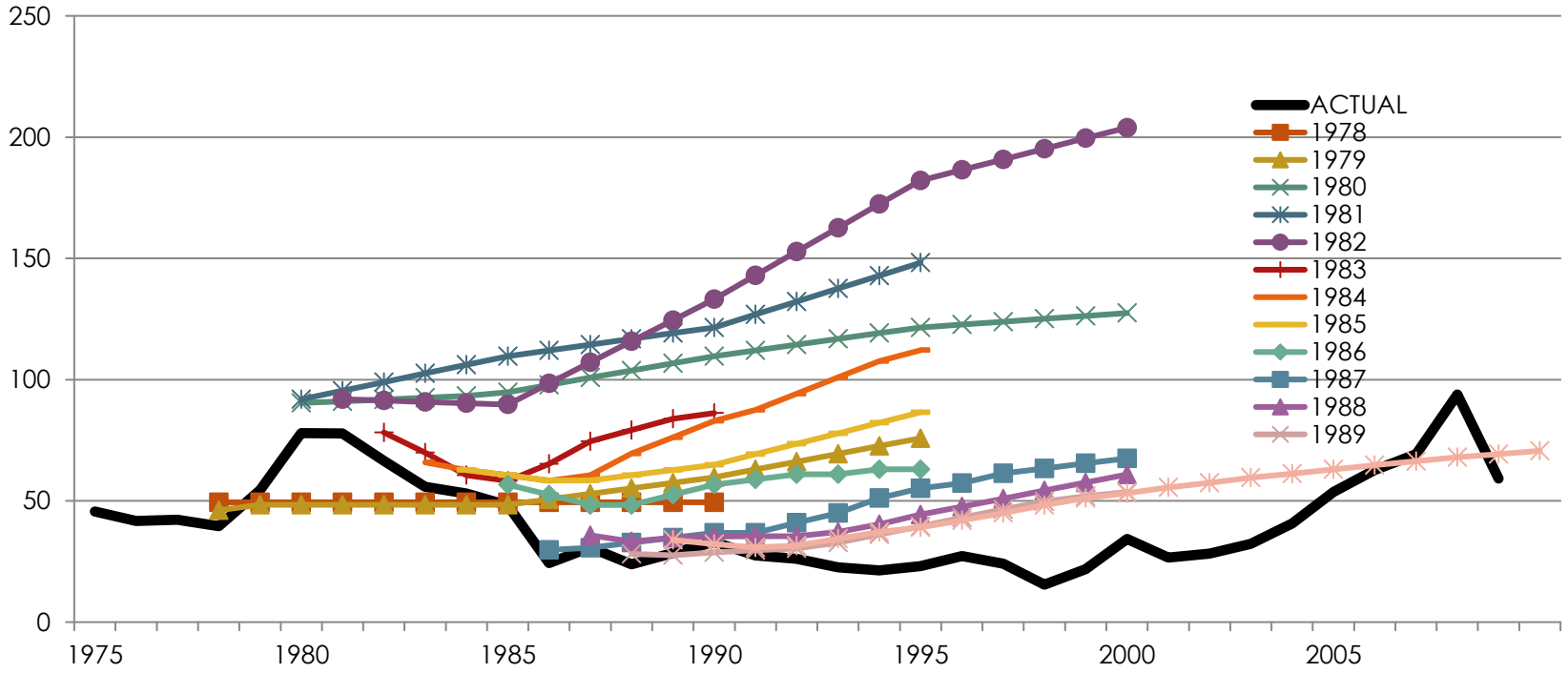
OIL PRICE DRIVERS

- NEARLY EVERY PRICE SPIKE HAS BEEN DRIVEN BY SUPPLY DISRUPTIONS
- PRICES REMAIN ELEVATED BECAUSE:
  - A) OPEC SUPPORTS THEM
  - B) RESOURCE NATIONALISM RESTRICTS SUPPLY
- PRICES CRASH BECAUSE:
  - TOO MUCH COMPETING SUPPLY (1985, US SHALE 2014)
  - CARTEL MEMBERS CHEAT (VENEZUELA 1998)

VERY LONG TERM PRICES



DOE PRICE FORECASTS 1980S



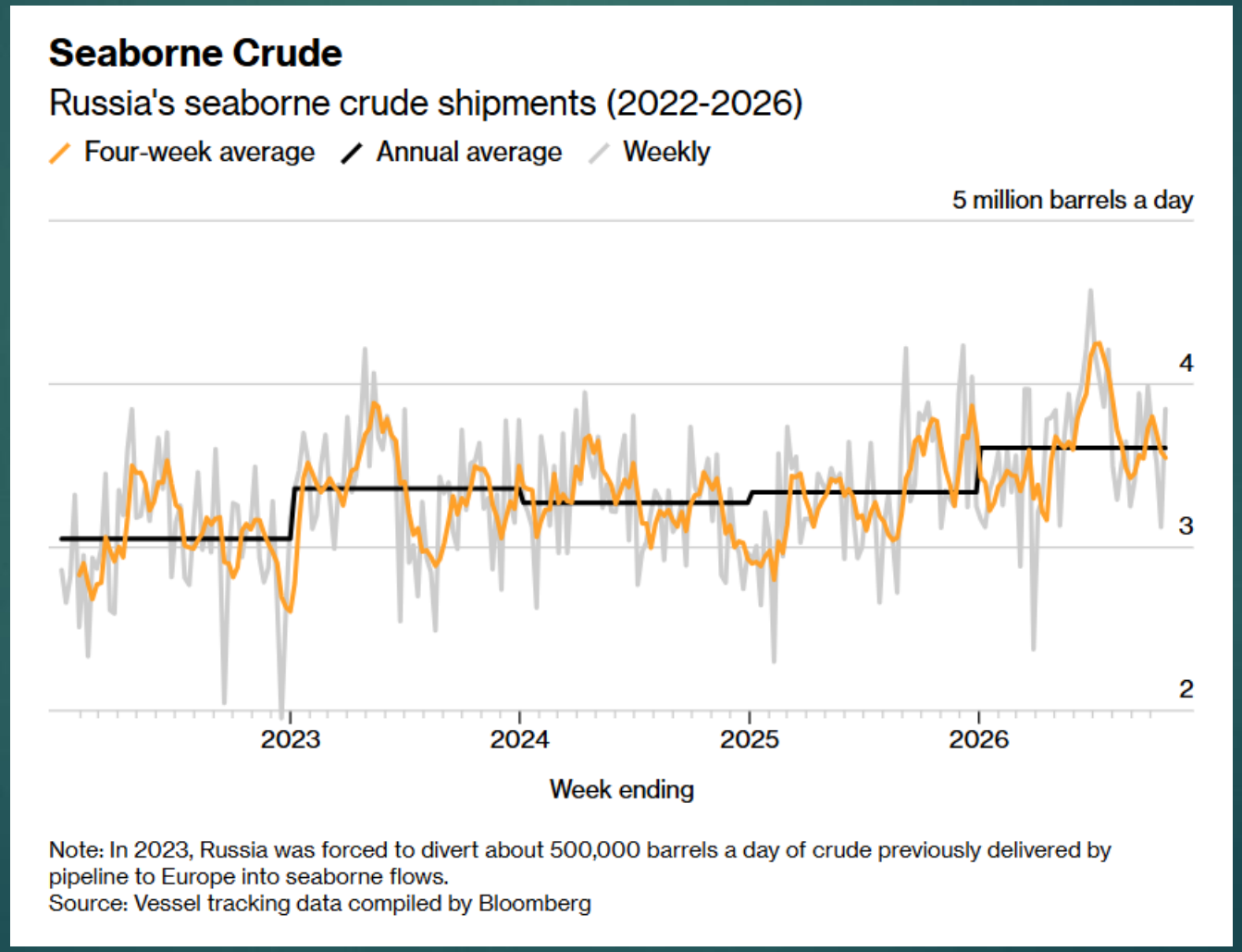
THE GULF-ISH CRISIS

- 20 MB/D OF SUPPLY THROUGH STRAITS OF HORMUZ LOST
  - IRAN BLOCKADED
    - 2 MB/D
  - RUSSIAN SANCTIONS
    - 1 MB/D LOST
  - UKRAINIAN ATTACKS ON REFINERIES, PORTS
    - 1 MB/D EXTRA RUSSIAN SUPPLY LOST (MOSTLY DIESEL)

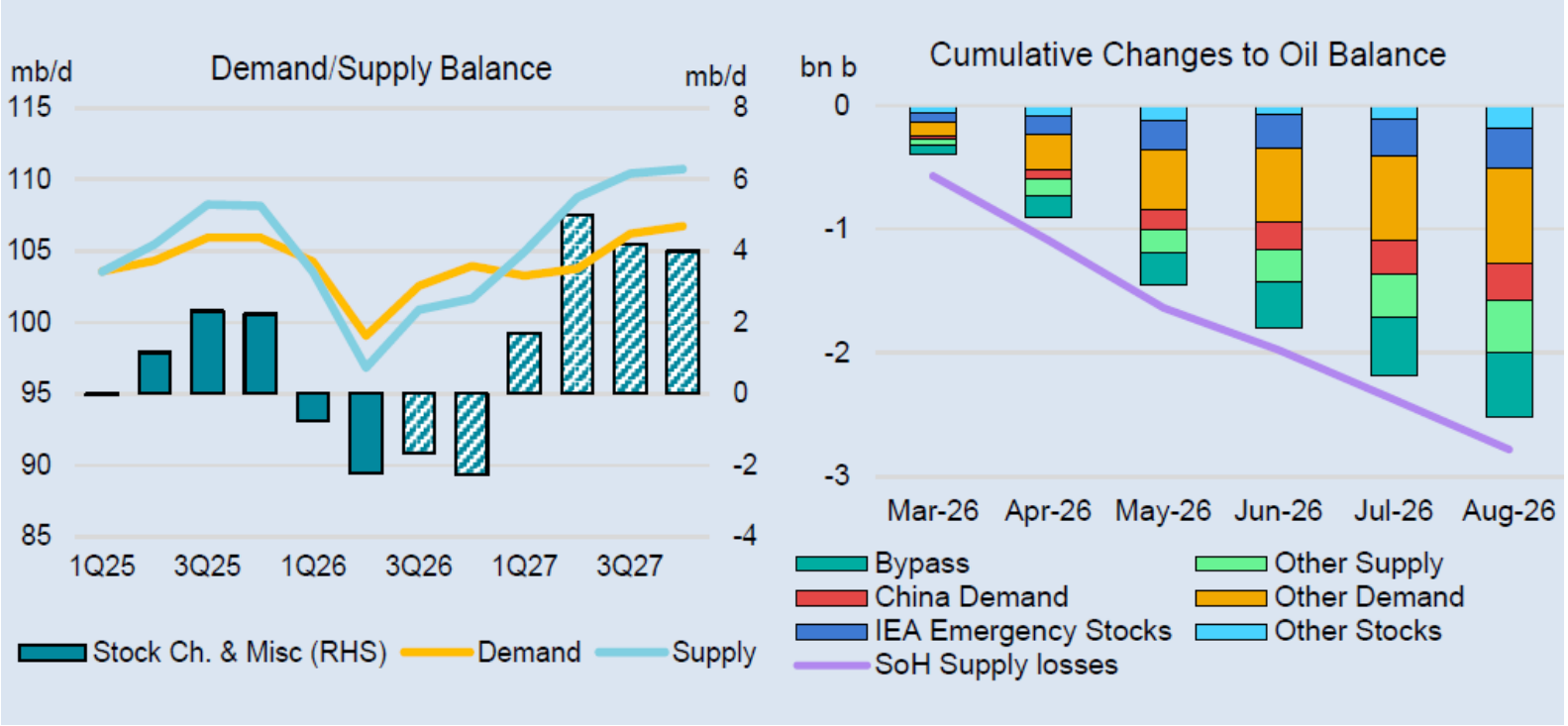
BUT OFFSETS

- 8-9 MB/D THROUGH PIPELINES
  - BUT HOUTHIS INTERDICT
- 3-4 MB/D OF IEA STOCK RELEASES
  - NOT ALL EFFECTIVE
- CHINA REDUCES IMPORTS 4 MB/D
  - AFTER LARGE INVENTORY BUILD
- SANCTIONED OIL SALES
  - 2-4 MB/D FOR A WHILE
- BALANCE: LOSS OF 3-4 MB/D

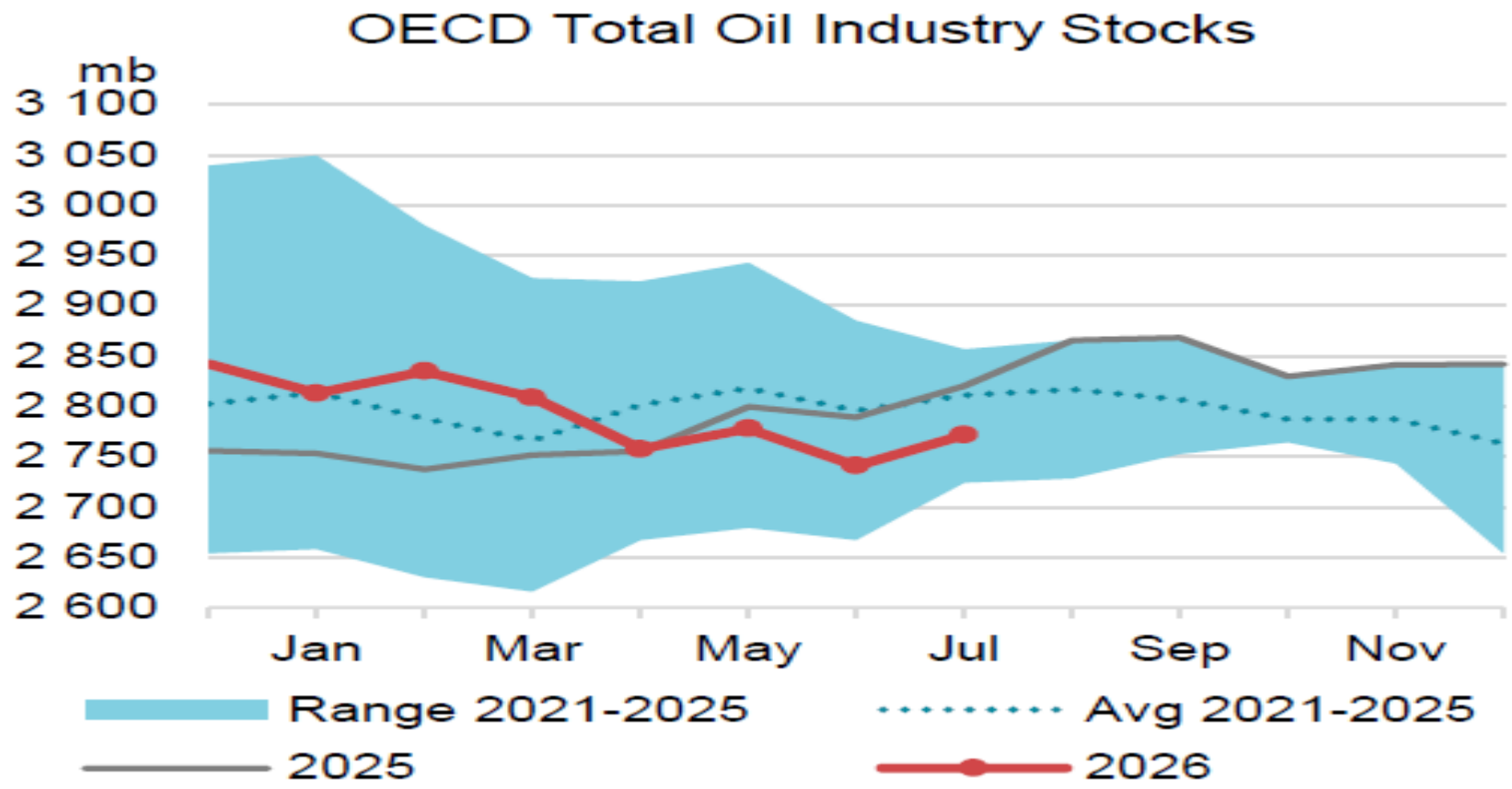
RUSSIAN EXPORTS



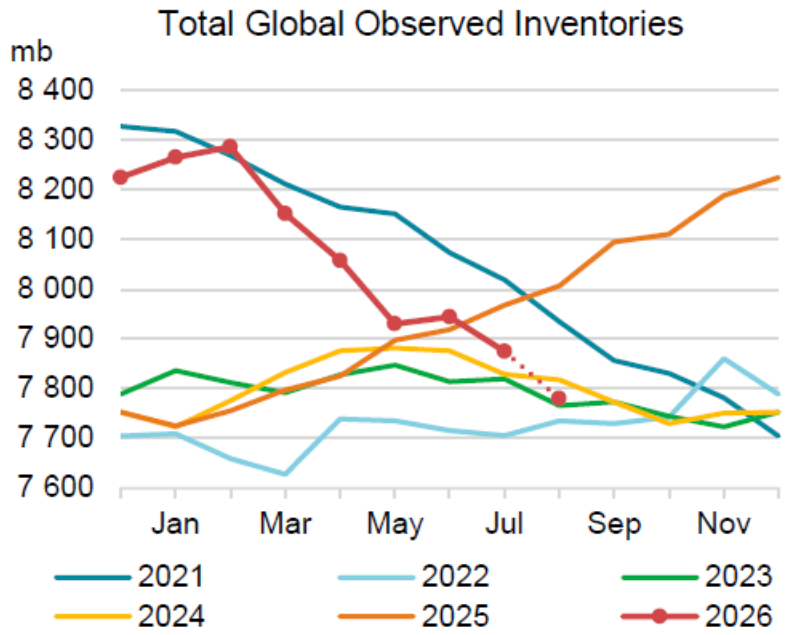
BARRELS LOST



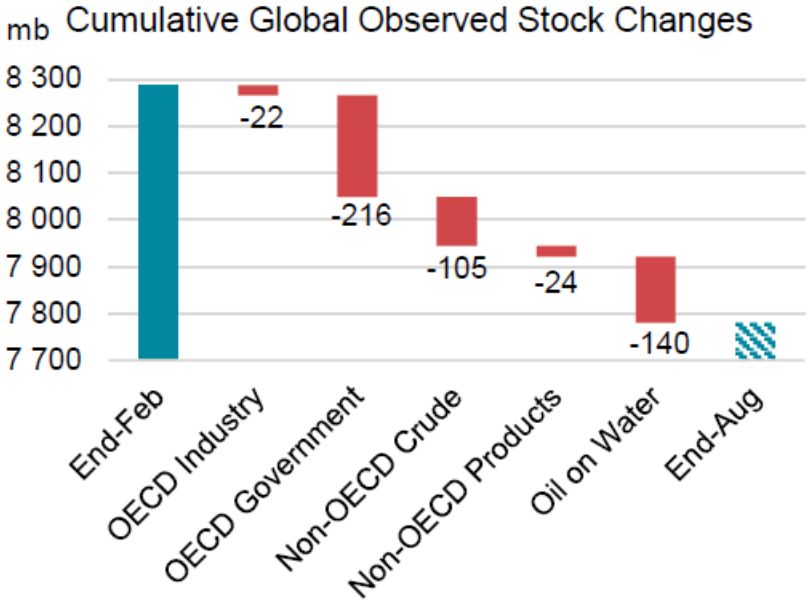
OECD COMMERCIAL INVENTORIES



GLOBAL INVENTORIES

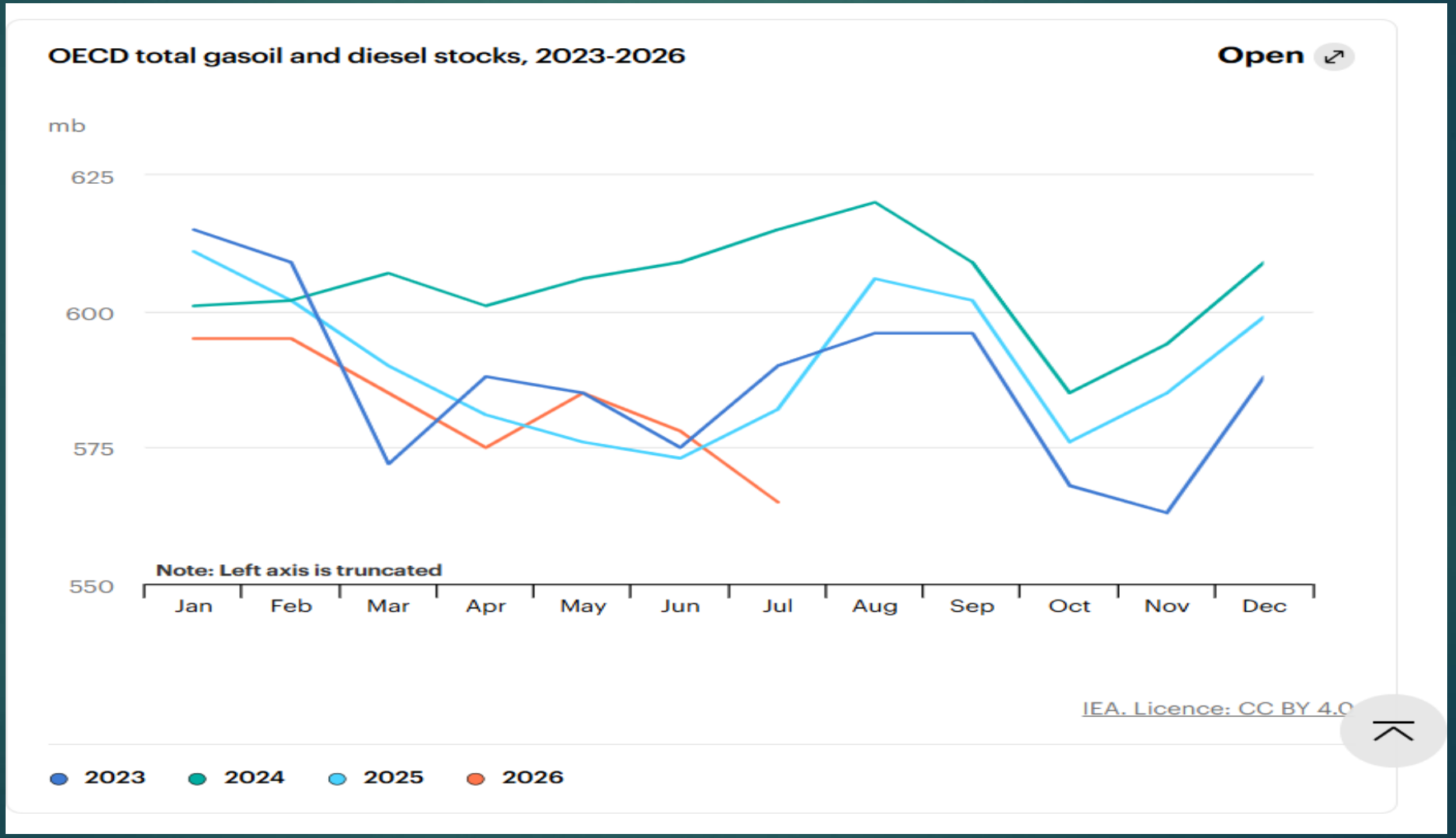


Source: IEA analysis based on data from IEA member countries, EIA, *PAJ*, *Kayrros, Kpler, FEDCom/S&P Global Platts* and *Enterprise Singapore*.

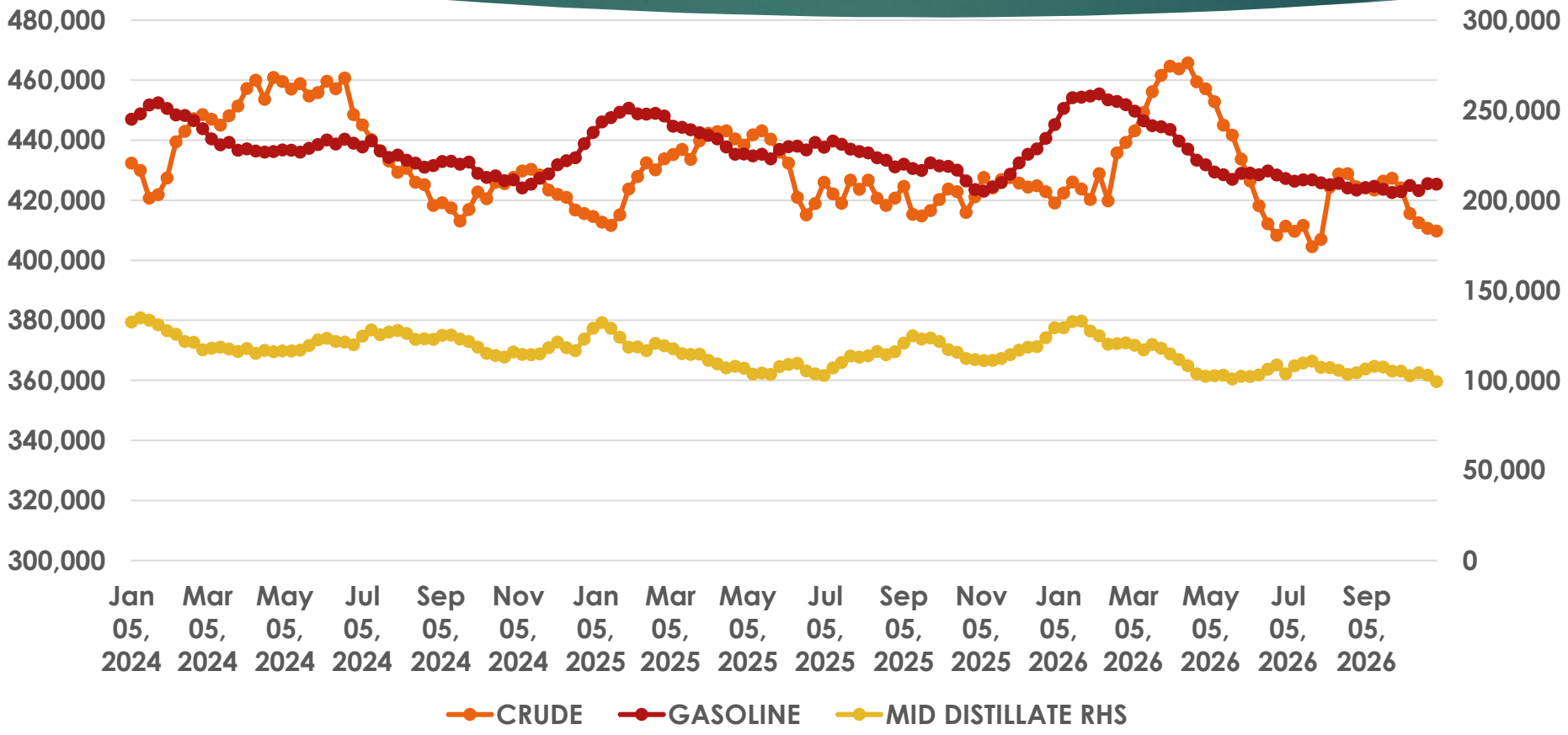


Note: Non-OECD Products include stocks in Fujairah and Singapore.
Source: IEA analysis based on data from IEA member countries, EIA, *PAJ*, *Kayrros, Kpler, FEDCom/S&P Global Platts* and *Enterprise Singapore*.

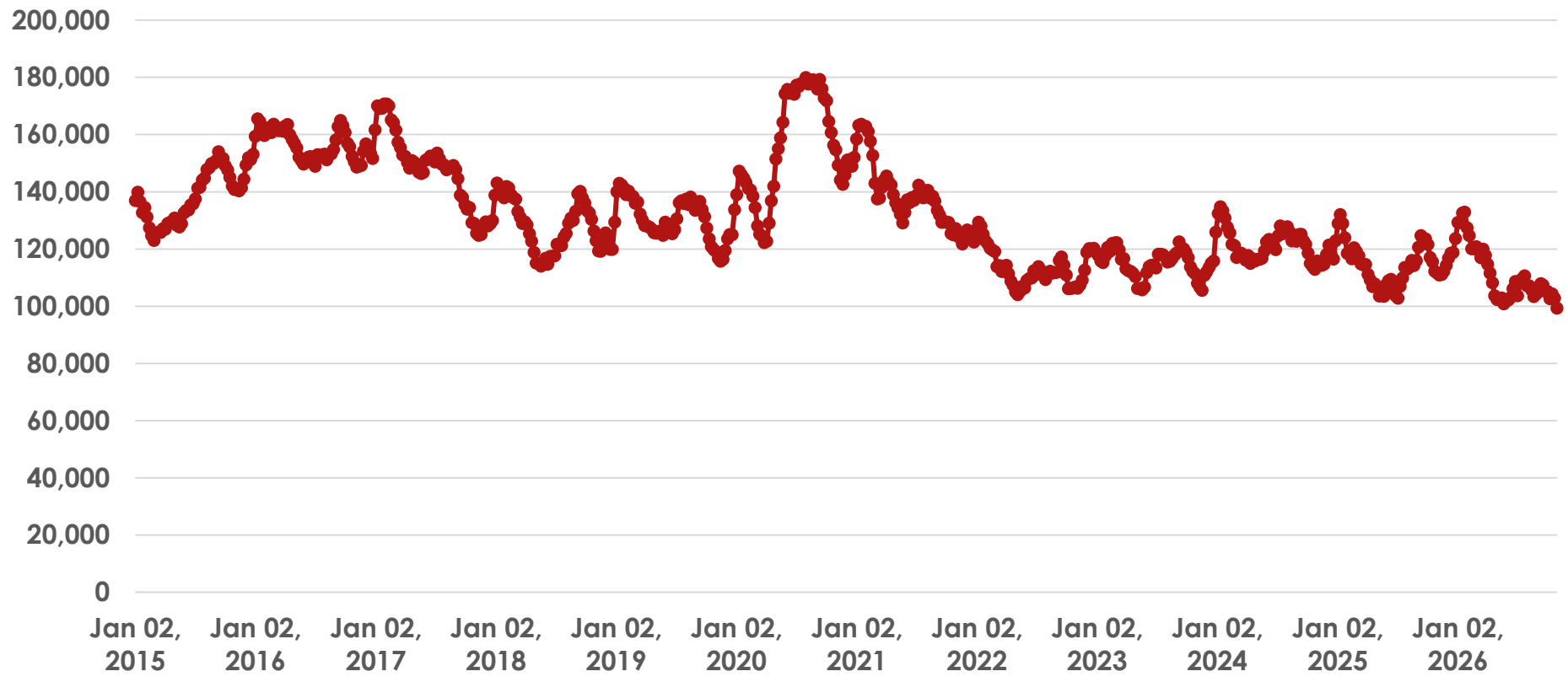
DIESEL STOCKS DROPPING



US INVENTORIES DROPPING SLOWLY



DISTILLATE CLOSE UP



BIG CONCERNS

DURATION IMPOSSIBLE TO PREDICT

- KHAMENI, PUTIN, TRUMP, XI

EFFECTIVENSS OF INTERDICTION

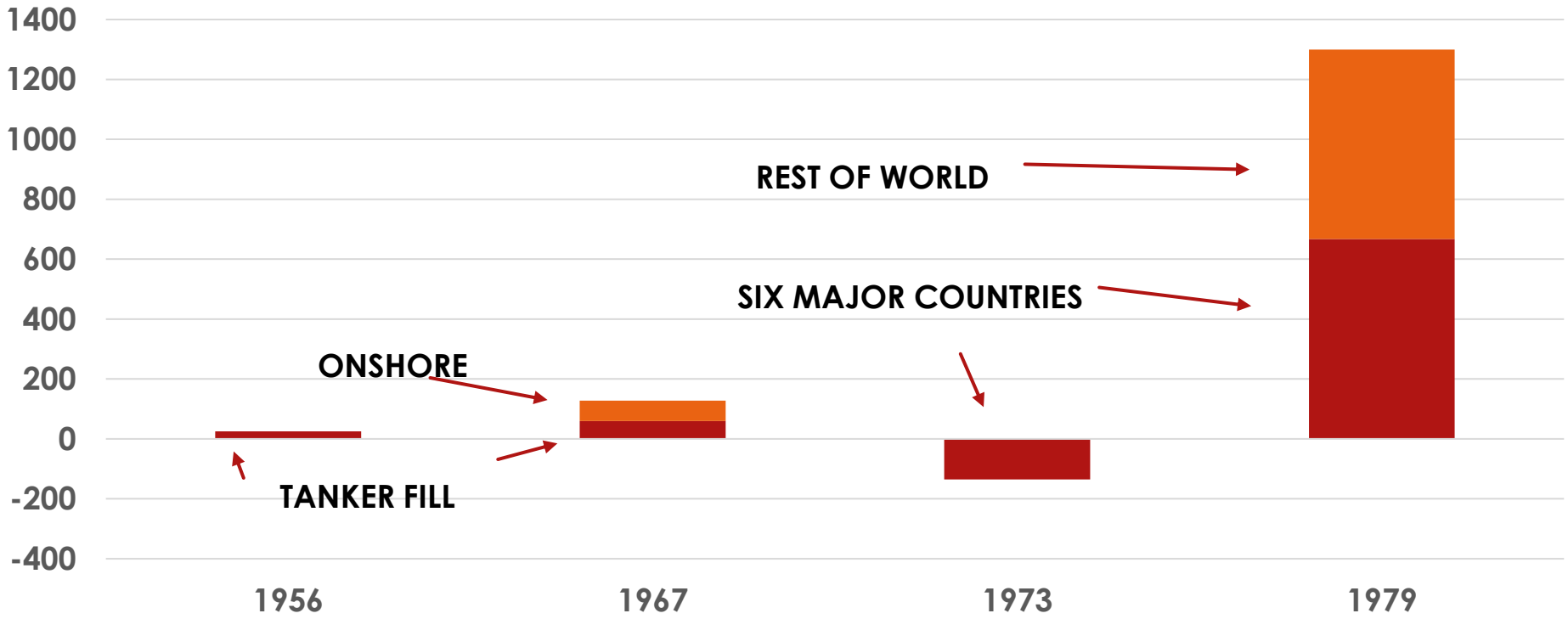
- DRONES, MINES, MISSILES

EXPORTERS TANKER SHUTTLE SOLVES SHIPPERS' RELUCTANCE

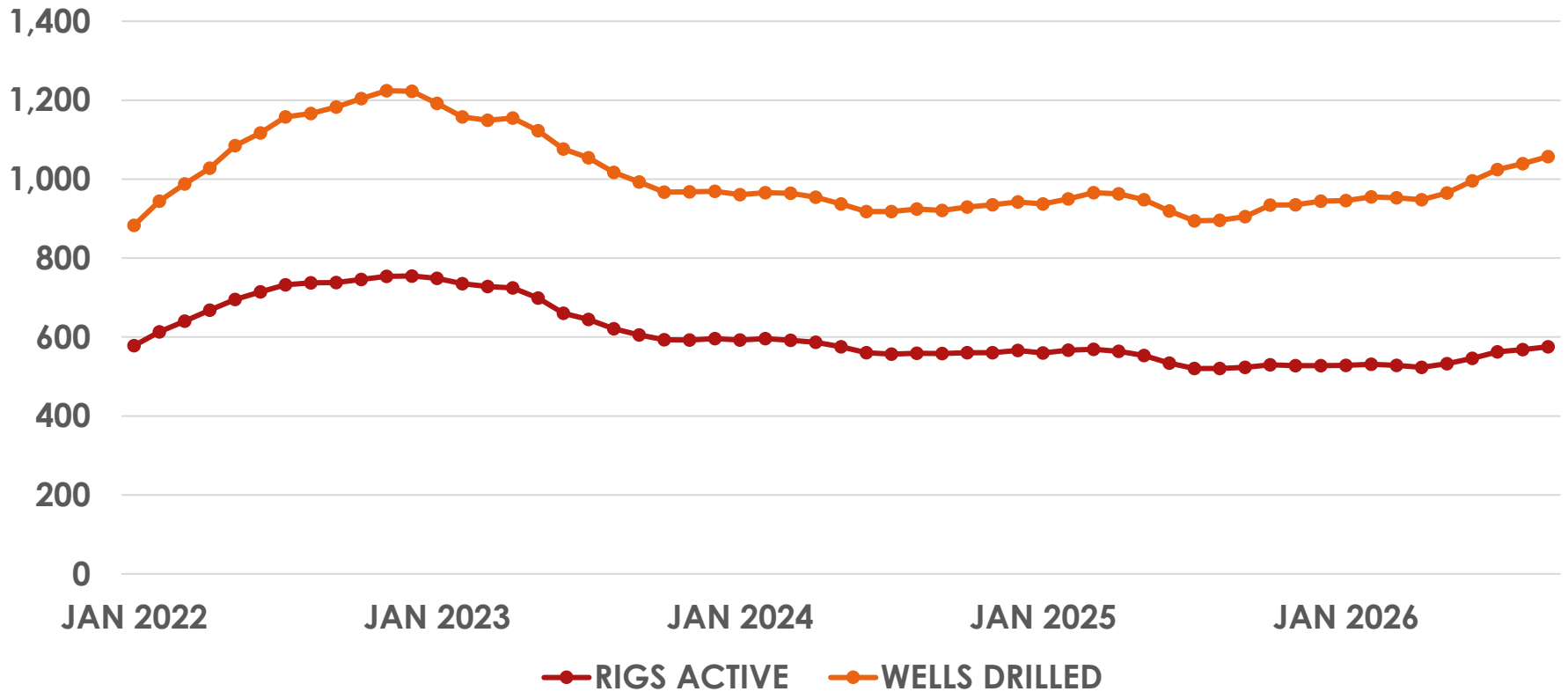
- LESS IMPACT FOR SHIP ATTACKS

REFINERY CONSTRAINTS

STOCK CHANGES IN CRISES



US DRILLING RECOVERING



INTANGIBLES MATTER

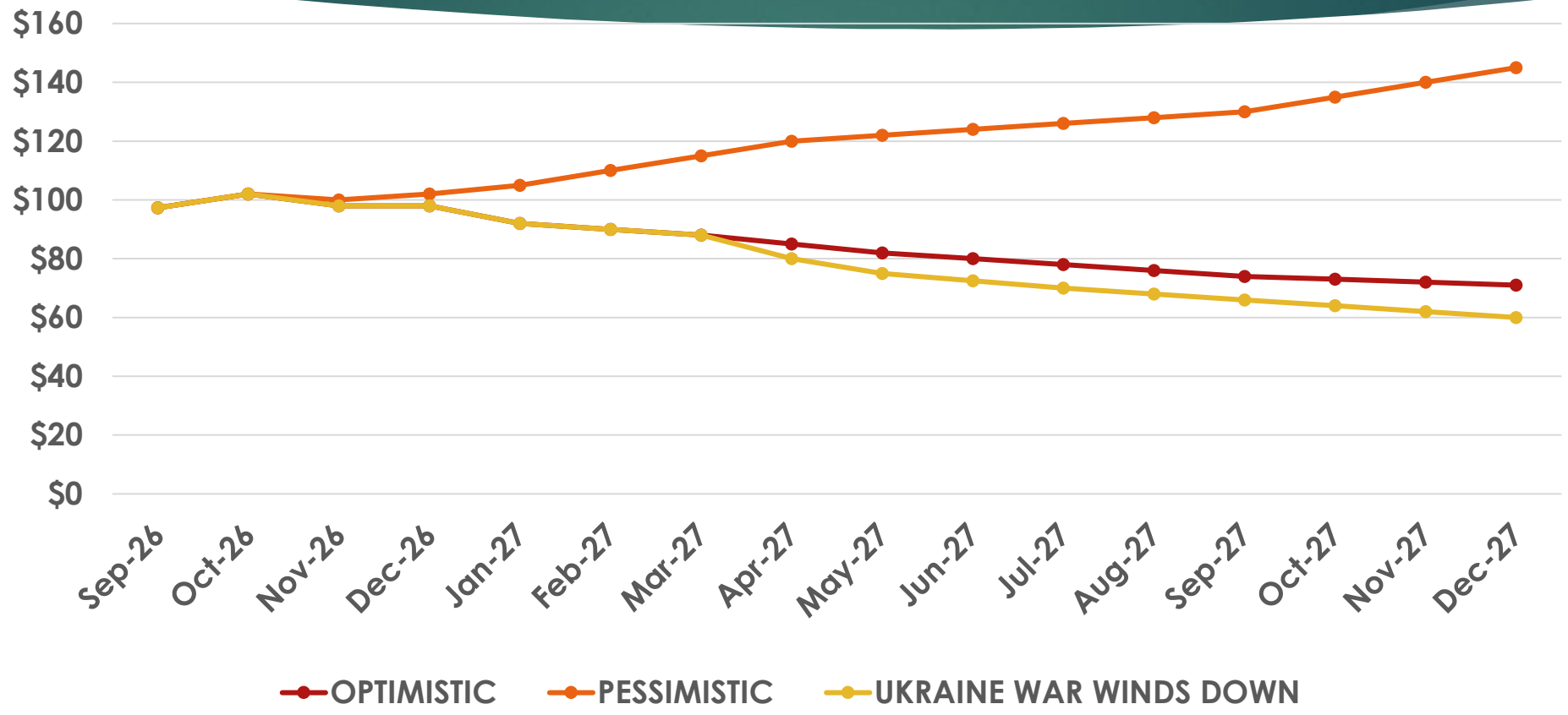
- EXPECTATIONS ARE INTANGIBLE BUT REAL
  - SECURITY PREMIUM
  - DEMAND FOR INVENTORY
- IS HOARDING PANIC OR PRUDENT?
  - 1979 INVENTORY BUILD TOPPED 3 MB/D FOR NEARLY 2 YEARS
  - UNCERTAINTY REIGNS (LIFEBOAT ANALOGY)
  - COMPETITION FOR BARRELS?
    - SPOT MARKET FOR NOW
    - NOCS LESS LIKELY TO SHARE



THREE SCENARIOS

- OPTIMISTIC: EARLY END TO HOSTILITIES BETWEEN U.S. AND IRAN
  - YEAR-END AGREEMENT
- PESSLIMISTIC: CONTINUED CONFLICT THROUGH NEXT YEAR
- PEACE BETWEEN RUSSIA AND UKRAINE BY END MARCH

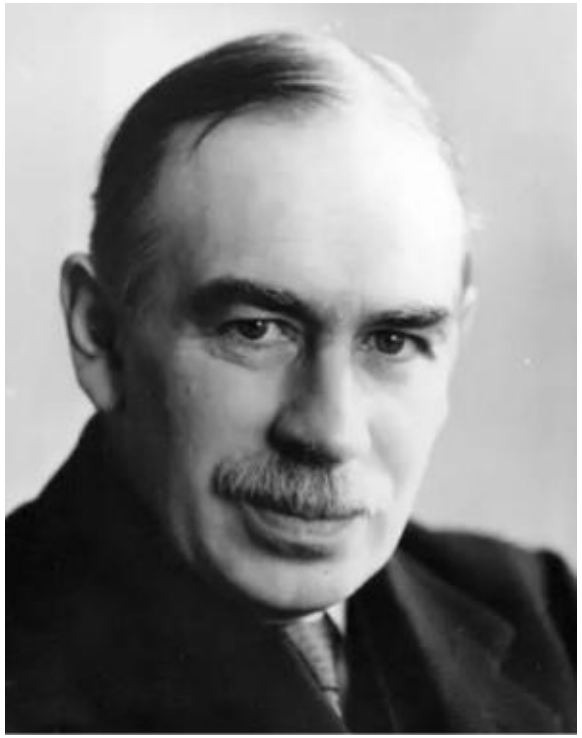
PRICE SCENARIOS



FUTURE SUPPLY

- GULF RESTORED (SOMEDAY….)
  - IRAN, RUSSIAN SANCTIONS END (SOMEDAY, NOT SOON…)
- GROWTH IN SOME AREAS
  - BRAZIL, GUYANA, US SHALE
  - DECLINE IN MATURE AREAS COULD BE DIMINISHED
- RESOURCE NATIONALISM DECLINES
  - MONEY ON THE TABLE
- INTRA-CARTEL: IRAQ, UAE (SORT OF)
- SHALE DEVELOPMENT SPREADING?
  - ARGENTINA, MEXICO

ECONOMICS DOESN'T EXPLAIN PRICE MOVEMENTS, BUT AN ECONOMIST DOES



Economic Effects of Rising Fuel Prices

Regional Economic Models, Inc.

what does REMI say?℠

Agenda

- Introduction
- Topic overview
- Model Structure
- Scenario
- Economic Impacts
- Conclusion
- Q&A

About Us

We are the nation's leader in dynamic local, state and national policy modeling.

From the start, REMI has sought to improve public policy through economic modeling software that informs policies impacting our day-to-day lives.

We were founded in 1980 on a transformative idea: government decision-makers should test the economic effects of their policies before they're implemented.

At REMI, we're inspired by a single goal: *improving public policies.*



About Us

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Our models are built for any state, county, or combination of counties in the United States.

Our Representative Clients

Our model users and consulting clients use REMI software solutions
to perform rigorous economic analysis that critically influences policy.

Arizona State University

GDOT Georgia Department of Transportation

NFIB The Voice of Small Business.

North Carolina Department of Commerce

PURDUE UNIVERSITY

Metro Los Angeles County Metropolitan Transportation Authority (Metro)

Houston-Galveston Area Council

SCAG Southern California Association of Governments

Massachusetts Department of Revenue

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Rising Oil Prices

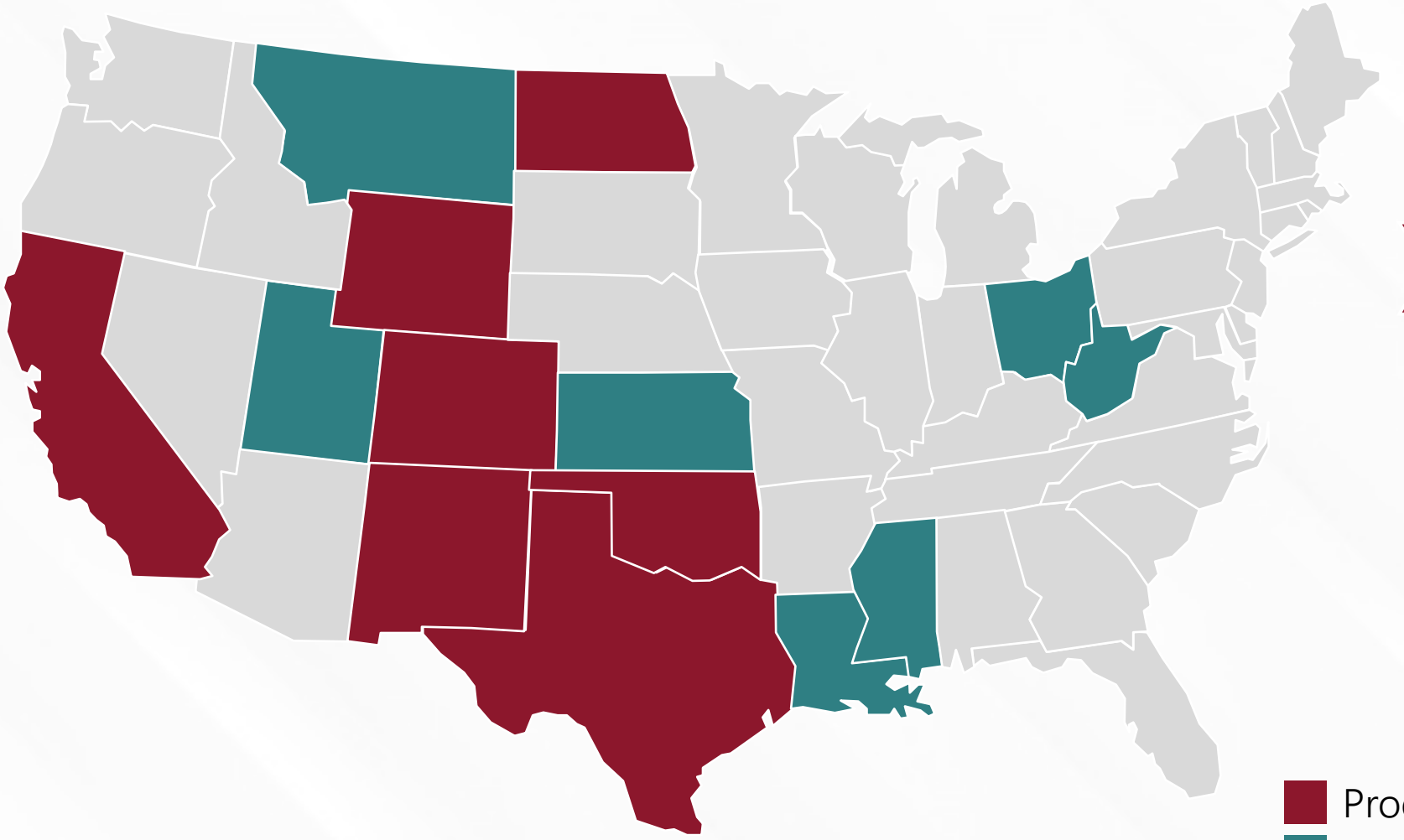
Crude Oil Price (USD/Bbl) 1 Year Graph



Last Updated: November 11th, 2026
Source: tradingeconomics.com

what does REMI say?sm

Oil Producing States



Top 5 Producers

1. Texas
2. New Mexico
3. North Dakota
4. Colorado
5. Alaska (Not pictured)

Produced >100 million barrels in 2025

Produced 10-100 million barrels in 2025

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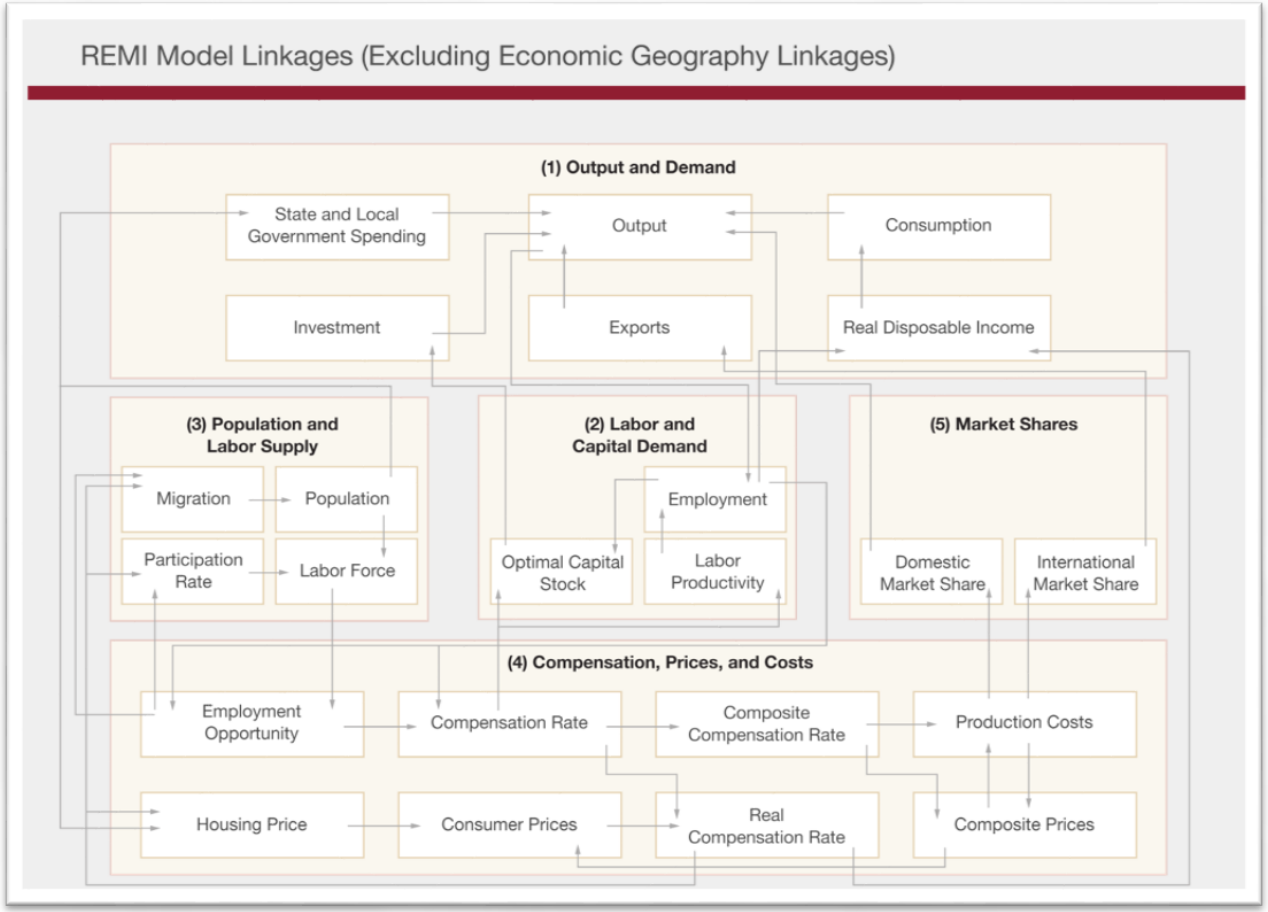
Model Structure



- The REMI Model is based off 5 main variables:
  - Output and Demand
  - Labor and Capital Demand
  - Population and Labor Supply
  - Compensation, Prices, and Costs
  - Market Shares
- Inputs to simulations known as policy variables all have result variables that they affect
- Based off of the structure, the REMI model is able to calculate economic impacts of price changes

Two Aspects of Modeling

Fuel Cost

- Changes to fuel price impacts production cost and use of capital
- Cobb-Douglas relationship with fuel, capital, and labor
- Three fuel types: electricity, natural gas, and residual
- Can be modeled by industry and region

Output Adjustment

- Changes to fuel prices affects the value of production
- If production remains the same, but fuel prices increases, the value of production increases
- No change to employment, compensation, & investment

Fuel Cost: Cobb-Douglas Relationship

Production
How much a business makes



Labor
How many workers are used

Fuel
How much electricity and gas is used

Capital
How much equipment and other aspects are used

Fuel Cost: Cobb-Douglas Relationship

Cobb-Douglas Relationship:

Developed in 1928, using United States manufacturing data, Charles Cobb and Paul Douglas developed the Cobb-Douglas production function to examine the relationship between capital, labor, and output.

Equation:

$$Y = AK^{\alpha}L^{1-\alpha}$$

Where:
Y: Output
A: Total Factor Productivity
K: Capital
L: Labor
α: Capital's share of income

Use in REMI Model:

The REMI model takes the Cobb-Douglas function and adds a third variable: fuel. REMI treats fuel, capital, and labor as inputs to production and changes to each of those inputs affects production.

Ratios such as Value Added / Output, Fuel / Output, and Factor Inputs / Value Added* are used to determine effects by industry.

**Derived from Bureau of Economic Analysis*

Other Aspects to Consider

Production Cost

- Production cost takes into account: fuel, capital, and labor
- Can be used for various of different scenarios
- Can be used for any industry and region combination

Foreign Import Cost

- Used to show how increased import costs from abroad can impact industries
- Relationship between import reliability and domestic production
- Best application with an MRUS model

Consumer Prices

- This analyzes consumer decisions, rather than businesses
- Changes to prices in one category affects purchasing and consumption in other categories
- Built in elasticities for consumption categories

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Model Simulation: $100 Billion Increase Nation Wide

Scenario:

- The overall price of oil goes up by $100 billion across the United States

Policy Variables:

- Output without effect on employment, compensation, & investment in the Oil & Gas extraction industry
- Fuel Cost (Residual) in all industries and states

Spreading:

Oil & Gas Output:

- Scaled by proportion of state oil production, relative to the nation

Fuel Cost:

- Scaled by proportion of state and industry output relative to nation
- Follow BEA's Input-Output matrix regarding fuel / output

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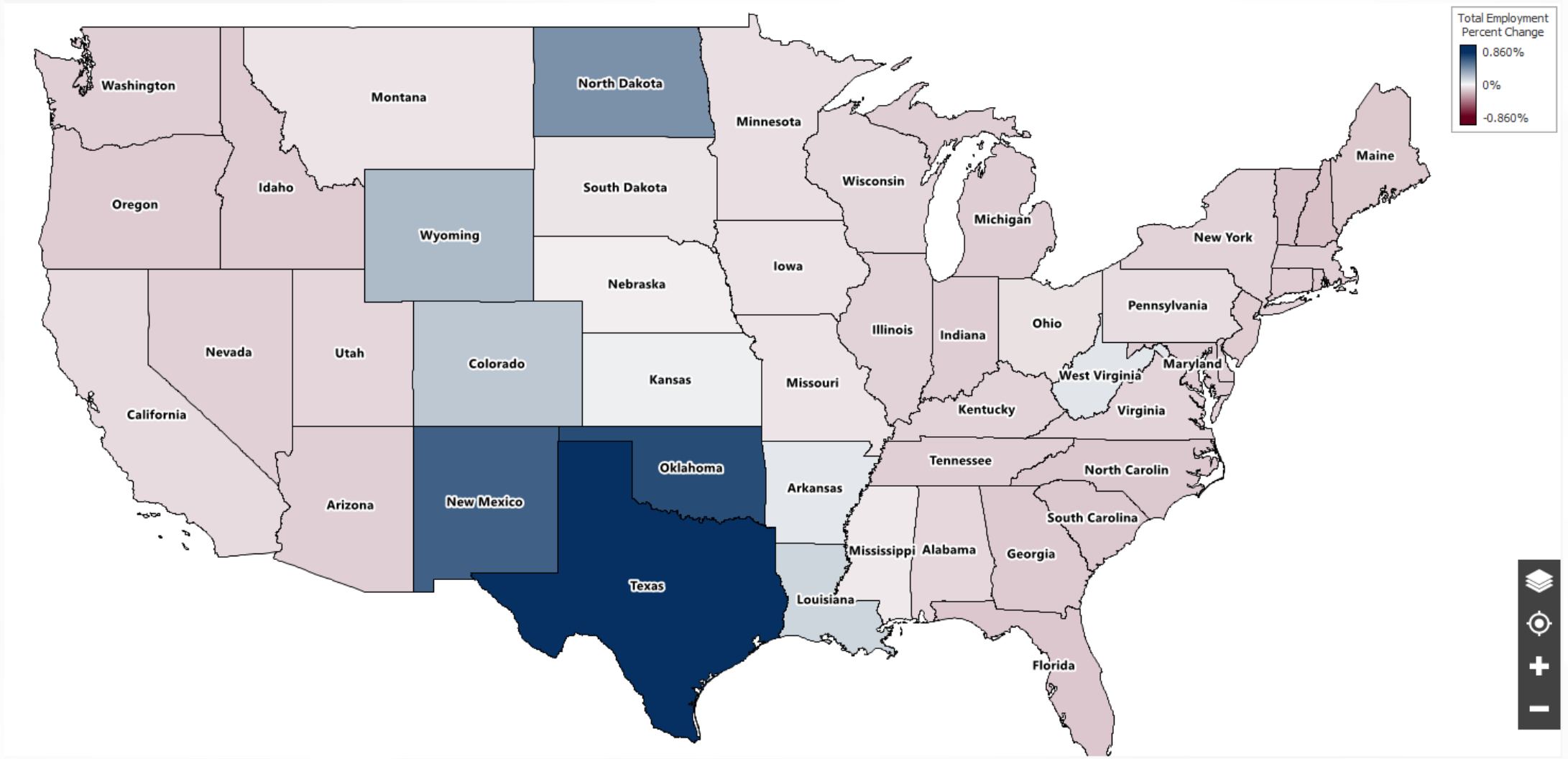
Employment Change: Percent Chage



Winners & Losers: State Employment Impact

Largest Decreases in Employment

State	Employment Impact (% Change)
New Hampshire	-0.186%
Vermont	-0.176%
Florida	-0.168%
North Carolina	-0.161%
South Carolina	-0.160%

Largest Increases in Employment

State	Employment Impact (% Change)
Texas	0.860%
Oklahoma	0.740%
New Mexico	0.651%
North Dakota	0.439%
Alaska	0.384%

Nationwide Industry Impact: Changes to Production

Largest Decreases in Output

Industry	Change in Production
Construction	-$7.77
Real estate	-$4.58
Retail trade	-$2.98
Ambulatory health care services	-$1.44
Air transportation	-$1.22

Largest Increases in Output

Industry	Change in Production
Oil and gas extraction	$105.78
Management of companies	$6.88
Professional, scientific, and technical services	$4.95
State and Local Government	$2.46
Insurance carriers and related activities	$2.10

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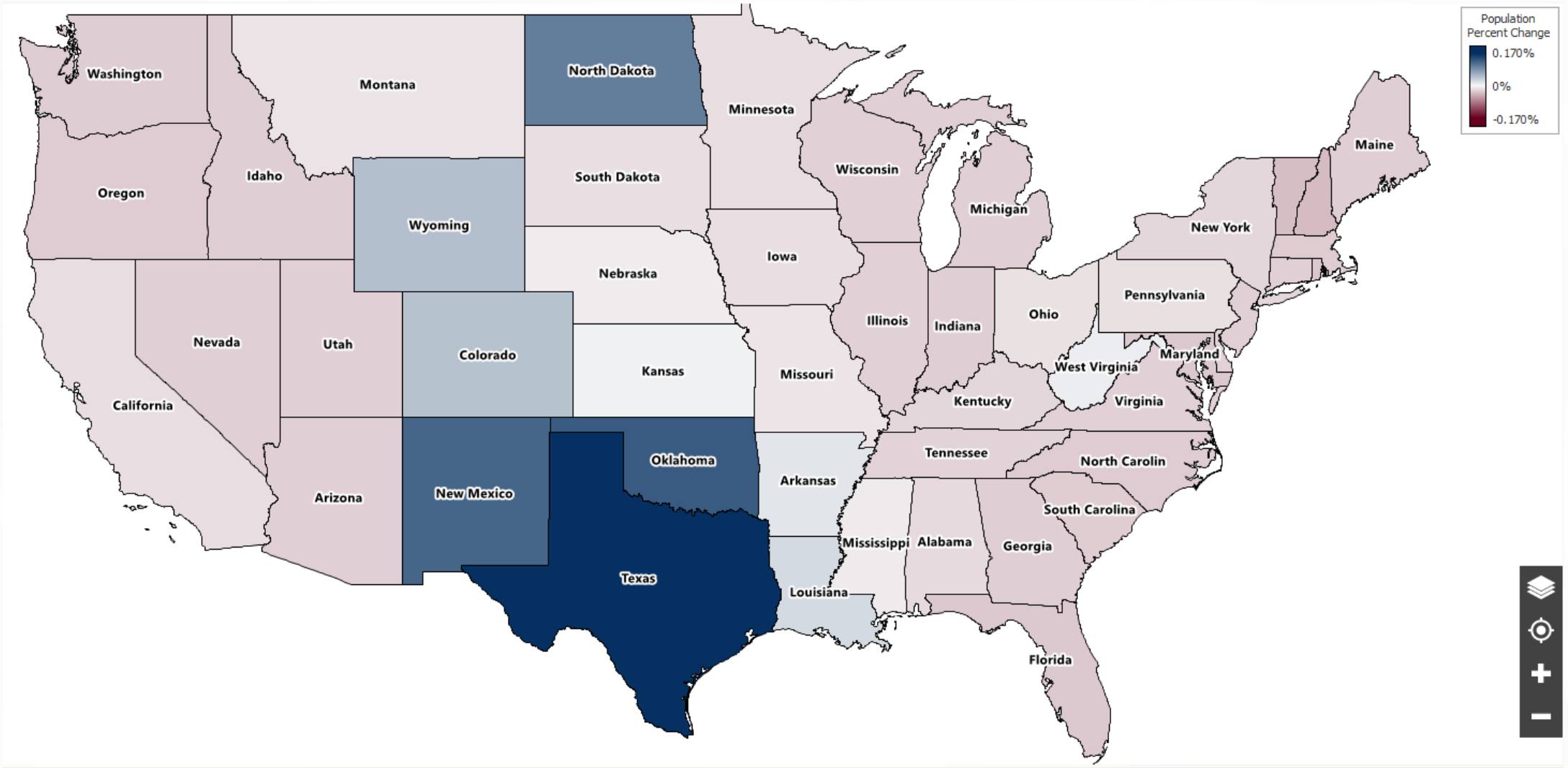
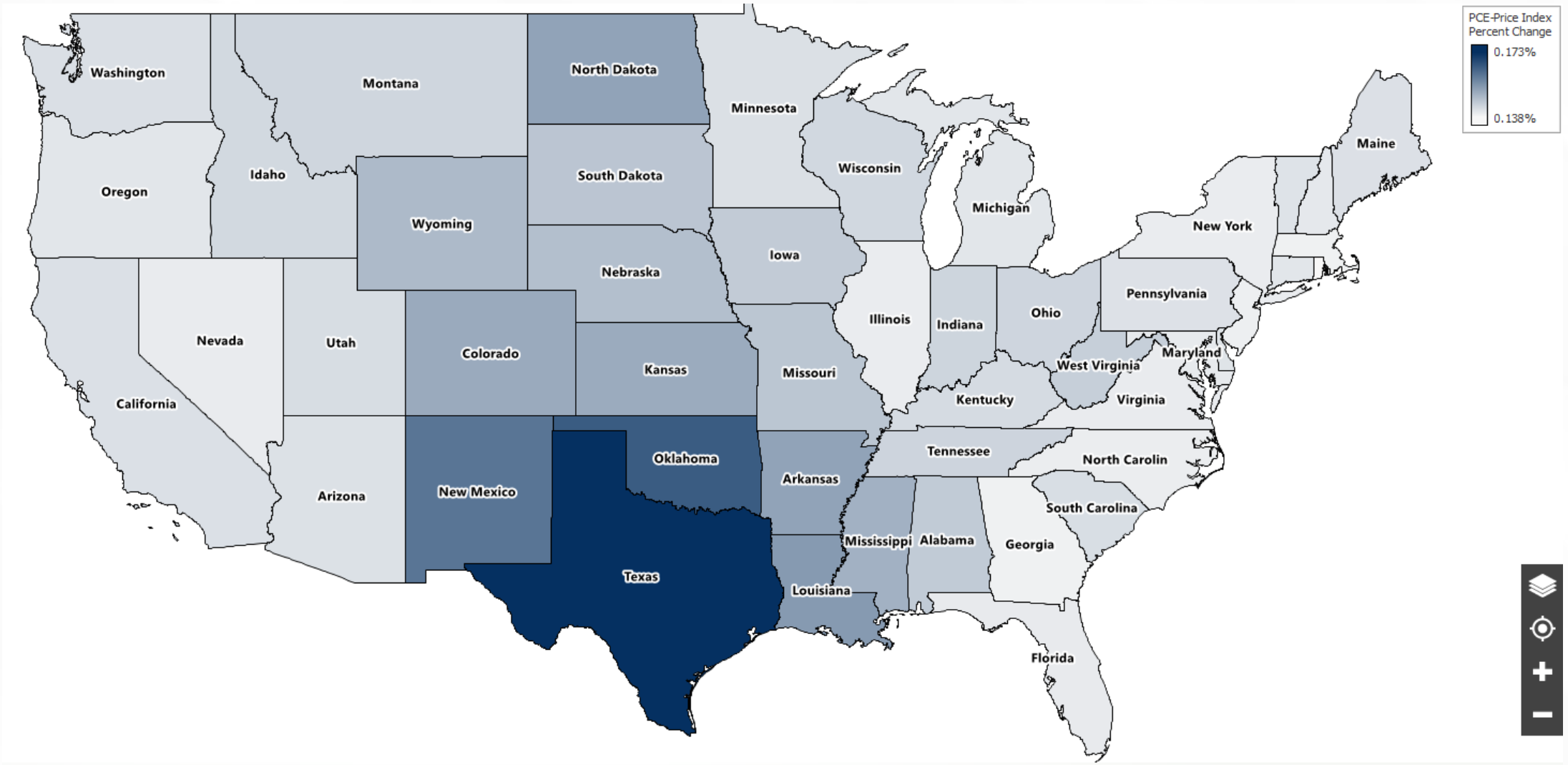
Units in Billions of Fixed 2025 Dollars

Economic Geography: Population Percent Chage



Inflation Response: PCE-Price Index Percent Chage



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Conclusions and Notable Results

Multiple Approaches

- Fuel cost and output paint most of the picture
- Additional aspects such as import costs and consumer price can be included as well

Cobb-Douglas

- The fuel cost variable follows a Cobb-Douglas relationship
- Industries might alter their structure depending on the relative cost of fuel

State Impact

- Oil-heavy states received positive impacts, while non-producing states saw a loss
- Inflation was increased across the country and most prevalent in oil-producing states

Industry Impact

- The oil industry saw the biggest output increase, given the value of production increasing
- Fuel heavy industries saw declines, service industries saw gains

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Thank you for attending!

For more information, please contact
info@remi.com