

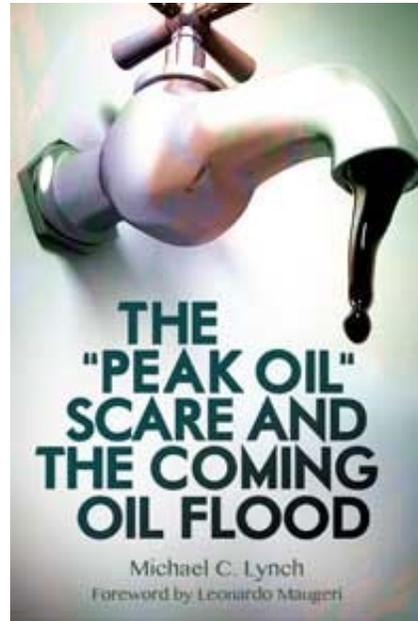
# THE OUTLOOK FOR THE LNG MARKET

February 27, 2020

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# THE BOOK IS FINALLY HERE! (JULY 2016)



# AT ISSUE

- ▶ MARKET HAS CHANGED
- ▶ WAS STABLE, STEADY AND PROFITABLE
  - ▶ NOT A REAL MARKET
  - ▶ BUT NOT WITHOUT RISKS
- ▶ NOW MERCHANT SELLERS
  - ▶ MORE COMPETITION
  - ▶ MANY MORE BUYERS
- ▶ POLITICAL RISK REMAINS/GROWING
- ▶ PRICE RISK NEW, SERIOUS

# THE GOOD NEWS

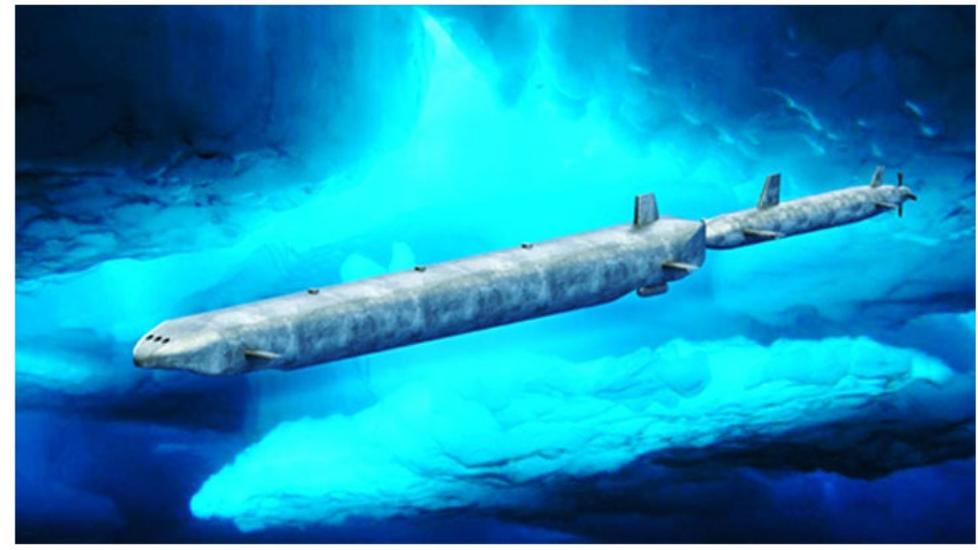
- ▶ DEMAND POTENTIAL IS ENORMOUS
  - ▶ GAS IS CLEANEST FOSSIL FUEL
  - ▶ BILLIONS HAVE NO ACCESS TO RELIABLE POWER/COMMERCIAL ENERGY
  - ▶ HUGE AMOUNTS OF COAL CONSUMED FOR POWER
  - ▶ BUT PRICE MATTERS
- ▶ RESOURCE IS ENORMOUS
  - ▶ EVEN WITHOUT U.S. SHALE
  - ▶ PRODUCTION COSTS CHEAP
  - ▶ MOST REQUIRES EXPENSIVE TRANSPORT

# THE GOOD OLD LNG DAYS

- ▶ FEW ACTORS (BUYERS OR SUPPLIERS)
- ▶ LONG-TERM CONTRACTS
  - ▶ HIGH TAKE OR PAY
- ▶ PRICE INDEXED TO CRUDE OIL
- ▶ DESTINATION RESTRICTIONS
- ▶ SPOT MARKET ALL BUT NON-EXISTENT
- ▶ MINIMAL COMPETITION
- ▶ OIL PRICE THE MAIN RISK
- ▶ BUT:
  - ▶ DEMAND RESTRICTED BY HIGH PRICES
  - ▶ MANY PROJECTS HAD LENGTHY DELAYS

# EXTRAVAGANT FAILURES

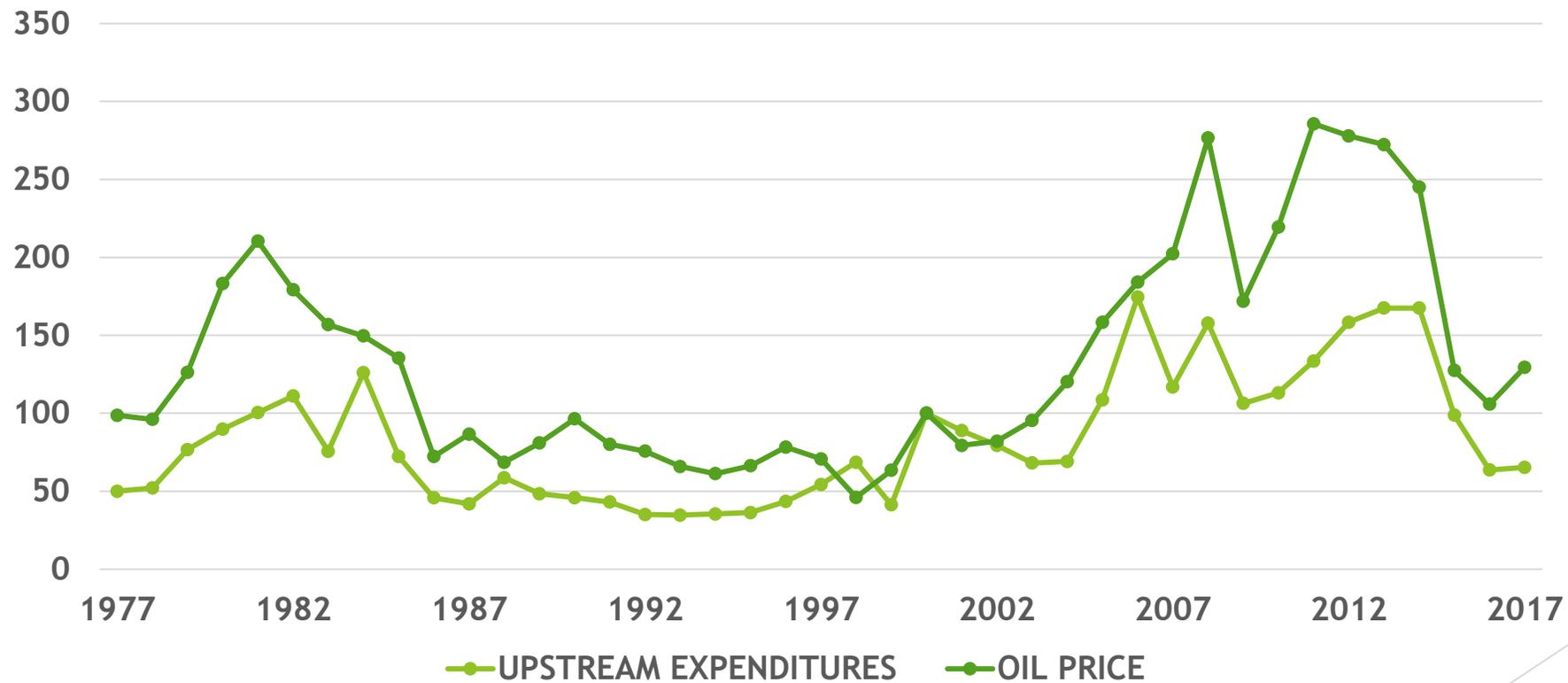
- ▶ NORTH STAR/SIBERIA
- ▶ ALASKAN NORTH SLOPE
- ▶ ALGERIA-US
- ▶ DOME PETROLEUM
- ▶ ENRON-DABHOL



# IRRATIONAL EXUBERANCE

- ▶ CAUSES:
  - ▶ DESIRE TO DO SOMETHING
  - ▶ HIGH PRICES/EXPECTED HIGH PRICES
- ▶ OVERBUILDING
  - ▶ 1970S ERA EXPORT PLANS
  - ▶ US REGASIFICATION BOOM IN 2000S
- ▶ BLIND OPTIMISM
  - ▶ ENRON DABHOL PROJECT
- ▶ RECENTLY: HIGH ASIAN LNG PRICES, LOW US GAS PRICES

# WHAT DRIVES SPENDING?



SOURCE: U.S. ENERGY INFORMATION ADMINISTRATION.

# THINGS THAT DIDN'T WORK THEN

## *BUT DO NOW*

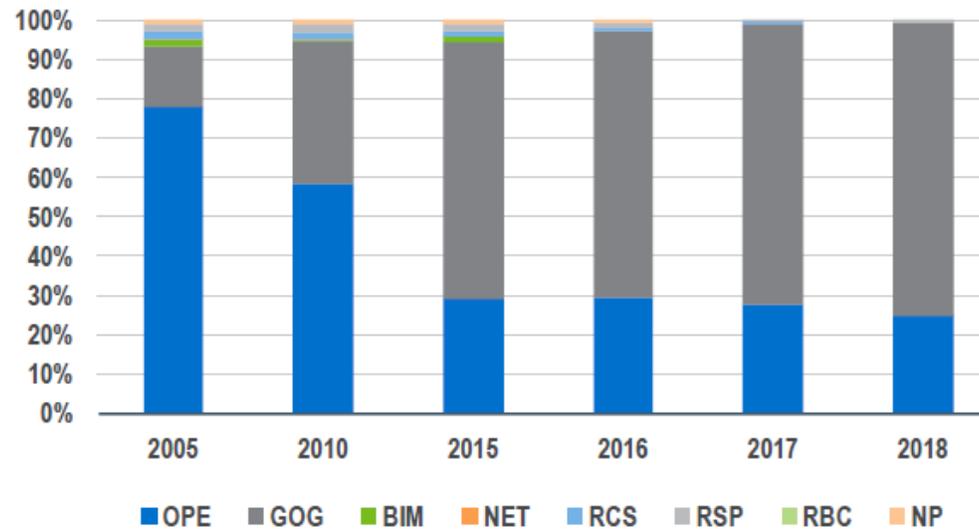
- ▶ ARCTIC/SIBERIAN LNG
- ▶ FLOATING LNG PLANTS
- ▶ FLOATING STORAGE AND REGASIFICATION UNITS
- ▶ MEGA-PROJECTS (SOMETIMES)
- ▶ N. AMERICAN EXPORTS

# NOW

- ▶ MANY BUYERS, SELLERS
  - ▶ SMALL-SCALE SALES CAN ADD UP
- ▶ MORE SPOT SALES
- ▶ LESS DESTINATION RESTRICTIONS
- ▶ DECREASING USE OF OIL PRICE INDEX
- ▶ DEMAND RISK GROWING
  - ▶ INCREASING SEASONAL IMPACT
- ▶ **MORE GAS ON GAS COMPETITION**
  - ▶ SPOT LNG
  - ▶ PIPELINE (ESPECIALLY RUSSIAN)
- ▶ MORE COMPETITION WITH CHEAP COAL (CHINA/INDIA)

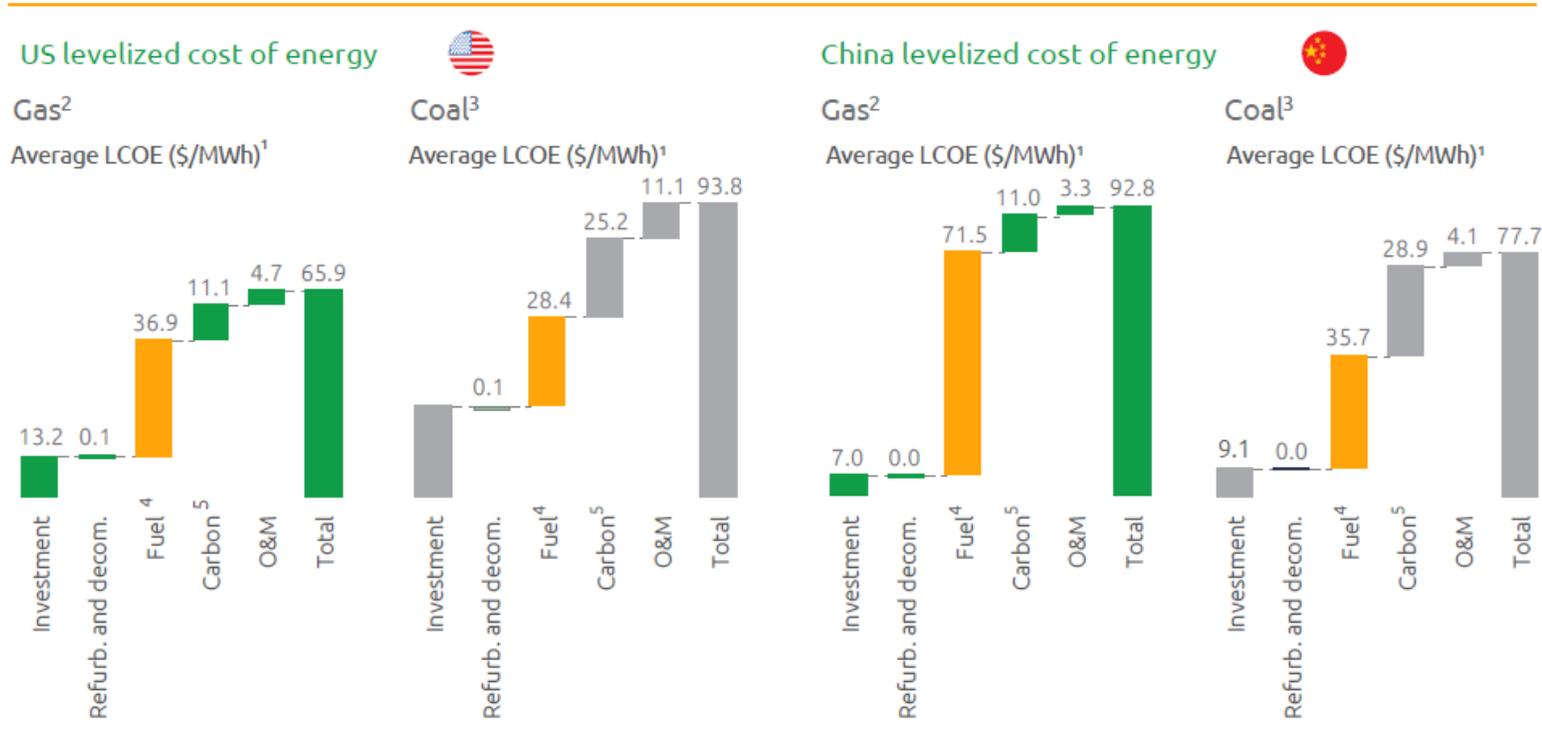
# PIPELINE GAS USUALLY NOT OIL PRICE INDEXED

Figure 1.2 Europe Price Formation 2005 to 2018



Source: International Gas Union, Global Gas Report 2018  
GOG IS GAS ON GAS PRICING

# PRICE COMPETITION WITH COAL IN CHINA



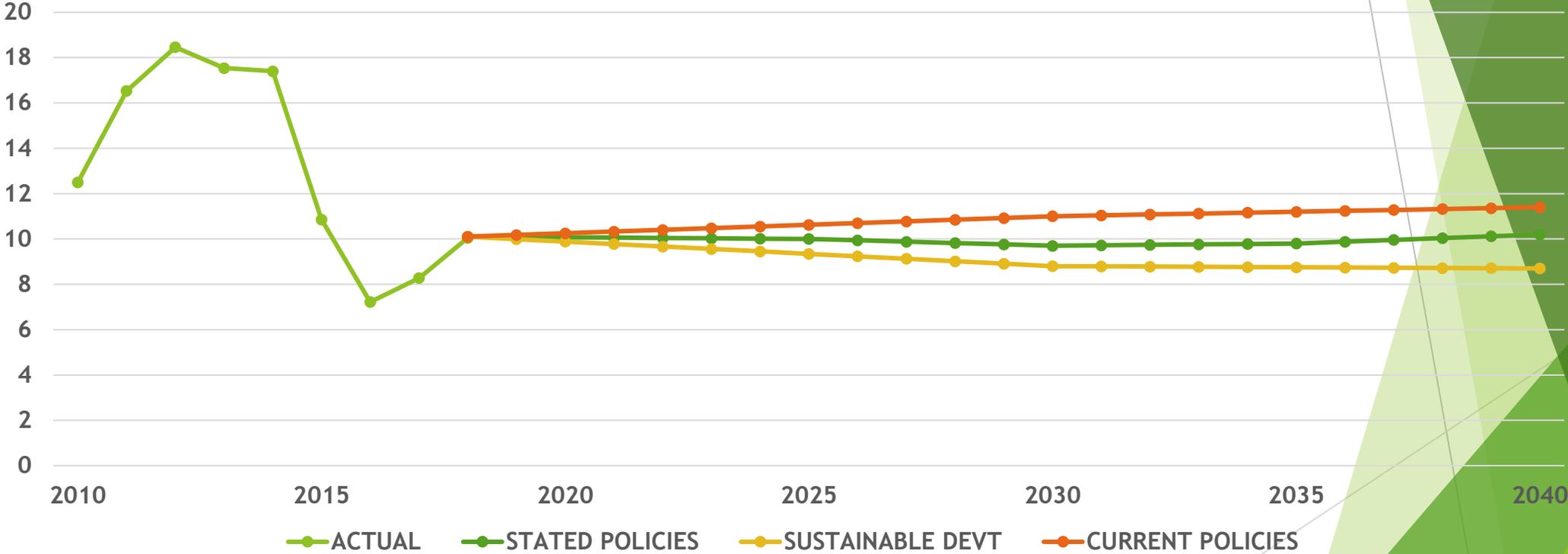
Source: International Gas Union, Global Gas Report 2018

# PRICE MATTERS!

- ▶ INTANGIBLES ARE RELEVANT
  - ▶ BUT OFTEN SECONDARY
- ▶ CLEAN ENERGY IS GREAT
  - ▶ BUT INDIA MOSTLY PREFERS CHEAP ENERGY
- ▶ DIVERSIFICATION MATTERS
  - ▶ BUT EUROPE HAS LONG HAD A HIGH DEPENDENCE ON RUSSIAN GAS
- ▶ QUESTIONS ALWAYS ARE:
  - ▶ HOW MUCH WILL PEOPLE PAY COMPARED TO MARKET PRICE?
  - ▶ CAN THAT CHANGE?

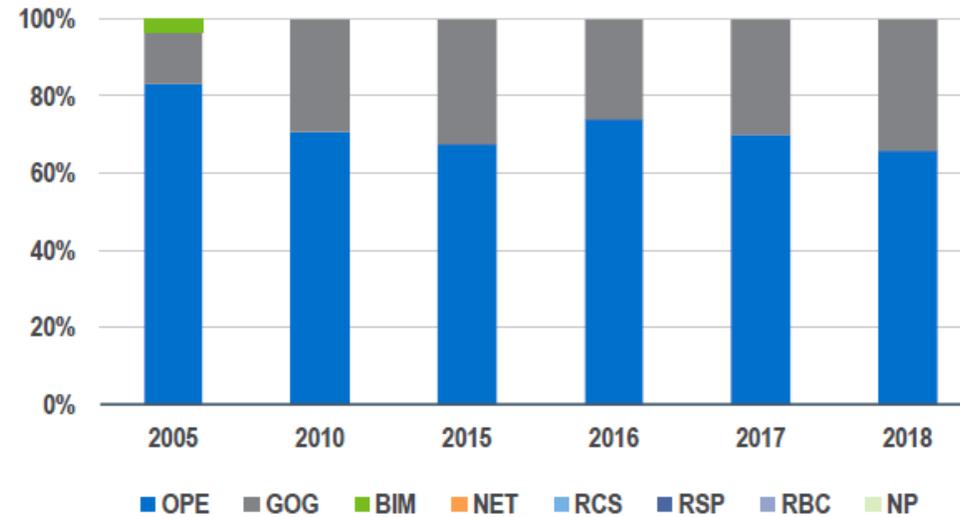
# RECENT CONSENSUS VIEW

IEA JAPAN GAS PRICE FORECASTS 2019



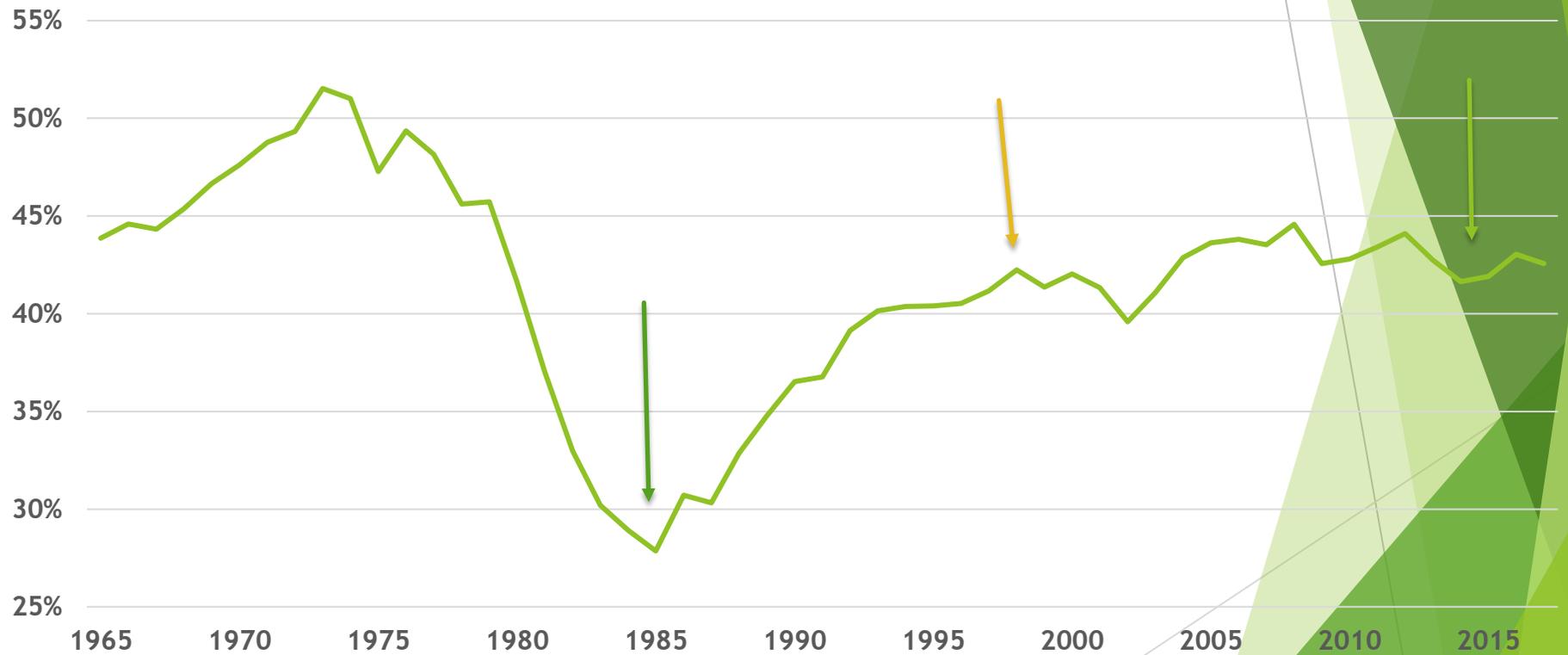
# LNG STILL RELIES ON OIL PRICE INDEXING

Figure 3.12 World Price Formation 2005 to 2018 – LNG Imports



Source: International Gas Union, Global Gas Report 2018

# OPEC MARKET SHARE (AND PRICE CRASHES)



Crashing market share clearly explains the 1985 oil price collapse; but was not so obviously important in 1998 and 2014.

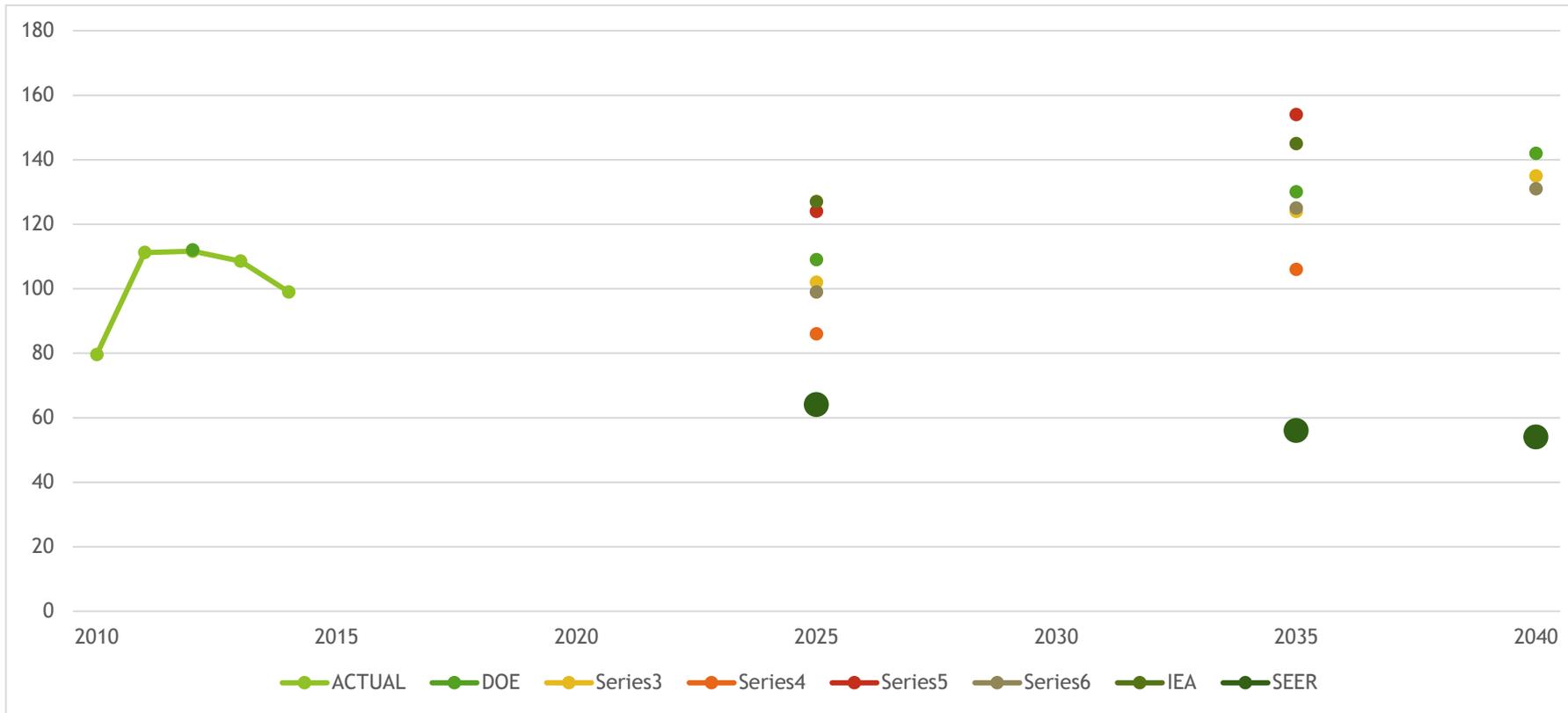
# COLLAPSE FROM LOW PRICE, NOT HIGH



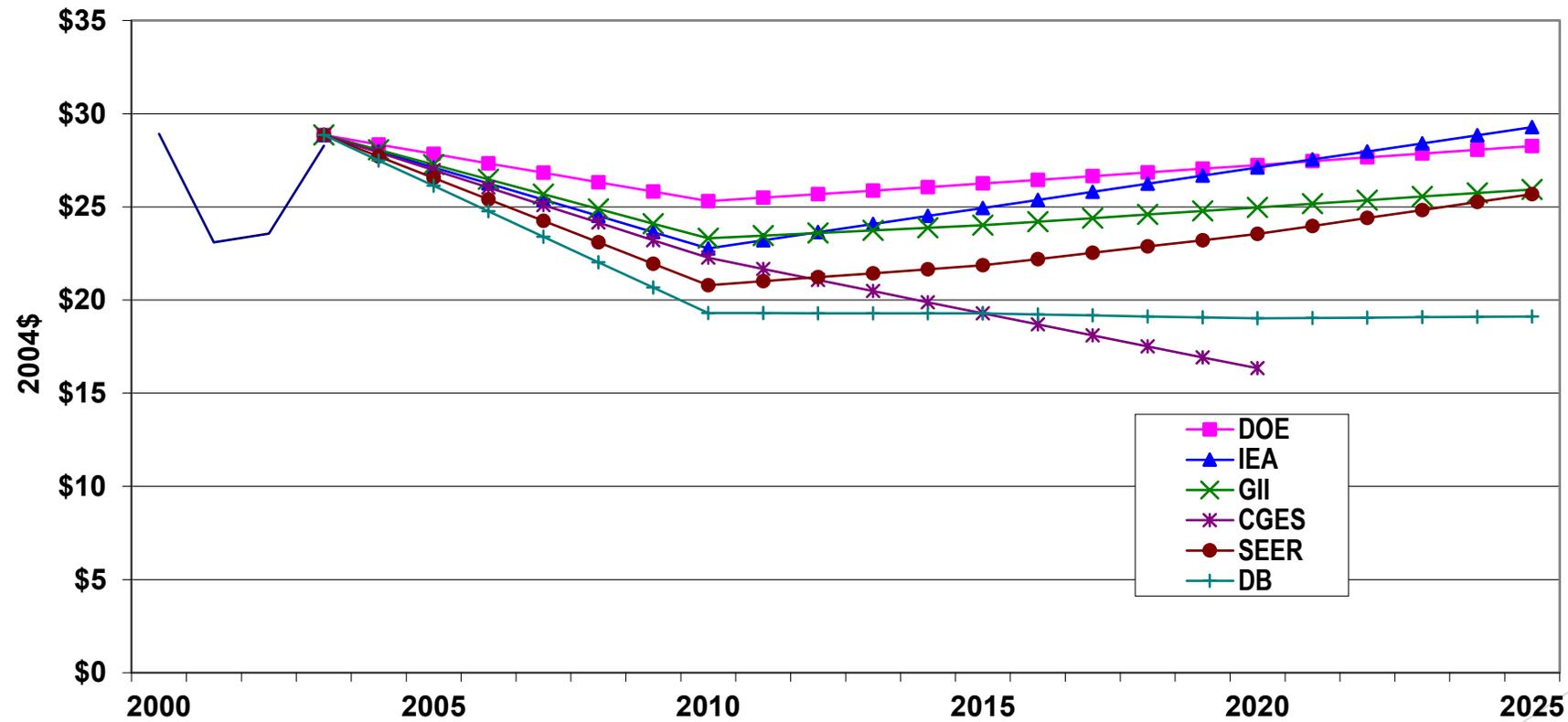
The 1998 oil price collapse occurred from a low price, suggesting it wouldn't last in contrast to 1986 and 2014.

# 2014 OIL PRICE FORECASTS

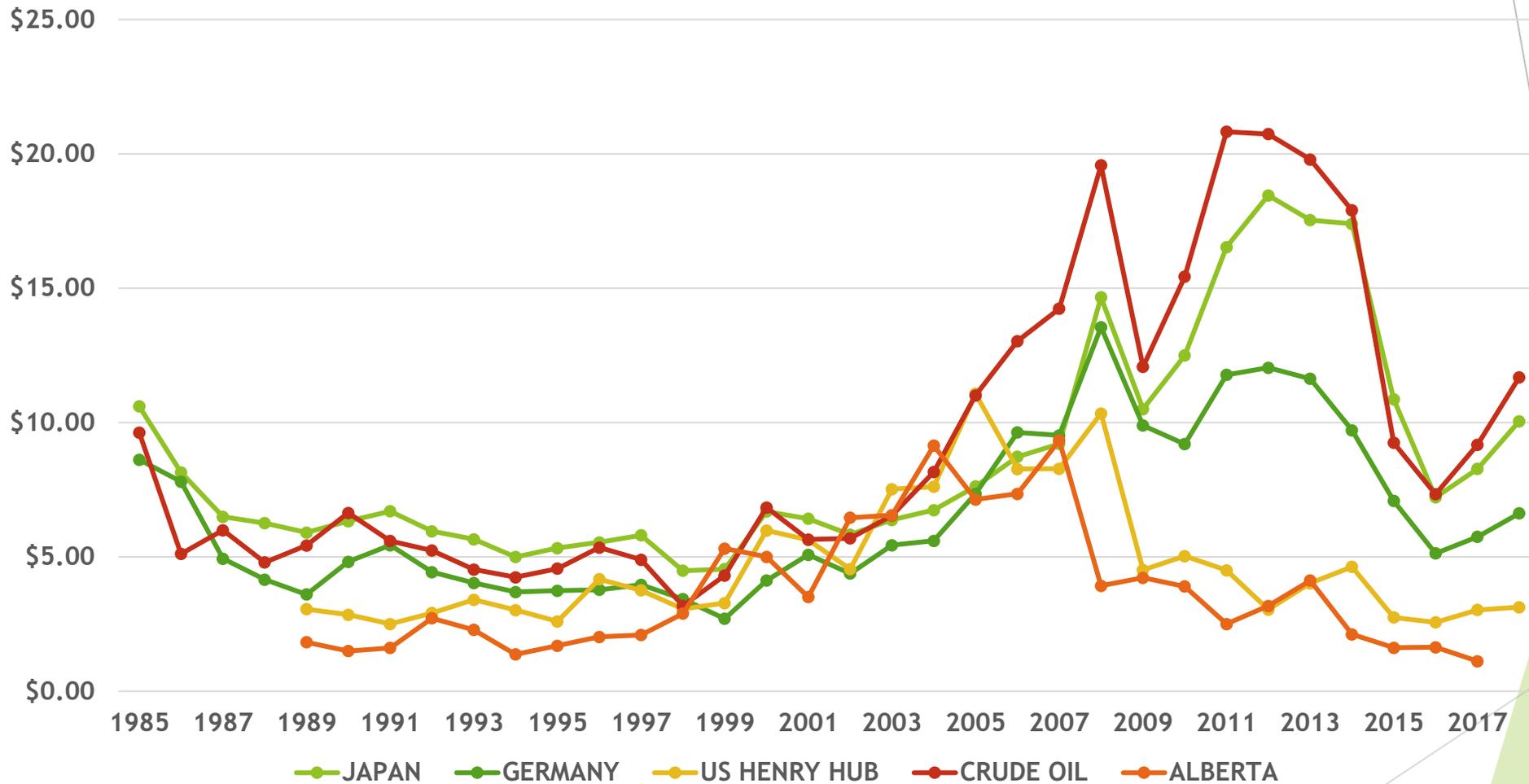
(SPOT THE DRUNK)



# PRICE FORECASTS 2004 / 2005



# GLOBAL GAS PRICES 2018\$/MMBTU

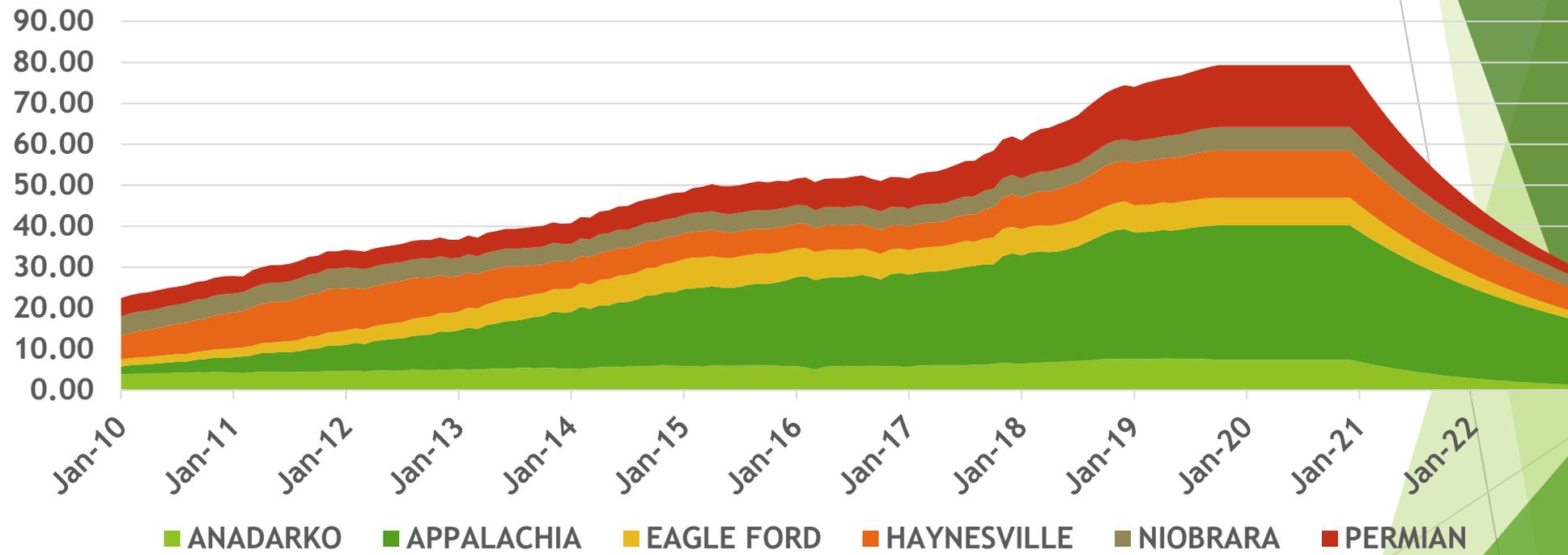


See: "Uncertainties Threaten Natgas Development," *Oil & Gas Journal*, 3/4/13.

# POLITICAL RISKS NOW

- ▶ FRACKING OR FLARING BANS
  - ▶ EXPORT BAN
- ▶ PRICES
  - ▶ MORE MARKETS, MORE PRICES
  - ▶ DIVERGENCE FROM MARKET IS RISKY
- ▶ COAL COMPETITION
  - ▶ CHINA/INDIA ESPECIALLY
- ▶ PRODUCING GOVERNMENT MISBEHAVES
  - ▶ ASSASSINATES DEFECTOR
  - ▶ STARTS TRADE WAR

# SHALE GAS AFTER FRACKING BAN (BCF/D)



# SHALE WITH CONVENTIONAL DRILLING REBOUND

	Shale Oil	Shale Gas	NGLs
	mb/d	bcf/d	mb/d
Jan-21	9	75.9	
Jan-22	4.2	45.8	
Dec-22	2.1	30.1	
2019	8.4	77.2	5.6
2020	9.2	79.4	6.2
2021	6.5	60.6	4.7
2022	3	37.3	2.9
	Assuming switch to conventional drilling		
2021	7.6	67.1	5.2
2022	6	43.8	3.4
	With gas emphasis		
2021	7	70.6	5.5
2022	4	57.3	4.4

# IMPACT ON NATURAL GAS TRADE BALANCE

Production Change Tcf/Yr	A) Production Drop		B) Lost Export Revenue		C) Higher Imports		D) Higher Import Prices	
	2021	2022	2021	2022	2021	2022	2021	2022
Basic ban	6.7	8.5	\$15.6	\$15.6	\$2.1	\$25.9	\$6.4	\$19.2
Ban with shift to conventional drilling	4.5	8.5	\$15.6	\$15.6	\$1.3	\$30.7	\$4.0	\$36.0
Ban with emphasis on conventional gas	3.2	4.8	\$1.7	\$4.2	\$0.0	\$2.1	\$0.0	\$6.4

C) is assuming pipeline imports remain at \$2.68. LNG imports at \$8

D) is assuming all imports are at \$8.

# NOT PERFECT SOLUTIONS

- ▶ IRON-CLAD CONTRACTS GOOD
  - ▶ BUT THINGS RUST
- ▶ GOOD POLITICAL RELATIONS
  - ▶ POLITICIANS AND GOVERNMENTS CHANGE
- ▶ MONOPOLY CUSTOMERS
  - ▶ SUBJECT TO POLITICS
- ▶ CHEAP RAW MATERIAL IS BEST

# THE ROLE OF CONTRACTS

- ▶ PROVIDE SOME PROTECTION
- ▶ PROVIDE HIGH DEGREE OF CERTAINTY
  - ▶ DEPENDING ON MARKET CONDITIONS
- ▶ ALLOCATE RISKS

# TAKE OR PAY CAN BACKFIRE



# GOALS OF PRICING CLAUSES

- ▶ STABILITY (BUYERS/SELLERS)
- ▶ CERTAINTY (BUYERS MORE)
- ▶ COMPETITIVENESS (BUYERS)
- ▶ PROFITABILITY (SELLERS)
- ▶ EQUITY (USUALLY SELLERS)
- ▶ PROTECTION (BUYERS AND SELLERS)

# PRICING CLAUSES

- ▶ FIXED
  - ▶ WITH INFLATOR
- ▶ INDEXED
  - ▶ TO ANOTHER FUEL
    - ▶ COMPETITIVE OR SIMILAR
  - ▶ TO ANOTHER MARKET
- ▶ S-CURVE
- ▶ SPOT

# PRICING CLAUSES

- ▶ FIXED {STABILITY, CERTAINTY}
  - ▶ WITH INFLATOR {PROFITABILITY}
- ▶ INDEXED
  - ▶ TO ANOTHER FUEL {COMPETITIVENESS, EQUITY, PROFITABILITY}
    - ▶ COMPETITIVE OR SIMILAR
    - ▶ TO ANOTHER MARKET
- ▶ S-CURVE {EQUITY, STABILITY}
- ▶ SPOT (COMPETITIVENESS)

# COPING WITH PRICE RISK

## ▶ BUYER:

- ▶ INDEX TO COMPETITION
  - ▶ NOT CRUDE OIL
- ▶ RE-OPENERS

## ▶ SUPPLIER

- ▶ HAVE CHEAP GAS
  - ▶ GUARANTEED PURCHASE PRICES
- ▶ SELL TO MONOPOLIES
- ▶ RE-OPENERS (FOR FEED GAS)

# SUPPLIERS:

- ▶ DIVERSIFY CUSTOMERS BY:
  - ▶ LOCATION
  - ▶ TYPE
  - ▶ COMPETING FUELS
- ▶ INCREMENTAL ADDITIONS BETTER THAN LARGE GREENFIELD
- ▶ LOCK IN BUYERS
  - ▶ BUT NOT TOO TIGHT
- ▶ BE FLEXIBLE

# BUYERS

- ▶ DIVERSIFY SUPPLIERS
  - ▶ NO ONE IS COMPLETELY TRUSTWORTHY
  - ▶ COMPETITION GOOD FOR BUYERS
- ▶ KEEP PRICES COMPETITIVE
  - ▶ IF YOU CAN'T PASS THROUGH AND MAYBE IF YOU CAN
- ▶ MAINTAIN FLEXIBILITY
  - ▶ STORAGE
  - ▶ AVOID DESTINATION RESTRICTIONS
  - ▶ CONTRACT RE-OPENERS

# AVOIDING IRRATIONAL EXUBERANCE

- ▶ RESIST TEMPTATION TO JUST DO SOMETHING
- ▶ DON'T INVEST BASED ON CURRENT PRICE
  - ▶ THEY FLUCTUATE
  - ▶ COMPETITIVE FUELS AS WELL
- ▶ DON'T EXPECT OTHERS TO DO WHAT YOU WANT
  - ▶ ESPECIALLY DON'T ASSUME NO PRICE COMPETITION
- ▶ THE IMPOSSIBLE KEEPS HAPPENING
  - ▶ US NATURAL GAS EXPORTS
  - ▶ OIL PRICES BELOW \$100
- ▶ RELIANCE ON INTANGIBLES IS RISKY



▶ **MEASURE TWICE, CUT ONCE**