

Oil outlook 2021

Searching for a new equilibrium

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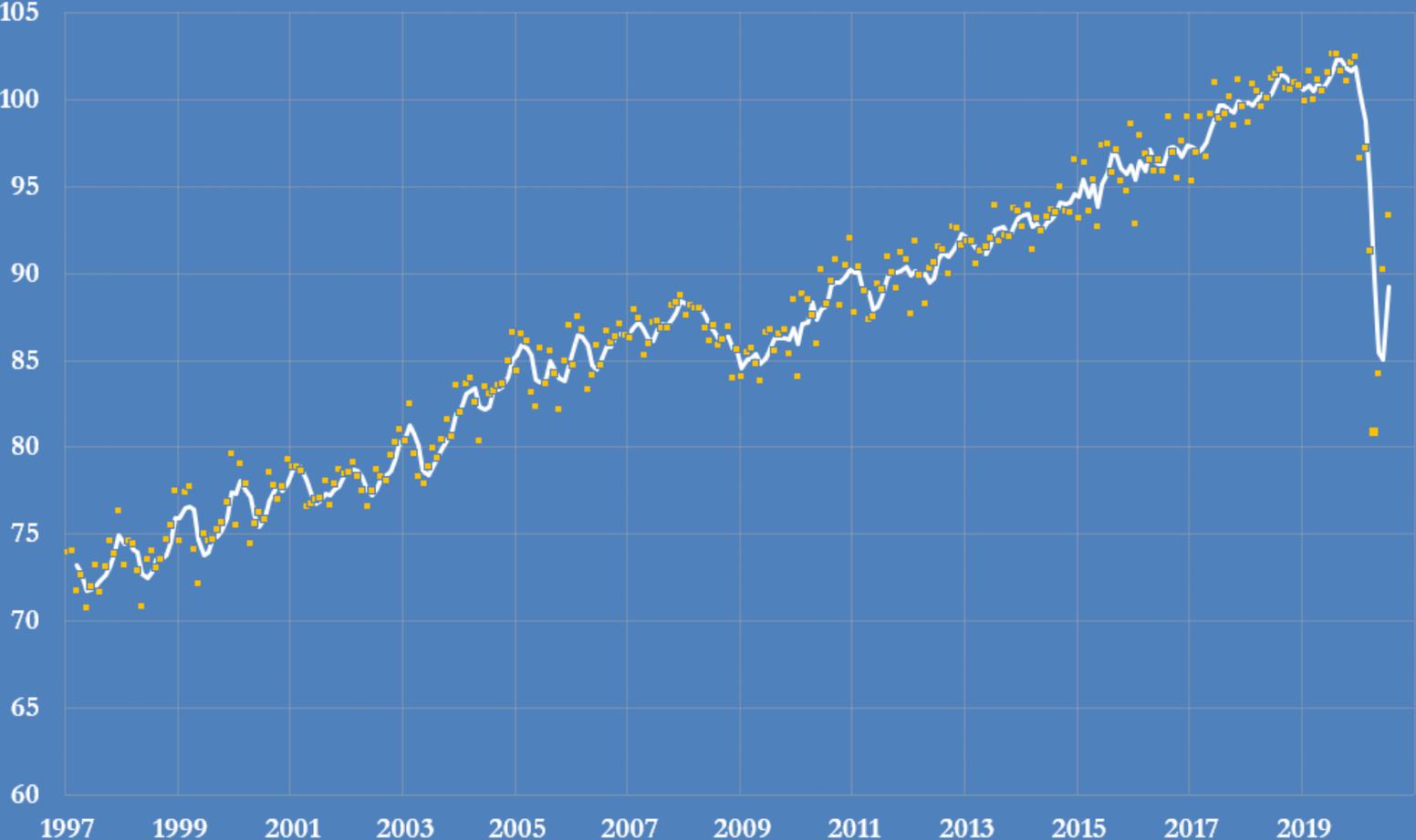
REUTERS

8 October 2020

Global oil industry experienced worst-ever shock in 2020

Epidemic and lockdowns cut consumption by -20mn b/d (-20%) in Apr

Global oil consumption, 1997-2000
million barrels per day, monthly and three-month average



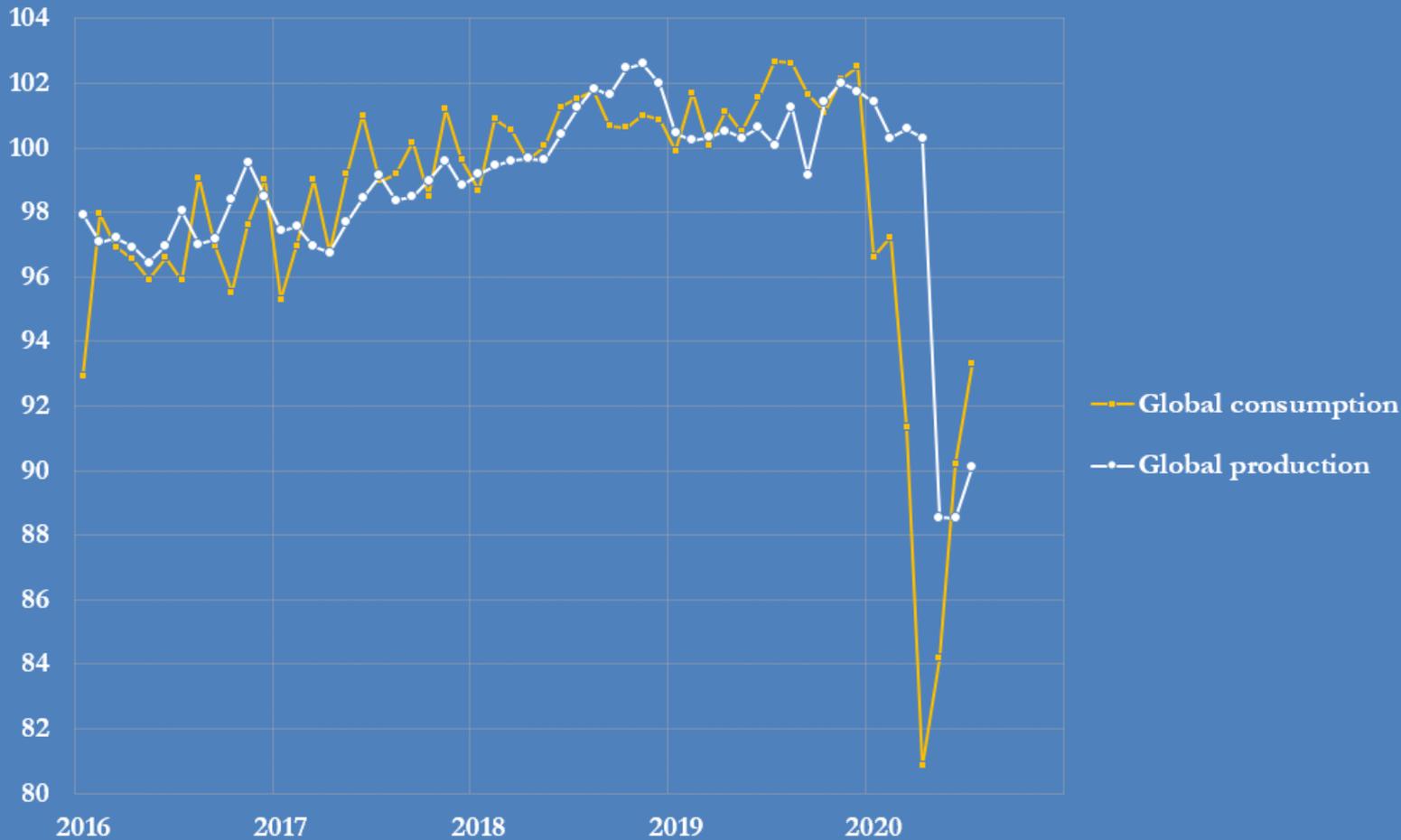
Source: U.S. Energy Information Administration

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Oil producers were slow to respond to fall in consumption

Saudi Arabia and Russia conduct volume war when oil demand already declining

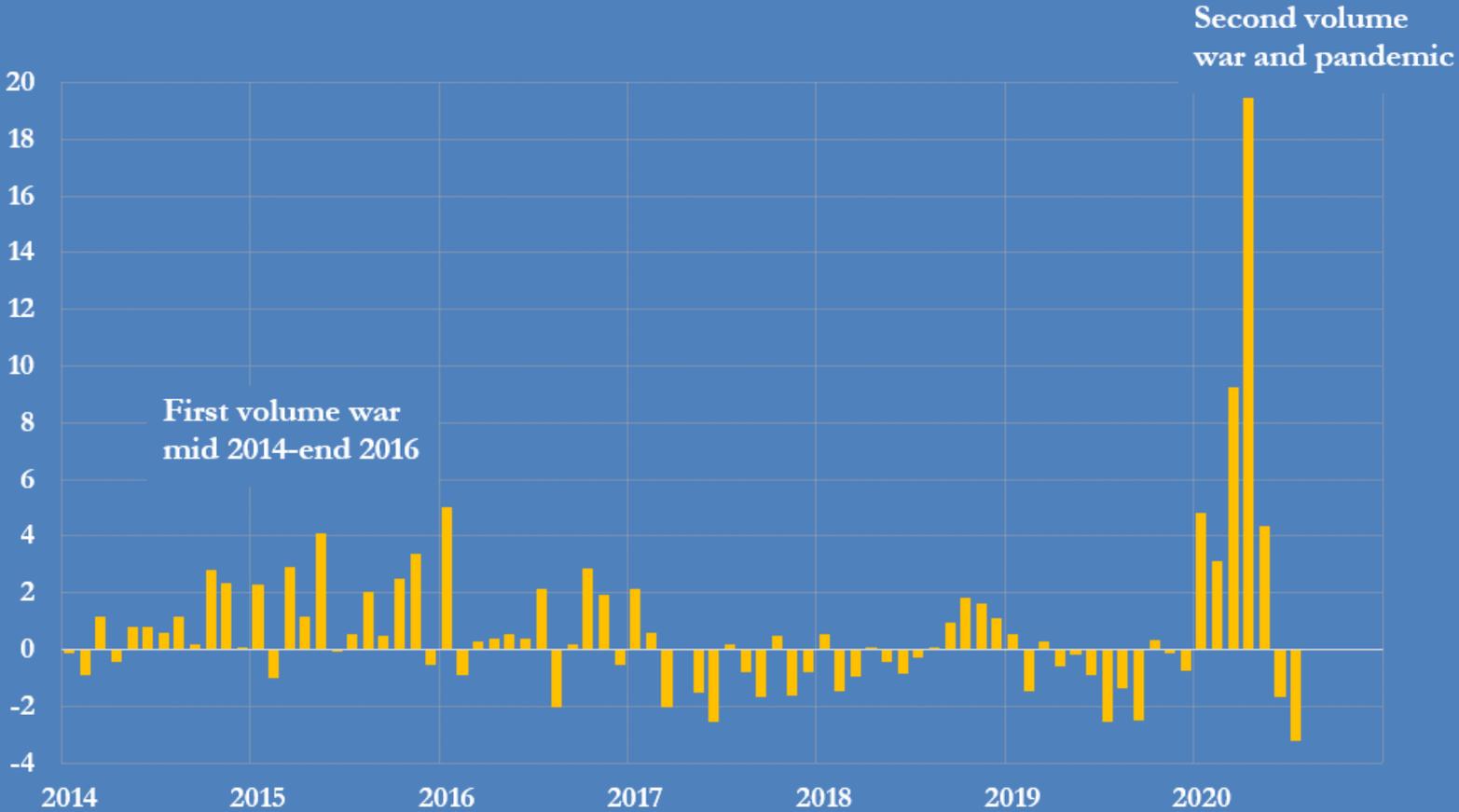
Global oil consumption and production, 2016-2000
million barrels per day, monthly through July 2020



Global market oversupplied every month between Jan and May

Cumulative overproduction of around 1.25 billion barrels

Global production-consumption balance, 2014-2020
million b/d, overproduction (+) and underproduction (-)



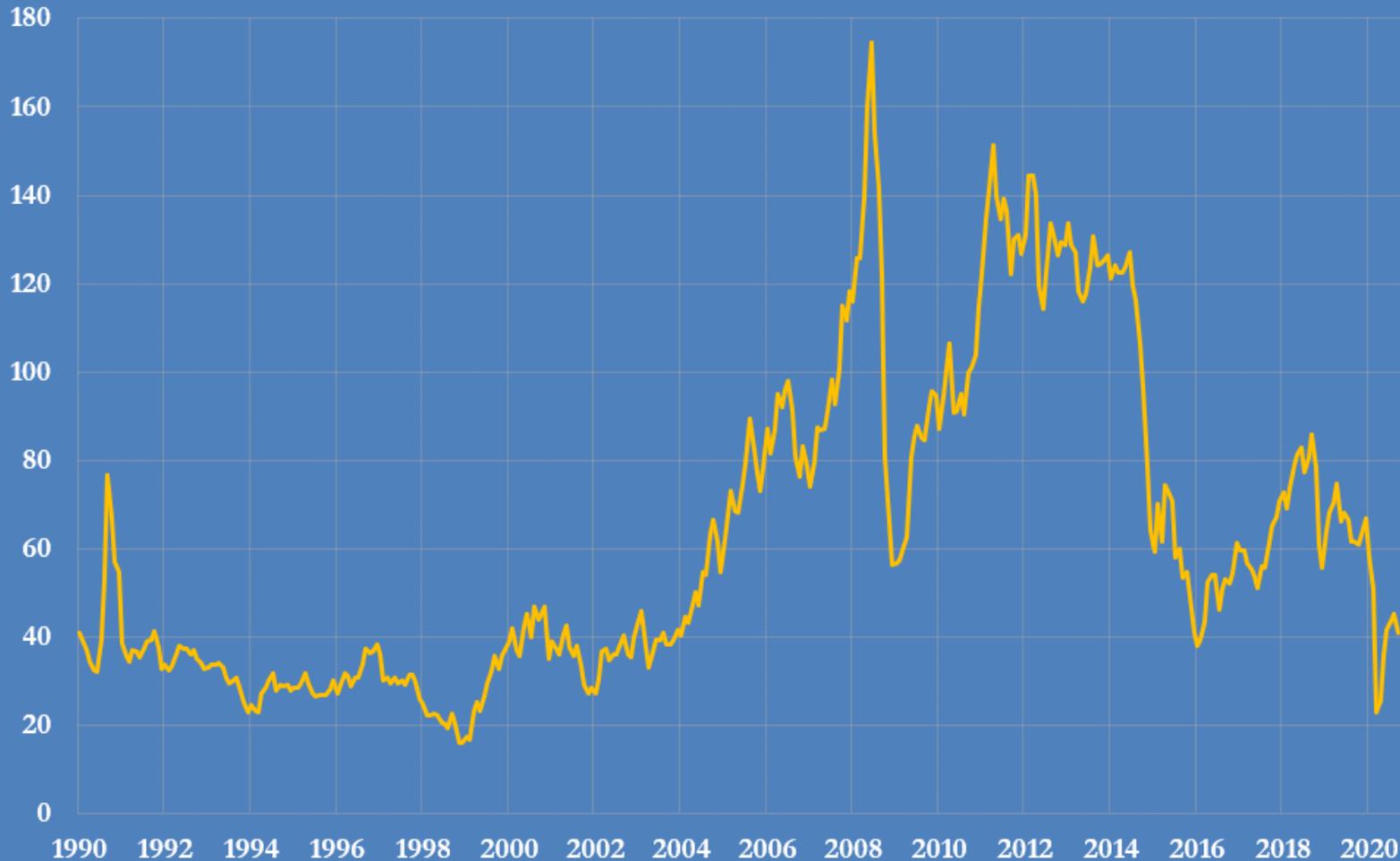
Source: U.S. Energy Information Administration

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Brent crude prices slumped to lowest level since 1999 in real terms

Enforced output reduction by U.S. shale producers and OPEC⁺

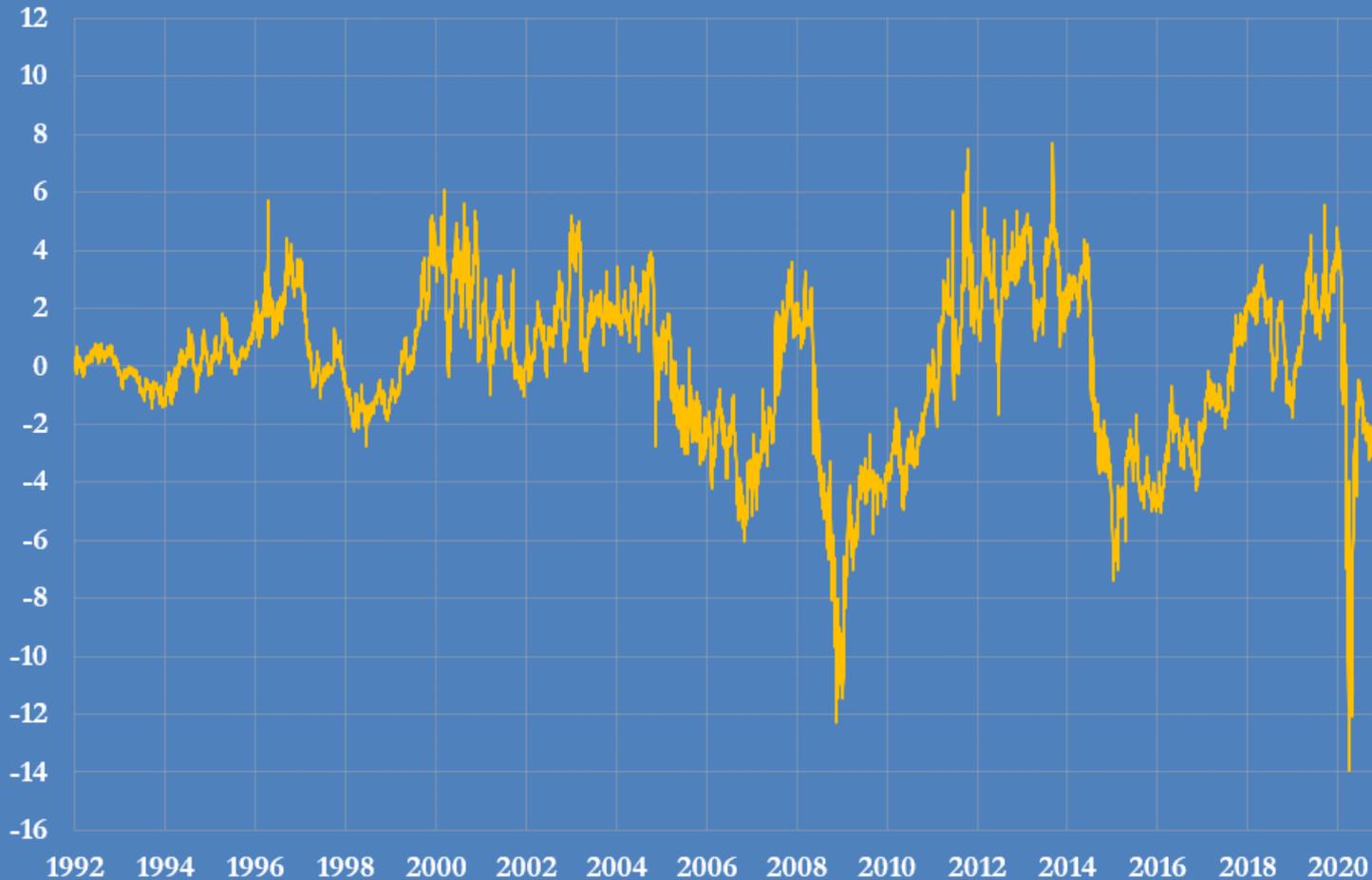
Real oil price, U.S./bbl, monthly, 1990-2020
Front month Brent futures adjusted by U.S. CPI ex food and energy



Brent prices moved to deep contango reflecting record stock build

Intensified pressure for immediate output cuts, incentivized storage

Shape of the futures price curve in Brent crude
Contango (-) or backwardation (+) from months 1 to 7 (US\$/bbl)



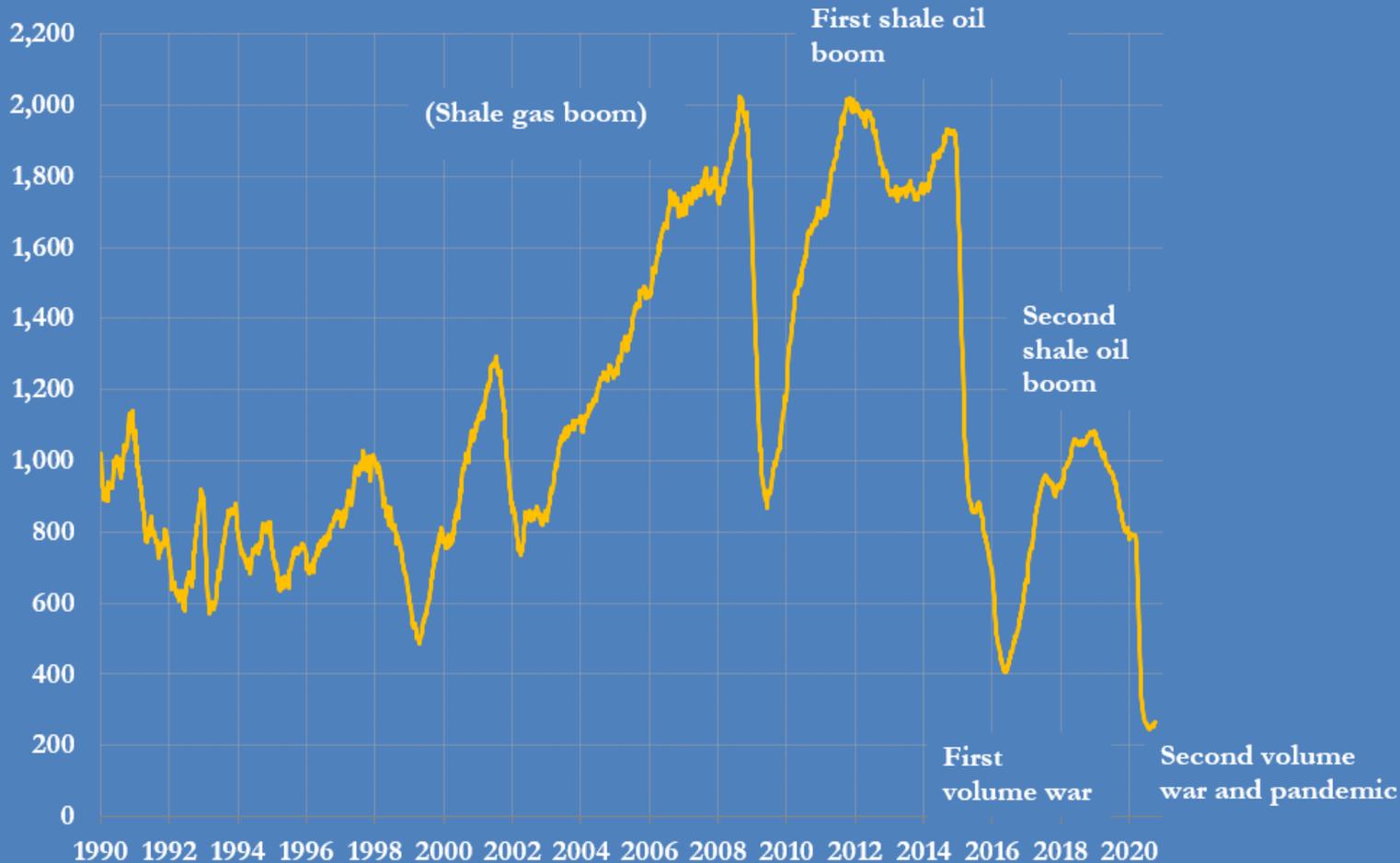
Price difference Brent month 1 and month 7 (U.S.\$/bbl)
Contango (-) or backwardation (+)

Source: ICE Futures, @JKempEnergy

U.S. oil and gas drilling tumbled in response to lower prices

Active rig count declines -70% between Jan and mid-Aug

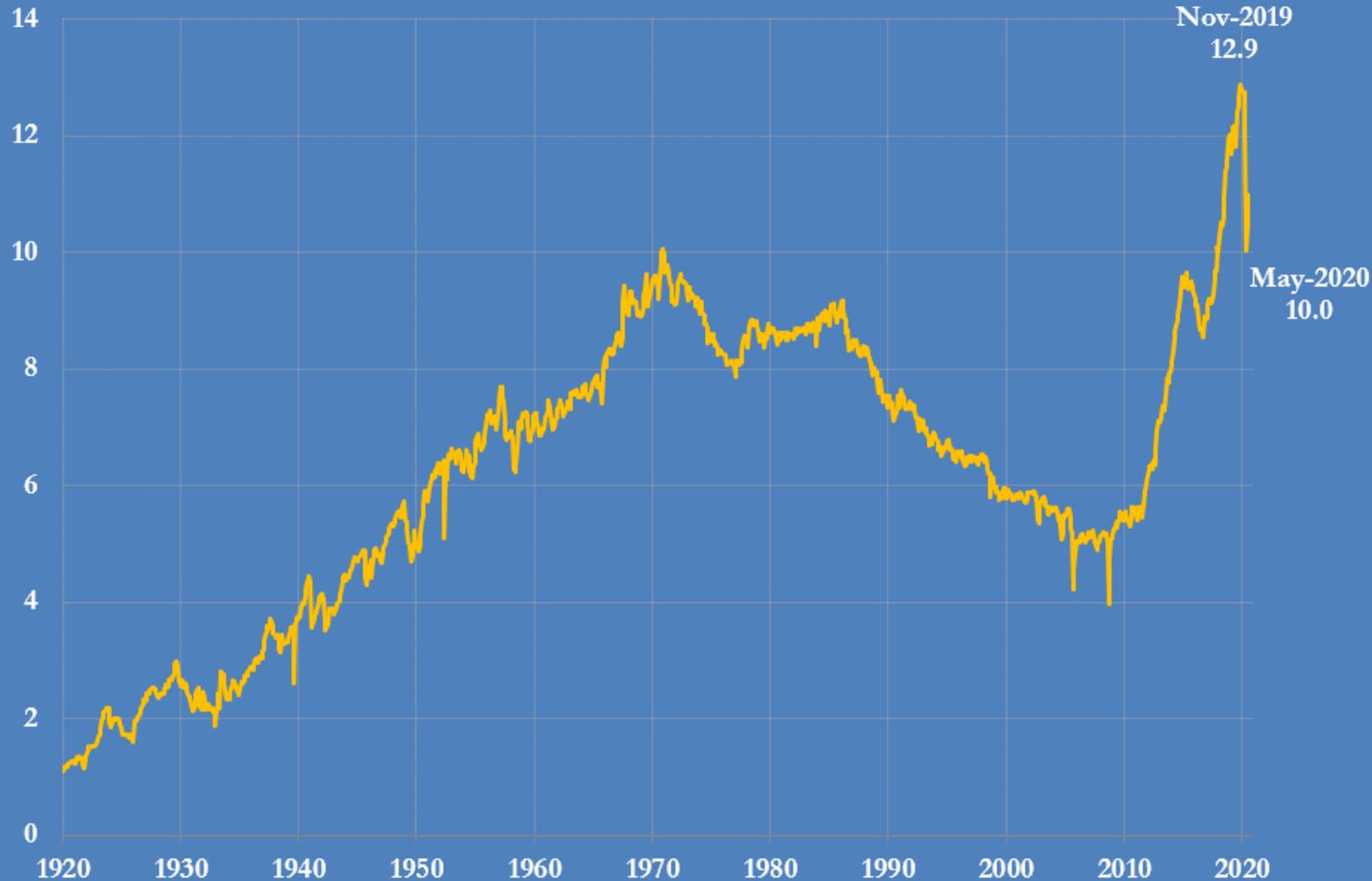
Number of rigs drilling for oil and gas in United States
weekly, 1990-2020



U.S. oil production fell at fastest rate on record

Drilling slowdown, completion slowdown, wells choked back or shut-in

U.S. crude oil production, 1920-2020
monthly, million b/d

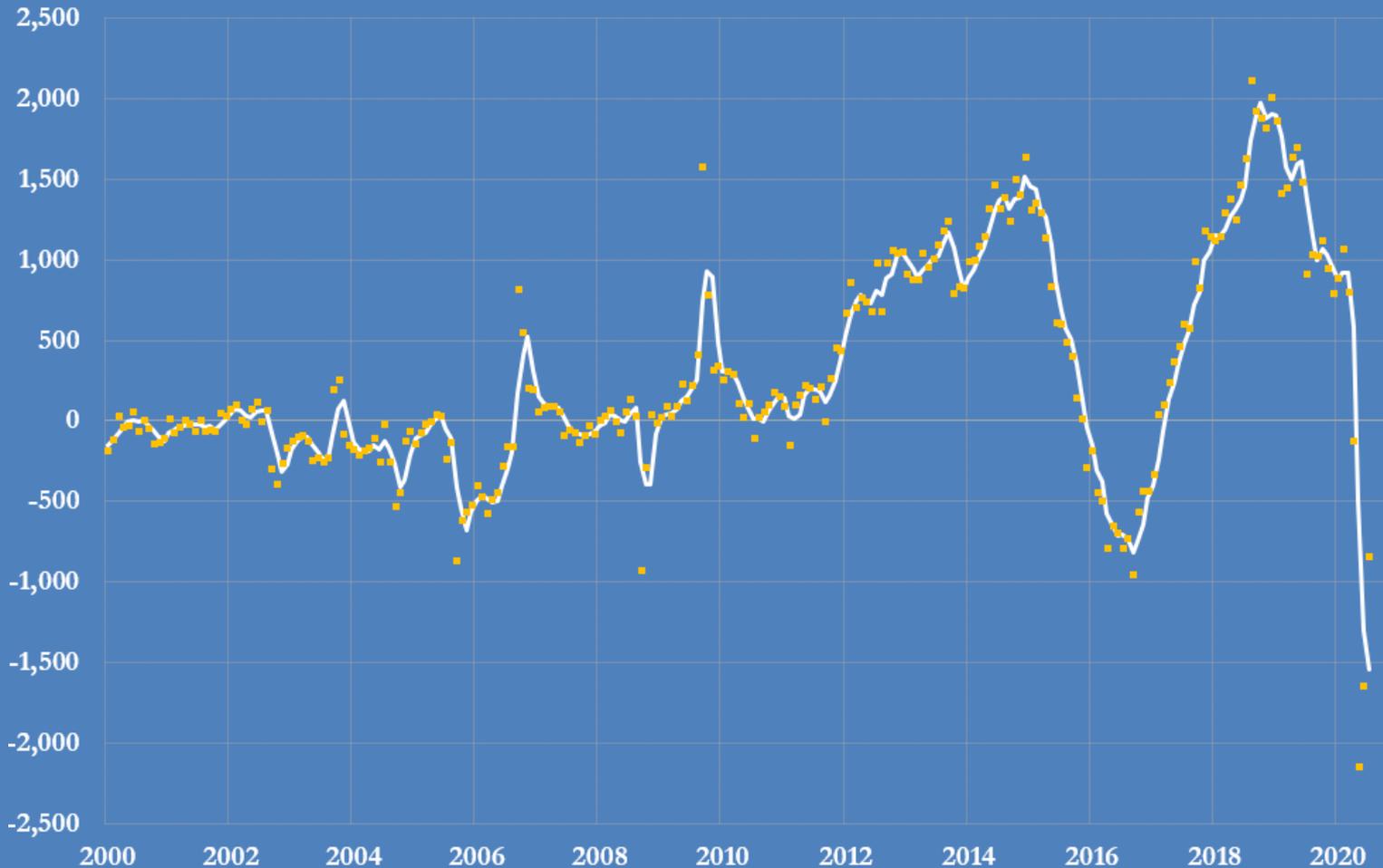


U.S. oil production pivots from expansion to contraction

From +1.1 million b/d year-on-year growth in Feb to -2.1 million b/d in May

U.S. crude oil production, 2000-2020

Increase compared with prior year, monthly and 3-mth average, 000 b/d



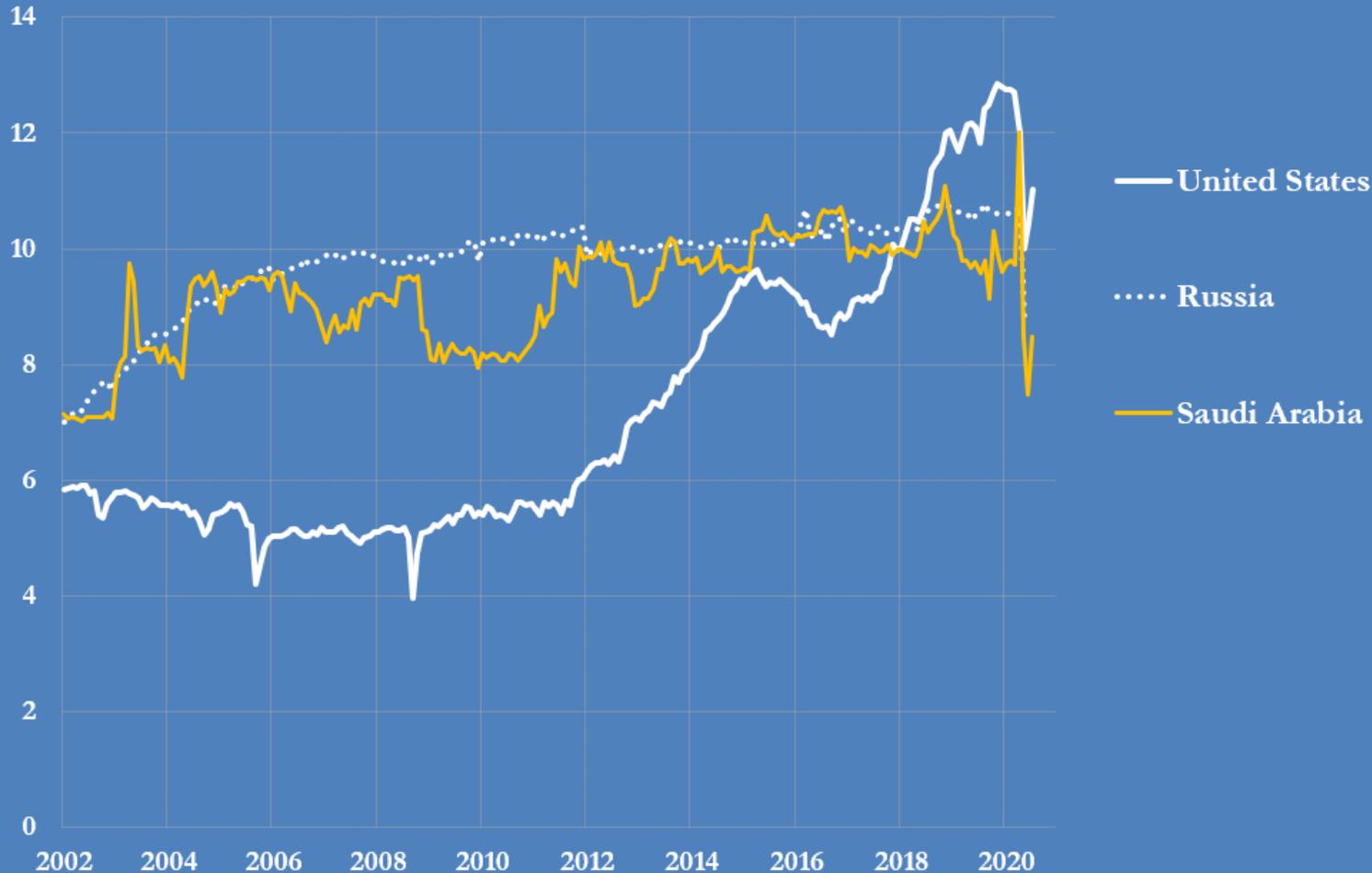
Source: U.S. Energy Information Administration

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Oil price slump forces output cuts from all three top producers

Pressure from prices forces shale output cuts and new OPEC+ agreement

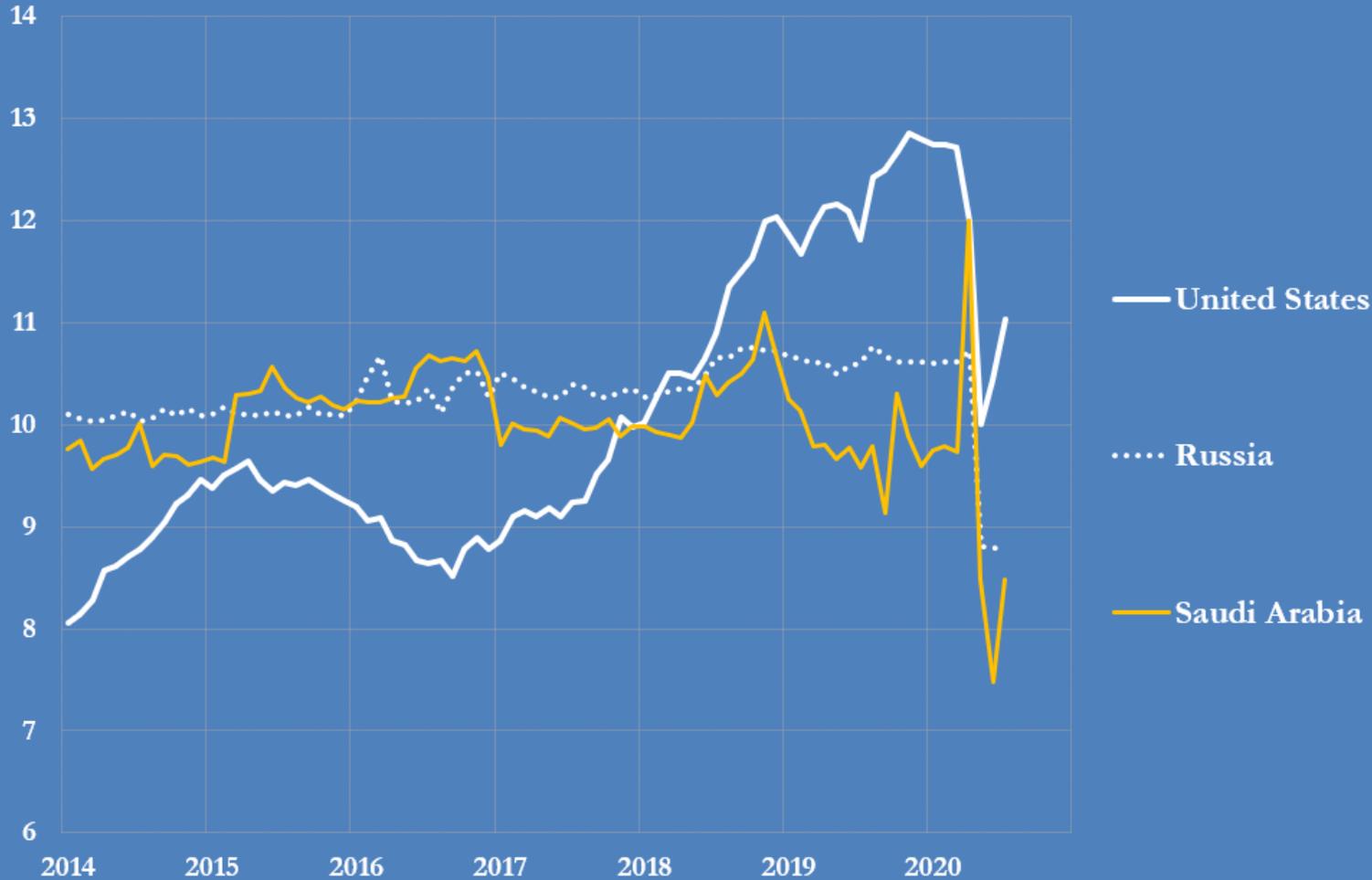
Global crude oil output by top three producers, 2002-2020
million b/d, monthly



Volume war had been launched just as pandemic intensified

Worst possible combination of rising output and falling consumption

Global crude oil output by top three producers, 2014-2020
million b/d, monthly



Post-shock adaptation

Searching for a new sustainable balance between production and consumption

Market rebalancing process has five inter-related elements:

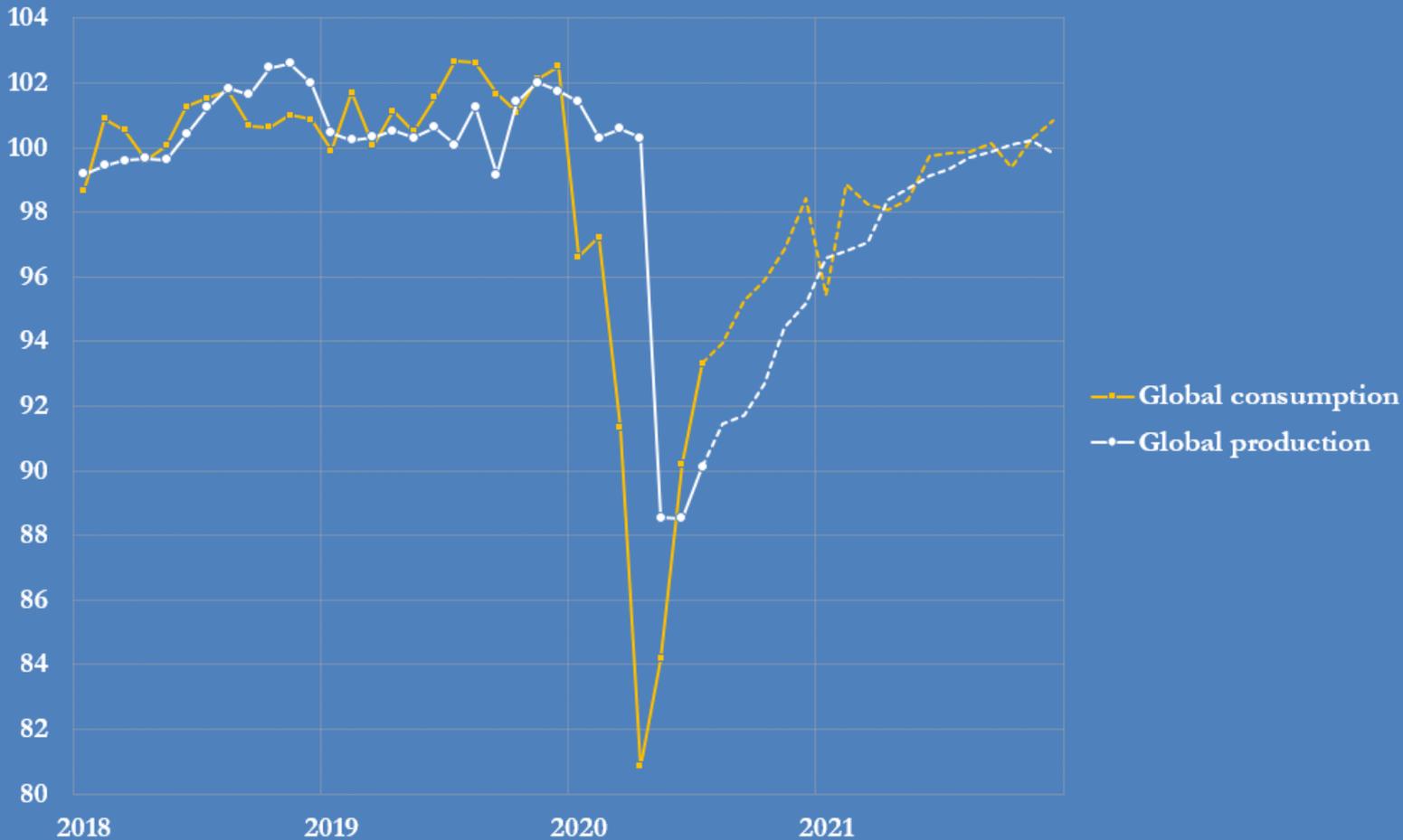
- Closer balance between production and consumption
- Normalisation of crude and product stocks
- Forward price curve
- Sustainable flat price
- Sustainable investment

Partial progress on each element but the adaptation process still has way to run

Criterion 1: Closer balance between production and consumption

Production surplus eliminated, at or below consumption through rest of 2020/21

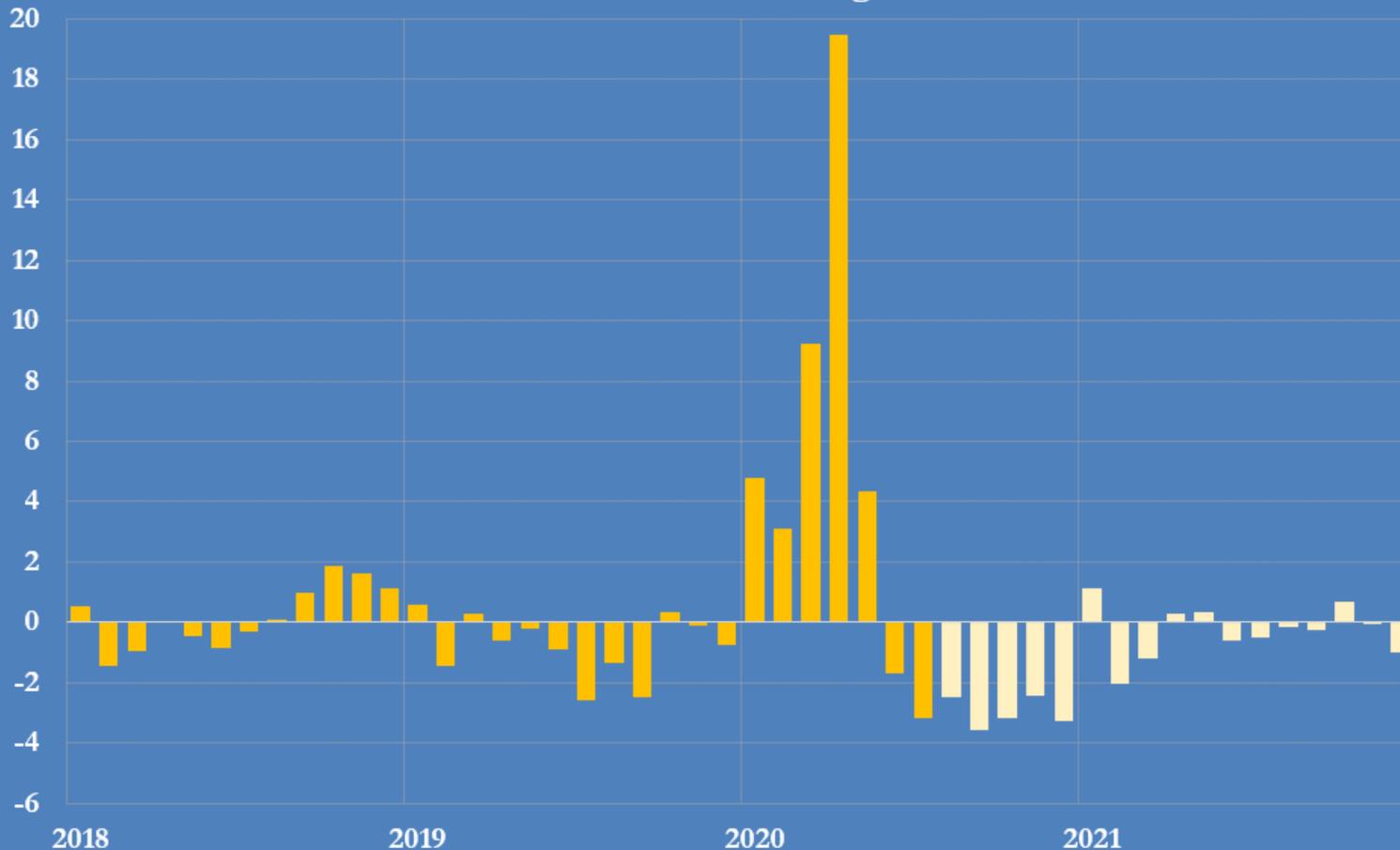
Global oil consumption and production, 2018-2021
million barrels per day, forecast from Aug 2020



Criterion 2: Normalisation of crude and product stocks

Production deficit to reverse earlier accumulation of inventories

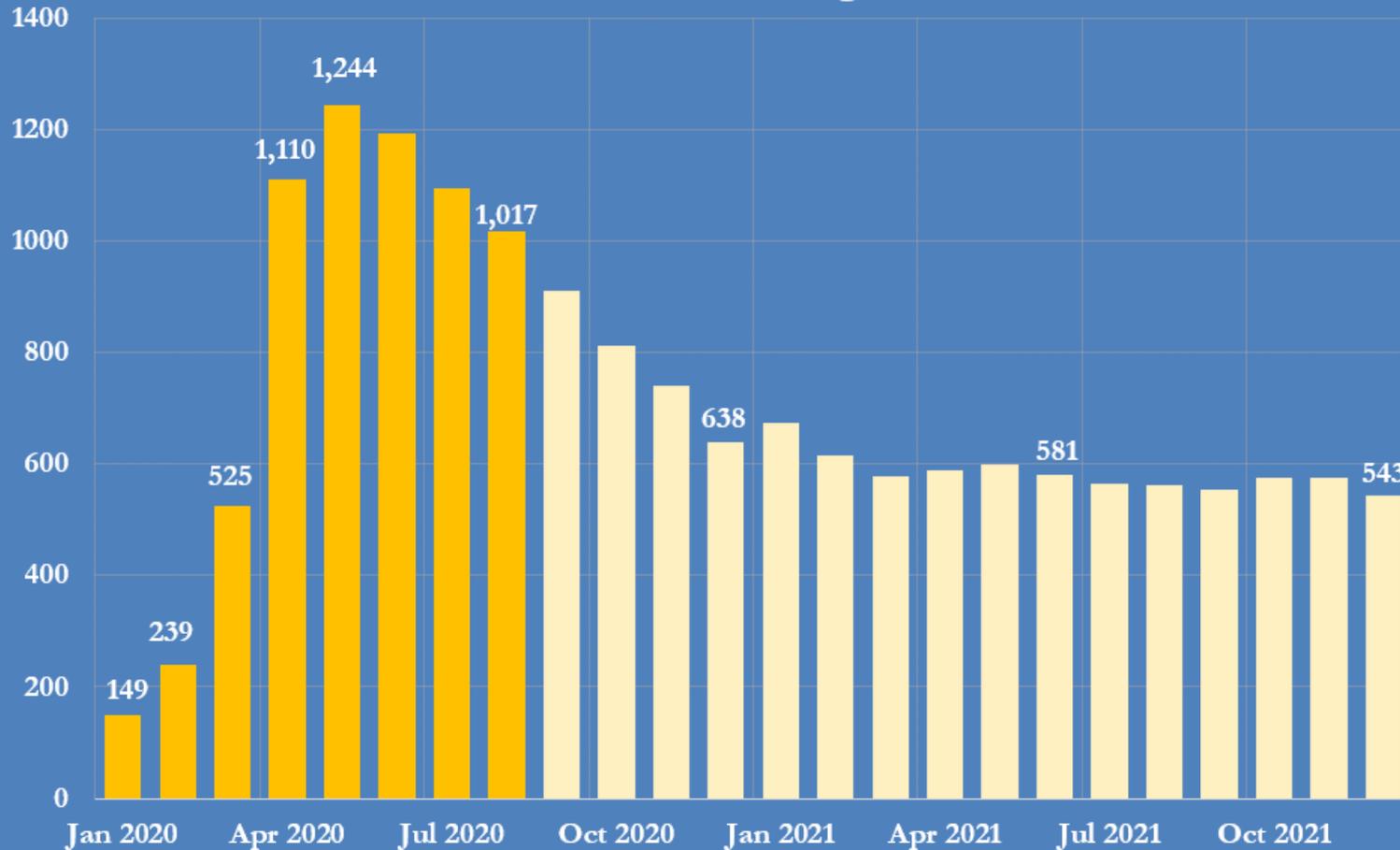
Global production-consumption balance, 2014-2020
million b/d, overproduction (+) and underproduction (-)
forecasts from Aug 2020



Build up of petroleum inventories halved by end of 2020

Crude market was tight at start of Jan 2020 so could absorb some extra stocks

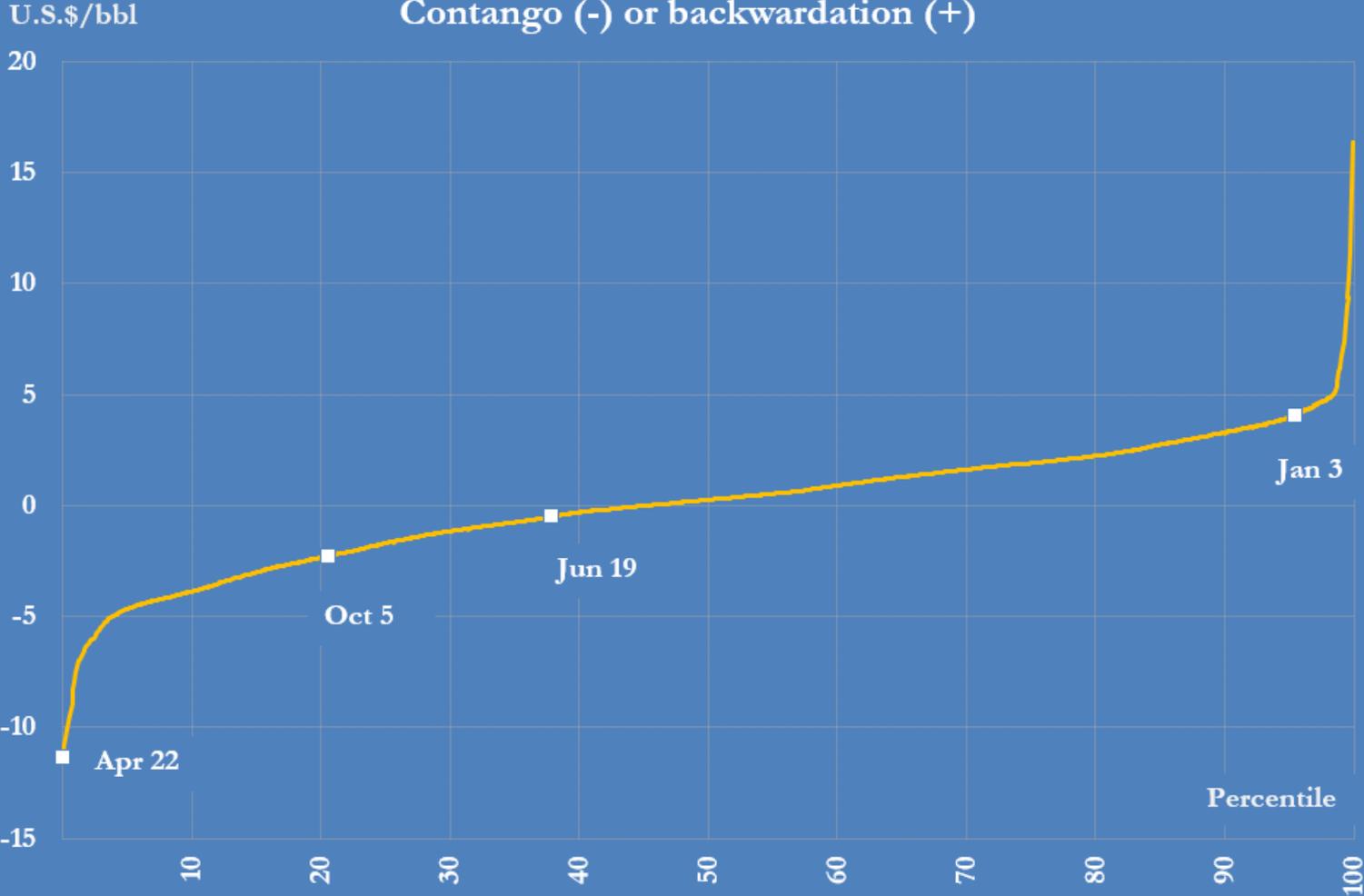
Global petroleum inventories, 2014-2020
Accumulated change since Dec 2019, million bbl
forecasts from Aug 2020



Criterion 3: Forward price curve

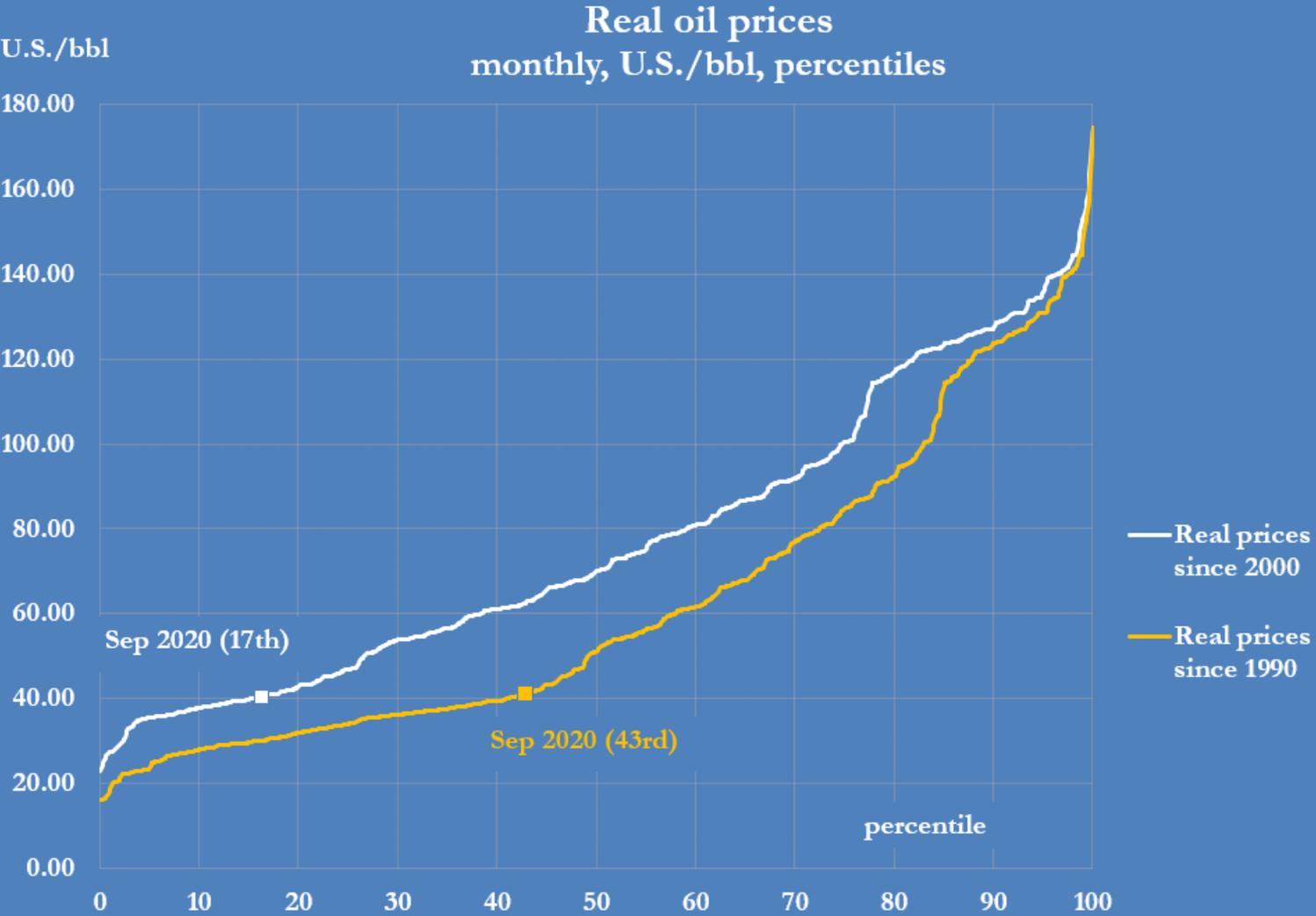
From deep contango to level or even backwardation

Brent calendar spread from month 1 to month 7
Percentiles 1990-2020, US\$ per barrel
Contango (-) or backwardation (+)



Criterion 4: Sustainable flat price

Real prices are still well below long-term averages for last few cycles

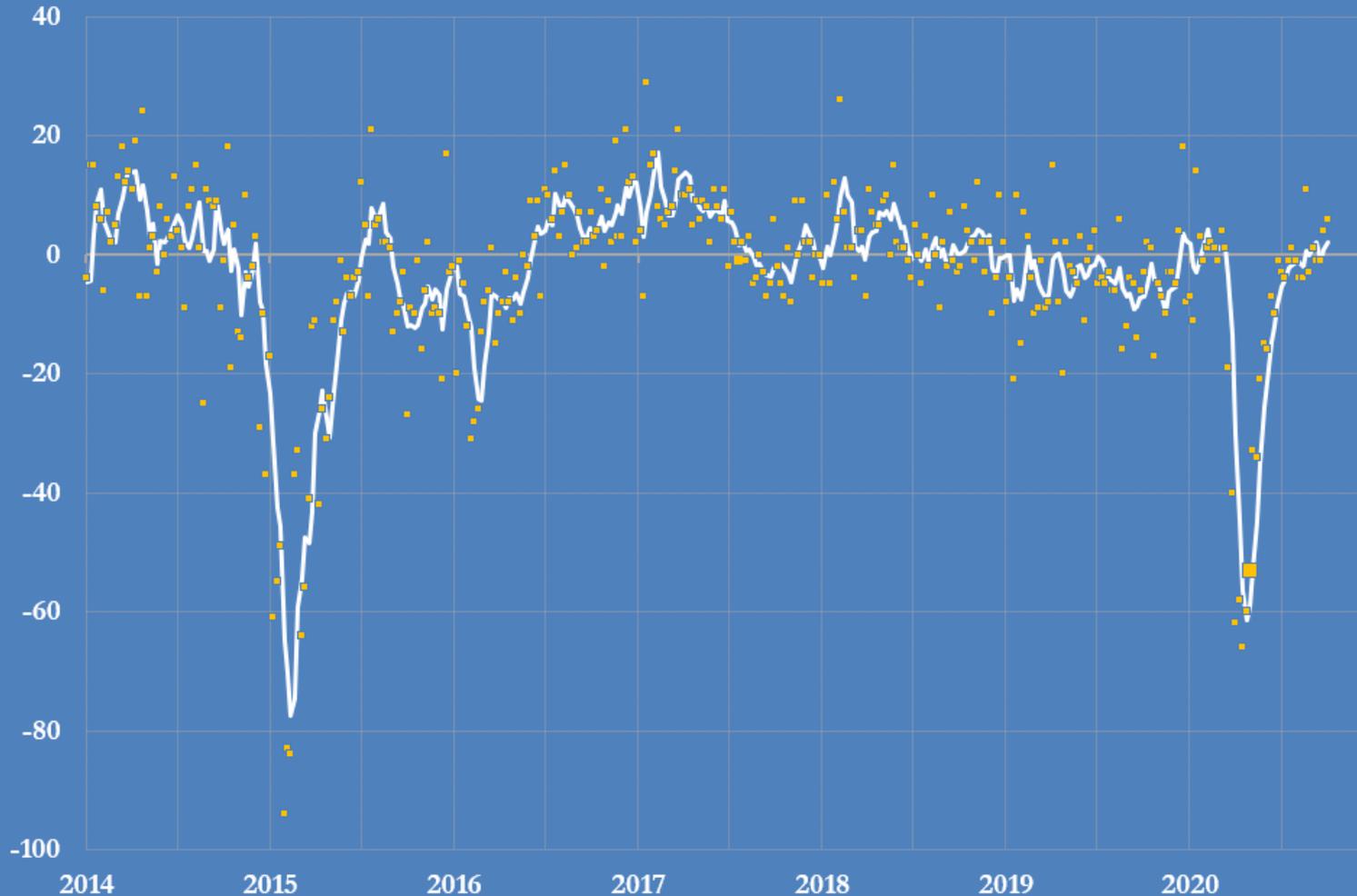


Source: ICE Futures Europe, U.S. Bureau of Labor Statistics

Criterion 5: Sustainable investment

U.S. oil rig count started to increase since Aug in response to earlier rise in prices

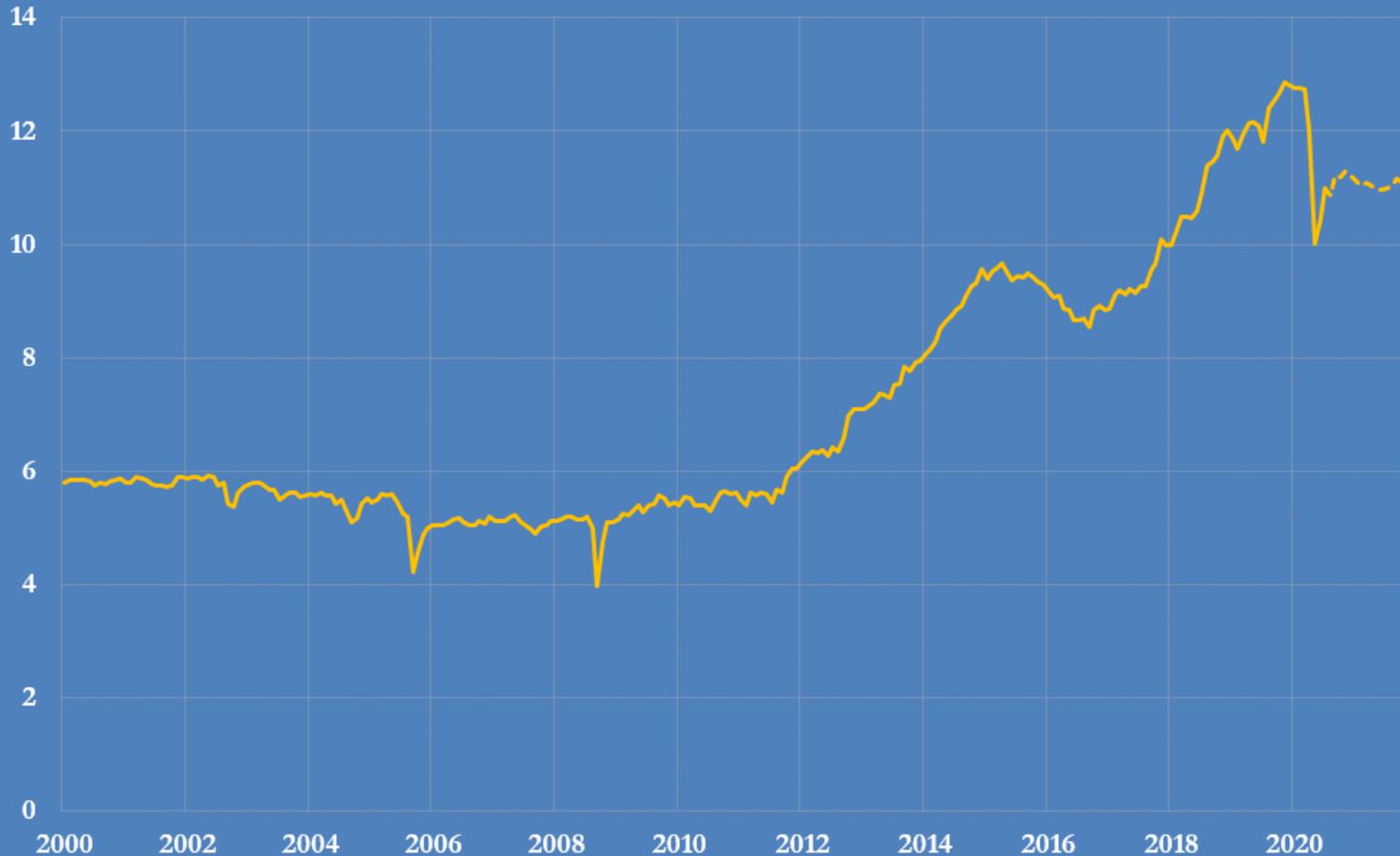
Number of rigs drilling for oil in the United States
Change from prior week and four-week average



U.S. oil production expected to remain broadly stable

Crude output around or just below 11 million b/d before climbing in late 2021

U.S. crude oil production, 2000-2021
million barrels per day, actual and forecast



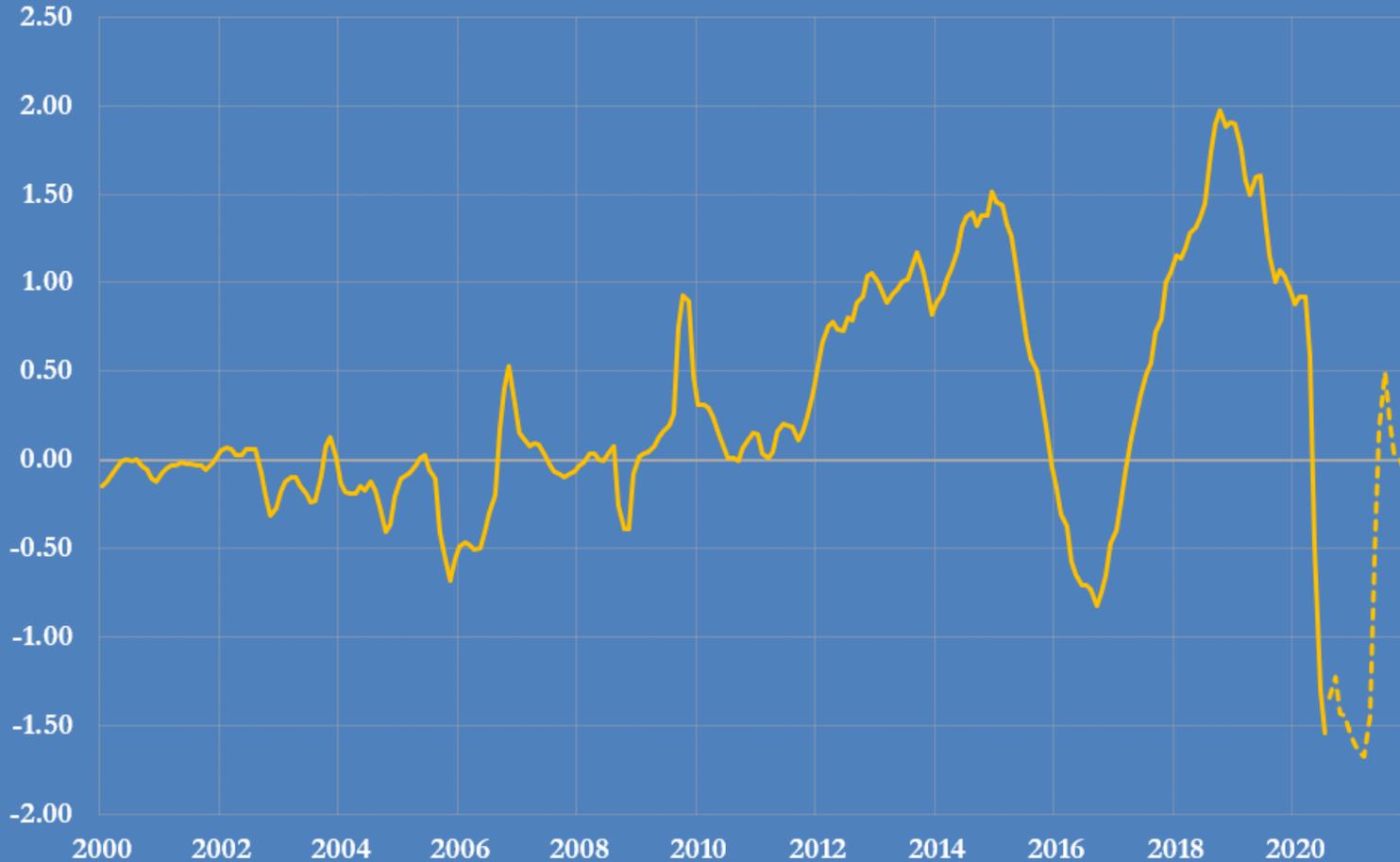
Source: U.S. Energy Information Administration ("Short-Term Energy Outlook", Oct 2020)
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U.S. output has already absorbed shock of epidemic and volume war

Shale production has adapted to reduced consumption via price forced adjustment

U.S. crude oil production, 2000-2021

million b/d, change from prior year, three-month average, actual and forecast

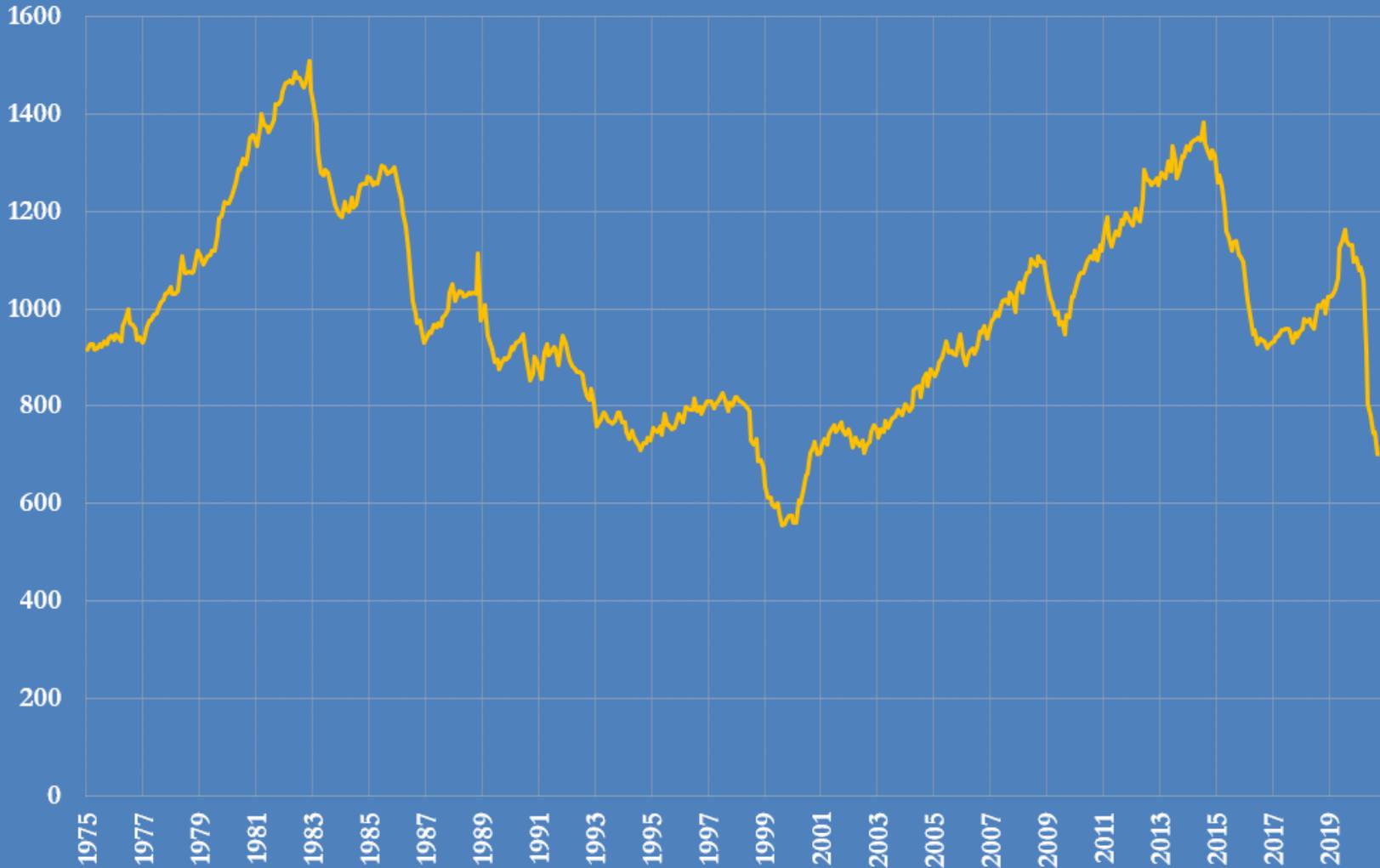


Source: U.S. Energy Information Administration ("Short-Term Energy Outlook", Oct 2020)
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Global oil and gas drilling has slumped

Active rig count down by -40% from recent cyclical peak in Jul 2019

Rigs drilling for oil and gas outside North America



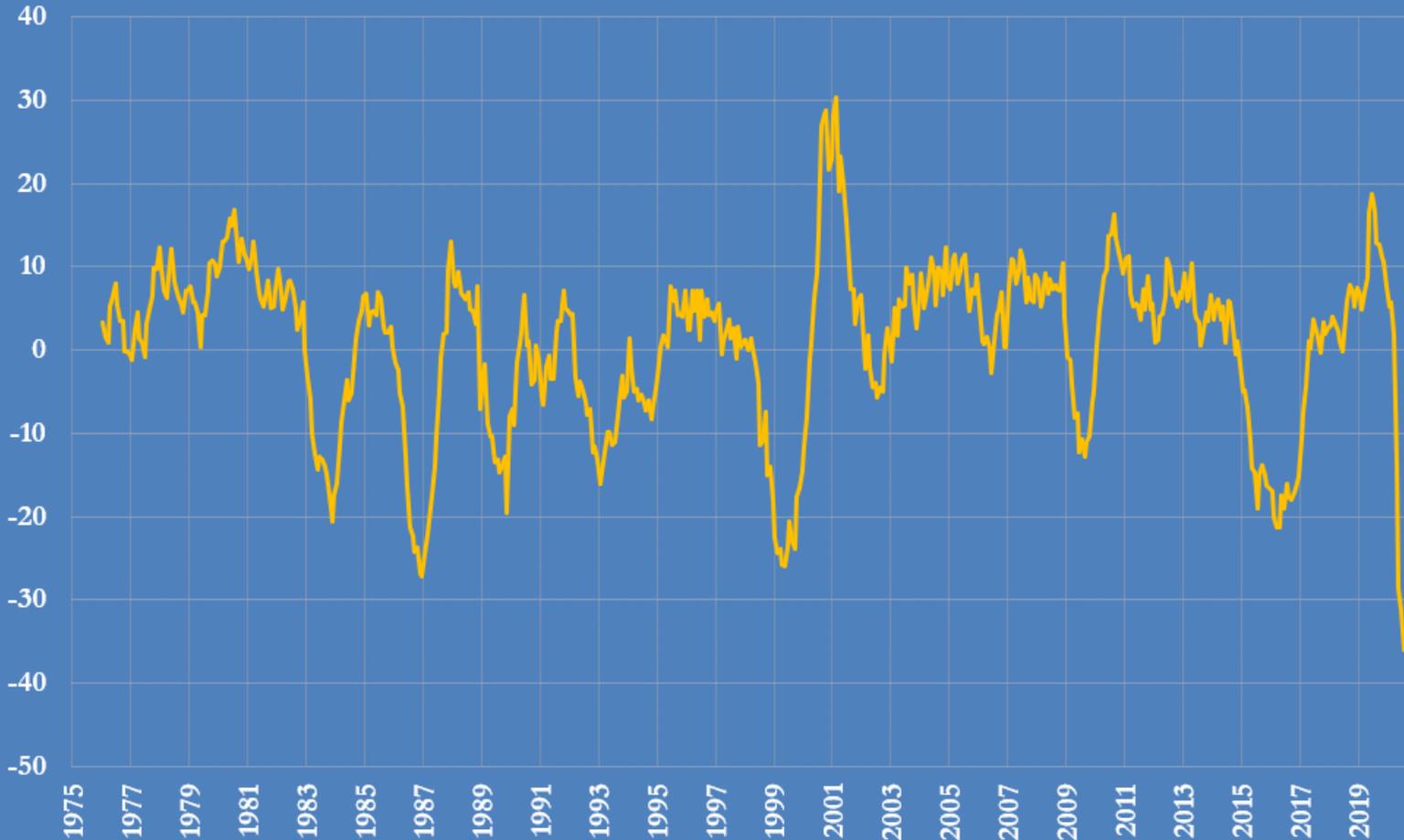
Source: Baker Hughes

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Global exploration and production downturn deepest for decades

More drilling needed just to stabilize output, implying higher cash flow and prices

Rigs drilling for oil and gas outside North America
monthly, percent change from prior year



Source: Baker Hughes

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Critical issues for the oil market in 2021

Major sources of uncertainty

Global pandemic evolution

- ❖ Vaccine deployment timeline
- ❖ Effectiveness and normalization
- ❖ Other control measures
- ❖ International aviation recovery
- ❖ Permanent behavior change

Global business cycle

- ❖ Pandemic evolution
- ❖ Cyclical unemployment
- ❖ Fiscal and monetary responses
- ❖ Structural unemployment

U.S. elections

- ❖ Trump or Biden
- ❖ Senate majority
- ❖ Supreme Court control

U.S. energy diplomacy

- ❖ Iran nuclear accord and crude exports
- ❖ Venezuela sanctions and enforcement
- ❖ Saudi Arabia relationship
- ❖ OPEC coordination

U.S./China relations

- ❖ Continuity or change
- ❖ Destabilization or restabilization
- ❖ Economic confrontation
- ❖ Energy flows
- ❖ Global investment environment

U.S. domestic energy production

- ❖ Federal government policy
- ❖ Investment flows and capital discipline
- ❖ Drilling programs and price sensitivity

Three key players: United States, Russia and Saudi Arabia

Learning to live together? Coordination or cohabitation? Menage à trois?

Two key relationships define the oil market

- ❖ U.S. shale with Saudi Arabia and Russia
- ❖ Russia and Saudi Arabia with each other

U.S. shale production – the boom bust cycle

- ❖ Output growth much faster than global consumption
- ❖ Captured 66-75% of incremental global consumption 2009-2019
- ❖ Market share doubled from 7-11% in 2009 to 15-19% in 2019
- ❖ Shale growth trajectory no longer sustainable

Saudi Arabia and Russia – struggling to agree

- ❖ Divided over response to shale
- ❖ Protect prices or defend market share
- ❖ Disagreement was at heart of second volume war
- ❖ Target of roughly \$50 (Russia) or \$70 (Saudi Arabia)?

U.S. shale revealed as marginal price setter

- ❖ Rapid expansion >\$65-70
- ❖ Contraction <\$50-55
- ❖ Disagreements will re-emerge when oil prices rise above \$50