Key points

Strong global economic rebound broadly expected this year and in 2022
- Led by emerging markets, 3rd party consensus estimates for global real GDP growth have risen to 4.7% y/y in 2021 and 4.0% y/y in 2022

Record global oil demand growth could stretch supply – EIA projects record two-year demand growth of +5.3 mb/d in 2021 and +3.8 mb/d in 2022 – and new global highs by Q4 2022
- OPEC & Russia could redeploy 4.6 mb/d of capacity by Q4 2022 per EIA
- The U.S. could add 3.0 mb/d of liquids production for a record-high of 20.8 mb/d by Q4 2022 per EIA

Natural gas – Strong productivity helped sustain production despite historically low drilling activity
- U.S. solid (regionally disparate) winter demand; record natural gas exports
- Natural gas remains integral to planned U.S. power generation capacity additions, but global coal-fired power additions could outpace it
Industry capital expenditures remained historically low in Q4 2020, and the backlog of U.S. projects under construction has fallen by $50 billion y/y

- The industry invested $42.1 billion in Q4 2020, compared with $70.5 billion in the same quarter one year ago
- Across the energy value chain, API is monitoring 77 oil & gas-related projects currently under construction worth $194 billion

Capital expenditures by industry segment

<table>
<thead>
<tr>
<th>Industry Segment</th>
<th>Billion Dollars (2021$)</th>
</tr>
</thead>
<tbody>
<tr>
<td>Downstream and Petrochemical</td>
<td>$69 B</td>
</tr>
<tr>
<td>Equipment &amp; Services</td>
<td>$18 B</td>
</tr>
<tr>
<td>Midstream</td>
<td>$84 B</td>
</tr>
<tr>
<td>Global integrated</td>
<td>$119 M</td>
</tr>
<tr>
<td>Upstream</td>
<td>$23 B</td>
</tr>
</tbody>
</table>

$194 billion in current U.S. energy infrastructure investments

- 7 LNG expansions: $84 billion
- 23 PetChem expansions: $69 billion
- 17 Refinery expansions: $18 billion
- 21 Pipelines: $23 billion
- 9 Gas storage: $119 million

Sources: S&P Market Intelligence; Oil & Gas Journal; American Chemistry Council; API Team calculations as of Feb. 2021

* All other oil & gas industry companies

Sources: Bloomberg; publicly-available company reports; BLS
Global Economy
Led by emerging markets, 3rd party consensus estimates are for global real GDP growth of 4.7% y/y in 2021 and 4.0% y/y in 2022.

Every region is expected to grow in 2021 and 2022, but China and the rest of Developing Asia Pacific economies have remained on a greater scale with relatively mild 2020 recessions and strong resumed growth.

China could overtake the U.S. as the world’s largest economy by 2028 per Bloomberg.
Global oil prices have historically been inversely correlated with the U.S. dollar’s broad foreign exchange value.

Three quarters after the onset of the Great Financial Crisis in 2008, the U.S. dollar appreciated, and oil prices fell. By contrast with the 2020 COVID-19 recession, the U.S. dollar depreciated, and oil prices rose.

Recent U.S. dollar depreciation has correlated with increased oil prices.
### What we’re watching now

> Although uncertainties on the path of global recovery remain, natural gas and oil demand is generally expected to be led by emerging markets. Central Bank Digital Currencies may present a credible threat to the U.S. dollar’s global status.

<table>
<thead>
<tr>
<th>Global economy on firmer ground, but with divergent recoveries amid high uncertainty</th>
</tr>
</thead>
<tbody>
<tr>
<td><strong>Improved outlook.</strong> Upgraded 2021 and 2022 GDP forecasts by +0.8% and +0.2%, respectively</td>
</tr>
<tr>
<td><strong>Divergent impacts.</strong> Disproportionate losses in countries reliant on tourism, commodity exports and those with “limited policy space to respond”</td>
</tr>
<tr>
<td><strong>High uncertainty remains</strong> with the health crisis</td>
</tr>
<tr>
<td><strong>Policy priorities</strong> vary by country but generally should boost productive capacity, foster efficient resource allocations, and scale back gradually (“avoid sudden cliffs”)</td>
</tr>
</tbody>
</table>

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<table>
<thead>
<tr>
<th>Ready, steady, go? Results of the 3rd BIS survey on central bank digital currency</th>
</tr>
</thead>
<tbody>
<tr>
<td><strong>Central banks</strong> collectively representing a fifth of the world’s population are likely to issue a central bank digital currency (CBDC) in the next three years --- a transparent and stable version of blockchain-based cryptocurrency</td>
</tr>
<tr>
<td>In emerging market and developing economies, financial inclusion and payments efficiency objectives motivate the shift towards CBDCs</td>
</tr>
</tbody>
</table>

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<table>
<thead>
<tr>
<th>Oil Market Report, April 2021</th>
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</thead>
<tbody>
<tr>
<td>The global oil market “changes dramatically in the latter half of this year as nearly 2 mb/d of extra supply may be required to meet expected demand growth - even after factoring in the announced ramp-up of OPEC+ production”</td>
</tr>
<tr>
<td>IEA upgraded its world oil demand growth projection to 5.7 mb/d in 2021 due to “robust prompt indicators”</td>
</tr>
<tr>
<td>IEA expects flat U.S. oil production in 2021</td>
</tr>
</tbody>
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Oil Markets
Global oil demand recovery in 2021 and 2022 could become the largest two-year increase on record since 1950

- EIA projects global oil demand was 96.7 mb/d in February - within 1.0% of its February 2020 level of 97.7 mb/d – and could rise by a total of 9.1 mb/d this and next year (5.3 mb/d in 2021 and 3.8 mb/d in 2022)

*Market exchange rate basis

sources: IEA; EIA; Bloomberg

Global oil demand

Million barrels per day

120

100

80

60

40

20

0

1950

1960

1970

1980

1990

2000

2010

2020

Real GDP (Trillion 2010$)


Great Financial Crisis (2008-2009)

COVID-19 recession

EIA estimates

2020

2021

2022
Global oil demand could set a new record-high by the end of 2022 per EIA

- EIA projects global oil demand of 102.4 mb/d in Q4 2022, with similar increases (Q1 2021 to Q4 2022) by developed (+3.4 mb/d) and emerging economies (+3.9 mb/d)
- For global supply by Q4 2022, EIA projects OPEC and Russian & Caspian producers to redeploy 4.7 mb/d of spare capacity, while U.S. production could rise by 1.7 mb/d by Q4 2021 and add another 1.4 mb/d to reach a new high for U.S. liquids production of 20.8 mb/d in Q4 2022

source: EIA STEO (March 2021)
Strong sustained U.S. oil well productivity has kept downward pressure on estimated breakeven prices

- EIA reported solid well productivity even as companies have begun to re-deploy rigs and crews that were idled
- BTU Analytics estimated breakeven prices were below recent market prices among major U.S. oil producing basins

**U.S. oil well productivity – new production per rig**

- Million barrels per day oil-equivalent

**Oil estimated breakeven prices**

- WTI month-ahead futures price
- Mar. 16, 2021
- Feb. 2020
- Feb. 2021

*Half cycle breakevens assuming 10% discount factor. Sources: BTU Analytics; CME Group*
EIA projects U.S. liquid fuels consumption could return to its 2019 levels by the second half of 2021

- Indicators of industrial and chemical production, daily flights and mobility statistics, and vehicle miles traveled tracking show broad recovery from Q2 2020 lows, but ongoing year-on-year declines as of Q1 2021
- EIA projects Q2 2021 total consumption for refined products to reach that of pre-COVID levels, with the strongest recoveries in motor and jet fuels

Refined product key U.S. demand indicators, As of March 2021 YoY

- Passenger VMT: -10%
- Truck VMT: +6%
- Total Flights: -13%
- Manufacturing: +20%
- Apple Mobility: +5%
- DAT Spot Loads: +72%
- TSA Passengers: -56%
- Chemicals: +3%

U.S. liquid fuel consumption by fuel

- Motor gasoline
- Distillates/diesel fuel
- Jet fuel
- Residual fuel oil
- Other (naphtha/gasoil; HGLs)

EIA estimates

sources: EIA; API MSR

source: U.S. Federal Highway Administration; FlightRadar24; ISM PMI; ACC; TSA; Apple; DAT
U.S. refinery capacity utilization could recover gradually, but U.S. crude oil trade is projected to revert to net imports in Q2 2021 per EIA

- EIA expects refinery capacity, domestic demand and refined product exports to re-strengthen over the next year, but lower U.S. drilling and production could set back U.S. crude oil exports.

**U.S. liquid fuel consumption and refinery throughput**

- Refinery crude distillation unit capacity utilization rate
- EIA estimates

**U.S. petroleum net trade**

- Million barrels per day
- EIA estimates
- Net exports
- Net imports

Sources: EIA; API MSR
Natural Gas
Natural gas market recovery in Asia Pacific and Europe has keyed record trade and U.S. liquefied natural gas (LNG) exports

- Asia and Europe have consistently led in LNG imports, while the U.S. has emerged as an exporter with new infrastructure
- Following weakness in mid-2020, robust global growth LNG trade and record U.S. exports appeared in Q1 2021
Recent natural gas futures prices have exceeded estimated breakeven prices among top producing regions.

- Dedicated drilling for dry gas sustained solid productivity gains per EIA.
- Estimated natural gas breakeven prices moved in different directions by producing region but generally remained below recent natural gas futures prices.

**Natural gas well productivity – production per rig**

- Million cubic feet per day nat. gas-equivalent

**Natural gas estimated breakeven prices**

- Dollars per million Btu (mmBtu)

  - Haynesville
  - Appalachia - Northeast PA
  - Appalachia - Southwest PA
  - Appalachia - Ohio
  - Henry Hub month-ahead futures price

*Half cycle breakevens assuming 10% discount factor and play-specific costs.*

Sources: BTU Analytics; CME Group.
U.S. natural gas exports could grow while supply and demand recede from 2019 highs per EIA, despite cold winter seasonality

- Q1 2021 brought a polar vortex and polarizing effects on gas demand for power by region, with large gains/losses as power competed with other fuels
- COVID-driven 2020 declines in demand and dry gas production could be extend into 2021 before broadly recovering per EIA

### U.S. power sector gas consumption

Year-to-date through March 1st, y/y%

- **Northwest**: -3.8%
- **Southwest**: -23.2%
- **CAISO**: +4.2%
- **ERCOT**: +2.7%

### U.S. natural gas consumption and production by sector, Trillion cubic feet

<table>
<thead>
<tr>
<th>Sector</th>
<th>Net Exports</th>
<th>Electric Power</th>
<th>Industrial</th>
<th>Res / Comm</th>
</tr>
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<tbody>
<tr>
<td>2020 Sources</td>
<td>EIA AEO 2021</td>
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<td>2021</td>
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<td>2024</td>
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</table>

Sources: EIA Hourly Grid Monitor; FERC

- **ISO-NE**: +9.7%
- **ISO-NY**: +17.3%
- **MISO**: -20.5%
- **PJM**: +4.2%
- **SWP**: -21.5%
- **CAISO**: +4.2%
- **ERCOT**: +4.2%
- **ISO-NE**: -20.5%
- **ISO-NY**: +17.3%
- **MISO**: -20.5%
- **PJM**: +4.2%
- **SWP**: -21.5%
- **CAISO**: +4.2%
- **ERCOT**: +4.2%

Sources: EIA AEO 2021

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American Petroleum Institute
While the U.S. is poised to add 190 GW of gas and renewable power through 2024, global coal capacity is expected to increase by over 200 GW.

- Natural gas has remained competitive in the mix of U.S. electricity capacity additions with a 30% share through 2024.
- By comparison, 209 GW of added coal capacity could come online by 2024 in emerging per the Global Energy Monitor estimates.

**Global coal capacity additions vs. U.S. net generation capacity changes**

Gigawatts

source: Global Energy Monitor, IEA WEO 2020, EIA AEO 2021

Projects listed as under construction or permitted.
API economics resources available at www.api.org

API's Economic Industry Outlook

The API Industry Outlook, developed by API's Chief Economist, Dr. R. Dean Foreman, is a quarterly report that provides an overview of the natural gas and oil industry as it relates to the U.S. and global economies.