The Impact of COVID-19 on the Energy Sector

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I. AFPM - Who We Are
II. COVID-19 Industry Preparedness & Response
III. COVID-19 & Energy Demand
Disclaimer

This presentation contains forward looking projections from government organizations, independent consultants and energy companies about global or regional refining capacity, utilization, supply and demand for commodities or products. This information is provided solely for educational purposes. The projections do **NOT** reflect the large variability among industry participants nor the unique market conditions facing individual facilities.
Who We Are
Who We Are

Deliver affordable, reliable fuel and petrochemical products that lift the living standards of people all over the world.

Share a culture of cooperation that advances safety and environmental performance across our industries.

Support our communities and provide meaningful jobs to people of varying backgrounds and experiences.

Improve the sustainability of our operations and products, and innovate to find breakthroughs to solve our greatest challenges.
Refiners of Essential Fuels

18.1 million barrels

The U.S. refining industry includes 129 refineries that can process a total of 18.1 million barrels per day of crude oil, accounting for close to 20% of global capacity.

In 2019, the United States supplied 275 billion gallons of gasoline, diesel, jet fuel and other products to consumers in the United States and exported more than 84 billion gallons of products to consumers in 136 countries.
Manufacturers of Chemical Building-Blocks

32 in 2019
Number of active and completed U.S. petrochemical projects in 2019

$29 billion
Additional investments planned through 2021\textsuperscript{10}

89 to 96 mmt
U.S. total petrochemical capacity growth from 2019 to 2027\textsuperscript{11}
Safer, Cleaner & More Sustainable

Incident Rates of Non-Fatal Injuries or Illnesses Among Manufacturing Sectors 2018

Number and rate of nonfatal occupational injuries and illnesses by selected industry group, U.S., private industry, 2018 (Number in thousands) per 100 full-time equivalent employees.

- Food Mfg.
- Metal Mfg.
- Paper Mfg.
- Chemical Mfg.
- Petroleum Refining

*The data for the 2018 petrochemical manufacturing industry is not currently available, data shown is from 2017.

Declining National Air Pollutant Emissions

Total emissions dropped by 68% between 1980 and 2018

“U.S. petrochemical producers are committed to the plastic waste issue and are at the forefront of addressing the problem. They’re developing innovative products, investing in new and advanced recycling methods, and collaborating closely with other stakeholders in the plastics and recycling supply chains.”

— AFPM President and CEO Chet Thompson
Partners In Our Communities

Contributing to Our Communities

- Renovate homes for people in need
- Provide funding and education to first responders
- Fund and donate supplies to local food banks
- Organize and participate in toy drives

U.S. refining and petrochemical manufacturers support 3.5 million jobs in all 50 states.

Our industries contributed over $60 billion in federal taxes and nearly $70 billion in state and local taxes.

$225,000

$200,000

$150,000

$100,000

$50,000

$0

Average refining industry worker total compensation
Average petrochemical industry worker total compensation
Average U.S. worker total compensation
COVID-19: Industry Preparedness & Response
Critical Industries & Essential Employees

Department of Homeland Security designation

- Integral to supply chains of essential fuels and petrochemical building-blocks
- Need to operate 24/7, 365 days a year

Supply Chain for N95 Mask

- raw materials
  - oil refinery
    - crude oil is processed using heat, pressure, and chemical reactions to make fuels, petrochemicals, and derivatives, which are used to make finished products

- petrochemical facility
  - naphtha, as well as ethane, butane and propane derived from natural gas liquids, are processed into various petrochemicals by a method called "cracking"

- derivatives
  - toluene
    - polyurethane nose piece
      - toluene is the key reactive material needed to make the polyurethane for the mask nose piece, assuring a snug fit
  - xylene
    - polyester mask sheath
      - a form of xylene, paraxylene, is used to make the polyester essential for a flexible, tight-fitting mask sheath
  - propylene
    - polypropylene filters
      - polypropylene monomers form polypropylene, which is used to filter particles and make mask filters

- product
  - N95 mask
    - consists of filtering airborne particles to prevent the spread of bacteria and viruses like COVID-19

It's not just about how tomorrow or next month looks; these refineries are here for the long haul.
## Safety & Preparedness

Disruption plans at-the-ready to guide safe, ongoing operations

<table>
<thead>
<tr>
<th><strong>Body temperature screening</strong></th>
<th><strong>Social distancing (min 6ft/2m)</strong></th>
<th><strong>Site policies for contractors and visitors</strong></th>
</tr>
</thead>
<tbody>
<tr>
<td><strong>Facial coverings required in common areas where social distancing not possible</strong></td>
<td><strong>Proper use of PPE, including activities that require PPE in addition to facial covering</strong></td>
<td><strong>Disinfecting and hygiene, especially in common areas such as cafeterias, kitchen areas, break rooms, open office spaces and conference rooms</strong></td>
</tr>
</tbody>
</table>

*Example measures from an AFPM member company*

**COVID-19 PREPAREDNESS**

Planning, preparing and practicing for emergencies and disruptions is an ongoing part of fuel and petrochemical manufacturer business models.

JEFF GUNNULFSEN  
Senior Director, Security & Risk Management

![COVID-19 Preparedness Image]
Innovation & Partnerships

New products, processes and collaboration

CHALLENGE
During a typical day, a doctor or nurse might need dozens of N95 masks, disposing them after each patient interaction. Because of the shortage, medical professionals have access to far fewer masks during this pandemic. Even at maximum production capacity, N95 masks – about 1 million per day – the demand from American hospitals cannot be fully met.

NEED
Create a safe, reusable mask.

SOLUTION
A new mask design that has a reusable centerpiece and two small, replaceable filter cartridges.

MASK
Health care workers can confidently wear the mask for an entire shift. At the end of the shift, the filter cartridges are removed, and masks can be reused for the next shift.

FILTER FABRIC
The filter pouch is made from a high-efficiency filter material. The pouch is made from non-woven, melt-blown polypropylene with the porosity of the fabric to improve performance for the mask. Filter cartridges, which can be safety discarded and replaced, significantly extend the shelf life of a health care worker’s or staff.

ENTIRE DEVICE
The U.S. Army Medical Command and NASA, with input from ExxonMobil, are ensuring the mask’s design protects from diseases such as COVID-19.

FILTER HOUSING
Filter housing can be made from medical-grade plastic through injection molding.

AFPM
American Fuel & Petrochemical Manufacturers

afpm.org
Ramping Up Production

Helping meet the 300-percent demand increase for hand sanitizer
Testing & Vaccine Dispensing

Advancing diagnostic tools and future prevention
Critical Fuel Products & Donations

Fuels for essential workers and supply chains

Cargo plane carrying 13 million masks arrives in Atlanta from China

Valero Energy 🥇ValeroEnergy - May 5
No one should ever go hungry. And now more than ever, millions of people need support. That’s why Valero, with the Valero Energy Foundation, has provided $1.4 million to help feed families in our communities. And together

Valero Energy 🥇ValeroEnergy - May 5
Today, we’re donating 10,000 fuel cards to the communities where we operate and donating them to organizations that rely on transportation as a vital part of their service. Let’s keep working together to keep moving forward.
Giving Where it’s Needed Most

More than $20 million in donations made by our industries

SABIC donates $1.5M to support COVID-19 Americas response efforts

Marathon Petroleum Co.

KPA in partnership with Mary Simmons from AOC7 neighborhood grants funding from Marathon Petroleum Co distributes grocery gift cards to over 20,000 diverse, vulnerable families. Each family received $15. KPA selected 7 families to get the cards. 2 more families each received food bags.

Westlake Contributes $1 Million to Greater Houston COVID-19 Recovery Fund

The Phillips 66 Bayway Refinery in NJ donated $50,000 to both Trinitas Regional Medical Center and the Robert Wood Johnson University Hospital to help keep their front-line workers safe. #HealthCareHeroes
COVID-19
Impact on Energy Demand
U.S. Energy Demand: 2019

U.S. primary energy consumption by energy source, 2019

- Total energy consumption: 100.2 quadrillion British thermal units (Btu)
- Natural gas: 32%
- Petroleum: 37%
- Coal: 11%
- Renewable energy: 11%

Note: Sum of components may not equal 100% because of independent rounding.
Source: U.S. Energy Information Administration, Monthly Energy Review, Table 1.3 and 10.1, April 2020, preliminary data
U.S. Energy Demand: 2020

U.S. primary energy consumption by energy source, 2020

- Total: 92.94 quadrillion British thermal units (Btu)
- Total: 11.59 quadrillion Btu

- Petroleum: 35%
- Natural gas: 34%
- Renewable energy: 12%
- Nuclear electric power: 9%
- Coal: 10%

- Wind: 26%
- Hydroelectric: 22%
- Solar: 11%
- Geothermal: 2%
- Biomass: 39%
- Biofuels: 17%
- Wood: 18%

Source: U.S. Energy Information Administration, *Monthly Energy Review*, Table 1.3 and 10.1, April 2021, preliminary data

Note: Sum of components may not equal 100% because of independent rounding.
U.S. Energy Demand: 2019 & 2020

U.S. primary energy consumption by energy source, 2019

- Total: 100.2 quadrillion Btu
- Petroleum: 37%
- Natural gas: 32%
- Renewables: 11%
- Nuclear: 8%
- Coal: 11%
- Wood: 20%
- Biomass: 43%
- Wind: 24%
- Hydroelectric: 22%
- Geothermal: 2%
- Solar: 9%

Note: Sum of components may not equal 100% because of independent rounding.
Source: U.S. Energy Information Administration, Monthly Energy Review, Table 1.3 and 10.1, April 2020, preliminary data

U.S. primary energy consumption by energy source, 2020

- Total: 92.94 quadrillion Btu
- Petroleum: 35%
- Natural gas: 34%
- Renewables: 15%
- Nuclear: 9%
- Coal: 10%
- Wood: 20%
- Biomass: 39%
- Wind: 29%
- Hydroelectric: 22%
- Geothermal: 2%
- Solar: 11%
- Biofuels: 17%

Note: Sum of components may not equal 100% because of independent rounding.
Source: U.S. Energy Information Administration, Monthly Energy Review, Table 1.3 and 10.1, April 2021, preliminary data
U.S. Energy Demand: 2020

Source: U.S. Energy Information Administration, Monthly Energy Review, Table 1.3, April 2021, preliminary data for 2020
Note: Petroleum is petroleum products excluding biofuels, which are included in renewables.
U.S. Oil Demand: 2020

Annual U.S. Oil Consumption

Source: U.S. Energy Information Administration
U.S. Oil Demand: 2020

Source: U.S. Energy Information Administration
U.S. Oil Demand: 2020 Refinery Utilization

U.S. Refinery Utilization Rates

Source: U.S. Energy Information Administration
U.S. Oil Demand: Too much crude oil

West Texas Intermediate Crude Oil Spot Price

Sources: EIA
U.S. Natural Gas Demand: 2020

Annual U.S. natural gas consumption by sector (1950–2020)

trillion cubic feet

(2019 to 2020 percentage change)

- electric power (+3%)
- industrial (-2%)
- residential (-7%)
- commercial (-10%)
- transportation (-1%)

Source: U.S. Energy Information Administration, Monthly Energy Review
U.S. Oil Market Outlook:
US oil demand returns to pre-pandemic levels in 2022

U. S. Oil Consumption

Source: U.S. Energy Information Administration
Global Oil Market Outlook: Short-term

- 2020 global crude and other liquids demand averaged 91 million barrels per day (mmbd), ~10% below 2019 level of about 100 mmbd
- 2021 world oil demand is expected to partially recover and to average 97 mmbd
- 2021 oil demand will depend on:
  - Economic recovery which will depend on reopening of economies around the world
  - Reopening of economies will depend on pace of vaccinations and effectiveness of immunization
- Analysts expect 2022 global oil demand to closely match or exceed 2019 consumption

Sources: June 2021 EIA STEO, IEA OMR, and OPEC MOMR and WOO 2020
Global Oil Market Outlook: Long-term

Note: * represent reference or base case. In some instances, data were interpolated for individual years to create a representative demand profile. In some instances, data were interpolated for individual years to create a representative demand profile.

Questions?