The members of the American Fuel & Petrochemical Manufacturers make and transport the fuels that keep Americans moving and the petrochemicals that are the essential building blocks for modern life. Our industries make life better, safer, healthier and — most of all — possible.
A Message from the Chairman of the Board and the President and CEO of AFPM

We began 2021 with a sense of hope — a hope to recover from the devastation of the COVID-19 pandemic and hope to return to normalcy. The vaccine put us on a path to recovery, but that path has been uneven. Supply chain disruptions, a volatile market, severe weather events and new variants tested our resilience. But resilience is a hallmark of the U.S. refining and petrochemical industries. Despite the challenges that persisted, our industries steadily, safely and sustainably continued to produce the fuels and petrochemical products that we need to not only recover, but to thrive. At the same time, we continued to invest, innovate and evolve to meet the ever-changing needs of society.

U.S. refiners continued to lead the world in the production and export of refined fuels, supplying the majority of U.S. demand and exporting refined products to more than 100 countries. As we did this, we also increased our production of lower carbon fuels, announcing a myriad of new renewable diesel and sustainable aviation fuel investments this year.

The resilience of the U.S. petrochemical industry was on full display in 2021. Though unplanned outages caused by Winter Storm Uri knocked as much as 75 percent of U.S. ethylene capacity offline, ethylene exports rose 9 percent from the previous year. Even amid disruption, petrochemical manufacturers continued to scale advanced recycling technologies and partnered with major brands to expand the use of recycled content in everyday products — leading us closer to a more sustainable, circular economy for plastics.

The U.S. refining and petrochemical industries continued to deliver on their commitment to the health and safety of our workforce, our communities and the environment. This commitment to safety is reflected in our record, with our industries ranking in the top tenth percentile of more than 500 manufacturing industries tracked by the government over the last decade. Our facilities and employees collaborate with local partners on programs to support community safety and environmental protection, among other community needs. And in 2021, new investments in carbon capture technologies, improved efficiency and air quality, water-use reduction, recycling, and land conservation continued to improve the environmental sustainability of our operations.

Our industries are foundational to our economy and our communities. We contribute more than 120 billion dollars in taxes and add hundreds of billions of dollars to the national GDP. We also support around three million jobs, while continuing the work to provide a diverse, equitable and inclusive workplace where our people are valued for their individual perspectives.

This past year was rife with challenges, but the U.S. refining and petrochemical industries continued to do what we have always done — provide the critical products that are fueling our recovery today and evolving our operations and products to meet the needs of society for decades to come.

We are positioned and committed to do the same again this year!

Jeff Ramsey
Chairman of the Board
President and
Chief Executive Officer
Flint Hills Resources, LLC

Chet M. Thompson
President and CEO
American Fuel & Petrochemical Manufacturers
There are 128 operable refineries and 344 petrochemical manufacturing units in the United States.

75 refineries produce gasoline, diesel, jet fuel and other products

53 refineries produce gasoline and other fuels, and produce base petrochemicals at 205 petrochemical units colocated with the refineries

139 standalone petrochemical units produce base petrochemicals
Refining — Fueling the World

U.S. refineries are among the most competitive, efficient and sophisticated in the world, which means they have greater flexibility to adapt and respond to market conditions than many global competitors. This flexibility allows refineries to adjust feedstocks and production to optimize, produce a large array of products and minimize emissions and environmental impacts. As a result, U.S. refineries are among the most productive in the world — enabling us to produce volumes of product to meet domestic and global demand, while continuing to evolve our product mix.

How Oil Refineries Work

Oil refineries are large industrial facilities, typically occupying several hundred acres of land, and housing precisely engineered structures and equipment used in the refining process.

Refineries with many process units that are able to do more advanced chemical conversions are referred to as complex. Complex refineries have specialized units and operations that can process heavy and sour crudes, which are less expensive but more difficult to refine. These refineries also yield the more higher value products.

Global Refinery Complexity

- Fuel Gas
  - Fuel Gas
  - Propane
  - Butane
  - 6%

- Gasoline
  - RBOB
  - CBOB
  - Conventional
  - CARB Premium
  - 47%

- Distillate
  - ULSK
  - Jet Fuel
  - ULSD
  - 33%

- Heavy Fuel
  - Oil & Other
  - 14%

- Resid
  - Diesel
  - Kerosene
  - Distillate
  - 6%

- Naphtha
  - Gasoline
  - ULSD
  - 47%

- Hydrogen
  - Propane
  - Butane
  - Alkylate

- Delayed Coker
  - Diesel
  - Distillate
  - 6%

- Alkylation Unit
  - Butylene
  - Gasoline
  - Slurry

- Fluid Catalytic Cracker (FCC)
  - LCO
  - Gasoline
  - 33%

- Hydrocracker (HCU)
  - ULSK
  - ULSD
  - 33%

- Hydrogen Plant
  - Propane
  - Butane
  - 6%

- Vacuum Distillation Unit
  - Resid
  - Gasoil
  - 14%

- Distillate Hydrotreater
  - Hydrogen
  - 14%

- Reformate
  - ULSK
  - Jet Fuel
  - 33%
Investing in Evolution

The evolution and sophistication of the U.S. refining industry is enabled by the high level of capital investment that has been made over the years. While a major new refinery to produce gasoline, diesel and other fuels has not been built in the United States since the 1970s, refineries are constantly being upgraded, expanded and modernized to increase efficiency, complexity and to meet shifting product demand.⁶ In 2019 alone, the U.S. refining industry spent $11.9 billion in capital investments.⁷

Refinery capacity utilization in the United States is among the highest worldwide at 86%.⁸
Liquid Fuels

From the simple early refineries that primarily produced kerosene to today’s refineries with their expansive product lines, U.S. refiners have a long tradition of constantly evolving to meet the ever-changing needs of society. While U.S. refineries largely produce commonly known, in-demand and energy-dense products like gasoline, diesel, jet fuel and marine fuel, they are evolving their product mix with fuels including renewable diesel, sustainable aviation fuel and ultra-low sulfur marine fuel oil to increase the efficiency of the fleet and decrease emissions throughout the transportation sector.

2021 monthly U.S. consumption of gasoline, diesel, jet fuel and other products

*million of barrels per calendar day*

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2019 – 2023 Global Crude and Other Liquids Demand

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Did you know?

Energy density is the amount of usable energy that can be stored in a given mass of a substance or system. Pound for pound, no product offers nearly the energy density or efficiency of petroleum-derived fuels. For instance, a gallon of gasoline contains the amount of energy produced by 13,000 AA batteries or 5 burning logs.\textsuperscript{11}
How Are Gas Prices Determined?

Gasoline prices are primarily a function of the price of crude oil, which accounts for more than 50 percent of the pump price of regular gasoline. Costs for distribution and marketing, federal and state taxes, Renewable Fuel Standard (RFS) compliance, refining costs and refining profits make up the balance. Components of the December 2021 national average pump price of $3.31 per gallon were as follows:

Regular Gasoline\(^1\)

- **Taxes**: 15%
  - a monthly national average of federal and state taxes applied to gasoline.

- **Distribution & Marketing Costs**: 21%
  - distribution costs are those for the delivery of gasoline along the supply chain to the consumer by pipeline, rail, marine and truck; marketing costs support the sale of gasoline by refiners, distributors and wholesalers.

- **Refining Costs**: 12%
  - the cost for refineries to process crude oil through the refinery to produce gasoline and other products plus the refinery profit. Costs include fixed and variable refinery operating costs like labor, other materials like catalysts, fuel and the cost of compliance with the Renewable Fuel Standard. The U.S. Energy Information Administration (EIA) calculates it as the difference between the cost of crude as defined above and the price at which the refinery sells the petroleum component of gasoline that is produced — the BOB or the blend stock into which ethanol and/or additives will ultimately be blended to produce finished gasoline that is sold at the pump.

- **Crude Oil**: 53%
  - the monthly average cost of crude oil purchased by all U.S. refiners.
Policy Impact on Prices

Domestic policies, such as the Renewable Fuel Standard (RFS), have an impact on prices. The RFS is a government mandate, passed in 2005 and expanded in 2007, that requires growing volumes of biofuels to be blended into U.S. transportation fuels like gasoline and diesel. RFS mandates were written into law as specific volumes, increasing each year through 2022. Volume targets drafted in 2007, however, do not reflect consumer demand today. This is a problem since the amount of ethanol we can physically blend is directly proportional to the amount of gasoline American drivers use. This detachment from consumer demand has resulted in U.S. refineries spending billions of dollars every year to attain RFS compliance, even though the vast majority of biofuels would continue to be blended without the mandate.

Annual RFS compliance has cost more in recent years than at any point in the program’s history. Compliance costs, based upon renewable identification number (RIN) trading values, totaled more than $25 billion in 2021—inflate the wholesale price of every gallon of gasoline and diesel manufactured in the United States. Concerns remain that the bank of RINs needed to comply with the RFS could run out in the near future, leaving many refineries with the difficult choice to potentially cut production of gasoline and diesel to avoid generating new RFS obligations.

Do We Export Refined Product?

The United States became a net exporter of refined products in 2011. Between 2019 to 2021, the U.S. exported 3.2 to 3.3 million barrels per day of petroleum products to more than 100 countries, primarily in Latin America and Europe.

The United States exports approximately 20 percent of the gasoline, diesel, jet fuel and other refined products it produces. The West and Gulf Coasts export refined products while the East Coast imports refined products. Gasoline is imported into the East Coast because of infrastructure constraints, including Jones Act shipping restrictions and insufficient pipeline capacity to move product from refining centers along the Gulf Coast and in the Midwest to the East Coast. As a result, the United States imports gasoline into the East Coast to minimize the cost to consumers, and exports it from the Gulf and West Coasts to supply primarily Mexico and Latin America.
Innovation and investment from America’s fuel refiners are changing heavy transportation in ways many didn’t think was possible. The air travel and trucking industries, reliant on liquid fuels including diesel and jet fuel, are looking at a future of renewable diesel and sustainable aviation fuels that could cut carbon emissions by as much as 80 percent.

These lower carbon fuels are developed from feedstocks such as grease, animal fat and used cooking oil, along with soy, woody biomass, forest residue, sugar and starch. These feedstocks are transformed into fuels that are chemically identical to petroleum counterparts and are compatible with existing engines and infrastructure, allowing trucks and airplanes to immediately utilize fuels that reduce carbon emissions, in some cases, repurposing and recycling everyday waste without requiring a costly infrastructure build-out.

Several of our members companies are at the forefront of producing large-scale renewable fuels, including renewable diesel and blue hydrogen. Valero — the world’s 2nd largest renewable diesel producer — completed a major expansion at its St. Charles refinery in Louisiana, bringing total renewable diesel production capacity to 700 million gallons per year and is investing another $725 million to build another renewable diesel plant adjacent to its refinery in Port Arthur, Texas, which is expected to increase total annual renewable diesel production capacity to 1.2 billion gallons in the first quarter of 2023.

HollyFrontier is investing more than $800 million in a renewable diesel unit and pre-treatment unit co-located at its Navajo Refinery in New Mexico and is converting its Cheyenne Refinery in Wyoming to renewable fuel production, with the target of eventually producing more than 200 million gallons of renewable fuel annually.

Phillips 66 unveiled plans in 2020 to convert the San Francisco Refinery’s Rodeo facility into one of the world’s largest renewable fuels plants. Dubbed Rodeo Renewed, the project would reconfigure Rodeo to produce an initial 800 million gallons per year of renewable diesel, renewable gasoline and sustainable aviation fuel from used cooking oils, fats, greases and soybean oils. If approved, production of these fuels is expected to begin in early 2024.

Sustainable aviation fuel (SAF) is becoming a more viable fuel as refiners partner with airlines and other companies to produce the fuel. For example, Phillips 66 and Southwest Airlines signed a memorandum of understanding (MOU) to advance the commercialization of SAF, focusing on public awareness and research and development. Chevron announced an MOU with Delta Air Lines and Google to track SAF test-batch emissions data using cloud-based technology. United Airlines and Honeywell unveiled a joint investment in a new technology from Alder Fuels, which — coupled with Honeywell’s refining process — could produce a first-ever carbon-negative jet fuel.

Marathon Petroleum subsidiary Virent contributed to an aviation industry first by using its patented technology to help make sustainable aviation fuel (SAF) that’s 100 percent renewable and 100 percent compatible with today’s aviation fleet. Virent’s bio-based synthesized aromatic kerosene, made from plant sugars, was used in a December 2021 passenger flight with 100 percent SAF fueling one engine and petroleum-based jet fuel for the other.

Marathon Petroleum started renewable diesel production at its converted Dickinson, North Dakota refinery in December 2020, with a production capacity of approximately 184 million gallons per year. The company is also transitioning its Martinez, California facility over to renewable fuel production, with an anticipated capacity of 730 million gallons per year.

Renewable fuel production is a central part of many American refiners’ sustainability ambitions. It also provides an avenue to comply with federal and state environmental policies. As public policy and consumer interest work together to make sustainable fuels more popular and affordable, the U.S. refining industry is well-positioned to meet growing demand — not just in our own country, but around the world. Our leading-edge facilities and ongoing investments in renewable fuels are part of the groundwork that will enable the transportation sector to be less carbon intensive every year.
Air travel and trucking industries — reliant on liquid fuels — are looking at a future of renewable diesel and sustainable aviation fuels that could cut carbon emissions by as much as 80 percent.
Petrochemical Manufacturing — Making the Building Blocks of Modern Life

Petrochemicals are the building blocks that are essential to making the goods that make modern life possible — from paints to plastics, space suits to solar panels, medicines to mobile phones, personal protective equipment to germ-fighting sanitizers. Over the last two years, the value of petrochemicals has been on display more than ever before.

Many products made from petrochemical feedstocks, including PPE, syringes, pharmaceuticals and food packaging, have become regular household items, helping to protect millions of people during the global pandemic. All of these things start with just six basic petrochemicals — ethylene, propylene, butadiene, benzene, toluene and xylene — that are combined with other chemicals and transformed into materials that make products better.

ethylene  propylene  butadiene  benzene  toluene  xylene

polyurethane-coated leather  WATER RESISTANT AND DURABLE
high-tenacity polypropylene, polyethylene and nylon  STRONG AND LIGHTWEIGHT
polyester  SOFT AND LIGHTWEIGHT
Did you know?

Petrochemicals and the specialty chemicals created from them have special properties that simply make the products we use better. They make nylon stronger, so seatbelts and parachute straps are safer. They make workout clothes sweat resistant. They make cars lighter, so they are more fuel efficient. They make implant replacement body parts compatible, so they do not get rejected.

Where does a petrochemical come from?

The petrochemical manufacturing process begins with a “feedstock.” A feedstock is a raw material that is used to make a useful product in an industrial process. The natural gas liquids and naphtha that are created from crude oil during the refining process are used as feedstocks to manufacture a wide variety of petrochemicals.

Petrochemical Manufacturing Basics

- **NATURAL GAS**
  - Natural gas liquids
  - ETHANE CRACKER
    - Ethane
    - Propylene
    - Butane

- **CRUDE OIL**
  - Gas oil
  - NAPHTHA CRACKER
    - Benzene
    - Xylenes
    - Toluene
    - Propylene
    - Butadiene

- BASE PETROCHEMICALS
  - Ethylene
  - Propylene
  - Butylenes
  - Benzene
  - Xylenes
  - Toluene

**Products**

- **carbon plate**
  - HIGH ENERGY RETURN

- **polyester**
  - SOFT AND LIGHTWEIGHT

- **rubber**
  - SHOCK ABSORBING
The petrochemical industry faced a few challenges in 2021 when unplanned facility outages caused by the mid-winter deep freeze hobbled the Texas electric grid. This winter storm caused much of the U.S. petrochemical manufacturing capacity, which is concentrated along the Texas Gulf Coast, to shut down. It also caused disruptions to railroads and ports, essential for transporting petrochemical feedstocks and products. At the height of the freeze-related outage, as much as 75 percent of the 40 million metric tons per year of U.S. ethylene capacity was offline. In the second quarter, a series of unplanned facility shutdowns continued to disrupt petrochemical production.

In the second half of 2021, as the outages resolved, the United States petrochemical industry ramped up production and exports to meet strong local and global demand for petrochemicals, particularly ethylene. By the end of the year, U.S. ethylene exports were up nine percent from the previous year, with most going to China and other northeast Asia countries and Europe. Like the United States, Europe and China faced supply shortages due to widespread petrochemical plant shutdowns.
Demand for Petrochemicals Continues to Grow

As the COVID-19 vaccine becomes increasingly available globally, allowing economies to reopen and industrial activity to resume, the need for petrochemicals is expected to remain strong. The world’s growing population and expanding middle class will continue to drive growth in this market for the foreseeable future.

Through the end of the decade demand for petrochemicals — used to produce plastic resins, synthetic fibers, paints and adhesives essential to manufacturing construction materials, textiles, medical devices, pharmaceuticals, automobiles and electronics — is expected to grow steadily.

The United States remains an economically advantaged location to build new ethylene production facilities that rely on comparatively low-cost ethane as a feedstock. In 2022, U.S. ethylene production capacity is expected grow as much as 4.4 million tons per year as three ethane crackers are planned to come online.
Partnering with Big Brands to Power Sustainability Gains

One of the areas of recent blockbuster innovation has been in advanced recycling, also known as chemical or molecular recycling. This process, which allows plastic waste to be broken down into its original “building blocks” and then recreated into new materials, is a huge breakthrough with tremendous potential for addressing plastic waste.

ADVANCED RECYCLING

Plastic manufacturing starts with monomers, the fundamental building blocks of plastics, which are typically derived from oil and natural gas.

Monomers are turned into larger molecules called polymers.

Manufacturers use polymers to make all kinds of finished plastic products.

Plastic products are used, re-used and disposed of, with recyclables often separated from other waste.

Advanced recycling can break a wide variety of plastics all the way down to monomers. Plastic can go through this process over and over.

Denotes processes AFPM members execute.

Mechanical (traditional) recycling systems sort, shred and melt certain plastics back down to polymers. Plastic can go through this process a limited number of times.
The commitment to innovation is a hallmark of our industries and is bearing fruit in efforts to address the dual challenge of providing the products the world needs in an increasingly sustainable way.

Significant investment, strong infrastructure and a culture of innovation have enabled the fuel and petrochemical industries to give consumer brands a leg up on increasing their sustainability. All of this is allowing diverse industries to safely and quickly scale up new technologies to help reduce waste and create a smaller footprint while delivering the quality and variety that consumers count on.

Here are a couple of ways AFPM members have partnered with big brands to incorporate recycled materials into daily life:

**LyondellBasell** is partnering with Wendy’s to create new cups that not only use 20 percent recycled plastic but are more recyclable than Wendy’s current plastic-lined paper cups. This is the first step in a plan to make all of Wendy’s drink cups with recycled plastic by 2023, a move that is estimated to divert about 10 million pounds of waste from landfills during the first two years.

**Eastman** Tritan™ Renew, powered by Eastman’s molecular recycling technologies, have enabled Nalgene, CamelBak and Ello to create reusable water bottles — made with 50 percent certified recycled content — that can be found nationwide. Eastman has also partnered with the University of Tennessee to encourage recycling at home football games by rewarding recyclers with a free CamelBak water bottle made from Tritan Renew and providing an opportunity for student participation in the circular economy.
Midstream — Moving Our Products

The U.S. refining and petrochemical industries, and their customers throughout the U.S. economy, rely on an extensive supply chain to move feedstocks like crude oil and natural gas products to their facilities and fuels and petrochemical products out to the market. This supply chain — known as midstream infrastructure — is made up of a complex system of pipelines, ports and waterways, railroads, roadways and storage facilities that move America’s energy supplies and petrochemical products from producers to manufacturers to retailers and consumers.

**SHIP**
36,000 miles of inland waterways and 926 coastal and inland ports facilitate domestic fuel movements and provide access to global import and export markets.

**TRUCK**
Over 164,000 miles of highways help to move truck shipments of fuels to retail outlets, businesses and homes.

**RAIL**
140,000 miles of railway track and more than 200,000 rail tank cars move crude oil and NGLs from areas not served by pipelines or where pipeline capacity is inadequate.

**PIPELINE**
224,000 miles of crude oil, natural gas liquids (NGLs) and refined product pipelines move raw materials from production areas to refineries and petrochemical plants and finished products to end users.
Did you know?

With 224,000 miles of crude oil, natural gas liquids (NGLs) and refined product pipelines, the United States has the largest network of energy pipelines in the world.\(^\text{19}\)
Pipelines are essential to affordable and reliable energy, energy security and the global competitiveness of the United States — now a net exporter of energy and a leading producer of petrochemicals. While pipelines operate safely and largely out-of-sight for most people, they are critical for the delivery of affordable and reliable energy. In fact, rising prices in certain geographies without local energy production reflect a need to better transport energy from where it’s produced to where it’s needed — in places like the U.S. Northeast and countries in Europe, for example. Pipelines are the most efficient way to get energy where it is needed.

Demand for energy, including refined products and petrochemicals, will continue to be essential throughout the world for decades to come because of population and economic growth. The United States, with the most sophisticated refining networks in world, has become the largest exporter of refined products. The U.S. petrochemical sector, bolstered by continued investment, is supported by affordable and plentiful natural gas and petrochemical feedstocks. Combined they position the United States to fulfill this demand; however, the appropriate infrastructure needs to be in place. This includes more pipeline capacity to get energy and feedstocks into refineries and petrochemical facilities — and to get products out to market, both domestically and for export.

Despite the clear advantages of a robust and modernized pipeline network, there is major opposition to modernizing, expanding and building new pipeline capacity. There have even been successful efforts to shutter existing pipelines that have been in operation safely for years and still more attempts are underway. For example, two major pipeline projects connecting the energy systems of Canada and the United States have been cancelled or are under the threat of being cancelled.
On President Biden’s first day in office he revoked the permit for the Keystone XL Pipeline, despite the significant economic, environmental and energy security benefits that came with it. The project employed nearly 2,000 Americans and would have provided over 10,000 high-paying union jobs during its construction, generated much-needed tax revenue, and injected billions of dollars into our economy. Upon completion the pipeline would have operated with net-zero emissions, while strengthening our relationship with Canada and our North American energy security.

The Line 5 pipeline in Michigan is another asset under attack, despite operating safety since 1953. It is essential to the delivery of affordable fuels, propane and other refined products in the United States and Canada. Although union, political and business leaders on both sides of the border support a project to modernize the pipeline, Michigan Governor Whitmer is seeking to shut it down. If she is successful, this will deal yet another blow to our important relationship with Canada and would cost more than 33,000 jobs and $20 billion dollars in economic activity in the region.

Without these projects and others like them, we will not get the full advantage of the U.S. energy sector. Building out our critical midstream infrastructure — including a robust and modernized pipeline network — is essential for our energy security and is a strategic advantage for the United States and our allies.

Did you know?

Pipelines are the safest mode for transporting energy products and pipeline companies are constantly investing to continue to make them even safer. Over the past five years, pipeline incidents were down 17 percent at the same time that pipeline mileage increased nearly 10 percent and total barrels delivered increased 35 percent, according to data from the Pipeline and Hazardous Materials Safety Administration (PHMSA). This is a result of millions of dollars in investment in technology like drones, sensors, auto-shutoff valves and smart pigs - robotic devices that can travel through a pipeline and record information about its internal conditions.
Environmental Stewardship — Protecting Our Environment

The U.S. fuel and petrochemical industries are committed to doing more with less and continually invest in ways to operate more efficiently. Our companies are actively working to reduce emissions, increase energy efficiency, manage water and other natural resources more efficiently, reduce waste and conserve the lands and ecosystems that surround us.

Reducing Emissions

U.S. refineries have invested more than $100 billion in the last 10 years to improve refinery efficiency, reduce emissions and produce cleaner fuels. As a result, the U.S. carbon intensity of operating refineries decreased by 12 percent during this period. And despite the historic expansion, U.S. petrochemical greenhouse gas (GHG) emissions have remained relatively flat. Our industries are setting their sights even higher, with companies making historic commitments to significantly reduce emissions. Our companies are working with each other, with government, academic institutions, non-governmental organizations (NGOs) and others to innovate and scale promising technologies that have the potential to drive even more significant emissions reductions.

Comparing Growth and Emissions

1980-2020

- 173% Gross Domestic Product
- 85% Vehicle Miles Traveled
- 46% Population
- 19% Energy Consumption
- 11% CO₂ Emissions from all sources
- -73% Aggregate Emissions six common pollutants
$100 billion

U.S. refineries have invested more than $100 billion in the last 10 years to improve refinery efficiency, reduce emissions and produce cleaner fuels.
Investment in Technology to Reduce Emissions

Flaring Reduction
Flares are essential pieces of safety equipment used to burn excess gases that can otherwise build up in the pipes and towers of a facility, so they don’t vent directly into the atmosphere when a facility shuts down, loses power or has some other technical issue. In recent years, refiners and petrochemical producers have invested hundreds of millions of dollars in technologies like flare-gas recovery systems that recover gases that would otherwise be flared and cycle them back through their processing plants, significantly reducing emissions and conserving energy.

Carbon Capture
Governmental and public interest in carbon capture, utilization and storage (CCUS) is on the rise. Federal officials, labor unions and experts — including the International Energy Agency — have all identified CCUS as critical to achieving significant near-term reductions in greenhouse gas emissions. And U.S. refining and petrochemical industries continue to advance CCUS projects as innovators and significant enablers of this technology worldwide.
Westlake Chemical will invest $45 million in a new flare-gas recovery system at one of its plants in Lake Charles, Louisiana, and a $25 million flare-gas recovery system at its Calvert City, Kentucky plant. In 2020, the company reduced 28,953 tons of emissions associated with flaring.

Valero’s Port Arthur refinery became the first industrial site in the United States to host a large-scale carbon capture project back in 2013, and it continues to capture more than 1 million tons a year.

In 2021, Valero announced that it is working with BlackRock and Navigator Energy Services to develop a large-scale carbon capture and sequestration project, with anticipated start up in late 2024. Valero is expected to be the anchor shipper with eight of its U.S. Midwest ethanol plants connected to this system, producing a lower carbon intensity ethanol product to be marketed in low carbon fuel markets while contributing to Valero’s GHG emissions reduction goals.

Marathon Petroleum signed an agreement with One Energy Enterprises LLC to install five 2.3 megawatt wind turbines at MPC’s renewable diesel facility in Dickinson, North Dakota. The turbines are expected to generate more than 40 million kilowatt hours of energy each year, providing approximately 45 percent of the renewable diesel facility’s electricity needs and will help further decrease its carbon emissions profile.

ExxonMobil has invested in CCUS for over 30 years, and currently has an equity share in roughly one-fifth of global carbon capture capacity and has “captured approximately 40 percent of all the captured anthropogenic CO2 in the world.” And that investment is set to grow. In 2021, Exxon announced the formation of its Low Carbon Solutions business, with the business looking to advance more than 20 CCUS projects internationally. These new projects will dramatically expand Exxon’s already-impressive carbon capture capacity of about nine million metric tons annually — the equivalent of planting 150 million trees every year.

In September 2021, nearly a dozen companies — including AFPM members Chevron, Dow, ExxonMobil, INEOS, LyondellBasell, Marathon Petroleum, Phillips 66 and Valero — announced their interest in supporting the large-scale deployment of carbon capture and storage technology in Houston. Early projections indicate that infrastructure could be built to safely capture and store about 50 million metric tons of CO2 annually by 2030 and about 100 million by 2040, which would significantly reduce CO2 emissions in one of the country’s largest concentrated sources of industrial emissions. The Houston-area facilities these companies operate produce energy and household products critical for modern life. This is on top of existing efforts — including Chevron’s investment of more than $1 billion in CCUS research and development to reduce carbon emissions.

Chevron is also aggressively incorporating carbon capture in its business ventures. Chevron recently announced that it is partnering with Microsoft and Schlumberger to build a bioenergy with carbon capture and sequestration (BECCS) project in Mendota, California. The plant will use agricultural biomass to produce electricity while capturing and storing the CO2 produced into the geologic formation below the facility. When fully operational, the project is expected to result in net-negative emissions, storing about 300,000 tons of CO2 annually. Chevron is also readying to test technology that captures CO2 from post-combustion gas at their Kern River facility in California, where they plan to design, construct, commission and test a pilot-scale carbon capture plant as a part of a project awarded to them by the Department of Energy.

Additionally, Chevron recently invested in Blue Planet Systems, a startup that “manufactures and develops carbon aggregates and carbon capture technology,” including a substitute for limestone — a substance used in concrete and building materials — made from captured CO2.

In 2021 Phillips 66 introduced a new organization, Emerging Energy, to help build a lower-carbon sustainable business platform by leveraging their existing capabilities and advancing investments in new energy technologies. Emerging Energy will focus on renewable fuels, battery value chain, carbon capture and hydrogen opportunities.
Continuously improving energy efficiency provides both environmental and economic benefits to refiners and petrochemical manufacturers. Refiners and petrochemical manufacturers employ processes like combined heating and power, also known as cogeneration — a process that simultaneously produces electricity while capturing useful heat or steam for industrial uses — and integrating alternative energy sources like solar and wind to power their facilities, allowing them to capitalize on efficiency gains while also lowering emissions.

For two consecutive years, 2020 and 2021, Marathon Petroleum Corporation (MPC) earned the U.S. Environmental Protection Agency’s (EPA’s) ENERGY STAR Partner of the Year – Sustained Excellence Award. This award recognizes companies for sustained, top-tier energy efficiency and excellent environmental compliance and is the highest honor among ENERGY STAR awards. This award is given to companies that have already received ENERGY STAR Partner of the Year recognition for a minimum of two consecutive years and then continue to go above and beyond the criteria needed to qualify for the award.

One contributing factor to MPC’s recognition is its industry-leading performance in ENERGY STAR certifications. Certification recognizes a facility for meeting the EPA’s strict energy efficiency performance levels, demonstrating excellent environmental compliance and achieving energy efficiency that places it in the top 25 percent of similar facilities nationwide.

Our industries are focused on being efficient and environmentally responsible and are doing so by recycling, reusing and reducing water used in their processes. Process water and stormwater are managed onsite at wastewater treatment plants and companies are finding innovative ways to treat it, including investing in technologies that allow facilities to more efficiently separate oil and water to recycle and reduce wastewater. Through these efforts, as much as 70 percent of the water used in refining processes and landscaping at certain facilities is now recycled or reclaimed.

CIRCON’s water treatment operations processed and recycled 145.3 million gallons of water that was sent back to the ecosystem for safe use.

Valero’s wastewater plants are operated by personnel trained in wastewater management, and each of their facilities have a wastewater plant for treating process water and stormwater. Valero uses specialized bacteria that naturally digest oil and other components in waste streams, before discharging the water or reusing it.
Land Conservation

Refiners and petrochemical manufacturers are deeply attuned to the immediate needs of the ecosystems in which they operate. In partnership with national and local non-profits, these industries restore regional landscapes, certify habitats and host community education and engagement programs on conservation.

Eastman partnered with The Longleaf Alliance (LLA) to plant 60,000 longleaf pines seedlings at Torrey State Park in Florida. The plantings will help restore an important ecosystem that provides a habitat to endangered species previously devastated by Hurricane Michael in 2018.

Waste Reclamation and Recycling

Our member companies are reducing the volume of waste produced and are always looking for alternatives to disposal, including reclamation and recycling. Companies have their own initiatives and are partnering with other businesses to recycle paper, plastics, aluminum, glass and cardboard; and to recover and recycle metals, including cobalt, copper, tin and steel, reducing the overall volume of material to be landfilled and producing a beneficial use for the materials.

CIRCON Environmental’s 2021 operations repurposed 121,719 tons of hazardous tank residual waste from cleaning operations and various non-hazardous wastes into 20,327,073 gallons of waste-derived fuel for use as a heat source in U.S. cement kilns. This effort alone displaced the need for 68,163 tons of coal, provided a net carbon offset of 292,126 tons, and prevented 60,860 tons of residual-waste ash from being landfilled. Oil recycling operations processed 613,739 barrels of oil that were sold back into the circular economy to bring fresh power and value to our industry. The company will introduce an annual Sustainability Awards Program this year to celebrate and spotlight achievements of companies in the refining sector that have made sustainability a priority throughout their operations.
Safety — Protecting the Health and Safety of Our Employees and Communities

There is nothing more important to the fuel and petrochemical industries than safety. Our commitment to the safety of our employees, facilities and communities goes beyond upholding the codes and standards that guide each of our company’s operations — it is embedded in the culture of our industries and instilled in every employee from the day they set foot on the job. We strive to have zero injuries and incidents and are never satisfied with the status quo; we constantly strive to improve upon our safety records year-over-year.

As a result, for the past decade, our industries have ranked in the top 10 percentile of more than 500 manufacturing industries tracked by the Bureau of Labor Statistics (BLS).

Incidence Rates of Non-Fatal Injuries or Illnesses Among Manufacturing Sectors\textsuperscript{21}

- Petroleum Refineries: 0.5
- Pulp Mills: 1.7
- Mining: 2.0
- Paper Manufacturing: 2.4
- Animal Food Manufacturing: 3.1
- Food Manufacturing: 5.1
- Ship & Boat Building: 5.3
- Iron Foundries: 7.3
- Travel Trailer and Camper Manufacturing: 7.5
- Mobile Home: 8.1

Refiners and petrochemical manufacturers are ranked in the top 10 percentile for safety of more than 500 manufacturing industries tracked by the government.\textsuperscript{22}
Did you know?

Safety within refining and petrochemical facilities takes two forms — process safety and occupational safety. Process safety is a management system that prevents any unintended release of energy within refining and petrochemical facilities by applying good operating, engineering, maintenance and other practices to manufacturing processes. Occupational safety refers to the protection of the safety, health and welfare of workers.

We strive for zero injuries and incidents. U.S. refiners and petrochemical manufacturers invest heavily in preventative maintenance to ensure the reliability of the equipment, and in operating practices to ensure the people are properly trained to work safely every time.
Advancing Process Safety Programs

Advancing Process Safety (APS) is AFPM’s flagship safety program. This groundbreaking program was developed to promote collaboration across industries and to continuously improve process safety through data collection and opportunities to share experiences and knowledge. Created in 2012 to work toward perfect process safety at facilities, this voluntary program has grown to include a suite of resources — including virtual reality, webinars and other tools and resources — that encourage the sharing of information and best practices.

AFPM’s Advancing Process Safety Program consists of several programs:

**Walk the Line:**
Employee human performance program directed at operators that provides a toolbox of training materials and good practices to prevent common incidents caused by common operational discipline errors.

**The Process Safety Regional Networks:**
Six regional information sharing networks that allow process safety professionals to improve overall safety performance through collaboration at the site and association level.

**The Process Safety Site Assessment Program:**
Independent third-party assessments that help facilities prevent process safety events through rigorous evaluation of written programs and operations.

**Hazard Identification/Practice Sharing Subgroup:**
Develops Hazard Identification and Practice Share documents for broad industry distribution that address common industry hazards and good industry practices.

**The Mechanical Integrity Subgroup:**
Develops resources to help members improve mechanical integrity programs, a key process safety program element.

**The Human Reliability Subgroup:**
Develops information and tools to improve human performance in operations that aid in reducing the likelihood and consequences of human errors.

**Industry Learning and Outreach Group:**
Industry data analysis that identifies opportunities for improvement for APS and conducts monthly industry webinars.

"Over the past 11 years, the Advancing Process Safety Program has proven to be effective in helping industry improve its process safety performance. Over the next several years, the program will continue to grow and expand its reach developing innovative tools for front line employees that gives them the right information at the right time to do their tasks safely."

— Mike Bukowski, Vice President, Strategy and Planning
Phillips 66
Industry Collaboration to Advance Safety

U.S. refiners and petrochemical manufacturers also work collaboratively to learn from each other and share good practices to advance safety across industries. AFPM facilitates this collaboration through a series of safety programs focusing on process safety, occupational safety and training and development.
Occupational Safety Programs

AFPM occupational safety programs and training are geared toward preventing injuries in our facilities. Through incident data collection, we are able to identify opportunities for industrywide improvement and build tools to address these issues; these tools are then shared throughout the industries. Our six Occupational Safety Regional Networks facilitate information sharing including lessons learned and good practices to improve the overall safety of the industries. Sharing of good energy isolation practices has been a significant focus of this program.

Immersive Learning Programs

The AFPM Training & Immersive Learning Committee provides a forum to share knowledge around the quickly evolving area of immersive learning. This includes highly interactive technologies like virtual and augmented reality to improve performance and safety, while also reducing training time. This group developed the first AFPM virtual reality (VR) simulation, a complex training tool replicating the process for lighting a fired heater from a cold start — a key facility operation for which hands-on, in-the-field training is difficult due to the potential consequences of inaccurate execution.

Sharing Safety Practices Across the Manufacturing Sector

Other industries and government partners are taking note of the success of AFPM’s safety programs and are seeking to apply good practices more broadly across the manufacturing sector. Over the course of the last year, AFPM has worked with organizations and government partners such as the American Gas Association, the American Petroleum Institute, the Center for Chemical Process Safety, the Chemical Safety Board and the Occupational Safety and Health Administration (OSHA) to share good practices derived from these programs.
Recognizing Outstanding Safety Performance

AFPM and our Safety and Health Committee have developed a slate of awards to further promote safe operations in the refining and petrochemical industries and to recognize facilities with outstanding occupational and process safety records.

AFPM proudly honors member company sites and their contractors that demonstrate excellent safety performance with the industries’ highest awards.

The highest honor, the **Distinguished Safety Award** (DSA) is AFPM’s most prestigious award. It is awarded to the sites with outstanding safety performance, program innovation, safety leadership and overall positive and proactive approaches to safety.

The **Elite Gold Award** recognizes facilities with safety performances in the top one percentile and that have demonstrated superior and consistent safety performance, program innovation and leadership.

The **Elite Silver Award** recognizes those sites that have attained top industry safety performance for the year and demonstrated excellent program innovation and leadership over time. The Elite Silver Award winners tout safety performance records in the top five percentile.

**Honoring Innovation in Safety Programs**

The U.S. refining and petrochemical industries’ commitment to continuous improvement has led to myriad new programs, protocols and processes to advance safety within our industries.

Introduced in 2021, the AFPM Innovation Awards recognize refineries, petrochemical facilities and their contractors that have developed unique and innovative programs to improve a site’s occupational or process safety performance. Last year, five sites were recognized with this award for developing programs that digitalized process hazard analyses, improved training, and improved the sharing of safety information and lessons learned to plant employees. Each program led to improvements in the site’s safety culture, training and hazard awareness. Recipients share their winning programs at AFPM meetings so that others can learn from these innovative programs.
“There is nothing more important to the fuel and petrochemical industries than safety. Our member companies go above and beyond requirements to keep our people, communities and facilities safe, and the AFPM Safety Awards recognize their strong commitment to safety and their persistence to improve on their already outstanding records.”

— Chet Thompson  
AFPM President and CEO
Security —
Securing Our Facilities

The threat landscape is constantly evolving and growing, challenging companies, industries and governments around the world. U.S. refiners and petrochemical manufacturers are meeting these changing risks with robust security measures and cutting-edge technology, making them more resilient. Our members’ sites are subject to various Federal security regulations and go above and beyond them to enhance their security.

Cyber Infrastructure

The refining and petrochemical industries utilize a complex system of information technology and operational technology to ensure their facilities remain secure.

Spotlight on Cybersecurity

The cybersecurity breach of a major pipeline in the spring of 2021 has placed a greater spotlight on the ways the oil and natural gas supply chains prevent, prepare for, and mitigate potential cybersecurity threats.

The refining and petrochemical industries employ security programs that are risk-based, flexible and that allow them to be responsive to emerging threats. Keeping a vigilant eye on information technology (IT) and operational technology (OT), our member companies employ a variety of security measures — and security experts — to ensure the safety of our facilities and people.

AFPM and our members also work collaboratively and proactively with federal agencies to develop strategic plans that have helped to identify and eliminate cybersecurity disruptions. Many AFPM member sites are subject to Chemical Facility Anti-Terrorism Standards (CFATS), the Maritime Transportation Security Act (MTSA) and Transportation Security Administration (TSA) security directives.
Cybersecurity software is just one defense that protects our facilities. Drones, sensors and smart fences have been used for years to secure the perimeter of our members’ operations. Other technologies such as thermal security cameras are effectively used to identify potential intruders and allow facilities to assess threats in darkness or bad weather.

The threat landscape is constantly evolving and growing, challenging companies and governments around the world. We are meeting these changing risks with robust security measures designed to protect our employees and facilities from operational threats and cybersecurity attacks. AFPM and our members work collaboratively and proactively with federal agencies to develop site security plans that have helped to identify and eliminate site vulnerabilities and cybersecurity disruptions.
The cybersecurity saying, “Information security is the immune system in the body of business,” rings true today more than ever. Events in recent years, including the pandemic and a cyber breach of one of our nation’s critical pipelines, reinforced the need for cybersecurity systems to be robust, flexible and agile — just like a healthy immune system.

These requirements are especially crucial for refining, petrochemical and midstream companies, since they are among the industries deemed critical for economic and national security by the Department of Homeland Security’s (DHS) Cybersecurity and Infrastructure Security Agency (CISA).

Our industries are not an easy target and have tools available and plans in place to help address the challenges that come their way. They have established relationships with state and federal government cyber intelligence networks, and communications channels are available to aid coordination when needed. Many companies also have extensive business continuity plans that include relevant contingency preparations — meaning that prior to COVID shutdowns many companies had, for instance, already conducted load tests to ensure their virtual private networks (VPNs) could scale up to handle the increased number of remote logins as employees worked from home.

In addition to individual company and government-led preparations, the industries’ deep-seated culture of safety and preparedness has resulted in a longstanding practice of industry-wide information sharing. The Oil and Natural Gas Information Sharing and Analysis Center (ONG ISAC), a private-sector cybersecurity hub that allows members to share information and coordinate against threats, is another valuable resource that AFPM and its members relied upon during the onset of the pandemic. Companywide training and testing are regularly conducted, including phishing simulations, to help employees better determine threats.

Our industries understand that their future relies on investing in and maintaining a healthy cyber immune system and will continue to innovate and respond to ensure their facilities and employees stay safe.
Workforce — Investing In and Supporting Our Employees

The U.S. refining and petrochemical industries support our communities and provide meaningful jobs to people of varying backgrounds and experiences. In total, we support three million jobs throughout the United States in a variety of roles including engineers, welders, truck drivers and even marine supply chain specialists.

3 million =

$225,000

Average U.S. refinery wage

$149,000

Average petrochemical wage

$73,000

National average wage

Total jobs supported by the U.S. refining and petrochemical industries

The people who work in our industries receive wages and benefits that are much higher than the national average. In fact, the U.S. refining industry, with average wages of $225,000 per year, is the fifth highest paid U.S. industry, only after computer manufacturing and investment activities. Workers in the petrochemical industries are also highly compensated with annual average wages of $149,000, significantly higher than the national average of $73,000.
Getting into the “Family Business”

The U.S. refining and petrochemical manufacturing industries offer rewarding, lifelong careers with family-supporting salaries and opportunities to try new things, all while staying within the same company or industry.

Take Leo Marquez, for example. Leo worked for Marathon Petroleum as a refinery plant operator but saw a new opportunity in the company that better fit with his passions, experience and career aspirations. He now works as a truck driver for the company.

He shared, “Originally I started out as a refinery plant operator but came across an opportunity which allowed me to follow in my father’s footsteps. Growing up my dad was a truck driver, and he had his own business. He taught me how to drive a truck when I was 24. Ever since then I enjoy being out on the road because it allows me to enjoy the open space, the outdoors, wildlife but more importantly the beautiful views.”

Our industries are also attractive to people who, like Leo, want to follow in the footsteps of their fathers in an even more literal way, so to speak.

If you visit one of our facilities, chances are you will run across fathers and daughters, brothers and sisters, and other family members who have all joined these industries for the many opportunities and benefits they provide.

Heather Smith Wood is an administrative assistant for reliability and mechanical integrity and works alongside her father and brother at the Phillips 66 Borger Refinery in Texas. Heather and her brother are the third generation to work at this facility.

Heather said, “It’s cool that we understand the day-to-day operations. Being able to relate and have those conversations, well it’s just nice to have that kind of support and understanding from your family.”

These industries, foundational to the global economy, are also the backbone to many communities across the United States, offering millions of people across the nation great opportunities to “get into the family business.”
Diversity, Equity and Inclusion

The U.S. refining and petrochemical industries believe that having a diverse workforce, and continuously promoting equity and inclusion, are critical to the future success of our industries. These companies are committed to cultivating cultures of belonging, where each employee is provided opportunities to succeed and grow and is valued for their unique experience and point of view. This commitment is reflected in the many ways our members attract, develop and retain the best talent from a variety of different backgrounds and experiences. These efforts take many forms including employee network groups; Black, Indigenous and People of Color (BIPOC) and female-focused scholarships and campus initiatives; mentoring and focused career development opportunities; and diversity, equity and inclusion (DEI) workshops and forums, for example.
The Phillips 66 Executive Inclusion and Diversity Council, chaired by Chairman and CEO Greg Garland, was established in 2019 and sets and monitors the execution of the company’s inclusion and diversity strategy, including driving performance against key progress metrics.

Valero considers its employees as a competitive advantage and its greatest asset. The company fosters a culture that supports diversity and inclusion, and provides a safe, healthy and rewarding work environment with opportunities for growth. Valero’s intern program, a key driver of its full-time workforce recruiting efforts, harnesses the nation’s top talent through hands-on learning, mentorship and professional development. Valero hosts annually across 18 company sites approximately 200 college students in engineering, accounting, commercial, trading, legal, communications, and information systems and cybersecurity. The company’s long-standing cultural values are reflected in the intern class, with women comprising 38 percent of the 2020 interns and racial minorities representing 30 percent.

The Human Rights Campaign (HRC) ranked Marathon Petroleum as a “Best Place to Work” for LGBTQ equality for the second consecutive year. For 2021, MPC scored 100 percent on the Corporate Equality Index (CEI) survey, which is the highest possible score. The CEI is a national benchmarking report for LGBTQ-related corporate policies and practices including non-discrimination workplace protections, inclusive benefits, supporting an inclusive culture and responsible citizenship.

In 2020, Chevron made a $15 million investment to support the Black community in the United States aimed to address barriers to equity. A year later, the company continues to address racial barriers through education, job creation, talent and leadership development, and community and small business partnerships. Since then the company has advanced initiatives to advance these pillars, including supporting the Thurgood Marshall College Fund, the nation’s largest organization exclusively representing the Black College community; making a $150,000 three-year pledge to the East Oakland Youth Development Center (EOYDC) to develop a Chevron Black Employee Network-led career-awareness program and providing funding to EOYDC graduates who need assistance with overcoming a financial hardship resulting from the COVID-19 pandemic through the Chevron EOYDC Special Scholarship Program; expanding the Chevron Leadership Academy to Prairie View A&M University; and establishing a Supplier Diversity Governance Board tasked with representing all U.S.-based businesses and implementing Chevron’s supplier diversity strategy to increase the utilization and development of small, local, and diverse suppliers.

Increasing resources, creating opportunities and empowering women throughout all levels of our organization remain priorities and areas of progress at Chevron Phillips Chemical (CPChem). The number of women holding senior leadership roles at the company has doubled over the last five years, and employees recently launched the company’s first employee-led resource group, STRIVE, offering resources focused on attracting, retaining and supporting women at CPChem.

“As a mom of two young kids, work-life balance is very important to me. It can be difficult to manage the demands of parenting and work responsibilities and I’m always seeking ways to improve on both fronts! One way we have tried to connect the two worlds was creating a parenting network group at the refinery. Our goal was to bring parents and caregivers together to learn from each other and share our experiences. It has been so great connecting with other parents, sharing good tips, or even just laughing about the mistakes we have made. Our group meets on a wide array of topics such as fun vacation ideas to effective discipline methods. It has been great to just take a break from a busy workday to connect with other parents. I’m happy to be working for a company that endorses employee-run groups such as these as a way of supporting our working community.”

—Kayla Waller, Process Safety Supervisor Flint Hills Resources
Community Involvement — Being Good Neighbors

AFPM member companies believe strongly in being good neighbors by supporting the local communities around their sites and businesses. In addition to contributing more than $62 billion in state and local taxes and more than $61 billion in federal taxes to the U.S. economy, U.S. refiners and petrochemical manufacturers support their communities through philanthropic donations and volunteering. Our companies partner with local policymakers, community-based organizations and academic institutions to create, fund and facilitate programs to protect the environment, provide educational opportunities and support local first responders, among other endeavors. Members of the refining and petrochemical workforce have a rich history in volunteering in their communities, serving as volunteer firefighters, tutors to school children, cooks and servers in food banks, caretakers of local wildlife habitats, and much more.

$583 billion in total GDP contributions of the refining and petrochemical industries.\(^{30}\)

$123 billion in local, state and federal taxes contributed to the U.S. economy annually.\(^{31}\)
Humans of the Industry

“I hope that what I have instilled in my children is the desire to serve the community and to be active in the charitable sector. Throughout my entire life, I’ve been involved in the nonprofit world, and I have included my kids from a very young age, taking them with me to many meetings and volunteer opportunities. I have really tried to stress to them the importance of serving other people and doing things that matter in the community, regardless of your job. With that said, Marathon has always been a big proponent of community service, which is important to me in an employer.”

— Alice Momenee
Senior Marine Supply Chain Rep.
Marathon Petroleum

The Coastal Bend Food Bank’s “Building Hope” capital campaign received a big boost from the Valero Energy Foundation with a $1.5 million kick-off gift to help build a new 108,000-square-foot facility.

At the campaign kick-off event, the executive director of the Food Bank explained how the increased need in the community has caused them to outgrow their current distribution facility. The lack of space had forced the food bank to store 60 percent of their dry products in outside storage, in addition to leasing freezer space. A planned $30 million distribution center will solve those issues while providing ample food storage, with more drive-through bays to receive donations or distribute food to families, and space to host educational events.

The Food Bank, which plans to distribute 14 million pounds of food to nearly 80,000 people a year, is expected to break ground on the new distribution center in April 2022. Work will be complete in 2023.

Motiva Enterprises awarded scholarship funds totaling $195,000 to 36 high school graduates from Southeast Texas last year. Recipients of the Motiva Excellence in Education Scholarship receive funds to aid in their pursuit of a science, technology, engineering and math (STEM) or business-related undergraduate, associate or vocational degree. To date, Motiva has awarded more than $2.5 million in higher education funds through its scholarship program.

In January Flint Hills Resources and nonprofit partner DARTS celebrated 25 years of working together to support Learning Buddies, a program that brings together older adults and elementary school children to share experiences and learn from one another. The program focuses on math, science, reading, spelling and vocabulary and serves 47 area schools. Over the years, Learning Buddies has mentored more than 75,000 students during more than 113,000 volunteer hours and brought thousands of smiles to local communities.

Community involvement is one of Monroe Energy’s core values. In addition to participating on community boards and organizations, Monroe’s team members tutor local students and volunteer with local environmental groups. They also support their community through philanthropy, including hosting an annual charity golf outing and a holiday toy drive.
Policies That Power Progress

AFPM works to advance public policies that address our most pressing challenges. Whether it’s advocating for a nationwide high-octane fuel standard that would drastically reduce emissions or pursuing strategies to address plastic waste in the environment, AFPM supports policies that enable our members to supply the fuel and petrochemicals that growing global populations and economies need to thrive, and to do so in a sustainable way.

This includes federal, state and local government investment; regulatory reform that encourages private investment; and streamlining our regulatory system and permitting processes to facilitate prompt construction of critical new infrastructure, including pipelines.

Enhance Transparency
The future of American manufacturing requires reasonable and cost-effective regulations. AFPM supports regulatory reform that enhances transparency, accountability and efficacy of federal regulations based in sound science.

Promote Competition
The refining and petrochemical industries welcome free-market competition unimpeded by market distorters including mandates and subsidies. Policymakers should also look to ensure U.S. companies operating abroad are treated fairly through a system of trade rules that facilitate cooperation and regulatory alignment and reflect the reality of an integrated energy and petrochemical market. Finally, policymakers must ensure the full potential of the modernized tax code is realized to spur growth now and into the future.

Balance Needs for All Americans
U.S. policies should balance the need for affordable and reliable fuels and a growing economy with sound environmental policies. The essential role and many societal benefits that petroleum fuels, natural gas and petrochemicals provide our nation and the world should not be ignored.

Strengthen our Foundation
The global gains of the U.S. refining and petrochemical industries can’t be maintained or built upon unless our nation’s infrastructure keeps pace. Investment in critical infrastructure, including roads, pipelines, rail, inland waterways and ports, are key to accessing and expanding the use of U.S. resources.
Climate Change Principles

AFPM is committed to engaging in the discussion and development of sound climate change policies that are:

- Balanced and measured to improve quality of life, ensuring the long-term economic, energy and environmental needs of humanity are met;
- Protective of U.S. competitiveness and prevent the shifting of production, jobs and emissions from the United States to other countries;
- Harmonized, preemptive and economy-wide;
- Simple and transparent; and
- Achievable and flexible to adjust, as necessary.

AFPM and our members are further committed to:

- Delivering affordable, reliable fuel and petrochemicals products that lift the standards of living for people all over the world;
- Improving the efficiency and sustainability of our operations;
- Offering fuels and petrochemicals that make engines and other products more efficient; and
- Continuing research, innovation, and application of new technologies and products.

Carbon Capture, Utilization and Storage (CCUS)

Carbon capture is a critical technology to pave the way to a lower carbon energy future. We are supportive of tax credits for carbon capture technologies — specifically the 45Q tax credit for carbon capture technologies — because these technologies are an essential pathway for reducing the carbon intensity of energy and industrial systems. We are working with Congress on other policies to activate, expand and fully realize the benefits of this innovative technology.

95-RON Fuel Standard

AFPM members are leading the effort to transition the United States to high-octane gasoline through a nationwide high-octane, 95-RON fuel standard that would meet the most stringent air quality standards in every state. Alongside refiners’ efforts to decarbonize heavy transportation through renewable diesel, a 95-RON octane standard would unlock an entirely new range of cleaner, fuel-efficient vehicle transportation options for consumers — options that include affordable, family-accommodating vehicles.
Addressing Plastic Waste

AFPM’s approach to addressing the challenges of global plastic waste considers many aspects of this complex issue. Ultimately, our solutions will always acknowledge the tremendous long-term value of plastic products, while considering data-driven innovations that promote advanced recycling solutions and remove regulatory barriers to widescale adoption of such technologies.

Specifically, we advocate for:

- Development of a national framework to eliminate plastic waste in the environment and grow the circular economy for plastics;

- Working collaboratively across the plastics value chain and with governments to encourage the responsible disposal of plastic products and the recycling, reuse and recovery of plastic waste on a global scale. This includes increased funding of state and local waste collection programs to better source and collect plastic waste;

- AFPM supports the innovation and development of plastic waste repurposing technologies that have the potential to recover plastic waste and transform it into usable materials. This includes removing regulatory barriers for new facilities that will allow for the continued expansion of advanced recycling capabilities;

- Appropriate regulatory classification for plastic waste as a manufacturing feedstock, which simplifies the process and reduces regulatory hurdles for companies processing plastic; and proper accounting and tracking of recycled content, allowing companies to set clear goals and to consistently track their recycling efforts.
Supporting Policies to Advance Recycling Technologies

AFPM has supported state efforts to classify advanced recycling as a manufacturing process and not a waste disposal or incineration process while refuting efforts to demonize plastic products, including Canadian efforts to deem plastic as toxic.

We’ve supported the passage of bi-partisan federal legislation that falls in step with these goals — such as the Save Our Seas Acts — to spur innovation and enable greater collaboration among industry, government and other stakeholders to keep waste out of waterways and drive recycling efforts that recapture the value of used plastic products.

We have also recently supported the Plastic Waste Reduction and Recycling Act, the PLASTICS Act and the RECOVER Act, all of which furthers efforts to mitigate plastic waste locally, nationally and globally. At a state level, AFPM has supported bills in 14 states that classify advanced recycling as a manufacturing process and not a waste disposal or incineration process.
AFPM Executive Committee

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President and Chief Executive Officer
Flint Hills Resources, LLC
Wichita, Kansas

AFPM Vice Chairman
Mr. Robert A. Herman
Executive Vice President, Refining
Phillips 66
Houston, Texas

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Monroe Energy, LLC
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Chevron U.S.A. Inc.
San Ramon, California

Mr. Willie Chiang
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Plains All American Pipeline, L.P.
Houston, Texas

Mr. Bruce Chinn
President and Chief Executive Officer
Chevron Phillips Chemical Company LP
The Woodlands, Texas
Mr. Brian Coffman  
President and  
Chief Executive Officer  
Motiva Enterprises, LLC  
Houston, Texas

Mr. Mike Jennings  
Chief Executive Officer  
HollyFrontier Corporation  
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ExxonMobil Fuels &  
Lubricants Company  
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Mr. Mike Nagle  
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INEOS Olefins & Polymers USA  
League City, Texas

Mr. Matt Smorch  
President and Chief Executive Officer  
Countrymark Cooperative Holding Corporation  
Indianapolis, Indiana

Mr. Mike Hennigan  
President and  
Chief Executive Officer  
Marathon Petroleum Corporation  
Findlay, Ohio

Mr. Thomas J. Nimbley  
Chairman and Chief Executive Officer  
PBF Energy, Inc.  
Parsippany, New Jersey

AFPM Associate Liaison  
Mr. Stephen M. Toups  
President and  
Chief Executive Officer  
Turner Industries Group, LLC  
Baton Rouge, Louisiana
AFPM is governed by a Board of Directors, comprised of representatives from each of our regular members. When the Board is not in session, it delegates authority to the AFPM Executive Committee to render judgments and govern the Association. The Board of Directors elects a chairman, seven vice presidents and a treasurer who, together with the immediate past chairman, comprise the Executive Committee. The Board also elects a president to serve as chief administrative officer of the Washington-D.C.-based staff and the headquarters office.

Albemarle Corporation
Raphael Crawford

American Refining Group, Inc.
Brian Zolkos

Arkema Inc.
Richard Rennard

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Our industries make life better, safer, healthier and — most of all — possible.
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AFPM publications inform our members about industry statistics, technical innovations, environment and safety developments, security, and many other relevant issues.

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- Green Room Report
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- Sustainability Report
- Tech Update

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- Annual Survey of Occupational Injuries & Illnesses
- Process Safety Event Report
- AFPM U.S. Refining & Storage Capacity Report

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- Annual Meeting Papers
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- National Occupational & Process Safety Conference Exhibition Papers
- Operational Planning Control and Automation Technologies Conference Papers (2019 and previous)
- Reliability & Maintenance Conference Papers (2019 and previous)

Transcripts

Operations & Process Technology Summit, formerly Q&A (2019 and previous)

* Publications are distributed to members only.
Standing Committees and Working Groups

The AFPM Board of Directors relies on the counsel and support of experts among its membership to accomplish specific Association functions and plan for the Association’s future. In addition to our standing 23 committees and subcommittees, we have a series of regional networks and working groups that serve to assist the Board in achieving AFPM’s goals.

The **Associate Steering Committee** provides a forum for the Association’s contractors, suppliers, vendors, and consultants, to communicate with the Board of Directors on items of mutual interest and support.
Chair: Stephen Toups, Turner Industries Group, LLC
AFPM Secretary: Susan Yashinskie

The **Base Oils & Waxes Committee** provides oversight and assistance on matters related to automotive oils, base oils and waxes.
Chair: Scott Flathouse, Phillips 66
Chair: Ross Reucassel, The International Group, Inc.
AFPM Secretary: Tanya Cooper

The **Communications Committee** shares information, ideas and communications strategies to increase support by external audiences for policy positions established by the Executive Committee and adopted by the AFPM Board.
Chair: Jake Reint, Flint Hills Resources, LLC
AFPM Secretary: Jaime Zarraby

The **Cybersecurity Committee** provides information and recommendations on matters pertaining to cybersecurity and cyber threats.
Chair: Blake Larson, Sinclair Oil Corporation
AFPM Secretary: Jeff Gunnulfsen

The **Environmental Committee** provides a forum for members to exchange views and discuss environmental activities and advises the AFPM Board and staff on current environmental laws and regulations.
Chair: Christopher Drechsel, Marathon Petroleum Corporation
AFPM Secretary: David Friedman

The **Fuels Committee** provides information and policy recommendations concerning legislative, regulatory and motor fuel specification developments.
Chair: Scott Roginske, CHS Inc.
AFPM Secretary: David Friedman

The **Government Relations Committee** serves as the principal forum for sharing information, ideas and strategies on legislative and regulatory issues important to the refining and petrochemical industries.
Chair: Salo Zelermyer, Valero Energy Corporation
AFPM Secretary: Geoff Moody

The **Immersive Learning Committee** provides a forum for the exchange of information on learning, as well as research and development of training tools and solutions that utilize existing and emerging technologies to enhance member training programs.
Chair: Bjorn Olson, Flint Hills Resources, LLC
Chair: Tyler Veenstra, Marathon Petroleum Company
AFPM Secretary: Abby Esterly

The **Issues Committee** advises the Executive Committee and provides direction and guidance to AFPM staff on current policy issues important to the refining and petrochemical industries.
Chair: Jeff Ramsey, Flint Hills Resources, LLC
AFPM Secretary: Geoff Moody
The **Labor Relations & Human Resources Committee** facilitates the exchange of information on matters related to industrial and labor relations, human resources practices and collective bargaining.
Chair: Terrence Martin, Phillips 66
AFPM Secretary: Adam Ali

The **Legal Committee** recommends litigation strategies to advance the interests of AFPM’s members and the industries. The Committee also provides guidance to the AFPM staff on legislative and regulatory proposals and general legal issues affecting the industry.
Chair: Richard Walsh, Valero Energy Corporation
AFPM Secretary: Rich Moskowitz

The **Manufacturing Committee** provides technical support and recommendations on matters that affect facility operations and products including federal, state and local laws and regulations.
Chair: Sharon Watkins, Monroe Energy, LLC
AFPM Secretary: Gordon Robertson

The **Operational Planning Control & Automation Technologies Committee** focuses on sharing practical experience with the application management, and integration of computing technology in areas including process control and automation, modeling, real-time optimization and Internet-based applications.
Chair: Tracy Sadowski, Monroe Energy, LLC
AFPM Secretary: Tanya Cooper

The **Petrochemical Committee** advises the AFPM Board and staff on current issues of importance to the petrochemical industry.
Chair: Mary Kurian, BASF Corporation
AFPM Secretary: Rob Benedict

The **Petrochemical Statistics Subcommittee** advises and assists the Petrochemical Committee and AFPM staff on matters pertaining to the collection and dissemination of statistics on petrochemicals, including trade, production and inventories.
Chair: Georgina Goodnight, Chevron Phillips Chemical Company LP
AFPM Secretary: Rose Sabijon

The **Reliability & Maintenance Committee** provides information and advice on issues related to process plant reliability, maintenance practices, mechanical integrity and workforce issues. The Committee promotes the exchange of technical information and proven practices on reliability, maintenance, inspection, procurement, project engineering, and turnarounds through the AFPM Summit.
Chair: Gerard Celestine, Motiva Enterprises, LLC
AFPM Secretary: Tanya Cooper

The **Security Committee** provides a forum for the exchange of information among the membership on security-related issues within the petroleum refining and petrochemical manufacturing industries.
Chair: Jeff Culver, Koch Industries, Inc.
AFPM Secretary: Jeff Gunnulfsen

Please visit the AFPM website for a complete description of all committees and their rosters at www.afpm.org/committees.
Standing Committees and Working Groups

continued

The **State & Local Outreach Committee's** purpose is to discuss state-level legislative and regulatory issues of importance to AFPM's refining and petrochemical members. The Committee will advocate for AFPM policies at the state and local levels, as directed by the Issues Committee.
Chair: Stephen Konig, Marathon Petroleum Corporation
AFPM Secretary: Don Thoren

The **Sustainability Working Group** provides a forum for discussing how the fuel and petrochemical industries are advancing sustainability today and contributing to a sustainable future through environmental stewardship, the advancement of health and safety, helping people and communities thrive, and driving progress both within our industries and in sectors across the economy.
AFPM Secretary: Jaime Zarraby

The **Tax Policy Committee** provides analysis and recommendations on tax-related legislation and engages in regulatory matters at the U.S. Treasury Department and Internal Revenue Service.
Chair: Nicole Busey, Marathon Petroleum Corporation
AFPM Secretary: Fernando Gomez

The **Transportation, Infrastructure & Midstream Committee** analyzes policy, regulations and guidance relating to the transportation of oil, natural gas, and the products derived from these critical resources, as well as other transportation and infrastructure issues that may arise.
Chair: Cindy Bond, Phillips 66
AFPM Secretary: Rob Benedict

The **Women in Industry Working Group** focuses on empowering women in our industry by helping them develop professional goals, create networking and mentoring opportunities, and provides training and skills development. Members take advantage of opportunities to learn from industry leaders, engage and connect.
AFPM Secretary: Latoya Britt

The **Workforce Development Network** directs and supports AFPM's Workforce Development Program. This network serves as a conduit for members and regional partners to share good practices and explore outreach opportunities to deliver the diverse and qualified workforce needed for the future.
AFPM Secretary: Adam Ali

The **Safety & Health Committee** provides a forum for members to exchange views and share occupational and process safety best practices and developments in safety related legislation and regulation.
Chair: James Upton, Ergon Inc.
AFPM Secretary: Rebecca O'Donnell

The **Industrial Hygiene Subcommittee** provides a forum for the exchange of information on industrial hygiene, regulatory and legislative trends and developments as well as other matters concerning industrial hygiene standards and practice.
Chair: Jason McGowan, HollyFrontier Corporation
AFPM Secretary: Rebecca O'Donnell
The **Occupational Safety Regional Network Leadership Subgroup** reports to the Safety & Health Committee on the AFPM occupational safety regional networks. In addition, the Subgroup highlights practices for inclusion in the Practice Sharing Program, topics for the National Safety Conference, and provides review for the Safety Innovation Award.

Chair: Scott Willis, Phillips 66  
AFPM Secretary: Eileen Scherzinger

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**Occupational Safety Regional Networks**  
AFPM Secretary: Eileen Scherzinger

- **Central States Regional Network**  
  Chair: Scott Willis, Phillips 66

- **East Coast/Mid-West Regional Network**  
  Chair: Keith Dempsey, PBF Energy Inc.

- **Eastern Gulf Coast Regional Network**  
  Chair: Garrett Alexander, LyondellBasell Industries

- **Pacific Coast Regional Network**  
  Chair: Casey Woods, Valero Energy Corporation

- **Rocky Mountain Regional Network**  
  Chair: Eric Roberts, Motiva Enterprises LLC.

- **Texas Gulf Coast Network**  
  Chair: Eric Roberts, Motiva

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**Hydrofluoric Acid Alkylation Safety Networks**  
AFPM Secretary: Eileen Scherzinger

**Mechanical Integrity Networks**  
AFPM Secretary: Gordon Robertson

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The **Process Safety Advisory Group (PSAG)** provides leadership, support and guidance to Advancing Process Safety (APS) programs in an effort to promote process safety performance excellence across the Association’s memberships.

Chair: Brook Vickery, Flint Hills Resources, LLC  
AFPM Secretary: Lara Swett

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The **Process Safety Workgroup** is responsible for implementing the direction and vision of the Process Safety Advisory Group by providing oversight and direction to the Advancing Process Safety Programs.

Chair: George Edwards, Koch Industries, Inc.  
AFPM Secretary: Mawusi Bridges

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**Hazard Identification and Practice Sharing**  
Chair: Justin Collins, Motiva Enterprises LLC  
AFPM Secretary: Mawusi Bridges

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**Industry Learning and Outreach**  
Chair: Shanahan Mondal, Cheniere Energy  
AFPM Secretary: Mawusi Bridges

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The **Regional Network Program** provides opportunities for site-level practitioners to network, share events, learnings, and good practices with each other in a non-competitive environment in a variety of disciplines.

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**Regional Network Program**  
Secretary: Eileen Scherzinger

- **Process Safety Regional Networks Subgroup**  
  Chair: Morgan Walker, Phillips 66

- **Central States Regional Network**  
  Chair: Ray Ralph, CVR Energy, Inc.

- **East Coast Regional Network**  
  Chair: Dave Dolnick, Phillips 66

- **Eastern Gulf Coast Regional Network**  
  Chair: Rebecca Bourg, PBF Energy Inc.

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**Walk the Line Subgroup**  
Chair: Lawrence Moreaux, LyondellBasell Industries  
AFPM Secretary: Mawusi Bridges
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Our live events, are thoughtfully designed to provide state-of-the-industry information in a dynamic and interactive format, encouraging connections between attendees, presenters and exhibitors.

**Annual Meeting**
Hyatt Regency  
New Orleans, LA  
March 13 - 15, 2022

**International Petrochemical Conference**
Grand Hyatt  
San Antonio, TX  
March 27 - 29, 2022

**Labor Relations / Human Resources Conference**
Royal Sonesta  
Houston, TX  
April 26 - 27, 2022

**Security Conference**
Royal Sonesta  
Houston, TX  
April 28 - 29, 2022

**National Occupational & Process Safety Conference & Exhibition**
Grand Hyatt  
San Antonio, TX  
May 10 - 12, 2022

**AFPM Summit**
Grand Hyatt  
San Antonio, TX  
October 18 - 20, 2022

**Environmental Conference**
October (TBD)

For more information, visit www.afpm.org/events
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To find out more contact Latoya Britt at membership@afpm.org
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Endnotes

1 AFPM
2 AFPM Analysis of IHS Markit data
3 AFPM Analysis of IHS Markit data
4 AFPM
5 Annual Survey of Manufacturing (ASM) and Oxford Economics
6 AFPM
7 ASM and Oxford Economics
8 U.S. Energy Information Administration (EIA)
9 U.S. EIA and AFPM analysis
10 U.S. EIA
11 ExxonMobil
12 U.S. EIA
13 U.S. EIA
14 Ethylene exports were from Jan to November. Source is US International Trade Commission data S&P Global Platts Analytics
15 S&P Global Platts Analytics
16 S&P Global Platts Analytic
17 S&P Global Platts Analytics
18 AFPM
19 U.S. Pipeline and Hazardous Materials Safety Administration
20 U.S. Environmental Protection Agency (EPA)
21 (The Bureau of Labor Statistics did not collect injury and illness data on the petrochemical industry for 2020)
22 U.S. Bureau of Labor Statistics
23 AFPM
24 AFPM
25 AFPM
26 Oxford Economics’ Analysis of IMPLAN data
27 Oxford Economics’ Analysis of IMPLAN data
28 Oxford Economics’ Analysis of IMPLAN data
29 Oxford Economics’ Analysis of IMPLAN data
30 Oxford Economics’ Analysis of IMPLAN data
31 Oxford Economics’ Analysis of IMPLAN data