



Commitment to a Sustainable Future

2024 Sustainability Report



A full-page background image featuring a dramatic sunset. The sky is filled with large, billowing clouds in shades of deep red, orange, and pink, transitioning to a clear blue at the top. Several birds are captured in flight, their dark silhouettes contrasting against the colorful sky. Below the horizon, the silhouettes of mountains and a small island are visible. The calm water in the foreground reflects the intense colors of the sunset. In the bottom left corner, there are some dark, out-of-focus reeds or grasses.

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A Message from the President and CEO of AFPM

During a time of continued uncertainty and upheaval, America's refiners and petrochemical manufacturers continue to deliver on their commitments to make the fuel and petrochemical products our growing world depends on in ever cleaner, safer and more sustainable ways.

AFPM members deploy a variety of approaches to operate more sustainably — from increasing energy efficiency, to reducing emissions from their operations, more effectively managing water and waste, and promoting technologies like carbon capture, use, and storage.

The refining and petrochemical industries are making these advancements even as they continue to invest in emerging technologies, collaborate across industry to share good practices, evolve emergency preparedness plans and promote safety throughout their communities to progress their shared goal of zero incidents and injuries.

AFPM members are pillars of their communities, providing a host of high-paying jobs while promoting diversity, equity and inclusion internally and throughout their communities; generously contributing to philanthropic causes while volunteering hundreds of thousands of hours annually; supporting their workforce with mental, physical and emotional health programs; and paving the way for the workforce of tomorrow through STEM education and skills-based training.

AFPM members are leading the way in developing the innovative technologies needed to ensure a more sustainable economy. Their investments in creating a circular ecosystem for plastics go well beyond scaling advanced recycling; they have significantly accelerated the use of renewable feedstocks, while also addressing pressing issues with plastic waste collection and sorting. Members are also partnering and collaborating — with each other as well as outside groups such as global consumer brands — to fast-track innovation and sustainability efforts. And as demand for lower-carbon fuels grows, U.S. refiners are increasing production of renewable diesel and sustainable aviation fuel, while also investing in hydrogen and next-generation fuels such as renewable natural gas and renewable gasoline.

We in the fuel and petrochemical industries are holding ourselves accountable on this sustainability journey by establishing measurable goals and tracking the metrics of our progress, altering our governance structure to reflect these priorities, working to improve our data quality and collaborating with our suppliers to enhance sustainability efforts outside of our direct operations. Additionally, our members are persistently pursuing effective policy solutions to further enhance their ability to contribute to our nation's sustainability progress, including legislative and regulatory approval for carbon capture, advanced recycling technologies, and a nationwide high-octane fuel standard.

I could not be prouder of AFPM's members and the many ways they are demonstrating their commitment to sustainability. Only a small fraction of these efforts made it into the following pages, but this glimpse reveals how our industries are sustainably delivering the fuels and petrochemicals the world needs to thrive.



A stylized, handwritten signature in dark ink, appearing to read 'Chet Thompson'.

Chet M. Thompson
President and CEO

American
Fuel & Petrochemical
Manufacturers

Our Commitment to Sustainability

Our Sustainability Pillars



Environmental Stewardship

We are committed and responsible stewards of the environment. We are doing more with less — reducing emissions, conserving energy, using water efficiently, preserving land and reducing waste to protect the climate, air, water and land around us today and for generations to come.



Health and Safety

We foster a strong culture of safety throughout our industries and our communities, building on the progress that has led our industries to be amongst the safest of hundreds of industries within the manufacturing sector.

The U.S. refining and petrochemical industries are committed to providing the critical fuel and petrochemical products that growing global populations need to thrive, and to do so sustainably.



Thriving People and Communities

We help people and communities thrive by providing well-paying jobs for people of all backgrounds, building more inclusive and diversified workforces and communities, preparing the future workforce for jobs in our industries, and giving back to our communities through philanthropy and volunteerism.



Driving Progress

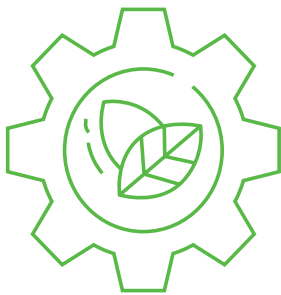
We are addressing society's biggest challenges — including building a lower-carbon future and advancing a more circular economy for plastics — and pushing past the status quo by driving innovation that will make life better, safer and more productive.

As a part of their commitment to operate responsibly, the U.S. refining and petrochemical manufacturing industries are operating more efficiently, reducing emissions, conserving water and other critical resources, and engaging in efforts to enhance biodiversity.

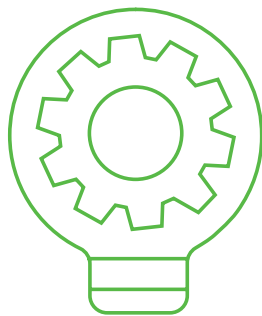
Environmental Stewardship

Operating More Sustainably

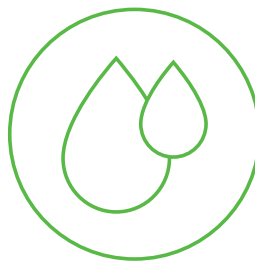
Dedicated to doing more with less, AFPM members are implementing practices to reduce their energy-use intensity, lower their critical emissions profiles and adopt renewable energy where possible.



The U.S. fuel and petrochemical industries are investing billions of dollars into saving energy and reducing emissions of their operations and products.



AFPM members look for ways to reuse, recycle and repurpose waste throughout their operations.



AFPM members are committed to doing more with less — and that includes freshwater use. The fuel and petrochemical industries are developing cutting-edge water treatment and recycling technologies to reduce their reliance on freshwater.



AFPM members prioritize the conservation and reclamation of the land and ecosystems around them.



Over the past few years, **CountryMark's** Energy Resources division has been installing pump off controllers on producing wells to improve operative efficiencies.⁹ The initial nine-well pilot demonstrated a 30% reduction in power consumption. Since the initial pilot, controllers have been installed on another 75+ wells to further capture the power savings. In 2023, CountryMark also launched its first pilot well in a program to test the effectiveness of solar arrays in pumping low volume wells. This will further reduce CountryMark's electric consumption.

Emissions Reduction

Refiners and petrochemical manufacturers have invested — and will continue to invest — billions in technology designed to reduce criteria air pollutants and keep emissions from escaping their operations.

- **ExxonMobil** has cut methane emissions intensity from across their operated assets by more than 50% and reduced operated absolute methane emissions by 50% through 2022 vs. 2016 levels.¹
- **Flint Hills Resources'** refineries have reduced annual flaring hours by over 90% and annual criteria air emissions by over 70% since 2000 through burner and heater replacements, pollution control equipment and other projects.²
- Since 2018, **Phillips 66** has reduced air pollutants such as nitrogen and sulfur oxides, particulate matter and volatile organic compounds by 27% across its assets. The reductions have been accomplished through projects like the installation of selective catalytic reduction units at two hydrogen plants at its Wood River Refinery, which is expected to reduce nitrogen oxides by 87% annually.³
- **Marathon Petroleum's** Los Angeles refinery is undergoing a series of projects to reduce its nitrogen oxide emissions by 2026. The initiative includes replacing and modernizing key utility systems, including electrifying some steam turbines, as well as replacing steam production equipment. The program will result in a reduction of nitrogen oxide (NOx) emissions by a total of about 49% from 2017 levels while lowering greenhouse gas (GHG) emissions and saving 375 million gallons of water each year.⁴
- **HF Sinclair** has installed additional emissions controls on its fluid catalytic cracking units, which significantly reduce sulfur dioxide and particulate matter emissions. Many of its units also feature NOx control technologies, which can reduce pollutants from 80% to 95% compared to uncontrolled levels.⁵
- **Monroe Energy** has spent \$35 million to install an innovative Flare Gas Recovery System, which along with other measures has reduced flare-related emissions by roughly 80%.⁶
- **PBF's** Toledo Refinery worked with Savage to upgrade the multi-engine locomotive used at the refinery to switch railcars and move them through the local railyards. The locomotive now has two new Cummins Tier 3-compliant QSK19 engines, which reduce nitrogen oxide and particulate matter emissions by up to 90% (while reducing fuel consumption by 70%), reduce noise levels by 85% and increase efficiency by up to 75% compared to traditional locomotives.⁷
- **TPC Group** uses real-time fenceline monitoring to detect volatile organic compounds and provide timely information when preventing or investigating emissions.⁸

Advancing Carbon Capture

Carbon capture technologies, including carbon capture, utilization and storage (CCUS), are critical to achieving significant near-term reductions in greenhouse gas emissions. In fact, the United Nations (UN) Intergovernmental Panel on Climate Change says that carbon capture and storage could reduce up to 15 percent of global emissions by 2040, and without it, global decarbonization efforts are estimated to double in cost.¹⁰ The U.S. fuel and petrochemical industries are making and scaling investments into these technologies as part of their efforts to reduce emissions throughout these industries.

- **ExxonMobil**, for instance, has over 30 years of experience with CCUS — and is, in fact, responsible for about 40% of all CO₂ captured worldwide since 1970.¹¹ In 2023, ExxonMobil expanded its CCUS capabilities by agreeing to purchase Denbury, which provides ExxonMobil with the largest CO₂ pipeline network in the U.S. — including nearly 925 miles of pipeline in Texas, Louisiana and Mississippi, one of the largest markets for CCUS.¹²
- **Marathon Petroleum** is partnering with TC Energy and the University of North Dakota's Energy and Environmental Research Center to help develop a carbon capture and utilization system for its Dickinson, North Dakota, renewable diesel refinery — a project that is also funded by a \$2.5 million U.S. Department of Energy grant.¹⁵
- **Phillips 66**, meanwhile, is performing an initial engineering design study for deploying CCS technology at the hydrogen production unit of its Rodeo, California, refinery as part of a U.S. Department of Energy grant.¹⁶
- **BASF** is partnering with CSSC Power Co. to expand CCUS use in a new arena: commercial maritime projects. The companies will test different types of marine fuels and engines using BASF's OASE blue gas treatment technology, which is a carbon capture technology with low energy consumption and a flexible operating range.¹⁷
- **Cenovus** currently operates two carbon capture projects — at the Lloydminster Ethanol Plant and at the Pikes Peak South thermal asset in Saskatchewan — with the capacity to capture roughly 89,000 metric tons of CO₂ each year. In addition to these projects and others being evaluated at the company's upstream assets, Cenovus is investigating carbon capture at its Minnedosa Ethanol Plant and Lloydminster Upgrader, which would have combined capacity to capture over 700,000 metric tons of emissions annually.¹⁴

As U.S. Department of Energy Secretary Jennifer Granholm said, "Following decades of R&D and early commercial deployment, carbon capture and storage — and carbon management more broadly — is finally having the big moment we all believe it needs."¹⁸



Energy Efficiency

AFPM members are increasing operational efficiency while expanding investments to realize further efficiency gains.

- **ExxonMobil** achieved highest refinery throughput since 2007 and prepared to bring 250,000 barrels per day of expanded refining capacity online in early 2023, while simultaneously improving energy efficiency in their businesses by adapting operational and maintenance processes, such as improving furnace efficiency.¹⁹
- **Marathon Petroleum's** "Focus on Energy" program, a holistic approach that sets key performance indicators to guide energy management across sites, has helped the company avoid the equivalent of two billion BTUs per hour of energy use, approximately the amount of energy used by 100,000 homes or 200,000 gasoline-powered passenger vehicles in a year.²⁰
- **Valero** has installed "expanders" that generate power from exhaust gases at six of its refineries, including the world's largest expander at its Corpus Christi West facility. The expanders are designed to collectively displace more than 600,000 tons of CO₂ annually that otherwise would be generated by conventional power plants.²¹
- **Emerson Automation Services** has benefited from Energy Treasure Hunts in its quest to increase energy efficiency. These multi-day events evaluate energy flows and opportunities on both low- and high-production days to identify prospects for improvement. Emerson typically finds energy savings opportunities of 10% to 15%, which accelerates progress to its goal of 25% energy reduction by 2030.²²
- Through a joint venture with **Talos Energy** and **Equinor**, **Chevron's** Texas Bayou Bend project is positioned to be one of the largest carbon storage projects in the United States. In early 2023, the project was expanded to cover nearly 140,000 acres of geological formation.²³



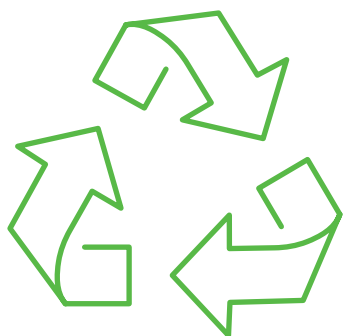


Utilizing Renewable Power

AFPM members are expanding the use of renewable energy at their facilities to further reduce emissions.

- **Gulf Coast Gulf Ventures, ExxonMobil-SABIC Joint Venture**, has entered a long-term power purchase agreement to receive renewable power supplies for its Texas Gulf Coast ethane cracker and derivatives complex from BP PLC's nearby Peacock solar project in San Patricio County, Texas. Once complete, the installation will generate enough renewable energy annually to power the equivalent of 34,000 homes.²⁴
- **Dow** is among the top 20 corporations globally for renewable power purchases, with roughly 40% of its purchased electricity coming from renewable sources.²⁵
- **INEOS Olefins & Polymers** has entered into a renewable power purchase agreement that will result in the construction of a new 310 megawatt (MW) solar project in north central Texas, with the entire output dedicated to INEOS O&P USA. The project is expected to cover the net purchased electricity load of all 14 of its manufacturing, fractionation and storage facilities in the U.S. and is expected to reduce GHG emissions by more than 320,000 metric tons annually.²⁶
- **LyondellBasell** signed thirteen renewable electricity power purchase agreements in the U.S. and Europe, representing roughly 1,366 megawatts of renewable energy and 89% of its goal to procure at least half of its electricity from renewable sources by 2030, based on 2020 procured levels. The projects will reduce LyondellBasell's Scope 2 emissions by more than one million metric tons annually when operational.²⁷
- **Cenovus** has signed a power purchase agreement to buy renewable electricity from a wind project in southeast Alberta, which is expected to become operational in early 2024. This is part of its larger efforts in the renewable energy market to fully offset its Scope 2 electricity-related emissions through such purchases. Cenovus is also participating in a large-scale project at its Asia Pacific operations with partner CNOOC Limited that will generate solar energy at the CNOOC Limited-operated Gaolan terminal. The generated power is connected to the grid, where it will be used to offset purchased power demand from its partnered operations.²⁸
- **Emerson Automation Solutions** has procured 30% of its electricity from renewable sources, on its way to achieving its goal of sourcing 100% renewable electricity by 2030. Much of the recent progress has stemmed from grid-sourced renewables in the U.S. and Europe, such as an agreement between its Copeland Compressor manufacturing operation in Missouri and the Cimarron Bend Wind Farm in Kansas to provide 80,000 MWh.²⁹
- **Flint Hills Resources** commissioned a 45 MWac, 350 acre solar power installation at its Pine Bend Refinery in Minnesota. This is reported to be the largest direct use industrial solar installation in the U.S.³⁰





Waste Reclamation and Recycling

By constantly looking for ways to reduce waste and implementing creative solutions to recover, utilize and recycle waste streams — ranging from hazardous waste to production byproducts like sulfur — at their facilities, our industries are making real progress in reducing waste throughout their operations.

- **Phillips 66** has a systemic hazardous waste program and has recycled more than 75% of its hazardous waste since 2019, keeping it out of landfills.³¹
- **Flint Hills Resources** uses ammonium thiosulfate technology to turn sulfur, a traditional pollutant from motor fuels, into a fertilizer product that benefits farmers while producing ultra-low sulfur fuel that helps reduce vehicle emissions.³²
- Almost 110,000 metric tons of waste from **Marathon Petroleum's** refineries was turned into an alternative fuel source for the cement industry, avoiding over 264,000 metric tons of CO₂ equivalent emissions when compared to coal use for cement manufacturing operations.³³
- In 2022, 97% of **Valero's** refinery hazardous and exempted waste was recycled.³⁴
- **CIRCON/Covanta** is a premier sustainable materials management solutions provider for both industrial/commercial and municipal clients. In 2023, Covanta recycled and reused one million tons of material and diverted over 21 million tons of materials from landfills, avoiding 19 million tons of GHGs. Covanta generated 10 million equivalent MWh of green energy, including eight billion pounds of steam export, enough to power one million homes. Covanta recycled half a million tons of ferrous and non-ferrous metals, enough to build six Golden Gate bridges and 2.4 billion cans, and recycled or reused 250 million gallons of customer wastewaters, enough to fill 200 Olympic-sized pools. Covanta's Refinery Services Group repurposed 44,333 tons of hazardous tank residual waste from cleaning operations into 7.4 million gallons of waste derived fuel for use as a heat source in U.S. cement kilns. This effort alone displaced 24,826 tons of coal, provided a net carbon offset of 106,399 tons and prevented 22,167 tons of residual waste ash from being landfilled. Covanta's oil recycling operations processed 225,000 bbls of oil which was sold back into the circular economy to bring fresh power and value to the industry.³⁵
- **HF Sinclair's** asphalt business recycled around 160,000 scrap passenger car tires in a year, using them as a component of paving asphalt — the equivalent of resurfacing a two-lane road around one inch in thickness for 550 miles.³⁶
- **CountryMark** has invested in a landfill gas offtake project. Methane (natural gas) that would have otherwise been released to the atmosphere is now captured and can be used as a transportation fuel.³⁷



Petrochemical Industry Mobilizes to Prevent Pellet Loss

Good things come in small packages. But small packages must also be handled carefully. As with many small, valuable items, that's the name of the game when dealing with plastic pellets.

"Certain polymers are fashioned into plastic pellets which are transported to manufacturers and molded into plastic products ranging from drinkware to packaging to coolers and more," explains AFPM's Vice President of Petrochemicals and Midstream Rob Benedict. "Pellets are essential to the efficient functioning of our modern society, but everyone involved in the production, transportation and handling of pellets has to stay vigilant to keep these tiny particles from escaping into the environment."

Preventing plastic pellets and flakes from evading containment is the first order of business, and AFPM members take that duty seriously. To ensure the integrity of their pellet ecosystem, U.S. petrochemical manufacturers are using innovative technologies, extensive training and shared best practices in their pursuit of zero pellet loss.

At its Bayway Refinery, for example, **Phillips 66** pipes pellets into an onsite storage silo, creating a closed system before they are blended and fed into rail cars. Phillips 66 also inspects rail cars for operable and closed valves and caps and has implemented a railcar return policy to prevent the possibility of pellets entering the environment via improperly sealed rail cars — all efforts to ensure that pellets remain within the containment system.³⁸

In 2023 **ExxonMobil** maintained zero reportable pellet losses to the environment from its operated resin-handling facilities. ExxonMobil has systems to responsibly manage plastics manufacturing, including the global standards we have set across all of their resin-handling operations. The standards are more stringent than the laws and regulations related to plastic pellet loss in many of the places they operate, and they collaborate with industry through Operation Clean Sweep-Blue to share best practices.³⁹

LyondellBasell, meanwhile, has invested in technologies to ensure that any pellets don't get far. It has installed truck blow off systems at its plants in Wesseling, Germany; Carrington, U.K.; Tarragona, Spain; and Berre, France to keep loose pellets from falling off trucks. The process starts with a sensor that detects when a vehicle approaches, which triggers two blowers to direct compressed air toward the top of the vehicle and propel any loose pellets into a collection area, where they are recovered.⁴⁰

Technology alone, however, can't ensure success. The human element remains a critical part of the equation in keeping pellets in their proper places. That's why **ExxonMobil, Phillips 66, INEOS, BASF, LyondellBasell, Chevron Phillips Chemical, Eastman, Dow, Occidental, SABIC, Westlake Chemical, Formosa** and **Mitsubishi Chemical** are all members of Operation Clean Sweep (OCS), an industry-wide initiative to reach zero pellet loss through employee education and training.⁴¹

All **Chevron Phillips Chemical** plastic handling facilities are strictly following OCS membership guidelines, which include sharing best practices, expanded reporting and cross-industry collaboration.⁴² Dow, meanwhile, incorporates OCS metrics into its supply chain process, including requiring logistics service providers that handle pellets to commit to the OCS pledge and utilize its guidance to reduce the risk of pellet loss.⁴³

Starting in 2023, and expanding globally, **OCS members** in many regions of the world invite independent auditors to verify that they are meeting their OCS commitments.

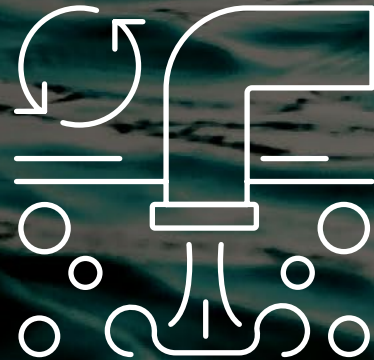
"The petrochemical industry will continue to innovate and iterate until its goal of zero pellet loss becomes a reality," says Chet Thompson, President and CEO of AFPM. "We are dedicated to doing everything we can to prevent the escape of pellets into the environment."

Water Management

As a way of demonstrating our commitment to responsibly utilizing water, we are making significant investments in technologies that are expanding our water reuse capabilities and utilizing non-fresh water — such as stormwater and municipal wastewater — in our operations.

Water Conservation and Reuse

Through reuse and reduced consumption, member companies have saved billions of gallons of water each year.



- **ExxonMobil** was able to supply about half (48%) of the water needed for fracturing operations in the Permian Basin (across Texas and New Mexico) from recycled, produced water, while the remaining half of the water needed for operations came from brackish sources.⁴⁴
- **Marathon Petroleum** has reduced its freshwater withdrawal intensity by 17% since 2016, equating to over 3.5 billion gallons of water saved each year, with over 500 million gallons saved last year through innovations like optimized influent treatment, optimized steam use and increased condensate recovery, and reduced reverse osmosis reject water.⁴⁵
- **Flint Hills Resources'** refineries have conserved approximately three billion gallons of water since 2010 through effluent recycling and stormwater recovery.⁴⁶
- **Phillips 66's** Remediation Management team treated roughly 50 million barrels of water in 2022, recycling 94% of the treated water for reuse at its facilities and thereby reducing the amount of freshwater needed to operate.⁴⁷
- **Monroe Energy** is constructing three cooling towers, which will reduce the facility's dependence on Delaware River water by 95%.⁴⁸
- **LyondellBasell** engaged a third-party expert to conduct a water use and risk assessment, which encompassed over 98% of its global water use. Results of the assessment will help steer potential watershed-specific targets, improvements and approaches.⁴⁹
- **Ecolab** has worked with its customers to help conserve 219 billion gallons of water, which is the equivalent of the drinking water needs of 758 million people.⁵⁰



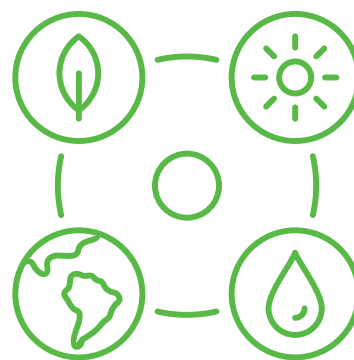
Wastewater Management

AFPM members operate high-tech water treatment processes at their facilities, enabling them to treat and reuse stormwater and municipal wastewater multiple times in their operations.

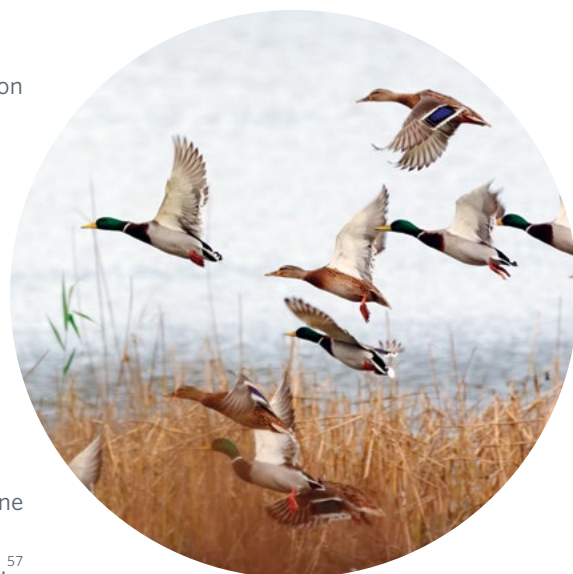
- **Monroe Energy's** Advanced Wastewater Treatment Plant treats various kinds of water used in the refining process, resulting in discharged water that is cleaner than it was when it came into the refinery.⁵¹
- **Chevron** piloted the Wastewater Impact Assessment Tool developed by the World Business Council for Sustainable Development at four refineries and hosted several training sessions to enhance its understanding of water footprint methodologies at site and product levels.⁵² In addition, Chevron's Pascagoula Refinery implemented several improvements — including upgrading its bioreactors with a new bioreactor inlet and aeration system — to better process wastewater with higher nitrogen loads, enabling enhanced environmental safeguards through improved wastewater treatment.⁵³
- **Flint Hills Resources'** refineries use continuous wastewater analyzers and other monitors to improve knowledge of where and how nitrates are formed; as a result of this and other efforts, refinery nitrate releases have decreased by about 60% since 2014.⁵⁴

Conserving and Enhancing Biodiversity

By working with nonprofits and community organizations to foster biodiversity within our fencelines and in neighboring communities, refiners and petrochemical manufacturers are demonstrating their dedication to serving as responsible environmental stewards.



- **Chevron, Flint Hills Resources** and **Phillips 66** have partnered with Ducks Unlimited to maintain habitats for birds. Flint Hills Resources is helping to conserve more than 250,000 acres in North America while Chevron is working with Ducks Unlimited to help preserve over 405,000 acres of wetlands in South Louisiana. Phillips 66, meanwhile, is supporting a project by Ducks Unlimited and the U.S. Fish and Wildlife Service's Two Rivers National Wildlife Refuge to enhance and restore more than 320 acres of floodplain wetlands.⁵⁵
- **Phillips 66** has partnered with the Sutton Avian Research Center to conduct ecological field research on developing and applying techniques for reintroducing and monitoring southern bald eagles, managing captive breeding of endangered species, performing bird surveys and monitoring declining grassland birds.⁵⁶
- **Valero** supported the nonprofit BCarbon to create a 1,000-mile living shoreline of oyster reef breakwaters in the Texas Gulf Coast to reduce erosion, restore shoreline habitat, enhance water quality and improve fish and wildlife habitat.⁵⁷



- **HF Sinclair's** refinery in Sinclair, Wyoming, sponsored a fencing project with the Bureau of Land Management to replace 400 feet of fencing in the Highwater Reservoir Wildlife Enclosure to protect the wetlands, wild horses and elk in the area.⁵⁸
- **Flint Hills Resources** hosts The Wildlife Learning Preserve on a 130-acre tract of land on its Corpus Christi property. The preserve, designated as a wildlife sanctuary with the Nature Conservancy, serves as a study site for students from elementary school through college, and features nest boxes for songbirds and waterfowl, a butterfly garden, a bat hotel, an outdoor education center and a fiddler crab garden.⁵⁹
- **Monroe Energy** supports the Tri-State Bird Rescue, which rescues and rehabilitates injured and orphaned birds. Monroe is also an active participant with the Partnership for the Delaware Estuary, which engages in habitat and environmental conservation along the Delaware River.⁶⁰



Nothing is more important to the U.S. refining and petrochemical industries than the health and safety of our employees, our communities and the environment. Our dedication to health and safety goes beyond the highly regulated codes and standards that guide each of our company's operations; it is instilled in every employee from day one and embedded in the culture of all AFPM members.

Health & Safety

Safety Record

Through rigorous employee training, the development and deployment of sophisticated safety technology and collaboration across industry, the fuel and petrochemical industries are among the safest industries tracked by the federal government. In 2022, the petrochemical industry ranked first and the refining industry tied for second out of 485 industries. This dedication to protecting the health and safety of our employees and our communities has resulted in illness and injury rates that have been consistently among the lowest of all manufacturing sectors over the past 20 years.



Collaborating to Enhance Safety

Health and safety are paramount at AFPM, and we take pride in our safety programs. AFPM's focus on both process and occupational safety is multifaceted and includes data collection that is shared across multiple member committees to develop programs and initiatives that improve safety, reliability, operating practices and training. This information is shared throughout the entire refining and petrochemical industries to further improve safety and is applied through the following safety programs.



Advancing Process Safety Programs

Advancing Process Safety (APS) is AFPM's flagship safety program. This groundbreaking program was developed in 2012 to promote collaboration across industries and to continuously improve process safety through data collection and opportunities to share experiences and knowledge. Over the past decade, APS has grown to include a suite of resources — including virtual reality training programs, webinars and other tools and resources — that encourage the sharing of information and good practices.

- **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 errors associated with operational discipline.
- **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 & Organizational Performance Subgroup:** Develops information and tools to improve human performance in operations that aid in reducing the likelihood and consequences of human errors.
- **Industry Learning & Outreach Subgroup:** Industry data analysis that identifies opportunities for improvement for APS and conducts monthly industry webinars.



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 that are then shared throughout the industries. Our Occupational Safety Regional Networks facilitate information sharing, including lessons learned and good practices to improve the overall safety of the industries. Sharing good energy isolation practices has been a significant focus of this program.



Immersive Learning Program

The AFPM 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 training with intricate procedures is crucial. This simulation aims to improve and support the retention and comprehension of training by providing the opportunity to “fail safely” by experiencing low frequency, high consequence incidents in a safe simulated environment.

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. During the last year, AFPM has worked with organizations and government partners such as the American Petroleum Institute, the Chemical Safety Board and the Occupational Safety and Health Administration (OSHA) to share learnings derived from these programs.

Pipeline Safety

With hundreds of thousands of miles of pipelines operating 24/7 nationwide, AFPM members take pipeline safety extremely seriously and employ a range of methods — from community awareness to artificial intelligence-guided technology — to ensure safe and reliable operations.

- **Plains All American Pipeline** augmented its Right-of-Way Watch program in 2022, enabling landowners and community members to receive financial rewards for reporting situations that may impact the safe operation of its pipelines, including unauthorized excavations; hazardous conditions such as sink holes, uncovered pipes or unauthorized structures; and suspicious activities like manipulation of pipelines by non-pipeline personnel.⁶¹
- **Phillips 66** recently implemented a Digital Control Room system to build compliance checks into its Midstream Pipeline Control Center, automated its Control Center steady-state operation and is piloting programs that use drones to perform tank seal inspections and satellites to monitor its property rights of way.⁶²
- **Marathon Petroleum** is using cameras equipped with artificial intelligence technology that can quickly identify potential spills and notify personnel at 32 of its remote pipeline facilities.⁶³
- **ExxonMobil** conducts regular testing to identify corrosion in its thousands of miles of pipelines, as well as utilizing well-trained personnel in both air and ground patrols, alarms and innovative systems to continuously monitor the pipelines.⁶⁴
- **CountryMark** educates the affected public, landowners, farmers, excavators and school districts about pipeline safety through 28,500 mailers delivered annually.

Technology Enhances Safety for U.S. Refiners and Petrochemical Manufacturers

U.S. refiners and petrochemical manufacturers are on the forefront of leveraging technology to improve their ability to monitor, inspect and react to changes in operations — which ultimately improves their ability to protect both workers and communities.



One area of investment is in detection technologies to ensure the safety of employees. Early detection of possible leaks is important to verifying that equipment is starting up safely and leaks can be responded to quickly. **Marathon Petroleum** uses acoustic imaging cameras, which are equipped with highly sensitive microphones that are able to detect noises made by the smallest leaks in noisy environments. These cameras can therefore quickly locate gas, air and vacuum leaks as well as confirm that leak repairs are effective.⁶⁵ **Flint Hills Resources** has deployed a leak detection sensor network across its refineries, as well as pipeline and terminal assets, that enables volatile organic compound leak detection at very low levels without needing personnel in the area. The sensor network was developed by Molex mPACT2WO and Flint Hills in collaboration with U.S. EPA and enables continuous monitoring that improves the safety of its facilities.⁶⁶

Many refiners are also taking to the sky to improve detection and inspection capabilities. **Marathon Petroleum** has launched new patrols using airplanes equipped with sensors that can detect ground elevations, hydrocarbon spills, land slips and other threats to pipelines.⁶⁷

And in 2023, **Delek** launched a remote operations flight of an autonomous drone using beyond visual line of sight, with an operator located in Brentwood, Tennessee, providing inspection all the way to Delek's El Dorado, Arkansas, refinery.⁶⁸ **Flint Hills Resources** has installed a two-unit drone system from Percepto with visual and OGI capabilities at its Corpus Christi refinery and refinery pilots are conducting automated and supervised routes for many use cases, including tank monitoring, flare line inspections and emergency response. By using drones, companies are able to more safely conduct inspections, meanwhile, **Dow** used pipe crawlers and similar technological advances to allow their crew to avoid over 1,600 confined space entries during site inspections in 2022, since avoiding risks is a safety imperative.⁶⁹

Several companies are combining their existing weather detection capabilities with advance modeling technologies to improve their ability to better predict the outcome of a release.

Flint Hills Resources' Pine Bend refinery, in turn, uses advanced modeling software to improve their ability to predict weather patterns and prepare accordingly. The refinery utilizes forecast models created with sensor data pulled every five minutes from weather stations and satellites, enabling operators to begin safety preparations up to 72 hours in advance of severe weather.⁷⁰

In the fast-moving, complicated world of refining, coordination and quick responses by employees are critical to safety. To aid in its pursuit of seamless operations, **Phillips 66** unveiled a new process workflow digitization tool called Applications for Refining Competitiveness, which enables task coordination and execution through a mobile interface that lets employees know when action is necessary. The system manages more than 14,000 process steps concurrently and improves response accuracy by offering employees instructions on how to complete needed tasks.⁷¹ **Phillips 66** is also installing wireless connectivity for smart operations monitoring at its refineries to enhance safety and reduce risk. The program enables "connected worker" capabilities through thousands of wireless sensors that provide near real-time data for predictive maintenance on rotating equipment.⁷²

"As safety technologies advance, refiners and petrochemical manufacturers will continue to invest in emerging technologies as part of their fundamental commitment to safety excellence," says Lara Swett, Vice President of Technical and Safety Programs at AFPM.



Supporting Community Safety

Our dedication to safety doesn't stop at the fenceline. AFPM members extend their safety culture to their local communities by disbursing community safety grants, providing training opportunities and coordinating joint emergency training with local emergency first responders.

- **Ergon Marine & Industrial Supply** works with the U.S. Coast Guard to operate the Vessel Information Center, which aids vessels in navigating the lower Mississippi River during high-water events. As a result of this initiative, Ergon has been honored by the Department of Homeland Security and the U.S. Coast Guard for its work in preventing casualties.⁷³
- For the second year, **CITGO's** Lemont, Illinois, refinery awarded first responder grants totaling \$60,000 to agencies in Lemont, Lockport and Romeoville. The grants are being used to fund a search-and-rescue drone program, paramedic school for two students, an emergency alert app, a police mobile security camera system and new digital speed signs, among other projects.⁷⁴
- Also in its second year, the **Motiva** First Responder Grant Program disbursed nearly \$159,000 to 23 emergency response organizations across six states. The grants are being used to purchase equipment such as automated external defibrillators and to fund additional training for first responders.⁷⁵
- The **Cenovus** Superior Refinery donated funds needed to purchase and train a new K-9 for the Superior Police Department. Atlas, the German Shepherd/Belgian Malinois mix, is now one of two K-9s in the department.⁷⁶
- **Flint Hills Resources** conducted an innovative training drill that included its Community Advisory Council (CAC) in an emergency response scenario, where the CAC members were assigned a role alongside the refinery employee. This was highly informative for the CAC members and connected them to the level of planning and care our industry takes in preparing to respond to unplanned conditions.
- **PBF** not only participated in a firefighting school at the Texas A&M Brayton Fire Training Grounds, it also sponsored several local municipal fire brigade members so that there would be seamless integration between facility and municipal firefighters in case of an emergency. During training, participants work through complex scenarios and drills while wearing full firefighting protective equipment, preparing both their minds and bodies for the stresses of a fire emergency.⁷⁷
- **Phillips 66** similarly provided scholarships for 80 community firefighters to receive specialized industrial emergency training in collaboration with Texas A&M Engineering Extension Services.⁷⁸
- A **Marathon Petroleum** grant enabled the volunteer East Fork, Kentucky, fire department to purchase a fire-retardant foam system that fights fires while being safe for the environment. In 2023, the department was able to successfully use the system on the back of its all-terrain vehicle to put out a wind-driven wildfire in that was spreading quickly.⁷⁹
- **Valero's** Meraux, Louisiana refinery has sponsored training for the St. Bernard Parish Fire Department for the last decade as a way to enhance community safety.⁸⁰
- **Plains All American Pipeline** conducted over 200 emergency response exercises and provided emergency preparedness training to roughly 500 first responders last year. One event in Corpus Christi, Texas, involved over 100 people, including representatives from 18 different agencies including the United States Coast Guard, the Federal Bureau of Investigation, the Pipeline and Hazardous Materials Safety Administration, local first responders and Plains personnel.⁸¹
- **Chevron Phillips Chemical** prioritizes the frequent, high-quality training of employee first responders, who often volunteer to aid their communities. In Orange, Texas, CPChem's Emergency Response Team trains with the City of Orange Fire Department four times a year to cross-train skillsets and share knowledge. CPChem also invites a member of the Orange Fire Department to its annual fire schools hosted at Texas A&M University's facilities in College Station.⁸²
- The **CHS** Seeds for Stewardship program has provided more than \$200,000 in grants and safety equipment to help prevent grain-bin entrapment. CHS also provides financial support to Nationwide Agribusiness, which has provided grain-entrapment training and rescue tubes to 272 fire departments across 31 states since 2014.⁸³
- Each year, **CountryMark** conducts more than 40 public awareness meetings to educate first responders, public officials, excavators and school age students on pipeline safety and the importance of contacting 811 before excavating.



U.S. fuel and petrochemical manufacturers are integral to the communities where we operate, and we take that responsibility very seriously. We provide good, high-paying jobs and support local businesses. We promote diversity, equity and inclusion in our workplaces and within our communities. Our facilities and our employees donate time, money and other resources to efforts important to their communities. And we support the future workforce — providing opportunities in STEM education and skills training for students and workers of all ages.

Thriving People & Communities

Supporting Our People

The refining and petrochemical industries recognize that our people are our most valued resources, and that success depends upon a healthy, engaged workforce. To inspire our team and to protect their well-being, AFPM members are investing in an increasing variety of employee supports, from employee resource groups to diversity training and mental health resources.





Promoting DE&I In Our Workplaces

Dedicated to fostering diverse, equitable and inclusive (DE&I) workplaces where employees are heard and championed, our companies are promoting peer networking groups, leadership advancement resources and training to encourage inclusive cultures.

- **LyondellBasell** employee networks are critical to cultivating a community where employees feel respected and valued. In 2022, the company launched the LEAD network for Latin Employees and ASPIRE network for Asian Pacific Islander Region, adding to the original four networks: BELIEVE — Black Employees Lead, Influence, Empower, Value and Embrace; LIFT — LyondellBasell Inspiring Females Together; True Colors — LGBTQ+; and YPEN — Young Professionals Employee Network.⁸⁴
- **Chevron** offers several leadership development programs designed for underrepresented groups. The Transformational Leadership® for Multicultural Women Program works to address headwinds faced by multicultural women in their leadership efforts, while the Global Women's Leadership Development Program helps accelerate women's leadership growth and experience. Chevron also offers leadership programs focused on the unique challenges faced by Asian American, Asia-Pacific, Black and Latino leaders as they grow their careers.⁸⁵
- **Marathon Petroleum** offers a Diversity Basics Foundations virtual course and includes DE&I training in its New Employee Onboarding and New Leader Onboarding virtual courses, which cover topics such as unconscious bias, identity and intersectionality, and emotional intelligence.⁸⁶
- **Cenovus** completed its first organizational health survey to help understand the experience of female employees and identify gaps. It also provided an updated inclusion and diversity strategy to the Board's Human Resources and Compensation Committee, complete with plans to review HR programs, evaluate recruitment technologies, provide tools and training to existing leaders, and explore new partnerships with female-focused groups to enhance attraction and retention of female employees.⁸⁷
- **Dow's** ALL IN 2025 inclusion, diversity and equity strategy elevates its focus on diversity; embeds equity into its practices, policies and procedures; and emphasizes leading with inclusion to deliver breakthrough results by 2025.⁸⁸
- **Chevron Phillips Chemical's** ICARE (Inclusion, Cooperation, Accountability, Respect Every Day) program was launched in 2013, but CPChem redoubled its commitment by requiring ICARE training sessions for all employees, by naming its first Chief Diversity Officer and by tying its Employee Incentive Program to company DE&I efforts.⁸⁹
- **HF Sinclair** recently established three new employee resource groups: Cultural Awareness in Energy, which promotes the education of heritage or ethnicity of members; Family Caregivers in Energy, which focuses on those employees who balance careers with caring for family members and loved ones; and Toastmasters in Energy, which aims to help support inclusive communication skills. These groups join the existing Veterans in Energy employee resources group (ERG) and Women in Energy ERG in addressing the needs of employees and celebrating diversity.⁹⁰

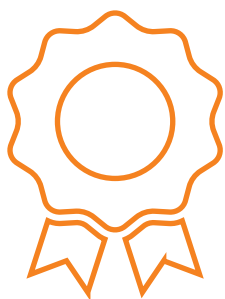
Workforce Well-being

AFPM members have developed a suite of wellness tools — ranging from physical fitness challenges to stress management apps — to support the mental, physical and emotional health of their workforce.



- **Chevron's** meQuilibrium stress-management app has been made available in more languages and expanded to include employees' adult dependents to make the app accessible to more. And many of Chevron's employee resource groups have organized events to promote mental, emotional and physical well-being, with the XYZ Employee Network showcasing the importance of emotional and physical well-being while the Women's Employee Network highlighted ways to mitigate burnout.⁹¹
- **Marathon Petroleum's** Well ALL Ways corporate wellness program focuses on occupational, social, financial, physical and mental health and includes initiatives like WebMD health coaching, an Invitational Team Steps Challenge and a Wellness Champion Network.⁹²
- **Valero's** Total Wellness programs aid in supporting employees' emotional, physical and financial well-being. Besides comprehensive medical and financial benefits, employees have access to Life Connections, a free, confidential service that includes a variety of employee and family resources like counseling and childcare referral suggestions.⁹³
- **Cenovus** continues to offer a workplace flexibility program and provide "inclusive amenities" for employees at their Calgary headquarters, including family room facilities (for nursing or pumping), a multifaith prayer room, a meditation room, all-gender washrooms and a community sharing space for their various network groups.⁹⁴ Cenovus also offers an employee and family assistance program with resources and professional services for managing personal health and well-being.
- In 2023, **Ergon** held its first Healthy Heart Campaign to raise awareness of the symptoms and causes of heart disease and stroke, provide employees with healthy heart tips and raise funds for the American Heart Association.⁹⁵
- **INEOS** Energy Station, an online health and well-being platform available to INEOS employees and their families, not only offers fitness and lifestyle tips but enables employees to book classes at INEOS gyms and sign up for events and well-being challenges.⁹⁶
- **Dow's** Employee Assistance Program is a mental health resource that is available at all times, offering free, professional guidance for employees and their dependents to help them navigate life changes and maintain positive mental health.⁹⁷





Awards

Our industries are routinely recognized by leading outside organizations for their work in promoting diverse, equitable, inclusive and responsible workplaces.



Chevron, Chevron Phillips Chemical, Dow, and Ecolab were named in *Forbes'* 2023 "America's Best Employers for Diversity" list.⁹⁹



Chevron, Dow, Enbridge, Ecolab, Baker Hughes and Honeywell all made the 2023 Disability Equality Index's "Best Places to Work for Disability Inclusion."¹⁰³



Chevron was awarded the 2023 Platinum Bell Seal for Workplace Mental Health by Mental Health America.¹⁰⁶



ExxonMobil, Chevron, Marathon Petroleum, Valero, Phillips 66, LyondellBasell, Albemarle, HF Sinclair, Eastman, Ecolab, Dow, Westlake, Huntsman, Occidental, CF Industries, & Chemicals, Linde and Baker Hughes were included in JUST Capital's 2023 ranking of "America's Most JUST Companies."¹⁰⁰



Chevron, Emerson, Eastman, BASF and Honeywell were named to the 2023 Readers' Choice "Top 50 Employers" by *Woman Engineer* magazine.¹⁰⁴



Dow and Marathon Petroleum were named to the Dow Jones Sustainability North America Index as a result of their performance on the annual S&P Global Corporate Sustainability Assessment (CSA).



HF Sinclair, Eastman, Ecolab, Baker Hughes and CF Industries were honored by *Newsweek's* "Most Responsible Companies."¹⁰¹



Phillips 66, Eastman, BASF and Emerson were named to the 2023 Readers' Choice "Top 50 Employers" by *Minority Engineer* magazine.¹⁰⁵



BASF, Chevron, Dow, Eastman, Marathon Petroleum and Phillips 66 were recipients of the Human Rights Campaign's "Equality 100 Award" for their leadership in LGBTQ+ inclusion in the workplace.⁹⁸



Valero, Albemarle, Dow, Enbridge and Linde were named to *Bloomberg's* Gender Equality Index.¹⁰²



Supporting Our Communities

AFPM members consider their role as anchors in their communities to be both a serious responsibility and a source of great pride. The fuel and petrochemical industries give back to the communities in which they live and operate by promoting DE&I, serving as philanthropic pillars for nonprofit and community organizations and spending hundreds of thousands of hours each year volunteering to improve their local neighborhoods.

Supporting DE&I In Our Communities

Our companies' commitment to diversity, equity and inclusion does not end at the fence line gates. AFPM members are delivering on their DE&I commitments by supporting organizations that provide STEM-related and community-based educational opportunities to underrepresented communities.

- From 2005 through 2021, **ExxonMobil** has invested over \$127 million to support global and community-based programs that benefit women.¹⁰⁷
- **Phillips 66** donated \$5 million to Junior Achievement of Southeast Texas to help fund a nearly 40,000-square-foot experimental learning center that will focus on serving under-resourced communities.¹⁰⁸
- As a part of **Emerson Automation Services'** \$200 million pledge to address education equity, Emerson supports The Urban League of Metropolitan St. Louis' Head Start early childhood program, 10 chapters of Junior Achievement nationwide, nine Boys and Girls Clubs locations, 20 brick-and-mortar grocery markets operating in schools serving underserved communities and has helped over 8,000 students obtain free glasses through its partnership with KidsVision.¹⁰⁹
- **Marathon Petroleum** supports Bridge Programs at Ohio State University, the University of Cincinnati and Michigan State University that help prepare students from underrepresented groups to make the transition from high school to college by providing a structured environment conducive to building the skills needed to obtain a university degree.¹¹⁰
- Since 2004, **Chevron's** Black Employee Network has awarded over 40 scholarships to local high school students as a part of its annual Dr. William F. King Scholarship Program, celebrating and encouraging diversity in honor of Dr. King, a Chevron chemical engineer and community activist who was responsible for over 40 patents.¹¹¹
- **Valero** supports the Educating Students Together College Access Program in Wilmington, California, helping over 350 students from economically disadvantaged backgrounds pursue college degrees.¹¹²
- **Flint Hills Resources** partners with the Summit Academy to host STEM Saturdays in communities where structural inequities are the most profound. Employees volunteer to bring engaging STEM education to children ages 6 to 16 in North Minneapolis, creating opportunities for dismantling systemic inequalities within technology and STEM-reliant careers.¹¹³
- **Dow** supported 13 nonprofits serving Black communities through grants totaling \$100,000 as part of its Dow Promise initiative.¹¹⁴







Giving Back

Refiners and petrochemical manufacturers are critical community partners, providing tens of millions of dollars to nonprofit organizations that contribute to the health, well-being and vitality of local community members.

- **Valero** and its Energy Foundation collectively generated over \$68 million for charities through corporate philanthropy, fundraising, more than 117,500 volunteer hours, and employee and company donations.¹¹⁵
- To date, **ExxonMobil** contributed \$163 million to communities globally through corporate giving, the ExxonMobil Foundation and employee and retiree giving — which is matched by the Foundation.¹¹⁶
- **LyondellBasell** contributed \$11 million to nonprofits via 1,800 grants, and its employees dedicated 23,286 hours to volunteer work.¹¹⁷
- **CITGO's** Lemont Refinery holds an annual Shamrock Bowl to raise funds for the Muscular Dystrophy Association, part of a larger company-wide effort of annual golf tournaments and fundraisers that has collected over \$260 million for the organization since 1986.¹¹⁸
- **Marathon Petroleum** contributed over \$23 million to over 1,000 local nonprofit organizations in 2022.¹¹⁹
- **CountryMark** held its annual Fueling Freedom event in June 2023 as it has for the past several years, raising over \$65,000 for local National Guard Family Readiness Groups and USOs to help local military families.¹²⁰
- For the past decade, **Placid Refining** employees have taken part in the "Adopt an Angel" program, providing Christmas gifts for underprivileged children. Placid Refining also supports the Port Allen Middle School, United Way, St. Jude's Children's Hospital and the West Baton Rouge Foundation for Excellence.¹²¹
- Since 2017, **Ergon** has supported the Marine Corps Toys for Tots Program with employees purchasing toys and providing monetary donations that are matched by Ergon. Employees volunteer to collect donations, shop for toys and even set up toy drives on behalf of the program. Employees also make donations to multiple Boys & Girls Clubs, Feeding America, Habitat for Humanity, Mississippi Blood Services and Truckers Against Trafficking.¹²²
- For 30 years, **Flint Hills** has served as the title sponsor of "Fiesta de los Ninos," a fundraiser for the Driscoll Children's Hospital of Corpus Christi that raises close to \$1 million annually.¹²³
- **HF Sinclair** partnered with Folds of Honor to raise over \$900,000 in 2022 to fund educational scholarships for the children and spouses of disabled or fallen veterans.¹²⁴
- **Chevron** is a decades-long sponsor of the California Prevention & Education Project, which assists underserved populations in the East Bay area by connecting them to infectious disease testing, vaccinations, and mental health and wellness programs as well as providing mobile units with hot showers, triage and hygiene services to those without access to basic resources.¹²⁵
- Employees in **PBF's** Toledo, Ohio refinery donate coats, school supplies, countless hours and even monetary awards to groups and charities in their neighborhood.¹²⁶ PBF's Martinez Refinery employees, meanwhile, volunteer for local organizations such as the Food Bank of Contra Costa and Solano, the Boys & Girls Club of Contra Costa, Loaves and Fishes of Contra Costa and the Martinez Education Foundation.¹²⁷
- **Plains All American Pipeline**, its joint ventures, subsidiaries and employees donated about \$3.5 million in cash and in-kind donations to help address local community needs in the U.S. and Canada. This included the Houston office raising roughly \$550,000 for the United Way of Greater Houston, with employees also volunteering at United Way beneficiary institutions such as food banks and Meals on Wheels.¹²⁸
- **Hunt Refining Company** supports key charitable agencies and nonprofits in its local areas, including the United Way, Adopt-A-School, Big Brothers/Big Sisters and Junior Achievement.¹²⁹
- **Flint Hills Resources** works with the Environmental Initiative on Project Clean Air Repair, which reimburses car repair shops for identifying and repairing broken exhaust systems in vehicles belonging to lower-income residents.¹³⁰



Community Volunteering

AFPM members aren't just philanthropic pillars of their communities in the financial sense; employees dedicate hundreds of thousands of hours of their time to support local nonprofits and community organizations.



- **Marathon Petroleum** employees volunteered over 87,000 hours in 2022, while donating over \$4.2 million — which Marathon Petroleum matched with \$3.7 million in grants.¹³¹

- **ExxonMobil** employees, retirees and their families volunteered roughly 135,000 hours in 2021, giving their time to over 1,450 community organizations in 19 countries.¹³²

- Hundreds of **Chevron** employees donated more than 800 volunteer service hours to 10 nonprofit organizations across Texas, Louisiana and Mississippi as part of Chevron's annual Humankind Campaign of Service, including: working with STEM NOLA and the Boys & Girls Club of Metro Louisiana to teach students about sound waves and circuitry as they built a Bluetooth speaker, enhancing and repairing preserves run by the Nature Conservancy of Louisiana to benefit wetlands communities, donating food and assisting the Houston Food Bank and the Second Harvest Food Bank of Greater New Orleans, and contributing to home builds with Habitat for Humanity and Rebuilding Together.¹³³

- **Phillips 66** donates money to nonprofit organizations based upon employee volunteer hours. The volunteer efforts of the Wood River Refinery employees, for instance, yielded more than \$150,000 in volunteer grant money for local organizations.¹³⁴



Developing the Workforce of Tomorrow

Given our industries' highly technical, complex nature, companies are natural resources for promoting science, technology, engineering and mathematics (STEM) education as well as industry-specific skills. AFPM members have built numerous long-term relationships with academic institutions, nonprofit organizations and community groups that contribute to the development of a highly trained workforce to ensure that community youth have the skills necessary to access the high-paying jobs available in our industries.

Advancing STEM Education

Encouraging STEM learning is critical to developing a qualified pool of applicants for future workforce needs. It also provides a pathway for students to better understand the world and enjoy the future employment opportunities that come with a technical education.



- **ExxonMobil** donated \$2 million to Louisiana State University (LSU) to fund student scholarships and workforce development programs in the College of Engineering, the Manship School of Mass Communication and North Baton Rouge through LSU's new Future Scholars Pipeline Initiative. The gift also provides funding for research into carbon capture, advanced recycling and greenhouse gas emission reduction technologies.¹³⁵
- **Motiva** awarded \$205,000 in scholarships to aid high school graduates in Southeast Texas, in their pursuit of STEM or business-related undergraduate, associate or vocational degrees.¹³⁶
- **Valero** provided funds to the Education Foundation in Santa Fe, Texas to enable a mobile STEM innovation lab for students.¹³⁷
- **Chevron** and the Fab Foundation created a new fellowship program to support STEM educators across the world. The one-year program is designed to help educators create and promote inclusive and innovative programs to teach STEM using digital fabrication, with the goal of helping to engage new and under-represented student populations in STEM education and careers.¹³⁸
- For over three decades, **Flint Hills Resources** has partnered with the Minnesota Zoo on educational programs like the ZOOMS STEM Design Challenge, which tasks students with real zoo-based issues and asks them to create solutions using their STEM skills.¹³⁹
- In January 2023, **Plains All American Pipeline** employees in Houston volunteered to assemble after-school learning kits for Girlstart, a nonprofit that aims to increase young women's interest and engagement in STEM fields.¹⁴⁰
- **Marathon Petroleum** encourages STEM through both donations and volunteering. A grant from Marathon Petroleum, for instance, is enabling Dickinson, North Dakota Public Schools to quadruple its collection of ozobots, app-connected robots that help introduce computer coding concepts, as well as purchasing additional STEM educational materials.¹⁴¹ Marathon Petroleum refinery engineers, meanwhile, visited elementary and middle schools in Kenai, Alaska, and Mandan, North Dakota, to host engaging STEM-based engineering activities, such as constructing a building out of spaghetti noodles and marshmallows.¹⁴²

Skills Training

The fuel and petrochemical industries provide ongoing training and education opportunities for our communities, since proper training of potential future employees is essential to long-term success. We give students the opportunity to gain real-world experience through apprenticeships and co-op programs as well as donating equipment and financial resources.

- **Valero** has invested more than \$1.8 million in the Craft Training Center in Corpus Christi to help in the development of skills such as welding.¹⁴³
- **Chevron** committed \$1.6 million to the Thurgood Marshall College Fund on the National Black Talent™ Bank program, which helps students with technical degrees from historically Black colleges and universities and predominantly Black institutions to complete technical training, certifications and upskilling to prepare them for software and industrial engineering roles — including at Chevron — after their training.¹⁴⁴
- Several **PBF** facilities partner with local colleges and universities to offer a cooperative education program to students, providing real-world work experience even as they continue their studies. Students are mentored and taught by experienced refinery personnel as they alternate semesters between academic studies and working at the refinery. By the end of the program, students have assumed most of the responsibilities of an entry-level engineer or technical employee.¹⁴⁵
- **HF Sinclair's** Tulsa Refinery has a Department of Labor accredited process operator apprenticeship that enables it to recruit veterans to work at the refinery and help them build skills. Because this training aligns with the provisions of the GI Bill, qualifying veterans can generate a substantial boost in income compared to entry-level roles.¹⁴⁶
- **Marathon Petroleum** and its midstream MPLX component provided \$100,000 to Nueta Hidatsa Sahnish College and a \$75,000 grant to United Tribes Technical College to enable both tribally affiliated colleges to restart their commercial drivers' license programs.¹⁴⁷
- **ExxonMobil's** Technology Center donated 17 gasoline test engines to Raritan Valley Community College's Automotive Technology program, which helps students become qualified automotive technicians. The donation allows students to repair engines, perform basic engine maintenance and learn to troubleshoot engine computer systems. Prior to the donation, the college didn't have identical engines, making it hard for students to follow along with the teacher's actions.¹⁴⁸
- **Emerson Automation Solutions'** Safety and Productivity business has partnered with the University of Wisconsin-Stout on an Industrial Design Studio, which allows students to obtain real-world design experience, from the initial research to the final design solutions.¹⁴⁹



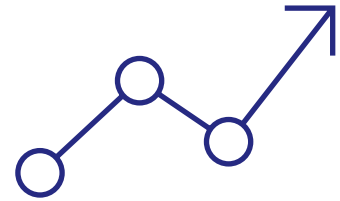
AFPM's member companies give students the opportunity to gain real-world experience through apprenticeships and co-op programs as well as donating equipment and financial resources.

From promoting next-generation renewable fuels to advancing a circular economy for plastics, refiners and petrochemical manufacturers are pursuing breakthrough technologies and processes that will help to solve emerging challenges and pave the way for future innovations for years to come.

Driving Progress

Renewable Fuels

Demand for lower-carbon fuels has never been higher, and U.S. refiners are meeting the moment by increasing renewable diesel and sustainable aviation fuel capacity, even as they continue to invest in hydrogen and next-generation fuels such as renewable natural gas and renewable gasoline.



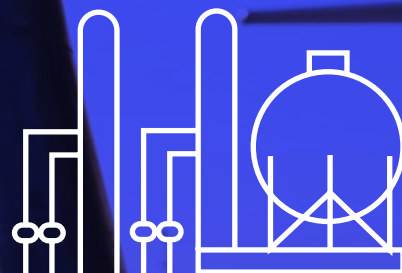
- In Canada, **ExxonMobil's** affiliate, Imperial Oil, announced a long-term contract with a supplier of low-carbon hydrogen at the Strathcona refinery. The project is designed to use low-carbon hydrogen, canola oil feedstock, and their proprietary catalyst to produce approximately 20,000 barrels per day of renewable diesel, thereby reducing transportation related emissions by about 3 million metric tons of CO₂-equivalent annually.¹⁵⁰
- **Valero** is investing \$315 million to build one of the world's largest sustainable aviation fuel (SAF) manufacturing facilities at its renewable diesel plant in Texas. Expected to be completed in 2025, the facility is being designed to enable roughly 50% of the facility's current 470 million gallons of annual production of renewable diesel to be upgraded into SAF.¹⁵¹
- **Phillips 66** made the final investment decision to move forward with the Rodeo Renewed conversion of its San Francisco refinery into one of the world's largest renewable fuels sites. Phillips 66 expects the project, which should begin scaled operations in 2024 and be partially powered by solar energy, to produce 800 million gallons of renewable fuel per year with 65% fewer lifecycle carbon emissions compared to traditional diesel, along with 55% lower criteria pollutant, all while using 160 million fewer gallons of water each year.¹⁵²
- **Par Pacific** is investing \$90 million to construct Hawaii's largest liquid renewable fuels manufacturing facility, which is expected to produce about 61 million gallons of renewable diesel, sustainable aviation fuel, renewable naphtha and liquified petroleum gases annually.¹⁵³
- **Chevron** has undertaken an improvement and expansion project at its renewable diesel facility in Geismar, Louisiana, that is intended to allow the facility to expand capacity from 95 million gallons to 348 million gallons annually.¹⁵⁴
- Chemically identical to regular petroleum diesel, renewable diesel is a low-carbon fuel made from renewable sources. **HF Sinclair** has invested over \$850 million in its renewables business and operates renewable diesel units in Cheyenne, Wyoming; Sinclair, Wyoming; and Artesia, New Mexico.¹⁵⁵
- **Honeywell** has created new technology that combines green hydrogen with CO₂ siphoned from industrial smokestacks to create lower-carbon methanol, which in turn can be used to produce fuels — including SAF — in a process that reduces greenhouse gas emissions by 88% compared to traditional jet fuels.¹⁵⁶
- **Vertex Energy** cut the ribbon on its first renewable diesel facility at the company's Mobile, Alabama, refinery in April 2023. The \$115 million conversion project is mainly running on soybean oil at present but is geared for other organic waste oils as well.¹⁵⁷



Partnering for Scale

The global fuel evolution is such a huge endeavor that companies are engaging in partnerships to accelerate the pace of innovation and pave the way for the scaling of renewable fuels.

- **PBF** is partnering with Eni Sustainable Mobility on a biorefinery co-located with PBF's Chalmette Refinery in Louisiana that is expected to have a production capacity of 306 million gallons per year of renewable diesel.¹⁵⁸
- **Chevron** teamed up with Walmart and Cummins for Walmart's debut of the first 15-liter renewable natural gas engine on the road in North America. Outfitted with the inaugural Cummins X15N™ CNG engine designed for heavy-duty transportation fleets, the first-of-its-kind truck will travel across the country fueling up at Chevron locations that will supply CNG linked to renewable natural gas to demonstrate the next-era in lower carbon.¹⁵⁹
- **Enbridge** has partnered with **Divert Inc.** on a \$1 billion infrastructure agreement which will support the development of waste-food-to-RNG facilities in every major geographic region in the U.S., with plans to be within 100 miles of 80% of the U.S. population in the next eight years.¹⁶⁰

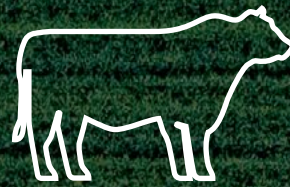




Hydrogen

Hydrogen holds promise as a transportation fuel as well as a low-carbon — and even a zero-carbon — energy source. AFPM members are pursuing a variety of technologies to produce hydrogen, including developing green hydrogen via electrolysis.

- **ExxonMobil** is constructing its first large-scale low-carbon hydrogen production plant at its refining and petrochemical facility in Baytown, Texas. The facility will produce up to one billion cubic feet of hydrogen each day, with over 98% of the CO₂ captured and stored, making it the largest low-carbon hydrogen project worldwide at the time of expected startup in 2027-2028.¹⁶¹
- **Phillips 66** is developing a project to produce green hydrogen via electrolysis to decarbonize its fuel production and supply its operations.¹⁶²
- **Plains All American Pipeline** signed a memorandum of understanding with Atura Power to conduct a low-carbon hydrogen and subsurface feasibility study that, if advanced, would utilize Plains' storage infrastructure and operations to store and supply low-carbon hydrogen to Atura Power's generation facility.¹⁶³
- **Chevron** has a majority interest in the Advanced Clean Energy Storage Delta (ACES Delta) electrolytic hydrogen production and storage project in Delta, Utah, with operations planned by mid-2025. The project is expected to initially produce up to 100 tons per day of electrolytic hydrogen and will utilize salt caverns to store the energy.¹⁶⁴



Renewable Natural Gas (RNG)

RNG is a lower-carbon intensity — and even in some cases net-negative — fuel that can be transformed into compressed natural gas and used as a transportation fuel to replace traditional natural gas. AFPM members are helping to scale RNG by diverting dairy waste and food waste from landfills and turning it into fuels instead.

- **Chevron** and **Brightmark** have joined forces to build five new anaerobic digestion dairy farm projects in Michigan, which will turn animal waste into renewable fuels, bringing the total number of these joint-venture projects nationwide to 20.¹⁶⁵
- **Valero** turned close to one trillion BTUs of renewable natural gas — produced from municipal solid waste — into low-carbon transportation fuels in 2022 and expects to process at least double that amount in 2023.¹⁶⁶
- **Marathon Petroleum** has acquired a 50% stake in LF Bioenergy, an emerging RNG producer in the U.S. The first plant is located in upstate New York and Marathon Petroleum expects the initiative to produce over 6,500 million BTU of RNG per day by the end of 2026.¹⁶⁷



Renewable Gasoline

Renewable gasoline — a renewable fuel which can be blended with traditional gasoline to reduce its carbon intensity — offers a way for existing internal combustion engines and hybrids to reduce their emissions.

- **ExxonMobil** has collaborated with Toyota to test innovative fuel blends with the potential to reduce GHG emissions from road transportation by up to 75% compared to conventional fuels. Toyota has determined the fuel is compatible with both older engines and its current model lineup.¹⁶⁸
- **Chevron** worked with Toyota on a road trip across the U.S. Gulf Coast to highlight a new gasoline blend with more than 50% renewable content, driving Toyota vehicles to demonstrate that the fuel — which is more than 40% less carbon intensive than traditional gasoline on a lifecycle basis — is appropriate for the existing automotive fleet.¹⁶⁹
- **Marathon Petroleum's** subsidiary Virent makes a drop-in renewable gasoline blend component that provides over 50% carbon intensity reduction on a lifecycle basis, with options to achieve net zero or better. When used in a hybrid vehicle, this gasoline can provide a carbon intensity similar to that of electric vehicles.¹⁷⁰
- **Valero** expanded its production of renewable naphtha, which is a blending component for renewable gasoline as well as a low-carbon feedstock for petrochemical production, to 50 million gallons per year.¹⁷¹



Renewable Feedstocks

AFPM members are using the ingenuity and innovation they are known for to produce renewable feedstocks that can offer a reduced emissions profile compared to traditional feedstocks.

- Working with **Marathon Petroleum** subsidiary Virent, a major outdoor clothing and equipment company created a fully biobased polyester coat. Virent used its BioForming process to convert Louisiana sugarcane into paraxylene, a polyester component traditionally derived from petroleum.¹⁷²
- **LyondellBasell** creates both polypropylene and polyethylene from renewable feedstocks produced from biobased wastes and residues, which are International Sustainability and Carbon Certification (ISCC) Plus certified as sustainably sourced and not in competition with the food chain. These feedstocks are used in the company's conventional production processes along with conventional feedstocks, and are allocated to its CirculenRenew line of products using a mass balance approach.¹⁷³
- **Dow's** ECOLIBRIUM technology converts responsibly sourced biowaste and byproducts, including used cooking oil, into petrochemical feedstocks. These feedstocks are being used by companies like Crocs in the manufacturing process of its Croslite material, creating a more sustainable product with a lower CO₂ impact than traditional petrochemical feedstocks.¹⁷⁴
- Renewable products created by **Ergon's** Process Oils Inc. have displace over 1.4 million gallons of traditional mineral oils in the past decade, which is the equivalent of more than two million barrels per year of crude oil.¹⁷⁵

Fostering a Circular Economy for Plastics

Addressing the global mismanagement of plastic waste requires a multitude of solutions, including creating an environment where plastic is designed, manufactured and recovered in ways that promote recycling and reuse. Our industries are piloting new ways to generate plastic products — as diverse as automotive parts and candy wrappers — in a sustainable way and collaborating with outside industries to more quickly scale these new solutions.

Advanced Recycling Collaborations

Advanced recycling, which breaks plastics back down into their original building blocks for use as feedstock in new, like-virgin plastics, holds tremendous potential for expanding the kinds of plastic that can be recycled and how that material can be used. AFPM members are working with a variety of industries to explore the myriad ways advanced recycling can help address plastic waste.

Finding ways to make product streams circular is critical to creating a more sustainable ecosystem for plastics. Our industries lend their expertise to collaborations with outside industries to advance the goal of addressing and scaling efforts to increase the use of recycled plastic.

- ExxonMobil, Cyclyx International, Ahold Delhaize USA and Sealed Air** demonstrated that plastic waste could be collected from grocery stores and diverted from landfills. The Ahold Delhaize USA brand Food Lion supported the pilot by collecting plastic waste at selected locations. Cyclyx International then sorted and preprocessed the waste before it was delivered to ExxonMobil's Baytown facility, where its Exxtend advanced recycling technology was used to recycle the materials back into its molecular building blocks. Sealed Air, in turn, converted the certified circular polyethylene resins into food-grade film that was used to package fresh poultry, which was then returned to stores as an example of the circular economy.¹⁷⁶
- LyondellBasell** announced the final investment decision to build the company's first industrial-scale catalytic advanced recycling demonstration plant at its Wesseling, Germany, site. Using LyondellBasell's proprietary MoReTec technology, this plant will be the first commercial scale, single-train advanced recycling plant to convert post-consumer plastic waste into feedstock for production of new plastic materials. The new plant is expected to have an annual capacity of 50,000 tons per year and is designed to recycle the amount of plastic packaging waste generated by over 1.2 million German citizens per year. Construction is planned to be completed by the end of 2025.¹⁷⁹
- BASF's** water-based adhesive played a critical role in a collaboration with Krones, Sudpack and Tomra Recycling Sorting that showed that multilayer polyethylene terephthalate (PET) packaging can successfully be recycled at scale using existing recycling infrastructure. BASF's adhesive allowed for the separation of the PET and polyethylene layers without affecting adhesive strength, making the packaging more recyclable. The partners are now working to further optimize the process by adjusting adhesive qualities to improve recycling rates.¹⁷⁷
- Eastman** worked with the U.S. Automotive Materials Partnership LLC, automotive recycler Padnos and global automotive interior supplier Yanfeng to demonstrate a successful closed-loop recycling project for automotive mixed plastic waste. Padnos supplied plastic-rich automotive shredder residue — which usually ends up in landfills — as a feedstock to Eastman, which transformed it into synthesis gas (syngas) using advanced recycling. The syngas was used to produce polyester and cellulosic thermoplastics, which were processed and supplied to Yanfeng, where it was turned into parts that meet a variety of vehicle manufacturer requirements.¹⁸⁰
- LyondellBasell** has joined forces with Audi to help make mixed automotive plastic waste more circular. Audi's seatbelt buckle covers in its Q8 e-tron model line are made using LyondellBasell plastic that supports the sourcing of feedstocks from mixed automotive plastic waste through advanced recycling. The recycled content is attributed to the Audi product using a mass balance approach.¹⁷⁸

Advanced recycling reduces the carbon intensity of plastics

Recent studies show that plastics made with just 5% of recycled materials can offer significant gains in environmental performance, including:¹⁸¹



18–23%

GHG emissions reductions



65–70%

Fossil energy use reduction



48–55%

Water use reduction



116–118%

Solid waste reduction

Waste Collection, Sorting and Tracking

AFPM members are working together and with outside organizations to help address an often-overlooked aspect of the plastic waste challenge: the collection, sorting and tracking of discarded plastic. In addition to contributing to a circular economy by diverting discarded plastic from landfills, this process is critical to ensuring that such feedstocks are usable for advanced recycling.



- **ExxonMobil** and **LyondellBasell** are working with Cyclyx International and the Houston Recycling Collaboration to help close the loop on plastic waste. Cyclyx recently announced its first Cyclyx 10 to 90® takeback program in Kingwood, Texas, that expands the materials accepted for recycling to include nearly all plastics.¹⁸²
- **LyondellBasell** formed a joint venture with 23 Oaks Investments to construct an energy-efficient, high-tech plastics sorting facility in Germany that uses renewable energy from wind and biomass to process an amount of plastic packaging waste equivalent to that generated by approximately 1.3 million German people annually.¹⁸⁵
- **SABIC** has launched a pilot program to evaluate Circularise's Smart Questioning blockchain technology — SABIC's latest pilot to track the carbon footprint of specific material streams from end to end — providing access to upstream and downstream data provided by recyclers to converters to original equipment manufacturers.¹⁸⁶
- **Chevron** has joined the National Lubricant Container Recycling Coalition, which is focused on developing a nationwide program to recover and recycle plastic packaging used to transport lubricants and related products for commercial and consumer use.¹⁸³
- **Chevron Phillips Chemical** has joined **LyondellBasell** and **Dow** in investing in the Closed Loop Circular Plastics Fund, bringing the organization's total capital to \$45 million — a sum which is dedicated to supporting the development of plastics recycling and recovery infrastructure in North America.¹⁸⁴
- **Dow** worked with HP Indigo, Reifenhäuser, Cadel Deinking and Karlville to implement a digital product passport, where all recycling-relevant information about plastic packaging has been recorded in a standardized form of data that can be retrieved via a marker using the R-Cycle database. R-Cycle is a cross-industry initiative to create an open and globally applicable traceability standard for sustainable plastic packaging.¹⁸⁷

Nurturing Innovation to Advance Sustainability

Innovation is in our industries' DNA, as evidenced by the thousands of scientists, engineers and technicians working at our companies who are tackling the world's greatest challenges to build a more sustainable future.

- **Chevron** Technology Ventures partnered with the U.S. Department of Energy (DOE) National Renewable Energy Laboratory to create the Chevron Studio, a \$10 million program to connect entrepreneurs with universities and national labs to scale up innovative, early-stage technologies with the potential to accelerate a lower-carbon future.¹⁸⁸
- **Emerson Automation Solutions** is currently partnering with the DOE's Oak Ridge National Lab on five projects that focus on increasing energy efficiency, ranging from lower-cost cooling mechanisms to novel heat pump architectures and geothermal storage and heating.¹⁸⁹
- In 2023, **BASF** celebrated the 10th anniversary of its partnership with Harvard University, the Massachusetts Institute of Technology and the University of Massachusetts Amherst as part of its Northeast Research Alliance (NORA). Over the past decade NORA has prompted 114 research projects in fields like 3D printing, advanced materials, digitalization, catalysts, sustainable chemistry, microplastics and synthetic biology. The initiatives have also resulted in over 46 patents and 42 peer-reviewed publications.¹⁹⁰
- At the **Phillips 66** Research Center in Bartlesville, Oklahoma scientists, engineers and technicians work on projects related to next-generation battery technologies, renewable fuels processing technologies, lower-carbon hydrogen production and novel carbon capture technologies.¹⁹¹
- It is through innovative endeavors such as these that our members have been able to create technologies that help outside industries pursue their sustainability goals.
- **ExxonMobil** is collaborating with the Wind Energy Institute of Canada to help create leading-edge wind turbine lubricants. Its lubricants are already used in more than 40,000 wind turbines worldwide.¹⁹²
- **Ergon** Asfaltos Mexico has created new paving technologies that nearly double the lifecycle of high-traffic roadways, extending their life by 35+ years and saving CO₂ emissions, energy and usage costs.¹⁹³
- **Dow** developed a washing technology called EVOWASH, a biodegradable, low-foam industrial detergent which maximizes adhesive removal, improves the optical quality of plastic resins and reduces foam in the mechanical recycling of PET, high-density polyethylene, low-density polyethylene and other polypropylene plastics.¹⁹⁴
- **Albemarle's** Ketjen ReNewFine catalysts have enabled the production of billions of liters of advanced biofuels over its 15-year history. Ketjen recently launched Quasar, a catalyst technology developed using artificial intelligence and high-throughput experimentation.¹⁹⁵

AFPM members are ensuring they achieve their sustainability goals by setting metrics-based targets, incorporating sustainability into internal governance structures, working to improve the quality of data tracking, and collaborating with suppliers to ensure that sustainability efforts permeate the supply chain.

Holding Ourselves Accountable

Making Commitments

Our industries have set ambitious targets, with several companies even increasing the stringency of their commitments in light of faster-than-expected progress towards previous ambitions.



- **LyondellBasell** increased its 2030 absolute GHG emissions reduction target for Scope 1 and Scope 2 emissions from 30% to 42% and established a 2030 Scope 3 emissions reduction target of 30%, relative to a 2020 baseline.¹⁹⁶
- **LyondellBasell** aims to assess a minimum of 70% of its key suppliers globally using sustainability criteria by 2025. To achieve this goal, LyondellBasell has trained 250 procurement professionals via its Sustainable Procurement training curriculum and was able to achieve 140% of its original target of assessing 470 suppliers.¹⁹⁷
- **Chevron** has created a carbon intensity pledge for 2028 of 36 kg CO₂e/boe (CO₂ equivalent per barrel of oil equivalent) for its Scope 1 and 2 emissions from its refining operations.¹⁹⁸
- In 2022, **Valero** achieved its short-term GHG target of reducing and displacing 63% of its refinery Scope 1 and 2 GHG emissions by 2025, with a 100% target planned for 2035.¹⁹⁹
- **HF Sinclair** has committed to a target of reducing its net GHG emissions intensity by 25% by 2030, relative to a 2020 baseline.²⁰⁰
- **Chevron Phillips Chemical** established a target to reduce the carbon intensity of its operations by 15% by 2030, relative to a 2020 baseline.²⁰¹
- **ExxonMobil** aims to invest more than \$20 billion on lower-carbon initiatives through 2027, which represents the third increase in the last three years, from an initial \$3 billion in projects identified in early 2021.²⁰²
- **Dow** has accelerated its sustainability targets by aiming to transform three million metric tons of circular and renewable solutions annually by 2030.²⁰³
- **SABIC** has unveiled a target of helping to advance the circular carbon economy by producing one million metric tons of its recycled TRUCIRCLE products by 2030.²⁰⁴
- By 2030, **Ecolab** aims to help customers conserve enough water to meet the drinking needs of one billion people, reduce GHG emissions by six million metric tons, and clean 90 billion hands, all while achieving a net positive water and carbon impact and 100% use of renewable energy.²⁰⁵

Delivering on Carbon Reduction Commitments

Our industries are making great strides in reducing both Scope 1 emissions — which come from the direct operation of owned assets — as well as the Scope 2 emissions resulting from the generation of purchased energy.

- **Valero** achieved its 2025 GHG emissions target three years early, reducing or displacing over 63% of refinery Scope 1 and 2 emissions.²⁰⁶
- **Marathon Petroleum** has set a target of cutting Scope 1 and 2 emissions by 30% from 2014 levels by 2030. Since it is already 25% of the way there and on track to achieve its goal prior to 2030, they are evaluating this metric to revise it by the end of 2024 and extend it at least through 2035.²⁰⁷
- **Phillips 66** has obtained an 8% reduction in Scope 1 and 2 emissions intensity compared to 2019 levels.²⁰⁸
- **Dow** reduced its carbon emissions by 15% between 2005 and 2020, while growing the volume of manufactured products by 30%. Dow remains on track to reduce Scope 1 and 2 emissions by 30% by 2030 compared to a 2005 baseline.²⁰⁹
- **BASF** Environmental Catalyst and Metal Solutions' site in Fremont, California, became net zero in 2023 after installing 428 rooftop solar panels as a part of a power-purchase agreement. The panels will produce 230,000 kilowatts each year and offset 100% of the site's current usage.²¹⁰





Governance

In order to ensure that environmental, social and governance (ESG) principles receive attention from everyone — from the C-suite down to the facility floor — our members have incorporated sustainability into their governing infrastructure and, in some cases, some members have even tied it to annual compensation programs.



- **LyondellBasell's** Board leads its sustainability commitment and maintains oversight of its ESG profile, while at the management level its CEO oversees the company's ESG efforts through discussion and regular reporting among members of his Executive Committee. In 2022, LyondellBasell promoted its Director, Global Sustainability to Vice President and Chief Sustainability Officer, a role which is responsible for sustainability program management, strategy and reporting. The position is supported by a global group of employees that collaborates with leaders across the organization, including members of the Executive Committee and the team leading LyondellBasell's GHG emissions reductions efforts, to combine the functional expertise and skills necessary to reach its sustainability objectives.²¹¹
- **Chevron** created an Equity Review Committee, complete with external experts, to review employee concerns with selections or promotions and to offer perspectives on whether Chevron's selection and promotion processes are leading to equitable outcomes.²¹²

- **Valero** has incorporated health, safety and environmental performance measures and ESG efforts — including those related to environmental stewardship, human capital, sustainability, corporate citizenship and community — into its annual bonus program.²¹³
- **Phillips 66's** Energy Best Practices network includes employees from all of its refineries — as well as staff from its corporate, IT and research facilities — who meet regularly to pool information about technologies, experiences at the plants and ongoing conservation projects.²¹⁴
- **PBF** formed the Environmental, Social, and Governance Executive Committee to oversee its ESG initiatives. The committee, which is composed of representatives from all sectors of the business, reports to the Board of Directors and is developing PBF's sustainability framework and strategy as well as making progress towards additional disclosures in alignment with the Task Force on Climate-Related Financial Disclosures.²¹⁵
- **HF Sinclair's** Board and its committees oversee its approach to ESG topics, including the Environmental, Health, Safety, and Public Policy Committee, which provides oversight of its environmental, health and safety performance and monitors legislative and regulatory policies, and the Nominating, Governance and Social Responsibility Committee, which provides oversight of its policies, practices and procedures regarding human rights in its operations and supply chain, environmentally sustainable practices, and strategies and performance in assessing and responding to climate-related risks and opportunities.²¹⁶
- **Chevron Phillips Chemical** established a Climate Technology Team to create innovative carbon reduction strategies and technologies and incorporate them into existing and future assets. The team is responsible for sourcing renewable electricity, examining carbon capture solutions, and exploring the electrification of cracking furnaces and hydrogen firing opportunities.²¹⁷
- **Cenovus'** Board approves corporate strategic plans, which factor in opportunities and risks to the business. The company also considers GHG targets as part of annual capital allocation investments and planning decisions. In addition, carbon compliance costs and GHG profile impacts are factored into acquisition and divestiture decisions.²¹⁸ Discussions about important ESG topics are included regularly in Board and Committee discussions and also covered during Board strategy sessions twice a year.²¹⁹ Cenovus' Safety, Sustainability and Reserves Committee, meanwhile, guides the company's ESG commitments and is specifically tasked with monitoring and overseeing the company's programs, policies and performance as they relate to sustainability, safety and the environment.²²⁰
- **Monroe Energy** has created an environmental scorecard to measure how the refinery operates in terms of resources used, its environmental footprint and its community involvement.²²¹
- **Dow** further refined its Board oversight by outlining distinct responsibilities for its ESG priorities in the Board committee charters, including relating to climate protection, ID&E efforts, and accountability and transparency around sustainability targets.²²²
- **Chevron Phillips Chemical's** Environmental, Health, Safety and Security Policy Committee oversees CPChem's global Operational Excellence program, recommending focus areas, policies, global metrics and sets of long-term strategies for improving performance for emissions control, facility resilience and manufacturing good practices and improvements. CPChem's Climate Guidance Review Team is tasked with the direction and development of the company-wide climate strategy, and this team reports to the Executive Steering Team to endorse procedures that aim to reduce CPChem's carbon footprint.²²³
- In 2023, **Plains All American Pipeline** formed a new Inclusion Steering Committee that is made up of a diverse group of vice presidents, directors and managers who are working to identify and recommend training and programmatic good practices to ensure organization-wide inclusion.²²⁴



Improving Data Quality

As technologies and methodologies improve, refiners and petrochemical manufacturers are enhancing their ability to identify lifecycle assessments and GHG emissions tracking.

- **Chevron** conducted independent third-party assurance for its GHG emissions and the processes used to create its sustainability report, and increased the assurance level for GHG emissions reporting from limited to reasonable for both operated and non-operated assets.²²⁵
- **LyondellBasell** is not only undertaking lifecycle assessments for its products and proprietary technologies, but also collaborating to support the harmonization of product lifecycle metrics and share good practices within the chemical industry. Moreover, LyondellBasell is growing its internal capability to calculate lifecycle metrics and product carbon footprints, using these tools to support the evaluation of new technologies and calculate product carbon footprints in its supply chain.²²⁶
- **ExxonMobil** is working with the MIT Energy Initiative to create a new tool that measures the lifecycle impact of numerous technologies, representing the majority of sources of GHG emissions.²²⁷
- As a part of its Operational Excellence program, **Chevron Phillips Chemical** has begun developing internal GHG accounting and reporting standards to standardize procedures, responsibilities and requirements of CPChem's GHG reporting and data management practices.²²⁸

Supporting Diversity Throughout the Supply Chain

Beyond championing their commitment to sustainability throughout their business models, the fuel and petrochemical industries are working with their suppliers to multiply their impact throughout the supply chain.



- For over 50 years, **ExxonMobil** has been working to expand supplier diversity, working with organizations including the Women's Business Enterprise National Council; the National Minority Supplier Development Council; the National Lesbian, Gay, Bisexual and Transgender Chamber of Commerce; and the National Veteran-Owned Business Association to help identify and build relationships with diverse suppliers in the U.S.²²⁹
- **Marathon Petroleum** has increased its annual diverse supplier spend by 79% since 2019, spending over \$700 million last year through its Supplier Diversity program.²³⁰
- **Phillips 66** updated its supplier diversity position statement to better reflect its commitment to working with diverse suppliers and highlighted the creation of the Tier II program. The Tier II program encourages key vendors to promote supplier diversity while supporting initiatives beyond direct relationships, with these key suppliers committing to quarterly reporting of their diverse spending. Phillips 66 spent \$115 million in Tier I diverse suppliers, and \$80 million on Tier II diverse suppliers.²³¹
- **Chevron** is a member of the Greater Houston Partnership and its One Houston Together buyer's cohort, which is dedicated to advancing racial equity and expanding spending on minority business enterprises. Chevron is also a leading supporter of nonprofits that help diverse businesses grow, including the Women's Business Enterprise National Council, National Minority Supplier Development Council, National LGBT Chamber of Commerce and Disability:IN.²³²
- **Dow** has a goal of exceeding \$500 million in global diverse supplier spending by 2025. In order to help expand the number of diverse suppliers globally, Dow launched the Dow Accelerator Program to empower diverse suppliers worldwide and also co-created the Women's Business Enterprise National Council Accelerator program, along with BASF and Ecolab, to provide a mentorship program to fill the diversity gap in chemical industry suppliers.²³³
- **Baker Hughes** invested \$50 million to support Unity Bank Houston, Texas' only Black-owned banking institution, as a part of its commitment to supplier diversification and advancement of racial equity.²³⁴



AFPM takes an all-of-organization approach to supporting our members' sustainability journeys. This includes facilitating knowledge sharing, promoting new and emerging technologies, and approaches to increasing the sustainability of our operations and products, advocating for policies that support sustainability within our industries, and elevating the role of and progress being made in the sustainability of our industries.

Supporting Industries' Commitment in Sustainability

Promoting Technologies and Facilitating Discussions to Support Sustainability Goals

The AFPM Sustainability Process Technology Committee supports industry's growth and sustainability goals by promoting new and emerging technologies, providing updated market and regulatory outlooks, and sharing good practices in engineering and operations. This group also develops sustainability-related curriculum for AFPM conferences and webinars.





Advancing Policies for a More Sustainable Future

AFPM's Carbon Policy Working Group and Plastic Policy Working Group are actively evaluating and pursuing policies based on member-driven principles to address the challenges of climate change and the mismanagement of plastic waste. Working with these groups, AFPM has advocated for the EPA to recognize the potential of renewable diesel and not limit its use under the RFS, supported the deployment of incentives for emerging technologies like carbon capture utilization and sequestration and hydrogen production, championed federal legislation to spur innovation and collaboration to keep waste out of the environment and increase recycling efforts, among others. AFPM is exploring a federal policy framework that considers vehicles and fuels as a system and realizes that emissions occur at all stages of the lifecycle of vehicles and fuels. And, as an accredited stakeholder with the United Nations (UN) Environmental Program, we are continuing to advocate for policies that enable industry innovation and global investment in plastics circularity through the development of the UN agreement on global plastic pollution.



AFPM Plastic Waste Policy Principles

AFPM approaches the challenges of global plastic waste by addressing the many aspects of this complex issue. Ultimately, our solutions 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:

- Developing 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.
- Supporting 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.
- Ensuring the regulatory classification for plastic waste is 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.

AFPM Climate Policy Principles

AFPM is committed to the development of sound 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 an environmentally sustainable way.

Policies addressing climate change must be:

- 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 petrochemical 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.

Elevating Industries' Role in Sustainability

AFPM is working with our members to elevate the role of sustainability and the progress our industries are making in increasing the sustainability of their operations and products. In addition to publishing our annual industries-wide Sustainability Report, the member-led, AFPM Sustainability Working Group brings top-tier sustainability experts and academics from leading companies and universities to speak and share information on emerging issues and trends in the sustainability space.



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