JUNE 2022

Perspectives on Climate-Related Scenarios

Risks and Opportunities

MARATHON | MPLX

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Glossary of terms

barrel: 42 U.S. gallons — a common volume measure for crude oil and petroleum products

barrel of oil equivalent or boe: A unit of energy based on the energy released by burning one barrel of crude oil or 5.8 million British thermal units

bcm: Billion cubic meters (a measure of natural gas volume)

bpcd: Barrels per calendar day — the average of how much crude oil or other feedstock a refinery processes over a period of time, divided by the number of days in that period, typically 365 days (a common rate measure for petroleum refineries)

bpd: Barrels per day — a common rate measure for crude oil and petroleum products

blue hydrogen: hydrogen produced through a reaction that separates methane into hydrogen and CO_2 and then captures and sequesters the CO_2

CDP: formerly known as the Carbon Disclosure Project, CDP is a not-for-profit charity that runs a global disclosure system for investors, companies, cities, states and regions to report environmental data

CO_2e: Carbon dioxide equivalent — a common unit of measurement converting all greenhouse gases to carbon dioxide. MPC calculates CO_2e emissions using the EPA factors identified in Table A-1 at 40 CFR Part 98.

EPA: The U.S. Environmental Protection Agency

ERM: Enterprise Risk Management

ESG: Environmental, social and governance

GHG: Greenhouse gases, such as carbon dioxide and methane

green hydrogen: hydrogen produced through electrolysis (from renewable sources) of water separating water into hydrogen and oxygen

IEA: International Energy Agency

LNG: Liquefied natural gas

LPG: Liquefied petroleum gases

Tonne or metric ton: 2,205 pounds

MPC: Marathon Petroleum Corporation

MPLX: MPLX is a diversified, large-cap master limited partnership formed by Marathon Petroleum Corporation that owns and operates midstream energy infrastructure and logistics assets, and provides fuels distribution services

MPLX G&P: our MPLX Gathering and Processing business

NGL: Natural gas liquid — a light hydrocarbon liquid often produced with natural gas

Renewable diesel: a hydrocarbon diesel fuel produced by hydroprocessing of fats, vegetable oils and waste cooking oils

Renewable fuel: liquid fuel derived from biomass and waste feedstocks and include ethanol, biogasoline, sustainable aviation fuel, biodiesel and renewable diesel

Scope 1 emissions: All direct GHG emissions by a company, including fuel combustion, company vehicles and fugitive emissions

Scope 2 emissions: Indirect GHG emissions from consumption of purchased electricity, heat or steam

Scope 3 emissions: Other indirect GHG emissions that occur in a company's value chain that are not captured by Scope 2

TCFD: Task Force on Climate-related Financial Disclosures, formed by the Financial Stability Board (an international body that monitors and makes recommendations about the global financial system)

A Message from Our CEO, Mike Hennigan

Thank you for your interest in our analysis of climate-related risks and opportunities. At MPC and MPLX, we continue to challenge ourselves to lead in sustainable energy. To take on this challenge effectively, we continually evaluate the evolving energy landscape and align our strategies accordingly.

This report provides insights into some of the strategic considerations we take to set meaningful objectives, dedicate resources to accomplish them, hold ourselves accountable and demonstrate results. Since our last report, we made significant progress on our stated goals and set even more aggressive targets.

In particular, in 2021, we further reduced our scope 1 and 2 GHG emissions intensity to 23% below our 2014 baseline, well on the way to our goal of a 30% reduction by 2030. We made similar progress on methane emissions intensity at our MPLX Gathering and Processing assets, achieving a 46% reduction below 2016 levels, on our way to a 50% reduction by 2025.

In last year's report, I noted a commitment to update and expand targets as new opportunities and technologies become available. Accordingly, earlier this year we announced a scope 3, category 11 absolute emissions reduction goal of 15% below 2019 levels by 2030 and expanded our methane goal to a 75% emissions intensity reduction by 2030.

These and other goals are important to our larger strategic plan, in which we are leveraging our legacy refining and logistics assets to meet today's energy needs while evolving our portfolio toward lower-carbon energy. This strategy – underway for several years – is informed by our view that long-term demand for certain petroleum-based fuels will decline, while demand for other fuels like natural gas and renewable fuels will increase. Since becoming an independent company in 2011, MPC's business has diversified from 93% petroleum-based fuels down to 58%, and we expect this will drop further as opportunities for natural gas and renewables continue to grow.

As you'll see in this report, we face a number of opportunities and risks as the energy industry evolves. By considering modeled scenarios, we continue to adapt in ways that will allow us to thrive in a lower-carbon, energy-diverse future. We are focused on the cost-competitiveness of our assets so that we can remain resilient, even in aggressive decarbonization scenarios like the IEA's Net-Zero by 2050.

We are on our way to becoming one of the largest global producers of renewable diesel. To achieve this, we invested over $500 million to convert our Dickinson, North Dakota, refinery to produce renewable diesel and announced our intent to form a joint venture with Neste to complete a similar $1.2 billion conversion of our Martinez, California, refinery. We also established a joint venture with ADM to construct the $350 million Green Bison Soy Processing facility that will supply refined soybean oil to MPC as a renewable diesel feedstock. We will continue to evaluate opportunities to strengthen our position in the evolving renewable fuels environment.

We continue making industry-leading strides in the energy efficiency of our refineries, earning more ENERGY STAR® certifications from the U.S. EPA than all other refiners combined. These and other factors, such as freshwater withdrawal reduction goals; advanced biofuels research and development; and managing physical risks to our assets, combined with our agreements with key partners, contribute to our long-term ability to thrive under carbon-constrained scenarios.

I invite you to read through this report and learn more about how we are positioning ourselves in the energy evolution and meeting the challenge to lead in sustainable energy.

Michael J. Hennigan
President and CEO, MPC and MPLX

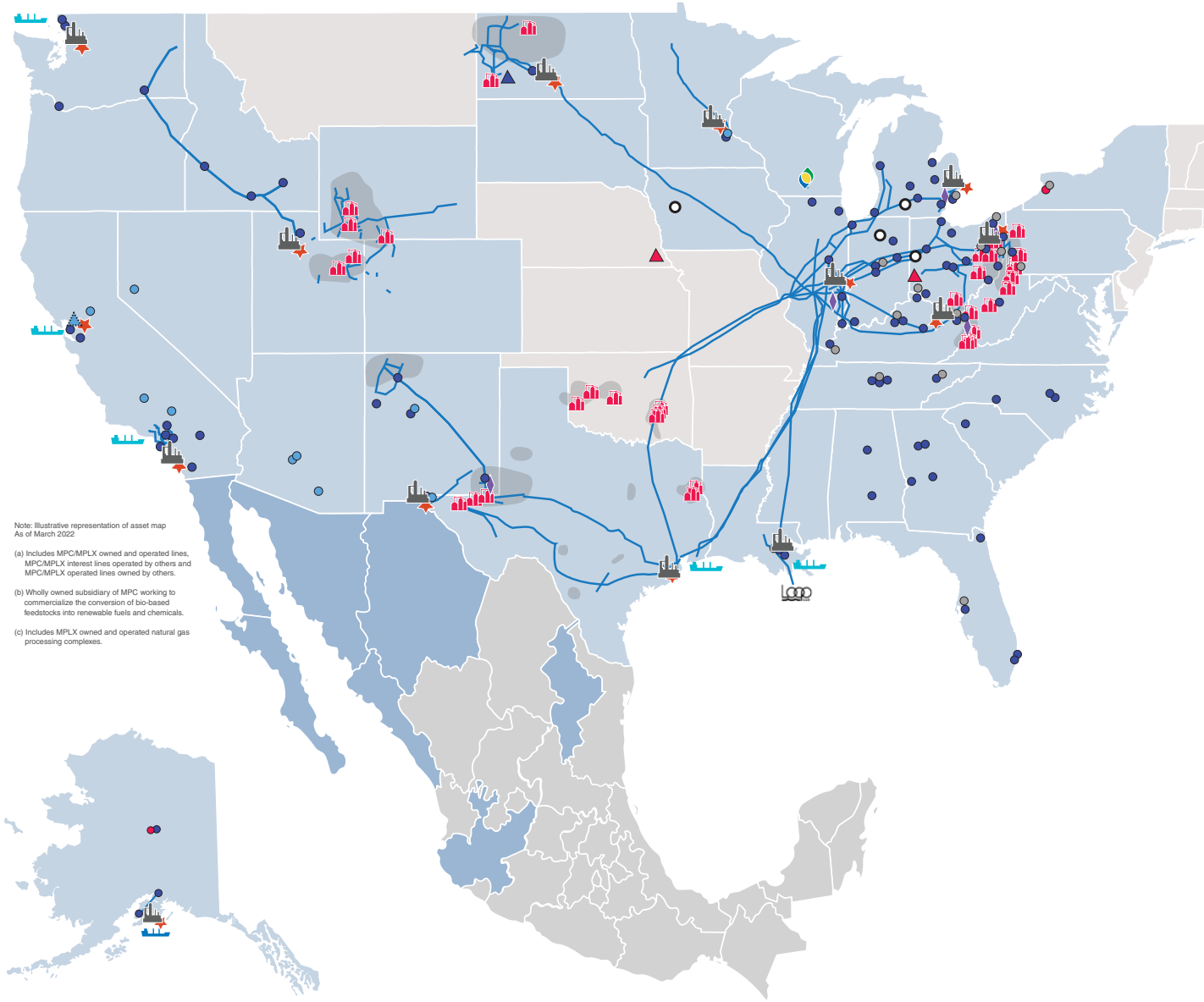
MPC and MPLX Operations

2.9 MILLION
bpcd of crude oil refining capacity

2.4 BILLION
gallons of renewable fuel delivered in 2021

11.8 BILLION
standard cubic feet per day of natural gas processing capacity

812 THOUSAND
bpcd of NGL fractionation capacity



Note: Illustrative representation of asset map
As of March 2022

(a) Includes MPC/MPLX owned and operated lines, MPC/MPLX interest lines operated by others and MPC/MPLX operated lines owned by others.

(b) Wholly owned subsidiary of MPC working to commercialize the conversion of bio-based feedstocks into renewable fuels and chemicals.

(c) Includes MPLX owned and operated natural gas processing complexes.

MARATHON

- MPC Refinery
- MPC Owned and Part-Owned Light Product Terminal
- MPC Owned Asphalt/ Heavy Oil Terminal
- MPC Owned and Part-Owned Marine Facility
- MPC/MPLX Pipeline[a]
- Martinez Renewable Fuels Project
- MPC Domestic Marketing Area
- MPC International Marketing Area
- Ethanol Facility (joint venture with The Andersons)
- MPC Renewable Feedstock Processing Facility
- Virent[b]
- MPC Renewable Diesel Facility

MPLX

- MPLX Owned and Part-Owned Light Product Terminal
- MPLX Owned Asphalt/ Heavy Oil Terminal
- MPLX Natural Gas Processing Complex[c]
- MPLX Refining Logistics Asset
- MPLX Gathering System
- MPLX Owned Marine Facility
- Cavern

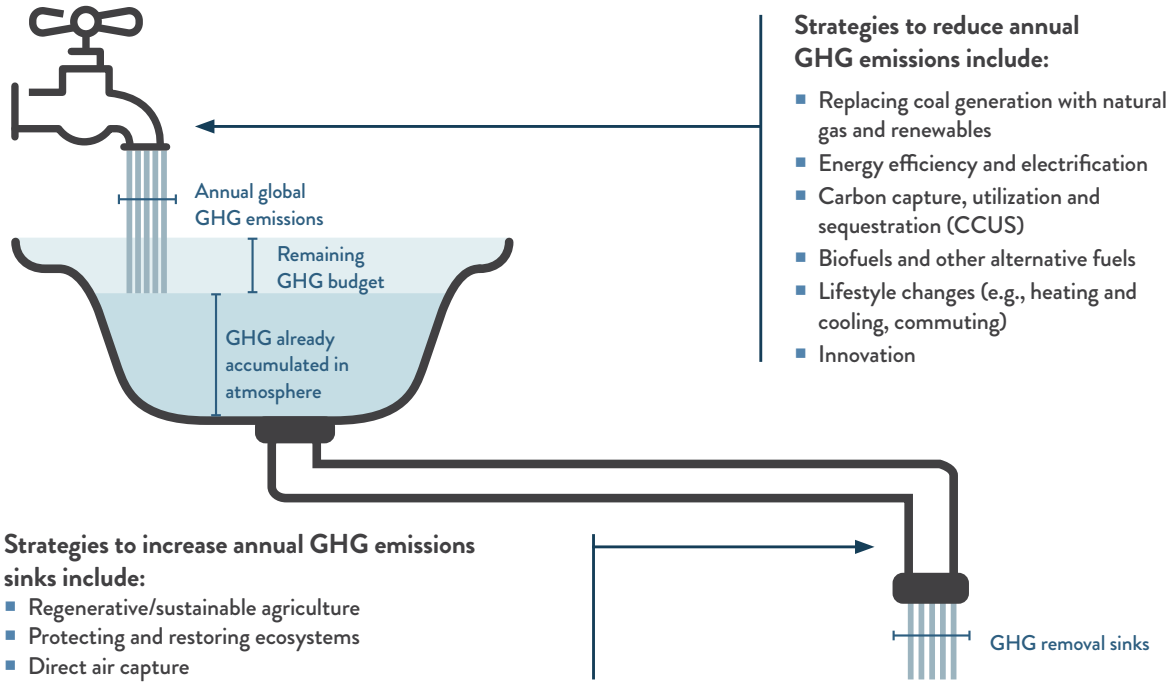
Introduction

Energy security is essential to meeting the Paris Agreement

The International Energy Agency (IEA) defines energy security as the uninterrupted availability of energy sources at an affordable price. When energy security is threatened, nations tend to utilize available energy sources, such as coal, even if those sources counter stated climate goals and initiatives. We need energy to get to work; to light, heat and cool our homes; to power our phones and computers; and to cook meals. Basic services like clean water, sanitation and medical care, all depend on energy. Virtually every consumer product depends on energy for its raw materials, manufacture and transport. When energy costs rise too rapidly or become less reliable, prosperity suffers, with those least able to afford such shocks impacted most. Worldwide, it is estimated there are 3.5 billion people without access to reliable electricity[1] and over 2.5 billion people without clean cooking fuels and technology who seek to improve their lives through an expansion of reliable and affordable energy.

Meeting the Paris Agreement's ambition to limit a global temperature increase will require a transformation of the global energy system throughout the remainder of the 21st century. Energy security must be at the heart of this endeavor. An all-of-the-above emission reductions strategy that incorporates renewables, nuclear and improved oil and gas efficiency is the best way to ensure success. According to the Intergovernmental Panel on Climate Change (IPCC), the global temperature will stabilize when CO_2 emissions reach a "net-zero" state. To limit warming to a 1.5 degree Celsius increase would mean achieving net-zero carbon dioxide emissions globally in the 2050s; for 1.7 to 1.8 degrees Celsius, it is in the 2070s. This timing is based on a "carbon budget" of the remaining GHG emissions that can enter the atmosphere before temperatures increase. Thus, it is equally important to embrace all GHG reductions to preserve the carbon budget, whether small or large, as it is to pursue aspirations of reaching net-zero. The world must do both to succeed.

To reach a net-zero state, global emissions must be reduced and balanced with GHG emissions sinks



Strategies to reduce annual GHG emissions include:

- Replacing coal generation with natural gas and renewables
- Energy efficiency and electrification
- Carbon capture, utilization and sequestration (CCUS)
- Biofuels and other alternative fuels
- Lifestyle changes (e.g., heating and cooling, commuting)
- Innovation

Strategies to increase annual GHG emissions sinks include:

- Regenerative/sustainable agriculture
- Protecting and restoring ecosystems
- Direct air capture
- Innovation

Deploying existing technologies and strategies that provide immediate GHG emission reductions – such as replacing coal with natural gas and renewables, energy efficiency, biofuels, nature-based solutions and carbon capture – allow next generation energy technologies to be developed and deployed in the decades to come. This must be done in a way that increases energy security to keep public support for the energy evolution.

Throughout this report, we provide disclosures that follow the recommendations from the TCFD, including a review of our business against two "less than 2-degree" or "low-carbon" scenarios developed by the IEA. We believe our investors and other interested stakeholders will find that the extensive disclosures in this report, our most recent Annual Report on Form 10-K, Sustainability Report and website align with the TCFD's principles and demonstrate our company's financial strength, adaptiveness and resilience to climate-related risks.[2]

[1] Ayaburi et. al, Measuring "Reasonably Reliable" Access to Electricity Services, The Electricity Journal 33 (2020) 106828.
[2] Referenced disclosures are available at www.marathonpetroleum.com/

Governance

At MPC, under the leadership and direction of our Board of Directors, we identify and manage climate-related risks and opportunities.

The Board's committees, including the Sustainability and Public Policy Committee, are responsible for specific areas of oversight and policy decision-making. Specific responsibilities are set forth in our Corporate Governance Principles and each committee's charter.[1]

Board Oversight

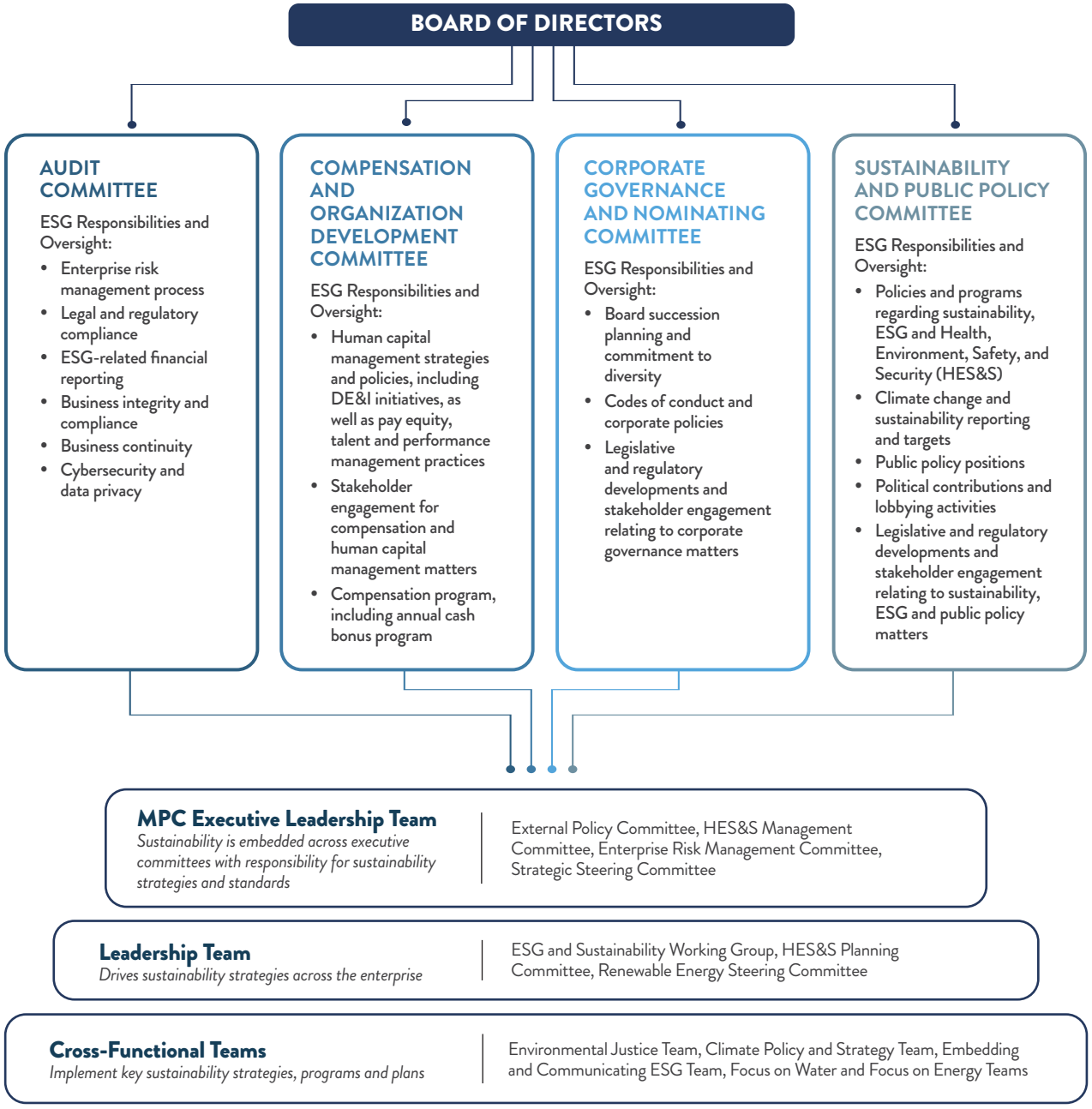
Sustainability Governance

At MPC, our performance, risks and opportunities related to ESG topics such as climate change, are identified and managed by company leadership with the oversight of our Board.

The Board has four standing committees, each of which is responsible for specific areas of oversight and policy decision-making.

Our executive leadership team has primary responsibility for sustainability strategies and standards. Sustainability is embedded in several cross-functional leadership committees that help ensure our objectives are incorporated into company standards, metrics and sustainability strategies. These are, in turn, cascaded throughout the organization. These standards and strategies are developed by committees of the executive leadership team and aligned with related procedures and plans at the operational level.

Collaboration and communication among the Board, its committees and MPC leadership are critical to maintaining our aligned direction on sustainability matters.



[1] Committee charters are available at https://www.marathonpetroleum.com/About/Board-of-Directors/

Risk Management

Enterprise Risk Management (ERM) Program
Enterprise Risk Management is how we identify, assess and manage enterprise-level risks and review the effectiveness of risk-mitigation strategies.

Enterprise-level risks include ESG, such as climate- and compliance-related risks, as well as those risks described in our most recent Annual Report on Form 10-K and other filings with the U.S. Securities and Exchange Commission.

ERM Process
Our ERM process is continuous and dynamic to help us identify emerging risks that may impact our ability to operate and efficiently allocate resources. The process involves a cross-functional review of potential enterprise-level risks, including sustainability risks. Our enterprise risk manager leads the process through quarterly leadership workshops that involve key leaders with responsibility for our sustainability priorities. Our risk analysis includes an examination of the causes and consequences of each enterprise-level risk, as well as the development of strategies to mitigate risks — imminent and potential — and position the company to capitalize on new opportunities.

ERM Community
We have formed an ERM community to support the ERM workshops. It comprises mid-level risk and assurance representatives across our value chain and meets quarterly to discuss, develop, standardize and integrate risk management best practices throughout the company to support risk-based decision-making.

The Board and executive leadership team routinely review and discuss enterprise-level risks and strategies, and the Board's Audit Committee further reviews our ERM process and performance trends and oversees internal processes to evaluate their effectiveness.

Climate-Related Risk
We carefully review, evaluate and manage climate-related risks and opportunities to ensure our ability to adapt and strengthen our resiliency. These include both transitional and physical risks, which we regularly discuss with the Board's Sustainability and Public Policy Committee and executive and senior leadership committees.

Compliance-Related Risk
As part of our ERM process, our Board oversees risks related to the regulatory landscape, including emerging and proposed regulations related to issues that have the potential to impact our business, such as greenhouse gas and other air emissions, water withdrawals and effluents, hazardous materials management, product specifications, and employee health and safety.

Identification and Disclosure of Risks
We disclose risks to our company in the Risk Factors section of our Annual Report on Form 10-K and other filings that are filed with the U.S. Securities and Exchange Commission. Categories of risk described in these reports include:

- Business and Operational Risks
- Financial Risks
- Legal and Regulatory Risks
- Strategic Transaction Risks
- General Risk Factors

The evolution of our climate-related disclosures and metrics helps demonstrate the effectiveness of our corporate governance process

	OPERATING YEAR					
	2022	2021	2020	2019	2018	2017
Absolute scope 3, category 11 GHG Emissions Reduction Target	✓					
Scope 3 GHG Emissions Disclosure	✓	✓				
CDP Disclosure[1]	✓	✓				
Freshwater Withdrawal Intensity Target	✓	✓				
Third-Party GHG Emissions Verification	✓	✓	✓			
MPLX G&P Methane Intensity Reduction Target	✓	✓	✓			
Scope 1 & 2 GHG Emissions Intensity Reduction Target	✓	✓	✓			
TCFD Disclosure	✓	✓	✓	✓	✓	✓

[1] Available at cdp.net/en

Planning for the Energy Evolution

In simple terms, our business strategy leverages our **LEGACY** petroleum refining and logistics assets to produce and deliver fuels the world needs today while generating cash to invest toward the energy evolution. This includes expanding availability of **TRANSITION** fuels, such as natural gas, and expanding into potential **GROWTH** areas, like renewable energy and low-carbon solutions. This strategy has already resulted in a shift to our asset portfolio and significantly reduced our scope 1, 2 and 3 emissions by over 50 million tonnes since 2019.

To promote success in each of these asset categories, we have adopted several corporate GHG-related targets that are explained starting on page 10. Each of these targets plays an important role in capital allocation as described on Page 9.

	LEGACY Petroleum Refining and Logistics	TRANSITION MPLX Natural Gas G&P	GROWTH Renewable Fuels & Low-Carbon Solutions
Growth Opportunity	HISTORIC: HIGH FUTURE: LOW	MID MID	LOW HIGH
Carbon Intensity	HIGHER	MEDIUM	LOWER
MPC/MPLX Portfolio 2019	**16** petroleum refineries **3.1 million** bpd crude oil refining capacity	**11.6 billion** standard cubic feet per day of natural gas processing capacity **0.8 million** bpd of NGL fractionation capacity	**4** ethanol facilities **1** biodiesel facility **~300 million** gallons of biofuels manufactured
MPC/MPLX Portfolio 2022	**13** petroleum refineries **2.9 million** bpd crude oil refining capacity	**11.8 billion** standard cubic feet per day of natural gas processing capacity **0.8 million** bpd of NGL fractionation capacity	**4** JV ethanol facilities **2** renewable pretreatment facilities **2** renewable diesel facilities **1** JV soybean crushing facility **~430 million** gallons of biofuels manufactured (~800 million gallons expected by 2024)
MPC/MPLX Long-term Indicators	**Petroleum-Based Transportation Fuels** Expected to decrease	**Gas Processing Capacity** Expected to remain steady	**Renewable Energy Production** Expected to increase

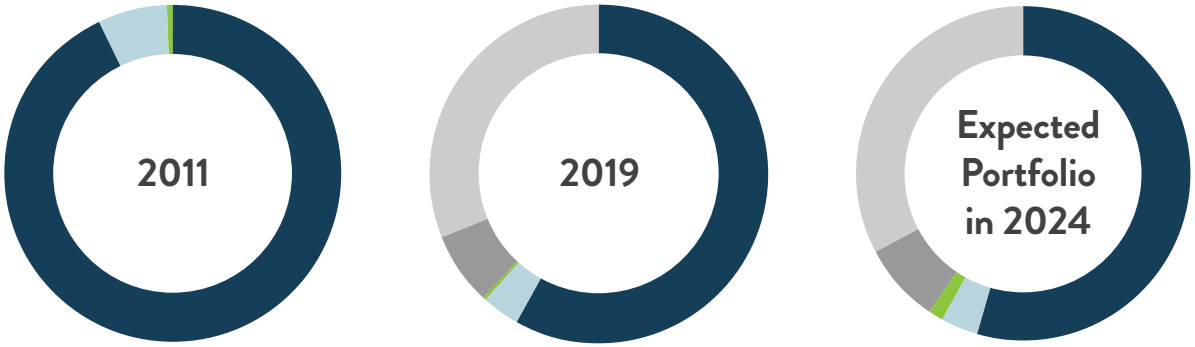
Business Planning and Capital Allocation

At MPC, we invest to strengthen the competitive position of our assets, diversify our portfolio, increase our resilience and support the energy evolution. As shown to the right, we have come a long way in our journey since separating from Marathon Oil in 2011. Today we are a diverse energy company focused on optimizing our LEGACY refining portfolio, promoting the energy TRANSITION through our natural gas business and investing capital in GROWTH opportunities in renewable energy and low-carbon solutions.

Our risk-based capital allocation strategy is designed to ensure capital discipline and long-term competitive returns for our shareholders. We continue to require higher return-on-investment (ROI) thresholds for projects with greater financial and regulatory uncertainty than those with more stable cash flow and lower regulatory risk. The ROI thresholds are highest for refining investments, which acts as a de facto carbon price because refining projects, with the highest carbon exposure, must overcome a much higher hurdle rate than, for instance, investments in our MPLX natural gas Gathering and Processing business, with lower carbon exposure. Projects are also individually evaluated against our long-term price forecast, which considers the demand projections from various Paris-aligned scenarios along with our four climate-related targets. This process has allowed us to achieve the shift in our manufacturing outputs shown to the right.

This process is driving significant capital investment that supports a lower-carbon future. For example, we are investing to convert our Martinez, California, refinery into a renewable diesel facility. This is in addition to more than $500 million of growth capital invested to convert our Dickinson Refinery. As a result of these two asset conversions, we expect to become one of the largest renewable diesel producers in the world. Further, we continue to invest growth capital to expand and increase utilization of our strategic natural gas business. Finally, of the growth capital allocated to our LEGACY refining assets, the majority is directed at strengthening the competitive position of our assets rather than increasing capacity.

Evolution of MPC and MPLX Processed Volume Portfolio
Based on energy content of products



	2011	2019	2024E
Petroleum-based fuel	92.9%	58.2%	54.5%
Nonenergy petroleum products	6.7%	3.5%	3.6%
Renewables	0.4%	0.3%	1.4%
Natural gas	0.0%	30.9%	32.5%
Natural gas liquids	0.0%	7.1%	7.9%

Considerations for Capital Allocation

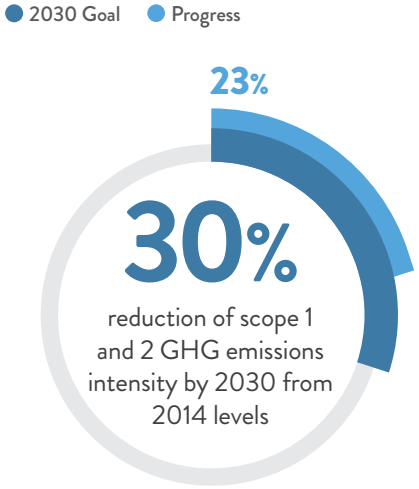
Hurdle risk-based ROI thresholds and long-term price forecast that incorporate Paris-aligned scenarios

Climate-related target assessment

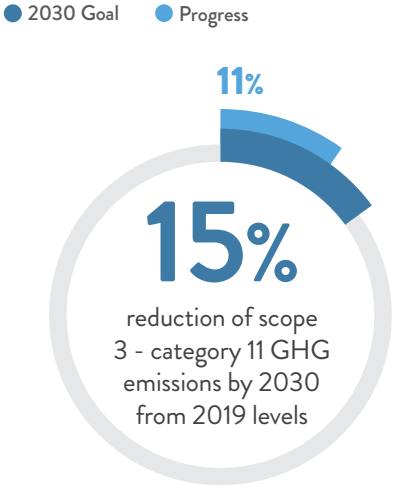
Climate-Related Metrics and Targets

We utilize the suite of metrics shown below to measure progress with our climate strategy and risk management process. We assess progress with these metrics on an annual basis and may modify these metrics or adopt new metrics as necessary. The absolute scope 3 – category 11 emissions reduction and long-term methane emissions reduction targets are new additions to this year's report. We are the first large downstream company to establish an absolute scope 3 target.

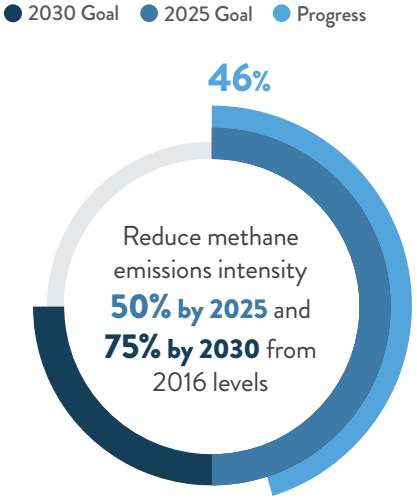
Scope 1 and 2 GHG Emissions Intensity
(tonnes CO_2e / thousand boe input)



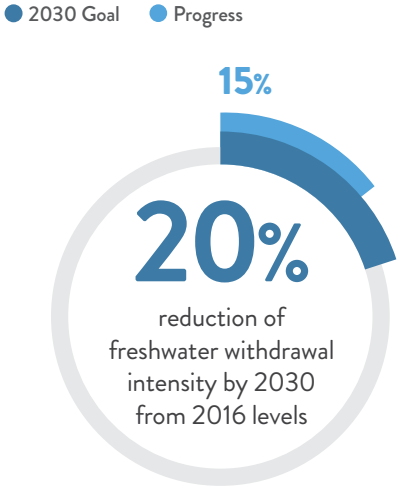
Absolute Scope 3 – Category 11 GHG Emissions
(tonnes CO_2e)



MPLX G&P Methane Emissions Intensity
(methane-scf / natural gas input-scf)



Freshwater Withdrawal Intensity
(megaliters / million boe input)



Basis for our emissions data and targets

We utilize several reporting protocols and guidance documents to develop and compute our GHG emission and targets, including:

- U.S. EPA's greenhouse gas reporting protocols (40 CFR Part 98)
- The Science Based Targets initiative (SBTi)
- The Greenhouse Gas Protocol
- Ipieca's petroleum industry guidelines for reporting greenhouse gas emissions

Beginning in 2020, an independent third party, LRQA, has validated our GHG data and emission calculation methodologies related to the above metrics.
This comprehensive review and assurance ensures accurate disclosures that align with accepted reporting practices.
The latest assurance statement can be found at https://www.marathonpetroleum.com/htmlEmails/LRQA/June_2021_MPC_Lloyds_Assurance_Statement.pdf.

Scope 1 and 2 GHG Emissions Intensity Target

In 2020, we adopted a companywide manufacturing scope 1 and 2 GHG emissions intensity reduction target of 30% by 2030 from 2014 levels. The metric is computed by aggregating the scope 1 and 2 GHG emissions across all our organizations divided by total manufacturing inputs. Because our manufacturing sites entail a wide range of inputs, including but not limited to crude oil, natural gas, natural gas liquid, and renewable feedstocks, we normalized these manufacturing inputs on a common energy unit known as barrels of oil equivalent (boe).

The Science Based Targets initiative (SBTi) protocol recommends that GHG emission targets should be established based upon one of three methodologies:

- Operational control of assets
- Equity ownership of assets
- Financial control of assets

We selected operational control of assets as the basis for this metric because it entails the largest scope 1 and 2 GHG emission footprint of the three criteria for our company. It also represented the scenario in which we have direct control to implement the necessary initiatives and strategies to reduce our GHG emissions intensity.

We have achieved a material reduction through multiple initiatives including our "Focus on Energy" program, the acquisition and expansion of our MPLX G&P business along with our growth in renewable fuels. In fact, we increased the percentage of natural gas, natural gas liquids and renewable feedstocks to our manufacturing sites from less than 1% in 2011 to nearly 40% by the end of 2021.

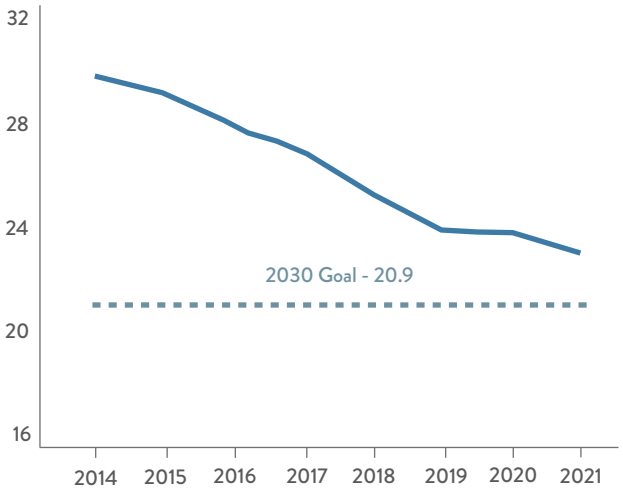
We have achieved significant energy reductions and costs savings through our "Focus on Energy" program, including avoiding the equivalent of nearly 2 billion BTU/hour of energy use and over $65 million per year on costs. This is roughly the same amount of energy used by over 100,000 homes or 200,000 gasoline-powered passenger vehicles in a year. As a three-time EPA ENERGY STAR® Partner of the Year — Sustained Excellence award recipient, we are an active participant in the program sharing our strategies and successes with other industrial companies.

Some other notable items related to our 2021 scope 1 and 2 emissions are as follows:

- Since 2014, our Refining scope 1 and 2 emissions have decreased on an absolute basis by 13% while absolute companywide scope 1 and 2 emissions have decreased by more than 5% even with the expansion of our MPLX G&P and renewable fuels business.
- Since 2019, our companywide scope 1 and 2 emissions have decreased by over 11%.

Overall, this metric is a direct measure of our climate performance and helps us assess our progress with our climate transition initiatives.

Companywide Scope 1 and 2 GHG Emissions Intensity
tonnes CO_2e / thousand boe input



We have reduced our scope 1 and 2 GHG intensity for the eighth straight year for a 23% reduction since 2014.

In 2022, MPC was one of only 19 industrial companies to receive the ENERGY STAR Partner of the Year—Sustained Excellence Award.

Scope 3 – Category 11 Absolute Emissions Reduction Target

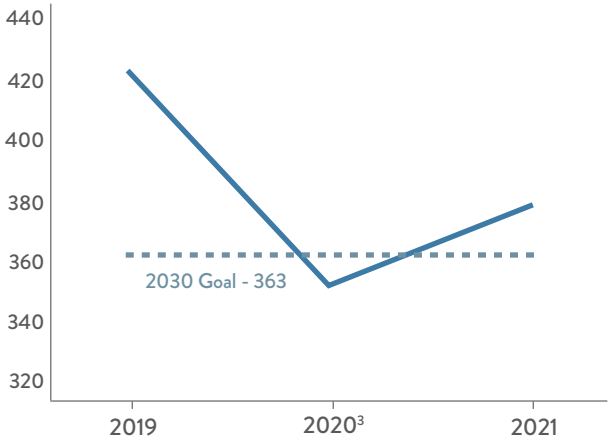
Earlier this year, we established an absolute 15% reduction target for scope 3 – category 11 GHG emissions by 2030 from 2019 levels. To date, MPC is the only large downstream company to establish an absolute scope 3 target. This target entails the end-use (i.e., scope 3) GHG emissions from customers who use the products we manufacture, own and market.

The boundaries we selected for our target are based upon criteria provided in draft guidance from the Science-Based Targets initiative (SBTi) for the Oil and Gas Sector[1], which recommends:

- A target baseline within the five-year period prior to establishing the target
- Absolute targets are preferred
- Target(s) should be based upon the company's operational segment with the highest scope 3 emissions among: 1) Exploration and production, 2) Refined product yields, or 3) Marketing
- A scope 3 target should be consolidated by equity share and entail at least 67% of all categories of scope 3 emissions. As documented in our CDP disclosures, MPC's scope 3 – category 11 emissions entail more than 70% of our total calculated scope 3 emissions

Our refinery yields were selected as the basis for our target because they represented the largest scope 3 – category 11 emissions of the three operational segments within the oil and gas sector. As shown below, since 2019 we have achieved an 11% reduction in our refining scope 3 – category 11 emissions.[3] This significant reduction was achieved in part by ceasing crude processing at three petroleum refineries, and repurposing two of them to produce renewable diesel.

Refining Scope 3 - Category 11 GHG Emissions
million metric tons



Through 2021, we have achieved an 11% reduction in our Refining scope 3 - category 11 GHG emissions since 2019.

2021 MPC Production Volumes and Scope 3 Category 11 – GHG Emissions Estimate[4]

2021 PRODUCTION VOLUMES BY INDUSTRY SEGMENT		
Upstream Production (mbpd)	**Petroleum Refining** (mbpd)	**Marketed Volumes[2]** (mbpd)
–	2,835	2,338

2021 SCOPE 3 – CATEGORY 11 GHG EMISSIONS ESTIMATE BY INDUSTRY SEGMENT		
Upstream Production (million tonnes CO_2e)	**Petroleum Refining** (million tonnes CO_2e)	**Marketed Volumes[2]** (million tonnes CO_2e)
–	379	302

[1] SBTi, Guidance on setting science-based targets for Oil, Gas and Integrated Energy companies (Aug. 10, 2020); SBTi, How To Guide for Setting Science Based Targets, Version 2.0 (December 2021).

[2] Marketed volumes are volumes marketed directly to end-users such as branded retail stations.

[3] 2020 data is not representative of a normal year because production was impacted by COVID-19 lockdowns.

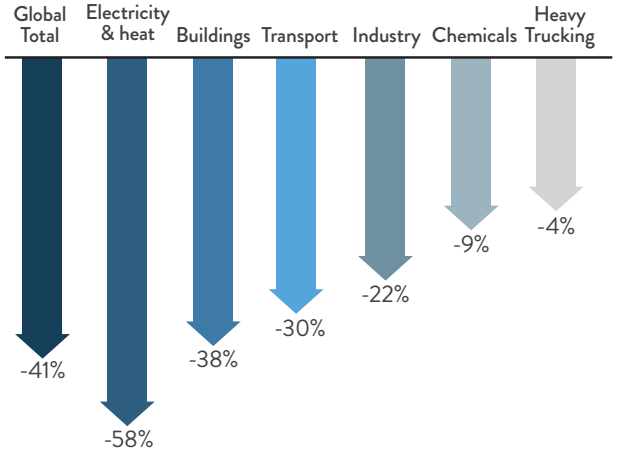
[4] MPC has a non-operating interest in a small amount of oil wells that are *de minimis* relative to petroleum refining volumes and petroleum refining scope category 11 emissions estimates.

Scope 3 – Category 11 Absolute Emissions Reduction Target (continued)

The magnitude of our 2030 scope 3 – category 11 absolute target was informed by (1) the modeled GHG reductions from the oil and gas sector in IEA's Paris-aligned scenarios, (2) the relative competitiveness of MPC's refining assets within the U.S. and global refining fleet, and (3) the expected differences in decarbonization rates of end-use sectors. Asset competitiveness is important because just as different sectors are expected to reduce GHG emissions at different rates (e.g., electricity and heat should reduce GHG sooner than transport), production capacity within a sector experiencing declining demand due to societal decarbonization will rationalize at different rates. Higher-cost operators will likely be pushed out first, thereby decreasing scope 3 GHG emissions faster than a lower-cost operator. Thus, a company like MPC with high complexity assets and low operating costs, can justify a Paris-aligned goal of 15%, whereas a company with lower-performing assets and higher costs would need to adopt a much steeper reduction to be Paris-aligned.

For petroleum refining companies like MPC, scope 3 emissions from sold products are closely tied to refinery throughput and refinery capacity. Unless mobile carbon capture technology is developed and deployed, reducing transport sector emissions will require a decrease in petroleum-based transportation fuels. This means scope 3 — category 11 emissions from petroleum refineries will need to decrease by either switching production to renewables and petrochemicals or reducing production. MPC has moved ahead of its domestic and worldwide peers in both of these indicators. MPC took decisive action beginning in 2020 by ceasing crude oil processing at three refineries (Dickinson, North Dakota, Gallup, New Mexico, and Martinez, California) that were providing marginal returns and facing future expenditures. Two of these facilities are being repurposed to produce renewable diesel, which will help reduce CO_2 emissions in hard-to-abate sectors such as heavy-duty shipping. As seen below, MPC's remaining petroleum refining fleet remains cost advantaged within the U.S. and the world. As a result, we do not anticipate further rationalization of remaining assets.

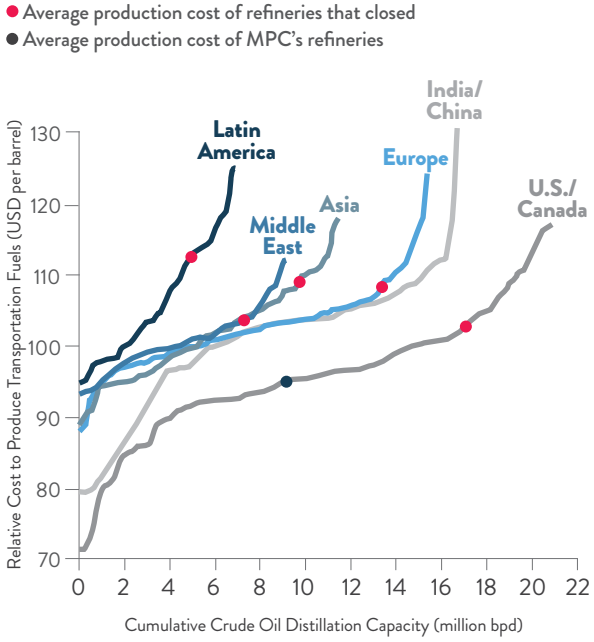
2030 GHG Reductions by Sector in a 1.5° Scenario



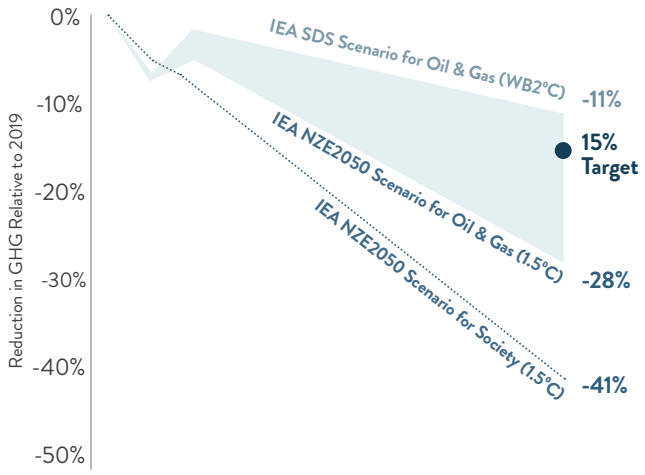
Oil and gas are integral in each of these sectors, which collectively entail a 28% reduction in GHG emissions by 2030.

United States Refining Cost Advantage

Data includes 2018 (pre COVID) and 2020 (during COVID shutdowns)



GHG Reductions by 2030 in IEA's Paris-Aligned Scenarios



IEA's SDS and NZE2050 scenarios align with the Paris Agreement objective of limiting warming to well below 2°C and pursuing a limit of 1.5°C, respectively. Global oil and gas emissions decrease by 11% and 28% in these two scenarios.

Methane Emissions Intensity Reduction Target

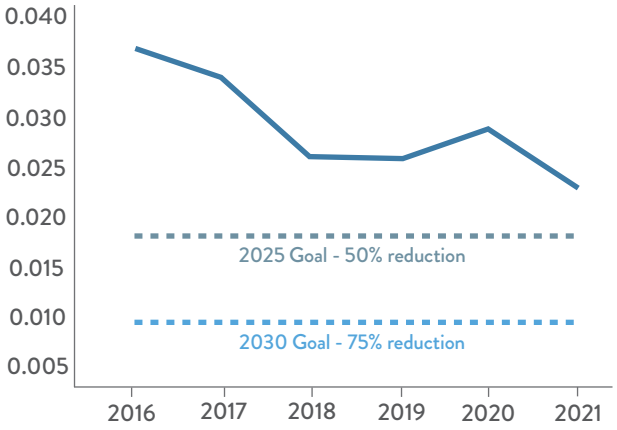
The reduction in methane emissions is considered a high priority for meeting society's GHG emission reduction goals. This is because methane has a much higher global warming potential than CO_2 and a much shorter lifespan in the atmosphere. As a result, governments and industry are placing a lot of focus on near-term reductions over the next five to 15 years. To align our targets with this near-term ambition, MPC established the following methane emissions intensity targets:

- **Mid-range:** Achieve a 50% reduction in methane emissions intensity from our MPLX G&P business by 2025 from 2016 levels
- **Long-range:** Achieve a 75% reduction in methane emissions intensity from our MPLX G&P business by 2030 from 2016 levels

As shown to the right, since 2016, we have achieved a 46% reduction in our methane emissions intensity within our MPLX G&P business. This equates to a 33% reduction in absolute methane emissions over the same period. This significant improvement was achieved through our "Focus on Methane" program, which included actions such as the phase-out of high-bleed pneumatic control valves, design and procedural changes in the blowdown of our pipeline launchers and receivers and a reduction in emissions associated with maintenance activities. Additional details regarding our planned methane reductions through our Focus on Methane program are available on Page 25.

Our target to reduce the methane emissions intensity of our natural gas assets by 75% below aligns with the reductions modeled in the NZE2050 Scenario. In the NZE2050 Scenario, oil and natural gas continue to comprise a large part of the overall energy mix in 2030. Natural gas is expected to play an important role in the energy transition by replacing more polluting fuels, such as coal, and enabling low-carbon hydrogen production with carbon capture and sequestration. Natural gas is expected to continue delivering services that are difficult to provide cost effectively with low-carbon alternatives, such as peak winter heating, seasonal energy storage and high-temperature heat for industry. However, central to this important role is minimizing methane emissions.

Methane Emissions Intensity
methane (scf) / natural gas input (scf)



We have achieved a 46% reduction in methane emissions intensity since 2016.

MPLX G&P Focus Areas for Methane Reductions

- Pneumatic Devices
- Pipeline Launchers and Receivers
- Fugitive Leak Detection and Repair (LDAR)
- Compressor Rod Packing Changeout
- Maintenance Venting and Miscellaneous Controls

REDUCE

Additional details regarding our planned methane reductions through our "Focus on Methane" program are available on Page 25.

Freshwater Withdrawal Intensity Reduction Target

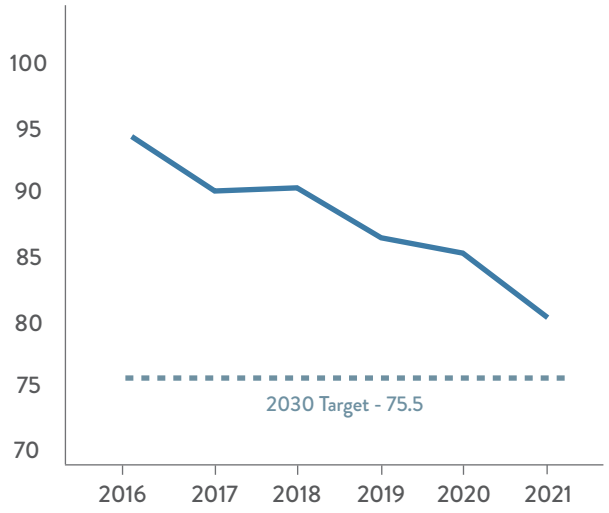
Freshwater is vital to society and our operations. It is used to add heat to our refining process (as steam), remove heat from the process (as cooling water), remove impurities from crude oil, protect equipment from corrosion, generate hydrogen, control emissions and clean equipment during maintenance activities.

Water availability is a major concern throughout much of the world, including parts of the United States. Population growth, together with a changing climate, could further exacerbate global water stress. Currently, two MPC refineries – El Paso, Texas, and Los Angeles, California – are located in water-stressed areas as defined by the Global Reporting Initiative and World Resources Institute assessment tools. Our Martinez Renewable Fuels facility, which is in the process of being converted from a petroleum refinery, is also located in a water-stressed area. Once converted, Martinez will use approximately 1 billion fewer gallons of water per year than when operating as a petroleum refinery.

To manage risk surrounding water use, in 2020 we adopted a formal "Focus on Water" program. The program is designed to assess site water use, understand and mitigate water risks and identify opportunities to reduce water use. Additional information on our Focus on Water program is available on Page 36.

To ensure success of the program, we established a companywide target to reduce freshwater withdrawal intensity 20% by 2030 from 2016 levels. To date, we have achieved a 15% reduction in intensity below 2016 levels.

Freshwater Withdrawal Intensity
megaliters / million boe



2021 marks the sixth consecutive year we reduced our freshwater withdrawal intensity.

Business Strategy and Climate-Related Scenario Planning

Today's energy landscape is constantly evolving, and the topic of climate change is at the forefront. Whether it is the significant investment in research and development of low-carbon energy technologies that may disrupt our current energy systems, the advances in scientific understanding of the global carbon cycle, or the many competing policies and strategies put forth at all levels of government, we continually evaluate these and other climate-related risks and opportunities as part of our governance strategy. This includes evaluating both long-term and short-term scenarios. Throughout this section, we provide detailed analyses of our business strategies against future scenarios from the IEA along with data from other sources such as HSB Solomon Associates LLC (Solomon).[1]

The IEA's scenarios forecast possible future energy landscapes with the aim of providing governments, companies and other stakeholders with a range of potential outcomes to consider. These scenarios provide our company with several versions of the future so we can plan ahead and adjust appropriately as the future unfolds. In this year's report, we apply the following three hypothetical scenarios:

- **Stated Policies Scenario (STEPS)** — previously known as the New Policies Scenario, the central scenario from IEA provides a detailed look at where today's policy ambitions would take the energy sector. It incorporates policies and measures that governments around the world have already put in place, as well as the effects of announced policies, most notably those in climate pledges submitted for the Paris Climate Agreement (COP21).
- **Sustainable Development Scenario (SDS)** — a hypothetical construct that starts with the outcomes to be achieved and then assesses a pathway of actions that could achieve them. The specific outcomes are modeled after the United Nations Sustainable Development Goals: 1) ensuring universal access to affordable, reliable, sustainable and modern energy services by 2030 (SDG 7.1); 2) substantially reducing air pollution (SDG 3.9); and 3) limiting worldwide temperature increases to well below 2 degrees Celsius (SDG 13).
- **Net-Zero Emissions by 2050 case (NZE2050)**— a supplement to the SDS analysis. The SDS sees many advanced economies reaching net-zero emissions by 2050 at the latest, and puts the world on track for net-zero emissions by 2070. The NZE2050 accelerates this further by modeling a pathway to reach net-zero CO_2e emissions globally by 2050.

[1] HSB Solomon Associates is uniquely qualified to perform this analysis because it has cost and production data for more than 320 refineries worldwide through its biennial fuels studies. https://www.solomononline.com/benchmarking/refining/fuels-study. The biennial HSB Solomon Associates Fuels Studies is a key resource we use to benchmark our operations and conduct scenario analyses.

Energy Outlook Through 2040

The last few years have highlighted why we must expect and plan for the unexpected. The global pandemic and the Russian invasion of Ukraine have significantly impacted global energy markets, reminding us how important affordable and reliable energy is to our daily lives. They have also highlighted the importance of energy security and where our energy originates.

The IEA's models to the right show a dramatic shift in the types and volumes of energy the global community uses relative to what is needed to meet the goals of the Paris Agreement. Energy security is key to the success of the energy evolution. Ensuring energy remains affordable, reliable and does not impact geopolitical stability will help build societal support for lower-carbon alternatives and lead to more decarbonization. If energy costs rise too rapidly, energy becomes less reliable or contributes to geopolitical instability, prosperity suffers and people shift to less costly alternatives.

A prime example is coal. Coming out of the pandemic, increased coal use was the main factor driving up global energy-related CO_2 emissions above pre-pandemic levels. This has been largely driven by China and India but has more recently occurred in the United States and the European Union, where competition between gas and coal power plants is tightest. As a first step, the world needs to move away from coal in favor of natural gas, nuclear power and renewable energy.

Many of the tools needed to decarbonize electricity, such as wind turbines, high voltage power cables, solar panels, batteries and heat pumps, are also susceptible to cost and availability disruptions because key raw materials are concentrated in regions subject to geopolitical tension. Just like with oil, gas and coal, disruptions to the renewable supply chain and the geopolitical implications of where raw materials originate is a concern that needs to factor into decarbonization strategies.

In the coming pages, we detail our strategies to thrive if any of these modeled scenarios become a reality.

IEA Global Energy Projections for 2040 at a Glance[1]

2020 Actual[2]	2040 STEPS	2040 SDS	NZE2050
Crude Oil 29%	Crude Oil 28%	Crude Oil 21%	Wind/Solar 27%
Coal 26%	Natural Gas 24%	Natural Gas 19%	Modern Bioenergy 18%
Natural Gas 24%	Coal 19%	Wind/Solar 17%	Crude Oil 15%
Modern Bioenergy 6%	Modern Bioenergy 9%	Modern Bioenergy 16%	Natural Gas 14%
Nuclear 5%	Wind/Solar 7%	Coal 11%	Hydro & Other Renewables 10%
Traditional Use of Biomass 4%	Nuclear 5%	Nuclear 9%	Nuclear 10%
Hydro & Other Renewables 4%	Hydro & Other Renewables 5%	Hydro & Other Renewables 8%	Coal 6%
Wind/Solar 2%	Traditional Use of Biomass 3%	Traditional Use of Biomass 0%	Traditional Use of Biomass 0%
Total Energy Demand 280 (million boe per day)	**Total Energy Demand 340 (million boe per day)**	**Total Energy Demand 276 (million boe per day)**	**Total Energy Demand 254 (million boe per day)**
Modeled temperature increase in 2100	**2.8°C**	**1.7°C**	**1.5°C**

[1] Adapted from IEA, World Energy Outlook 2021.
[2] Latest year available

Source: IEA, World Energy Outlook 2020

Potential Risks and Opportunities

MPC and MPLX face the following key climate-related risks and opportunities:

Potential Transitional Risks

Policy and Legal Risks

- Regulations (e.g., fuel economy standards, renewable energy mandates) could reduce demand for the petroleum-based transportation fuels we manufacture in our refineries and the natural gas we gather and process at our natural gas gathering and processing assets. Reduced demand for fossil fuels could also impact our logistics assets where we transport and store fossil fuel products in our pipelines, terminals, ground transport and marine fleets.
- While we do not conduct hydraulic fracturing operations, we do provide gathering, processing and fractionation services with respect to natural gas and NGLs produced by our customers through such operations. As a result, any prohibitions on hydraulic fracturing or increased regulation of the upstream producers could affect our Midstream business.
- We could face increased climate-related litigation with respect to our operations or products

Technology Risks

- Advances in battery technology and electric vehicle market penetration could reduce demand for traditional transportation fuels.
- Technology breakthroughs relating to renewable fuels or other fuel alternatives (e.g., hydrogen or ammonia), or efficiency improvements for internal combustion engines, could reduce demand for traditional transportation fuels.

Market Risks

- Consumer preference could shift away from fossil fuels, reducing demand.
- Potential reduced demand for transportation fuels due to changes to work, school and travel habits.

Reputational Risks

- Controversies associated with carbon emissions could impact investor sentiment, affecting access to capital.

Potential Physical Risks

Acute Physical Risks

- The intensity of weather events, such as hurricanes, flooding, wildfires, snowstorms, drought or temperature extremes, could impact our operations.

Chronic Physical Risks

- Sea-level rise or availability of fresh water could impact our operations.

Potential Opportunities

Resource Efficiency

- We consider energy efficiency to be a core business function and opportunity because it reduces costs, GHG emissions and enhances long-term cost competitiveness.
- Reduced freshwater use intensity increases resiliency and reduces long-term operating costs.

Energy Source

- The availability and procurement of lower-carbon or renewable energy to power our operations could further reduce the life-cycle carbon intensity of the fuels and products we manufacture.

Products and Services, Markets and Resilience

- Continued coal-to-natural gas switching, and production of blue hydrogen could increase demand for natural gas.
- Research and development of renewable fuels could provide new products and markets, increasing revenues.
- Domestic production, processing and export of LNG to Europe and other regions facing energy security issues may steadily increase as these regions look to secure energy from the United States.
- Increased demand for petrochemical feedstock and clean cooking fuel could strengthen demand for NGLs from our facilities.

Climate Scenario Analysis for Refining and Marketing

Scenarios

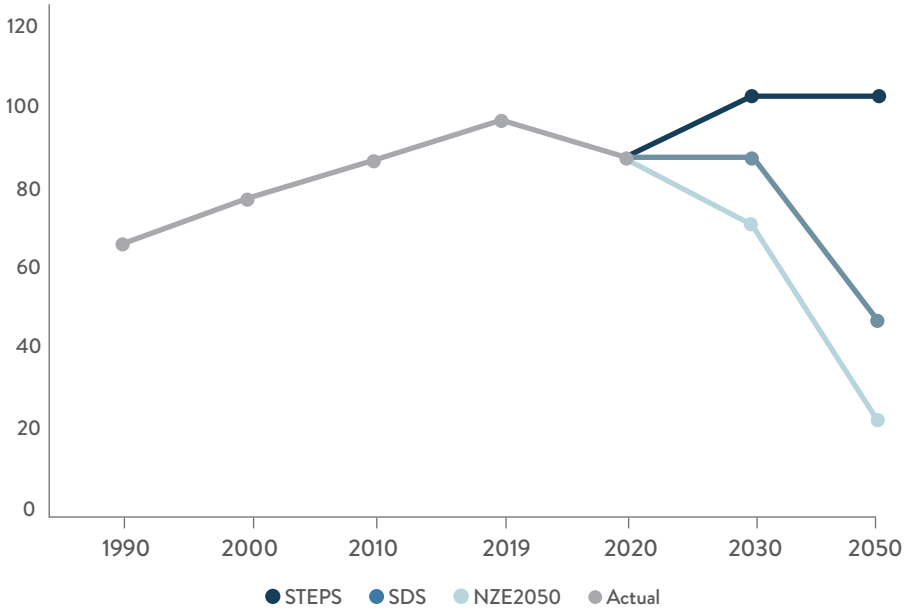
There are a multitude of possibilities where the future energy system and scenario analysis can be used to stress test our assets against future energy systems that are drastically different than today. For MPC's Refining and Marketing segment, the IEA's well-known STEPS, SDS and NZE2050 scenarios have been used to assess how demand for MPC's Refining and Marketing products may change under various future energy systems that achieve different temperature outcomes. The future petroleum demand modeled in the IEA scenarios is shown to the right.

Transition Risks

MPC's refineries primarily produce liquid transportation fuels and petrochemical feedstocks. The NZE2050 scenario represents a relatively extreme case for these products since it assumes demand for petroleum-based liquids in 2050 decreases by 78% relative to 2019.

If the hypothetical NZE2050 scenario were to materialize, it is not likely that every company with petroleum refining operations would experience the same degree of rationalization. Refined products are commodities, and in commodity industries the low-cost operator typically survives during periods of rationalization. Thus, it is important to take asset competitiveness into account when analyzing a scenario where declining demand leads to rationalization of an industry.

Worldwide Petroleum-based Liquids Demand through 2050
(million bpd)



	Temperate Change by 2100 (°C)
SCENARIO	**RANGE**
Stated Policies	2.4 – 2.8
Sustainable Development	1.4 – 1.7
Net-Zero Emissions by 2050	1.3 – 1.5

Source: IEA, World Energy Outlook 2021

	Oil Demand Change from 2019	
SCENARIO		
Year	**2030**	**2050**
Stated Policies	+7%	+7%
Sustainable Development	-9%	-51%
Net-Zero Emissions by 2050	-27%	-78%

Source: IEA, World Energy Outlook 2021

Climate Scenario Analysis for Refining and Marketing (continued)

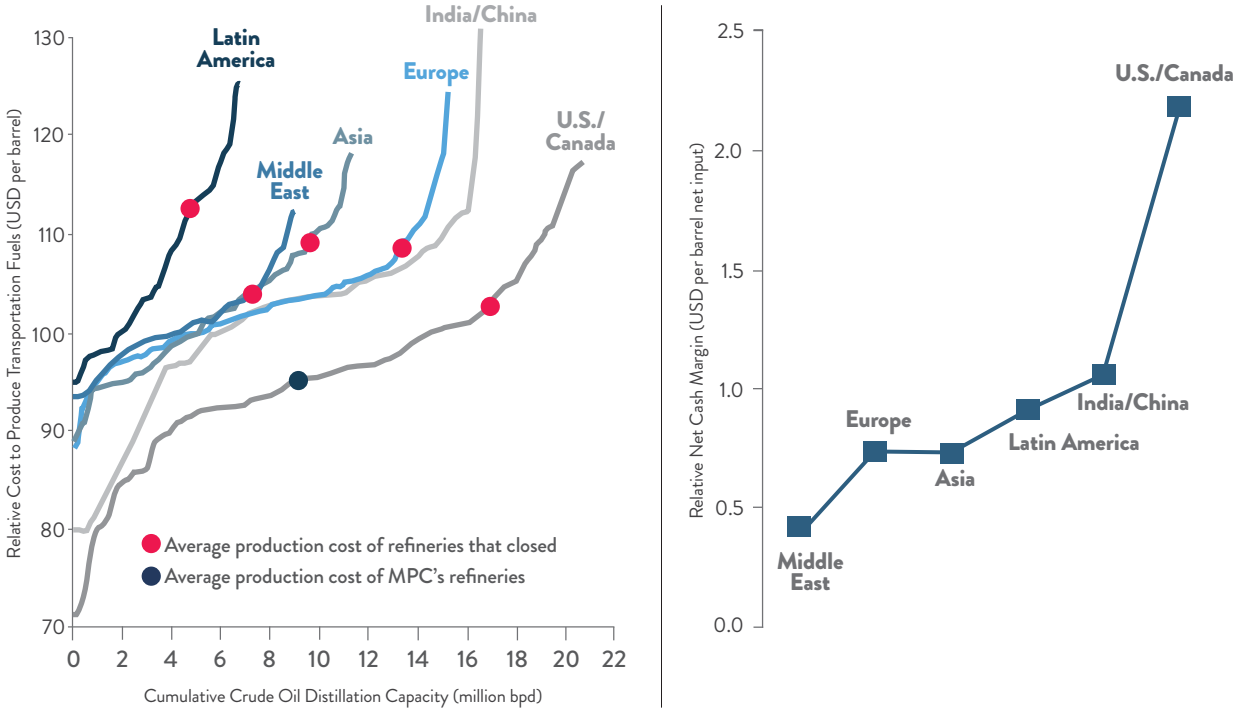
MPC retained HSB Solomon Associates LLC (Solomon)[1] to evaluate the resiliency of our refining assets against the projections in the NZE2050 and SDS as presented in the World Energy Outlook 2021. As seen to the right, the U.S. refining industry has a lower cost structure than the rest of the world. This is, in part, due to cheaper natural gas, which is a significant operating cost to refineries. This cost disparity has been widened by the disruption in energy markets caused by the Russian invasion of Ukraine.

Furthermore, MPC's refineries are cost-advantaged within the United States. Recent actions that have contributed to the cost competitiveness include:

- Strengthening our portfolio by ceasing crude processing at three less-competitive refineries and repurposing two for renewable diesel production.
- Embarking on a journey in 2020 to improve our asset base by: (1) strengthening the competitive position of our assets, (2) instilling a low-cost culture, and (3) improving commercial performance, which enabled us to lower our cost structure. This journey has, in part, caused our refining operating costs to decrease more than 10%.

Due to the cost competitiveness of our refining assets, we expect our refining system to remain resilient, even under carbon-constrained scenarios such as the NZE2050.

United States Refining Cost Advantage
Data includes 2018 (pre COVID) and 2020 (during COVID shutdowns)



U.S. refining is cost-advantaged, and MPC is cost advantaged in the U.S.

[1] HSB Solomon Associates is uniquely qualified to perform this analysis because it has cost and production data for more than 320 refineries worldwide through its biennial fuels studies. https://www.solomononline.com/benchmarking/refining/fuels-study. The biennial HSB Solomon Associates Fuels Studies is a key resource we use to benchmark our operations and conduct scenario analyses.

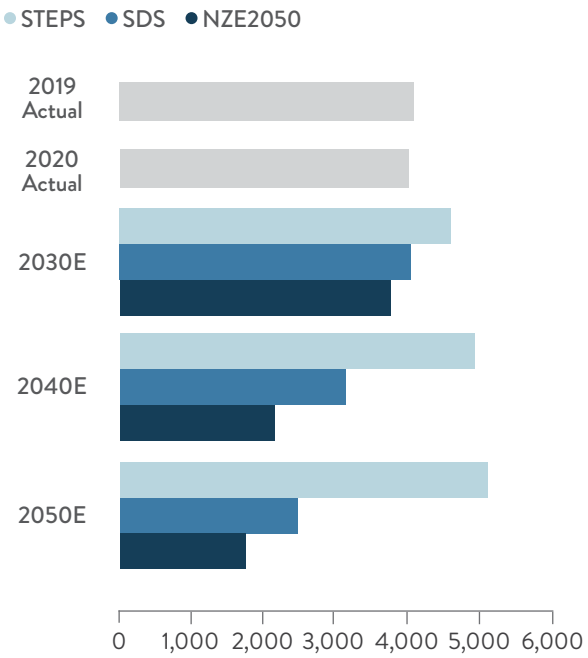
Climate Scenario Analysis for Midstream

Under each of IEA's scenarios, demand for natural gas is expected to stay strong through 2040. This is because, as the cleanest burning fossil fuel, natural gas provides a pathway toward significant near-term GHG emissions reductions and is an option for blue hydrogen production in the future.

Natural gas remains the best option for replacing coal in the short term because natural gas produces half the emissions for the same amount of energy as coal, is abundant, burns cleanly and can provide efficient heat production on demand. Natural gas powerplants can also be equipped with CCUS technology to further reduce emissions and supplemented with renewable power generation, such as wind and solar, with natural gas providing the baseload and peak energy.[1]

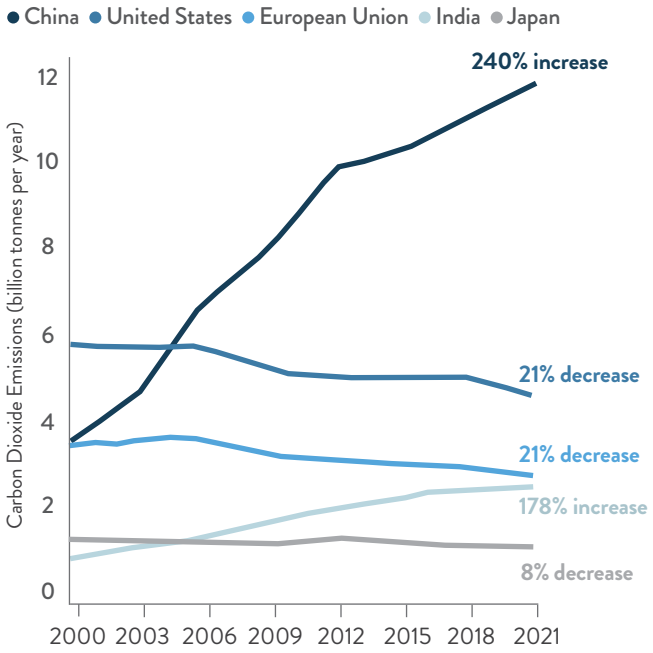
This exact strategy has been on display in the U.S. As shown below, the U.S. reduced CO_2 emissions from fuel combustion by over 1 billion tonnes per year below 2000 levels, a 21% decrease. Much of this reduction occurred as a result of coal combustion displacement in favor of natural gas and, to a lesser extent, renewable sources such as wind and solar. This is in stark contrast to China and India, where coal use continues to expand. For instance, China and India, collectively, still produce nearly two-thirds of their electricity from coal combustion. Both countries continue to build new coal plants, signaling they intend to continue coal use for many years, further reducing the remaining global carbon budget.

Natural Gas Demand Projections Through 2050
(billion cubic meters)



Source: IEA, World Energy Outlook 2021

Regional Carbon Dioxide Emissions from Fuel Combustion
(2000-2021)



Source: IEA, CO_2 Emissions from Fuel Combustion (2021)

In 2020 and 2021, the U.S. and European Union retired over 40 gigawatts (GW) of coal plants. These retirements were eclipsed by over 63 GW of net coal-fired power capacity added by China (51.8 GW), Indonesia (6.1 GW) and India (5.3 GW).

Global Energy Monitor, Global Coal Plant Tracker (March 2022)

[1] Because both energy demand and the ability to produce wind and solar energy differ significantly by region, each region has an optimal ratio of gas and renewables that would assure grid reliability at the most affordable cost. For simplicity, we have assumed that coal will be displaced with 50% gas and 50% renewables as a basis for potential emission reductions.

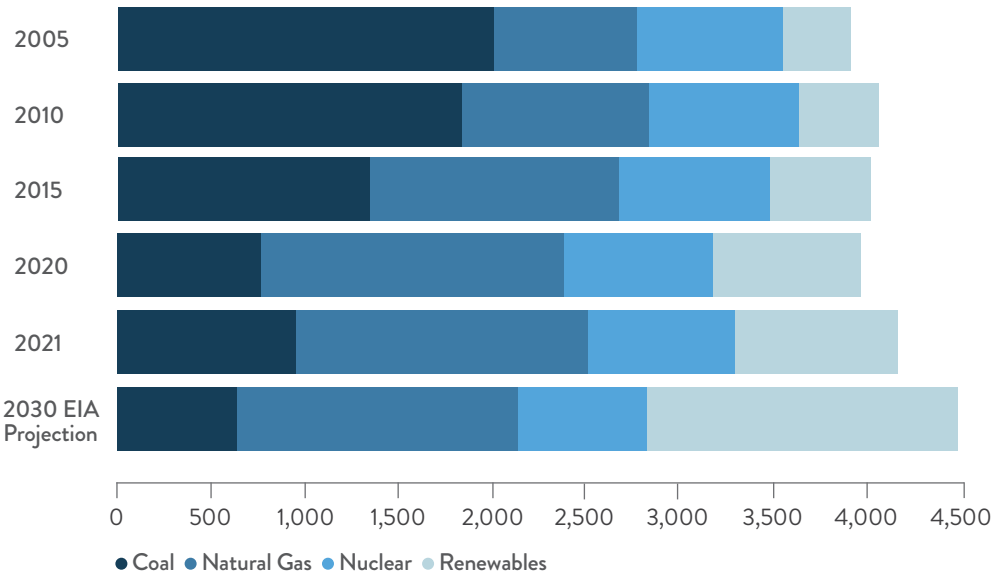
The Potential of a Coal-to-Natural-Gas Transition

Over the last decade and a half, U.S. electricity generation has experienced significant decarbonization facilitated by natural gas. In 2005, nearly 50% of U.S. electricity was generated from coal with less than 20% from natural gas. Today that has switched, with roughly 20% of electricity generated from coal and about 40% from natural gas. This coal-to-natural gas shift is the primary reason the U.S. reduced CO_2 emissions by nearly 1 billion tonnes per year since 2005. Over this period, natural gas demand increased by over 35%, equivalent to approximately 22 billion standard cubic feet per day (scfd). This was accomplished through significant private investment across all key segments of the natural gas system, including production, gathering and processing, distribution and storage, and transmission. This coal-to-natural gas strategy maintained a stable electric grid, kept prices affordable and facilitated a significant increase in renewable power without disrupting electricity supplies. This is a proven model that can be replicated throughout much of the world to reduce near-term GHG emissions.

Unfortunately, many governments around the world are increasingly implementing policies that hinder natural gas production and/or use within their borders under a narrow view that society must forgo using any fossil fuels and immediately switch to wind, solar and other renewable energy technologies. These narrow all-or-nothing net-zero strategies ignore the many technology, intermittency, supply chain and cost barriers that must be overcome to completely switch to renewable energy. Policies that inhibit natural gas production have contributed to an increase in natural gas costs, which in turn allowed coal to become an attractive replacement for natural gas. In 2021, the increased use of coal in lieu of natural gas increased global CO_2 emissions by around 250 million tonnes.[1] These policies have also contributed to energy security issues, including Europe's current dependence on Russian natural gas imports as European nations have scaled back investments in domestic oil and gas production.

Another troubling trend is occurring in China, India and Indonesia. These three nations collectively added over 63 GW of net coal-fired capacity in 2020 and 2021, outpacing the net capacity reductions of 33 GW from the rest of the world. This trend could be reversed if the developed world embraced the benefits that natural gas brings as a transition fuel instead of obstructing expanded use. If the U.S. and other areas of the world with significant natural gas reserves unleashed the potential of natural gas, billions of tonnes of additional near-term CO_2 reductions could be quickly realized worldwide by replacing coal with natural gas. This strategy would help preserve the carbon budget while continuing to facilitate investment in renewables.

United States Electricity Generation by Source[2]
(billion kWh)



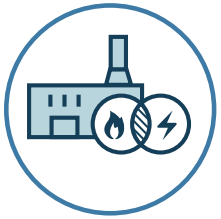
Source: U.S. Energy Information Association

[1] IEA, Global Energy Review: CO_2 Emissions in 2021, available at https://www.iea.org/reports/global-energy-review-co2-emissions-in-2021-2

[2] Petroleum and other fuels not shown in graph as these make up less than 1% of the total generation.

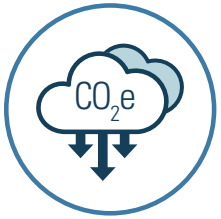
Additional Carbon Reductions Natural Gas Can Deliver

Natural gas is a versatile, clean-burning and efficient fuel that can be used in a wide variety of applications.



Natural gas and combined heat and power (CHP)

Replacing lower-efficiency boilers and deploying CHP systems reduce the emissions intensity of the industrial sector, even as natural gas continues to grow as a proportion of total fuel consumption in the sector. MPC operates several CHP systems at our refineries, which have avoided millions of tonnes of GHGs when compared to separately generating electricity and steam.



Natural gas power generation with CCUS

Natural gas power plants can be retrofitted for carbon capture, utilization and sequestration (CCUS), leading to further GHG reductions. Natural gas generation will be critical to providing grid stability as electrification strategies for buildings, industry and transportation increase electricity demand.

Natural gas as feedstock

Natural gas and NGLs are important feedstocks to make products such as chemicals and plastics, which do not emit greenhouse gases in end-use. Methane is also the primary feedstock used to produce hydrogen. The proliferation of blue hydrogen made through steam methane reformation with CCUS or methane pyrolysis is a future low-carbon use for natural gas that is expected to drive substantial CO_2 reductions.

Natural gas as transportation fuel

Compressed natural gas (CNG) and LNG can be deployed directly as a transportation fuel. Most natural gas-fueled vehicles in the United States today are buses and trucks. CNG and LNG can reduce GHG emissions as compared to gasoline and diesel and are energy-dense fuels that can be used in heavy-duty engines and cargo ships where electrification is currently not viable. Limited availability of fueling infrastructure is one of the hurdles to deploying more natural gas-fueled vehicles.

MPLX Contributions to U.S. GHG Reductions

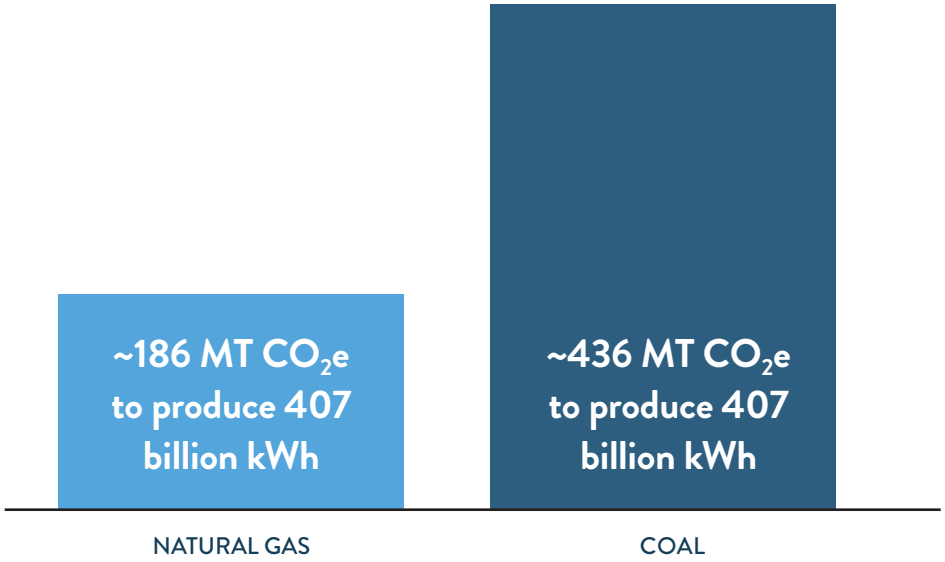
We have invested over $20 billion to acquire and expand natural gas gathering and processing capacity through our master limited partnership, MPLX. Since first acquiring natural gas assets in December 2015, we have steadily grown MPLX into one of the largest natural gas processing companies in the U.S. These investments facilitated the build-out of infrastructure in the Marcellus, Utica and Permian basins, among others, and helped to significantly reduce the carbon intensity of the U.S. energy supply chain. This infrastructure build-out corresponds to the increase in natural gas electricity generation shown on Page 22. During this period, electricity demand remained relatively flat but carbon intensity fell dramatically.

Evaluating the gross emissions facilitated by these investments shows that MPLX's scope 1 and 2 GHG emissions grew year over year as gathering and processing infrastructure build-out progressed. However, climate-risk reporting and analysis must consider net societal benefits and impacts to be meaningful. Using this lens, MPLX helped to facilitate a substantial net societal GHG reduction from the natural gas that it processed when compared to the coal that would have been used.

An illustrative example of how our involvement in the natural gas value chain entails a net reduction in CO_2 of nearly 250 million tonnes per year is shown to the right. A full conversion of the remaining U.S. coal power plant fleet to natural gas could result in an additional 540 million metric tonne reduction in CO_2 per year. This is achievable today without use of unproven technology or complete transformation of the energy supply chain. Worldwide, if natural gas were embraced, the world could quickly achieve billions of tonnes of additional CO_2 reductions per year, and more if CCUS is deployed. This is needed to reverse the current trend of increased coal use as natural gas prices have increased.

Illustrative Comparison of Lifecycle Emissions from Natural Gas-fired vs. Coal-fired Electricity Generation

MPLX processed ~8.2 billion cubic feet per day of natural gas in 2021 which would produce ~ 407 billion kWh of electricity



The annual volume of natural gas processed by MPLX has helped avoid nearly 250 million tonnes of CO_2e from the U.S. energy supply chain per year when compared to coal for electricity generation.

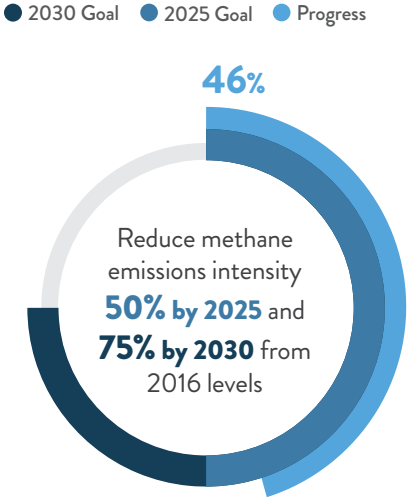
Focus on Methane

To fully realize the climate benefits of natural gas, it is important to minimize leaks, venting and flaring of methane. MPLX, and others within the natural gas industry, continue to implement measures that minimize and eliminate methane emissions.

MPLX Commitments

MPLX established a 2025 target to decrease methane emissions intensity by 50% below 2016 levels and a 2030 target to decrease methane emissions intensity by 75% below 2016 levels. Through 2021 we have achieved a 46% reduction.

MPLX G&P Methane emissions intensity



MPLX Focus Areas for Methane Reductions

	Reductions Achieved Since 2016 (tonnes per year)	Additional Reductions Expected Through 2030 (tonnes per year)
Pneumatic Devices • Over 80% of 25,000+ pneumatic controllers are powered by compressed air • Eliminate all (~340) high-bleed pneumatic controllers from service by end of 2022 • Convert (~3,400) intermittent-bleed pneumatic controllers to compressed air or lower-emitting devices • Route methane emissions from pneumatic pumps to control devices • Enhance monitoring of pneumatic devices	~1,500	~7,000
Pipeline Launchers and Receivers • Controlled existing pipeline launchers and receivers that are opened frequently • Designed new installations with a smaller launcher/receiver chamber • Modified purging practices to reduce venting events	~1,000	-----
Fugitive Leak Detection and Repair (LDAR) • Implement LDAR programs at all compressor stations by the end of 2023 • Employ advanced monitoring technologies such as satellite imagery, flyovers, drones and fenceline monitoring to conduct more frequent/real-time monitoring	~500	~ 1,000
Compressor Rod Packing Changeout • Install monitoring ports and complete periodic monitoring to proactively replace rod packing when warranted • Install low-emission rod packing, where feasible, as rod packing is changed	~500	~1,000
Maintenance Venting and Other Controls • Optimize necessary maintenance venting and blowdowns to reduce emissions going to the atmosphere, including using vapor recovery units and/or portable flares • Install additional controls where appropriate (e.g. select tanks)	~5,000	~2,000
Total Reductions	**~8,500**	**~11,000**

Focus on Methane (continued)

THE ENVIRONMENTAL PARTNERSHIP
An Initiative of the U.S. Natural Gas and Oil Industry

In 2022, MPLX joined The Environmental Partnership, which is a coalition of nearly 100 oil and natural gas companies committed to continuously improving environmental performance in members' operations across the country. The Environmental Partnership provides a platform for the industry to collaborate with stakeholders and share best practices and new technologies. Its goals are consistent with the aims of our Focus on Methane program. Specifically, partners commit to the following:

- A program to replace, remove or retrofit high-bleed pneumatic controllers
- A program to install or retrofit pneumatic controllers with lower- or zero-bleed methane emissions devices
- A leak detection and repair program for natural gas and oil facilities
- A program to reduce emissions from compressors
- A program to reduce emissions from pipeline blowdowns and flaring

More information on The Environmental Partnership is available at https://theenvironmentalpartnership.org/

QMRV

Quantification, Monitoring, Reporting and Verification

In 2022, MPLX also began a collaboration with Cheniere Energy, Inc. (Cheniere) and other natural gas midstream companies, methane detection technology providers and leading academic institutions to implement quantification, monitoring, reporting and verification (QMRV) of GHG emissions at natural gas gathering, processing, transmission and storage systems specific to Cheniere's supply chain. The program is intended to improve the overall understanding of GHG emissions and further the deployment of advanced monitoring technologies and protocols. The QMRV program will support Cheniere's Cargo Emissions Tag (CE Tag) initiative to provide GHG emissions data to customers for LNG cargoes, a critical first step for the industry to quantify GHG emissions, enhance transparency and, over time, look for reduction opportunities to maximize the climate benefits of LNG.

The midstream QMRV work will be conducted by emissions researchers from Colorado State University and the University of Texas. The measurement protocol designed by the research group and Cheniere will be field tested at MPLX facilities that are part of Cheniere's supply chain.

The midstream QMRV program involves a combination of ground-based, aerial and drone-based emissions monitoring technologies. The midstream QMRV program requires emissions monitoring over at least a six-month period, with all data independently analyzed and verified by the project's academic partners.

By participating in the program, MPLX will gain expertise in advanced monitoring techniques and technologies that we can leverage to further reduce methane emissions throughout our vast gas gathering and processing network.

Midstream Scenario Analysis

Throughout this report we highlight the great potential of U.S. produced natural gas to further the ambitions of the Paris Agreement to reduce GHG emissions. As the cleanest burning fossil fuel, natural gas emits about half the amount of carbon dioxide as coal and is highly versatile. Natural gas can coexist with wind and solar generation to deliver electricity with a much lower carbon footprint while providing necessary reliability and affordability. As a transition fuel, it should be utilized to replace coal while the world continues to innovate toward a net-zero world. Not embracing natural gas as the bridge fuel of choice has resulted in increased coal use as energy prices have spiked. This unnecessarily erodes the carbon budget. Given the significant advantages of natural gas, we expect this will change with strong demand for natural gas and NGLs through 2040.

- **Natural Gas:** The IEA projections indicate worldwide natural gas demand could increase by over 20% through 2040 under the STEPS and a steady decline of 20% to 57% in 2040 below today's levels in its SDS and NZE2050 scenarios respectively. These projections were published prior to the Russian invasion of Ukraine which has spotlighted the importance of energy security. This prompted the Biden Administration to increase energy security in Europe through the *Task Force to Reduce Europe's Dependence on Russian Fossil Fuels*. One of the main goals of the Task Force is to secure Europe's energy system by immediately increasing LNG volumes to Europe of at least 15 billion cubic meters (bcm) in 2022 and ramping up U.S. exports of 50 bcm/year of additional U.S. LNG by 2030. This will require an increase in natural gas production, which is expected to be concentrated in the Utica, Marcellus and Permian basins.
- **NGLs:** Demand remains strong through 2040 for the non-methane fractions of natural gas called NGLs, which are important feedstocks for the petrochemical industry (e.g., steam cracking). The IEA projects petrochemical feedstock demand is expected to increase through 2050, even under the NZE2050 Scenario. The IEA and United Nations also project a significant market increase is needed for clean cooking fuel in the developing world to combat indoor air pollution.
- **U.S. Product Exports:** The continued strong outlook for U.S. crude, natural gas and NGL production will require additional infrastructure to link supply to global demand markets. Pipelines and processing, fractionation, terminals, transport vessels and LNG export facilities will be needed to allow U.S. producers to realize full product value. The IEA projects that almost all the growth in U.S. natural gas production will be destined for export. This is consistent with the Biden administration's pledge to increase LNG exports to Europe.

The restricted use of Russian oil and gas helps contribute to the sectoral reductions sought under IEA's Paris-aligned scenarios and will require other countries, like the U.S., to also increase production to fill the immediate worldwide void in the energy supply of light products and natural gas.

Natural Gas - Potential for Low-Carbon Hydrogen Production

Natural gas has potential to produce blue hydrogen as a zero-carbon fuel and feedstock. In the SDS, around 50 million tonnes of oil equivalent (Mtoe) of low-carbon hydrogen would be produced globally in 2030, and this rises to 470 Mtoe in 2050. Blue hydrogen is produced through a reaction that separates methane into hydrogen and CO_2 and then captures and sequesters the CO_2. It is lower cost than green hydrogen produced through the electrolysis of water. Much of the 470 Mtoe of hydrogen production would need to be produced through CCUS-equipped natural gas reformers, unless there are significant advancements in electrolysis and pyrolysis.

	Description	Key Advantages	Key Challenges
SMR with CCUS	Steam methane reforming (SMR) is a thermal process that reacts methane (CH_4) with steam to produce hydrogen and CO_2. In order to be carbon neutral, it needs to be combined with CCUS.	The only technology currently operating at scale. As such, it is the most cost-effective form of hydrogen production, even with the addition of CCUS.	Complex storage of CO_2 gas. Political opposition to CCUS in many countries.
Pyrolysis	Pyrolysis is the decomposition of methane into hydrogen and solid carbon (c). Residual carbon is in solid rather than in gaseous form.	No complex CO_2 storage in underground caverns, as is the case with CCUS. Solid carbon can be used as a feedstock in existing industries.	Early stages of technology development.

Climate Scenario Analysis of Renewable Fuels

Scenario Projections for Renewable Liquid Fuels

Renewable fuels are derived from biomass and waste feedstocks and include ethanol, biogasoline, sustainable aviation fuel, biodiesel and renewable diesel. Because renewable fuels are sourced from biomass materials (e.g., plants and animal fats), the CO_2 released from combusting these fuels is part of the current carbon cycle and offset by the CO_2 that was recently removed from the atmosphere to create the biomass feedstock. Renewable fuels are an important tool for reducing the carbon intensity of liquid fuels, especially in the near term, without needing to change existing engines and infrastructure.

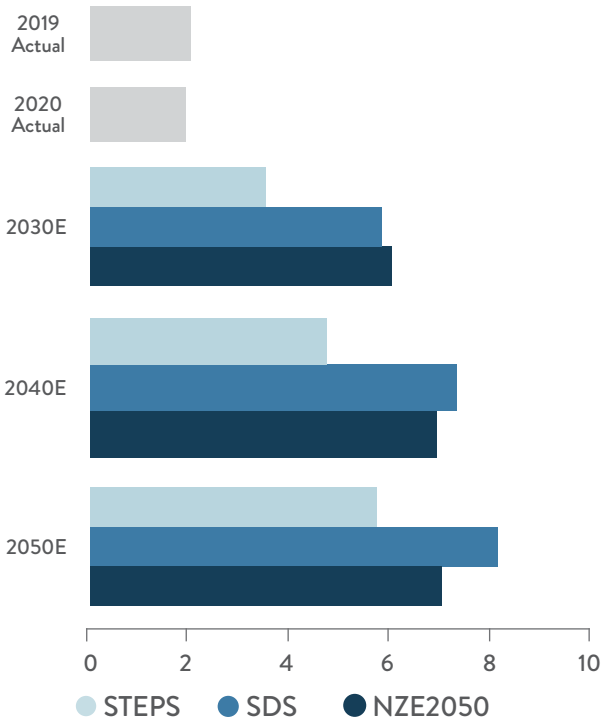
Current renewable fuels technology, however, cannot completely replace petroleum-based fuels because of inherent volume limitations, which include:

- Biofuels production needs to ensure natural ecosystems, such as forests and grasslands, are not impacted because natural ecosystems are already effective carbon sinks.
- Fuel production should not impact food production when agricultural based feedstocks are utilized.
- Although the IEA indicates that cellulosic biofuels are needed to meet projections under its Paris-aligned scenarios, technology has yet to be commercialized at scale to meet this aim.
- Most renewable fuels are expensive to produce, with many renewable feedstocks being more expensive than finished petroleum-based transportation fuels even before any processing takes place.

As a result, renewable fuels rely heavily on government programs to incentivize production. Examples include the U.S. Renewable Fuel Standard (RFS), California Low Carbon Fuel Standard (LCFS) and various blending mandates throughout the world. Without the market mandates and subsidies, production would not be economical. This is an example of a market-based program incentivizing behaviors to reduce greenhouse gases.

Most renewable fuels today are not considered net-zero fuels because it takes energy to turn biomass material into fuel and deliver it to the consumer. For example, soy-based renewable diesel requires energy to plant and harvest soybeans, transport and process the soybeans into meal and oil, refine the oil into fuel, and transport and deliver the final product to consumers. The carbon emissions associated with each point in the value chain are added together to determine the carbon intensity (CI) of the fuel. Carbon reductions anywhere along the value chain, such as changes in farming practices or more efficient refining, will result in a lower CI value for the fuel.

Global Renewable Liquids Fuel Demand Projections through 2050 (million bpd)



MPC's Renewable Fuels Program Climate Scenario Analysis

In 2021, MPC delivered approximately 2.4 billion gallons of renewable fuels to consumers, making us one of the largest marketers of renewable fuels in the U.S. This amount of renewable fuel avoids nearly 10 million tonnes of customers' CO_2 transportation emissions per year.

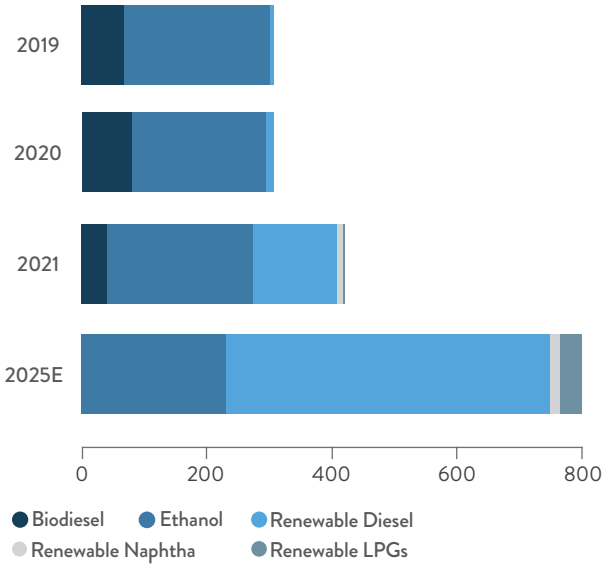
As shown to the right, we reached a milestone in 2021 by producing over 400 million gallons of renewable fuels. We did this, in part, by reaching full operating capacity at our 12,000 bpd Dickinson, North Dakota, renewable diesel facility, the second-largest such facility currently operating in the U.S. The facility converts biogenic oils (e.g. distillers corn oil, soybean oil and tallow) into renewable diesel, which is a drop-in fuel that can be used in existing infrastructure and engines. The Dickinson facility was operated as a petroleum refinery until 2020. This is a prime example of how MPC is supporting the energy evolution by using existing assets and workforce to transition to a lower-carbon future.

In the second half of 2022, we expect to begin conversion of our 161,000 bpd Martinez, California, refinery into a 48,000 bpd renewable diesel production facility. When complete, the Martinez facility will be one of the largest renewable diesel production facilities in the world.

Leading up to approval, we entered into an agreement with Neste to form a joint venture for the Martinez Renewable Fuels facility. MPC and Neste will leverage their complementary core competencies in the joint venture. MPC brings experience in renewable diesel facility conversion, large capital project execution and operating expertise. Neste brings knowledge in sustainable feedstock sourcing and renewable liquid fuels production. The joint venture reflects both partners' commitment to obtain low-carbon intensity feedstocks to achieve the project objectives of providing fuels that meet the demand driven by the LCFS and other similar programs now in place in Canada, Oregon and Washington. The Martinez facility is currently targeted to have a production capacity of 260 million gallons per year of renewable diesel in late 2022, with pretreatment capabilities to come online in 2023. The facility is expected to be capable of producing 730 million gallons of renewable diesel per year by the end of 2023. Estimated total project costs for Martinez are approximately $1.2 billion.

MPC is projected to become one of the largest global producers of renewable diesel in early 2024

MPC Renewable Fuels Production Increases 2019-2025
(Equity Share)



MPC is producing renewable diesel with a carbon intensity **~50% lower than conventional diesel**

Martinez Renewable Diesel Facility

730 MILLION gallons/year capacity by 2024

Will become one of the **LARGEST** renewable diesel facilities in the world

Dickinson Renewable Diesel Facility

184 MILLION gallons/year capacity

2ND LARGEST in the U.S.

Advanced Biofuels Research and Development

Virent – Advancing Toward Commercialization

Virent, Inc., is a wholly-owned subsidiary of MPC, working to commercialize its BioForming® platform for converting bio-based feedstocks into low-carbon renewable fuels and chemicals. The BioForming platform is a pioneering technology poised to contribute to the energy evolution. It has the potential to make a broad impact on the future bioeconomy by providing pathways for producing both renewable fuels and chemicals from the carbohydrate portion of plants in order to achieve lower carbon products.

In December 2021, Virent and MPC contributed to an aviation industry first, partnering with United Airlines to fly an aircraft full of passengers using 100% sustainable aviation fuel (SAF) in one engine and petroleum-based jet fuel in the other. Virent used its BioForming process to produce synthesized aromatic kerosene (SAK), a critical component that made the 100% drop-in SAF possible.

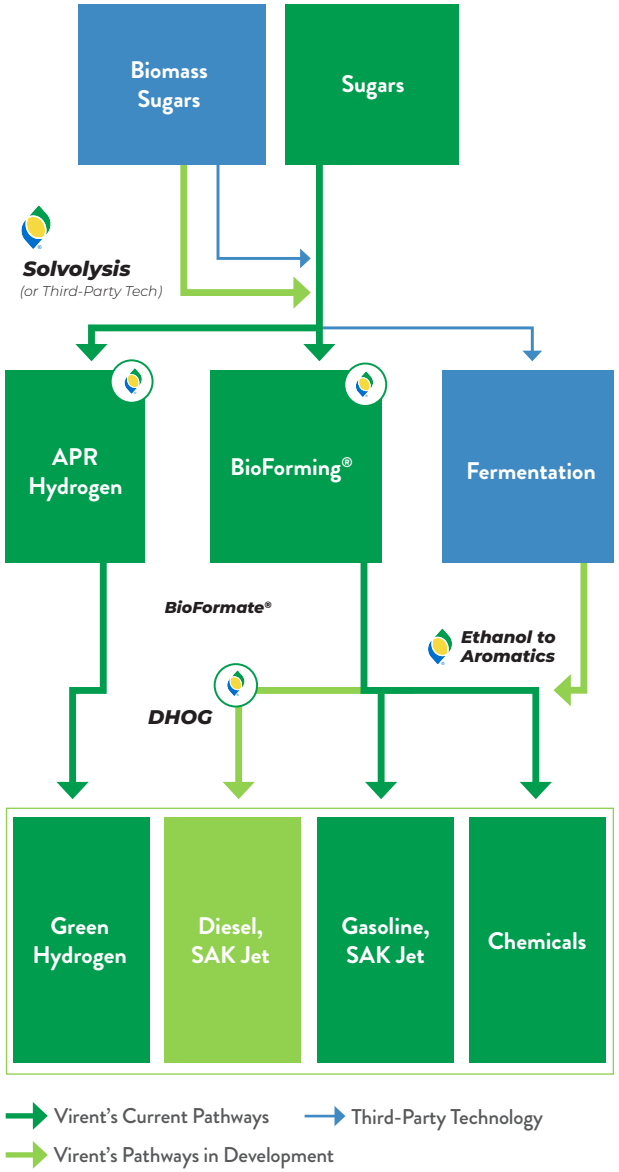
(l-r) MPC Executive Vice President, Refining, Ray Brooks and Virent President and General Counsel Dave Kettner after flying on board the historic Dec. 1 flight, which showed sustainable aviation is possible without modifying modern airline engines.

Virent is also creating new market opportunities by enabling renewable gasoline, which can reduce the carbon intensity of gasoline. Virent's BioForm® gasoline is currently registered with the EPA for use as a gasoline blendstock up to 45% and has the potential to achieve a lower carbon footprint for the gasoline market. A life cycle analysis (LCA) of Virent's BioForm gasoline indicates a greater than 50% carbon intensity reduction, with the potential for it to be competitive with electric vehicles on overall carbon reduction when used in a hybrid vehicle.

Virent has created options for renewable chemicals by expanding the market for 100% bio-based plastics, fibers and films. Most recently, a multinational beverage company's 100% plant-based bottle prototype was developed using Virent's bio-based paraxylene (BioForm PX®), which is made from naturally occurring sugars. Through this future-facing packaging solution, Virent has the potential to contribute to the beverage company's goal to achieve 100% plant-based content.

At its facility in Madison, Wisconsin, Virent's demonstration plant has accrued over 30,000 hours of total operating time, generating process engineering data that will allow for direct scale-up to its first commercial plant. The demonstration plant has the capacity to produce more than 30 tonnes per year of BioFormate® product from sugar feedstocks and approximately 10 tonnes per year of BioForm PX. All products are fully in-spec, certified and have been supplied to various partners for commercial demonstration.

Virent is currently evaluating options with MPC for a first commercial plant and has recently initiated a feasibility assessment.



Carbon Capture, Utilization and Sequestration (CCUS)

MPC and MPLX support the continued development and use of CCUS technology as a strategy to reduce emissions of CO_2 and reduce the carbon intensity of the critical products we supply.

CCUS Alliances

The IPCC and IEA agree that CCUS has a critical role in achieving global greenhouse gas reduction goals. Additionally, CCUS is one of the best options to enable "hard-to-abate" sectors – such as refining, steel and cement – to decarbonize.[1]

CCUS technology has been used in limited applications for decades. To further the goal of large-scale CCUS deployment, alliances of private companies, federal, state and local governments, policy institutions, academia, national laboratories, and others are bringing their resources and expertise to bear. These alliances are a way for key stakeholders to leverage each region's resources and advantages to help make progress toward reducing greenhouse gas emissions.

MPC and MPLX are actively involved in three publicly announced alliances – Houston CCUS, Appalachian Energy Future and the Greater St. Louis and Illinois Regional Clean Energy Hydrogen Hub (St. Louis-Illinois Hub). At present, the Houston alliance is the largest, with 14 companies evaluating how to use safe, proven CCUS technology at Houston-area facilities.

In addition to CCUS, Appalachian Energy Future and the St. Louis-Illinois Hub are also exploring hydrogen energy production and utilization. The hydrogen energy work of these two alliances and other coalitions is a direct response to the 2021 Infrastructure Investment and Jobs Act, which provides initial financial support to several regional hydrogen hubs.

The primary benefit of our work with carbon capture, utilization and sequestration alliances will be accelerating broad-based efforts to reduce greenhouse gas emissions.

Near-term Efforts

- Increase the understanding and importance of CCUS
- Progress enabling legislation and regulations that are foundational for the development of large-scale CCUS projects

~478,000

tonnes of CO_2

captured from MPC and MPLX operations and joint ventures in 2021 for use in

industrial applications

food and beverage industry

Tonnes CO_2 captured

CCUS SITE	
Los Angeles, California, refinery	~150,000
Catcher Ranch, Oklahoma, gas plant	~42,000
Albion, Michigan, ethanol plant	~105,000
Greenville, Ohio, ethanol plant	~101,000
Denison, Iowa, ethanol plant	~80,000
Total CO_2 captured	**~478,000**

[1] Intergovernmental Panel on Climate Change, Special Report: Global Warming of 1.5°C – Strengthening and implementing the global response (April 2022), https://www.ipcc.ch/sr15/. International Energy Agency, Special Report on Carbon Capture Utilization and Storage – CCUS in clean energy transitions (September 2020), available at IEA website.

Managing Physical Risks to Our Facilities

Our facilities are subject to acute physical risks, such as floods, hurricane-force winds, wildfires and winter storms, and chronic physical risks, such as sea-level rise or water shortages. For example, in 2021, our Galveston Bay refinery in Texas City, Texas, was affected by Winter Storm Uri and our Garyville, Louisiana, refinery was affected by Hurricane Ida. The occurrence of these and similar events have had, and may in the future, have an adverse effect on our assets and operations. We have incurred and will continue to incur additional costs to protect our assets and operations from such physical risks and employ the evolving technologies and processes available to mitigate such risks. To the extent such severe weather events or other climate conditions increase in frequency and/or severity, we may be required to modify operations and incur costs that could affect our business.

Managing Acute Physical Risks

Hurricanes and Tropical Storms

Hurricanes and tropical storms pose potential risks to our Gulf Coast assets through excessive winds, storm surge and/or flooding. Efforts to mitigate these weather-related risks include: measures to protect against flooding, hardening infrastructure to protect against wind damage and electrical upgrades to ensure power supply continuity.

External flood and storm surge controls

Our two Gulf Coast refineries and associated logistics assets are protected from storm surge and flooding through external levee and pump station systems.

Our Galveston Bay refinery is protected by an external levee and pump station system that protects 36 square miles of land in the Texas City area. This levee, ranging in height from 19 to 23 feet, has provided adequate protection through several storms, including Hurricane Ike in 2008, which was accompanied by an unprecedented Category 4 storm surge, and Hurricane Harvey in 2017, which was accompanied by record rainfall and region-wide flooding. Neither of these major storms caused any material flooding to our Galveston Bay operations.

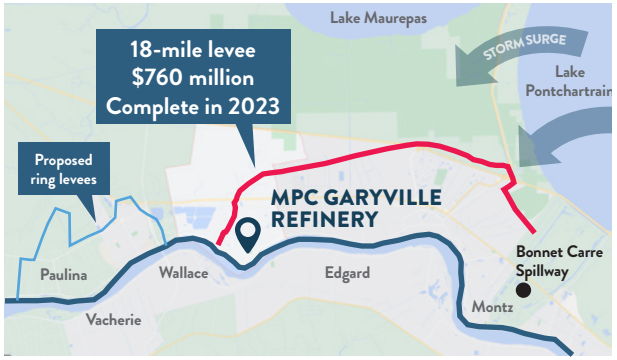
In fact, our Galveston Bay refinery continued to operate throughout Hurricane Harvey, albeit at reduced rates due to interruptions at the ports and pipelines that supply crude to the refinery and transport finished products from the refinery. We were able to quickly increase throughput as ports and pipelines reopened since we did not shut down.

Our Garyville refinery is positioned on a local high point and currently protected by an external levee system that runs along the Mississippi River with several spillways both upstream and downstream of our facility. This system has adequately protected the refinery from significant flooding, including during severe hurricanes like Katrina in 2005, Gustav in 2008 and Ida in 2021. In addition, an 18-mile levee system called the West Shore Lake Pontchartrain Hurricane and Storm Damage Risk Reduction System is currently being constructed by the Pontchartrain Levee District with federal and local funding to protect areas around the refinery from a storm surge in Lake Pontchartrain.

Beyond these external barriers, MPC has implemented additional safeguards within our Gulf Coast operational areas, including locating most pumps and compressors on foundations above grade and adopting hurricane preparedness measures that are implemented well before a storm impacts operations.

Texas City Hurricane Flood Protection

Levee Systems Protecting Garyville Refinery



- Mississippi River levee system
- West Pontchartrain levee system
- Mississippi River spillway (1 of 2)

Managing Acute Physical Risks (continued)

Facility hardening and other measures

Wind and/or water damage to our control systems or electrical motors could lead to significant repair costs or downtime to our Gulf Coast operating sites. In recent years, new centralized control rooms were built at our Garyville and Galveston Bay refineries to withstand wind and storm surges characteristic of the most extreme weather in their respective locations:

- Galveston Bay refinery's centralized control room is built to withstand winds from a Category 5 hurricane and located approximately 20 feet above grade.
- Garyville's centralized control room is built to withstand a Category 3 hurricane and located five feet above grade. This design basis represented worst-case conditions at the refinery based upon thousands of simulated hurricane scenarios making landfall along the Louisiana coast.

These hardening measures ensure the main control systems at our two Gulf Coast refineries remain in good operational standing during extreme weather events. Beyond our control rooms, we also designed process vessels, storage tanks and other logistical assets to withstand significant winds so they typically experience little to no damage even in the most significant hurricanes. On occasion, we have experienced some wind damage to insulation and cooling towers, however, this damage is repairable and has not hindered the restart or operation of our assets.

Electrical infrastructure and power supply

We continue to proactively implement a multiyear program to replace and upgrade electrical infrastructure at our refineries. Improvements include, but are not limited to, cable replacement, high-resistance ground installations, combining substations, installing new safety features and elevating infrastructure to avoid flooding. Our refineries on the U.S. Gulf Coast each have redundant power supplies and historically have experienced few problems maintaining power during severe weather events, including hurricanes. Our other facilities historically exposed to hurricanes or other severe weather – such as fuel terminals and pipeline stations – elevate power infrastructure above historic flood levels and maintain a combination of on-site generators and contracts for rapid procurement of generators in the event of power loss. Notably, in 2017, all our operations in the greater Houston area maintained power throughout Hurricane Harvey and its aftermath.

Pipeline integrity management

MPLX owns, leases or has an ownership interest in ~19,000 miles of pipelines throughout the United States. We continuously monitor and manage the integrity of our pipeline systems based on changing conditions. One of the programs is monitoring stream crossings using a powerful combination of physical inspections and predictive modeling. By doing so, we identify and proactively relocate pipeline segments deeper below waterway beds to reduce risk of future scouring if flow conditions change due to increased rainfall or increased development.

Managing Acute Physical Risks (continued)

Emergency preparedness and response

Beyond maintaining our physical assets, we also prepare and train personnel to respond in the event of an emergency such as a major flood, fire or hurricane. We have a dedicated Emergency Management Group that coordinates preparedness and response activities throughout the company so that we can respond rapidly and appropriately to an emergency incident.

We train personnel in the Incident Command System, a globally recognized organizational structure designed to integrate resources across multiple agencies and organizations when an emergency event occurs. To maintain readiness, we conduct training sessions that include tabletop exercises with a review of our emergency plans and resources. We also conduct periodic training simulations that involve federal organizations, such as the U.S. EPA or the U.S. Coast Guard, state environmental protection or wildlife agencies and local emergency responders.

Our robust programs and procedures allow us to safely maintain our operations throughout severe weather incidents and quickly recover. We have standing agreements in place for alternate workspaces, necessary office equipment and multiple means to maintain internet and telephone connectivity, even during prolonged power outages.

We also have agreements for supplies such as generators, repair materials, water and more. We maintain an emergency mass notification system to communicate with personnel before, during and after an emergency. This information is vital to providing humanitarian aid to our personnel, contractors and local communities.

Our Business Recovery Team (BRT) that responds during emergency situations to maintain transportation fuel supplies to affected areas. The BRT coordinates supply and transportation methods throughout our operational areas. The team's efforts help ensure fuel supplies reach affected areas, facilitating recovery efforts and enabling daily life and normal operations to resume as quickly as possible.

Managing Chronic Physical Risks

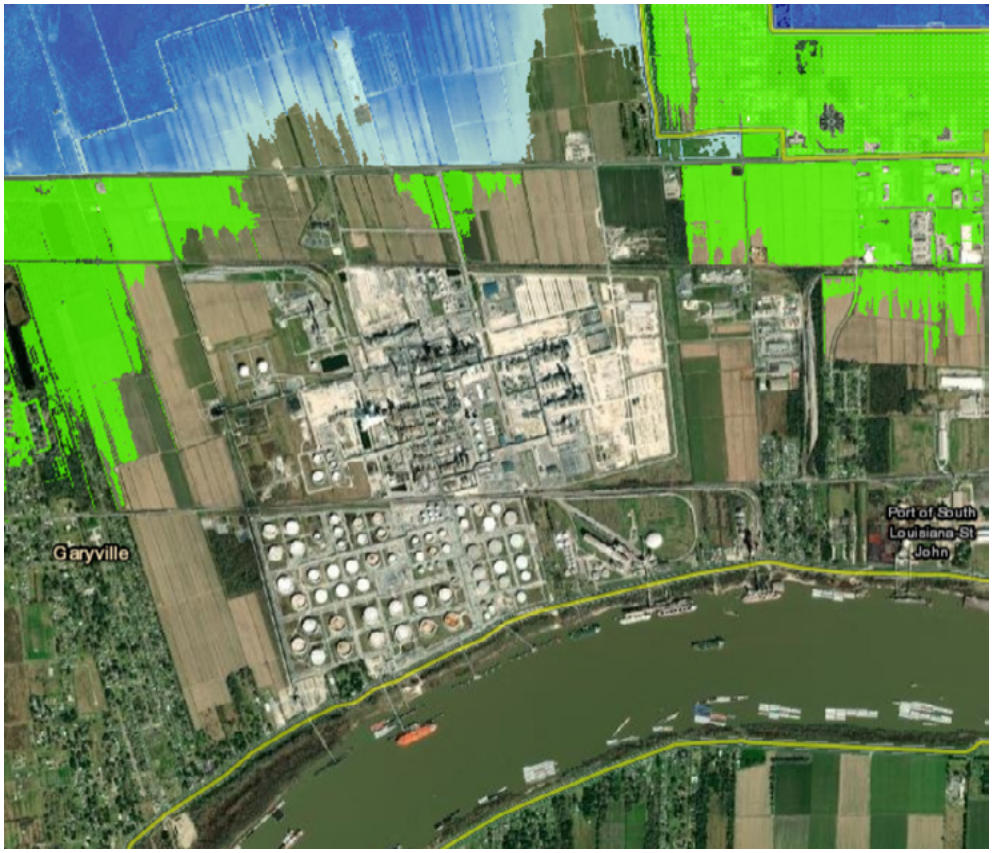
Sea-level rise

In 2019, the IPCC published the Special Report on the Ocean and Cryosphere in a Changing Climate, which included a potential sea level rise in various representative concentration pathway (RCP) scenarios. The high emissions scenario, RCP 8.5, had the highest sea level rise, with a median value of 0.84 meters (2.76 feet) and likely range of 0.61 to 1.1 meters (2.00 to 3.61 feet).

MPC operates five coastal petroleum refineries located in Anacortes, Washington; Garyville, Louisiana; Texas City, Texas (Galveston Bay); Los Angeles, California and Kenai, Alaska. We also have one coastal renewable fuels facility in Martinez, California, and several coastal terminals located in Alaska, California, Florida, Louisiana, Texas and Washington. The National Oceanic and Atmospheric Administration's (NOAA) sea level rise modeling tool can be used to screen for potential flooding levels due to sea level rise. At four feet of sea level rise, which is above the high end of the likely range in the high emissions scenario, flooding is not indicated at the Anacortes, Garyville, Galveston Bay and Los Angeles refineries. The tool did identify a low level of flooding at the northern end of the Martinez facility at Avon Wharf. However, a project was completed in 2017 to upgrade the Avon Marine Terminal to the latest Marine Oil Terminal Engineering & Maintenance Standards that considered potential sea level rise in its design. As part of the permit for the project, a technical memorandum estimating future water levels at the Avon terminal (Simpson, Gumpertz & Heger Inc., 2021) was prepared.[1] The assessment determined that 2030 water levels would increase by approximately 2.7 inches (0.221 feet), resulting from an extreme tide or 100-year flood conditions and that the Avon terminal pipeway infrastructure would not be inundated. The assessment further concluded that, assuming a measured water level rise of approximately 0.1 inch per year, the pipelines would not likely be inundated until 2070, which provides adequate time to monitor and mitigate any potential impacts.

While we can use different scenarios and tools to screen for potential risks, the actual acute and chronic physical risks faced by our facilities in the future are not certain. As such, we have developed mature systems to effectively manage these risks through our ERM process.

Garyville refinery at four feet of sea level rise using NOAA modeling tool



Source: https://coast.noaa.gov/slr/

[1] Contra Costa County, Martinez Renewable Fuels Project, Environmental Impact Report, p. 6-9 (October 2021), available at https://www.contracosta.ca.gov/DocumentCenter/View/72957/Martinez-Refinery-Renewable-Fuels-DEIR-Vol-1-Complete-DEIR

Managing Chronic Physical Risks (continued)

Water availability and drought

Clean freshwater is essential to sustaining life. Our society relies on water for food, health, livelihoods and for fun and leisure. Water is also vital to our operations. It is used to add heat to our refining process (as steam), remove heat from the process (as cooling water), remove impurities from crude oil, protect equipment from corrosion, generate hydrogen, control emissions and clean equipment during maintenance activities.

Water availability is a major concern throughout much of the world, including parts of the U.S., and population growth, together with a changing climate, could further exacerbate water stress. Currently, two MPC refineries – El Paso, Texas, and Los Angeles, California – are located in water-stressed areas as defined by the Global Reporting Initiative and World Resources Institute assessment tools. Our Martinez Renewable Fuels facility, which is in the process of being converted from a petroleum refinery, is also located in a water-stressed area. Once converted, Martinez will use approximately 1 billion fewer gallons of water per year than when operating as a petroleum refinery.

To manage risk surrounding water use, in 2020, we adopted a formal "Focus on Water" program. The program is designed to assess site water use, understand and mitigate water risks and identify opportunities to reduce water use. Toward the program's success, we also established a companywide target to reduce freshwater withdrawal intensity by 20% by 2030 from 2016 levels. To date we have achieved a 15% reduction in intensity below 2016 levels, which equates to over 3.5 billion gallons of freshwater per year. This is equivalent to the annual freshwater used by over 30,000 U.S. households.

Some of the key areas where significant savings were realized include:

- **Ceasing crude oil processing at the Gallup, New Mexico, and Martinez, California, refineries.** Both the Gallup and Martinez refineries were high-intensity water users and high-cost facilities. By rationalizing and repurposing assets, we are also able to reduce our water usage. Once the Martinez facility begins operation as a renewable fuels facility later this year, we expect to see a slight increase in our freshwater withdrawal intensity albeit still much lower than in 2019.
- **Increasing cycles of concentration:** By using a new anti-scaling dispersant in cooling towers at our Los Angeles refinery, we were able to increase the number of times water could be cycled back through the towers, which reduced the amount of freshwater required. Similar programs were implemented at our Galveston Bay refinery in Texas, and Salt Lake City, Utah, refinery, saving millions of gallons per year.
- **Reusing and recycling wastewater effluent:** We continue to operate a temporary reverse osmosis (RO) system during summer months at our Detroit refinery to reuse a portion of the plant's treated effluent. We also continue to recycle municipal wastewater at our Los Angeles, California, and Dickinson, North Dakota, facilities.
- **Optimizing filter backwash:** Backwashing refers to pumping clean freshwater backward through a filter media to clean the filters of particulate matter and other captured impurities. By optimizing the frequency and duration of backwashing, along with using recycled water, we were able to reduce freshwater use at our Galveston Bay refinery in Texas, and Catlettsburg, Kentucky, refinery.

We will continue to use the lessons learned from these and other projects to drive additional improvements to achieve our water reduction goal.

FACILITY DESIGN

Our MPLX gas processing plants are designed to use little to no water in their routine operations. Instead of using steam for heating and water for cooling, nearly all our gas processing facilities use hot oil heaters that transfer heat to the process and air-cooling units (called fin fans) that circulate hot product through air-cooled radiators. These measures eliminate the need for cooling towers and steam boilers that rely on fresh water.

		Unit of Measure	2014	2016	2019	2020	2021
GREENHOUSE GAS METRICS[1][2]							
Activity							
1	MPC Refining manufacturing inputs	million boe	1,026	1,075	1,142	940	**1,012**
2	MPLX G&P gas plant manufacturing inputs	million boe	332	513	675	687	**670**
3	Total MPC and MPLX manufacturing inputs	million boe	1,358	1,588	1,817	1,627	**1,682**
4	MPLX G&P gas gathering throughput	billion scf	-	1,541	2,178	1,951	**1,873**
5	MPLX G&P gas processing throughput	billion scf	-	2,366	3,062	3,088	**3,004**
Scope 1 GHG emissions[3][4]							
6	MPC Refining scope 1 GHG emissions	million tonnes CO_2e	31.4	32.4	31.0	26.7	**27.5**
7	MPLX G&P scope 1 GHG emissions	million tonnes CO_2e	3.3	4.8	5.4	5.0	**5.0**
8	MPLX L&S scope 1 GHG emissions	million tonnes CO_2e	0.3	0.4	0.3	0.4	**0.5**
9	MPC Other scope 1 GHG emissions	million tonnes CO_2e	0.04	0.03	0.06	0.04	**0.03**
10	Total MPC and MPLX scope 1 GHG emissions	million tonnes CO_2e	35.0	37.7	36.8	32.2	**33.0**
11	Total scope 1 biogenic CO_2 emissions	million tonnes biogenic CO_2	0.0	0.0	0.0	0.0	**0.1**
Scope 2 GHG emissions (location-based)[4][5]							
12	MPC Refining scope 2 GHG emissions	million tonnes CO_2e	4.3	4.4	4.0	3.8	**3.5**
13	MPLX G&P scope 2 GHG emissions	million tonnes CO_2e	1.9	2.9	3.2	3.3	**2.7**
14	MPLX L&S scope 2 GHG emissions	million tonnes CO_2e	0.6	0.7	0.6	0.5	**0.6**
15	MPC Other scope 2 GHG emissions	million tonnes CO_2e	0.4	0.5	0.4	0.4	**0.1**
16	Total MPC and MPLX scope 2 GHG emissions	million tonnes CO_2e	7.1	8.5	8.2	8.0	**6.9**
Scope 2 GHG emissions (market-based)[4][5]							
17	MPC Refining scope 2 GHG emissions	million tonnes CO_2e	4.3	4.4	4.0	3.8	**3.5**
18	MPLX G&P scope 2 GHG emissions	million tonnes CO_2e	1.9	2.9	3.2	3.3	**2.7**
19	MPLX L&S scope 2 GHG emissions	million tonnes CO_2e	0.6	0.7	0.6	0.5	**0.6**
20	MPC Other scope 2 GHG emissions	million tonnes CO_2e	0.4	0.5	0.4	0.4	**0.1**
21	Total MPC and MPLX scope 2 GHG emissions	million tonnes CO_2e	7.1	8.5	8.2	8.0	**6.9**
Scope 3 GHG emissions[4][6]							
22	MPC scope 3 category 11 GHG emissions (refinery yield method)	million tonnes CO_2e	-	-	426	352	**379**
23	Biogenic MPC scope 3 category 11 GHG emissions (refinery yield method)	million tonnes biogenic CO_2	-	-	1	1	**2**

		Unit of Measure	2014	2016	2019	2020	2021
GHG Intensities							
24	MPC Refining scope 1 & 2 GHG intensity[7]	tonnes CO_2e / thousand boe input	33.7	33.1	29.5	31.2	**29.3**
25	MPLX G&P scope 1 & 2 GHG intensity	tonnes CO_2e / thousand boe input	15.6	15.0	12.7	12.1	**11.5**
26	MPC total scope 1 & 2 GHG intensity[8]	tonnes CO_2e / thousand boe input	29.9	28.0	23.8	23.7	**22.9**
27	MPC total scope 1 & 2 GHG intensity[8]	reduction from 2014 baseline	-	-6%	-21%	-21%	**-23%**
Methane							
28	MPLX G&P gas gathering methane emissions	thousand tonnes CH_4	-	24.1	18.4	23.2	**15.2**
29	MPLX G&P gas processing methane emissions	thousand tonnes CH_4	-	3.8	7.9	4.5	**3.5**
30	MPLX G&P total methane emissions	thousand tonnes CH_4	-	28.0	26.3	27.7	**18.7**
31	MPLX G&P gas gathering methane emissions	billion scf CH_4	-	1.26	0.96	1.21	**0.79**
32	MPLX G&P gas processing methane emissions	billion scf CH_4	-	0.20	0.41	0.24	**0.18**
33	MPLX G&P total methane emissions	billion scf CH_4	-	1.46	1.37	1.45	**0.98**
34	MPLX G&P gas gathering methane emissions intensity	methane (scf) / natural gas input (scf)	-	0.082%	0.044%	0.062%	**0.042%**
35	MPLX G&P gas processing methane emissions intensity	methane (scf) / natural gas input (scf)	-	0.008%	0.013%	0.008%	**0.006%**
36	MPLX G&P combined methane emissions intensity	methane (scf) / natural gas input (scf)	-	0.037%	0.026%	0.029%	**0.020%**
37	MPLX G&P combined methane emissions intensity	reduction from 2016 baseline	-	-	-30%	-22%	**-46%**
WATER (MPC AND MPLX COMBINED)							
38	Total freshwater withdrawal	thousand megaliters	-	150	157	139	**135**
39	Total water discharge	thousand megaliters	-	83	89	82	**79**
40	Total freshwater withdrawal in stressed areas	thousand megaliters	-	38	40	32	**31**
41	Total water discharge in stressed areas	thousand megaliters	-	21	21	18	**16**
42	Freshwater withdrawal intensity	megaliters / million boe input	-	94	87	85	**80**
43	Freshwater withdrawal intensity	reduction from 2016 baseline	-	-	-7%	-10%	**-15%**

(1) Data before 2019 inclusive of facilities that MPC did not yet own so that performance can be compared across the same asset base over time.

(2) GHG and Water data reported for facilities of which MPC has operational control.

(3) Scope 1 direct GHG emissions include those from Refining, Midstream and Retail/other and are typically calculated per the EPA's Mandatory Greenhouse Gas Reporting Program or the 2009 API Compendium of Greenhouse Gas Emissions Methodologies for the Oil and Natural Gas Industry. Global Warming Potentials used are from Table A-1 to Subpart A of 40 CFR Part 98 as of the year they were reported. It includes emissions from fuel combustion, company vehicles and fugitive emissions.

(4) Inclusive of carbon dioxide (CO_2), methane (CH_4), nitrous oxide (N_2O) and sulfur hexafluoride (SF_6). Nitrogen trifluoride (NF_3), hydrofluorocarbons (HFC), and perfluorocarbons (PFC) emissions are considered to not be significant to our operations and are therefore excluded.

(5) Scope 2 emissions include indirect GHG emissions from consumption of purchased electricity, heat or steam.

(6) MPC estimates emissions from third-party use of sold products in alignment with methods in Category 11 of IPIECA's Estimating Petroleum Industry Value Chain (Scope 3) Greenhouse Gas Emissions (2016). Emission estimates are based on refinery yields as stated in MPC's Annual Report on Form 10-K, emission factors from EPA's GHG Emission Factors Hub at the EPA Center for Corporate Climate Leadership, and storage factors derived from Table 3-22 and Annex 2 of EPA's Inventory of U.S. Greenhouse Gas Emissions and Sinks.

(7) Excludes GHGs assoicated with exported power from cogeneration units.

(8) Excludes Retail and GHGs assoicated with exported power from cogeneration units.

The external assurance statement from LRQA relating to our GHG data is available at https://www.marathonpetroleum.com/htmlEmails/LRQA/June_2021_MPC_Lloyds_Assurance_Statement.pdf

TCFD Recommendations

The table below shows how the disclosures in this report align with the recommendations of the Financial Stability Board's Task Force on Climate-related Financial Disclosures (TCFD), as the TCFD has described the categories, and where the relevant information can be found in this report.

TCFD RECOMMENDATION		SECTION	PAGE
Governance			
Disclose the organization's governance around climate-related risks and opportunities.	Describe the board's oversight of climate-related risks and opportunities.	**Governance: Board of Directors**	**6**
	Describe management's role in assessing and managing climate-related risks and opportunities.	**Governance: Executive Leadership**	**6**
Strategy			
Disclose the actual and potential impacts of climate-related risks and opportunities on the organization's businesses, strategy and financial planning where such information is material.	Describe the climate-related risks and opportunities the organization has identified over the short, medium and long term.	**Business Strategy and Climate-Related Scenario Planning**	**16-31**
	Describe the impact of climate-related risks and opportunities on the organization's businesses, strategy and financial planning.	**Planning for the Energy Evolution** **Business Planning and Capital Allocation**	**8** **9**
	Describe the resilience of the organization's strategy, taking into consideration different climate-related scenarios, including a 2°C or lower scenario.	**Business Strategy and Climate-Related Scenario Planning**	**16-31**
Risk Management			
Disclose how the organization identifies, assesses and manages climate-related risks.	Describe the organization's processes for identifying and assessing climate-related risks.	**Governance**	**6-7**
	Describe the organization's processes for managing climate-related risks.	**Risk Management** **Physical Risks**	**32-36**
	Describe how processes for identifying, assessing and managing climate-related risks are integrated into the organization's overall risk management.	**Risk Management**	**7**
Metrics and Targets			
Disclose the metrics and targets used to assess and manage relevant climate-related risks and opportunities where such information is material.	Disclose the metrics used by the organization to assess climate-related risks and opportunities in line with its strategy and risk management process.	**Climate-Related Metrics and Targets**	**10**
	Disclose Scope 1, Scope 2, and, if appropriate, Scope 3 greenhouse gas (GHG) emissions, and the related risks.	**Greenhouse Gas Metrics**	**37-38**
	Describe the targets used by the organization to manage climate-related risks and opportunities and performance against targets.	**Climate-Related Metrics and Targets**	**11-15**

ENERGY STAR AWARD 2022
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2021 Accomplishments

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- ★Fifth consecutive Partner of the Year Award
- ★Third consecutive Partner of the Year Sustained Excellence Award

Five Refineries ENERGY STAR Certified

- ★Anacortes, Washington (2 years)
- ★Canton, Ohio (16 years)
- ★Garyville, Louisiana (16 years)
- ★Robinson, Illinois (7 years)
- ★St. Paul Park, Minnesota (4 years)

Four Additional Terminals Achieved the ENERGY STAR Challenge for Industry (10 Total)

- ★Cincinnati, Ohio
- ★Jackson, Michigan
- ★Lansing, Michigan
- ★Muncie, Indiana

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Forward looking Statements

This publication includes forward-looking statements regarding Marathon Petroleum Corporation (MPC) and MPLX LP (MPLX). You can identify forward-looking statements by words such as "anticipate," "believe," "commitment," "could," "design," "estimate," "expect," "forecast," "goal," "guidance," "imply," "intend," "may," "objective," "opportunity," "outlook," "plan," "policy," "position," "potential," "predict," "priority," "project," "proposition," "prospective," "pursue," "seek," "should," "strategy," "target," "would," "will," or other similar expressions that convey the uncertainty of future events or outcomes. We have based our forward-looking statements on our current expectations, estimates and projections about our business and industry. We caution that these statements are not guarantees of future performance and you should not rely unduly on them, as they involve risks, uncertainties and assumptions. While our management considers these assumptions to be reasonable, they are inherently subject to significant business, economic, competitive, regulatory and other risks, contingencies and uncertainties, most of which are difficult to predict and many of which are beyond our control. Factors that could cause actual results to differently materially from the future performance that we have expressed or forecast in our forward-looking statements include but are not limited to: general economic, political or regulatory developments, including inflation, changes in governmental policies relating to refined petroleum products, crude oil, natural gas or NGLs, or taxation; our ability to complete the conversion of the Martinez, California, refinery into a renewable fuels facility, within the expected timeframe or at all; the magnitude, duration and extent of future resurgences of the COVID-19 pandemic and its effects; and the factors set forth under the heading "Risk Factors" in MPC's and MPLX's Annual Reports on Form 10-K for the year ended Dec. 31, 2021, and in other filings with the Securities and Exchange Commission (SEC). Any forward-looking statement speaks only as of the date of the applicable communication and we undertake no obligation to update any forward-looking statement except to the extent required by applicable law. Copies of MPC's filings with the SEC are available on the SEC's website, MPC's website at https://www.marathonpetroleum.com/Investors/ or by contacting MPC's Investor Relations office. Copies of MPLX's filings with the SEC are available on the SEC's website, MPLX's website at http://ir.mplx.com or by contacting MPLX's Investor Relations office.